ROAD REPAIR AND ACCOUNTABILITY ACT OF 2017
PROJECT BASELINE AGREEMENT
California-Mexico Border System Network Improvements (6 Projects)

Resolution TLEP-P-1819-03B SHOPP-P-1819-02B
(will be completed by CTC)

1. FUNDING PROGRAM

Active Transportation Program

Local Partnership Program (Competitive)

Solutions for Congested Corridors Program

State Highway Operation and Protection Program

Trade Corridor Enhancement Program

2. PARTIES AND DATE

2.1 This Project Baseline Agreement (Agreement) for the *California-Mexico Border System Network Improvements (6 Projects)*, effective on, August 15, 2018 (will be completed by CTC), is made by and between the California Transportation Commission (Commission), the California Department of Transportation (Caltrans), the Project Applicant, *Caltrans, SANDAG, ICTC*, and the Implementing Agency, *Caltrans*, sometimes collectively referred to as the "Parties".

3. RECITAL

3.2 Whereas at its March 21, 2018 and May 16, 2018 meeting the Commission approved the State Highway Operation and Protection Program, Trade Corridor Enhancement Program, and included in this program of projects the *California-Mexico Border System Network Improvements (6 Projects)*, the parties are entering into this Project Baseline Agreement to document the project cost, schedule, scope and benefits, as detailed on the Project Programming Request Form attached hereto as Exhibit A and the Project Report attached hereto as Exhibit B, as the baseline for project monitoring by the Commission.

3.3 The undersigned Project Applicant certifies that the funding sources cited are committed and expected to be available; the estimated costs represent full project funding; and the scope and description of benefits is the best estimate possible.

4. GENERAL PROVISIONS

The Project Applicant, Implementing Agency, and Caltrans agree to abide by the following provisions:

4.1 To meet the requirements of the Road Repair and Accountability Act of 2017 (Senate Bill [SB] 1, Chapter 5, Statutes of 2017) which provides the first significant, stable, and on-going increase in state transportation funding in more than two decades.

4.2 To adhere, as applicable, to the provisions of the Commission:

Resolution *Insert Number*, "Adoption of Program of Projects for the Active Transportation Program", dated

Resolution *Insert Number*, "Adoption of Program of Projects for the Local Partnership Program", dated

Resolution *Insert Number*, "Adoption of Program of Projects for the Solutions for Congested Corridors Program", dated

Resolution G-18-13, "Adoption of Program of Projects for the State Highway Operation and Protection Program", dated March 22, 2018

Resolution TCEP-1718-01, "Adoption of Program of Projects for the Trade Corridor Enhancement Program", dated May 16, 2018

4.3 All signatories agree to adhere to the Commission's Trade Corridor Enhancement Program, Guidelines. Any conflict between the programs will be resolved at the discretion of the Commission.

4.4 All signatories agree to adhere to the Commission's SB 1 Accountability and Transparency Guidelines and policies, and program and project amendment processes.

4.5 SANDAG, ICTC, and Caltrans agrees to secure funds for any additional costs of the project.

4.6 SANDAG, ICTC, and Caltrans agrees to report to Caltrans on a quarterly basis; after July 2019, reports will be on a semi-annual basis on the progress made toward the implementation of the project, including scope, cost, schedule, outcomes, and anticipated benefits.

4.7 Caltrans agrees to prepare program progress reports on a quarterly basis; after July 2019, reports will be on a semi-annual basis and include information appropriate to assess the current state of the overall program and the current status of each project identified in the program report.

4.8 SANDAG, ICTC, and Caltrans agrees to submit a timely Completion Report and Final Delivery Report as specified in the Commission's SB 1 Accountability and Transparency Guidelines.

4.9 All signatories agree to maintain and make available to the Commission and/or its designated representative, all work related documents, including without limitation engineering, financial and other data, and methodologies and assumptions used in the determination of project benefits during the course of the project, and retain those records for four years from the date of the final closeout of the project. Financial records will be maintained in accordance with Generally Accepted Accounting Principles.

4.10 The Transportation Inspector General of the Independent Office of Audits and Investigations has the right to audit the project records, including technical and financial data, of the Department of Transportation, the Project Applicant, the Implementing Agency, and any consultant or sub-consultants at any time during the course of the project and for four years from the date of the final closeout of the project, therefore all project records shall be maintained and made available at the time of request. Audits will be conducted in accordance with Generally Accepted Government Auditing Standards.

5. SPECIFIC PROVISIONS AND CONDITIONS

5.1 Project Schedule and Cost
See Project Programming Request Form, attached as Exhibit A.

5.2 Project Scope
See Project Report or equivalent, attached as Exhibit B. At a minimum, the attachment shall include the cover page, evidence of approval, executive summary, and a link to or electronic copy of the full document.

5.3 Other Project Specific Provisions and Conditions

Attachments:

Exhibit A: Project Programming Request Form
Exhibit B: Project Report

SIGNATURE PAGE
TO
PROJECT BASELINE AGREEMENT

California-Mexico Border System Network Improvements (6 Projects)

Resolution TCEP-P-1819-03B SHOPP-P-1819-02B

Timothy M. Gubbins — Date 6/26/18

Interim District Director

California Department of Transportation, Implementing Agency

Laurie Berman — Date 7-23-18

Director

California Department of Transportation

Susan Bransen — Date 8/15/18

Executive Director

California Transportation Commission

SIGNATURE PAGE
TO
PROJECT BASELINE AGREEMENT

California-Mexico Border System Network Improvements (6 Projects)

Resolution TLEP-P-1819-03B SHOPP-P-1819-02B

Kim Kawada

6-20-2018
Date

San Diego Association of Governments, SANDAG

Chief Deputy Executive Director

Project Applicant

SIGNATURE PAGE
TO
PROJECT BASELINE AGREEMENT

California-Mexico Border System Network Improvements (6 Projects)

Resolution TLEP-P-1819-03B SHOPP-P-1819-02B

Mark Baza 6/18/18

Mark Baza Date

Imperial County Transportation Commission, ICTC

Executive Director

Project Applicant

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
PROJECT PROGRAMMING REQUEST
DTP-0001 (Revised Mar, 1 2018 v7.08)

General Instructions

Amendment (Existing Project) Y/N					Date: 05/30/18
District	**EA**	**Project ID**	**PPNO**	**MPO ID**	**Alt Proj. ID / prg.**
11	28883	1117000088	1036		

County	**Route/Corridor**	**PM Bk**	**PM Ahd**	**Project Sponsor/Lead Agency**	
SD	905	9.8	9.8	Caltrans	
SD	125	0.8	0.8	**MPO**	**Element**
				SANDAG	CO

Project Manager/Contact	**Phone**	**E-mail Address**
Mario Orso	(619)688-2561	mario.orso@dot.ca.gov

Project Title

1-Southbound State Route 125 to Westbound State Route 905 Connector

Location (Project Limits), Description (Scope of Work)

In San Diego County, in and near San Diego at Route 125/905 separation. Construct freeway to freeway connector.

Component	**Implementing Agency**
PA&ED	Caltrans
PS&E	Caltrans
Right of Way	Caltrans
Construction	Caltrans

Legislative Districts

Assembly:	80	**Senate:**	40	**Congressional:**	51

Project Benefits

The Project will complete the remaining connector needed to integrate three major state roads serving the border region just north of the Otay Mesa POE at the U.S.-Mexico border, and will contribute to a safer and efficient border highway network that will alleviate congestion while providing predictability and reliability for cross border international freight movements. SEE PAGE 2 FOR CONTINUATION OF PROJECT BENEFITS.

Purpose and Need

The Project will construct a freeway connector providing greater mobility and access to the SR-905 corridor and the border region, completing the SR-125/SR-905/SR-11 interchange. This freeway connector represents a critical link in the San Diego region facilitating the movement of people and goods, serving the border area. There is no direct connector linking southbound SR-125 to westbound SR-905. SEE PAGE 2 FOR CONTINUATION OF PURPOSE AND NEED

Category	**Outputs/Outcomes**	**Unit**	**Total**
State Highway Road Construction	Modified / Improved Interchanges	each	1

ADA Improvements No	Bike/Ped Improvements No	Reversible Lane analysis Yes
Inc. Sustainable Communities Strategy Goals Yes		Reduces Greenhouse Gas Emissions Yes

Project Milestone	**Existing**	**Proposed**
Project Study Report Approved		
Begin Environmental (PA&ED) Phase		
Circulate Draft Environmental Document — **Document Type**		
Draft Project Report		
End Environmental Phase (PA&ED Milestone)		07/30/04
Begin Design (PS&E) Phase		08/11/17
End Design Phase (Ready to List for Advertisement Milestone)		08/15/19
Begin Right of Way Phase		09/11/17
End Right of Way Phase (Right of Way Certification Milestone)		08/15/19
Begin Construction Phase (Contract Award Milestone)		03/02/20
End Construction Phase (Construction Contract Acceptance Milestone)		04/04/22
Begin Closeout Phase		04/04/22
End Closeout Phase (Closeout Report)		10/25/24

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Additional Information

PROJECT BENEFITS cont'd: The Project is a net positive on the freight system in that throughput, velocity and travel time reliability will be improved. Safety is addressed as this direct freeway access ramp will lift trucks off local roads. The community has long advocated for removal of truck traffic from the local roads to improve both safety and congestion concerns.

Southbound State Route 125 to Westbound State Route 905 Connector: Construct freeway to freeway South-West Connector, completing the SR-905/SR-125/SR-11 Interchange and immediately accommodating southbound commercial traffic from SR 125 heading west on SR 905. This component also improves local traffic circulation by completing a needed interchange for the community. Two-way traffic on this connector will be roughly 10,000 ADT in the first year, rising to about 15,000 in year 20.

A total of 14,097 tons of all emissions will be reduced over 20 years.

PURPOSE AND NEED cont'd: Vehicles that need to make this movement are forced to use local roads. This has resulted in significant congestion, pollution and safety challenges in the surrounding communities.

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STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08)

Date: 05/30/18

District	County	Route	EA	Project ID	PPNO	Alt. ID
11	SD, SD,	905, 125,	28883	1117000088	1036	
Project Title:	1-Southbound State Route 125 to Westbound State Route 905 Connector					

Existing Total Project Cost ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Implementing Agency
E&P (PA&ED)									Caltrans
PS&E									Caltrans
R/W SUP (CT)									Caltrans
CON SUP (CT)									Caltrans
R/W									Caltrans
CON									Caltrans
TOTAL									
Proposed Total Project Cost ($1,000s)									**Notes**
E&P (PA&ED)									
PS&E	4,857							4,857	
R/W SUP (CT)									
CON SUP (CT)			5,000					5,000	
R/W									
CON			26,400					26,400	
TOTAL	4,857		31,400					36,257	

Fund No. 1:	State SB1 TCEP - Trade Corridors Enhancement Account (TCEA) – Regional share								Program Code
Existing Funding ($1,000s)									20.XX.723.200
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)			5,000					5,000	
R/W									
CON			16,980					16,980	
TOTAL			21,980					21,980	

Fund No. 2:	Demo - Demonstration-State TEA21 (DEMOS21)								Program Code
Existing Funding ($1,000s)									20.30.010.680
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E	4,857							4,857	
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL	4,857							4,857	

Fund No. 3:	Local Funds - Local Transportation Funds (LTF) SR-125 Toll Revenue								Program Code
Existing Funding ($1,000s)									20.10.400.100
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									San Diego Association of Governm
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									SR-125 is a toll road operated by SANDAG. The SR-125 plan of finance includes the $9.42 million.
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON			9,420					9,420	
TOTAL			9,420					9,420	

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
PROJECT PROGRAMMING REQUEST
DTP-0001 (Revised Mar, 1 2018 v7.08) *General Instructions*

Amendment (Existing Project) Y/N					Date: 06/04/18
District	**EA**	**Project ID**	**PPNO**	**MPO ID**	**Alt Proj. ID / prg.**
11	05637	1117000087	0999E		

County	Route/Corridor	PM Bk	PM Ahd	Project Sponsor/Lead Agency	
SD	11	2.0	2.7	San Diego Association of Governments (SANDAG)	
				MPO	**Element**
				SANDAG	CO

Project Manager/Contact	Phone	E-mail Address
Jacqueline Appleton-Deane	(619)688-3080	mario.orso@dot.ca.gov

Project Title

2-Siempre Viva Interchange and Site Preparation Design for Commercial Vehicle Enforcement Facility, Segment 2B

Location (Project Limits), Description (Scope of Work)

In San Diego County near San Diego at 1.9 miles east of Sanyo Avenue undercrossing - Construct Interchange at Siempre Viva Road and site preparation design for CVEF. Design work for CVEF includes: grading, drainage and utilities.

Component	Implementing Agency
PA&ED	Caltrans
PS&E	Caltrans
Right of Way	Caltrans
Construction	Caltrans

Legislative Districts

Assembly:	80	Senate:	40	Congressional:	51

Project Benefits

1) Increased Safety for DHS/CHP personnel with the addition of the new POE and CVEF and its improved design and circulation for trucks to/from and through U.S. and Mexico Inspections, enhance pedestrian safety within the POE facility.
2) 58% increased average truck velocity (12 to 19 mph) SEE PAGE 2 FOR A CONTINUATION OF BENEFITS

Purpose and Need

The Siempre Viva Interchange will serve as the last southbound interchange point on SR 11 for passenger vehicles and trucks approaching the new OME POE. It will also serve as the first northbound interchange point for passenger vehicles entering the U.S., and for trucks exiting the CVEF. SEE PAGE 2 FOR A CONTINUATION OF PURPOSE AND NEED.

Category	Outputs/Outcomes	Unit	Total
State Highway Road Construction	New Interchanges	each	1
State Highway Road Construction	Local road operational Improvements	each	1

ADA Improvements No	Bike/Ped Improvements No	Reversible Lane analysis Yes
Inc. Sustainable Communities Strategy Goals Yes		Reduces Greenhouse Gas Emissions Yes

Project Milestone			Existing	Proposed
Project Study Report Approved				
Begin Environmental (PA&ED) Phase			05/30/2007	
Circulate Draft Environmental Document	Document Type	EIR	12/11/2010	
Draft Project Report			12/11/2010	
End Environmental Phase (PA&ED Milestone)			04/01/2012	03/29/12
Begin Design (PS&E) Phase			11/01/2011	08/16/18
End Design Phase (Ready to List for Advertisement Milestone)			04/22/2018	04/15/19
Begin Right of Way Phase			04/13/2015	07/01/18
End Right of Way Phase (Right of Way Certification Milestone)			04/01/2018	04/12/19
Begin Construction Phase (Contract Award Milestone)			07/30/2018	10/15/19
End Construction Phase (Construction Contract Acceptance Milestone)			07/20/2020	06/01/21
Begin Closeout Phase			07/20/2020	08/20/21
End Closeout Phase (Closeout Report)			07/30/2021	10/23/23

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Additional Information

DESCRIPTION Please note the Commerical Vehicle Enforcement Facility will not be constructed with this project.

PROJECT BENEFITS cont'd: 3) Increased throughput by the addition of the new border crossing. 4) 67% reduction in truck cross-border idle time from 80 to 30 minutes. 5) 38% truck traffic congestion reduction in 2015 (6,400 to 4,000 ADT at Otay Mesa POE) 40% truck congestion reduction in 2035 (11,500 to 6,900 ADT at Otay Mesa POE). 6) Improved freeway/arterial operations for truck trips would result in emission reductions.

Siempre Viva Interchange at State Route 11 and Commercial Vehicle Enforcement Facility site preparation - This component will complete the final piece of SR 11 roadway including construction of the interchange at Siempre Viva Road. This component also improves local traffic circulation by completing a needed interchange for the community. An estimated 4,000 vehicles daily will use the interchange, with 25 percent of that being truck traffic. Forecasts indicate that 1,300 trucks (700 northbound and 600 southbound) are expected to use the CVEF daily.

A total of 13,585 tons of total emissions will be reduced over 20 years.

PURPOSE AND NEED cont'd: The project will decrease border wait times and congestion by adding capacity to the regional border crossing infrastructure and creating a link between the U.S. highway system and the Mexico free and tollroad systems. This link will maintain the economic viability of goods movement through the California/Baja California region.

PROJECT MILESTONE: Begin Design (PS&E) Phase milestone is delayed one month as the phase cannot begin before allocation of funds in August of 2018.

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STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08)

Date: 06/04/18

District	County	Route	EA	Project ID	PPNO	Alt. ID
11	SD	11, ,	05637	1117000087	0999E	
Project Title:	2-Siempre Viva Interchange and Site Preparation Design for Commercial Vehicle Enforcement Facility, Segment 2B					

Existing Total Project Cost ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Implementing Agency
E&P (PA&ED)									Caltrans
PS&E	17,500	8,911						26,411	Caltrans
R/W SUP (CT)	2,100							2,100	Caltrans
CON SUP (CT)			14,500					14,500	Caltrans
R/W	44,600							44,600	Caltrans
CON			92,036					92,036	Caltrans
TOTAL	64,200	8,911	106,536					179,647	
Proposed Total Project Cost ($1,000s)									**Notes**
E&P (PA&ED)									
PS&E		4,810						4,810	
R/W SUP (CT)									
CON SUP (CT)			5,096					5,096	
R/W									
CON			27,212					27,212	
TOTAL		4,810	32,308					37,118	

Fund No. 1:	Local Funds - Local Transportation Funds (LTF)								Program Code
Existing Funding ($1,000s)									20.10.400.100
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									San Diego Association of Governm
PS&E		8,911						8,911	
R/W SUP (CT)									
CON SUP (CT)			14,500					14,500	
R/W									
CON			92,036					92,036	
TOTAL		8,911	106,536					115,447	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 2:	Federal Disc. - COORDINATED BORDER INFRASTRUCTURE PROGRAM (CBIP)								Program Code
Existing Funding ($1,000s)									20.XX.400.300
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									Caltrans
PS&E	17,500							17,500	$9200 RW voted 01/21/16
R/W SUP (CT)	2,100							2,100	
CON SUP (CT)									
R/W	9,200							9,200	
CON									
TOTAL	28,800							28,800	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 3:	Federal Disc. - Corridor Border Infrastructure (CBI)								Program Code
	Existing Funding ($1,000s)								20.XX.400.301
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									Caltrans
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W	35,400							35,400	
CON									
TOTAL	35,400							35,400	
	Proposed Funding ($1,000s)								Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 4:	State SB1 TCEP - Trade Corridors Enhancement Account (TCEA) - STATE SHARE								Program Code
	Existing Funding ($1,000s)								20.XX.723.000
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
	Proposed Funding ($1,000s)								Notes
E&P (PA&ED)									
PS&E		4,810						4,810	
R/W SUP (CT)									
CON SUP (CT)			5,096					5,096	
R/W									
CON			27,212					27,212	
TOTAL		4,810	32,308					37,118	

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08)

Complete this page for amendments only

Date: 06/04/18

District	County	Route	EA	Project ID	PPNO	Alt. ID
11	SD	11	05637	1117000087	0999E	

SECTION 1 - All Projects

Project Background

This project is a child of Segment 2 of the SR-11/OME POE project. Segment 2B, Siempre Viva interchange and site preparation of the Commercial Vehicle Enforcement Facility (CVEF) constructs the new interchange at Siempre Viva Road and includes the site preparation (grading, utility placement and drainage) for the CVEF.

Programming Change Requested

It is proposed that Segment 2B (0999E) be split from Segment 2 (0999B) for the design and construction phases. Funds for these phases will be moved from Segment 2 to Segment 2B. Trade Corridor Enhancement Program (TCEP) funds replace the Local funds moved from the parent project as those funds are toll revenue which are backed by bonds that have not yet been realized. To facilitate delivery it was prudent to seek and replace the Local Funds with TCEP funds which are currently available.

Reason for Proposed Change

This project has been split into multiple segments to facilitate construction and to maximize funding opportunities. Originaly segment 2 included roadway improvements from Enrico Fermi to the proposed POE and the Siempre Viva Interchange as well as the CVEF. The proposal is for segment 2B which includes only the Siempre Viva interchange and the CVEF site preparation. The remaining section of the roadway will be constructed under segment 2A which is not part of this application and it is partially funded by FASTLANE grant.

If proposed change will delay one or more components, clearly explain 1) reason the delay, 2) cost increase related to the delay, and 3) how cost increase will be funded

Other Significant Information

SECTION 2 - For SB1 Projects Only

Project Amendment Request (Please follow the individual SB1 program guidelines for specific criteria)

SECTION 3 - All Projects

Approvals

I hereby certify that the above information is complete and accurate and all approvals have been obtained for the processing of this amendment request.*

Name (Print or Type)	Signature	Title	Date
Mario Orso		Trade Corridor Infrastructure Program, Corridor Director	6/28/18

Attachments

1) Concurrence from Implementing Agency and/or Regional Transportation Planning Agency
2) Project Location Map

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
PROJECT PROGRAMMING REQUEST
DTP-0001 (Revised Mar, 1 2018 v7.08)

General Instructions

Amendment (Existing Project) Y/N					Date:	06/05/18
District	**EA**	**Project ID**	**PPNO**	**MPO ID**	**Alt Proj. ID / prg.**	
11	05639	1117000151	0999F			

County	**Route/Corridor**	**PM Bk**	**PM Ahd**	**Project Sponsor/Lead Agency**	
SD	11	2.7	2.7	Caltrans	
				MPO	**Element**
				SANDAG	CO

Project Manager/Contact	**Phone**	**E-mail Address**
Jacqueline Appleton-Deane	(619)688-3080	mario.orso@dot.ca.gov

Project Title

3- Otay Mesa East Port of Entry (OME/POE), Segment 3A

Location (Project Limits), Description (Scope of Work)

In San Diego County near San Diego, on Route 11 at 1.9 miles east of Sanyo Avenue undercrossing. Site preparation design for the OME/POE which includes grading, drainage and utilities.

Component	**Implementing Agency**
PA&ED	Caltrans
PS&E	Caltrans
Right of Way	Caltrans
Construction	Caltrans

Legislative Districts

Assembly:	80	**Senate:**	40	**Congressional:**	51

Project Benefits

1) Increased Safety for DHS personnel with the addition of the new POE and its improved design and circulation for trucks to/from and through U.S. and Mexico inspections, enhance pedestrian safety within the POE facility.
2) 58% increased average truck velocity (12 to 19 mph)
3) Increased throughout by the addition of the new border crossing. SEE PAGE 2 FOR CONTINUATION OF PROJECT BENEFITS.

Purpose and Need

Site preparation for the OME POE is the penultimate critical phase before actual POE construction begins. Currently, commercial truck traffic at the existing Otay Mesa POE currently faces delays that can exceed four hours. SEE PAGE 2 FOR CONTINUATION OF PURPOSE AND NEED

Category	**Outputs/Outcomes**	**Unit**	**Total**
Port	Site Preparation for International Port of Entry	acres	100

ADA Improvements No	Bike/Ped Improvements No	Reversible Lane analysis Yes
Inc. Sustainable Communities Strategy Goals Yes	Reduces Greenhouse Gas Emissions No	

Project Milestone			**Existing**	**Proposed**
Project Study Report Approved				
Begin Environmental (PA&ED) Phase			05/30/2007	
Circulate Draft Environmental Document	**Document Type**	EIR	12/11/2010	
Draft Project Report			12/11/2010	
End Environmental Phase (PA&ED Milestone)			04/01/2012	
Begin Design (PS&E) Phase			11/01/2011	08/16/18
End Design Phase (Ready to List for Advertisement Milestone)			07/01/2013	04/15/19
Begin Right of Way Phase			11/01/2011	08/16/18
End Right of Way Phase (Right of Way Certification Milestone)			07/16/2013	04/07/19
Begin Construction Phase (Contract Award Milestone)			09/01/2013	10/20/19
End Construction Phase (Construction Contract Acceptance Milestone)			03/30/2016	10/20/20
Begin Closeout Phase			04/30/2016	12/03/20
End Closeout Phase (Closeout Report)			04/30/2018	10/23/22

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Additional Information

DESCRIPTION cont'd: Please note
the Port of Entry facility will not be constructed with this project.

PROJECT BENEFITS cont'd:
4) 67% reduction in truck cross-border idle time from 80 to 30 minutes.
5) 38% truck traffic congestion reduction in 2015 (6,400 to 4,000 ADT at Otay Mesa POE) 40% truck congestion reduction in 2035 (11,500 to 6,900 ADT to Otay Mesa POE)
6) Improved freeway/arterial operations for truck trips would result in emission reductions.

Otay Mesa East Port of Entry - Segment 3A: Complete site preparation, including constructing needed utilities, underground drainage structures, and preparing the site elevations for building construction. Component is a key milestone as the region moves toward POE construction. The OME POE will serve 700 trucks and 12,500 northbound passenger vehicles daily, rising to roughly 900 trucks and over 16,250 vehicles in year 20.

PURPOSE AND NEED cont'd:
Upon completion, State Route 11 leading to the Otay Mesa East Port of Entry (POE) project will provide fast, predictable, and secure crossings via tolled approach roads that connect directly to a new state-of-the-art POE serving both personal and commercial vehicles. The goal is to operate the new POE with an average 20-minute border wait time.

PROJECT MILESTONE: Begin Design (PS&E) Phase and Begin Right of Way Phase milestones are delayed one month as they cannot begin before allocation of funds in August of 2018.

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STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08)

Date: 06/05/18

District	County	Route	EA	Project ID	PPNO	Alt. ID
11	SD	11, ,	05639	1117000151	0999F	
Project Title:	3- Otay Mesa East Port of Entry (OME/POE), Segment 3A					

Existing Total Project Cost ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Implementing Agency
E&P (PA&ED)									Caltrans
PS&E	10,000							10,000	Caltrans
R/W SUP (CT)	900							900	Caltrans
CON SUP (CT)									Caltrans
R/W	30,083							30,083	Caltrans
CON	285,000							285,000	Caltrans
TOTAL	325,983							325,983	
Proposed Total Project Cost ($1,000s)									**Notes**
E&P (PA&ED)									
PS&E		3,900						3,900	
R/W SUP (CT)			600					600	
CON SUP (CT)			6,100					6,100	
R/W			550					550	
CON			29,200					29,200	
TOTAL		3,900	36,450					40,350	

Fund No. 1:	Local Funds - Local Transportation Funds (LTF)								Program Code
	Existing Funding ($1,000s)								20.10.400.100
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E	10,000							10,000	
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON	285,000							285,000	
TOTAL	295,000							295,000	
	Proposed Funding ($1,000s)								Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)			6,100					6,100	
R/W									
CON			29,200					29,200	
TOTAL			35,300					35,300	

Fund No. 2:	Federal Disc. - COORDINATED BORDER INFRASTRUCTURE PROGRAM (CBIP)								Program Code
	Existing Funding ($1,000s)								20.XX.400.300
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									Caltrans
PS&E									$14268 RW voted 01/21/16
R/W SUP (CT)	627							627	
CON SUP (CT)									
R/W	14,268							14,268	
CON									
TOTAL	14,895							14,895	
	Proposed Funding ($1,000s)								Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 3:	Local Funds - TRANSNET (XSD)								Program Code
Existing Funding ($1,000s)									20.10.400.100
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									San Diego Association of Governm
PS&E									
R/W SUP (CT)	273							273	
CON SUP (CT)									
R/W	6,215							6,215	
CON									
TOTAL	6,488							6,488	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 4:	Federal Disc. - Corridor Border Infrastructure (CBI)								Program Code
Existing Funding ($1,000s)									20.XX.400.301
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									Caltrans
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W	9,600							9,600	
CON									
TOTAL	9,600							9,600	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 5:	State SB1 TCEP - Trade Corridors Enhancement Account (TCEA) STATE SHARE								Program Code
Existing Funding ($1,000s)									20.XX.723.000
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E		3,900						3,900	
R/W SUP (CT)			600					600	
CON SUP (CT)									
R/W			550					550	
CON									
TOTAL		3,900	1,150					5,050	

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08)

Complete this page for amendments only

Date: 06/05/18

District	County	Route	EA	Project ID	PPNO	Alt. ID
11	SD	11	05639	1117000151	0999F	

SECTION 1 - All Projects

Project Background

This project is a child of Segment 3 of the SR-11/OME POE project. Segment 3A prepares the site for the construction of the Port of Entry. Complete site preparation, including constructing needed utilities, underground drainage structures, and preparing the site elevations for building construction.

Programming Change Requested

It is proposed that Segment 3A (0999F) be split from Segment 3 (0999C) for the design and construction phases. Funds for these phases will be moved from Segment 3 to Segment 3A.

Reason for Proposed Change

This project has been split into segments to facilitate construction and to maximize funding opportunities. Originally, segment 3 included all the work for the POE. Site preparation (includes utilities, grading and drainage) proposed in this application will become Segment 3A.

If proposed change will delay one or more components, clearly explain 1) reason the delay, 2) cost increase related to the delay, and 3) how cost increase will be funded

Other Significant Information

SECTION 2 - For SB1 Projects Only

Project Amendment Request (Please follow the individual SB1 program guidelines for specific criteria)

SECTION 3 - All Projects

Approvals

I hereby certify that the above information is complete and accurate and all approvals have been obtained for the processing of this amendment request.*

Name (Print or Type)	Signature	Title	Date
Mario Orso		Trade Corridor Improvement Program, Corridor Director	6/28/18

Attachments

1) Concurrence from Implementing Agency and/or Regional Transportation Planning Agency
2) Project Location Map

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
PROJECT PROGRAMMING REQUEST
DTP-0001 (Revised Mar, 1 2018 v7.08) *General Instructions*

Amendment (Existing Project) Y/N					Date:	05/30/18
District	**EA**	**Project ID**	**PPNO**	**MPO ID**	**Alt Proj. ID / prg.**	
11	42750	1116000177	1241			

County	**Route/Corridor**	**PM Bk**	**PM Ahd**	**Project Sponsor/Lead Agency**	
SD				Caltrans	
IMP				**MPO**	**Element**
				SANDAG	CO

Project Manager/Contact	**Phone**	**E-mail Address**
Mario Orso	(619)688-2561	mario.orso@dot.ca.gov

Project Title

4-Intelligent Transportation system Technology (Advanced Technology Corridors at Border Ports of Entry)

Location (Project Limits), Description (Scope of Work)

In San Diego County and Imperial County on various routes at various locations, install Intelligent Technology statewide Border Wait Time system, Implement a fiber optic cable network to facilitate an advanced traveler information and border wait time system connecting the entire San Diego and Imperial border network.

Component	**Implementing Agency**
PA&ED	Caltrans
PS&E	Caltrans
Right of Way	Caltrans
Construction	Caltrans

Legislative Districts

Assembly:	78, 80, 71, 56	**Senate:**	36,40	**Congressional:**	51

Project Benefits

The ITS project will deploy a critical portion of the underlying architecture, hardware, and software needed to support advanced traffic management technology on southbound lanes at LPOEs in San Diego and Imperial Counties. SEE PAGE 2 FOR CONTINUATION OF PROJECT BENEFITS.

Purpose and Need

The purpose of this project is to install fiber optic connectivity, an Intelligent Transportation System to determine and disseminate south bound border wait times at the California/Mexico ports of entry. While travellers have options for crossing the border, they do not have advanced information on border wait times to make informed decisions. SEE PAGE 2 FOR CONTINUATION OF PURPOSE AND NEED.

Category	**Outputs/Outcomes**	**Unit**	**Total**
Intelligent Transportation System	Fiber Optic Installation	Miles	16
Intelligent Transportation System	Connecting Existing and new Field Elements into FO network	each	160
Intelligent Transportation System	SB Border Wait Time Systems at all CA/Mex POE's	each	6

ADA Improvements N	Bike/Ped Improvements N	Reversible Lane analysis No
Inc. Sustainable Communities Strategy Goals Yes	Reduces Greenhouse Gas Emissions Yes	

Project Milestone	**Existing**	**Proposed**
Project Study Report Approved		
Begin Environmental (PA&ED) Phase		01/28/18
Circulate Draft Environmental Document — **Document Type**		07/15/18
Draft Project Report		08/11/18
End Environmental Phase (PA&ED Milestone)		11/16/18
Begin Design (PS&E) Phase		01/15/19
End Design Phase (Ready to List for Advertisement Milestone)		02/15/20
Begin Right of Way Phase		01/15/19
End Right of Way Phase (Right of Way Certification Milestone)		02/01/20
Begin Construction Phase (Contract Award Milestone)		07/15/20
End Construction Phase (Construction Contract Acceptance Milestone)		05/20/22
Begin Closeout Phase		10/20/22
End Closeout Phase (Closeout Report)		01/23/24

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Additional Information

DESCRIPTION: Install Intelligent Technology Statewide Border Wait Time System to include: •
Install fiber optic line on I-5 from San Ysidro Port of Entry (POE) to I-15 interchange
• Install fiber optic line on I-805 from San Ysidro POE to SR-905 interchange
• Install fiber optic line on SR-905 from I-5 to the existing Otay Mesa POE
• Connect existing ITS elements to existing fiber optic line from I-5/I-15 interchange
• Install readers for the border wait time system at various locations on I-5, SR-805, SR-905, SR-186, SR-111,SR-7 and SR-188
• Develop back office system (software updates, algorithms and applications to disseminate information)
• Install air monitors in Otay Mesa consistent with the Sustainable Freight Action Plan Pilot
• Install cellular modems at SR-186, SR-111, SR-188 and SR-7

PROJECT BENEFITS cont'd: This will serve as a blueprint for building a regional border management system designed to coordinate traffic management between the existing California Department of Transportation (Caltrans) Transportation Management Center (TMC) and a new Tijuana/Mexico Regional TMC, and ultimately, the SANDAG Regional Border management System (SD County only). The ITS System will be capable of determining and disseminating south bound border wait times at the California/Mexico ports of entry. This project is part of the California Sustainable Freight Action Plan as a pilot project.
Intelligent Transportation System Technology (one of three statewide California Sustainable Freight Action Plan pilot projects called the Advanced Technology Corridors at Border Ports of Entry Pilot Project):
Implement a fiber optic cable network to facilitate an advanced traveler information and border wait time system connecting the entire San Diego and Imperial border network. Caltrans District 11 is currently conducting a Border Wait Time Pilot that is already providing border wait times for southbound traffic at the San Ysidro POE. This information is broadcast on the Caltrans website. Implementation of the complete fiber optic network and other technological improvements will provide more accurate and timely traveler information pertaining to conditions at all POEs in the Border Region. This component also includes 15 air quality monitors at the Otay Mesa and OME POEs, expanding Casa Familiar's study, a non-profit group, currently tracking air emissions at the San Ysidro POE. The component is expected to serve almose 180,000 vehicle trips in the first year, rising to 230,000 in year 20.

A total of 24,220 tons of all emissions will be reduced over 20 years.

PURPOSE AND NEED cont'd: The Fiber optic network will provide the basic communication infrastructure between the ITS elements and the Transportation Management Center. The border wait times system will provide advanced traveler information for the traveling public to make informed decisions as to when and where to cross the border.

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STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08)

Date: 05/30/18

District	County	Route	EA	Project ID	PPNO	Alt. ID
11	SD, IMP,	, ,	42750	1116000177	1241	
Project Title:	4-Intelligent Transportation system Technology (Advanced Technology Corridors at Border Ports of Entry)					

Existing Total Project Cost ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Implementing Agency
E&P (PA&ED)									Caltrans
PS&E									Caltrans
R/W SUP (CT)									Caltrans
CON SUP (CT)									Caltrans
R/W									Caltrans
CON									Caltrans
TOTAL									
Proposed Total Project Cost ($1,000s)									**Notes**
E&P (PA&ED)	818							818	
PS&E		4,038						4,038	
R/W SUP (CT)		62						62	
CON SUP (CT)			1,534	4,404				5,938	
R/W				375				375	
CON			8,118	19,827				27,945	
TOTAL	818	4,100	9,652	24,606				39,176	

Fund No. 1:	State SB1 TCEP - Trade Corridors Enhancement Account (TCEA) STATEShale								Program Code
Existing Funding ($1,000s)									20.XX.723.100
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									**Notes**
E&P (PA&ED)									
PS&E		2,317						2,317	
R/W SUP (CT)									
CON SUP (CT)			1,534					1,534	
R/W									
CON			8,118					8,118	
TOTAL		2,317	9,652					11,969	

Fund No. 2:	SHOPP - Mobility								Program Code
Existing Funding ($1,000s)									20.XX.201.315
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									**Notes**
E&P (PA&ED)	818							818	SHOPP EA 42750, PPNO
PS&E		1,721						1,721	1241. Reprogramming the
R/W SUP (CT)		62						62	Construction and R/W
CON SUP (CT)				4,404				4,404	Capital funds to the 19/20
R/W				375				375	year will be requested.
CON				19,827				19,827	
TOTAL	818	1,783		24,606				27,207	

STATE OF CALIFORNIA « DEPARTMENT OF TRANSPORTATION

BASELINE AGREEMENT

Date:	07/05/18 07:54:23 AM

District	EA	Project ID	PPNO	Project Manager
11	42750	1116000177	1241	SALAZAR, ISMAEL

County	Route	Begin Postmile	End Postmile	Implementing Agency	
SD	VAR			PA&ED	Caltrans
IMP	VAR			PS&E	Caltrans
				Right of Way	Caltrans
				Construction	Caltrans

Project Nickname

Intelligent Transportation system Technology

Location/Description

In San Diego County and Imperial County on various routes at various locations. Implement a fiber optic cable network to facilitate an advanced traveler information and border wait time system.

Legislative Districts

Assembly:	78, 80	Senate:	39, 40	Congressional:	49, 51, 52, 53, 50

PERFORMANCE MEASURES

Primary Asset	New	Fair to Good	Poor to Good	Total	Unit
Transportation Management System	6			6	Each

Project Milestone	Actual	Planned
Project Approval and Environmental Document Milestone		11/16/18
Right of Way Certification Milestone		01/31/20
Ready to List for Advertisement Milestone		02/15/20
Begin Construction Milestone (Approve Contract)		08/14/20

FUNDING

Component	Fiscal Year	Other State	State SB1 TCEP				Total
PA&ED	17/18	817					817
PS&E	18/19	1,721	2,317				4,038
RW Support	18/19	62					62
Const Support	19/20	4,404	1,534				5,938
RW Capital	19/20	375					375
Const Capital	19/20	19,827	8,118				27,945
Total		27,206	11,969				39,175

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08) *General Instructions*

Amendment (Existing Project) Y/N					Date:	05/30/18
District	**EA**	**Project ID**	**PPNO**	**MPO ID**	**Alt Proj. ID / prg.**	
11	08028	1117000085	1258	6120003	145.1	TCRP

County	**Route/Corridor**	**PM Bk**	**PM Ahd**	**Project Sponsor/Lead Agency**	
IMP	98	32.1	32.5	Caltrans	
				MPO	**Element**
				SCAG	CO

Project Manager/Contact	**Phone**	**E-mail Address**
Kazim Mamdani	(619)718-7840	kazim.mamdani@dot.ca.gov

Project Title

5-State Route 98 Improvements

Location (Project Limits), Description (Scope of Work)

In Imperial County in Calexico from Ollie Avenue to Rockwood Avenue. Widening Route 98 from 4 lanes to 6 lanes. The purpose of this project is to improve traffic operations, provide congestion relief and improve traffic flow, enchance bicycle safety and pedestrian access and improve drainage along this section of SR-98.

Component	**Implementing Agency**
PA&ED	Caltrans
PS&E	Caltrans
Right of Way	Caltrans
Construction	Caltrans

Legislative Districts

Assembly:	56	**Senate:**	40	**Congressional:**	51

Project Benefits

The project propses to improve traffic operations with 3 signalized intersections, drainage improvements, adding sidewalks with ADA access and a Class II bike lane along with additional capacity to accommodate the traffic that will be generated once the new Calexico West Border crossing is completed in 2018/2019. SEE PAGE 2 FOR CONTINUATION OF PROJECT BENEFITS.

Purpose and Need

The purpose of this project is to improve traffic operations, provide congestion relief in order to improve traffic flow, enhance bicycle safety and pedestrian access, and improve drainage along this section of SR98. This project is needed to accommodate the additional traffic that will be generated once the new Calexico West Border crossing is complete in May 2018.

Category	**Outputs/Outcomes**	**Unit**	**Total**
State Highway Road Construction	Operational Improvements	Miles	0.8
State Highway Road Construction	Intersections Modified	each	3
State Highway Road Construction	Bicycle lane/ sidewalk miles	Miles	0.8
State Highway Road Construction	Curb Ramps	each	22

ADA Improvements Yes	Bike/Ped Improvements Yes	Reversible Lane analysis Yes
Inc. Sustainable Communities Strategy Goals Yes	Reduces Greenhouse Gas Emissions Yes	

Project Milestone	**Existing**	**Proposed**
Project Study Report Approved		
Begin Environmental (PA&ED) Phase		
Circulate Draft Environmental Document — **Document Type**		
Draft Project Report		
End Environmental Phase (PA&ED Milestone)	02/18/2009	
Begin Design (PS&E) Phase	07/12/2017	09/29/17
End Design Phase (Ready to List for Advertisement Milestone)	09/02/2019	08/30/19
Begin Right of Way Phase	12/18/2017	10/13/17
End Right of Way Phase (Right of Way Certification Milestone)	08/02/2019	07/30/19
Begin Construction Phase (Contract Award Milestone)	02/15/2020	02/13/20
End Construction Phase (Construction Contract Acceptance Milestone)	02/28/2024	05/10/22
Begin Closeout Phase	02/28/2024	11/15/22
End Closeout Phase (Closeout Report)	11/30/2024	11/01/24

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STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08) **Date:** 05/30/18

Additional Information

PROJECT BENEFITS cont'd: The SR-98 widening and expansion project will provide improved access to the commercial trucking facilities that are located in the Downtown Calexico area, and help to reduce conflicts between large commercial vehicles, autos, pedestrians and bicyclists.

State Route 98 Improvements: Widening from four to six lanes on SR-98 from Ollie Avenue to Rockwood Avenue, including associated sidewalks, Class II bike lanes, and curb ramps. This component will provide improved access to the commercial trucking facilities that are located in the Downtown Calexico area, and help to reduce conflicts between large commercial vehicles, autos, pedestrians and bicyclists. The improvements will complement the Calexico East POE expansion by enhancing the region's roadway network to handle the increase in freight traffic. This section of SR-98 serves roughly 29,000 vehicles daily, and is expected to increase to almost 40,000 in 2035.
A total of 38,265 tons of emission will be reduced over 20 years for vehicles only. Truck emissions could not be projected for Calexico East POE but there is an expected savings of 150 million vehicle hours of idling over 20 years.

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From	Subject	Received	Size	Categories
Edmonds, Sar	RE: California-Mexico Border System Network Improvements Project Baseli	#######	48 KB	

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08)

Date: 05/30/18

District	County	Route	EA	Project ID	PPNO	Alt. ID
11	IMP, ,	98, ,	08028	1117000085	1258	145.1
Project Title:	5-State Route 98 Improvements					

Existing Total Project Cost ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Implementing Agency
E&P (PA&ED)		169						169	Caltrans
PS&E	1,000		650					1,650	Caltrans
R/W SUP (CT)	1,000							1,000	Caltrans
CON SUP (CT)					661			661	Caltrans
R/W	1,000							1,000	Caltrans
CON			5,000		2,141			7,141	Caltrans
TOTAL	3,000	169	5,650		2,802			11,621	
Proposed Total Project Cost ($1,000s)									**Notes**
E&P (PA&ED)		169						169	
PS&E	1,000		650					1,650	
R/W SUP (CT)	1,000							1,000	
CON SUP (CT)					661			661	
R/W	1,000							1,000	
CON			5,000		2,141			7,141	
TOTAL	3,000	169	5,650		2,802			11,621	

Fund No. 1:	TCRP (Committed) - Traffic Congestion Relief Fund (TCRF)								Program Code
Existing Funding ($1,000s)									20.XX.710.870
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									Caltrans
PS&E	1,000							1,000	$1000 PSE voted 06/28/17
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL	1,000							1,000	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E	1,000							1,000	
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL	1,000							1,000	

Fund No. 2:	Demo - Demonstration-Pre ISTEA (DEMO)								Program Code
Existing Funding ($1,000s)									20.xx.010.680
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									ICTC
PS&E									
R/W SUP (CT)	1,000							1,000	
CON SUP (CT)									
R/W	1,000							1,000	
CON			1,630					1,630	
TOTAL	2,000		1,630					3,630	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)	1,000							1,000	
CON SUP (CT)									
R/W	1,000							1,000	
CON			1,630					1,630	
TOTAL	2,000		1,630					3,630	

Fund No. 3:	SHOPP								Program Code
Existing Funding ($1,000s)									SHOPP
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)		169						169	
PS&E			650					650	
R/W SUP (CT)									
CON SUP (CT)					661			661	
R/W									
CON					2,141			2,141	
TOTAL		169	650		2,802			3,621	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)		169						169	SHOPP EA 42780, PPNO 1240. Reprogramming the SHOPP funds to 19/20 year in the Construction phases will be requested.
PS&E			650					650	
R/W SUP (CT)									
CON SUP (CT)					661			661	
R/W									
CON					2,141			2,141	
TOTAL		169	650		2,802			3,621	

Fund No. 4:	State SB1 TCEP - Trade Corridors Enhancement Account (TCEA) STATESHARE								Program Code
Existing Funding ($1,000s)									20.XX.723.100
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON			3,370					3,370	
TOTAL			3,370					3,370	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON			3,370					3,370	
TOTAL			3,370					3,370	

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
PROJECT PROGRAMMING REQUEST
DTP-0001 (Revised Mar, 1 2018 v7.08) *General Instructions*

Amendment (Existing Project) Y/N					Date: 06/06/18
District	**EA**	**Project ID**	**PPNO**	**MPO ID**	**Alt Proj. ID / prg.**
11	43050	1118000265	1335		

County	**Route/Corridor**	**PM Bk**	**PM Ahd**	**Project Sponsor/Lead Agency**	
IMP	7	0.0	0.0	Imperial County Transportation Commission	
				MPO	**Element**
				SCAG	LA

Project Manager/Contact	**Phone**	**E-mail Address**
Mario Orso	(619)688-2561	mario.orso@dot.ca.gov

Project Title

6-Calexico East Port of Entry Truck Crossing Improvement

Location (Project Limits), Description (Scope of Work)

In Imperial County, near the city of Calexico, 0.7 mile south of Route 7 near the U.S./Mexico Border, at the Calexico East Port of Entry Truck Crossing and California Commercial Vehicle Enforcement Facility - Widen bridge over the All American Canal allowing for the expansion of the Calexico East Port of Entry, including the increase in the number of commerical vehicle inspection lanes.

Component	**Implementing Agency**
PA&ED	Caltrans
PS&E	Caltrans
Right of Way	Caltrans
Construction	Caltrans

Legislative Districts					
Assembly:	56	**Senate:**	40	**Congressional:**	51

Project Benefits

By widening the All American Canal Bridge and adding capacity at Calexico East POE, the proposed improvements will benefit the region by allowing commercial freight to enter and exit the POE more efficiently reducing wait times and air pollution and enhancing international trade and economic competitiveness.

Purpose and Need

The project would widen the bridge over the All American Canal by adding four more lanes to increase travel and freight capacity at the Calexico East Port of Entry (POE) and to address bottlenecks that hinder economic competitiveness. The project will also improve border delays that reach up to three hours during peak periods and signficantly reduce emissions from idling vehicles.

Category	**Outputs/Outcomes**	**Unit**	**Total**
State Highway Road Construction	Modified/Reconstructed bridge(s)	Each	1

ADA Improvements Yes	Bike/Ped Improvements Yes	Reversible Lane analysis Yes
Inc. Sustainable Communities Strategy Goals Yes		Reduces Greenhouse Gas Emissions Yes

Project Milestone	**Existing**	**Proposed**
Project Study Report Approved		
Begin Environmental (PA&ED) Phase		08/16/18
Circulate Draft Environmental Document **Document Type**		03/15/19
Draft Project Report		04/15/19
End Environmental Phase (PA&ED Milestone)		06/01/19
Begin Design (PS&E) Phase		01/02/19
End Design Phase (Ready to List for Advertisement Milestone)		01/10/20
Begin Right of Way Phase		06/01/18
End Right of Way Phase (Right of Way Certification Milestone)		07/02/20
Begin Construction Phase (Contract Award Milestone)		07/05/20
End Construction Phase (Construction Contract Acceptance Milestone)		11/05/21
Begin Closeout Phase		11/10/21
End Closeout Phase (Closeout Report)		10/11/23

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Additional Information

DESCRIPTION cont'd: work includes adding two lanes, providing an 8 foot shoulder with new barriers and installing security fence in each direction.

BENEFITS cont'd: Calexico East Port of Entry Truck Crossing Improvement: This Project Approval and Environmental Document (PAED) component will assess widening the bridge over the All-American Canal, allowing for the expansion of the Calexico East Port of Entry and increasing the commercial vehicle inspection lanes by more than double. This component will address current bottlenecks that hinder economic competitiveness, and will also work to improve border delays and significantly reduce emissions from idling vehicles. The Calexico East POE serves roughly 23,500 vehicles daily, northbound and southbound, just over ten percent of which are trucks.

A total of 35 tons of all emissions will be reduced over 20 years.

PROJECT MILESTONE: Begin Environmental (PA&ED) Phase milestone is delayed one month as the phase cannot begin before allocation of funds occurs in August of 2018.

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STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised Mar, 1 2018 v7.08)

Date: 06/06/18

District	County	Route	EA	Project ID	PPNO	Alt. ID
11	IMP, ,	7, ,	43050	1118000265	1335	
Project Title:	6-Calexico East Port of Entry Truck Crossing Improvement					

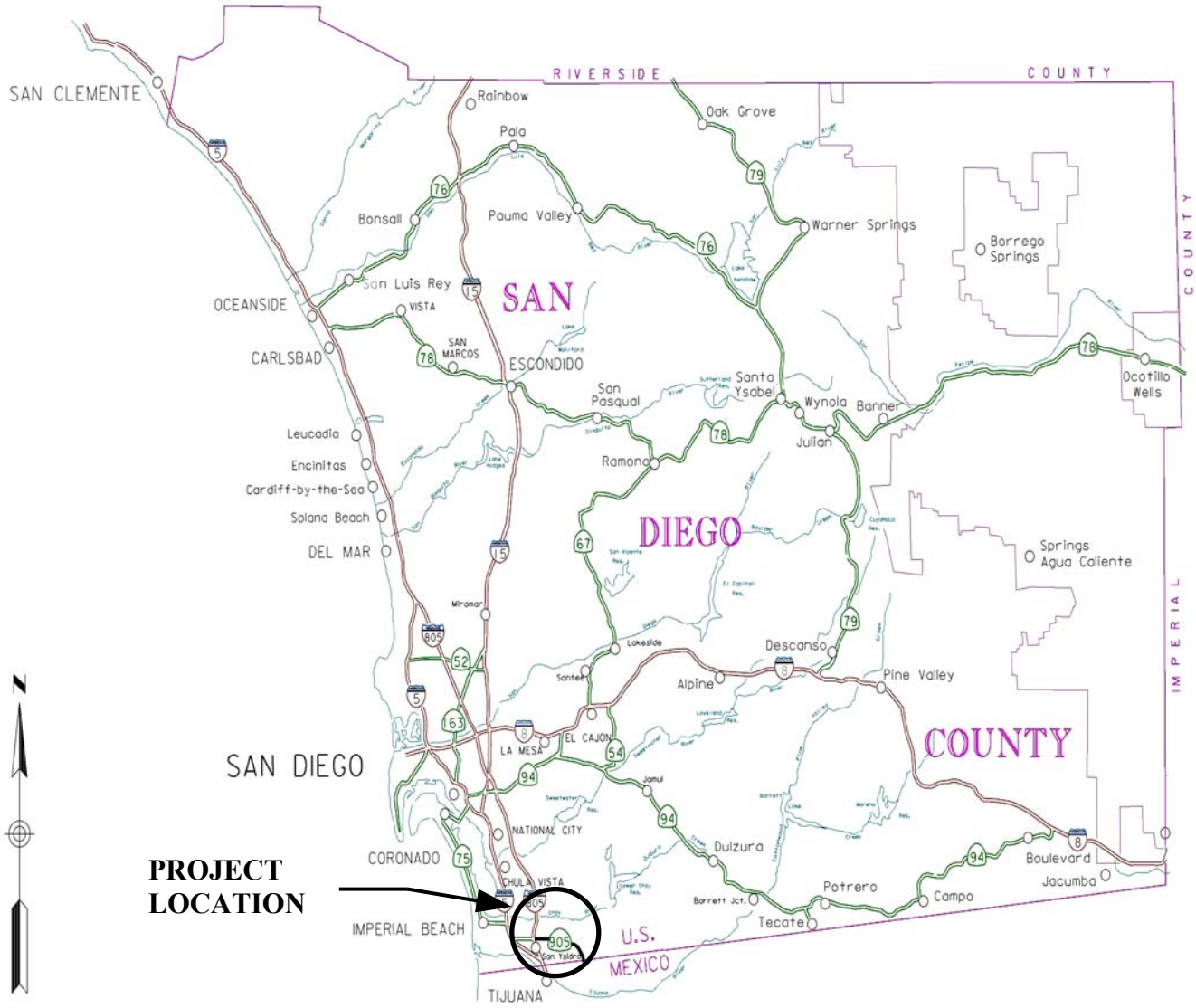
Existing Total Project Cost ($1,000s)									
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Implementing Agency
E&P (PA&ED)									Caltrans
PS&E									Caltrans
R/W SUP (CT)									Caltrans
CON SUP (CT)									Caltrans
R/W									Caltrans
CON									Caltrans
TOTAL									
Proposed Total Project Cost ($1,000s)									**Notes**
E&P (PA&ED)		3,000						3,000	
PS&E			3,355					3,355	
R/W SUP (CT)									
CON SUP (CT)					2,517			2,517	
R/W									
CON					20,972			20,972	
TOTAL		3,000	3,355		23,489			29,844	

Fund No. 1:	State SB1 TCEP - Trade Corridors Enhancement Account (TCEA) STATEShale								Program Code
Existing Funding ($1,000s)									20.XX.723.100
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)		3,000						3,000	
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL		3,000						3,000	

Fund No. 2:	Future Need - Future Funds (NO-FUND)								Program Code
Existing Funding ($1,000s)									FUTURE
Component	Prior	18/19	19/20	20/21	21/22	22/23	23/24+	Total	Funding Agency
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									
PS&E			3,355					3,355	
R/W SUP (CT)									
CON SUP (CT)					2,517			2,517	
R/W									
CON					20,972			20,972	
TOTAL			3,355		23,489			26,844	

11-SD-805, 905
KP 3.1/4.2, KP 8.4/R18.6
11224-093160
374K

PROJECT REPORT



ON ROUTE 805 IN SAN DIEGO COUNTY, IN SAN DIEGO, FROM 0.2 KILOMETER NORTH OF ROUTE 905 TO 0.4 KILOMETER SOUTH OF PALM AVENUE OVERCROSSING, AND ON ROUTE 905 FROM 0.1 KILOMETER EAST OF ROUTE 805 TO THE OTAY MESA BORDER CROSSING

PEDRO ORSO-DELGADO
DISTRICT DIRECTOR

11-SD-805,905
KP 3.1/4.2, 8.4/R18.6
PM 1.9/2.6, 5.2/R11.6
11224-093160

Submitted by: _____
C. W. DAVIS
Design Manager

Concurred by: _____
RANDY SANCHEZ
Project Manager

I have reviewed the right of way information contained in this Project Report and the R/W Data Sheet attached hereto, and find the data to be complete, current, and accurate:

_____
ANNE MARC-AURELE
Deputy District Director -
Right of Way

Environmental Certification: _____ 7-28-04
MUGGS STOLL DATE
Deputy District Director -
Environmental

APPROVED BY: _____ 7/30/04
JOEL HAVEN DATE
Deputy District Director -
Design

APPROVED BY: _____ 7/30/04
ALLAN KOSUP DATE
Deputy District Director -
Program/Project Management

11-SD-805,905
KP 3.1/4.2, 8.4/R18.6
PM 1.9/2.6, 5.2/R11.6
11224-093160

This Project Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Tom Guerrini

Tom Guerrini
REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
THOMAS M. GUERRINI
C 65539
EXP. 12-31-05
CIVIL
STATE OF CALIFORNIA

7-28-04
DATE

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DEPARTMENT OF TRANSPORTATION
District 11
2829 Juan Street
P. O. BOX 85406, M.S. 25
San Diego, CA 92110
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11-SD-805, 905
KP 3.1/4.2, 8.4/R18.6
11224-093160

Project Report

1. INTRODUCTION

This Project Report (PR) proposes extending State Route (SR) 905 from 0.1 kilometer east of Interstate (I) 805 to the Otay Mesa Border Port of Entry (POE) to reduce congestion, enhance the safe transportation of people, goods, and services, and to improve the mobility of local, regional, interregional, and international traffic. The Freeway Central Alternative was selected as the *Preferred Alternative* from the six project alternatives proposed in the Draft Project Report: Freeway South, Freeway Central, Freeway North, Tollway South, Tollway Central, and Tollway North. The total cost for the *Preferred Alternative* is $309 million, as of July 2004, with costs distributed as follows:

- Construction $148 million
- Right of Way $118 million
- Support $ 43 million

The cost of the project, *escalated to the program year (2005/2006) is $314.5 million*.

The program code is HE 14 and current funding is from the following programs:

- Transportation Equity Act for the 21st Century (TEA-21) High Priority Projects Program (DEMO)
- 1996 and 1998 State Transportation Improvement Program (STIP)
- 1998 Interregional Transportation Improvement Program (ITIP)
- 1998 Regional Transportation Improvement Program (RTIP)
- 1999 TEA-21 Coordinated Border Infrastructure Program (CBI)
- 2000 TEA-21 CBI
- 2001 TEA-21 CBI
- 2002 TEA-21 CBI

- 2003 Surface Transportation Program (STP)
- 2004 TEA-21 CBI
- 2003 TEA-21 National Corridors Planning and Development Program (NCPD)
- Local Funds
- Transportation Congestion Relief Program (TCRP)

This project has been assigned Project Development Processing Category 1 because it requires new access control, new right-of-way (ROW), an adoption of a route location by the California Transportation Commission (CTC), and new Freeway Agreements.

Attachment 1 shows the project location and Attachment 2 shows the project vicinity.

2. RECOMMENDATION

This Project Report recommends approval of the proposed SR 905 extension, using the *Preferred Freeway Central Alternative*, and to proceed with final design of the proposed facility.

All affected local agencies have been consulted with respect to the recommended plan, their views have been considered, and they are in general accord with the plan as presented.

3. BACKGROUND

3.1 Project History

The California Highway Commission, in 1965, adopted a freeway route then known as SR 75. The adopted route extended from I-5 to approximately 1.3 kilometers east of La Media Road in the community of Otay Mesa, in the City of San Diego (City). Between 1969 and 1972, three freeway agreements were executed with the County of San Diego (County) and City covering most of the adopted route, as shown in the table below.

Table 1
Freeway Agreements

Limits	**Date**
Heritage Road to future SR 125	January 2, 1969
Beyer Blvd. to 1.2 miles east of I-805	March 27, 1969
1.2 miles east of I-805 to Caliente Blvd.	May 23, 1972

In 1973, SR 75 was re-designated SR 117. A four-lane freeway segment from I-5 to I-805 was constructed within the adopted route, and opened in 1976. In 1987 the route designation was changed to SR 905.

A four-lane highway segment connects Otay Mesa Road (OMR) at KP 16.8, approximately 1.3 kilometers east of La Media Road to the POE (KP 19.2). This segment of conventional highway was originally adopted as SR 125 in March 1983. It was constructed under a Cooperative Agreement between The Department, the County, and the City, and was adopted into the State Highway System upon completion in 1985. The City maintained this segment of highway, now designated as Interim SR 905, until August 1, 1990, when ownership of the facility was vested in the State.

In October of 1991, a Project Study Report (PSR) for SR 905 was approved. The study addressed the adopted portion of the route from I-805 to the POE. The PSR presented a single design variation for SR 905 and a freeway-to-freeway interchange with SR 125. This document coordinated with the local and regional planning documents, confirming this major circulation element in the land use planning for Otay Mesa.

On January 6, 1991, California Transportation Ventures (CTV) signed a franchise agreement to develop 18 kilometers of SR 125 from SR 905 to San Miguel Road as one of four toll road demonstration projects statewide (see Attachment 2). On June 9, 2000 a Record of Decision (ROD) was obtained for the SR 125 project from SR 905 to SR 54. The facility is now under construction, with completion expected in 2006.

In 1994, SR 11 was added to the State Highway System. SR 11 begins near the junction of SR 125 and SR 905 and extends easterly to a proposed third border crossing somewhere east of the present POE. No funding has been identified for SR 11, and no decision has been made regarding its alignment.

In December 1996, a Project Study Report proposing to widen OMR to a six-lane facility was approved. The widening extended from the I-805/SR 905 separation to just east of La Media Road. Construction was completed in December 1999.

A cooperative agreement between the State of California and the City of San Diego was approved for the OMR widening project in December 1996. A summary follows:

- The CTC would adopt the widened portion of OMR, assuming the project is completed in compliance with the State Specifications.
- When the State completes segments of SR 905 that provide parallel travel, the City of San Diego agrees to accept ownership, operation, and maintenance of OMR.
- If the State does not complete SR 905, but completes equivalent segments of SR 125, and if the City of San Diego desires to modify OMR, the City can accept ownership, operation, and maintenance of OMR.

In October of 2001 the CTC adopted the portion of OMR widened by the City as "Traversable State Route 905". That adoption provides for a continuous interim state highway between I-805 on the west and the POE on the east.

In November 2002 a contract was awarded to construct a highway grade separation and interchange at the intersection of Siempre Viva Road and Interim State Route 905. That contract is scheduled for completion in early 2005.

3.2 Community Interaction

In December 1993, U. S. Congressman Bob Filner convened the Otay Mesa Transportation Summit, a meeting of elected officials representing the Otay Mesa area. Briefings from Federal, State and local officials as well as from the public were received. More than 125 people attended, an indication of the level of local interest and concern.

Since 1993, many meetings have taken place with community groups such as:

- The Citizens for Route 905 later known as the Citizens for Border Transportation
- The South County Economic Development Corporation Transportation Infrastructure Advisory Committee
- The Highway Development Association
- The San Ysidro Border Transportation Committee
- The Otay Mesa Chamber of Commerce
- The San Diego Police Department South Bay region
- The San Ysidro Chamber of Commerce
- The San Ysidro Neighborhood Partnership Program
- The Imperial Beach Kiwanis

Former City Councilman Juan Vargas, the City's staff, and business community members have also been involved in project update meetings.

A public scoping meeting was held on April 10, 1995, to gather information from the public regarding concerns and issues in the study area and to help set the scope of the environmental studies. Written comments from the attendees supported the project.

The members of the California Transportation Commission (CTC) expressed support for the project during a tour of SR 905 and the Otay Mesa Border on September 19, 1997.

On September 25,1997, a public information meeting was held to give the community an opportunity to review and comment about the proposed project. Overall, no opposition to the project was made, although landowners adjacent to the proposed alignment voiced concerns about potentially adverse economic impacts to their properties.

In September 2001, another public information meeting was held to give the community another opportunity to review and comment about the proposed project.

3.3 Existing Facility

SR 905 is a 19.2-kilometer legislative route extending from the International Boundary near Border Field Park, 4.5 kilometers West of I-5, to the POE. It is the only East-West interregional route between the Otay Mesa border area of San Diego County and the cities of Chula Vista, Imperial Beach and the San Diego metropolitan region.

The National Highway System (NHS) includes SR 905 and is defined in the 1996 State Statutes as extending from:

(a) The International Boundary near Border Field northeasterly to I-5, and

(b) From I-5 near the south end of San Diego Bay to the International Boundary, south of Brown Field.

The portion of SR 905 from the International Boundary near Border Field Park (KP 0.0) to just west of I-5 (KP 4.5), while part of the legislative route, is neither adopted nor constructed. From I-5 (KP 4.5) to I-805 (KP 8.3). SR 905 is a four-lane freeway, plus auxiliary lanes, with interchanges at I-5, Beyer Boulevard, Picador Boulevard, and I-805. This freeway continues easterly from I-805 to the junction with Traversable SR 905 (OMR) (KP 10.4). SR 905 traffic continues along

Traversable SR 905, an east-west six lane conventional highway, connecting with Interim SR 905. As mentioned above, Interim SR 905 provides connection to the POE.

4. NEED AND PURPOSE

4.1 Problem, Deficiencies, Justification

The project's purpose is to reduce congestion and provide more efficient transportation of people, goods, and services within and through Otay Mesa, between I-805, an existing eight-lane Interstate freeway, and the POE. The project is needed to provide improved mobility for existing and forecasted local, regional, interregional, and international traffic by implementing the local and regional development planning.

According to the San Diego Association of Governments' (SANDAG) regional growth forecast, the Otay Mesa population will expand by 20 times, and employment will expand by ten times, by the year 2030. Development plans for Otay Mesa include approved subdivision maps for 900 hectares, with approved building permits for over 280,000 square meters of floor space. There are nine residential precise plans, which comprise 700 hectares and propose more than 10,000 dwelling units.

The adjacent City of Tijuana has a growth rate twice that of the San Diego region, with a current population over one million. That city's population is projected to increase to 3.2 million people by the year 2030. Population growth in the City of Tijuana has a substantial effect on the transportation needs within the South Bay and the entire San Diego region. Thousands of residents of Tijuana travel to the United States to work or shop, resulting in extensive cross-border movement of people to and from the San Diego region every day. Rapid commercial development in the area is also partly due to the establishment of a five-site Foreign Trade Zone on Otay Mesa as well as the proximity to the Maquiladora manufacturing/assembly industry just across the border in Mexico.

The need to extend the existing SR 905 Freeway has been magnified by the enactment of the North American Free Trade Agreement (NAFTA), the passing of Tijuana's $171 million infrastructure improvement ballot initiative, the opening of the U.S. Commercial Inspection Facility on Otay Mesa, and the lifting of a building moratorium in the Otay Mesa area by the City of San Diego.

Although OMR has been widened from a four-lane city street to a six-lane conventional highway, it is predicted to reach its capacity for an acceptable Level of Service (LOS) by the year 2005. Capacity is the maximum traffic flow rate at which a highway can operate at a given Level of Service. Capacity of the facilities (the new six-lane OMR and Interim SR 905) are affected by the following factors:

- High truck volumes. The San Ysidro commercial port-of-entry station closed in December of 1994. **All** commercial truck traffic now must pass through the Otay Mesa POE, causing the truck traffic on OMR to increase to more than 15% of the total traffic volume.
- Grades. Steep and sustained grades affect truck speed and overall capacity. The maximum grade between the I-805/SR 905 Separation and Traversable SR 905 (OMR) is 5.7% with a length of approximately one kilometer. This reduces truck speed by 50 km/h, reducing the capacity of the facility.
- Spacing and timing of traffic signals. Signal timing and spacing plays a major role in the capacity of OMR by limiting the portion of time that is available for movement along the facility

through intersections. There are 11 signalized intersections between Heritage Road and the Otay Mesa POE, and five more intersections may be signalized, in accordance with planned development, before OMR is relinquished to the City.

- Operating speed. Posted speed limits range from 70 km/h to 80 km/h. Traffic congestion, however, limits the operating speed during the peak traffic hours. Projected operating speeds for OMR in 2025 are forecast to be 13 km/h (Table 3). Average operating speeds during the peak traffic hour would increase in the corridor, relative to the No Project alternative, as shown in the following table.

Table 3
SR 905 and Otay Mesa Road Operating Speeds (km/h)

	SR 905		Otay Mesa Road	
SR905 Alignment Alternatives	**Opening year**	**2025**	**Opening year**	**2025**
Six Lane Freeway	90	82	31	24
No Project	-	-	23	13

- Lane and Shoulder Width. The lane widths on OMR are 3.6 m, with the exception of a 3.4 m westbound through lane from La Media Road to 411 m east. The shoulder widths on OMR are 2.4 m, except from Heritage Road to approximately 411 m east of La Media Road, where there are no left shoulders, and from La Media Road to 411 m east, where the westbound right shoulder is 1.5 m. Studies show that there is a direct correlation between narrow or missing shoulders and reduction in roadway capacity.
- Traffic Volumes. The Existing Average Daily Traffic (ADT) volumes, for the segments of OMR, range from 42,000 to 55,000 (Attachment 3A). According to City thresholds, OMR is operating at LOS D from Old Otay Mesa Road to Britannia Boulevard and LOS E from La Media Road to future SR 125. For the year 2025, traffic volumes along OMR with no new facility are forecast to exceed 70,000 ADT (Attachment 3B). The corridor, with a new facility, is expected to provide capacity for the forecasted ADTs of less than 40,000 for OMR and 155,000 for SR 905 (Attachment 3C). See also Section 4.3.2.1, Forecast Methodology, for further traffic volume information.

The extension of SR 905 would improve capacity by providing the following:

- The project would add alternate lanes, with uninterrupted flow, through the corridor. Based on the forecast traffic volumes, a six-lane freeway is warranted well before the year 2025.
- Maximum grades would be reduced from 5.7% to 4.0%.
- For inter-regional travelers, the number of signalized intersections would be reduced from 11 to zero
- Proposed lane and shoulder widths on the new SR 905 facility are standard.

Extending the existing SR 905 Freeway would provide congestion relief for OMR, the only major East-West road currently servicing Otay Mesa, and would allow direct access to the I-5 and I-805 freeways. SR 905 would also provide access to future SR 11. SR 11 would connect SR 905 and SR 125 with a proposed third border crossing on the eastern edge of Otay Mesa.

4.2 Regional and System Planning

4.2.1 Identify Systems

The California Department of Transportation (Department) and the Federal Highway Administration (FHWA), in 1984, signed an agreement designating SR 905 as a future part of the Interstate System. Such designation will be implemented when SR 905 is constructed to Interstate standards.

From I-5 to the International Border, SR 905 is part of the NHS. According to the 1996 statutes, SR 905 is part of the California Freeway and Expressway System.

The route is part of the Interregional Road System, from 0.8 kilometers east of Cactus Road to the POE. The portion from I-5 to I-805 is designated as part of the national network for the Surface Transportation Assistance Act. From I-5 to the POE, SR 905 is designated as part of the Oversize Load Highway System. Also, the route is part of the State Highway Terminal Access Route System, from I-805 to OMR. It is expected that this designation will be extended to the other segments of SR 905 upon their completion. SR 905 is not a part of the California State Scenic Highway System.

4.2.2 State Planning

The Department's SR 905 Transportation Concept Report (September, 1994 TCR) documents the State highway facilities needed to serve traffic for the year 2015. The TCR is composed of two parts: (1) a minimum Level of Service for peak hours, and (2) a description of physical facility necessary to provide that LOS. Additional components of the 2015 Transportation Concept include implementation of an intermodal approach, using Transportation Systems Management (TSM), Transportation Demand Management (TDM), Transportation Control Measures, and air quality improvement tactics. The 2015 SR 905 Transportation Concept sets forth the number of freeway lanes needed based on a minimum LOS of "E."

The Department's District 11 Transportation System Development Plan (1995) includes needed improvements to SR 905. The Recommended Plan, Level 1 (2002-2015), in Category 1 - Intermodal (Goods Movement and Freight) is to construct a six-lane freeway, with a wide median that would allow the facility to be upgraded to accommodate eight lanes plus two HOV lanes, from I-805 to the POE. The Recommended Plan, Level 2 (Beyond 2015), in Category IV- Urbanized (Highway, Regional Arterial and Transportation System Management) is to upgrade from a six-lane freeway to an eight-lane freeway plus two HOV lanes. The Cost Constrained Plan, Level 1 (2001-2015), Category 1-Intermodal (Goods Movement and Freight) is to construct a four-lane expressway from I-805 to the POE.

The Department's 1996 District 11 System Management Plan (SMP) was developed to plan the implementation of the region's transportation system, which could best accommodate the region's growth in population and travel. The strategy developed includes the Inner Loop Element and the Outer Loop Element. SR 905 is part of the Outer Loop, along with SR 52, SR 54, SR 56 and SR 125, and portions of SR 67 and Interstate 8 (Figure 1-4, Attachment 14). The Outer Loop will allow traffic to bypass the metropolitan area and serve as an alternate for interregional traffic on existing SR 67, I-8, I-15, and I-805, which are functioning at or near capacity. The proposed project is a connecting link in the Outer Loop. SR 905, Traversable Route 905 (OMR), and

Interim State Route 905 form the only east-west route serving traffic between the rapidly developing Otay Mesa community/POE area and destinations to the north via I-5 and I-805.

4.2.3 Regional Planning

SANDAG, designated as the Regional Transportation Planning Agency, prepares and periodically updates the following two regional transportation planning documents.

The Regional Transportation Plan (2030 RTP): adopted on March 28, 2003 by SANDAG, this document describes SR 905 as a proposed six-lane freeway from I-805 to the Otay Mesa Border Crossing under the Revenue-Constrained Plan (RCP). The RCP includes those projects that could be implemented based on funding reasonably expected to be available during the 30-year plan period without requiring any future legislative actions or voter approvals to raise the gas and sales taxes, or to provide any additional revenues. The RCP is phased in three periods: Fiscal Year (FY) 2002-2010, FY 2011-2020, and FY 2021-2030. SR 905 is included in the FY 2011-2020 period with a total project cost of $290 million. The RTP also includes those projects that could be implemented under the Reasonably Expected Revenue Plan. This section of the RTP has scheduled the construction of SR 905 in the 2002-2010 period. According to the 2030 RTP, the actual scheduling of the projects is done biennially through the Regional Transportation Improvement Program (RTIP) development process.

The 2030 RTP does not include the Tollway Alignment Alternatives. The current SR 905 schedule shows ROW acquisition beginning in the 2004/2005 FY, with construction starting in FY 2005/2006. A preliminary project cost estimate is provided as Attachment 8.

The Regional Transportation Improvement Program (2002 RTIP): Adopted on June 28, 2002 by SANDAG, this document outlines a four-year program of regional transportation improvements for major state highway, local street and road, transit, and non-motorized projects. The 2002 RTIP covers the fiscal years 2003-2007. This document allocates a total of $236 million for the SR 905 project. The proposed project is included as a six-lane freeway.

4.2.4 Local Planning

The Otay Mesa Public Facilities Financing plan (Fiscal Year 2000), published in October 1999 by the City of San Diego, includes a number of project categories for the Otay Mesa community. They include transportation, parks, fire protection, police, library, water utilities, drainage, and airport projects. In the transportation category two projects have been identified within the SR 905 corridor, which are:

Project T-80.1 Acquisition of ROW for Project T-80.2 (SR 905)

> This project consists of acquiring a portion of the Route 905 Right of Way. The City estimate of cost for this project is $52.3 million. Funding for the project included $800,000 from the City Facilities Benefit Assessment (FBA) – East and $51.5 million from Federal and State programs. The Project Year was 1995-1999.

Project T-80.2 Construct SR 905 from 0.8 km east of I-805 to the Otay Mesa International POE as a six-lane freeway (with a wide median to allow for an ultimate 8+2 HOV lane freeway) in two phases:

- Phase 1- complete the environmental document and construct an interim four-lane arterial street on the six-lane freeway alignment, as a federally funded project.

- Phase 2- widen the four-lane facility to a six-lane facility, and construct the SR 905/SR 125 interchange and a portion of the northerly extension to SR 125. This phase also includes bridge structures for the three surface street crossings: OMR, Airway Road, and Harvest Road.

The City estimate of cost for this project is $170.3 million. The Project Year was 1995-2015. City's portion of funding was shown as $5 million in 2015, from FBA – East and FBA - West. The remaining portion of the funding was expected from Federal and State programs.

The Otay Mesa Local and Collector Street Study (1988) is a planning document that depicts SR 905 as conceived in the SR 905 PSR.

4.2.5 Transit Operator Planning

4.2.5.1 Existing

Transit bus Route 932 connects the San Ysidro Port of Entry to downtown San Diego. Bus Routes 933 and 934 run east and west along Palm Avenue, and along Coronado Avenue, west of I-805. Bus Route 905 connects the Iris Avenue trolley station to the POE. This route runs from Iris Avenue along OMR, south along Britannia Boulevard, east along Airway Road, south on La Media Road, east on Siempre Viva Road to SR 905, east on Airway Road, and south on Paseo de las Americas to the POE. The San Diego Trolley has stops at Iris Avenue, Beyer Boulevard, and the San Ysidro Port of Entry. Trolley stations provide bicycle storage facilities in conjunction with the SANDAG Ride Link Program.

4.2.5.2 Future

Two plans are described in the 2030 RTP:

a) *The Revenue Constrained Plan* is limited to existing funding sources and funding levels. This plan includes one new express bus corridor to connect Otay Ranch (immediately north of the project study area) and the POE.

b) The *Preferred Plan* provides greater mobility within the region but requires new, substantial financial resources. Within the project limits, two projects are proposed: 1) a Light Rail Transit (LRT) corridor from the POE along OMR and also along the SR 125 corridor, and 2) an Express Bus route along the SR 905 corridor. The planned bridges over OMR and Sanyo Road will be designed to accommodate the LRT.

The San Diego Metropolitan Transit Development Board (MTDB) prepared a conceptual plan for a local bus loop route to link the light rail/regional bus transfer facility to the planned industrial land uses on Otay Mesa. Regional bus stops are planned to be located near the ramp terminals of planned freeways. In the long term, light rail transit is planned to serve Otay Mesa from existing service in Chula Vista and San Ysidro. The planned north-south line from Chula Vista would operate along the SR 125 alignment to the POE, and the planned east-west light rail line from Iris Avenue in San Ysidro would operate adjacent to OMR to the POE (East Otay Mesa Specific Plan, July 1994).

No funding sources have been identified or committed for the planned regional bus, light rail lines, or the local bus loop service at this time (East Otay Mesa Specific Plan, July 1994). The SR 905 extension would not constrain development of these or other modes of transportation.

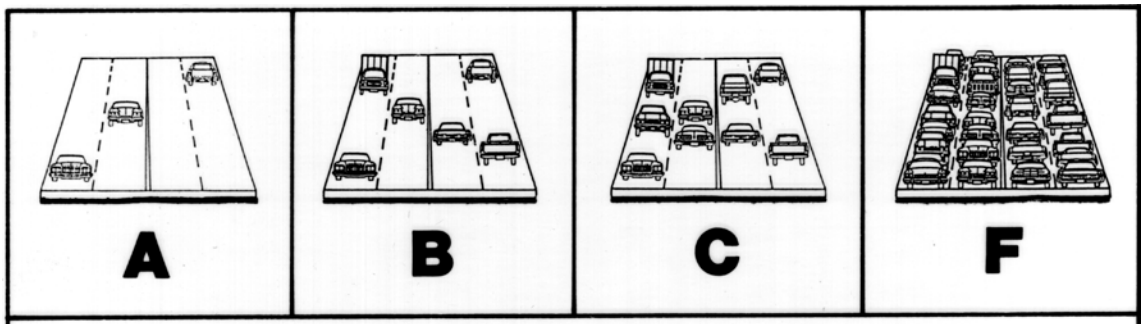
The 2030 RTP addresses both short- and long-range transit services and facility improvements, including a new South Bay LRT line serving the Otay Ranch area and connecting to the POE, and a transit-way along the SR 905 corridor for the year 2030 transit plan. A transit-way is a high-level regional bus service.

4.3 Traffic

Traffic circulation issues associated with the proposed project are the basis for the development of the project design. The discussion below is based on the detailed Transportation Analysis Technical Report (TATR) for SR 905, approved in November 1999, which analyzes conditions for street segments, peak hour intersections, and freeway segments, using forecast data for the year 2000 and the year 2025. The year 2025 has been determined as the design year for this project. The traffic volumes shown in the TATR were revised to reflect a change in the November 1999 City of San Diego Circulation Element of the General Plan that eliminated Siempre Viva Road between San Ysidro and Heritage Road.

LOS is determined for each type of facility based on the number of lanes and the peak hour volume of traffic on that facility. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations from "A" to "F," with LOS "A" representing the best operating conditions and LOS "F" the worst. Each LOS represents a range of operating conditions. LOS is illustrated in Table 4.

Table 4
Level of Service



A	Highest quality of service. Free traffic flow, low volumes and densities. Little or no restrictions on maneuverability or speed. 55+ mph. No delay.
B	Stable traffic flow, speed becoming slightly restricted. Low restriction on maneuverability. 50 mph. No delay.
C	Stable traffic flow, but less freedom to select speed, change lanes, or pass. Density increasing. 45 mph. Minimal delay.
D	Speeds tolerable but subject to sudden and considerable variation. 40 mph. Minimal delay.
E	Unstable traffic flow with rapidly fluctuating speeds and flow rates. Short headways, low maneuverability, and low driver comfort. 35 mph. Significant delay.
F	Forced traffic flow. Speed and flow may drop to zero with high densities. Less than 25 mph. Considerable delay.

Design capacity, for a given LOS, is the maximum traffic rate of flow for which a highway can provide that LOS. Design capacity varies with a number of factors, including: LOS selected, width of lanes, number of lanes, presence or absence of shoulders, grades, horizontal alignment, operating speed, lateral clearance, side friction generated by parking, driveways, intersections and interchanges, and volumes of trucks/ buses/ recreational vehicles/ bicycles/ pedestrians.

4.3.1 Current Traffic

Table 5 shows the counts in terms of existing ADT volumes and LOS. ADT is the average number of vehicles using a roadway in one day. Table 5 reflects the six-lane OMR facility, with traffic in both directions. Attachment 3A shows the existing traffic circulation network for the area with traffic volumes.

Table 5
Existing Average Daily Traffic Volumes

LOCATION	ADT	LOS
I-805 to Old OMR	54,000	D
Old OMR to Heritage Rd	55,000	E
Heritage Rd to Britannia Blvd	52,000	E
Britannia Blvd to La Media Rd	44,000	C
La Media Rd to Future Route 125	42,000	F
Future Route 125 to Airway Rd	32,000	D

The City of San Diego thresholds were applied to all street segments on OMR. As can be observed, OMR is operating at LOS "E" between Old Otay Mesa Road and Britannia Blvd, and at LOS "F" between La Media Road and Future Route 125.

In addition to the ADTs for street segments, both A.M. and P.M. peak hour intersection traffic data were collected. SANDAG's Congestion Management Program (CMP) technical guidelines were used to establish the LOS goal (LOS "D"). The operational analysis method was used for intersection peak hour analysis. Operational analysis determines the LOS based on vehicle delay expressed in seconds. Computer analysis was used. The intersection of OMR and Heritage Road in the P.M. peak does not conform to the CMP goal; it is LOS "F", below the LOS "D" goal. All other intersections are currently operating at a LOS "D" or better.

Based on the above information, the capacity of the present facility is inadequate.

4.3.2 Forecast Traffic

The design year for the proposed project is 2025. The traffic model provides forecasts of traffic volumes for the year 2025. The selected facility would be designed to meet these volumes. The forecast traffic circulation networks for the area are shown in Attachments 3B, 3C, and 3D, with traffic volumes for the no build alternative, freeway alignment alternatives, and tollway alignment alternatives, respectively.

Table 6 shows forecast traffic for project alignment alternatives for the year 2025. The analysis was based on the SANDAG Series 8 traffic forecasting methodology and land use information,

modified to reflect the latest revisions to the City of San Diego Circulation Element. The LOS calculations were modified from those shown in the Draft Environmental Impact Statement/Report to conform to the procedures shown in the current Highway Capacity Manual.

Table 6
Forecast Traffic Volumes: 2025 Freeway and Tollway Alignment Alternatives

Segment	2025 (DESIGN YEAR)					
	EB Lanes	WB Lanes	Freeway Alignment Alternatives		Tollway Alignment Alternatives	
			ADT	LOS	ADT	LOS
I-805/Caliente Ave.	3	4*	151,200	D	144,300	D
Caliente Ave./Heritage Rd.	3	3	153,500	E	146,300	E
Heritage Rd./Britannia Blvd.	4*	4*	140,200	D	132,700	D
Britannia Blvd./La Media Rd.	4*	3	129,400	D	124,800	D
LaMedia Rd./SR 125	4*	3	96,600	C	88,100	B
SR 125/Airway Rd.	3	3	77,800	B	77,000	B

ADT = Average Daily Traffic
LOS = Level of Service
4*= three-lane + one-auxiliary lane

4.3.2.1 Forecast Methodology

The year 2025 ADT volumes for the proposed SR 905 project alternatives are 10%-15% higher than the latest 2030 ADT volumes from SANDAG's current regional transportation model. The traffic volumes from the preliminary 2030 Cities/County Forecast are based on the latest approved SANDAG land use data and forecasts, which are developed in coordination with the region's 18 cities and the County.

In developing the land use forecast for the SR 905 project, the Department, SANDAG, the County, and the City agreed to use a combination of what was, at that time, the City's build-out land use, which was estimated to occur by approximately 2040, and SANDAG's Series 8 land use forecast, which had a horizon year of 2015. To develop the 2025 ADT volumes for the SR 905 project, it was decided to average the volumes forecast for 2000, by the Series 8 1990 base land use, and the City's 2040 volumes based on build-out land use.

An analysis of the ADT growth on SR 905 from 1991 to the present was performed, which showed a decline in the ADT growth rate during that period. That analysis also showed that volumes previously forecasted for year 2000 were not realized until 2002. In addition, preliminary

modeling results from SANDAG's 2030 Cities/County forecast confirm a reduction in the previously observed ADT growth rate over the next 25 years.

Furthermore, the SANDAG Series 8 travel demand model did not have programmatic methods by which TSM/TDM strategies could be accounted for within the regional model. Since that time, new methods have been developed both in the 2030 Cities/Counties forecast (Series 10), and the previous SANDAG 2020 forecast (Series 9), which apply these strategies within a travel demand modeling context on a regional basis.

According to the most current planning assumptions, the forecasted traffic volumes shown in the Attachment 3C will not occur until 2030 or later, which means that the *Preferred Alternative* will accommodate the projected ADT and peak hour volumes for 2025, the design year.

4.3.2.2 Year 2025 Freeway Alignment Alternatives

The freeway scenario provides for SR 905 as a six-lane facility. Traffic volumes are predicted to increase substantially between opening day and the design year. All freeway segments in Table 6 are projected to operate at a LOS "E" or better for the year 2025. Design guidelines recommend that freeways in urban areas accommodate the design year traffic (2025) while operating at LOS "E" or better.

4.3.2.3 Year 2025 Tollway Alignment Alternatives

The tollway scenario also provides for SR 905 as a six-lane facility. Due to toll collection, traffic volumes are predicted to be less than the 2025 Freeway scenario. All tollway segments (Table 6) are projected to operate at LOS "E" or better for the year 2025 forecast traffic.

4.3.2.4 Local Streets

Table 7 shows local street segment traffic forecasts, for all alignment alternatives, for the year 2025. ADT volumes as well as LOS are included in Table 7. Forecast traffic volumes are substantially higher on the local streets for the No Project Alternative compared to the Freeway and Tollway Alternatives. Border crossing between San Diego County and Mexico will increase as development and international trade increases.

4.3.2.4.1 Year 2025 Freeway Alignment Alternatives

The freeway alternative would accommodate more traffic on all segments of the new facility than any other. As a direct result of the projected high freeway usage, all segments of the local street network, as shown on Table 7, between Caliente Avenue and SR 125 will maintain an acceptable LOS (LOS "A" to LOS "C") with minimal traffic congestion and delay through the design year.

4.3.2.4.2 Year 2025 Tollway Alignment Alternatives

Although this scenario incorporates the same design features as the Freeway scenario, toll collections would discourage, to some extent, the use of the tollway, thus increasing the traffic on the local street system, as indicated in Table 7.

4.3.2.5 Year 2025 No Project Alternative

The No Project Alternative assumes that SR 905 would not be constructed. Future traffic would utilize local streets to access the project area. Ten out of 16 segments on local streets (as shown in Table 7) are projected to operate between LOS "E" and LOS "F" with substantial congestion and considerable delay.

Table 7
Year 2025 Street Segment Comparison-East/West Streets
Freeway And Tollway Alignment Alternatives

Street	Segment	2025 (DESIGN YEAR)					
		Freeway Alignment Alternatives		Tollway Alignment Alternatives		No Project	
		ADT	LOS	ADT	LOS	ADT	LOS
Otay Mesa Road	Old OMR/ Caliente Blvd.	1,900	A	2,100	A	81,700	F
	Caliente Blvd./ Heritage Rd.	18,500	A	19,600	A	71,600	F
	Heritage Rd./ Britannia Blvd.	14,300	A	15,800	A	66,100	F
	Britannia Blvd./ La Media Rd.	15,100	A	15,900	A	65,700	F
	La Media Rd./ Route 125	38,000	C	38,500	C	70,700	F
	Route 125/ Enrico Fermi Dr.	39,000	C	40,100	C	61,300	F
Airway Road	Caliente Ave./Heritage Rd.	10,400	A	11,500	A	56,800	F
	Heritage Rd./ Britannia Blvd.	8,500	A	8,800	A	44,000	F
	Britannia Blvd./ La Media Rd.	13,500	A	13,300	A	33,800	D
	La Media Rd./ Route 905	11,000	A	10,900	A	28,400	C
	Route 905/ Enrico Fermi Dr.	12,000	A	11,800	A	31,000	D
Siempre Viva Road	Heritage Rd./ Britannia Blvd.	18,400	A	20,900	A	47,300	D
	Britannia Blvd./ La Media Rd.	20,800	A	22,600	A	45,900	D
	La Media Rd./ Route 905	16,600	A	18,100	A	41,200	C
	Route 905/ Enrico Fermi Dr.	50,500	D	51,200	D	58,100	F

4.3.3 Local Access and Local Street Improvements

The proposed project would need to fit into the local street system and some work on local roads would be necessary to improve traffic flow. The local access ramp to Enrico Fermi Drive, as described in section 5.1.1.3, is a critical element of the proposed SR 905/SR 125 interchange. It would facilitate access for trucks traveling north from the Commercial Vehicle Enforcement Facility (CVEF) at the border. It would provide an additional direct access for the East Otay Mesa area, thereby reducing congestion on the system of local roads and local interchanges (such as OMR, Siempre Viva Road, and La Media Road) due to international border traffic traveling through the Otay Mesa Community. Between SR 125 and Enrico Fermi Drive, the No Project Alternative shows higher traffic volumes along local streets such as OMR, Siempre Viva Road, and Airway Road (see Table 7). Higher traffic volumes on local streets would increase congestion and decrease the LOS. The local connector ramp to Enrico Fermi Drive, included in the Freeway and Tollway alignment alternatives, would have the effect of reducing congestion on OMR, Siempre Viva Road, and Airway Road; the No Project Alternative would not provide this benefit.

Local street widening is proposed as a necessary part of the project to improve local access to SR 905, thereby reducing congestion and facilitating traffic flow on the Mesa. The project proposes the following:

- Widen OMR from two to four lanes between SR 125 and Sanyo Avenue, and
- Widen the uncompleted portion of Sanyo Avenue from two to four lanes between OMR and Airway road.

These proposed improvements to local streets would allow the local street system to function better, and also would compensate for the deletion of Harvest Road between OMR and Airway Road.

Within the SR 905 ROW, local streets would also be widened to the City's street standards. Reconstruction of City streets will be required where the vertical alignment must be changed to accommodate the freeway construction.

4.3.4 Future State Route 11

SR 11 has been identified as a proposed transportation facility necessary to provide access between a future border crossing, east of the POE, and the SR 125/SR 905 interchange. Funding for SR 11 has not been identified within the STIP, the project is not yet programmed, and no decision has been made regarding a specific alignment. SR 11 was added to the State Highway System in 1994. The RTP for the year 2020 includes SR 11, stating that it is planned as a four-lane freeway from the planned SR 125/SR 905 interchange to a proposed new border crossing about 3.2 kilometers east of the existing POE.

A need for a third border crossing has been identified by the Federal Government of Mexico and the State of Baja California, as well as state and local agencies, to alleviate existing traffic congestion and to accommodate future traffic anticipated due to population and trade growth. This proposed future border crossing would require a presidential permit application submittal to, and approval of, the Bi-National Committee on Bridges and Border Crossings, in conjunction with Mexican transportation agencies. This future border crossing and the necessary presidential permit would be contingent upon the processing and approval of a National Environmental Policy Act (NEPA) document.

4.3.5 Accident Rates

The transfer of trips from a city street to a regional freeway is expected to reduce accidents on the city streets. Between October 19, 1997 and November 17, 2000, a total of 92 accidents were recorded along OMR. Of the 92 accidents, 59 occurred in intersection areas. Of the intersection accidents, rear-end accidents accounted for 54%, right-angle accidents accounted for 22%, and sideswipe accidents for 10%. There were 67 accidents with injuries.

Intersection locations have a higher potential for traffic conflict compared to other highway sections. At an intersection, continuity of traffic is interrupted, traffic patterns cross, and turning movements occur. The types of accidents noted above are typical of intersection accidents. The proposed project would allow through traffic to avoid the intersections on OMR by including grade separations, thereby reducing traffic conflicts and improving safety while greatly increasing the capacity of the SR 905 corridor.

Table 8 depicts existing accident rates per million vehicle-miles. The table contrasts accident rates for the different sections of the existing corridor, versus the average rate for similar facilities throughout the state. The accident rates for the existing facility are generally less than the rates on similar facilities in the state.

Accident rates for the corridor are expected to decrease markedly with the construction of the proposed Freeway. In addition to the increased capacity, which reduces the ADT on OMR, freeways have an average accident rate less than half that of conventional highways.

Table 8
SR 905 Corridor Composite Accident Rates
January 2002 - March 2004

Section	Length	MVM	Rates (/MVM)			Rates (/MVM)		
			Actual			Similar Facilities		
			Fatal Accidents	Fatal + Injury Accidents	Total	Fatal Accidents	Fatal + Injury Accidents	Total
I-805 to OMR*	1.390	84.010	0.012	0.150	0.330	0.013	0.530	1.380
OMR to Heritage Rd	1.290	54.180	0.018	0.074	0.092	0.015	1.000	2.200
Heritage Rd to La Media Rd	2.010	79.970	0.000	0.760	0.760	0.015	1.000	2.200
La Media Rd to SR 125	0.745	22.750	0.000	0.350	0.350	0.015	1.000	2.200
SR 125 to Border*	1.303	43.830	0.000	0.320	0.410	0.017	0.600	1.650
Overall Rates/Totals	**6.738**	**284.740**	**0.007**	**0.349**	**0.419**	**0.015**	**0.800**	**1.873**

MVM……Million Vehicle Miles
Fatal Accidents……..…Fatal Accidents/MVM
Fatal + Injury Accidents…(Fatal Accidents + Injury Accidents)/MVM
Total…..…….Total Rate
* January 2000-May 2003

5. ALTERNATIVES

5.1 Viable Alternatives

5.1.1 *Preferred Alternative*

The following build alternatives for the proposed six-lane SR 905 facility were considered:

- Freeway-North Alignment Alternative,
- Freeway-Central Alignment Alternative (**the *Preferred Alternative***),
- Freeway-South Alignment Alternative,
- Tollway-North Alignment Alternative,
- Tollway-Central Alignment Alternative, and

- Tollway-South Alignment Alternative.

The *preferred* and other viable project alternatives have three distinct segments in common: West, Middle, and East. The alignments of the alternatives diverge in the Middle Segment (i.e. between Caliente Avenue and Britannia Boulevard) but are identical in the West and East segments.

The North Alignment alternatives were designed to minimize impacts to the sensitive habitat of Diegan coastal sage scrub and Multiple Species Conservation Program (MSCP) lands. The Central Alignment alternatives were designed to minimize impacts to vernal pools and their associated watersheds, which are also sensitive habitat. The South Alignment alternatives correspond closely with the "adopted route" identified for the SR 905 corridor in regional and local planning documents. This alignment has been incorporated into the design of existing, proposed, and approved developments on Otay Mesa.

Typical roadway cross-sections are provided in Attachment 4. Attachment 5 contains project features maps for all project alternatives and Attachment 6 contains profiles for all project alternatives. Attachment 7 contains either the General Plans or the Planning Study plans for all overcrossing, undercrossing, separation, and bridge structures for the *preferred alternative*. In some instances, the alignment stationing has been changed since the General Plan or Planning Study plan has been completed.

5.1.1.1 Identification of the *Preferred Alternative*

The cost or engineering features did not provide the rationale for selection of the *preferred alternative*. Without consideration of natural resources, the SR 905 Freeway alternatives have comparable environmental impacts. The impacts to socioeconomic concerns, farmland, noise, and water quality are the same, and impacts to hazardous waste, air quality, cultural resource, and visual resources within the project area are essentially identical between the Freeway alternatives. The impacts to the biological and wetland resources must be looked at in order to identify the alternative that has the least amount of impact on the environment.

5.1.1.1.1 Wetlands/Waters Under the Jurisdiction of the U.S. Army Corps of Engineers (ACOE) and/or California Department of Fish and Game (CDFG)

All the alignments would result in impacts to jurisdictional areas overseen by the ACOE and CDFG. Due to the extent of anticipated disturbance, an Individual Permit (Clean Water Act, Section 404) and Streambed Alteration Agreement (Fish and Game Code Section 1601) would be required from the resource agencies before the project could commence. Calculations indicate that the magnitude of impacts to those areas regulated by the two resource agencies would be largest for the North Alignment Alternative (ACOE – 3.43 hectares impacted, CDFG – 4.84 hectares impacted) and least for the Central Alignment Alternative (ACOE – 3.10 hectares impacted, CDFG – 4.37 hectares impacted). As the Freeway-Central Alignment Alternative has the least amount of impacts to waters of the U.S. and wetlands it is identified as the least environmentally damaging practicable alternative (LEDPA) and the *Preferred Alternative* on wetlands/waters issues. There are no over-riding considerations that force the identification of another alternative. Therefore, on wetlands/waters issues alone, the Freeway-Central Alignment Alternative is the *Preferred Alternative* (see section 4.10 of the Environmental Impact Statement/Report (EIS/R)).

5.1.1.1.2 Biology

A review of the proposed alignment alternatives and of the results of the field surveys for the project demonstrate that in a comparison between the three alignment alternatives, the Central Alignment Alternative would have the least impacts on listed/sensitive biological resources and, as such, would be the *preferred alternative* for the proposed project (see section 4.10 of the EIS/R).

Based upon the rationale outlined above, on September 22, 2003, the Department, District 11, SR 905 Project Team identified the Freeway-Central Alignment Alternative as the *SR 905 Preferred Alternative* and, for the purposes of the CWA, Section 404, the LEDPA. FHWA concurred with the selection on April 23, 2004 in a telephone conversation with FHWA Team Leader, South Region, Cesar Perez, and formally concurred by the signing of the EIS/R on July 23, 2004.

5.1.1.2 Proposed Engineering Features

The proposed project *preferred alternative* would construct SR 905 from I-805 to the POE, a distance of approximately ten kilometers. It would include six travel lanes (three in each direction) and each would be constructed with sufficient ROW for a wide median that could accommodate four additional lanes, two of which could function as HOV lanes, should demand justify their construction. Separate environmental approval is required for any additional transportation use of the wide median such as HOV or Transit lanes. The ROW area requirements for the *preferred alternative* are approximately 140 hectares. Grading would involve approximately 2.5 million cubic meters of excavation and 1.0 million cubic meters of imported borrow. The project boundaries would be fenced along the north and south ROW lines. Local interchanges would be provided at Caliente Avenue, Heritage Road, Britannia Boulevard, and La Media Road. A freeway-to-freeway interchange would be provided at SR 125.

To incorporate drainage and storm water requirements, detention basins and other storm water facilities would be constructed within the ROW throughout the length of the project. These facilities would provide protection from flooding downstream of the proposed facility as well as protection from downstream pollution from the freeway.

5.1.1.2.1 West Segment

The project begins at the SR 905/I-805 Interchange. The West Segment extends easterly a distance of approximately 0.9 kilometers. The West Segment also includes a 1.7 kilometer portion of northbound I-805, from the SR 905/I-805 Separation to the I-805/Palm Avenue Interchange. The West Segment includes the following design elements:

- Immediately east of I-805, SR 905 would have an auxiliary lane on the westbound side to accommodate traffic from Caliente Avenue to I-805. SR 905 would transition to three lanes in each direction west of the Caliente Avenue Interchange.

- A 730 meter long auxiliary lane would be constructed along NB I-805 between the westbound SR 905 to NB I-805 connector and Palm Avenue. This feature would accommodate merging traffic from WB SR 905.

The WB SR 905 to NB I-805 connector would be modified to provide a two-lane exit from SR 905 and a two-lane entrance to I-805.

5.1.1.2.2 Middle Segment

The Middle Segment extends east from the West Segment to approximately 600 meters east of Britannia Boulevard.

- Diamond-type interchange would be constructed at Caliente Avenue, with an overcrossing for the local street.

- The need for the Heritage Road Interchange is based on the opening of the circulation element roads of the City of San Diego General Plan, which shows a street network connecting Heritage Road to planned city streets south of SR 905. Those streets are scheduled to be funded in the 2016-2022 time frame. The Heritage Road interchange would be constructed when programmed and justified.

- Access from OMR to SR 905 would be terminated at a cul-de-sac approximately 350 meters west of its intersection with Caliente Avenue. Old Otay Mesa Road connection between Airway Road and OMR would be closed in accordance with existing freeway agreements between the City and the Department. Adequate access is provided by the Caliente Avenue interchange. The project would not preclude the installation of a future overcrossing at Old Otay Mesa Road by others.

- A Park-and-Ride lot, with provisions for public bus service, is proposed in the northeast quadrant of the Caliente Avenue interchange and would provide approximately 210 parking spaces in a 0.9 hectare lot. This location would conform to long-range transit plans since it would coincide with a planned light rail station.

- South of OMR, SR 905 would sever Cactus Road. North of SR 905, Cactus Road would end in a cul-de-sac. On the south side of SR 905, a two-lane frontage road would provide access by connecting Gateway Park Drive to Cactus Road. The severance of Cactus Road would be in accordance with existing freeway agreements between the City and the Department. The project would not preclude the installation of a future overcrossing at Cactus Road by others.

- Utilities would be relocated within the project construction disturbance limits; further details are provided in Section 5.1.9 Utility and Other Owner Involvement.

- The Middle Segment is approximately 5.2 kilometers long. This construction would include approximately 2,100 linear meters of fill slopes, with maximum heights of 30 meters. Approximately 3,100 linear meters of cut slope would be required, with maximum depths of ten meters.

- Two parallel bridge structures would be constructed at the SR 905 crossing of Spring Canyon, approximately 650 meters west of Heritage Road. The WB bridge would be 77 meters long, 18 meters wide, and 1.5 meters deep. The EB bridge would be 51 meters long, 18 meters wide, and 1.3 meters deep. The WB and EB bridges would be centrally supported by columns set outside of the canyon flow line. The minimum clearance from the canyon bottom to the bottom of the bridges would be 8.3 meters.

- The future Heritage Road interchange would incorporate loop ramps for the EB exit ramp and for the WB entrance ramp. All access would be from the east side of Heritage Road so as to

minimize impacts to Spring Canyon and wetlands in the northwest quadrant of the future interchange.

5.1.1.2.3 East Segment

The East Segment would extend approximately 4.1 kilometers east and south to the POE, beginning at about 600 m west of Britannia Boulevard.

Major design elements for this segment are as follows:

- Approximately 2,100 linear meters of cut slope, with a maximum depth of approximately 20 meters, and 5,100 linear meters of fill slope would be required. The largest fill slope would be approximately 1,800 meters long and nearly 18 meters high near the SR 905/SR 125 interchange.

- A Diamond-type interchange would be constructed at Britannia Boulevard, with an overcrossing for the local street.

- A double 3.05 x 2.75 m reinforced box culvert (RCB) would be constructed along the south side of the freeway from station 170+20 to station 174+60. This RCB would convey storm waters from outside (offsite) of the project ROW adjacent to the freeway, where the alignment is bordered on both sides by an existing industrial development.

- A wide earthen channel would convey the storm waters from the RCB described above, along the south side of the freeway alignment, to the existing outfall of the drainage way. This channel is wider than necessary for conveyance of the storm waters expected, but is required to provide an earth bottom equivalent to that portion of the current earth channel that will be replaced by the RCB.

- A two-quadrant cloverleaf interchange would be built at La Media Road.

- A quadruple 2.44 x 1.22 m RCB, approximately 500 m long, would be constructed to convey offsite storm waters from an existing culvert that crosses OMR just east of La Media Road to the existing earthen channel south of the freeway alignment and east of La Media Road.

- OMR would be constructed/widened to four lanes from the west end of Interim SR 905 to Sanyo Avenue. The unfinished portion of Sanyo Avenue would be widened from two to four lanes, for approximately 580 meters, between OMR and Airway Road.

- A local connector ramp would extend approximately 1.8 kilometers east from the SR 905/SR 125 interchange to the existing Enrico Fermi Drive. Since the circulation of the Draft Project Report and the Draft EIS/R, the County has extended Enrico Fermi Drive north to OMR, so there is no longer a need for the Department to build Enrico Fermi Drive from the proposed intersection with the connector ramp south to Siempre Viva Road, as was indicated in the Draft EIS/R. To minimize impacts to existing adjacent industrial uses, retaining walls up to 6.5 meters high are planned adjacent to this ramp, extending from Sanyo Road easterly for approximately 400 meters. Grading for the proposed local connector ramp would also include an adjacent material site area just west of the intersection with Enrico Fermi Drive. Each side of the access road would be inclined at a slope of 1:6 (1 vertical unit of distance to 6 horizontal units of distance) and contour graded to blend with the existing terrain. This excavation would provide approximately 1 million cubic meters of fill material. A temporary construction easement would allow excavation of the

area outside the ROW. A ramp is also proposed for WB traffic on the local access ramp to access NB SR 125.

- SR 125 is scheduled for completion prior to completion of SR 905. Current plans for SR 125 anticipate an at grade connection at OMR. The SR 905 project would include a multi-level SR 905/SR 125 interchange, with connectors for SB SR 125 to WB SR 905, EB SR 905 to NB SR 125, SB SR 125 to EB SR 905, and WB SR 905 to NB SR 125. A number of separation structures would be required for the various ramp and roadway crossings. The SR 905/SR 125 interchange would require removal of some facilities, including existing Interim Route 905 between Airway Road and OMR.

- Harvest Road will remain disconnected between OMR and Airway Road. A "right in/right out" intersection at Harvest Road and OMR will be constructed. Harvest Road will be extended southerly of Airway Road to connect with the existing street.

5.1.2 Other Viable Alternatives Considered

As noted above, 6 different alternatives were considered before selecting the *preferred alternative*.

5.1.2.1 Tollway Alternatives

The Tollway alternatives vary from the Freeway alternatives only in that the Tollway will require additional cost to build and for ROW to accommodate the toll collection facilities, and, in addition, would not incorporate ramp metering facilities. ROW required for the Tollway Alternatives varies from 135 to 144 hectares.

When compared to the three SR 905 Freeway alternatives, the Tollway alternatives would impose greater environmental impacts as the toll facilities would:

- Require more ROW that would have been available for other land uses, including approximately 0.3 hectares in the Multi-Habitat Planning Area (MHPA);
- Require the acquisition of one more residence;
- Have greater biological resource impacts;
- Have an increased visual impact due to the presence of the toll facilities; and
- Impact the Mesa Business Park and the Otay Heights Business Park.

Moreover, the SANDAG 2030 RTP, representing the comprehensive transportation plan for the San Diego region, does not mention consideration of a Tollway; but includes SR 905 as a six-lane freeway.

The three Tollway alternatives were studied because they provided an alternate way to fund the facility. It was assumed that bond purchasers would be repaid over the life of the facility by the toll fees. In addition to the reasons mentioned above, none of the three Tollway alternatives were identified as the *Preferred Alternative* because the Department anticipates that it will be able to fully fund the SR 905 Freeway. .

A Tollway alternative would have added an inconvenience to the public in that stopping at the tollbooths would have caused travel delay. In addition, toll roadways historically have less usage than free roadways. Furthermore, a toll for use of SR 905 would mean there would be no “free”

way to get to and from the busy Otay Mesa area by highway, since both state highways serving the area would require tolls for use. This would overload the few existing or planned local arterials, increasing the congestion to and from Otay Mesa. Public comment has indicated opposition to building a Tollway for these reasons.

A number of toll facilities would need to be constructed in and between the Heritage Road and Britannia Boulevard interchanges. These would include tollbooths along the EB exit ramp and WB entrance ramp at Heritage Road, and the EB entrance ramp and WB exit ramp at Britannia Boulevard. A 1.9-hectare area, to accommodate a parking lot and utility structure, would also need to be located along the south side of SR 905 approximately mid-way between Heritage and Cactus roads. Two toll plazas would be needed between the Heritage Road and Britannia Boulevard interchanges, as well as a 2.4-hectare site for the toll administration building and parking lot, located on the north side of SR 905 approximately 200 meters east of Cactus Road.

Toll Alternatives toll facilities would also need to be constructed along the four-lane local access ramp from the SR 905/SR 125 interchange to Enrico Fermi Drive. These would include two tollbooths and two parking lots for toll operators located along the EB and WB lanes, approximately 1,300 meters east of the SR 905/SR 125 interchange.

5.1.2.2 North and South Freeway Alternatives

The North and South Alternatives are identical to the *preferred alternative* except for the alignment through the Middle Segment.

5.1.2.2.1 Proposed Engineering Features

Depending on the alignment alternative, ROW area requirements vary from approximately 130 to 144 hectares. Grading would involve approximately 2.5 million cubic meters of excavation for all alternatives. The project boundaries would be fenced along the north and south ROW lines of the selected alignment. Local interchanges would be provided at Caliente Avenue, Heritage Road, Britannia Boulevard, and La Media Road. A freeway-to-freeway interchange would be provided at SR 125.

5.1.2.2.1.1 Freeway - West Segment: North and South Alignment Alternatives

- The North and South alignment alternatives, through the west segment are identical to the *preferred alternative*.

5.1.2.2.1.2 Freeway - Middle Segment: North and South Alignment Alternatives

As noted above in section 5.1.1, the Middle Segment would incorporate the variable alignments for the Freeway and Tollway alternatives. ROW required for the North and South Alternatives varies from 130 to135 hectares, respectively.

5.1.2.2.1.2.1 Freeway – Middle Segment - North Alignment Alternative

The freeway elements noted in section 5.1.1.2.2 are common to all alignments except as follows:

- The Middle Segment of the North Alignment Alternative would be approximately 4.9 kilometers long. This construction would include approximately 2,000 linear meters of fill slopes,

with maximum heights of 11 meters. Approximately 2,900 linear meters of cut slope would be required, with maximum depths of eight meters.

- Two parallel bridge structures would be constructed at the SR 905 crossing of Spring Canyon approximately 650 meters west of Heritage Road. The WB bridge would be 77 meters long, 18 meters wide, and 1.5 meters deep. The EB bridge would be 55 meters long, 18 meters wide, and 1.3 meters deep. The WB and EB bridges would be centrally supported by columns set outside of the canyon flow line. The minimum clearance from the canyon bottom to the bottom of the bridges would be 8.3 meters.

- The future Heritage Road interchange would be a diamond-type interchange.

5.1.2.2.1.2.2 Freeway – Middle Segment - South Alignment Alternative

Unique characteristics of the Freeway - South Alignment Alternative are:

- The Middle Segment of the South Alignment Alternative would be approximately 4.9 kilometers long. This construction would include approximately 2,400 linear meters of fill slopes, with maximum heights of eight meters. Approximately 2,500 linear meters of cut slope would be required, with maximum depths of nine meters.

- A 158 meter long bridge structure would be constructed at the SR 905 crossing of Spring Canyon, approximately 210 meters west of Heritage Road.

5.1.2.2.1.2.3 Freeway - East Segment: North and South Alignment Alternatives

The North and South alignment alternatives, through the east segment are identical to the *preferred alternative*.

5.1.3 No Project Alternative

As required by NEPA and CEQA, the No Project Alternative (i.e., no SR 905 construction project) was addressed. Under the No Project Alternative, proposed SR 905 would not be constructed and the existing SR 905/OMR/Interim Route 905 would continue to serve as the principal access between I-805 and the POE. None of the above-described alternative facilities would be constructed, and the noted modification, or removal, of existing or facilities would not occur.

5.1.4 Proposed Engineering Features Comparison

Table 9 shows a comparison of the planned engineering features for all alternatives. The main line has a capacity of 6,900 Passenger Cars Per Hour (PCPH) in each direction over the entire length of the facility.

Table 9
SR 905 Engineering Features Comparison

Feature		Alignment Alternative		
		North	**Central (*Preferred*)**	**South**
Length		9380 m	9420 m	9375 m
Design Speed		110 km/h	110 km/h	110 km/h
Horizontal alignment (Main Line)	Min./ Max. Radius	700 m / 1700 m	600 m / 1700 m	600 m / 1700 m
		Number of Horizontal Curves = 5	Number of Horizontal Curves = 7	Number of Horizontal Curves = 6
Vertical Alignment (Main Line)		Max. grade = 4.00% Min. grade = 0.30%	Max. grade = 4.00% Min. grade = 0.30%	Max. grade = 4.00% Min. grade = 0.30%
Local Road Interchanges		Caliente Ave., Heritage Rd., Britannia Blvd., and La Media Rd.		
Freeway to Freeway Interchanges		SR 125		
Right of Way Widths		Min. Width = 70 m, Max. Width = 440 m		
Access Control Requirements		Minimum 30 m beyond curb return or ramp radius, or as noted in the design exception fact sheet.		
General Geometrics of Interchanges and Intersections				
North Alignment		Diamond interchanges at Caliente Ave., Heritage Rd., and Britannia Blvd. Partial Cloverleaf interchange at La Media Rd.		
Central Alignment (*Preferred*)		Diamond interchanges at Caliente Ave. and Britannia Blvd. Partial Cloverleaf interchange at Heritage Rd. and La Media Rd.		
South Alignment		Diamond interchanges at Caliente Ave. and Britannia Blvd. Partial Cloverleaf interchange at Heritage Rd. and La Media Rd.		
Structural Section Requirements				
Main Line		Travel Way = PCC, Inside Shoulder = PCC, Outside Shoulder = PCC		
Ramps		Travel Way = AC, Inside Shoulder = AC, Outside Shoulder = AC		

PCC = Portland Concrete Cement Pavement; AC = Asphalt Concrete Pavement

5.1.5 Nonstandard Design Features

5.1.5.1 Mandatory Standard Design Exceptions

Three Mandatory Design Standard Exceptions were documented. Documentation was reviewed and approved by the Headquarters' Project Development Coordinator, as noted below. All three Mandatory Design Exception Fact Sheets were sent to the FHWA Division Administrator for review and approval on July 7, 2004.

5.1.5.1.1 Cross Slopes

Mandatory Design Standards (*Highway Design Manual* [HDM] Topic 301.2(2)) **Standards** states **"The standard cross slope to be used for new construction on the traveled way for all types of surfaces shall be 2%."**

The main freeway lanes have varying cross slopes, in accordance with HDM Topic 831 and 833, to reduce the possibility of hydroplaning. Those variations are incorporated at all crown cross slope conditions on the main lanes.

The Fact Sheet for Exceptions to Mandatory Design Standards for these exceptions was approved on June 3, 2004.

5.1.5.1.2 Interchange Spacing

Mandatory Design Standards (HDM Topic 501.3) **Spacing** states: **"The minimum interchange spacing shall be ……., and 3 km between freeway-to-freeway interchanges and local street interchanges."**

The following interchanges do not meet the mandatory spacing standard and are the subject of a Request for Mandatory Design Exception:

- Between Proposed Caliente Avenue local street interchange and the existing SR 905/I-805 freeway to freeway interchange.

- Between Proposed La Media Rd. local street interchange and the proposed SR 905/SR 125 freeway to freeway interchange.

- Between Proposed SR 905/SR 125 freeway to freeway interchange and the Siempre Viva Road local street interchange.

The Headquarters' Project Development Coordinator approved the Fact Sheets for Exceptions to Mandatory Design Standards for Interchange Spacing exceptions on June 30, 2004.

5.1.5.1.3 Intersection Spacing

Mandatory Design Standards (HDM Topic 504.3(3)¶ 8) **Location and design of Ramp Intersections on the Crossroads** states: **"For new construction or major reconstruction of interchanges, the minimum distance (curb return to curb return) between ramp intersections and local road intersections shall be 125 m.**

Seven locations require a mandatory design exception for this standard, they are:

- The EB ramp intersection at Caliente Ave. is located 103 m north of the Airway Road intersection.
- The WB ramp intersection at Caliente Ave. is located 106 m south of the Otay Mesa Road intersection.

- On Heritage Road, the distance between the proposed EB ramp intersection is 61 m from the Gateway Park Drive intersection.
- On Heritage Road, the distance between the proposed WB ramp intersection is 91 m from the Camino Maquiladora intersection.
- The SB to WB entrance ramp from La Media Road is 99 m from the intersection of St. Andrews Drive and La Media Road.

The Headquarters' Project Development Coordinator approved the Fact Sheets for Exceptions to Mandatory Design Standards for Intersection Spacing exceptions on June 3, 2004.

5.1.5.2 Advisory Standard Design Exceptions

Embankment Slopes Steeper than 1:4

Advisory Design Standards (HDM Topic 309.1(2)) **Clear Recovery Zone** states: "Fixed objects or embankments steeper than 1:4, which are closer to the edge of traveled way than the distances listed above *(9 m for freeways)* should be eliminated, moved, redesigned to be made yielding, or shielded in accordance with the following guidelines: (italics show clear zone for freeways).

The following locations have embankment slopes that are steeper than 1:4 and are not shielded.

- At the Caliente Avenue Interchange, from 130+00 to 133+40 E5, between the main lanes and the eastbound ramps
- At the Caliente Avenue Interchange, from 133+50 to 135+20 E5, between the main lanes and the westbound exit ramp
- At the La Media Road Interchange, from 180+60 to 182+00 E4, between the main lanes and the westbound entrance ramp
- At the Airway Road Under Crossing, from 201+60 to 203+00 E2, between the SV3P2 ramp and the right of way.

This section of the HDM is being revised and the revised text will require different citations and justification. Therefore, this design exception is being deferred until the new standard is published in the summer of 2004. The new standards will be addressed in any design exceptions necessary.

5.1.6 High Occupancy Vehicle (HOV) Lanes

The Department and SANDAG have jointly developed a HOV express lane plan for the San Diego region, which has been incorporated into the RTP. As mentioned above, the proposed SR 905 will be constructed as a six-lane facility with sufficient ROW for a wide median that could accommodate four additional lanes, two of which could function as HOV lanes. These HOV lanes would be built as traffic demand grows and would accommodate transit modes. The SR 905 six-lane freeway would accommodate the 2025 forecast traffic. Should traffic growth increase more rapidly than expected, HOV lanes could be constructed in the median, providing additional capacity for the corridor, once separate environmental review is completed.

This project provides space for the HOV lanes in the future, but does not include them in the project design. The design of the future HOV lanes and their connections, at the I-805 and at the SR 125 interchanges, will be the subject of separate project planning, design, and environmental review. HOV lane connections at the freeway-to-freeway interchanges may include additional interchange structures or the widening of the structures planned in this project, or a combination, but are not part of this project's design.

5.1.7 Ramp Metering and CHP Enforcement Areas

Grading for ramp metering facilities would be incorporated into each entrance ramp. Grading for ramp metering would also be incorporated into the Enrico Fermi local access ramp and the WB 905 to NB I-805 connector. CHP enforcement areas would be provided.

5.1.8 Park and Ride Facilities

As mentioned above, a park-and-ride lot, with provisions for public bus service, is proposed in the northeast quadrant of the Caliente Avenue interchange and would provide approximately 210 parking spaces in a 0.9 hectare lot. This location would conform to long-range transit plans since it would coincide with a planned light rail station.

5.1.9 Utility and Other Owner Involvement

A variety of utility lines traverse the project area, including, telephone, electric, cable TV, natural gas, and water. Conflicts with the *preferred alternative* of the proposed project have been identified. The estimated relocation cost for the preferred alignment is included in the ROW Data Sheet, which can be found in Attachment 9. A utility conflict resolution has been prepared. The following utilities, that are within the project construction disturbance limits and are impacted by the proposed project, would be relocated.

5.1.9.1 Underground Utilities

- A 250 mm (10 inch) gas line owned by San Diego Gas & Electric along Old Otay Mesa Road would be impacted. The recommended solutions are to depress the gas line along its present alignment (beneath the SR 905 facility) or relocate the gas line.

- Relocate underground telephone lines along Old Otay Mesa Road.

- Relocate underground cable TV lines and two 400 mm (16 inch) water lines at Caliente Avenue.

- Relocate a 250 mm (10 inch) gravity sewer main at Caliente Avenue. The proposed profile of Caliente Avenue would not allow a gravity sewer to flow across the Caliente overcrossing. This sewer would be relocated to a new gravity sewer line in Airway Road, proposed by the City, which would not cross SR 905 at Caliente Avenue.

- Relocate a 250 mm (10 inch) sewer force main, a 300 mm (12 inch) water line, underground electric power lines, underground telephone lines, and a 75 mm (3 inch) gas line at Heritage Road.

- Encase a 300 mm (12 inch) water line at station 153+90.

- Encase a 250 mm (10 inch) water line and a 400 mm (16 inch) sewer force main at Cactus Road.

- Relocate a 300 mm (12 inch) water line, a 75 mm (3 inch) gas line, underground electric power lines, and underground telephone lines at Britannia Boulevard.

- Relocate a 300 mm (12 inch) water line at station 170+00.

- Encase a 400 mm (16 inch) sewer line at station 170+00.

- Relocate a 400 mm (16 inch) water line, a 75 mm (3 inch) gas line, underground electric power lines, and underground telephone lines at La Media Road.

- There is a High Risk 750 mm (30 inch) gas line along Sanyo Road that will be avoided by using a reduced pavement thickness.

- Relocate underground telephone lines and a 450 mm (18 inch) water line along Harvest Road between the intersections with OMR and Airway Road.

- Relocate a 70 mm (3 inch) gas line; underground telephone lines; and 250 mm (10 inch), 300 mm (12 inch), and 450 mm (18 inch) water lines along Airway Road and Harvest Road.

- Relocate underground electric power lines at Harvest Road station 17+30.

5.1.9.2 Overhead Utilities

- Relocate overhead telephone lines and overhead electric power lines at Caliente Avenue.

- Relocate 12 Kv overhead electric power lines between Gateway Park Drive and Cactus Road.

- Relocate 12 Kv overhead electric power lines and overhead telephone lines at Cactus Road.

- Relocate overhead telephone lines along OMR between the intersection with Interim Route 905 and Sanyo Road.

- Relocate 12 Kv overhead electric power lines along OMR between the intersections with Interim Route 905 and Harvest Road.

- Relocate 12 Kv overhead electric power lines along Harvest Road between the intersections with OMR and Airway Road.

- Relocate 12 Kv overhead electric power lines along Airway Road, west of Harvest Road.

5.1.10 Railroad Involvement

- There is no railroad involvement on this project. The Metropolitan Transit Development Board (MTDB) has future plans for an LRT system to operate between Otay Mesa and South Bay/Chula Vista. These plans are long range (more than 20 years into the future). Future proposed LRT extensions include a line from Iris Avenue to Otay Mesa and the POE. After meeting with MTDB representatives, it seemed most likely that the future light rail line would pass along OMR and Interim Route 905, under any of the SR 905 build alignment alternatives. The Department has agreed to provide enough horizontal and vertical clearance under the proposed OMR and Sanyo Avenue undercrossing structures to accommodate the future LRT. MTDB is

planning to implement a transit network that will initially provide bus service until the mesa develops enough to support an LRT extension.

5.1.11 Highway Planting and Structures Aesthetics

Vegetation replacement and mitigation planting will be implemented as described in the EIR/S. The drought tolerant landscape design will incorporate the use of both ornamental and native species. An emphasis will be placed on planting that is self sustaining and low maintenance and on a design that fits the community character, as described in the Otay Mesa community plan. Measures such as slope rounding, contour grading, and benching will be incorporated in the project design to reduce the contrast of the grading and drainage structures with the surrounding landforms. The landscaped areas will include slope and median planting and irrigation. Replacement highway planting is planned in areas where mature vegetation will be removed for construction. Some areas will receive "above standard" landscaping as indicated in the EIR/S. The Department's District 11 Landscape Architect will design the landscape plans.

Bridges, retaining walls, bridge abutment walls, slope paving, and drainage structures will receive aesthetic treatment incorporating the use of textures, forms, patterns, coloring, or other architectural elements. Materials used may include stone, cobble, brick and veneers. All elements will be designed so that they fit the character of the area and emphasize architectural similarities between California and Baja California, Mexico.

5.1.12 Erosion Control

On July 15, 1999 the State Water Resources Control Board adopted Order 99-06 DWQ, the National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from the Department's properties, facilities and activities. This project will be designed in conformance with NPDES requirements. Caltrans Guidance documents will be used to assess all storm water issues. Best Management Practices (BMPs) that will reduce or eliminate run-off of sediment or other contaminants from the proposed work area during construction will be given priority consideration on this project. Post-construction BMPs will be implemented as a standard practice whenever feasible such as detention basins, bioswales and biostrips. All disturbed slopes will be stabilized with permanent erosion control application and appropriate landscaping.

5.1.13 Noise Abatement

Long-term noise affects three residences over the project limits. All of these residences are located along Cactus Road. The impacts were the subject of a Noise Abatement Decision Report (NADR), approved April 2004, that was prepared for the project. Year 2025 traffic noise impacts have been analyzed at the following receptor sites:

- Receptor 1 - 1708 Cactus Road: A one-story single-family residence located north of the proposed project with chapel services offered in the garage. Under the all the Tollway Alternatives this receptor removed.
- Receptor 2 – 1812 Cactus Road: A one-story single-family residence located south of the proposed project. This residence is set back 80 meters west of Cactus Road.
- Receptor 3 – 1916 Cactus Road: This receptor is a two-story single-family residence located south of the proposed project.

The NADR was prepared to consider abatement options for the noise impacts. Noise abatement is termed *feasible* if a proposed barrier reduces the impact by a certain noise level (5 dBA). If analysis determines that a barrier is *feasible*, the barrier is then subject to a determination of reasonability. A barrier is *reasonable* if it can be constructed within a cost budget. The budget varies for each receptor, and is based on several factors.

Normally, noise barriers, if found to be both *reasonable* and *feasible,* are placed along the ROW to provide continuous noise abatement. For SR 905, however, the three impacted residences are located along Cactus Road, perpendicular to the proposed facility. As a result, a noise barrier built along the SR 905 ROW would need to be quite long in order to provide adequate abatement. The cost of that type of abatement for the two properties south of SR 905 is in excess of that termed *reasonable* budget amount.

A second option, for special cases, provides for noise barriers to be built on private property, as long as homeowners agree to the barrier placement, i.e., agree to a permanent easement for the barrier. This kind of mitigation, called a "half-box" barrier, wraps partially around the residence providing a noise "shadow." This kind of noise barrier was found to be *feasible* for all impacted receptors, and was found *reasonable* for receptors 1 and 3. However, the owners declined this type of barrier.

Because the property at receptor 2 was severely impacted, noise abatement for that receptor was recommended, even though the cost was not within the *reasonable* budget for that receptor. A noise berm, in accordance with the NADR, is planned to provide for noise abatement for this receptor.

The NADR recommended that a noise barrier wall be constructed adjacent to the westbound shoulder to abate the noise impacts at receptor 1.

Actual location and configuration of the noise barriers will be determined during final design. The final design will be reviewed and modeled to assure noise abatement requirements are met.

5.1.14 Non Motorized and Pedestrian Features

An existing Class II bikeway (a striped lane for one-way bike travel) extends along OMR and along Interim Route 905, and provides bicycle access through the corridor. As Interim Route 905, from OMR to the POE, will be eliminated by the *preferred alternative*, this existing bikeway will need to be re-routed. The bikeway, instead, would be extended along the new OMR extension to Sanyo Avenue, then south to Heinrich Hertz Drive. The extension would continue south and east to Paseo De Las Americas and then south to Siempre Viva Road.

5.1.15 Cost Estimate Comparison

The cost of each project alternative was determined from the quantities of various items and their unit prices. An eleven-page cost estimate is included for the *preferred alternative* as Attachment 8. Detailed estimates for the other alternatives are available in the project files. Table 11 shows a summary of the costs *escalated to the 2005/2006 fiscal year*.

Table 11
Project Costs ($million) (2006)

	Project Alternative					
	Freeway-North	Freeway-Central	Freeway-South	Tollway-North	Tollway-Central	Tollway-South
Roadway	117.9	115.4	115.3	138.8	133.3	133.1
Structure	37.0	37.0	44.9	39.5	39.9	49.2
Subtotal Construction	154.9	152.4	160.2	178.3	173.2	182.3
Right of Way	116.1	118.1	115.1	289.3	121.8	116.3
Support	44.0	44.0	44.0	44.0	44.0	44.0
Total	**315.0**	**314.5**	**319.3**	**333.3**	**339.0**	**342.6**

5.1.16 Right of Way Data

Detailed ROW cost estimates for the *preferred alternative*, including utility relocation costs, is shown in Attachment 9, the ROW Data Sheet. ROW Data sheets for the other alternatives are available in the project files.

5.2 Rejected Alternatives

5.2.1 Alternatives and Variations Withdrawn from Consideration before Circulation of the Draft EIS/R

5.2.1.1 Expressway Staging Option

The Expressway Staging Option (ESO) was presented in the Draft EIS/R for informational purposes only. The ESO was developed to evaluate the minimum facility (cost constrained) that could be constructed to mitigate the congestion on OMR and provide a second arterial between I-805 and the POE. It was initially meant to be a full alternative to the SR 905 Freeway. However, upon review of the TATR and traffic forecasts, it became evident that the ESO could only serve as an interim improvement – an initial phase of the ultimate facility. The expressway would have improved conditions on Otay Mesa, but only for approximately three years after the facility opened. See section 2.4.1 of the EIS/R for more details on this rejected alternative.

5.2.1.2 Alternatives Withdrawn from Consideration During Early Resource Analysis

Evaluations of project alignment alternatives have been ongoing since 1995, and have indicated that some alternative alignments should not be evaluated in greater detail. A comprehensive effort by the project team over a three-month period (February through April, 1995) using detailed resource constraint mapping resulted in four preliminary alternatives, which are discussed below. An alternatives analysis was conducted using the prepared land use and resource constraints maps for the Otay Mesa area. Alternatives were considered and rejected, based on impacts to the identified land uses and resources.

5.2.1.2.1 Alternative Alignments North of Otay Mesa Road

Alternative alignments, which would traverse areas north of OMR, were considered and rejected because they would have severe impacts to the Brown Field airport, commercial development along OMR, and biological resources (coastal sage scrub, vernal pools, and sensitive wildlife habitats within the Otay River Valley).

5.2.1.2.2 Alternative Alignments South of the Current Alternatives

Alternative alignments to the south were also considered and rejected based on impacts to high quality wildlife habitat within Spring Canyon and to MSCP lands, and also because of higher construction costs. Subsequent to the preliminary alternatives analysis, identification of the current study corridor was finalized and alternative alignments were developed within this corridor.

5.2.1.2.3 Alternative Alignments Within the Study Corridor

Alternative alignments were evaluated during a May 11, 1995 meeting with representatives of the ACOE, USFWS, CDFG, and the City. Using the detailed resource constraint maps, four alternatives were created and color-coded brown, green, blue, and pink. These are depicted in Attachment 10. The meeting participants agreed that the Brown Alternative should be eliminated since it presented excessive disruption to existing development, buildings, and local streets along OMR. This alternative passed slightly north of OMR and would have been too costly and too disruptive to existing development. Any alignment which impacted OMR would have required realignment of OMR as a frontage road in order to allow continued access to existing businesses. The meeting participants also agreed that neither the blue nor green alternatives would be biologically preferred, and that a new hybrid alternative should be found between the two that would balance the impacts to vernal pools and to occupied coastal sage scrub. The resulting hybrid alternative was developed and proposed for further detailed technical study. This new alignment alternative improved on the previous blue and green alternatives by preserving some of the smaller vernal pools and by reducing impacts to the coastal sage within Spring Canyon. The Blue Alternative was retained for further study because it presented the vernal pool avoidance alternative. The Pink Alternative was retained for further study because it was the adopted route, was an alignment alternative that the community and developers were aware of, and it resulted in a corridor that would be reserved from development.

A pre-application meeting for a Section 404 permit was held on June 15, 1995, with the ACOE, EPA, USFWS, DFG, and the County Department of Health Services. The three alignment alternatives selected (Hybrid, Blue, and Pink) were presented and proposed for further detailed study as part of the ultimate EIS/R. The resource agency representatives concurred that the three alignment alternatives proposed were sufficient for the EIS/R and could be carried forward for further detailed study. These alignment alternatives were also renamed as the North (hybrid), Central (blue), and South (pink) alignments. No additional alternatives were suggested by the agencies.

5.2.2 Variations Withdrawn from Consideration after Circulation of the Draft EIS/R

The La Media Road Partial Interchange Option would have only included access to the west of La Media Road (i.e., an exit-ramp from EB SR 905 and an entrance-ramp to WB SR 905). This option was being considered in the event that funding for the full interchange was not obtained.

The ROW for the full interchange would have been purchased under this option. Funding for the full interchange is available.

Since the circulation of the Draft EIS/R and the Draft Project Report, the Siempre Viva Interchange project, with limits from Airway Road to the POE, has been processed as a separate project. The Siempre Viva interchange, previously identified as an integral element of the SR 905 project, was considered and evaluated as a stand-alone project with independent utility and was pursued under a separate environmental process. A Categorical Exclusion (NEPA) was approved on May 10, 2002. This project creates a grade-separated highway interchange to address localized congestion at the intersection of Siempre Viva Road and Interim Route 905. The SR 905 project would nevertheless require work in and around the Siempre Viva interchange and south to the POE to address continuity for international traffic and incorporation of the Siempre Viva interchange into the new SR 905 freeway facility. Work would include revised pavement delineation on the SR 905 main lanes and ramps, new area signs from Airway Road to the POE, and ramp meter installation on the northbound entrance ramp from Siempre Viva Road to SR 905. Therefore, the limits of the SR 905 project remain the same as in the Draft EIS/R even though the Siempre Viva interchange was processed as a separate project.

6. CONSIDERATIONS REQUIRING DISCUSSION

6.1 Hazardous Waste

Initial Site Assessments (ISA) were performed by Ninyo & Moore in 1995, 1996 and 1997. the *preferred alignment* alternatives include properties that have undocumented discharges of waste (illegal dumping). Mitigation at these sites will include removal of surface discharge, along with a more in-depth assessment, including soil testing for potential impacts, where warranted.

Two locations were identified to have the potential for hazardous waste. The first location is the Barnhart property, also known as the Tripp Landfill. The second location is the property occupied by Cactus Recycle. Both properties are located on Cactus Road and along the southerly limits of the proposed facility.

A Site Investigation (SI) was performed on the Tripp Landfill by ENVIRON Corporation in 1993 and 1994. The SI report identified the composition of the fill material and the limits of the landfill. The portion of the site within the project construction disturbance limits contains burn-ash and burn-ash contaminated soil. The limits of the contaminated soil within the proposed project limits are 50 m long, 35 m wide and up to 3.6 m deep. The Department performed a geotechnical investigation of the area in question to determine the engineering properties of the waste material. Several options for Tripp Landfill remediation were identified, including an impervious cap, densification, disposal as non-hazardous or as hazardous waste, bridging, and no action. The remediation costs for the various remedies are estimated to be between $16,000 and $658,000.

The Department has completed a focused SI on the Cactus Recycle property. While the investigation found some hazardous waste, further investigation was not warranted, because the new facility construction will be in embankment over the site, and the existing ground will not be disturbed.

The Tripp Landfill and Cactus Recycle properties will be impacted by all of the build alternatives. See section 4.12 of the EIS/R for more detailed information on the hazardous waste findings and mitigation.

6.2 Value Analysis (VA)

A VA study of the PROPOSED SR 905/SR 125 INTERCHANGE was completed in June 1996. The VA team, consisting of members from the Department, FHWA, City, County and private citizens, reviewed the developed alternatives and prioritized their potential for acceptance. Alternative No. 80 (a composite design alternative) was selected as the most viable alternative and was classified as priority one in the VA study (Attachment 11). This alternative is implemented in this Project Report. Some of the benefits include:

- Provide local access at La Media Road, Lone Star Road, OMR, and Enrico Fermi Drive.
- Minimize impacts on present land use plans.
- Improve operations by redirecting southbound truck traffic onto a dedicated truck route while providing ample truck storage.
- Additional direct "system" access for the East OMR.
- Reduce congestion on local roads.
- Accommodate weaving concerns and the excessive number of decision points due to the close proximity of interchanges by using connector roads and eliminating certain moves.

The final geometry selected for SR 905, from Las Media Road to Enrico Fermi Drive, is that recommended by the VA Study, with minor changes to accommodate forecast traffic volumes.

6.3 Resource Conservation

Resource Conservation methods are limited to specific design items and construction-techniques. Some project conservation features include:

- Reduce the number of at-grade intersections and reduce uphill gradients, to improve average traffic operating speeds.
- Provide sufficient ROW to accommodate a wide median that would allow for future HOV lanes.
- Specify alternate construction materials so that the contractor may select the construction materials that are most efficient at the time of construction.
- Recycle existing asphalt concrete to be incorporated in the base material for the new roadway sections.
- Minimize lighting by placing lighting only where needed for safety reasons.
- Allow concrete and base material preparation at on-site batch plants to reduce haul distances.
- Use of reclaimed water for landscape irrigation purposes.

6.4 Right of Way Issues

6.4.1 Right of Way Required

The following table shows the right of way requirements for the six project alternatives.

Table 12
Right of Way Requirements

Alternative	Required Right of Way Areas
Freeway-Central (*Preferred Alternative*)	140 hectares
Freeway-North	130 hectares
Freeway South	135 hectares
Tollway-Central	144 hectares
Tollway North	135 hectares
Tollway-South	141 hectares

The Right of Way Data Sheet for the preferred alignment is shown in Attachment 9. The Right of Way Data Sheets for other alternatives are available in the project files.

6.4.2 Relocation Impact Studies

The *Preferred Alternative*, the Freeway-Central Alternative, requires either full or partial acquisitions of eleven parcels where some level of relocation would be involved. There would be an impact to one residence/church and 22 non-residential units. The non-residential units include a batch yard, a recycling yard, various automotive businesses, and a storage facility.

A detailed discussion of right of way impacts is included in the Final Relocation Impact Statement (FRIS). The FRIS is part of the EIR/S. For more detailed information see section 4.5.1 of the EIS/R.

6.5 Environmental Issues and Mitigation

The EIR/S has been prepared in accordance with the Department's environmental procedures, as well as State and Federal environmental regulations. The EIR/S is the appropriate document for the project. Environmental impacts that warranted detailed analysis for the project include visual and landform alteration, socioeconomic, biology, impacts to the MSCP, and cumulative impacts.

6.5.1 Visual Impacts and Landform Alterations

Visual impacts would result from cut and fill slopes, alterations to the existing viewsheds, introduction of new visual features, e.g. noise barriers, and tree removal. All embankment slopes, wherever feasible, would have a maximum slope rate of one vertical to four horizontal, and best management practices for erosion control would be incorporated. Landscaping would be provided as a buffer for viewshed alteration and new visual features. Required noise barriers would incorporate treatment to deter graffiti. The loss of any mature eucalyptus trees within the middle segment of the Project Corridor would be replaced at a ratio of 5:1.

6.5.2 Socioeconomic Impacts

Socioeconomic impacts involve land use, residential and business relocation, and impacts to growth. There are direct industrial, commercial, and mixed land use impacts and indirect impacts

on planned and approved industrial developments. These impacts, and their required mitigation, are detailed in the EIS/R and summarized below.

6.5.2.1 Land Use

The project will affect the existing land use, especially during construction, with noise, visual, and air quality impacts. Measures are set forth in the EIS/R which provide both short and long term mitigation for these impacts. The SR 905 project was included in the Final Air Quality Conformity Analysis for San Diego's -2030 RTP as a six-lane freeway in the 2030 revenue constrained plan.

6.5.2.2 Residential and Business Relocation

The *Preferred Alternative*, the Freeway-Central Alternative, would involve residential and business relocation, as summarized in section 6.4.2 and detailed in the FRIS. Relocation would be done in accordance with State and Federal laws as outlined in the FRIS. The project includes plans to maintain access and/or provide new access where necessary to reduce or eliminate impacts to businesses.

6.5.2.3 Growth

Growth impacts include:

- The project is a facility that provides infrastructure for planned residential and commercial development in a controlled process. Unplanned or uncontrolled growth, without infrastructure planning, leads to more serious impacts.
- Existing access serving local businesses may be reduced for short times during construction. However, access will be maintained/replaced as necessary. Access improvements, if required, will be replaced in kind.
- Growth forecasts are not expected to change as a result of the proposed project, although ease of transportation access and traversal will be an enabling factor in implementing the planned growth.
- Mitigation is governed by the local land use plans, which provide for orderly, timely, and environmentally approved land use development.

6.5.3 Biology

Biology impacts and planned mitigation include:

- Vernal pool impacts will be mitigated in accordance with the Vernal Pool Mitigation Plan for this project. The mitigation plan will be developed in coordination with the CDFG and the United States Fish and Wildlife Service (FWS).
- Impacts to CDFG jurisdictional areas are the subject of the required Streambed Alteration Permit.
- Impacts to ACOE jurisdictional areas are treated in the required CWA Section 404 permit.
- Impacts to San Diego and Riverside fairy shrimp, Quino checkerspot butterfly, and San Diego button-celery, all endangered species, require a Section 7 consultation with the FWS. Since the shrimp habitats are vernal pools, the Vernal Pool Mitigation Plan will include mitigation for San Diego and Riverside fairy shrimp impacts.

- The impacts to coastal sage scrub also require a Section 7 consultation for potential impacts to the coastal California gnatcatcher, a threatened species. The consultation will determine the mitigation to be applied.

6.5.4 Multiple Species Conservation Program (MSCP)

The proposed project impacts areas designated as part of the MSCP. The Spring Canyon Bridge will maintain the wildlife corridor between Dennery Canyon and Spring Canyon in accordance with the MSCP. The preferred alignment was revised to reduce the impacts to Spring Canyon. A bridge over Spring Canyon is now planned instead of a fill placed in the canyon with an Animal Undercrossing culvert to provide access for animals traversing the area. Existing undocumented fill placed across the canyon, south of the freeway central alignment, will be removed and the canyon slopes restored with native planting. The preferred alignment will include two wildlife access routes from Spring Canyon to the OCCS Preserve.

6.5.5 Cumulative Impacts

Cumulative impacts, such as sensitive biological resource impacts, will be mitigated by the project and by regional measures such as the MSCP.

6.6 Air Quality Conformity

The proposed project is included in the SANDAG 2030 RTP, which was fully funded and found to be conforming by FHWA and FTA on April 9, 2003. The proposed project is included in the SANDAG 2002 Federal Transportation Improvement Plan (FTIP), which was found to be conforming on October 4, 2002. Project design, concept and scope are also consistent with the project description in the above RTP and FTIP. The project is also in the 2004 RTIP, which was approved by SANDAG on 7/23/2004 and is pending FHWA and FTA approval.

6.7 Title VI Considerations

The project design incorporates the standards of the Americans with Disabilities Act (ADA) and the State Building Code for accessibility for persons with disabilities. Design guidelines to encourage the development of transit and pedestrian-friendly communities will be included in the project.

7. OTHER CONSIDERATIONS

7.1 Public Hearing Process

During the public circulation of the Draft EIR/S, a public hearing was held on September 20, 2001, which 36 people attended. There was general support for the project, although several landowners expressed concerns regarding impacts to their property. Several agencies, and the City, support the Freeway-Central Alignment Alternative as the *Preferred Alternative*, as discussed in the EIS/R.

7.2 Route Matters

7.2.1 Freeway Agreements

Freeway agreements between the State and the City, and between the State and the County, to document the planned traffic circulation features, are required. Important issues to be addressed are local road closures, access to the proposed facility, frontage road locations, and other changes to the circulation system.

7.2.2 Route Adoption

The alignment of SR 905 has been adopted by the CTC as noted in Section 3.1 above. The alignment of SR 905 from just east of La Media Road to the POE will need to be adopted as a freeway. Currently, that portion identified as Interim SR 905 is adopted as a state highway.

7.2.3 Relinquishments

As described by Cooperative Agreement 11-8193, dated December 1996 (Attachment 12), the State will relinquish OMR (Traversable SR 905) when the State completes appropriate functional equivalent segments of SR 905 as a regional transportation facility.

In addition, after completion of the project, the State will relinquish the proposed two-lane frontage road located on the south side of SR 905 from Gateway Park Drive to Cactus Road.

A flood storage easement between Britannia Blvd and La Media Road, immediately south of the planned freeway will be improved and then relinquished to the City of San Diego.

As part of the traffic handling for the project, a portion of OMR between the west end of Interim SR 905 and Sanyo Road will be constructed. Those portions outside of the permanent ROW will be relinquished to the City of San Diego or to the County of San Diego after construction of SR 905 is complete and Interim SR 905 removed.

7.3 Permits

Several permits and/or approvals from a number of State and Federal Resource Agencies will be required to construct this project. Table 13 shows the Resource Agencies and required activities:

Table 13
Permits and Approvals

Agency	Permit/Approval
California State Water Resource Control Board	CWA† Section 401 Certification
Regional Water Quality Control Board	CWA† Section 402 Permit No. CAS 029998 (NPDES*)
U.S. Army Corps of Engineers	CWA† Section 404 Permit
California Department of Fish and Game	1601 Streambed Alteration Permit
Air Pollution Control/Air Quality Management	Approval to Construct and Permit to Operate
State Historic Preservation Office	Section 106 Clearance for Archeology
United States Fish and Wildlife Service	Section 7 Consultation

† Clean Water Act
* National Pollution Discharge Elimination System

7.4 Cooperative Agreements (CA)

The State and the City of San Diego entered into CA No.11-8193 on December 2, 1996. That agreement sets forth the conditions for relinquishment of OMR (Traversable SR 905) to the City as portions of SR 905 are put into service. In addition, the State and the City of San Diego entered into CA No.11-8193, on June 5, 1998, to fund acquisition of ROW for SR 905. No additional CAs are expected to be needed for the construction or operation of SR 905.

7.5 Other Agreements

Other Agreements required are:

- Maintenance agreements between the State and both the City and the County outlining responsibility for maintenance for the city streets and county roads abutting and crossing the state facility..
- A revised or supplemental Franchise Agreement, between the State and CTV, will be required to include construction and support funding for the access to/from SR 125.
- Utility agreements with utilities affected by the construction of the project.

7.6 Transportation Management Plan

Since this would be a new facility on a new alignment, traffic disruption is expected to be minimized. However, there are two locations where the proposed alignment joins existing roads. Temporary stage construction detours at these locations are within the construction disturbance limits. Some delays may occur for short-term traffic handling. The locations that would require special consideration are:

- Traversable SR 905 between I-805 and Caliente Avenue.
- Interim 905 between OMR and Airway Road.

Existing roads, which may have increased traffic due to construction, include:

- Caliente Avenue and Heritage Road in the Middle Segment.
- Britannia Blvd, La Media Road, Otay Mesa Road, Sanyo Road, Airway Road, and Enrico Fermi Drive in the East Segment.

This increased use would vary depending on specific construction operations. The additional construction related traffic is not expected to exceed the capacity of these local streets.

Traffic delays would be mitigated by using temporary message signs and by implementation of a pubic awareness program. Project bulletins would be periodically distributed to the print media, radio stations, and at the District 11and CHP Public Affairs Offices. A construction outreach program would be developed to inform local residents and businesses about construction activities. All construction zones would have appropriate warning signs. Construction would be performed in accordance with the Department's standard specifications. No night work would be performed in residential areas, with the possible exception of falsework erection and removal over existing roads. $500,000 has been included in the project estimate for the public awareness campaign.

7.7 Phased Construction

The proposed project will be constructed in phases. Consideration of the construction schedule, physical layout of the project, public transportation needs, contract phase dollar amount, and other requirements influenced the phasing and construction contract limits. The detailed project phasing plan and contract limits will be determined in the design phase. Four phases are proposed, as described below:

7.7.1 Phase 1:

- This phase includes all construction between I-805 and the POE.
- The interchanges at Caliente Avenue, Britannia Boulevard, and La Media Road would be constructed and improvements to Sanyo Avenue, Otay Mesa Road, Harvest Road, and Airway Road would be made.
- The Caliente Avenue and Britannia Road overcrossings, the Heritage Road, La Media Road, Airway Road, and Sanyo Road undercrossings, and the Spring Canyon bridges would all be constructed during this phase.
- A frontage road from Gateway Park Drive to Cactus Road would be constructed along the south side of SR 905 and a cul-de-sac would be constructed where Cactus Road terminates on the north side of SR 905.
- A park-and-ride lot would be constructed in the northwest quadrant of the Caliente Avenue interchange. Direct access to and from SR 905, at the west end of OMR, would be terminated in a cul-de-sac and traffic on OMR would be redirected to the Caliente Avenue interchange for access to SR 905.
- Lastly, as discussed in Section 5.1 above, this phase would include the work in and around the Siempre Viva interchange and south to the POE.

7.7.2 Phase 2:

- During this phase, the WB SR 905 to NB I-805 connector, the exit from SR 905, and the entrance to I-805 would be widened to two lanes.
- An auxiliary lane along NB I-805, between SR 905 and Palm Avenue, would be constructed that would include widening the Del Sol Boulevard undercrossing.

7.7.3 Phase 3:

- The SR 905/SR 125 freeway-to-freeway interchange would be constructed during this phase.
- The four-lane local access ramp would be constructed from the SR 905/SR 125 interchange east to the intersection with Enrico Fermi Drive.
- Structures would be built at the following locations:

    - SB SR 125 to WB SR 905 connection over OMR,
    - SB SR 125 to WB SR 905 connection over the WB SR 905-La Media Road exit ramp,
    - WB local access ramp from Enrico Fermi Drive over the WB SR 905-La Media Road exit ramp,
    - WB local access ramp from Enrico Fermi Drive over the WB SR 905 to NB SR 125 and SB SR 125 to EB SR 905 connector ramps,
    - EB local access ramp to Enrico Fermi Drive over the WB SR 905 to NB SR 125 and SB SR 125 to EB SR 905 connector ramps,

- EB local access ramp to Enrico Fermi Drive over SR 905 and the WB SR 905-La Media Road exit ramp,
- SB SR 125 to EB SR 905 connector ramp over SR 905, and
- Sanyo Avenue undercrossing.

7.7.4 Phase 4:

- During this final, and future, phase, the Heritage Road interchange ramps would be constructed so as to coincide with completion (by others) of the future local Circulation Element roads (Airway Road connecting Britannia Boulevard and Caliente Avenue and Heritage Road [south across Spring Canyon] connecting to Siempre Viva Road). The construction of the Heritage Road interchange is being postponed based upon the following rationale:

    - The traffic numbers forecast for the SR 905 facility depend on the development of the surrounding land in conformance with the Land Use Element of the City and County General Plan. Development for the Otay Mesa area was estimated to be fully built-out in 2040. Based upon this estimate, development would be one-half of the year 2040 build-out estimate in 2025 (the SR 905 design year).

    - The development of the land use is also tied to the Circulation Element. Streets and roads are not constructed until the development is imminent or complete. In the case of Heritage Road, there is no traffic generator/attractor south of Gateway Park Drive, a local industrial street.

- Until Heritage Road is connected to the rest of Otay Mesa, either by the connection to Siempre Viva (slated for 2016-2018 in the City's Finance Plan) or by the connection of Airway Road (2022), or both, the only traffic that would use Heritage Road would be from the local businesses or from the Heritage Road/Otay Mesa Road intersection. Consequently, the interchange would not be of public value for 15 to 20 years.
- Given these facts, the Department concluded that a better use of public funds would be to recognize that the Heritage Road interchange needs to be built to accommodate the traffic forecast for 2025, but that construction at the same time as the rest of SR 905 Freeway is built is premature.
- The Heritage Road undercrossing would be constructed in such a way as to allow future construction of the interchange ramps without remodeling the structure or impacting traffic on SR 905. Heritage Road will be realigned as necessary when the future ramps are constructed.

7.7.5 Phase Construction Costs:

The preliminary construction cost estimates for the proposed construction phases, including ROW costs, indicate the following costs in 2004 dollars:

- Phase 1 cost estimate - $230 million
- Phase 2 cost estimate - $ 11 million
- Phase 3 cost estimate - $ 48 million
- Phase 4 cost estimate - $ 20 million

7.7.6 Design Sequencing

The SR 905 project has been approved for design and construction using the *Design Sequencing* process. This process, set forth in Assembly Bill 405, amends Article 6.5 of Chapter 1 of Division 1 of the Streets and Highways Code, to allow the advertising and award of a highway construction project with plans that are at least 30% complete. Design is then completed during the construction phase of the project. *Design Sequencing* has been used for several projects throughout the State as a pilot for an innovative process to reduce the time to design and build highway infrastructure.

7.8 Accommodation of Oversize Loads

SR 905 is designated as a part of the Oversize Load Highway System (OLHS) adopted originally in 1984. The OLHS consists primarily of those roads used to accommodate the transport of oversize loads. The oversize loads have widths up to 8.23 meters and loaded heights in the 5.49–7.01 meter range.

Proposed vertical clearances for the Freeway Central alignment alternatives range from 5.78 to 11.7 meters between I-805 and SR 125. South of SR 125, vertical clearances of 5.1 meters are being proposed.

Passage of vehicles with unrestricted height would be through the southbound and northbound truck routes. The southbound truck route is La Media Road. The northbound truck route will connect the CVEF to the four lane Enrico Fermi Road connector, providing vehicles direct access to SR 905. Oversize loads would be accommodated by routing through ramp intersections at overcrossing interchanges (Caliente Ave. and Britannia Blvd) if loaded heights exceeded the clearance provided over the freeway.

7.9 Graffiti Control

The following measures will be implemented during design, where feasible, to discourage graffiti:

- Avoidance of smooth surfaces when slope paving.
- Use of planting, where appropriate, to cover surfaces; and
- Use of anti-graffiti coatings as needed.

7.10 Other Appropriate Topics

7.10.1 US International Boundary and Water Commission Requirements (USIBWC)

The proposed project bisects a substantial drainage basin. Because this basin drains into Mexico, comments and design criteria were requested from the USIBWC. The USIBWC provided the following:

- The USIBWC requests that the project sponsor provides assurance that the project meets the appropriate jurisdiction's requirements (City of San Diego) in the United States to guard the downstream properties from flows greater than those in pre-development conditions;
- The USIBWC requests this assurance from the appropriate jurisdiction in the United States, in order to provide it to Mexico, along with a copy of the project plans for Mexico's review and comment;

The USIBWC's role in this process is one of facilitating information exchange between the project sponsors, the appropriate jurisdiction in the United States, and the competent agencies of the affected Mexican community. The USIBWC will forward Mexico's comments to the project sponsor and to the appropriate jurisdiction in the United States.

8. PROGRAMMING

8.1 Scheduling

The current project schedule anticipates approval of the EIS/R in the 2004 fiscal year and approval of the Record of Decision by September of 2004. Plans, Specifications and Estimate are expected in the spring of 2005, with project Advertisement slated for the summer of 2005. Construction completion is expected by late 2008.

8.2 Funding

Since the adoption of the 1996 RTP, the SR 905 project has attracted significant attention from local, state, and federal legislators that resulted in a significant increase in the funds programmed for the project. Specific legislation in the federal TEA-21 earmarked $54.5 million for the construction of SR 905, and the NCPD and CBI programs have provided an additional $25.5 million for the project. These additional federal funds, along with recent allocations from State and local sources, resulted in the programming of approximately 70% of the funds needed for the six-lane freeway project. The amounts programmed are shown on table 13.

Construction of the project will be addressed in phases, as noted above in section 7.7, to take advantage of the funds already programmed and available. Additional funds are anticipated, as the need grows, from the following sources:

- Future STIP cycles (RIP & IIP)
- Future CBI cycles (average about $7 Million/yr)
- Future federal earmarked funds (One version of the TEA reauthorization includes $15 Million)
- Additional Regional funds - $25 Million is included in the Proposed Transnet extension
- Additional local funds such as developer contributions
  (The city is considering adding 8 to 10,000 homes - this will require mitigation)
- There is a cost sharing agreement between the Department and CTV for fair share agreement on the SR 125/SR 905 Interchange improvements.

The specific amount and timing of the availability of these funds are unknown, so other options to reduce and/or stage scope have been identified. Priorities for use of the available funds would be:

- Purchase all necessary ROW as soon as possible to reduce cost liability
- Construct at least four lanes from the POE to 805 to meet basic need and purpose of providing a facility for existing traffic volumes between the POE and 805 - additional lanes (and improvements for 805) would be added as traffic volumes increased and additional funds became available.
- Defer the 905/125 Interchange until full funding available - interim access to the SR 125 toll road would be provided by Otay Mesa Road

- Local interchanges could be phased as growth continues on the mesa and as funding becomes available - in between facility would be an expressway
- Reassess design features (such as concrete shoulders) to determine other opportunities for cost savings

Table 13
Programmed Funding ($ thousands)

Funding Program		Amount
1996 and 1998 State Transportation Improvement Program	$	7,237
1998 Interregional Transportation Improvement Program	$	90,511
1998 Regional Transportation Improvement Program	$	22,496
1999 TEA-21 CBI	$	2,490
2000 TEA-21 CBI	$	7,500
2001 TEA-21 CBI	$	4,096
2002 TEA-21 CBI	$	7,282
2003 Surface Transportation Program	$	1,000
2003 TEA-21 CBI	$	3,974
2003 TEA-21 DEMO	$	3,000
2003 TEA-21 NCPD	$	175
Local Funds	$	4,000
TCRP	$	21,000
TEA-21 DEMO*	$	40,485
Total	**$**	**215,246**

*Although $54.5 million has been programmed from the TEA-21 DEMO, $14 million was used in the funding of the Siempre Viva Interchange project mentioned in section 5.2.2.

8.3 Risk Management

A detailed risk assessment that identified several project risks was completed on September 16, 2002, and is on file with the project records.

The following are some of the major risks identified in the assessment:

- New development in the area is causing project rework to project geometrics, which could impact environmental timeline and is directly affecting R/W costs.

- Without completed bridge plans, utilities cannot design their relocations which could delay the right-of-way certification and subsequently overall project schedule - could lead to cost increase.

- City of San Diego would like additional structures added to the project – this could adversely impact cost/schedule since they were never included in the original scope of work.

- Resource agencies may not accept conceptual mitigation plans and could cause failure to issue permits and impact schedule.

The original risk assessment did not assign a dollar value to the specific risks but the magnitude can be seen as development in the area has raised land values so that the cost to acquire project right of way has increased from the Draft Project Report estimate of $75 million to the current estimate of $118 million.

The major increases in project costs are attributed to the overall cost of right-of-way acquisition, increases in unit costs, increase in NPDES costs, and the additional structure added at Spring Canyon.

9. REVIEWS

David Cordova (current), Jim Douglas and Karla Sutliff (former), Headquarters (HQ) Geometric Reviewers, as well as, Luis Betancourt (current), Jim DeLuca and Tim Craggs (former), HQ Project Development Coordinators, have reviewed this project at various times throughout its development. Luis Betancourt concurred with the project on June 30, 2004. HQ Traffic Safety reviewer, Alex Kennedy has reviewed the project, including safety concerns at specific locations, on numerous occasions throughout the development of the project.

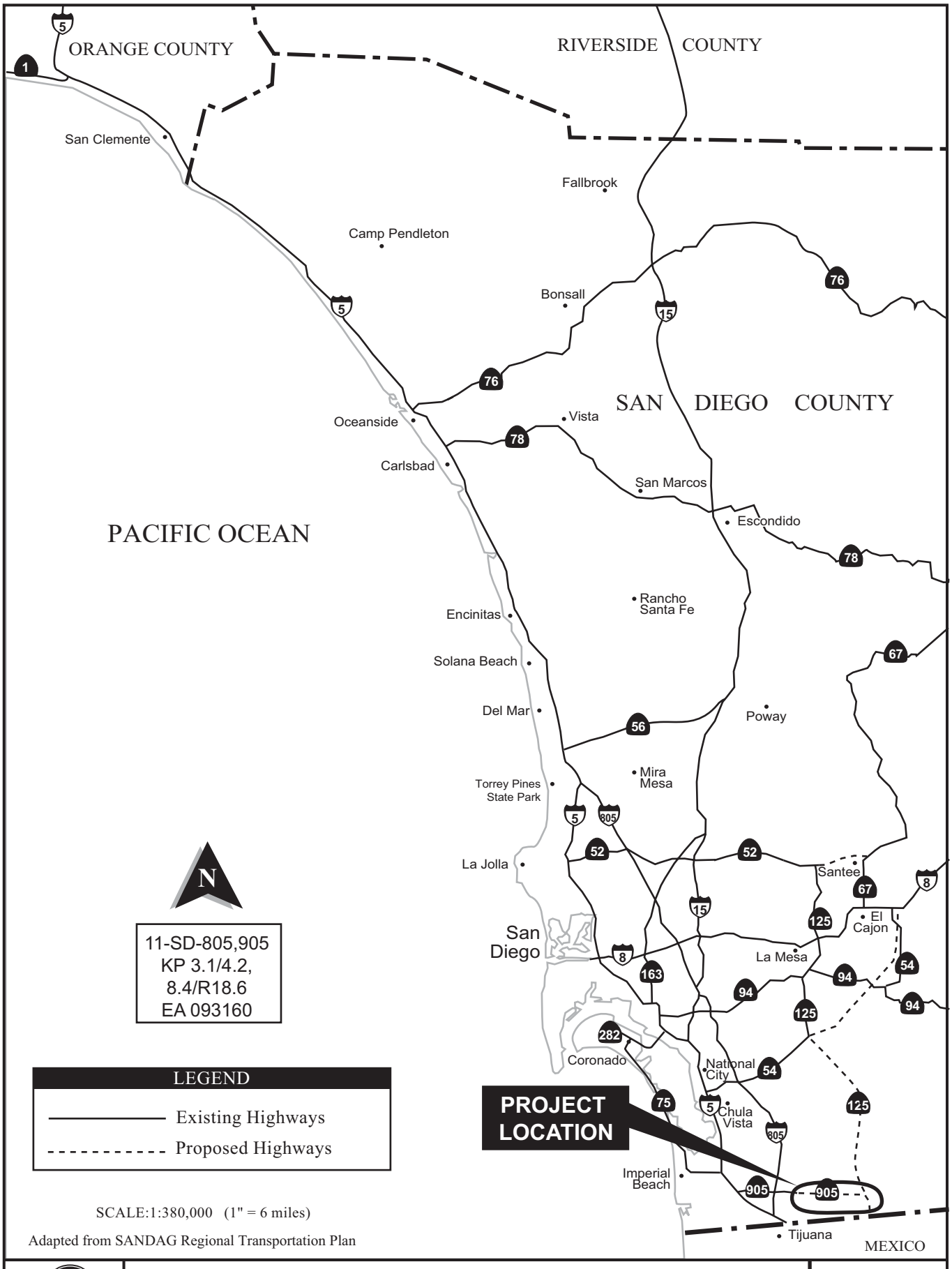
Jeffrey S. Lewis, Senior FHWA Field Operations Engineer, has reviewed the Project Report on July 16, 2004. Per TEA-21, this project is eligible for federal funding and is considered to be FULL-OVERSIGHT under the current FHWA/Caltrans Stewardship Agreement.

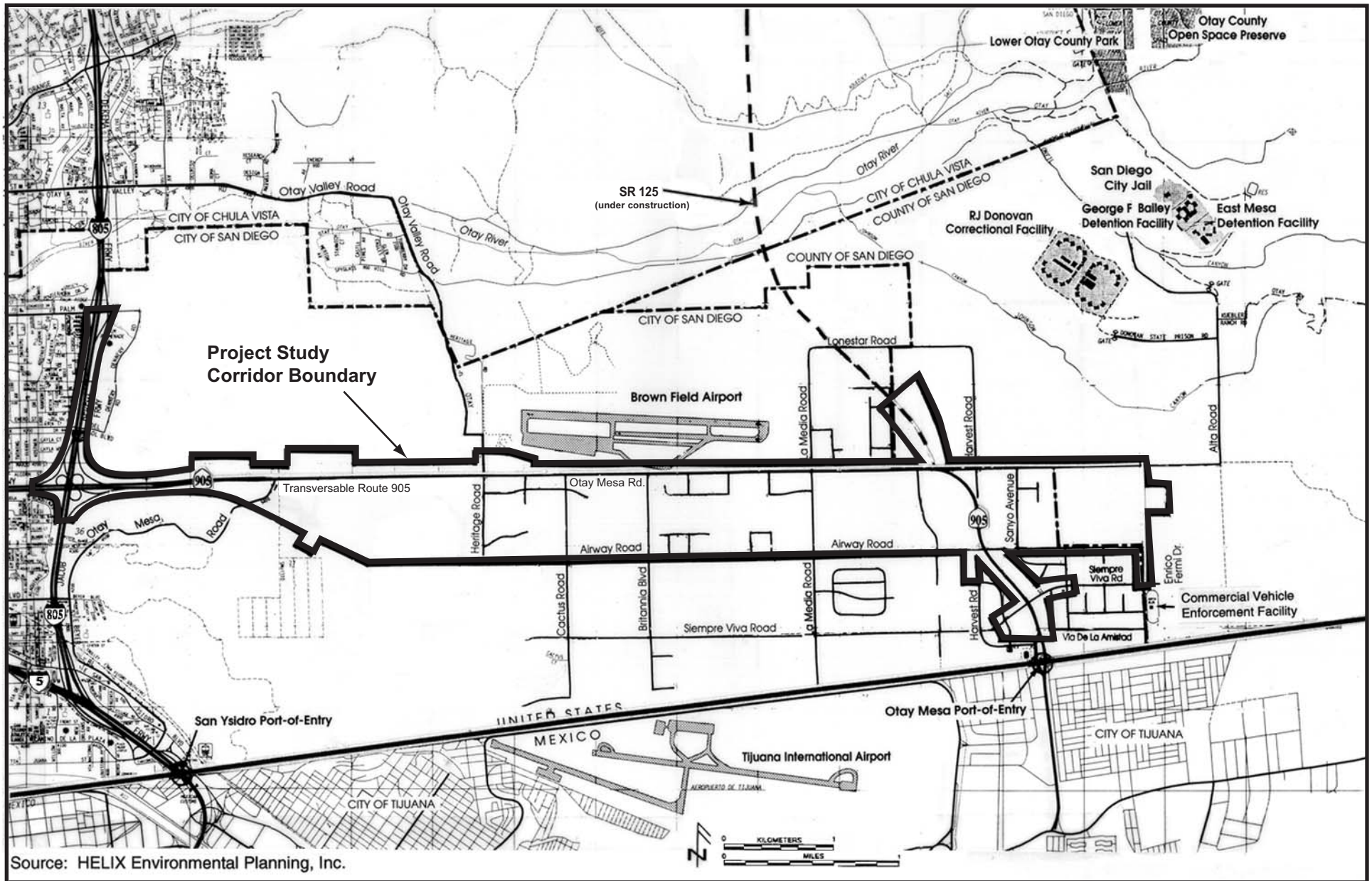
10. PROJECT PERSONNEL

• Randy Sanchez	Project Manager	619-688-6728
• Chuck Davis	Design Manager	619-688-3156
• Tom Guerrini	Project Engineer	619-220-7384
• John Chisholm	Environmental Analysis Branch Chief	858-616-6610
• Kevin Hovey	Environmental Analyst	858-616-6638

11. LIST OF ATTACHMENTS

Attachment 1: Location Map
Attachment 2: Project Vicinity
Attachment 3: Existing and Forecast Traffic Circulation Network and Volumes
Attachment 4: Typical Cross-Sections
Attachment 5: Project Features
Attachment 6: Profiles
Attachment 7: Structure General Plans or Planning Study Plans (*Preferred Alternative*)
Attachment 8: Cost Estimate (*Preferred Alternative*)
Attachment 9: Right of Way Data Sheet (*Preferred Alternative*)
Attachment 10: Preliminary Alternative Alignments
Attachment 11: Value Analysis Alternative No. 80 (excerpts)
Attachment 12: Structural Section Recommendation Sheet
Attachment 13: Mitigation compliance cost sheet


ORANGE COUNTY
RIVERSIDE COUNTY
SAN DIEGO COUNTY
PACIFIC OCEAN
San Clemente
Fallbrook
Camp Pendleton
Bonsall
Oceanside
Vista
Carlsbad
San Marcos
Escondido
Rancho Santa Fe
Encinitas
Solana Beach
Del Mar
Poway
Mira Mesa
Torrey Pines State Park
La Jolla
Santee
El Cajon
San Diego
La Mesa
Coronado
National City
Chula Vista
Imperial Beach
Tijuana
MEXICO
PROJECT LOCATION
N
11-SD-805,905
KP 3.1/4.2,
8.4/R18.6
EA 093160
LEGEND
Existing Highways
Proposed Highways
SCALE:1:380,000 (1" = 6 miles)
Adapted from SANDAG Regional Transportation Plan
Route 905
Regional Project Location
Attachment 1



Source: HELIX Environmental Planning, Inc.

Route 905

Project Vicinity

Attachment 2

OTAY VALLEY RD

BROWN FIELD AIRPORT

LONESTAR RD

HARVEST RD

LA MEDIA

OTAY MESA RD

HERITAGE RD

CACTUS RD

BRITANNIA BLVD

CALIENTE AVE

SANYO AVE

ENRICO FERMI DR

AIRWAY RD

SIEMPRE VIVA RD

OTAY MESA
PORT OF ENTRY

USA

MEXICO

SAN YSIDRO
PORT OF ENTRY

CITY OF TIJUANA

TIJUANA INTERNATIONAL AIRPORT

N

W E

S

2400 0 2400 Feet

700 0 700 Meters

Revised May 2004

Functional Classifications:

- Freeway
- Prime Arterial
- Major Arterial
- Local Access
- Collector
- Local Collector
- Rural Collector
- Rural Light Collector
- Ramp
- Zone Connector

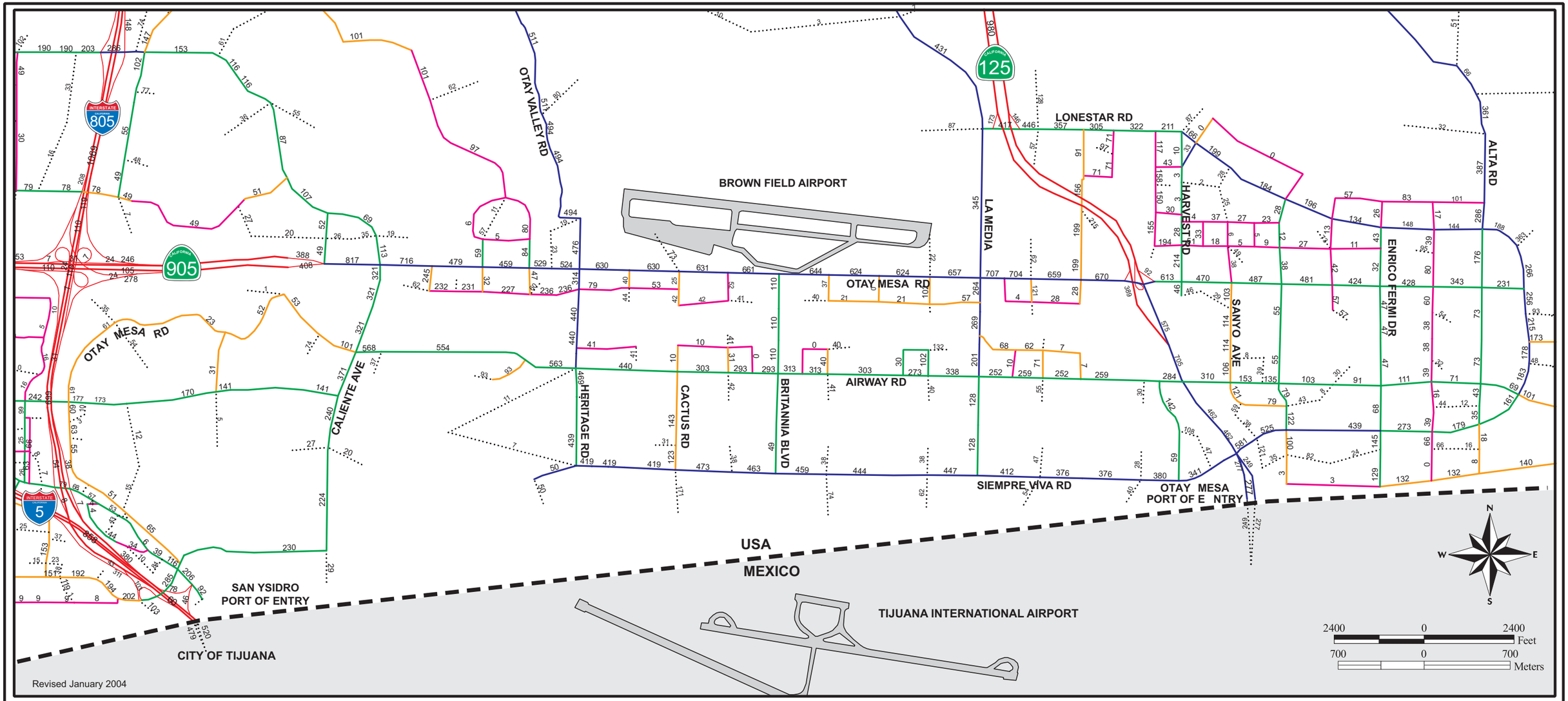
ROUTE 905
2003 EXISTING CONDITIONS

Otay Mesa Rd@ 6 Lanes
SR-125 Not Built
ADT Volumes (in Hundreds)

Route 905

Existing Traffic Volumes

Attachment 3A



Functional Classifications:

- Freeway
- Prime Arterial
- Major Arterial
- Local Access
- Collector
- Local Collector
- Rural Collector
- Rural Light Collector
- Ramp
- Zone Connector

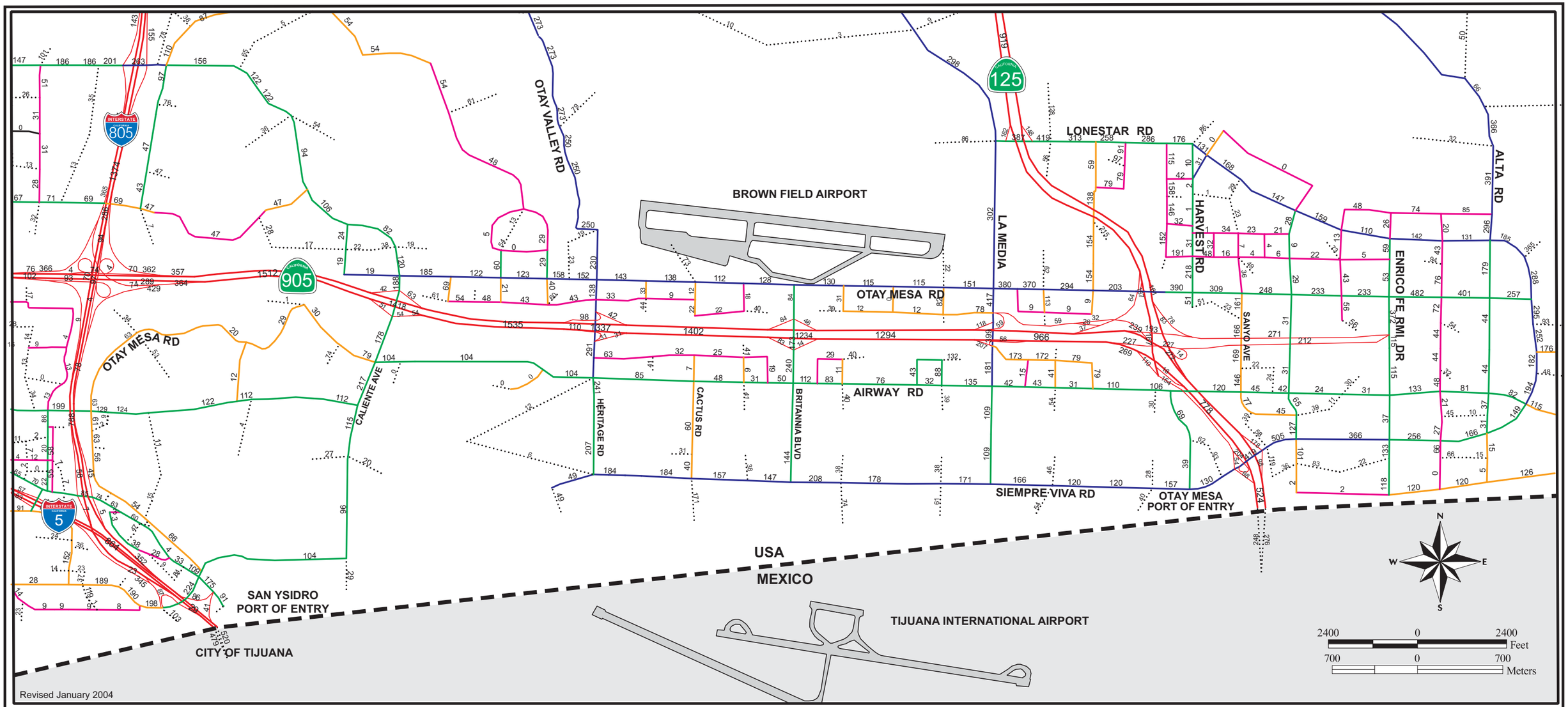
ROUTE 905 NO BUILD

Assumptions:
Otay Mesa Rd. @ 6 Lanes
Route 125 Toll Road in Operation
ADT Volumes (in Hundreds)

Route 905

No Build Alternative: Year 2025 Traffic Forecast Volumes

Attachment 3B



Functional Classifications:

- Freeway
- Prime Arterial
- Major Arterial
- Local Access
- Collector
- Local Collector
- Rural Collector
- Rural Light Collector
- Ramp
- Zone Connector

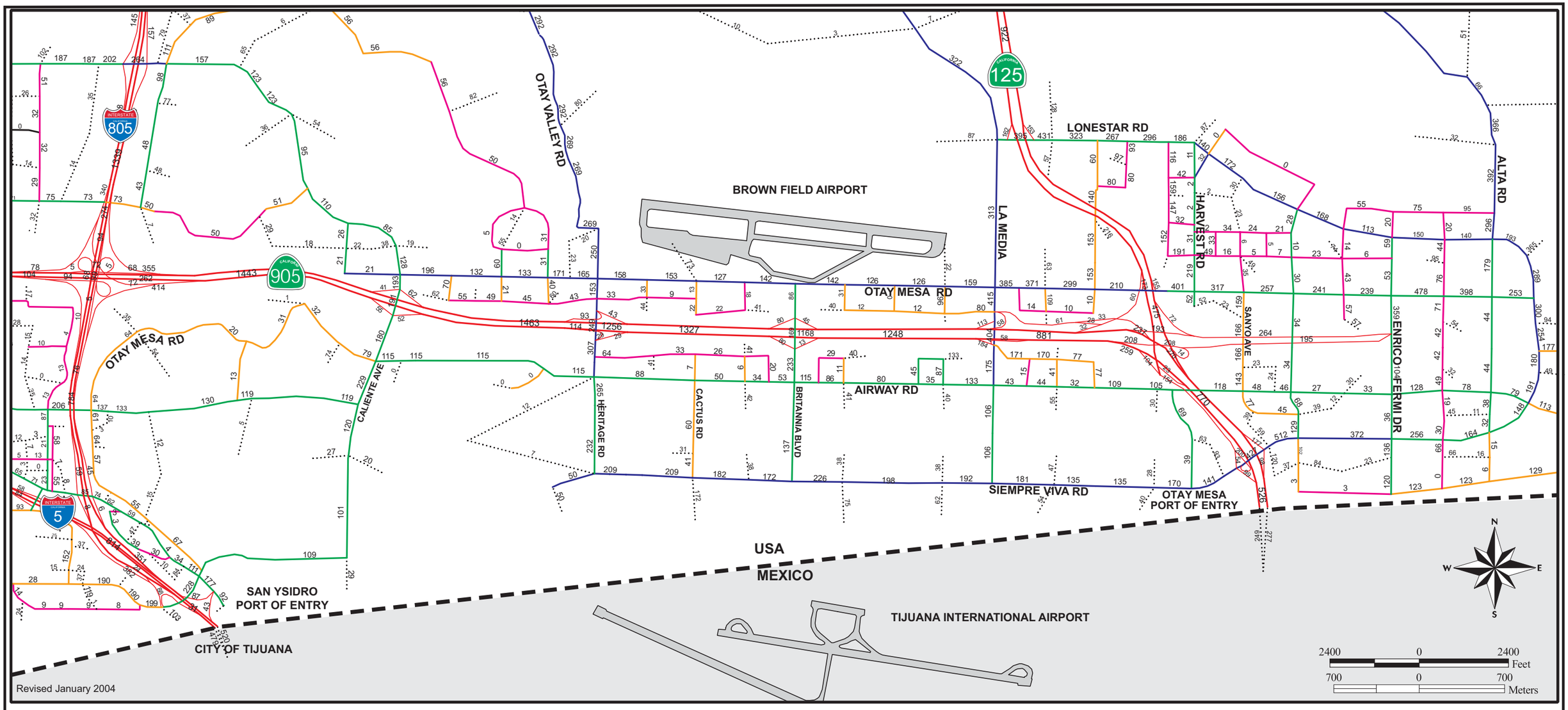
ROUTE 905 FREEWAY

Assumptions:
Otay Mesa Rd @ 6 Lanes
Route 125 Toll Road in Operation
ADT Volumes (in Hundreds)

Route 905

Freeway Alternatives: Year 2025 Traffic Forecast Volumes

Attachment 3C



Functional Classifications:

- Freeway
- Prime Arterial
- Major Arterial
- Local Access
- Collector
- Local Collector
- Rural Collector
- Rural Light Collector
- Ramp
- Zone Connector

ROUTE 905 TOLL ROAD

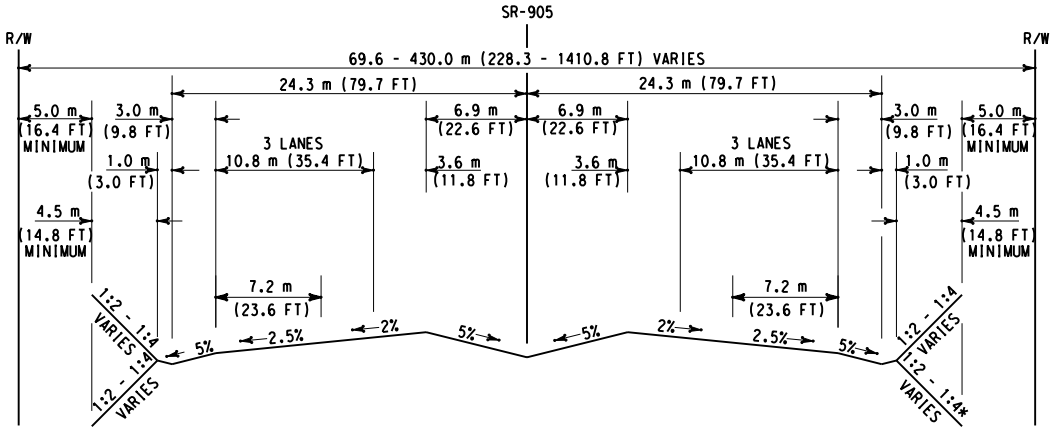
Assumptions:
Otay Mesa Rd @ 6 Lanes
Route 125 Toll Road in Operation
ADT Volumes (in Hundreds)

Route 905

Tollway Alternatives : Year 2025 Traffic Forecast Volumes

Attachment 3D

MAY 14, 2004



EASTBOUND ROADBED

* 1:1 CRIB WALL AT STATION 125+40 TO 127+40
AND STATION 146+20 TO 147+20
FREEWAY AND TOLLWAY CENTRAL ALIGNMENTS ONLY

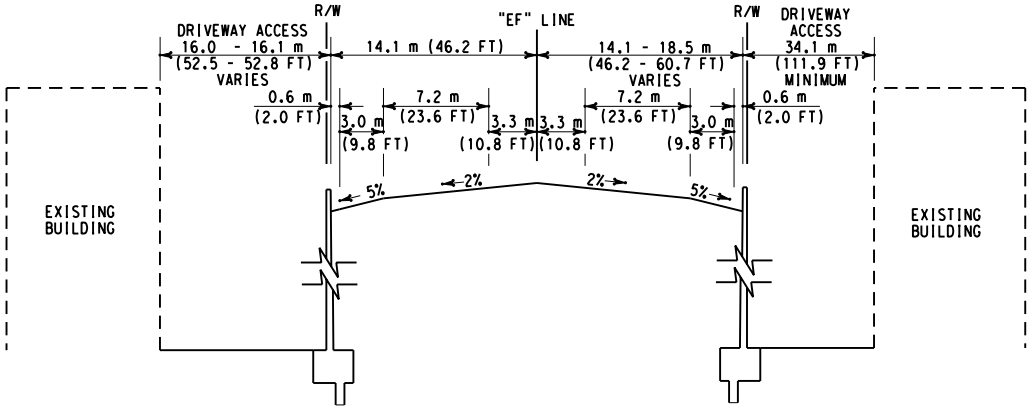
FREEWAY AND TOLLWAY ALTERNATIVES

DESIGN STUDY
SUBJECT TO CHANGE

VERTICAL SCALE EXAGGERATED

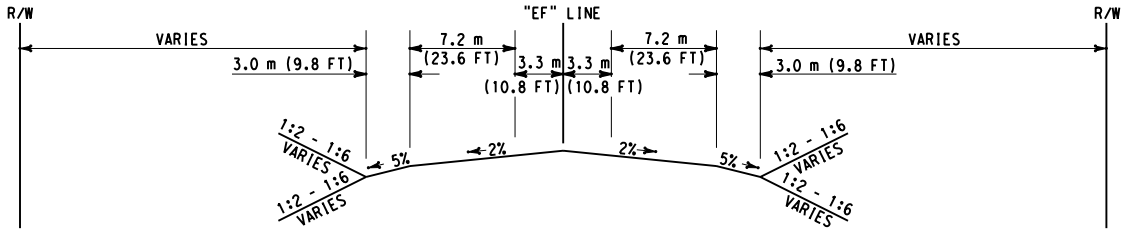
CALIFORNIA 905	**SR 905 TYPICAL ROADWAY CROSS-SECTIONS**	**ATTACHMENT 4** SHEET 1 OF 4

MAY 14, 2004



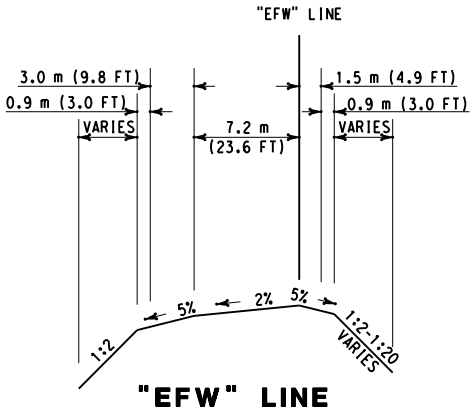
"EF" LINE

STATION 12+20 TO 13+00



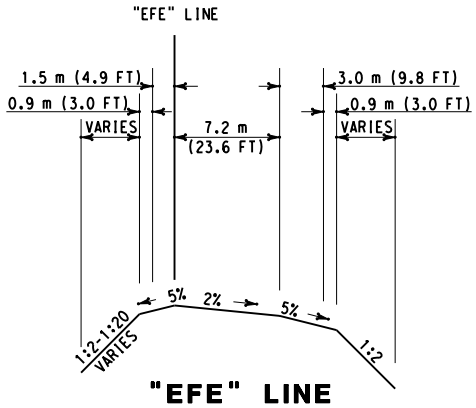
"EF" LINE

STATION 16+00 TO 23+80



"EFW" LINE

STATION 13+50 TO 20+80



"EFE" LINE

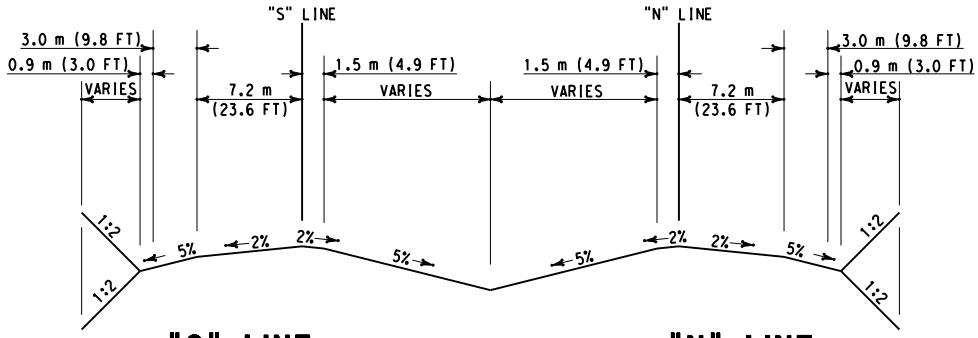
STATION 10+00 TO 22+40

DESIGN STUDY
SUBJECT TO CHANGE

VERTICAL SCALE EXAGGERATED

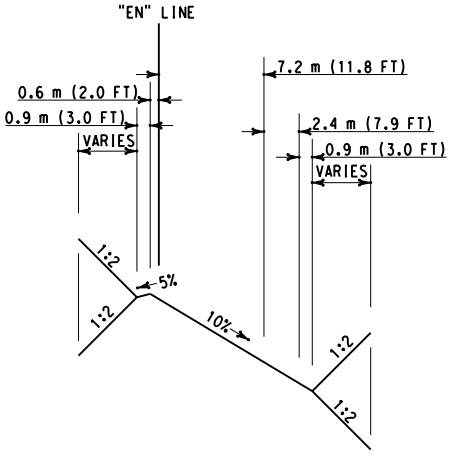
905	**ENRICO FERMI DRIVE** **LOCAL ACCESS RAMP**	**ATTACHMENT 4** SHEET 2 OF 4

MAY 14, 2004

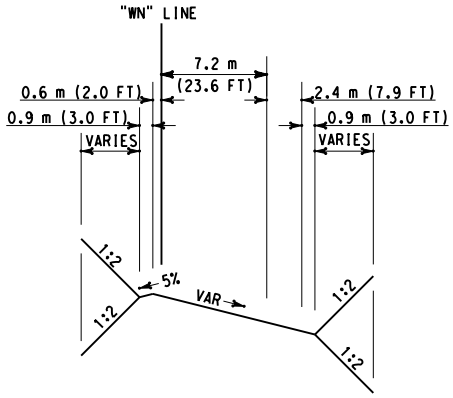


"S" LINE
STATION 14+20 TO 20+00

"N" LINE
STATION 11+30 TO 18+60



"EN" LINE
STATION 11+90 TO 13+90



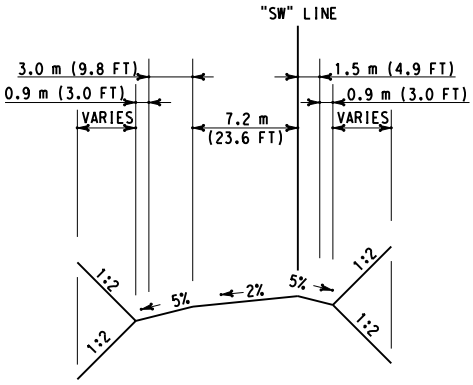
"WN" LINE
STATION 11+60 TO 14+10

DESIGN STUDY
SUBJECT TO CHANGE

VERTICAL SCALE EXAGGERATED

CALIFORNIA 905	**SR 905/SR 125 INTERCHANGE RAMPS**	**ATTACHMENT 4** SHEET 3 OF 4

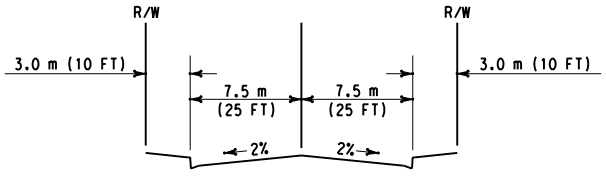
MAY 14, 2004



"SW" LINE

STATION 14+80 TO 28+60

SR 905/SR 125 INTERCHANGE RAMPS



GATEWAY PARKWAY DRIVE TO
CACTUS ROAD FRONTAGE ROAD

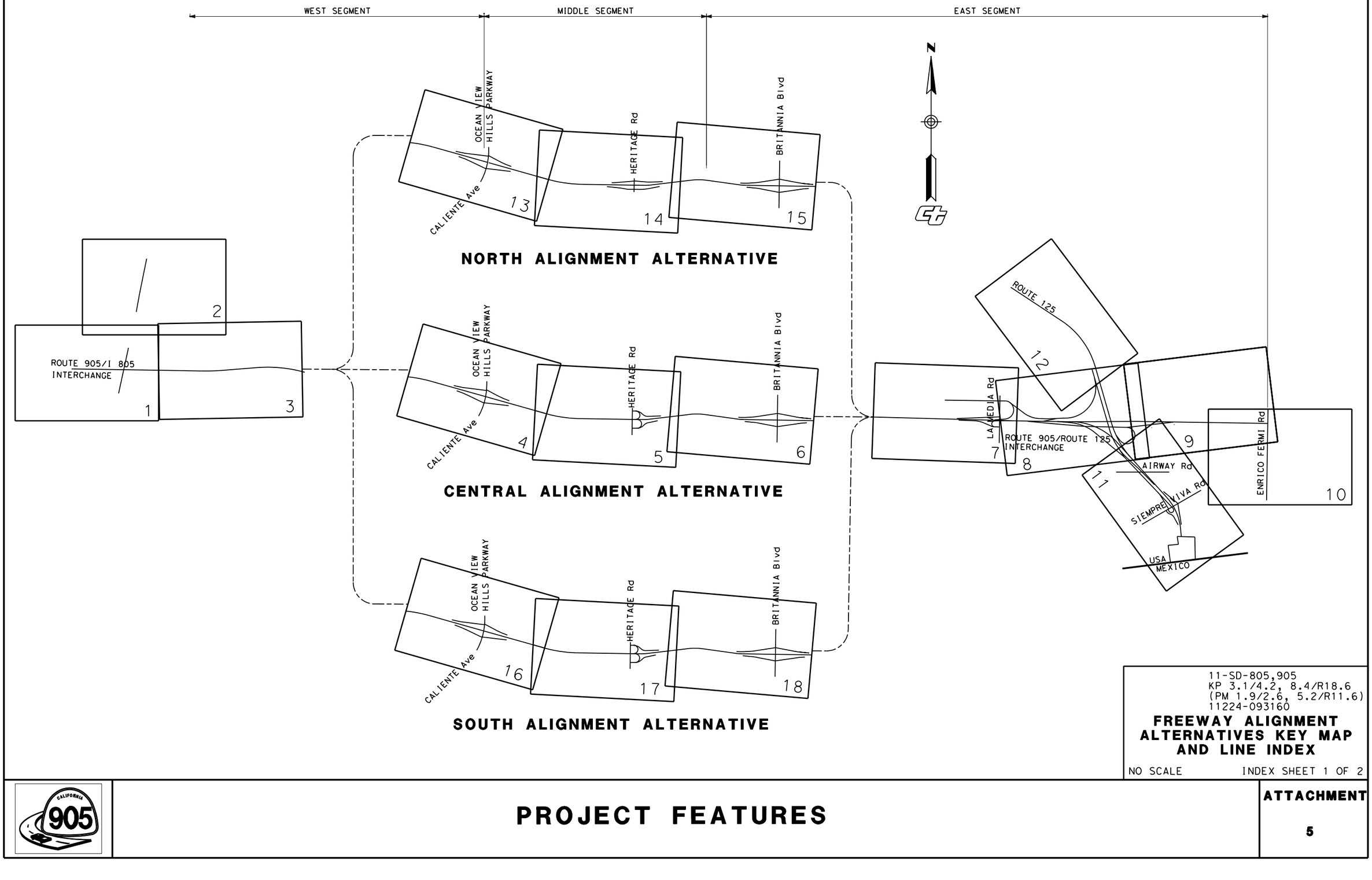
STATION 10+00 TO 15+40

DESIGN STUDY
SUBJECT TO CHANGE

VERTICAL SCALE EXAGGERATED

CALIFORNIA 905	**SR 905/SR 125 INTERCHANGE RAMPS AND GATEWAY PARKWAY DRIVE TO CACTUS ROAD FRONTAGE ROAD**	**ATTACHMENT 4** SHEET 4 OF 4

GRAPHIC REVISED APRIL 12, 2004



11-SD-805,905
KP 3.1/4.2, 8.4/R18.6
(PM 1.9/2.6, 5.2/R11.6)
11224-093160

FREEWAY ALIGNMENT ALTERNATIVES KEY MAP AND LINE INDEX

NO SCALE INDEX SHEET 1 OF 2

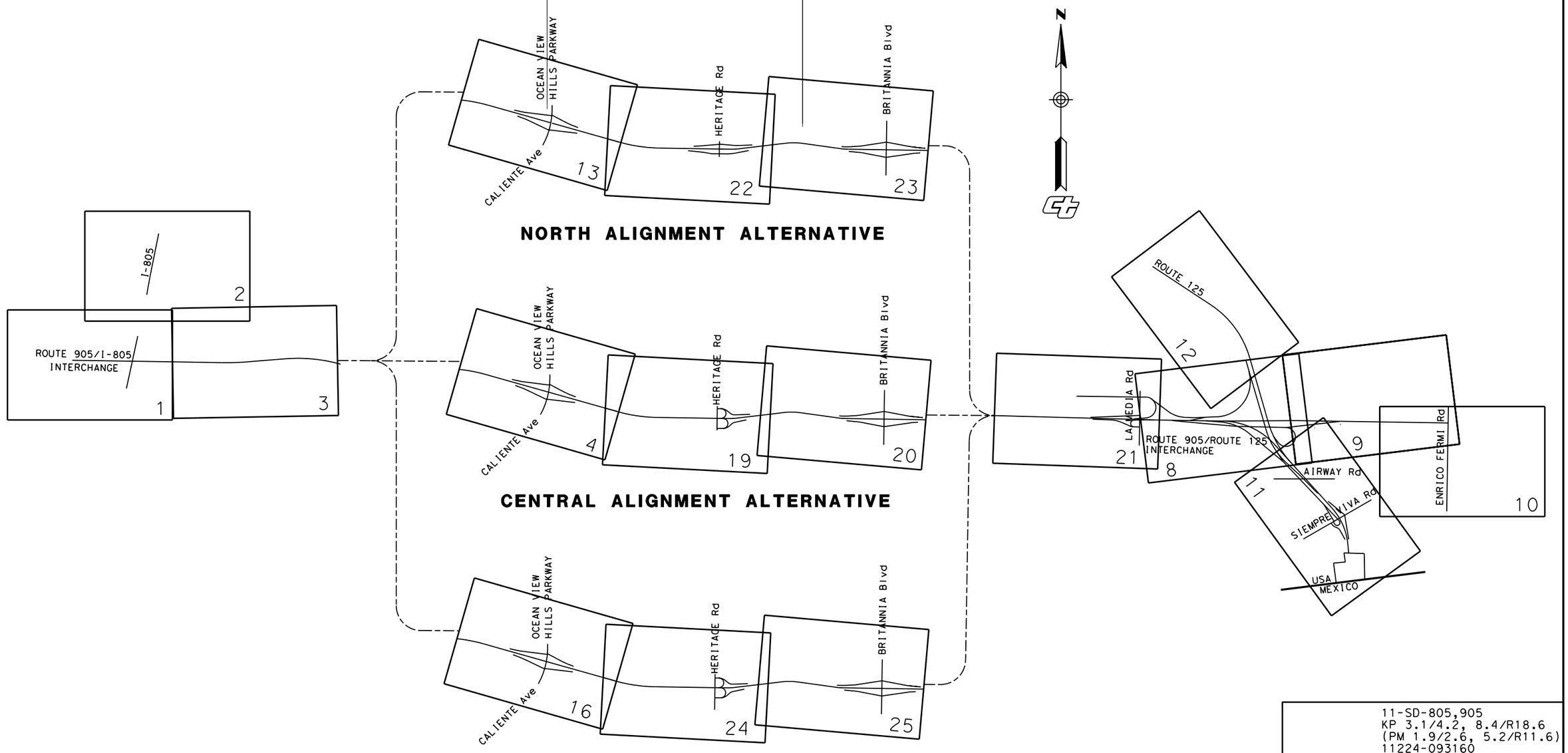
PROJECT FEATURES

ATTACHMENT

5

GRAPHIC REVISED APRIL 12, 2004

WEST SEGMENT | MIDDLE SEGMENT | EAST SEGMENT



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KP 3.1/4.2, 8.4/R18.6
(PM 1.9/2.6, 5.2/R11.6)
11224-093160

TOLLWAY ALIGNMENT ALTERNATIVES KEY MAP AND LINE INDEX

NO SCALE

INDEX SHEET 2 OF 2

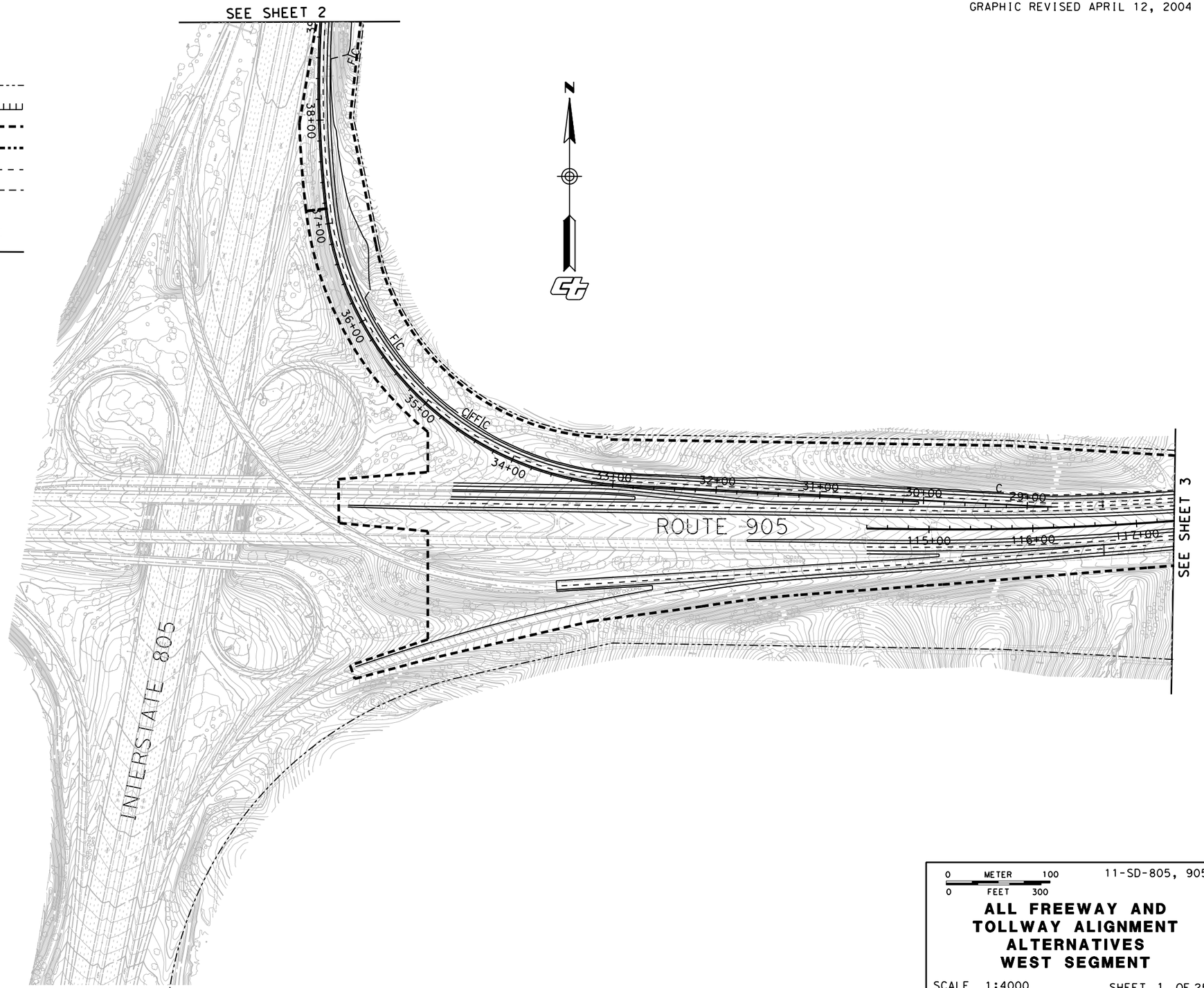
PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004

LEGEND:

- EXISTING RIGHT OF WAY (R/W)
- PROPOSED RIGHT OF WAY (R/W)
- CONSTRUCTION DISTURBANCE LIMITS
- BIOLOGICAL MITIGATION AREA
- CUT SLOPE CATCH LINE (C)
- FILL SLOPE CATCH LINE (F)
- EXISTING BUILDING
- BRIDGE
- RETAINING WALL
- TOLL BOOTH
- TOLL PLAZA



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

ALL FREEWAY AND TOLLWAY ALIGNMENT ALTERNATIVES WEST SEGMENT

SCALE 1:4000

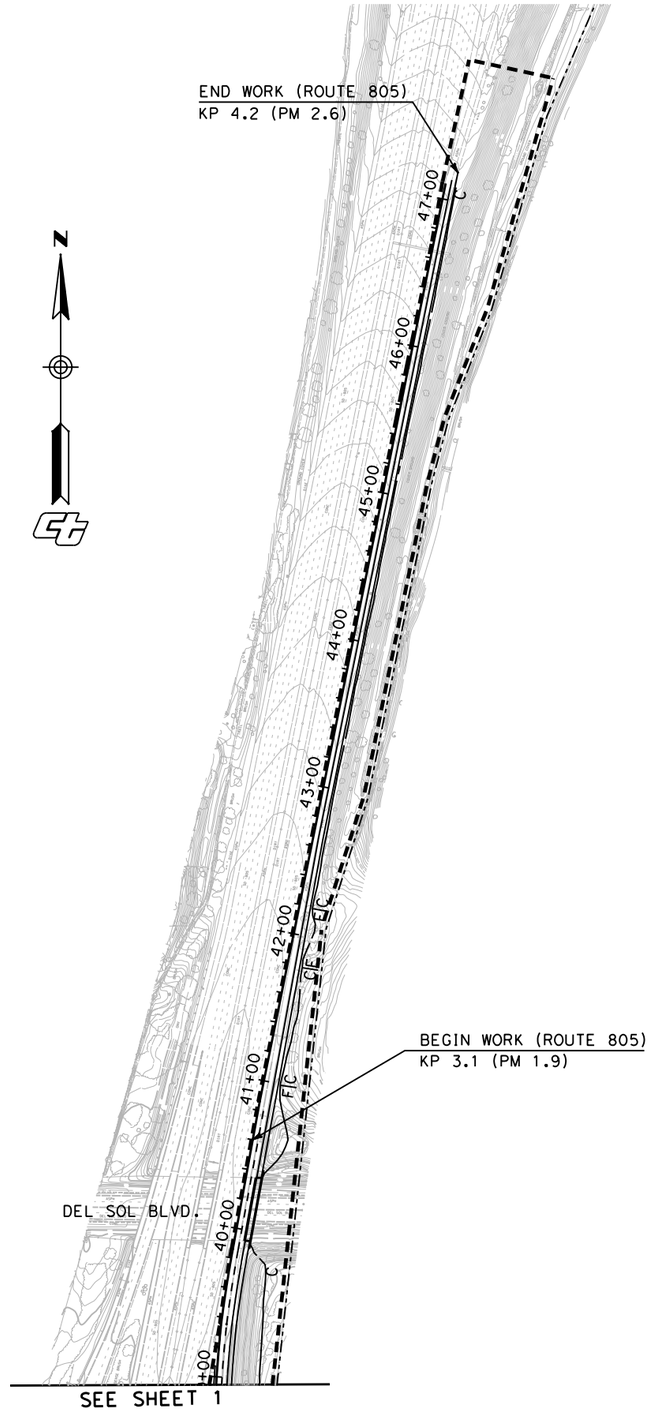
SHEET 1 OF 25

PROJECT FEATURES

ATTACHMENT

5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

ALL FREEWAY AND TOLLWAY ALIGNMENT ALTERNATIVES WEST SEGMENT

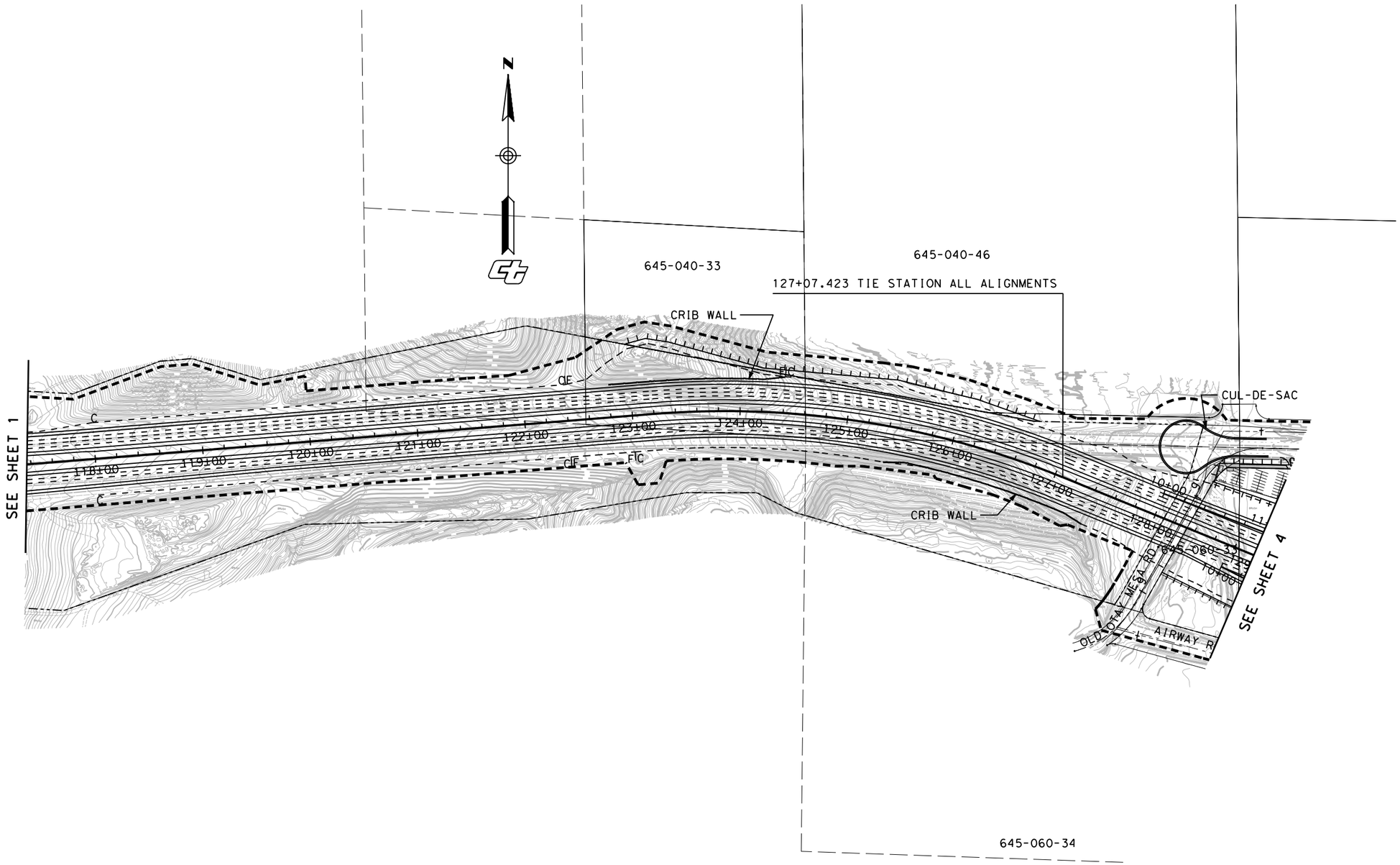
SCALE 1:4000

SHEET 2 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS
UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

ALL FREEWAY AND TOLLWAY ALIGNMENT ALTERNATIVES WEST SEGMENT

SCALE 1:4000

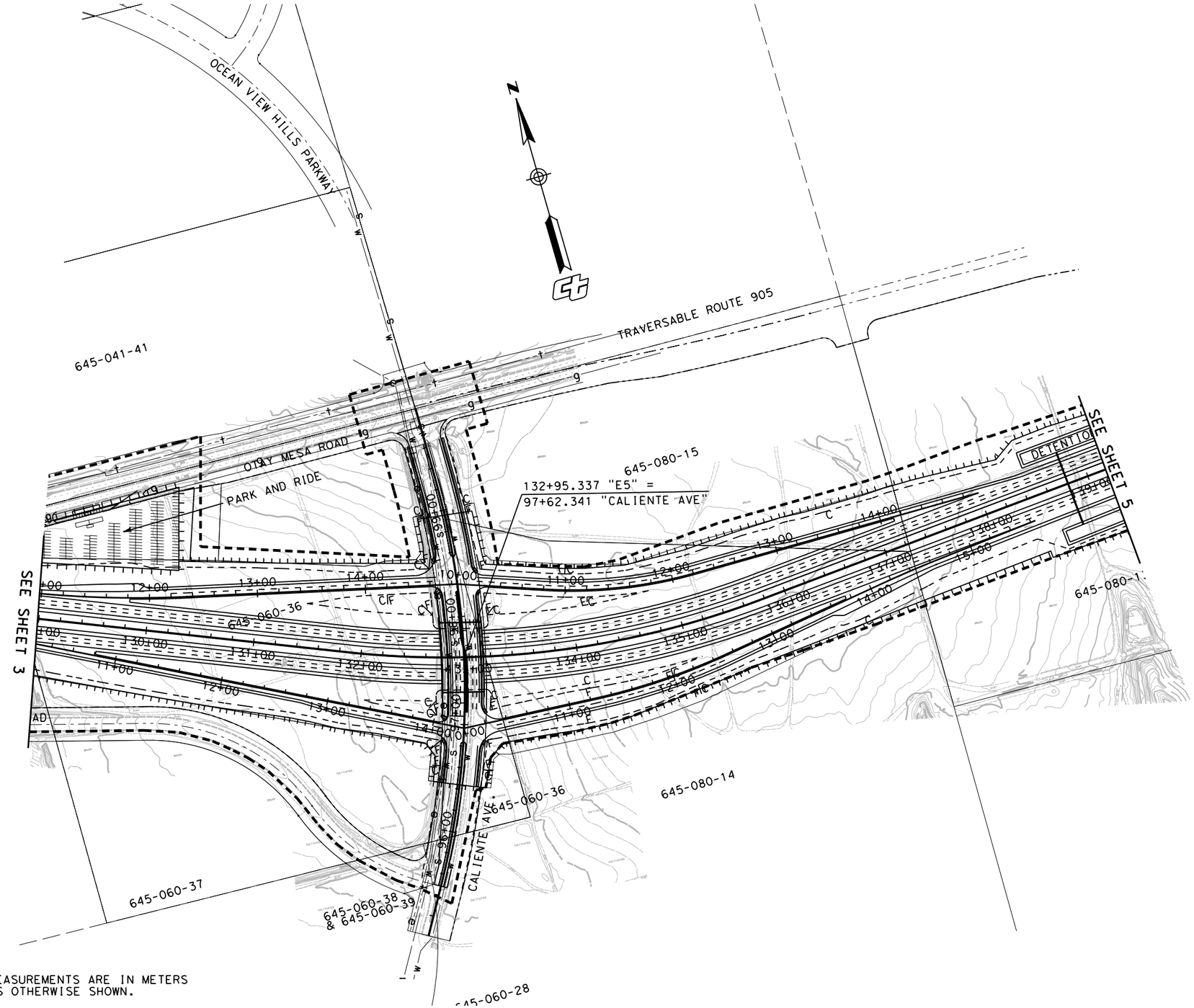
SHEET 3 OF 25

PROJECT FEATURES

ATTACHMENT

5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

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0 FEET 300

11-SD-805, 905

FREEWAY (PREFERRED) AND TOLLWAY CENTRAL ALIGNMENT ALTERNATIVES MIDDLE SEGMENT

SCALE 1:4000

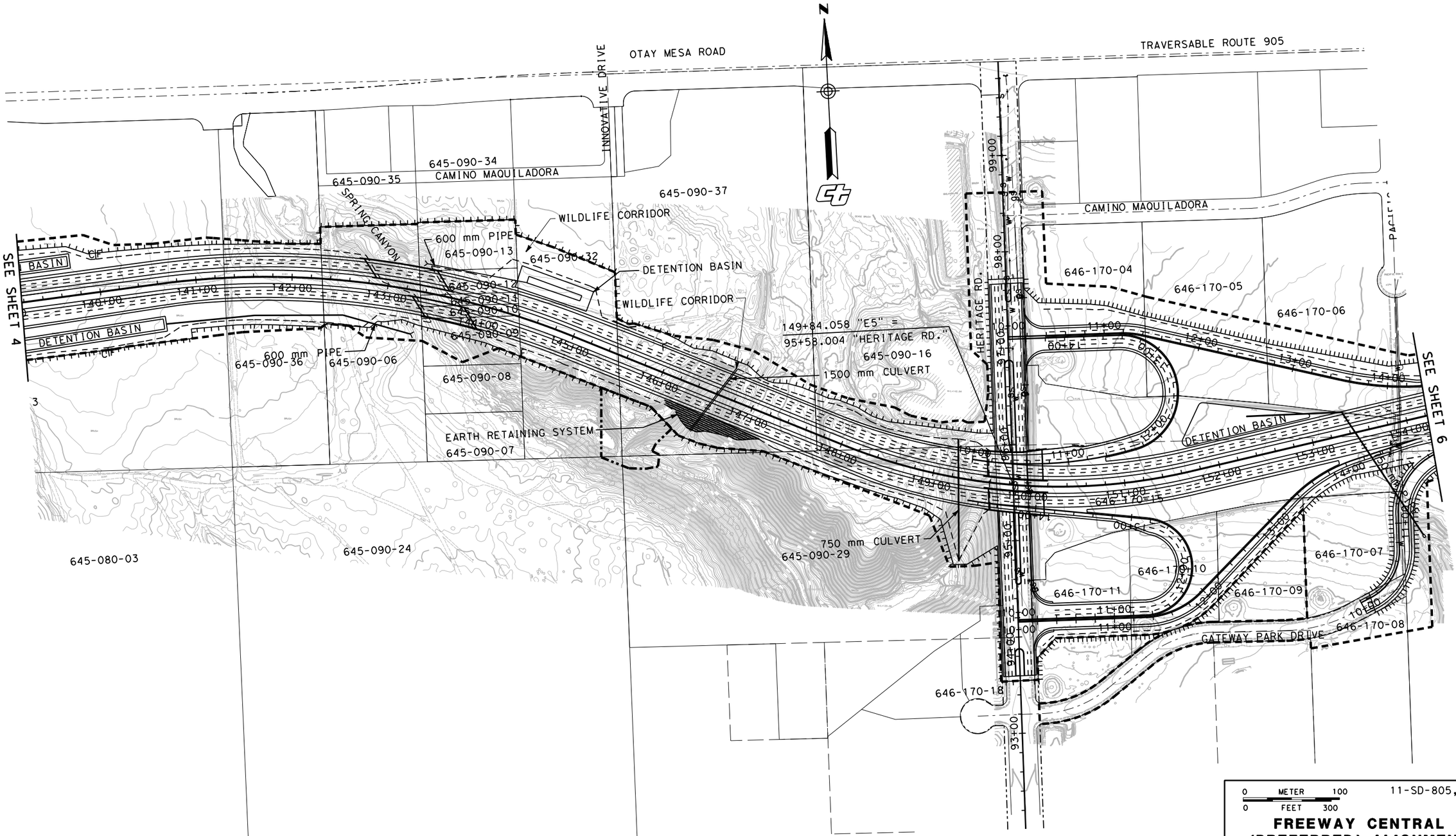
SHEET 4 OF 25

PROJECT FEATURES

ATTACHMENT

5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

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11-SD-805, 905

FREEWAY CENTRAL (PREFERRED) ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

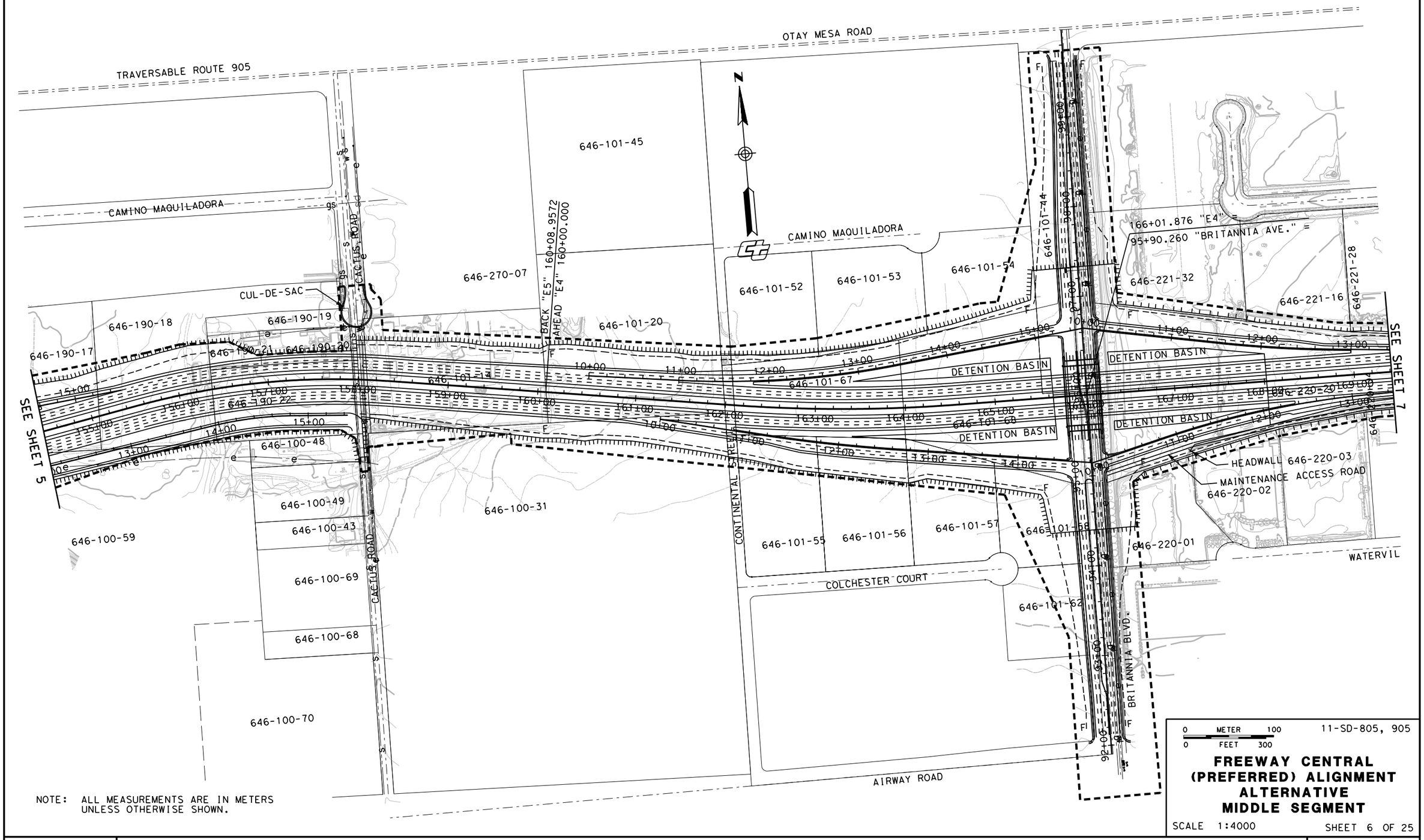
SCALE 1:4000

SHEET 5 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

FREEWAY CENTRAL (PREFERRED) ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

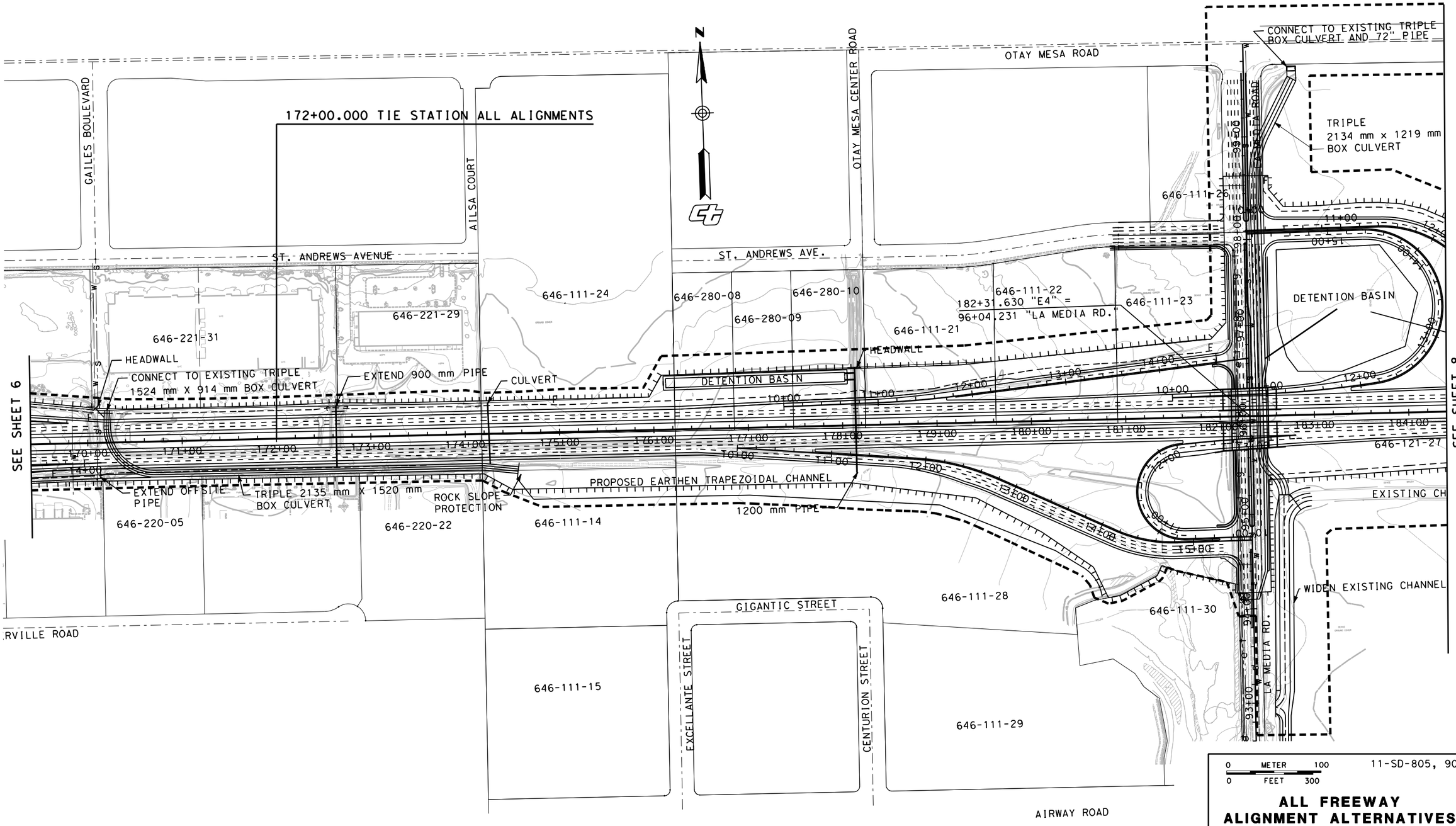
SCALE 1:4000

SHEET 6 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

ALL FREEWAY ALIGNMENT ALTERNATIVES EAST SEGMENT

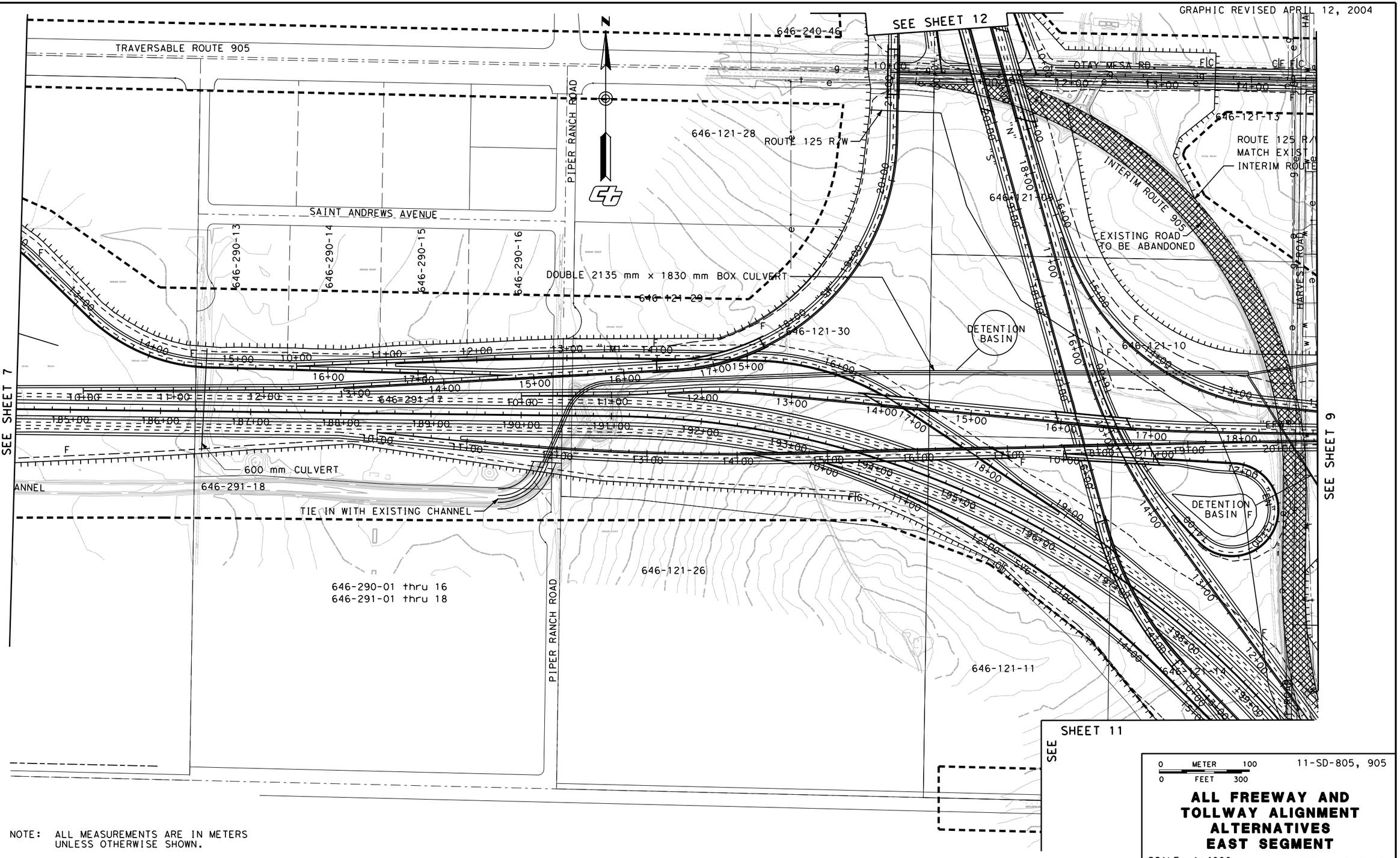
SCALE 1:4000

SHEET 7 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS
UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

ALL FREEWAY AND TOLLWAY ALIGNMENT ALTERNATIVES EAST SEGMENT

SCALE 1:4000

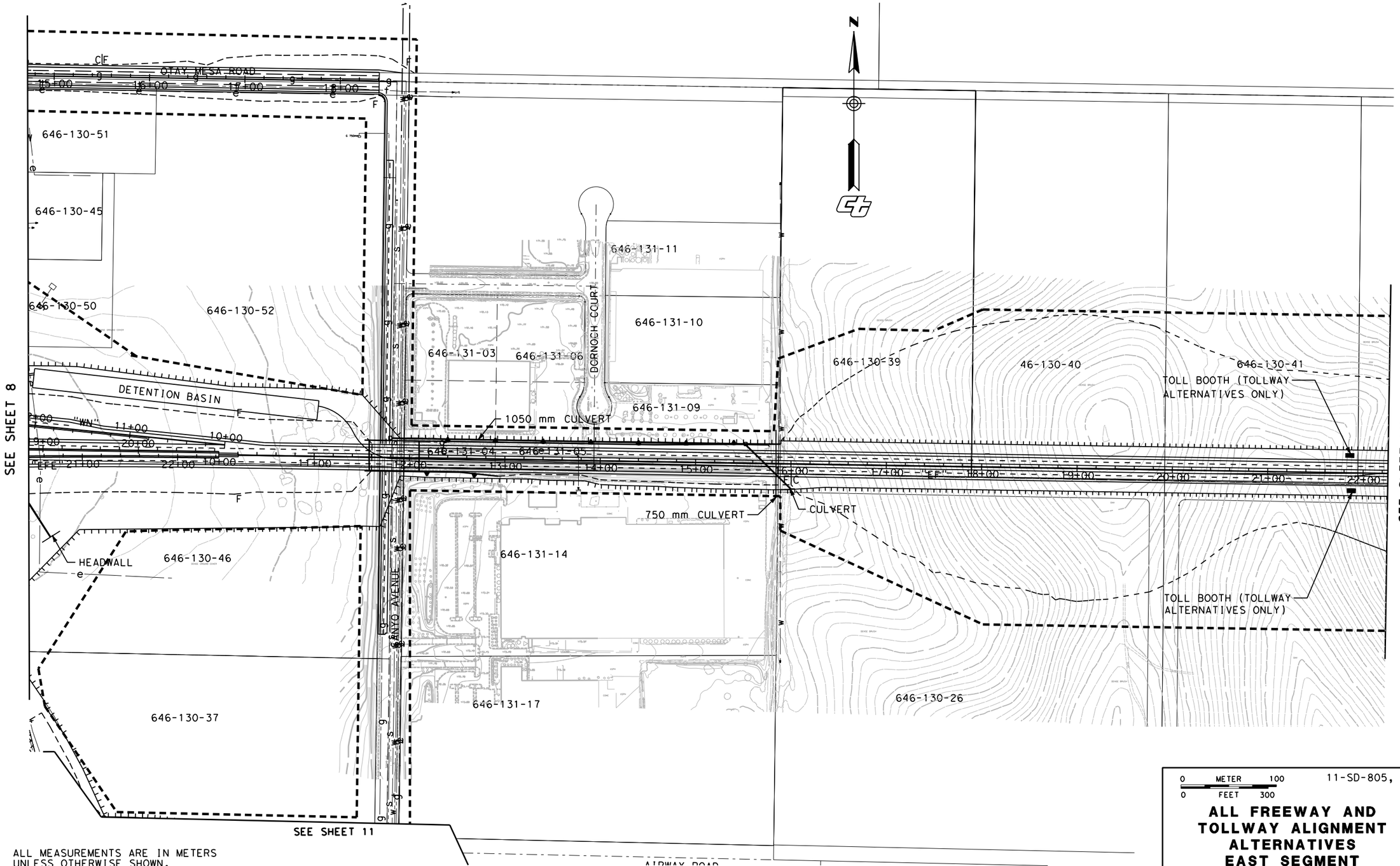
SHEET 8 OF 25

PROJECT FEATURES

ATTACHMENT

5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

ALL FREEWAY AND TOLLWAY ALIGNMENT ALTERNATIVES EAST SEGMENT

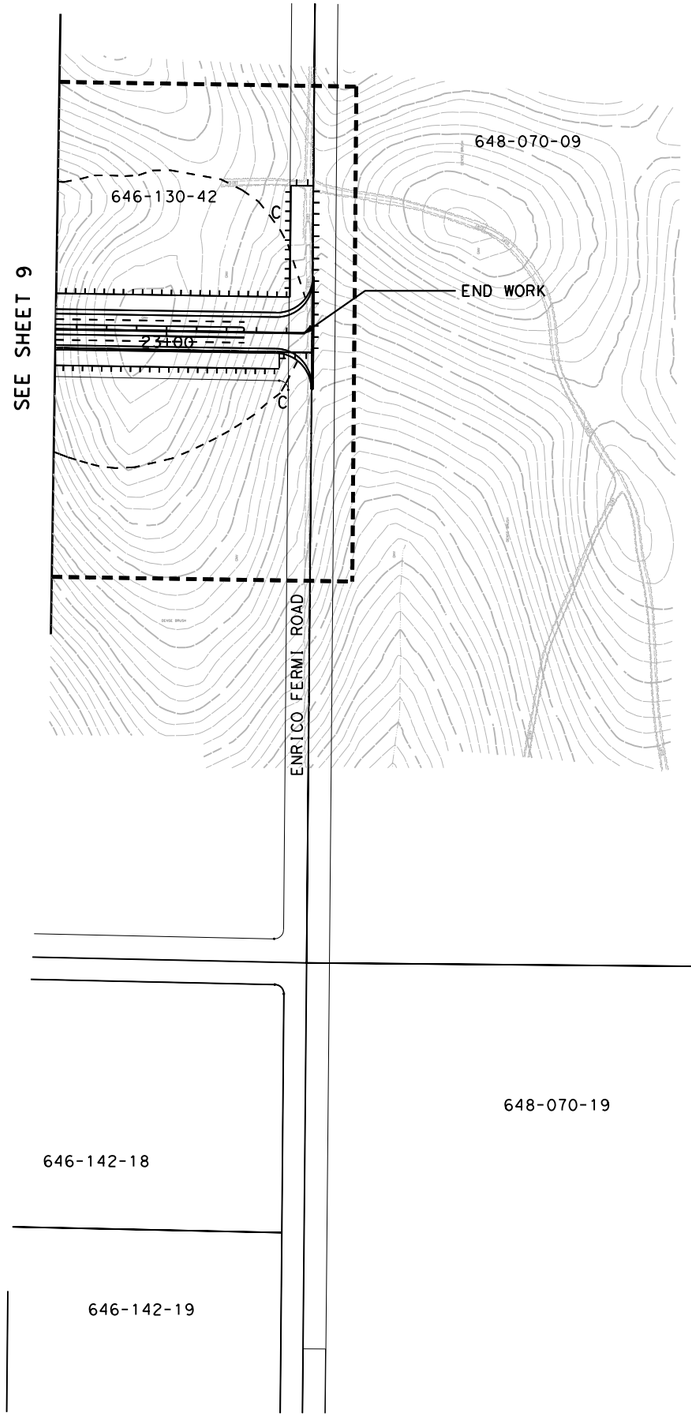
SCALE 1:4000

SHEET 9 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

ALL FREEWAY AND TOLLWAY ALIGNMENT ALTERNATIVES EAST SEGMENT

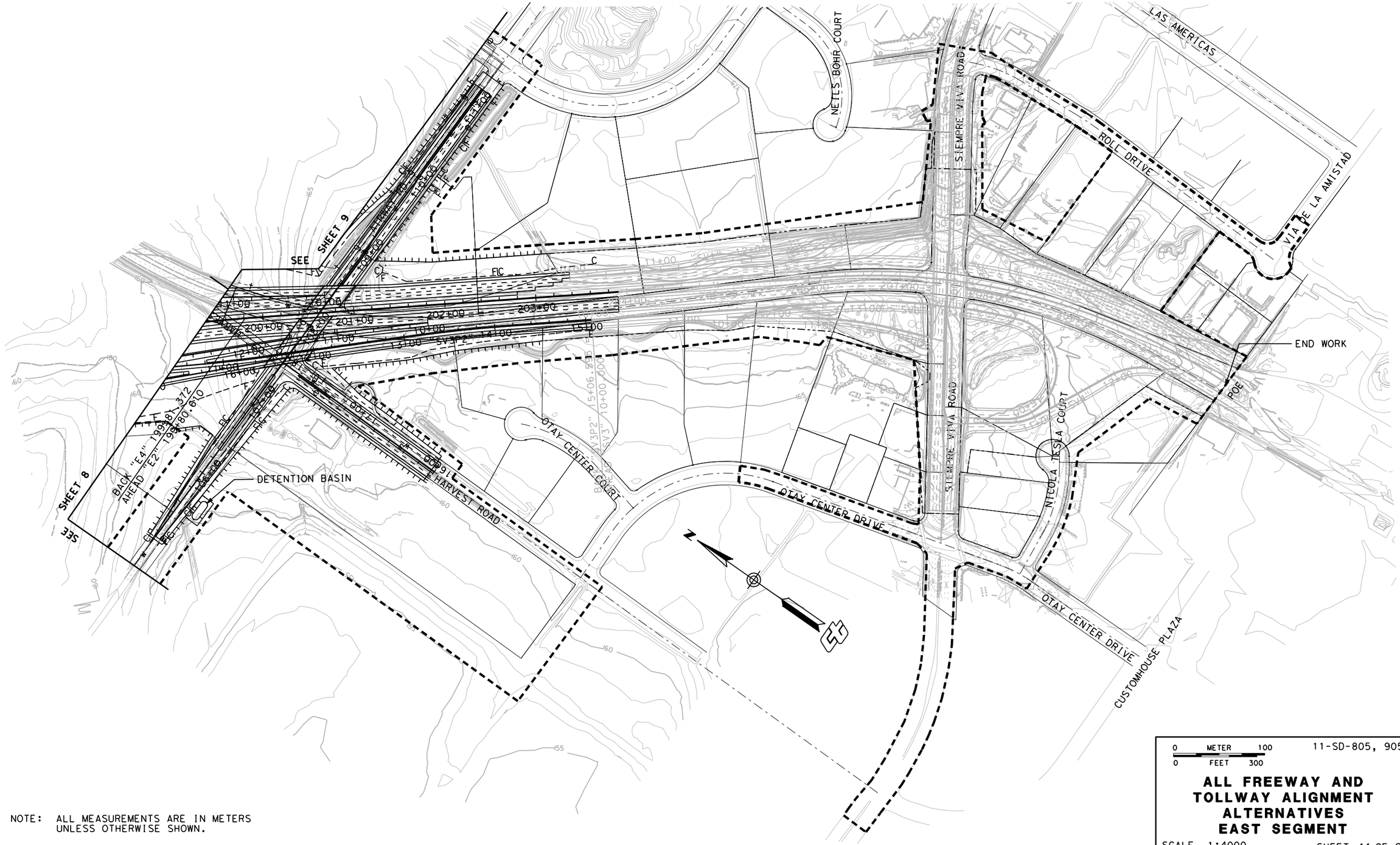
SCALE 1:4000

SHEET 10 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS
UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

ALL FREEWAY AND TOLLWAY ALIGNMENT ALTERNATIVES EAST SEGMENT

SCALE 1:4000

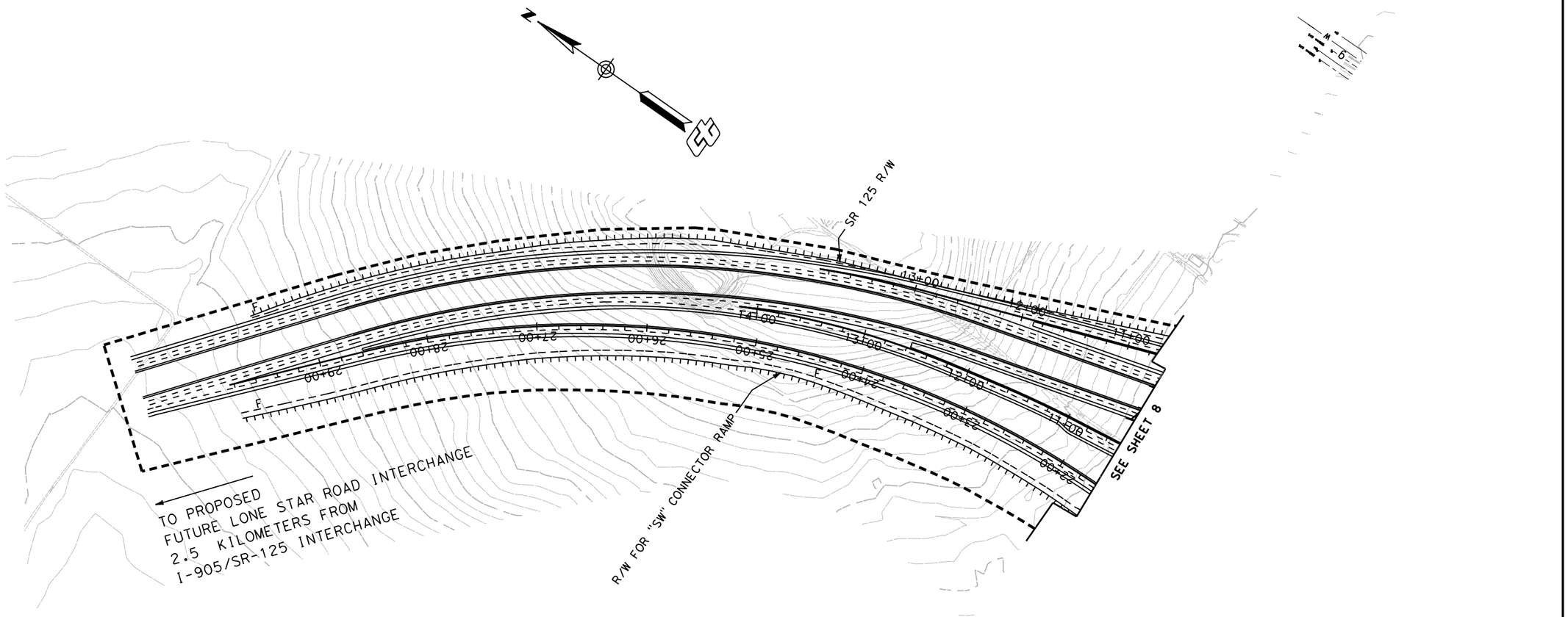
SHEET 11 OF 25

PROJECT FEATURES

ATTACHMENT

5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS
UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

ALL FREEWAY AND TOLLWAY ALIGNMENTS ALTERNATIVES EAST SEGMENT

SCALE 1:4000

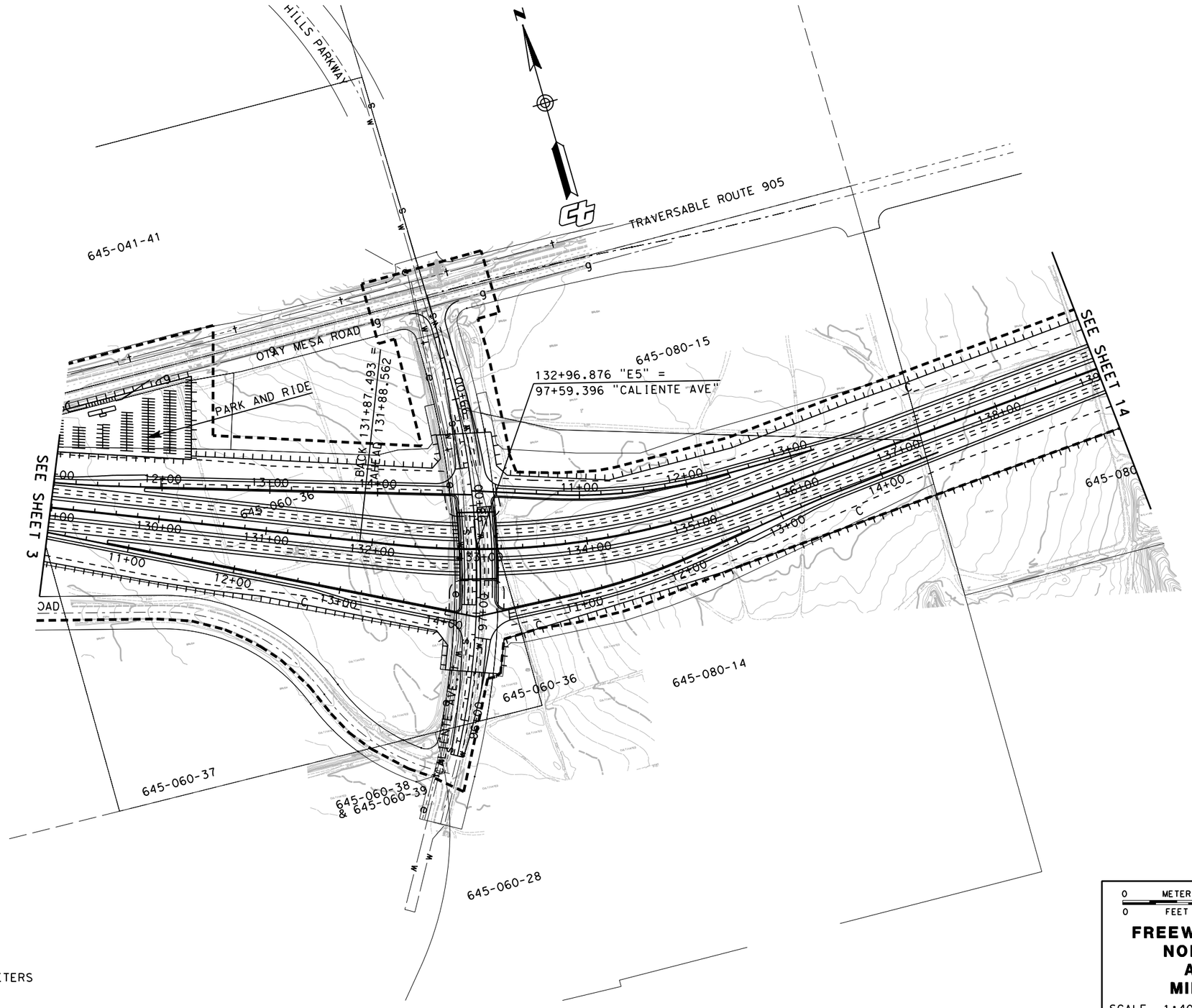
SHEET 12 OF 25

PROJECT FEATURES

ATTACHMENT

5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS
UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

FREEWAY AND TOLLWAY
NORTH ALIGNMENT
ALTERNATIVES
MIDDLE SEGMENT

SCALE 1:4000

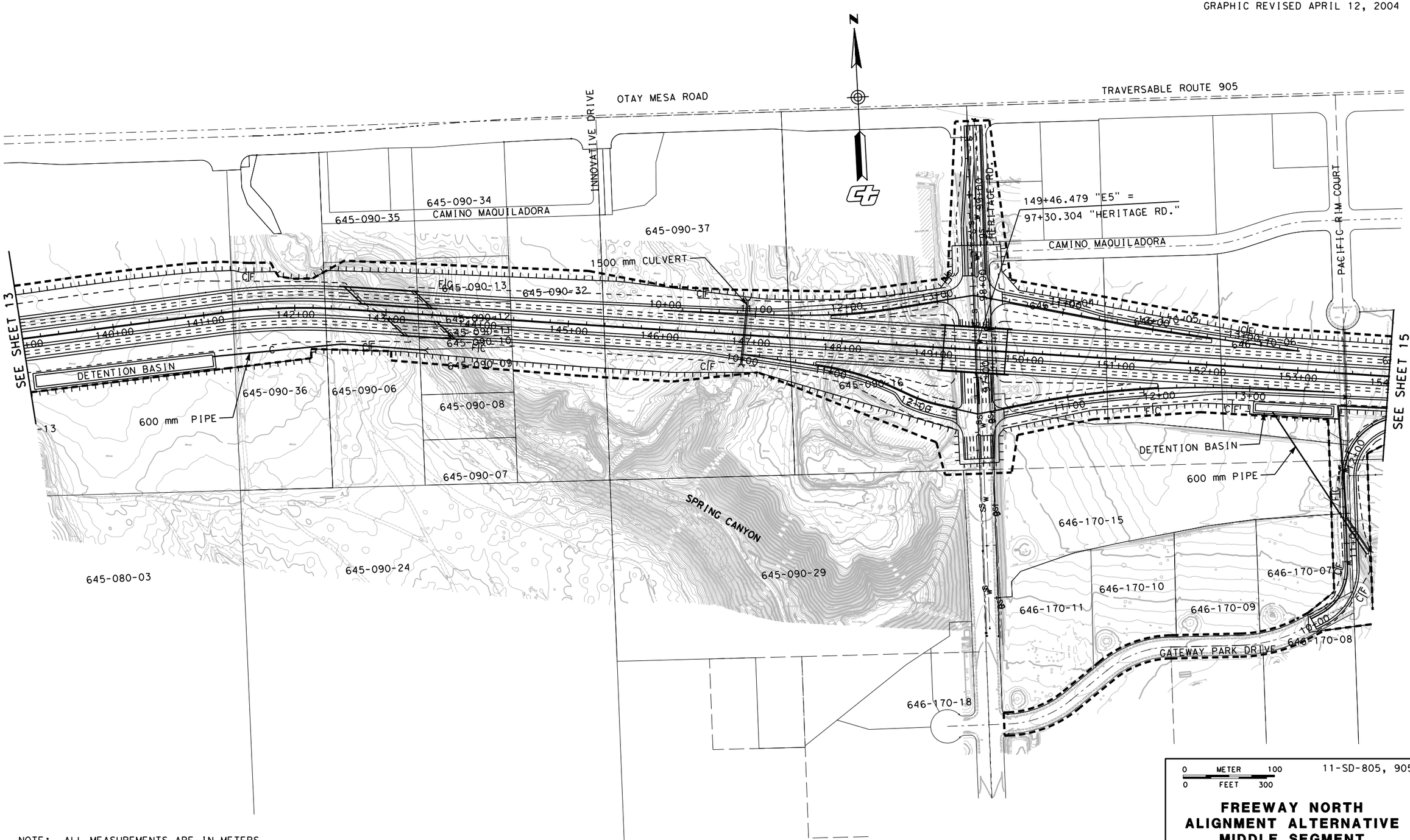
SHEET 13 OF 25

PROJECT FEATURES

ATTACHMENT

5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

FREEWAY NORTH ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

SCALE 1:4000

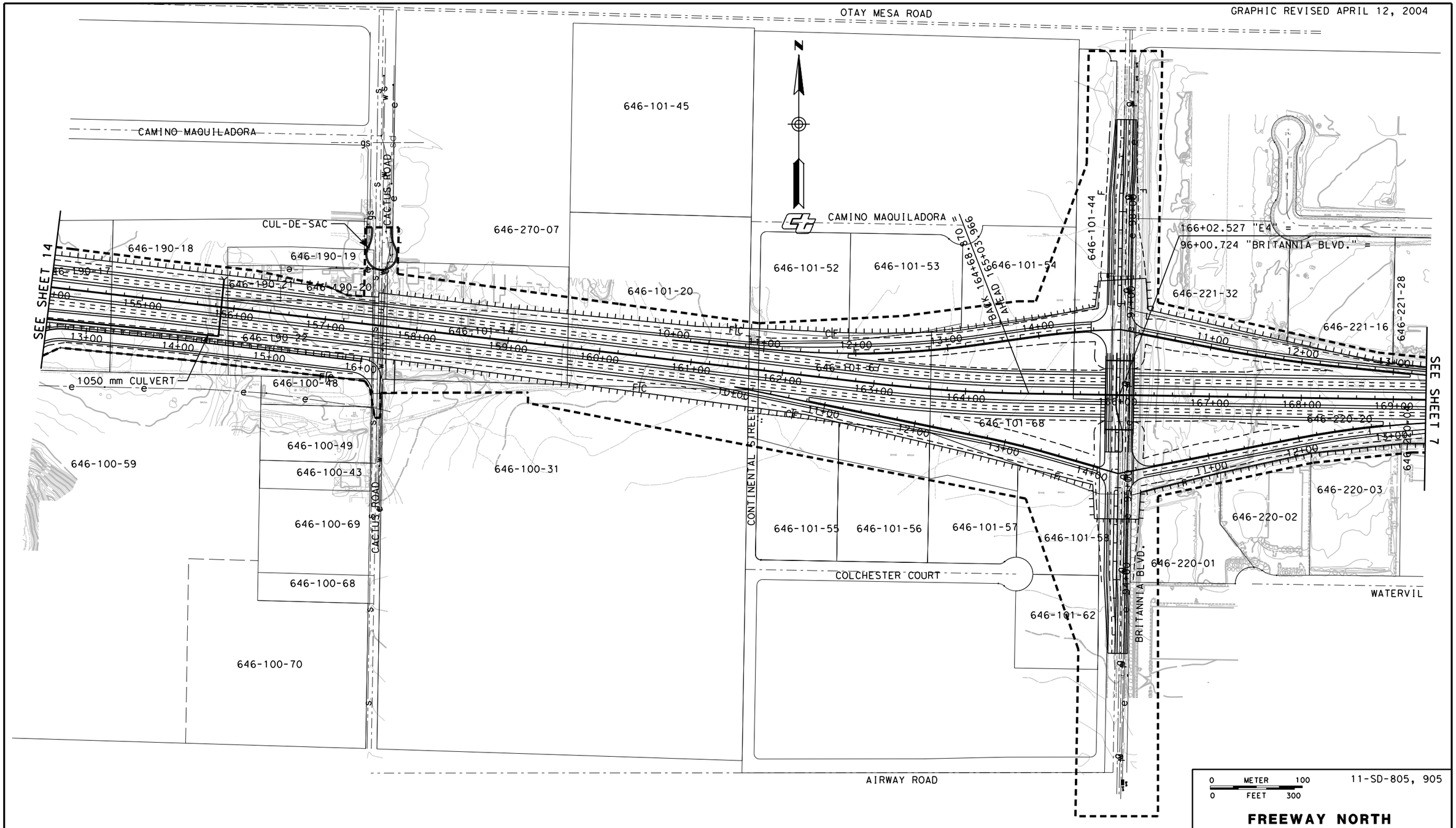
SHEET 14 OF 25

PROJECT FEATURES

ATTACHMENT

5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

FREEWAY NORTH ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

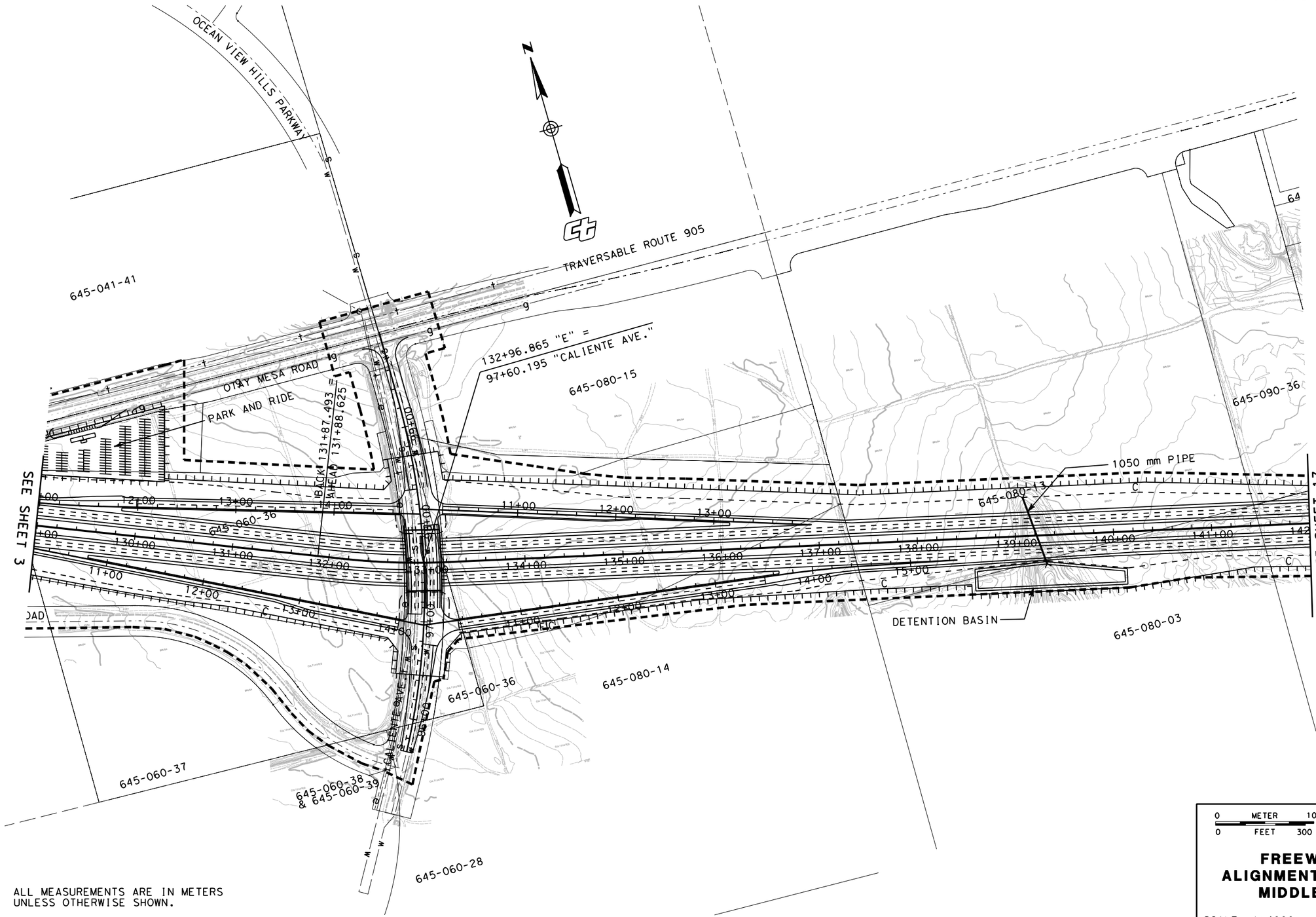
SCALE 1:4000

SHEET 15 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

FREEWAY SOUTH ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

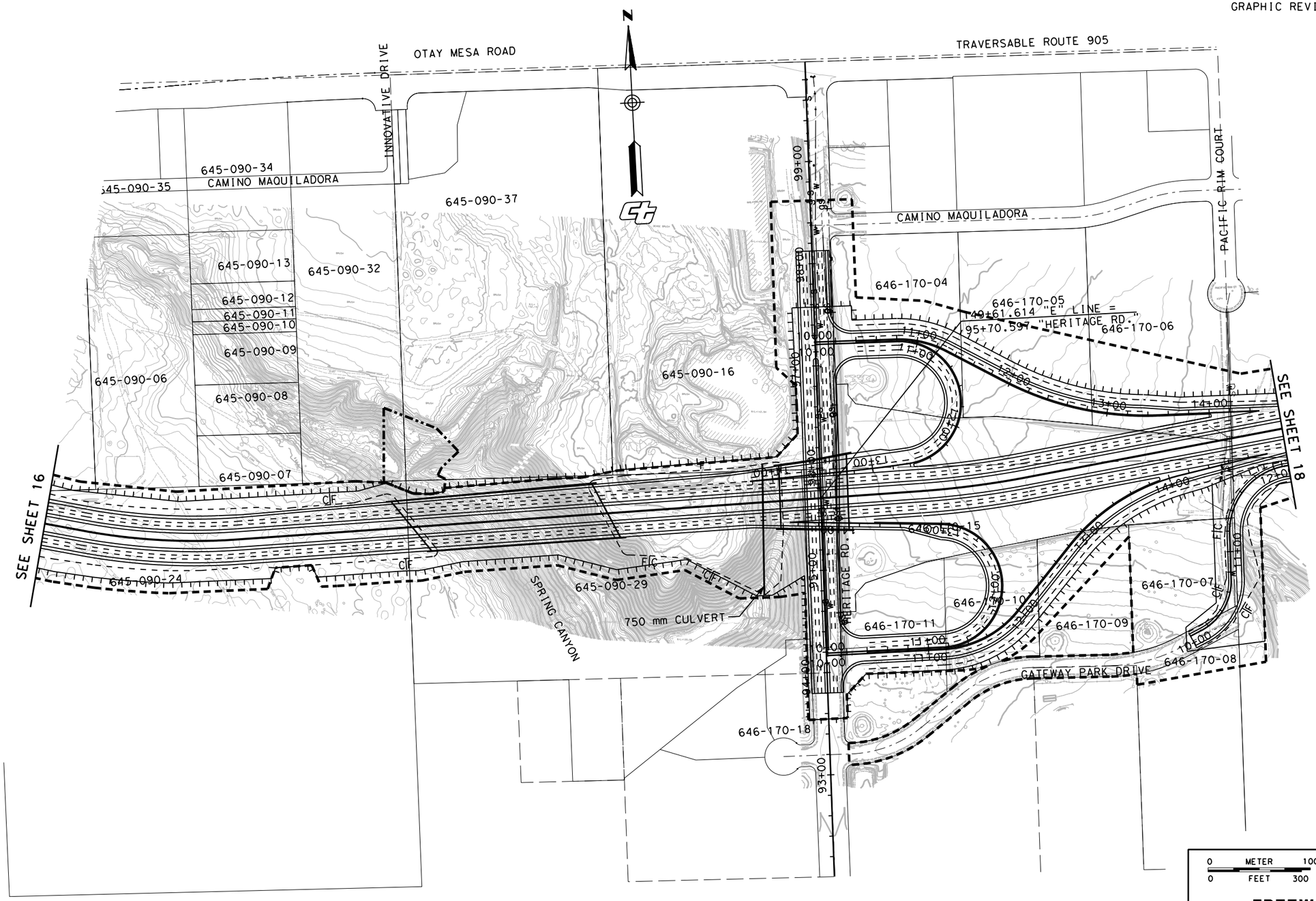
SCALE 1:4000

SHEET 16 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

FREEWAY SOUTH ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

SCALE 1:4000

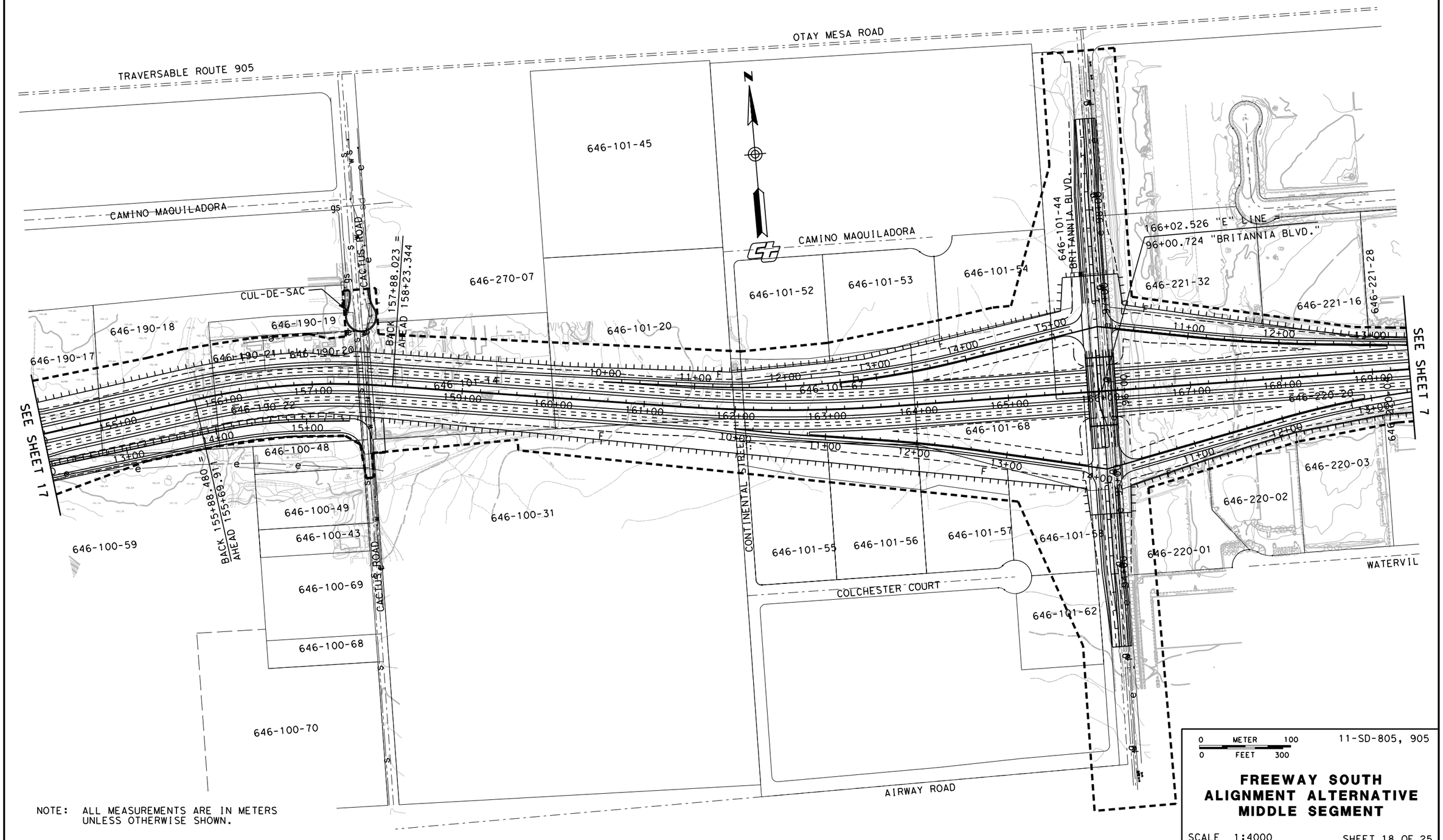
SHEET 17 OF 25

PROJECT FEATURES

ATTACHMENT

5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

FREEWAY SOUTH ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

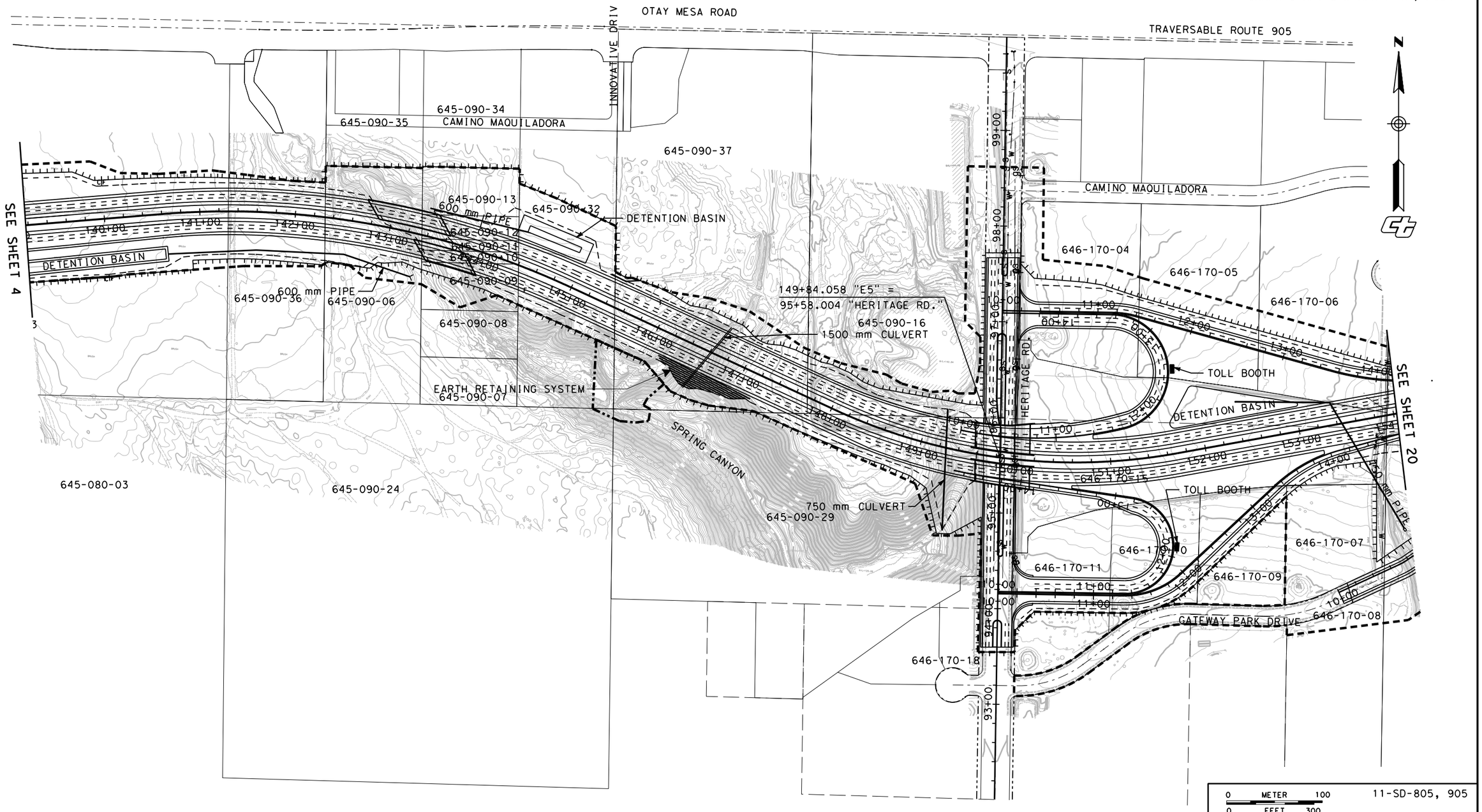
SCALE 1:4000

SHEET 18 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



0 METER 100
0 FEET 300

11-SD-805, 905

NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

TOLLWAY CENTRAL ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

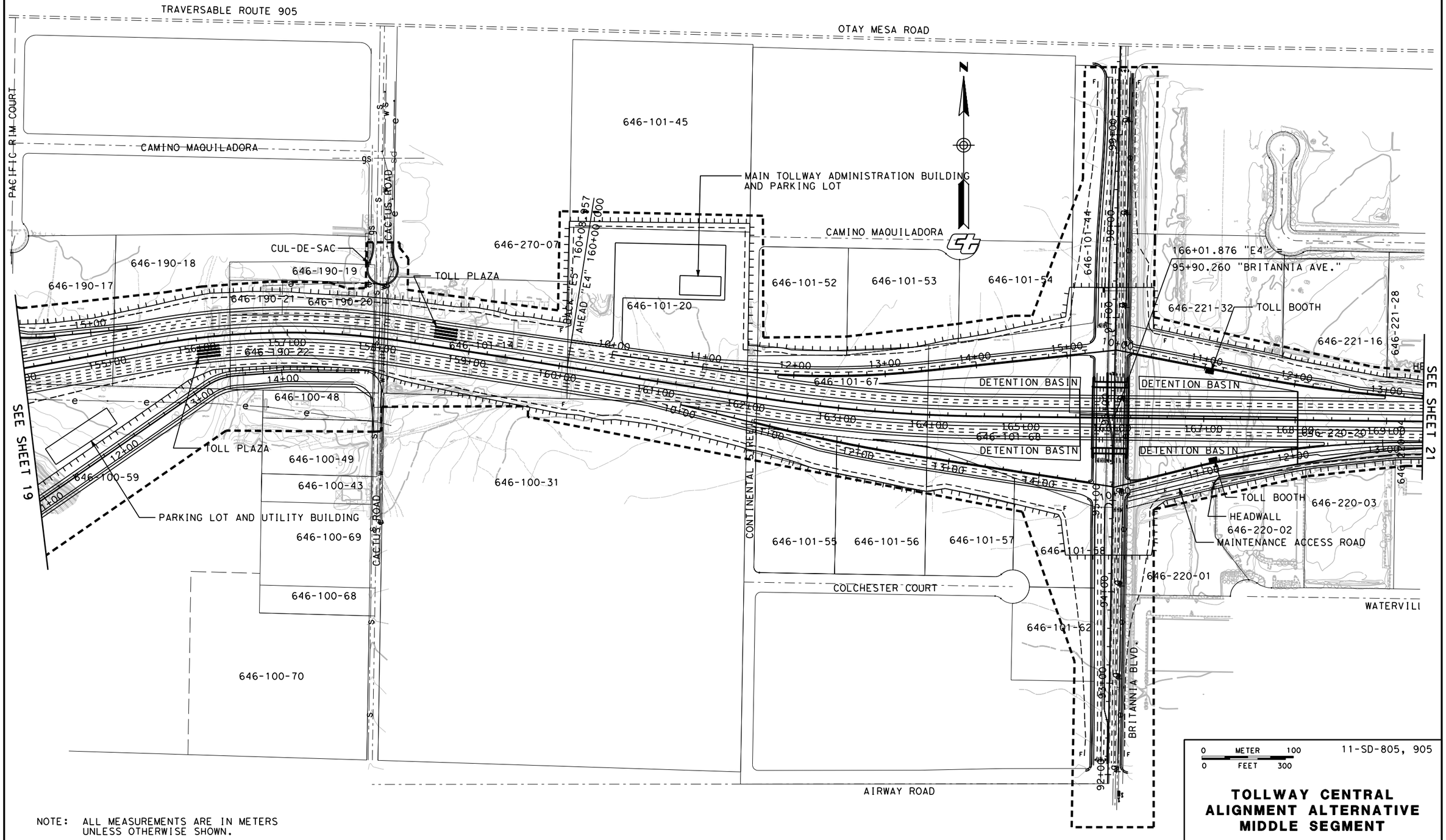
SCALE 1:4000

SHEET 19 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

TOLLWAY CENTRAL ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

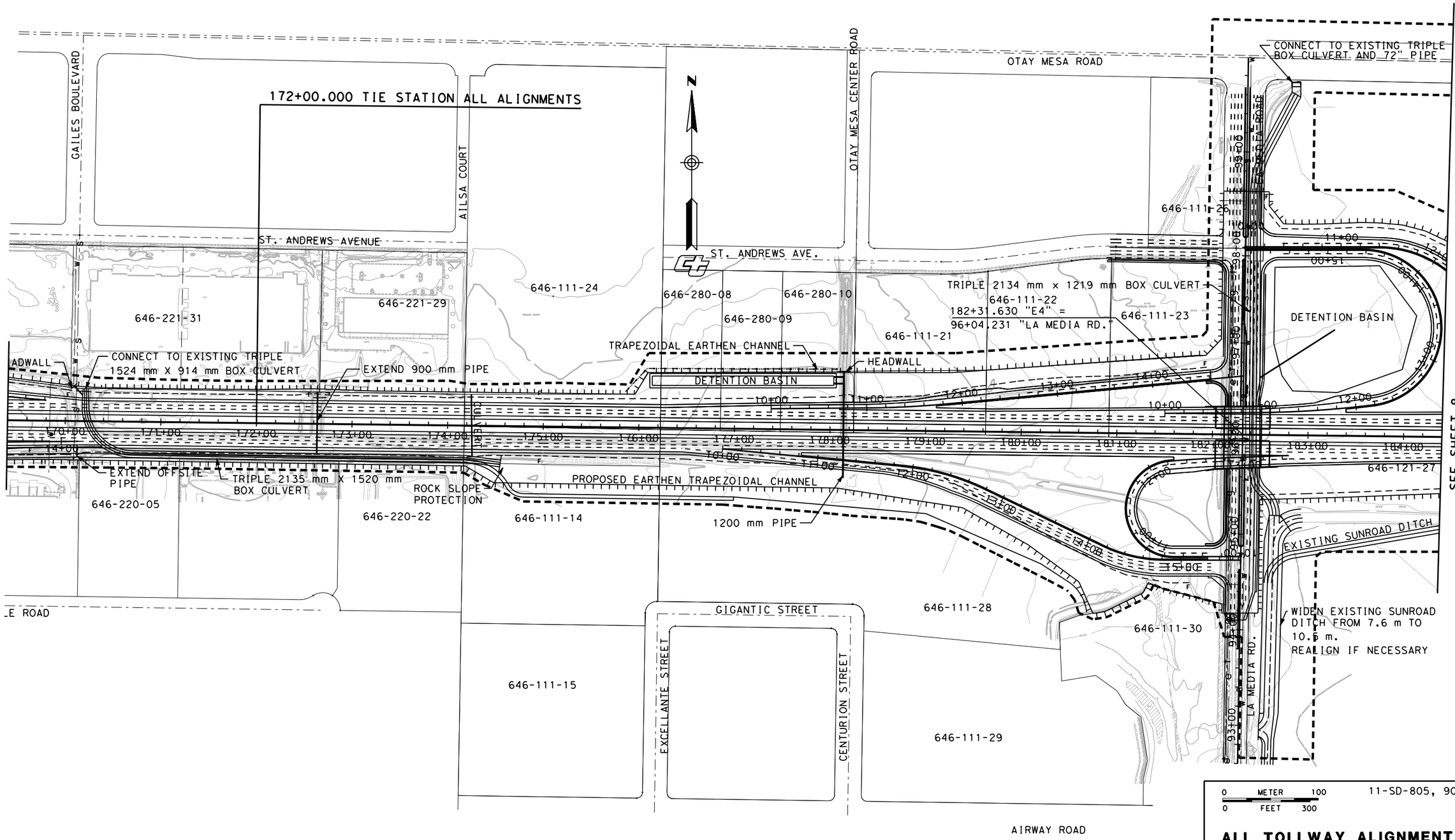
SCALE 1:4000

SHEET 20 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

ALL TOLLWAY ALIGNMENT ALTERNATIVES EAST SEGMENT

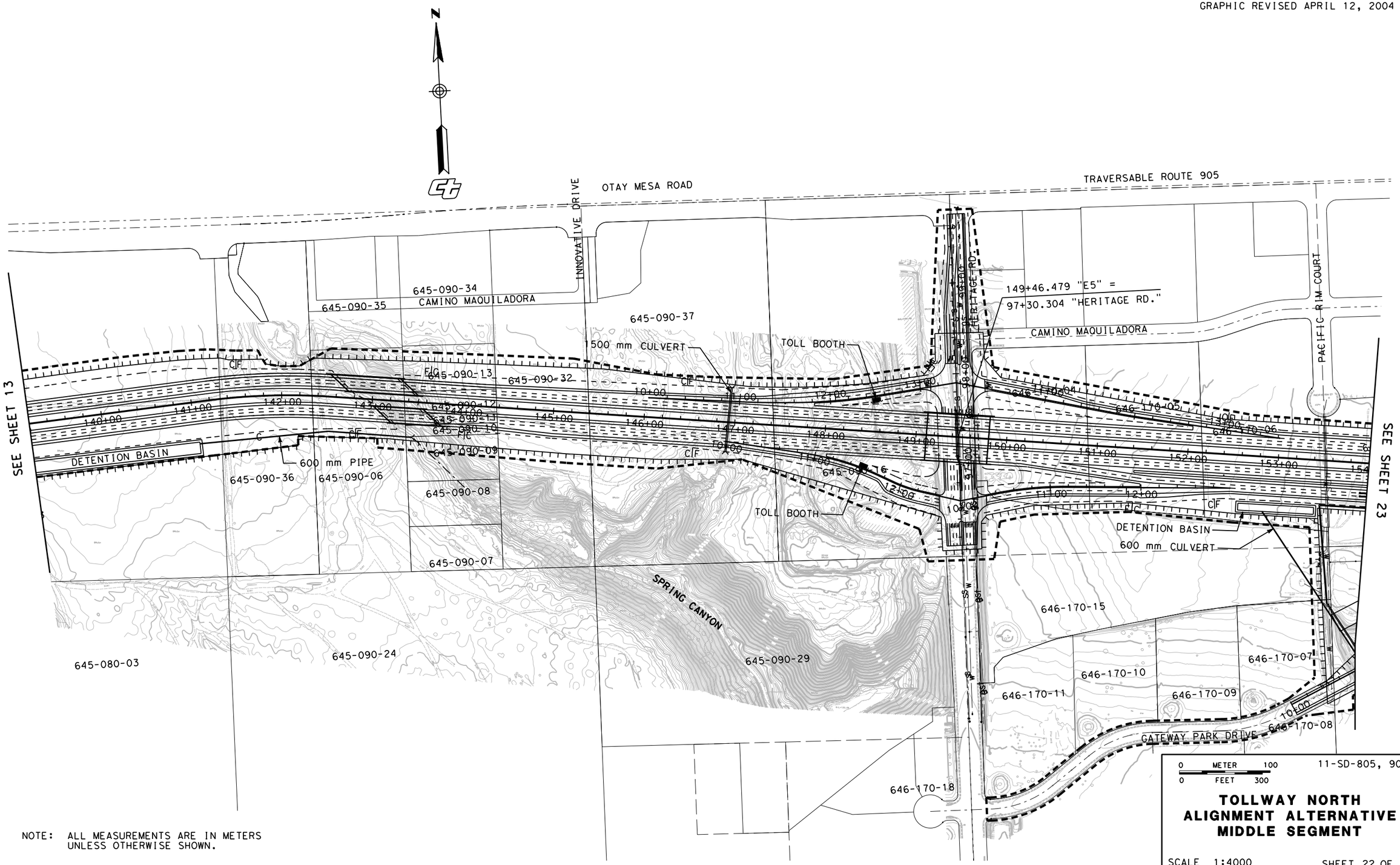
SCALE 1:4000

SHEET 21 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

TOLLWAY NORTH ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

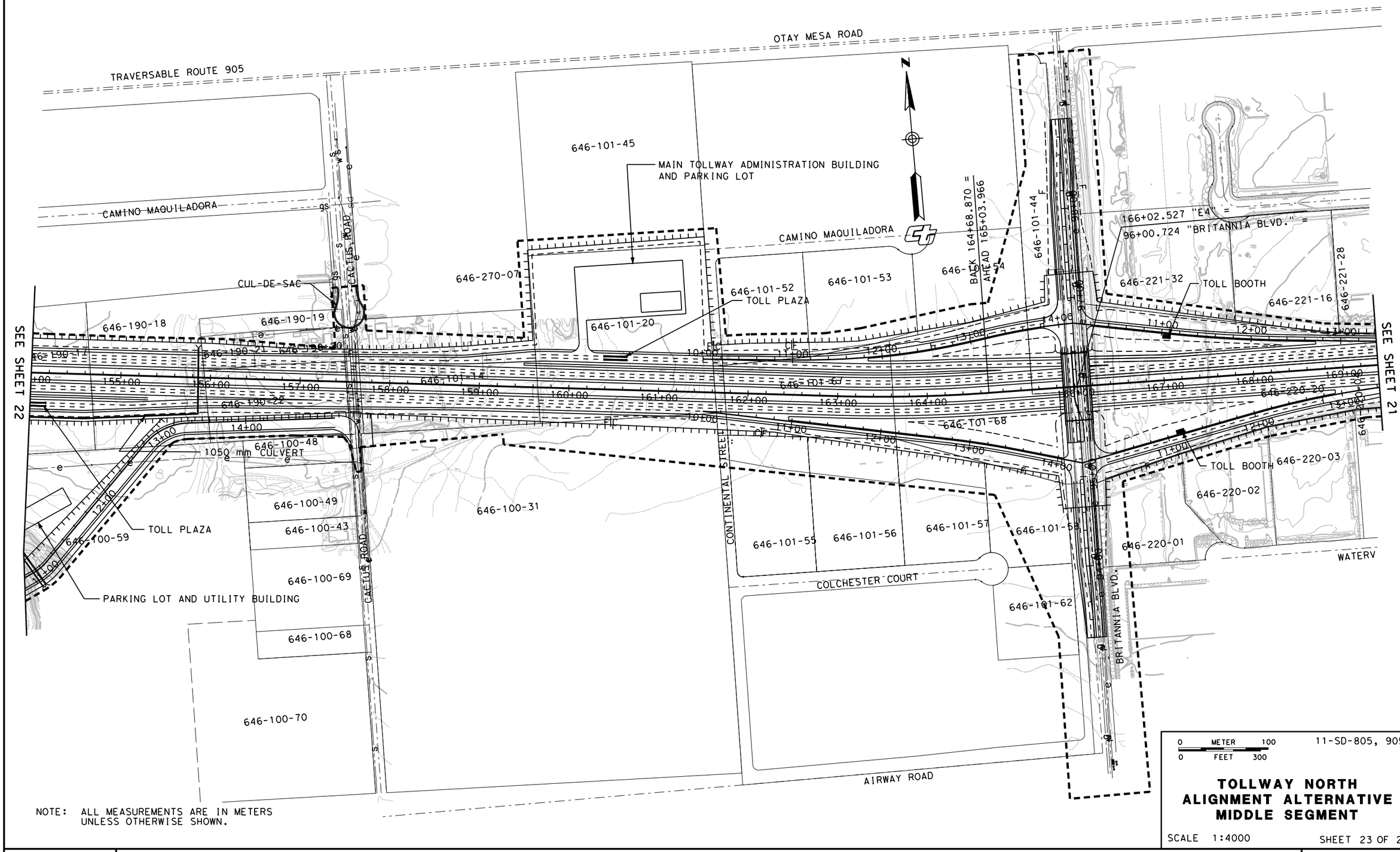
SCALE 1:4000

SHEET 22 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

TOLLWAY NORTH ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

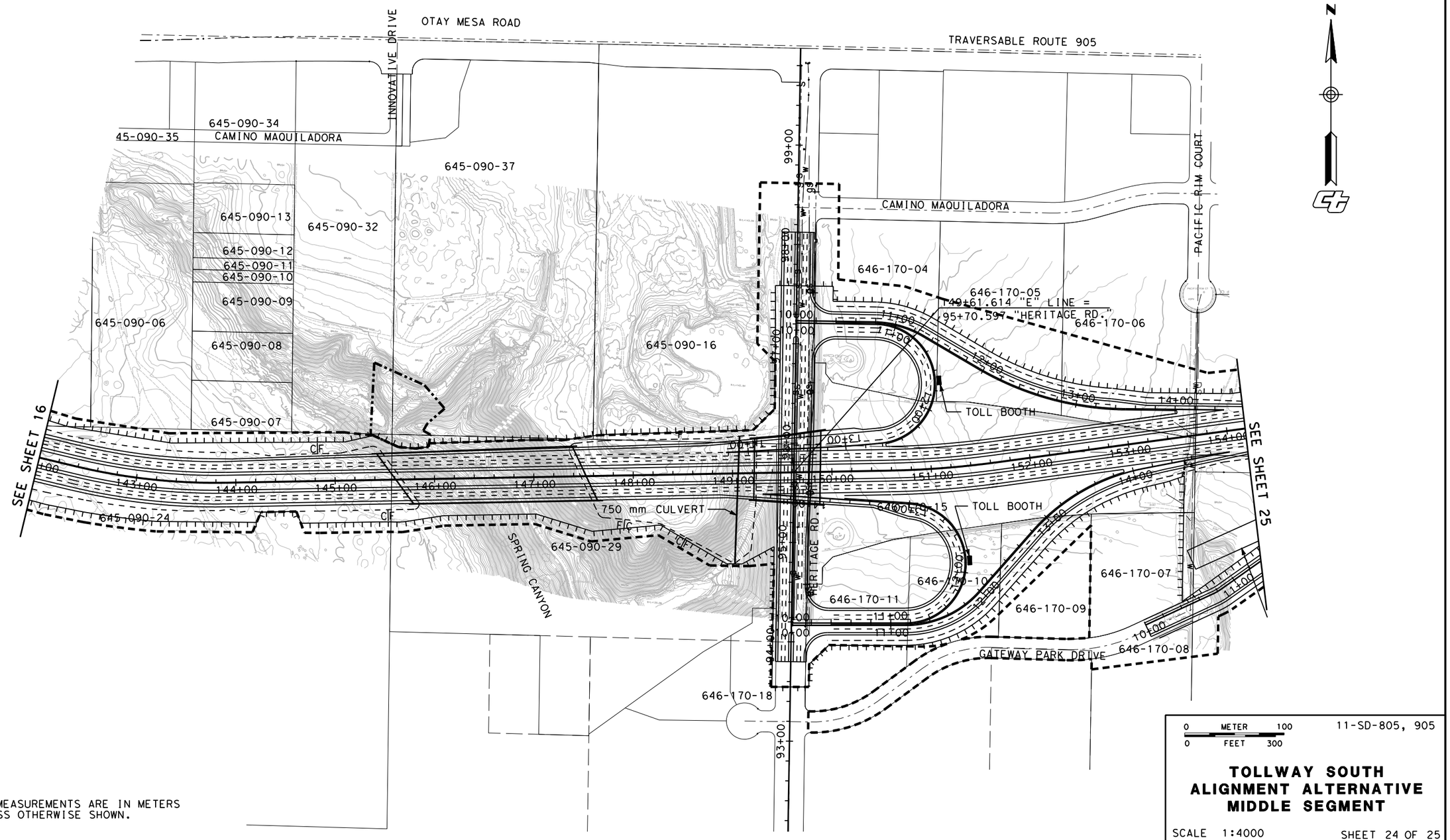
SCALE 1:4000

SHEET 23 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

TOLLWAY SOUTH ALIGNMENT ALTERNATIVE MIDDLE SEGMENT

SCALE 1:4000

SHEET 24 OF 25

PROJECT FEATURES

ATTACHMENT 5

GRAPHIC REVISED APRIL 12, 2004

TRAVERSABLE ROUTE 905

OTAY MESA ROAD

CAMINO MAQUILADORA

646-101-45

MAIN TOLLWAY ADMINISTRATION BUILDING AND PARKING LOT

CAMINO MAQUILADORA

CACTUS ROAD

BACK 157+88.023 = AHEAD 158+23.344

CUL-DE-SAC

646-270-07

646-190-18

646-190-19

646-190-17

646-190-21

646-190-20

TOLL PLAZA

646-101-20

646-101-52

646-101-53

646-101-54

646-101-44

BRITANNIA BLVD.

166+02.526 "E" LINE =
96+00.724 "BRITANNIA BLVD."

646-221-32

TOLL BOOTH
646-221-16

646-221-28

646-190-22

646-101-14

646-101-67

646-101-68

646-220-20

646-220-00

646-220-03

646-220-02

646-220-01

SEE SHEET 24

SEE SHEET 21

TOLL PLAZA

646-100-48

646-100-49

646-100-43

646-100-59

646-100-31

BACK 155+88.480
AHEAD 155+69.911

PARKING LOT AND UTILITY BUILDING

646-100-69

646-100-68

646-100-70

CACTUS ROAD

CONTINENTAL STREET

646-101-55

646-101-56

646-101-57

646-101-58

646-101-62

COLCHESTER COURT

WATERVILL

AIRWAY ROAD

NOTE: ALL MEASUREMENTS ARE IN METERS
UNLESS OTHERWISE SHOWN.

0 METER 100
0 FEET 300

11-SD-805, 905

TOLLWAY SOUTH
ALIGNMENT ALTERNATIVE
MIDDLE SEGMENT

SCALE 1:4000

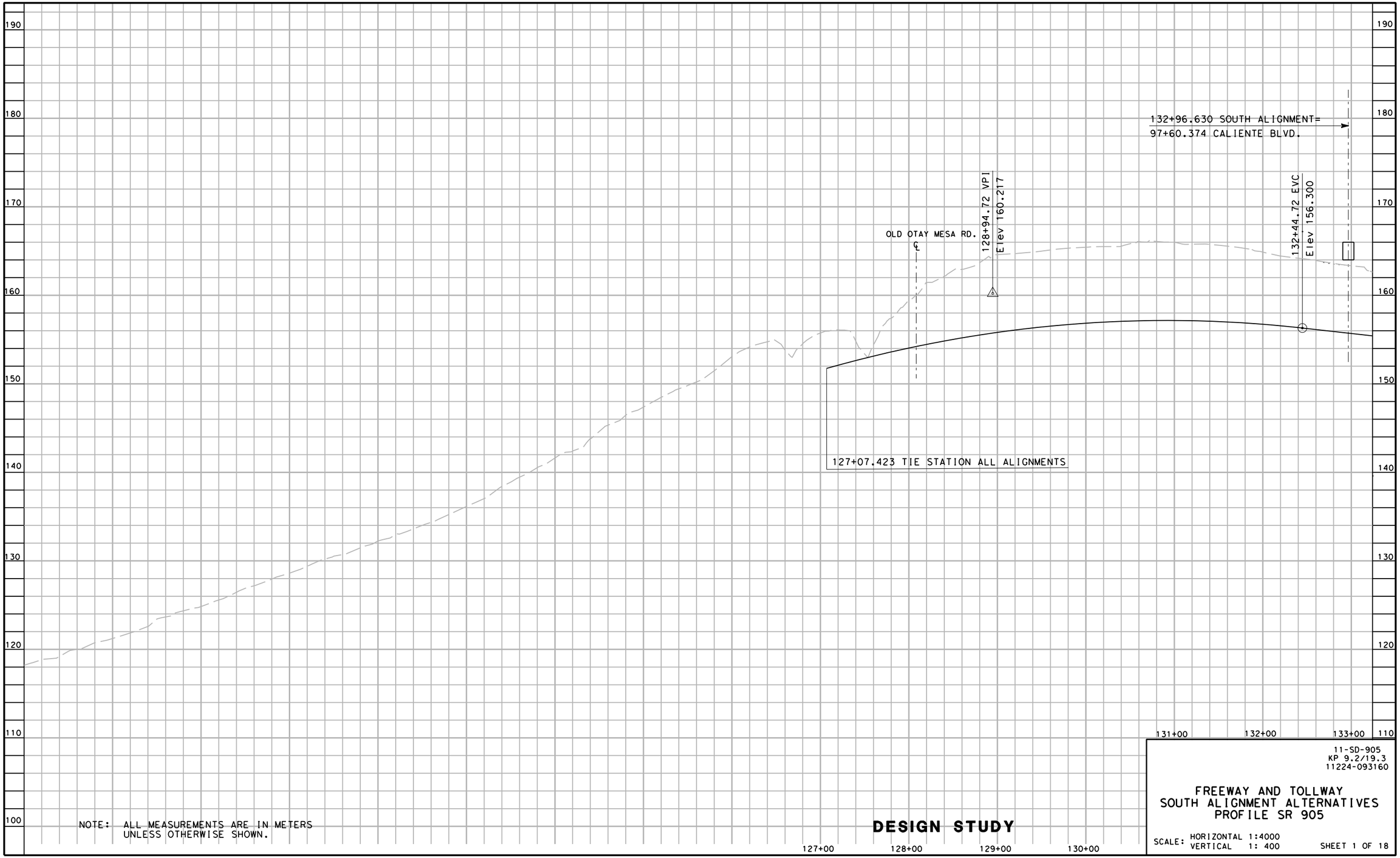
SHEET 25 OF 25

PROJECT FEATURES

ATTACHMENT

5

MAY 14, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

11-SD-905
KP 9.2/19.3
11224-093160

FREEWAY AND TOLLWAY
SOUTH ALIGNMENT ALTERNATIVES
PROFILE SR 905

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 1 OF 18

ATTACHMENT 6

MAY 14, 2004

132+44.720 EVC
Elev 156.300

132+96.63 SOUTH ALIGNMENT=
97+60.374 CALIENTE BLVD.

-1.1178 %

138+35.000 BVC
Elev 149.707

139+00.000 VPI
Elev 148.980

130 m VC

139+65.000 EVC
Elev 149.187

OG
0.3191 %

SPRING CANYON

159+50.000 BVC
Elev 155.521

161+00.000 VPI
Elev 156.000

300 m VC

0.3191 %

149+61.696 SOUTH ALIGNMENT=
95+70.600 HERITAGE ROAD

NOTE: ALL MEASUREMENTS ARE IN METERS
UNLESS OTHERWISE SHOWN.

DESIGN STUDY

11-SD-905
KP 9.2/19.3
11224-093160

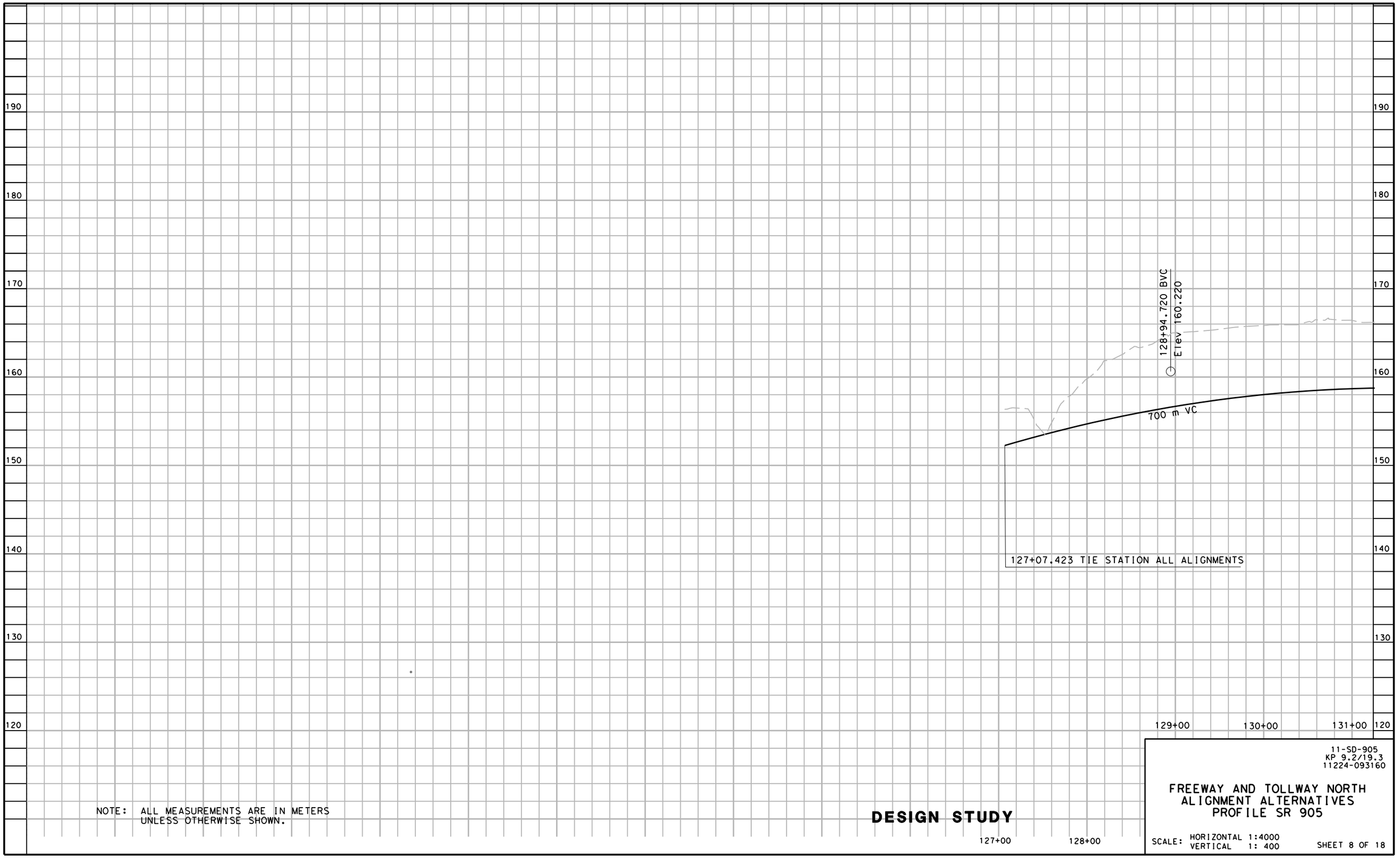
FREEWAY AND TOLLWAY
SOUTH ALIGNMENT ALTERNATIVES
PROFILE SR 905

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 2 OF 18

ATTACHMENT 6

MAY 14, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

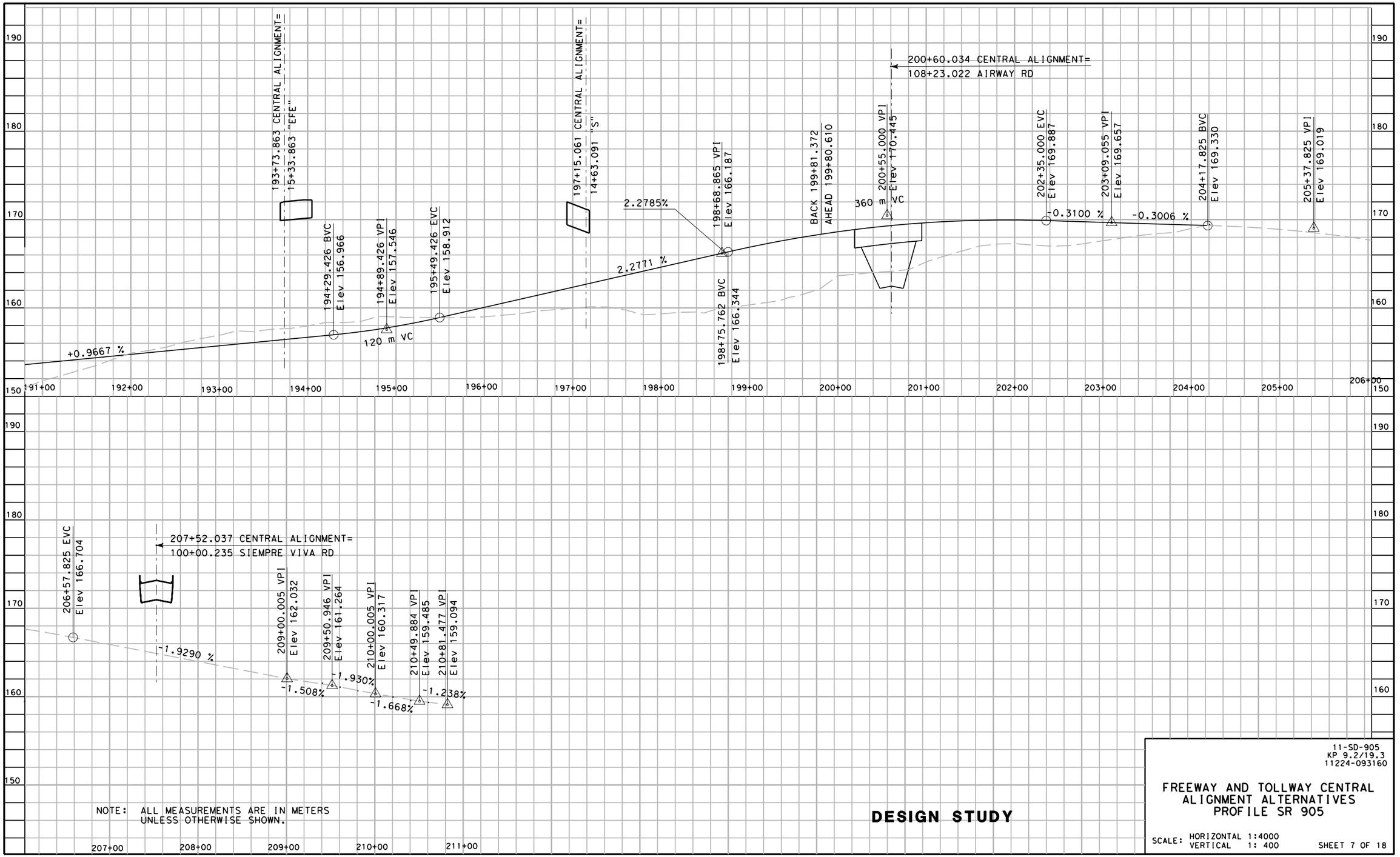
11-SD-905
KP 9.2/19.3
11224-093160

FREEWAY AND TOLLWAY NORTH
ALIGNMENT ALTERNATIVES
PROFILE SR 905

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 8 OF 18

ATTACHMENT 6



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

11-SD-905
KP 9.2/19.3
11224-093160

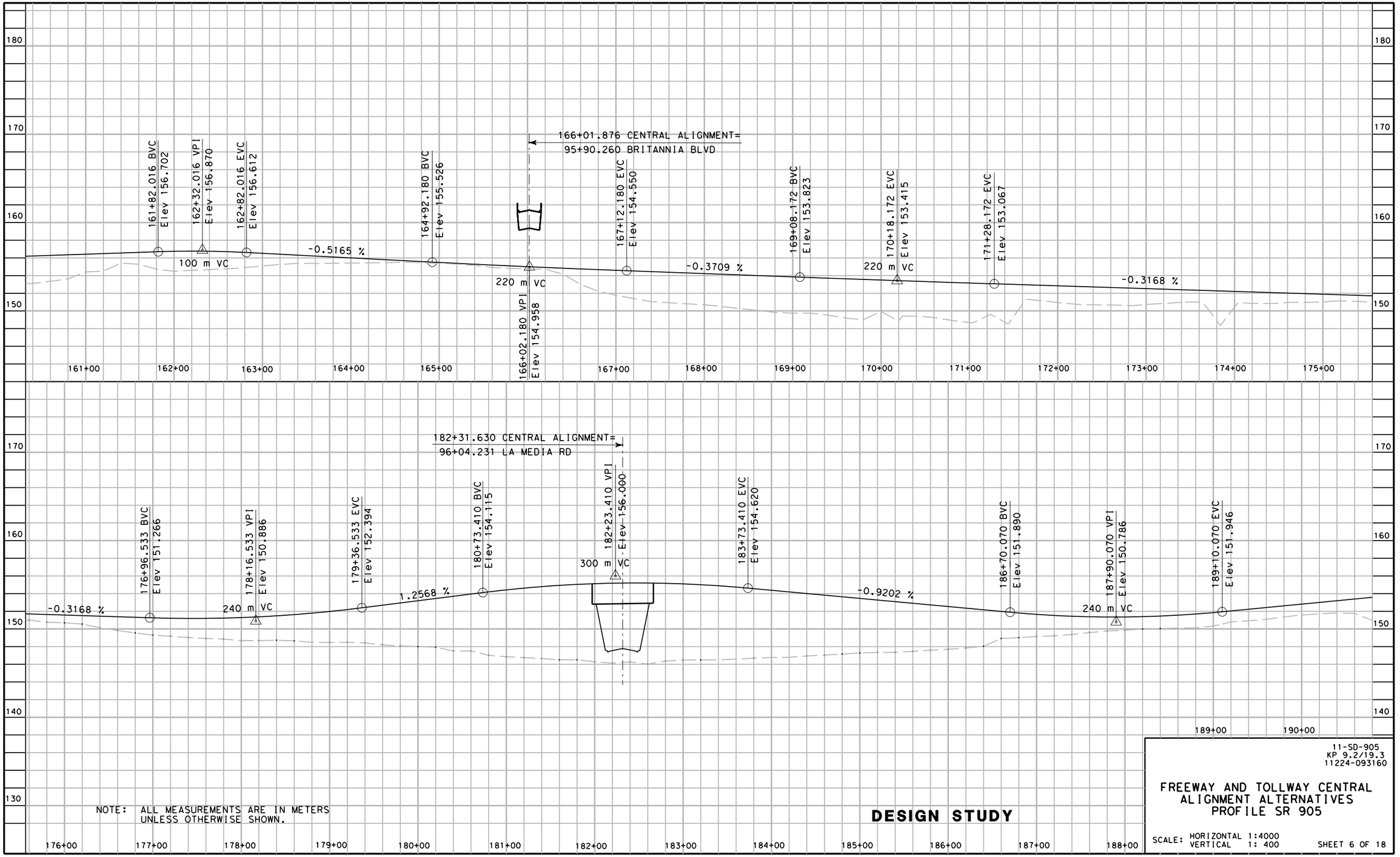
FREEWAY AND TOLLWAY CENTRAL ALIGNMENT ALTERNATIVES
PROFILE SR 905

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 7 OF 18

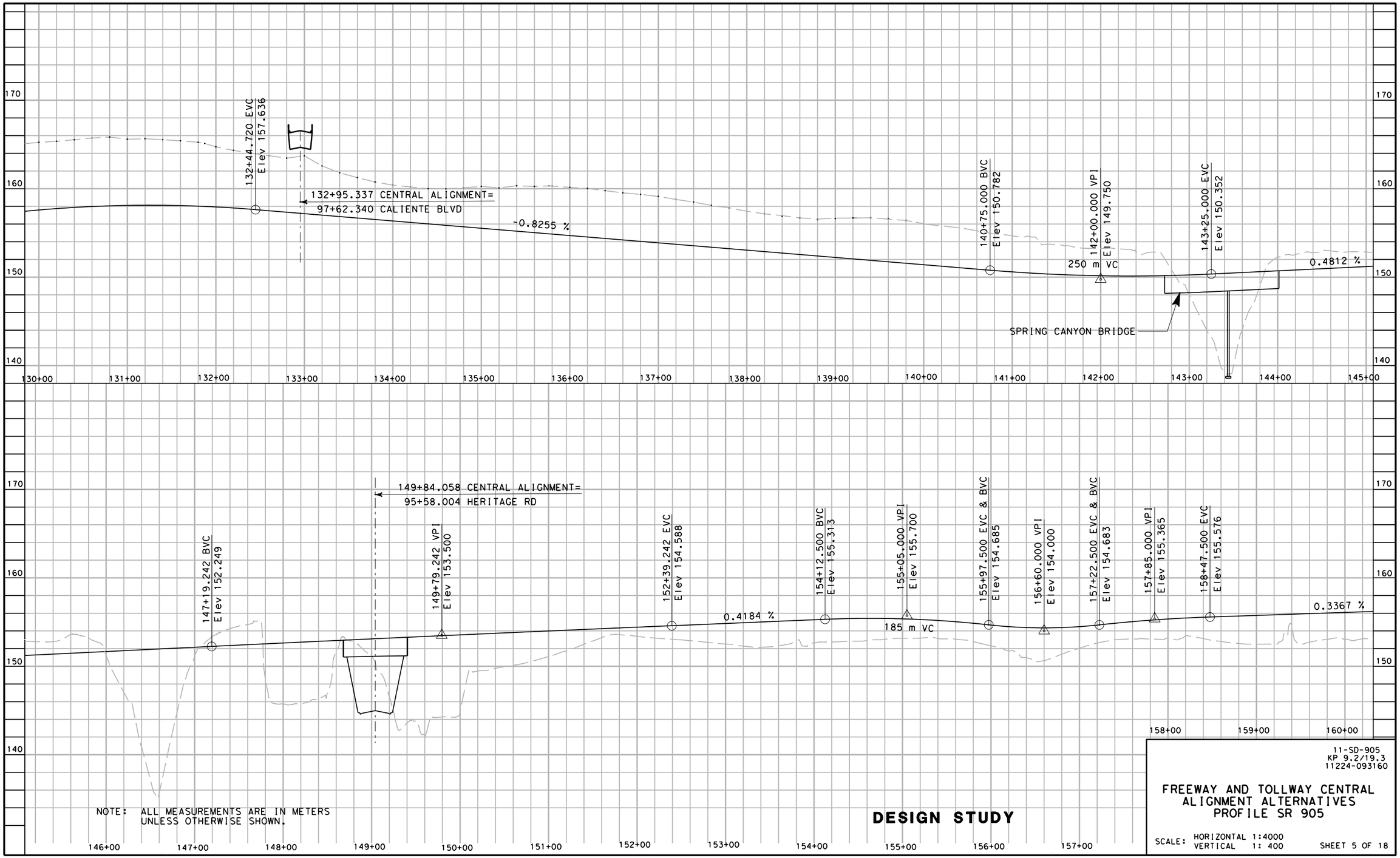
ATTACHMENT 6

MAY 14, 2004



ATTACHMENT 6

MAY 14, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

11-SD-905
KP 9.2/19.3
11224-093160

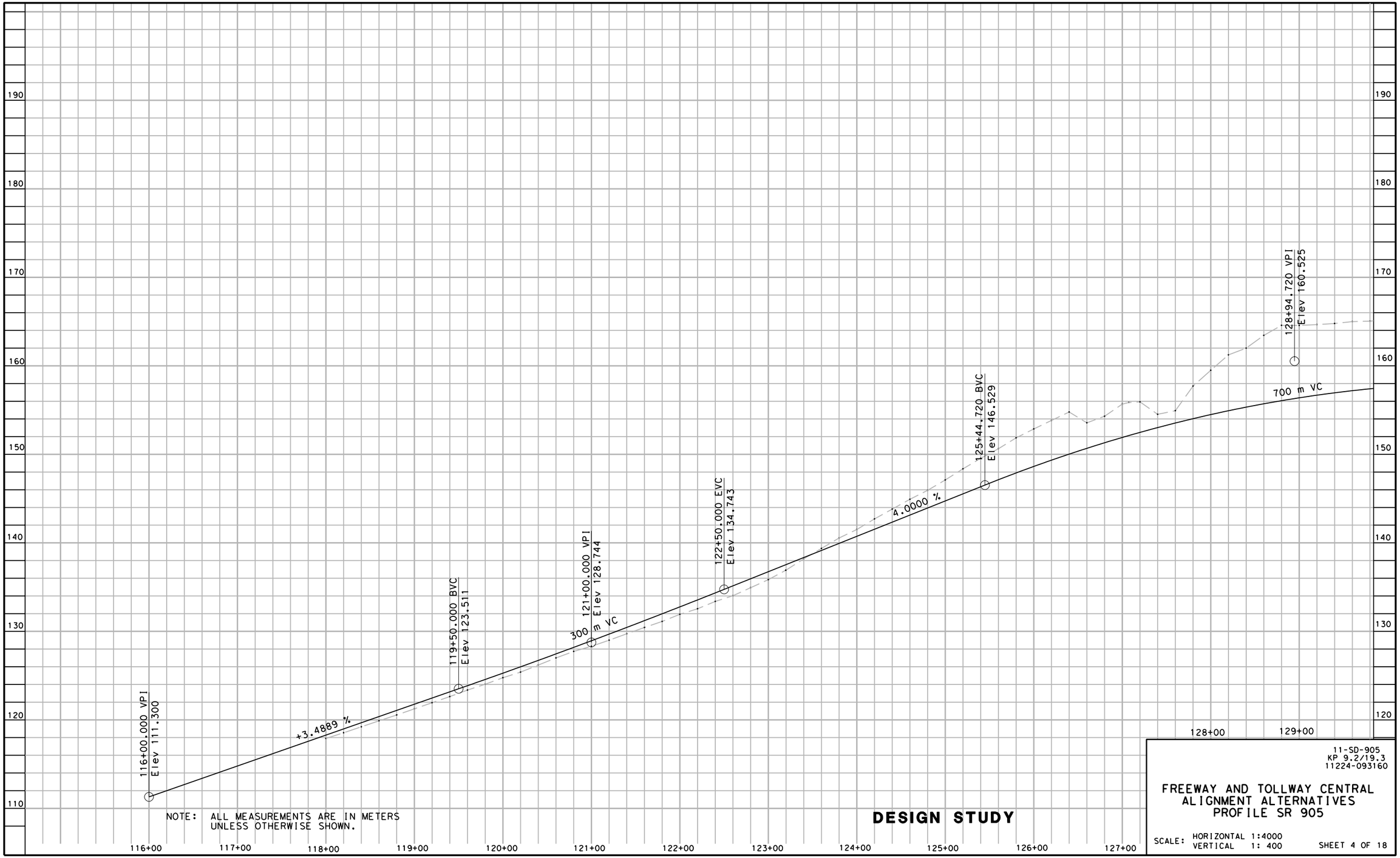
FREEWAY AND TOLLWAY CENTRAL ALIGNMENT ALTERNATIVES
PROFILE SR 905

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 5 OF 18

ATTACHMENT 6

MAY 14, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

11-SD-905
KP 9.2/19.3
11224-093160

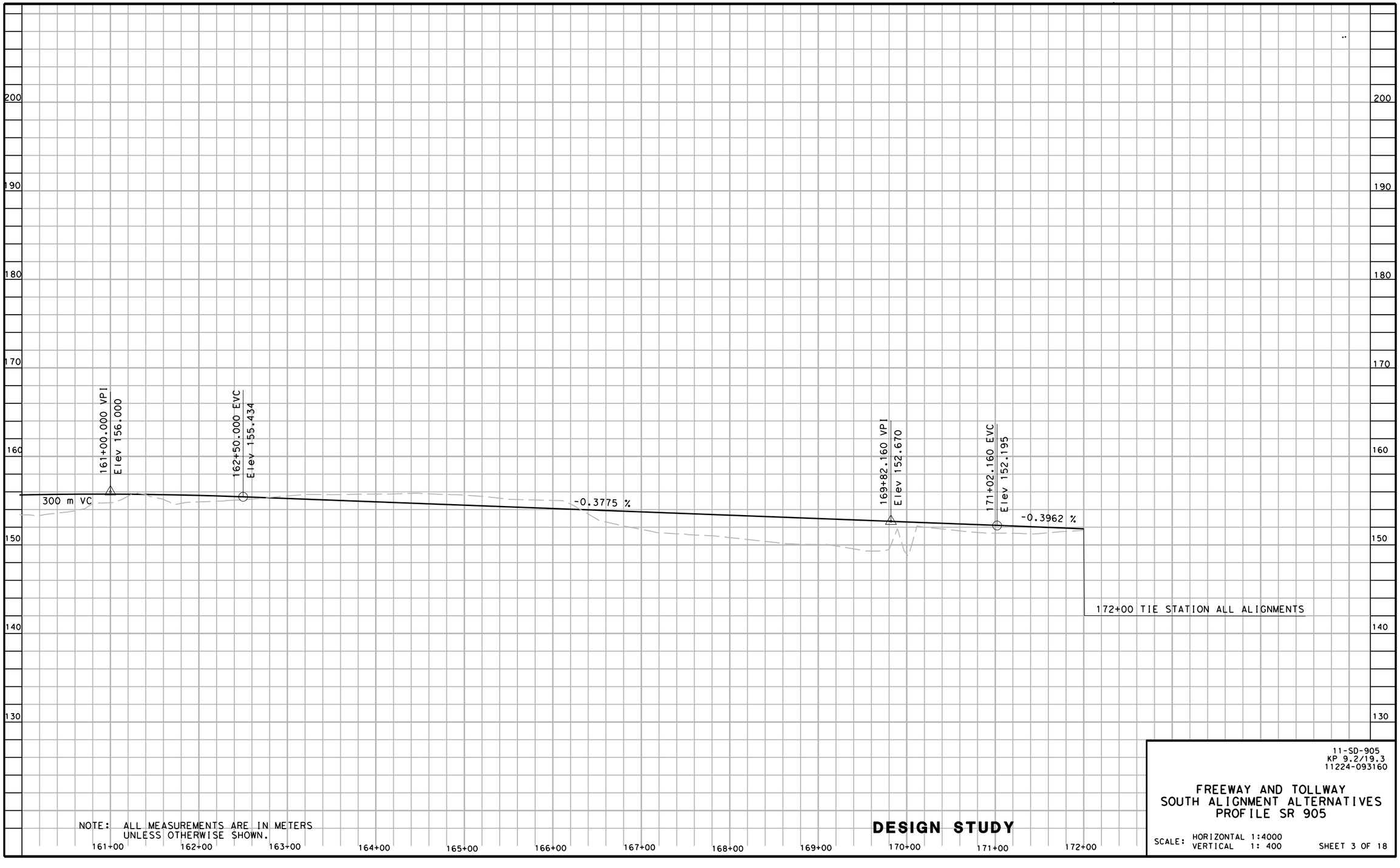
FREEWAY AND TOLLWAY CENTRAL
ALIGNMENT ALTERNATIVES
PROFILE SR 905

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 4 OF 18

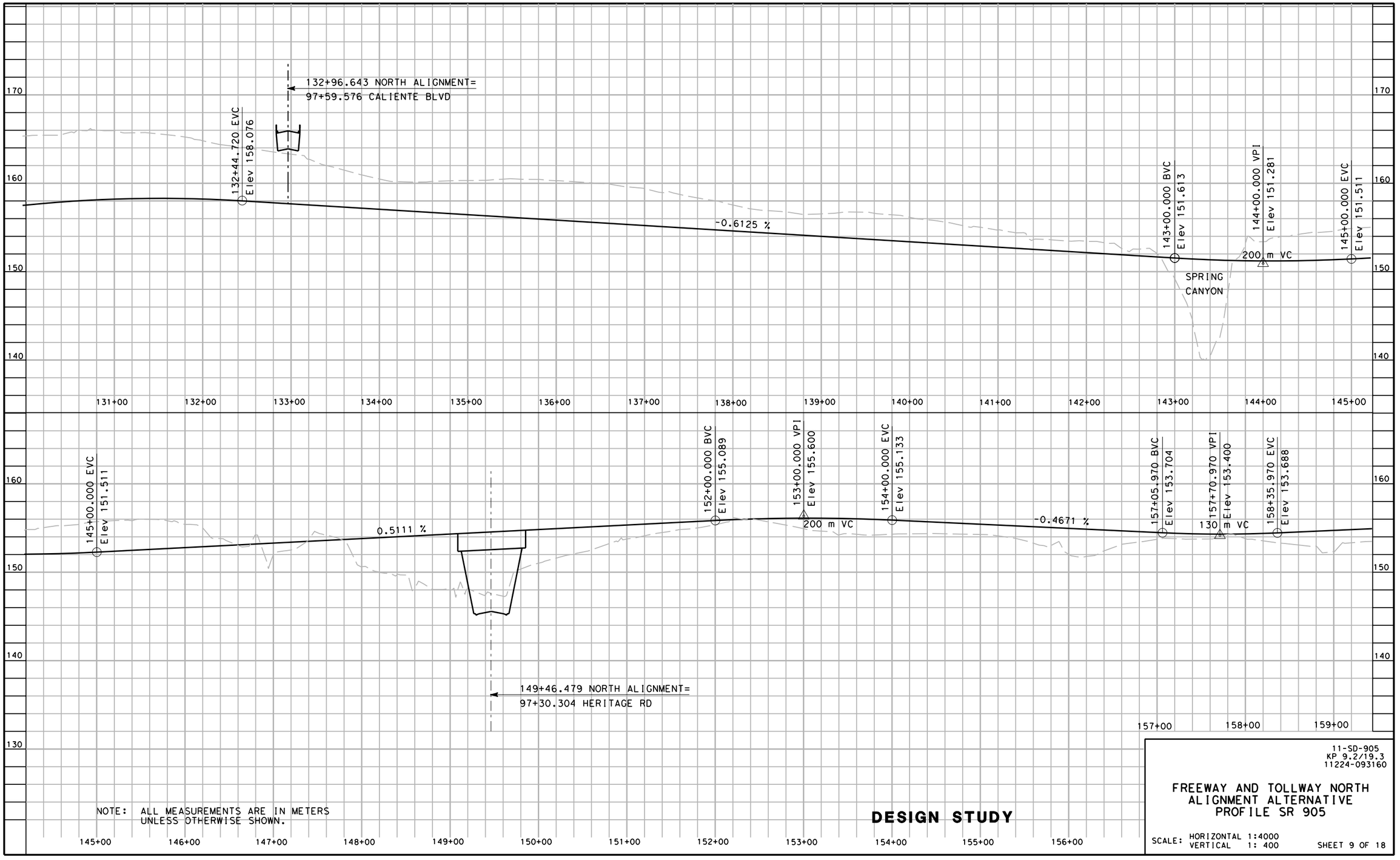
ATTACHMENT 6

MAY 14, 2004



ATTACHMENT 6

MAY 14, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

11-SD-905
KP 9.2/19.3
11224-093160

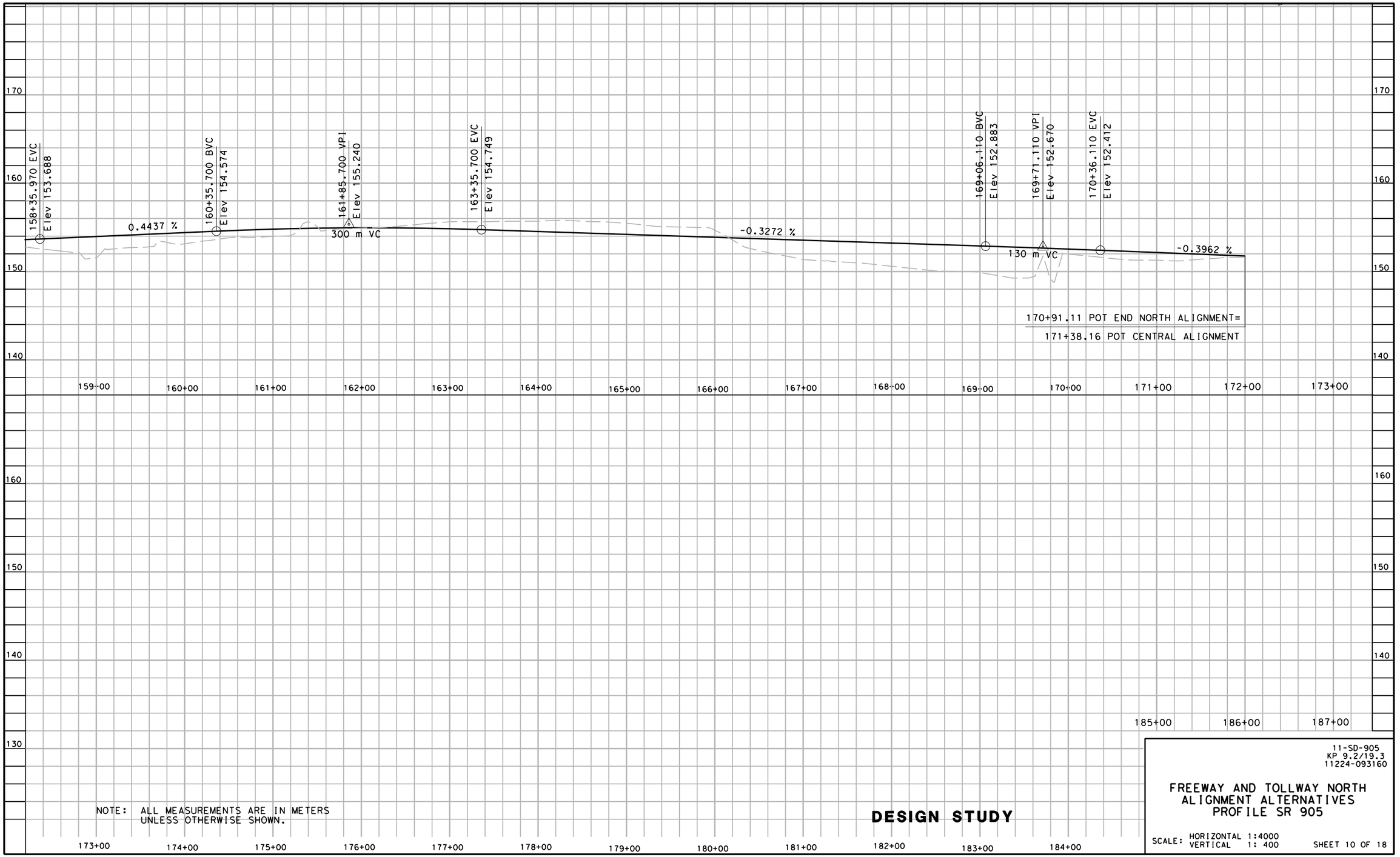
FREEWAY AND TOLLWAY NORTH ALIGNMENT ALTERNATIVE PROFILE SR 905

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 9 OF 18

ATTACHMENT 6

MAY 14, 2004



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

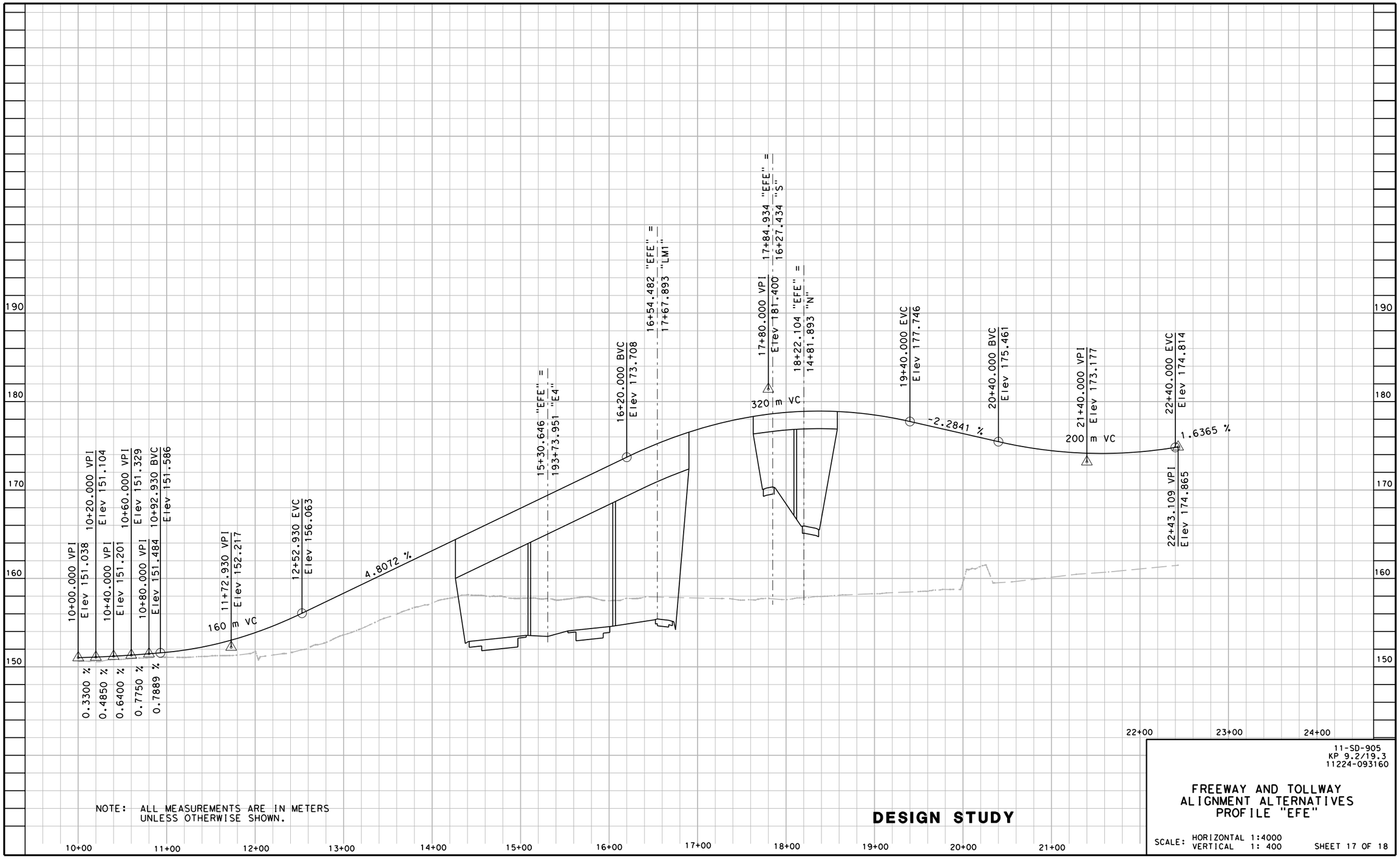
11-SD-905
KP 9.2/19.3
11224-093160

FREEWAY AND TOLLWAY NORTH
ALIGNMENT ALTERNATIVES
PROFILE SR 905

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 10 OF 18

ATTACHMENT 6



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

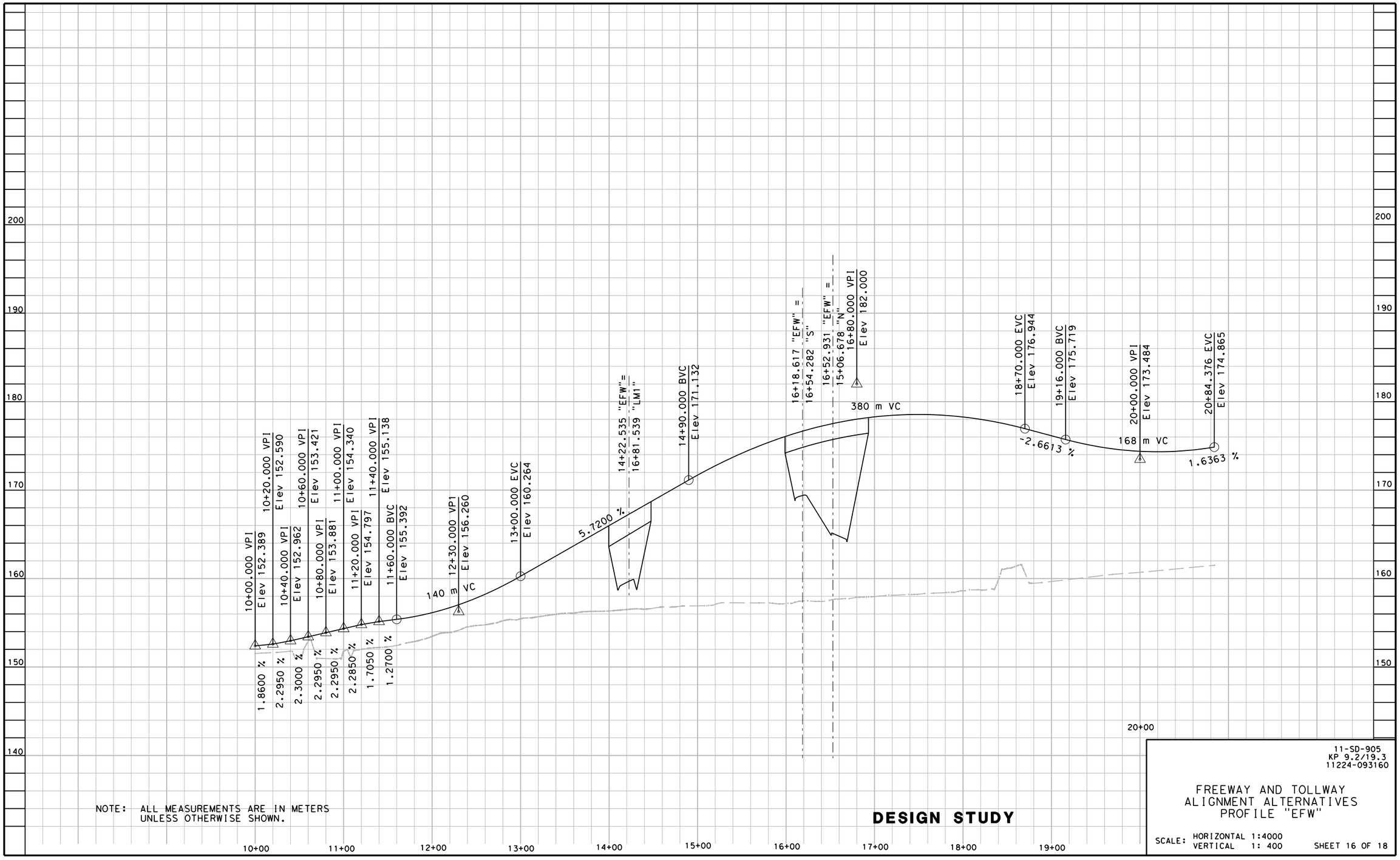
11-SD-905
KP 9.2/19.3
11224-093160

FREEWAY AND TOLLWAY
ALIGNMENT ALTERNATIVES
PROFILE "EFE"

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 17 OF 18

ATTACHMENT 6



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

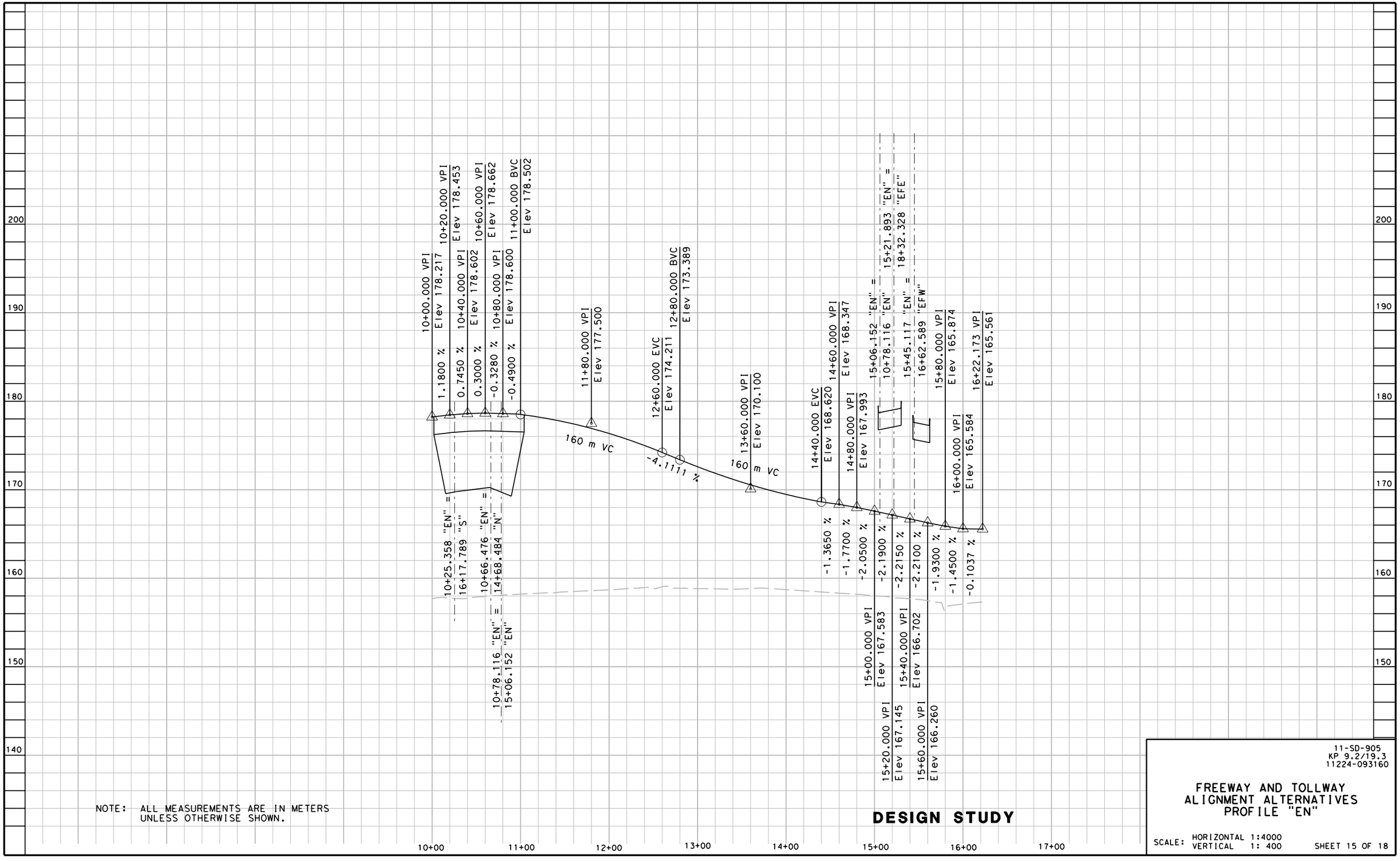
11-SD-905
KP 9.2/19.3
11224-093160

FREEWAY AND TOLLWAY
ALIGNMENT ALTERNATIVES
PROFILE "EFW"

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 16 OF 18

ATTACHMENT 6



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

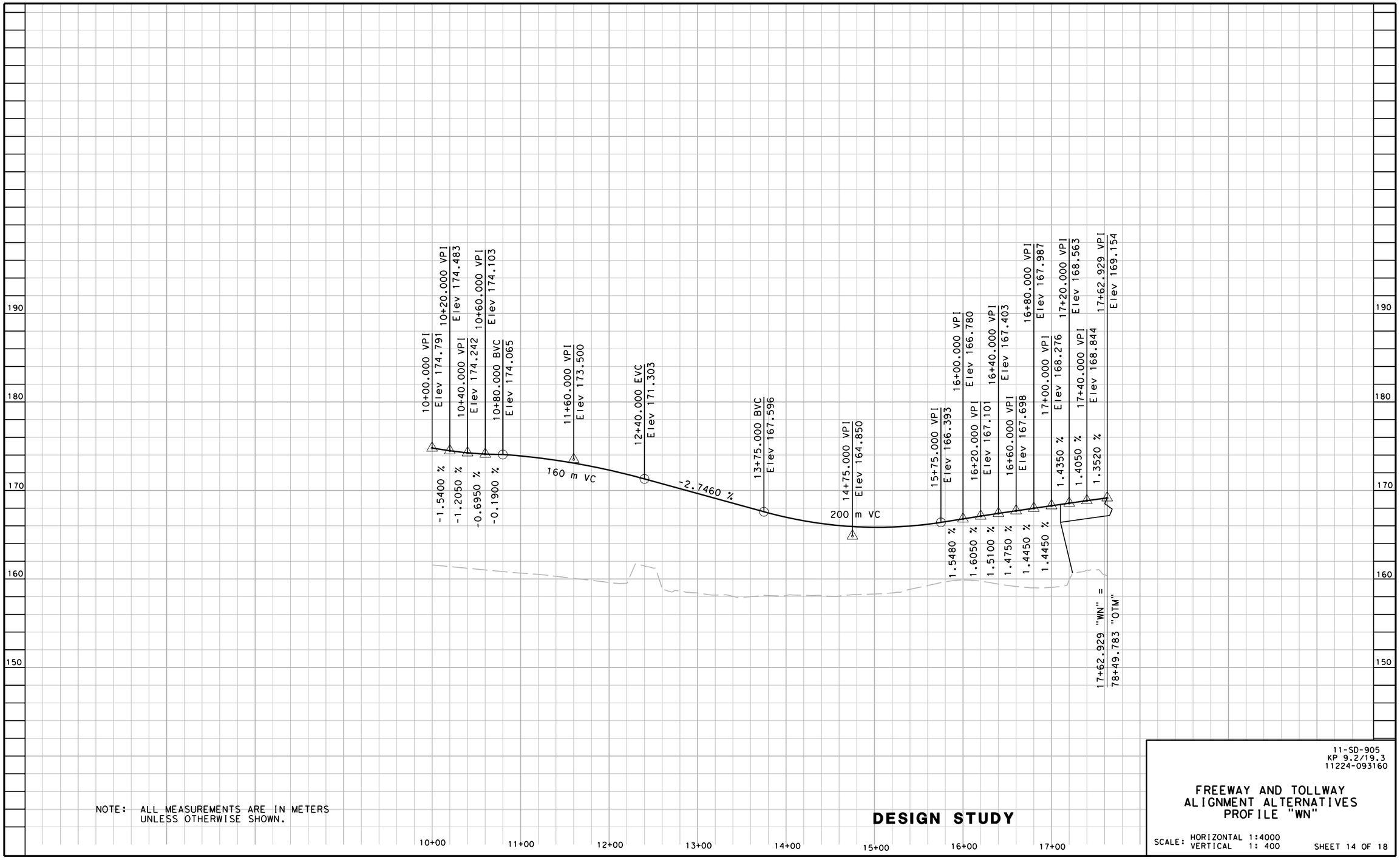
11-SD-905
KP 9.2/19.3
11224-093160

FREEWAY AND TOLLWAY
ALIGNMENT ALTERNATIVES
PROFILE "EN"

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 15 OF 18

ATTACHMENT 6



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

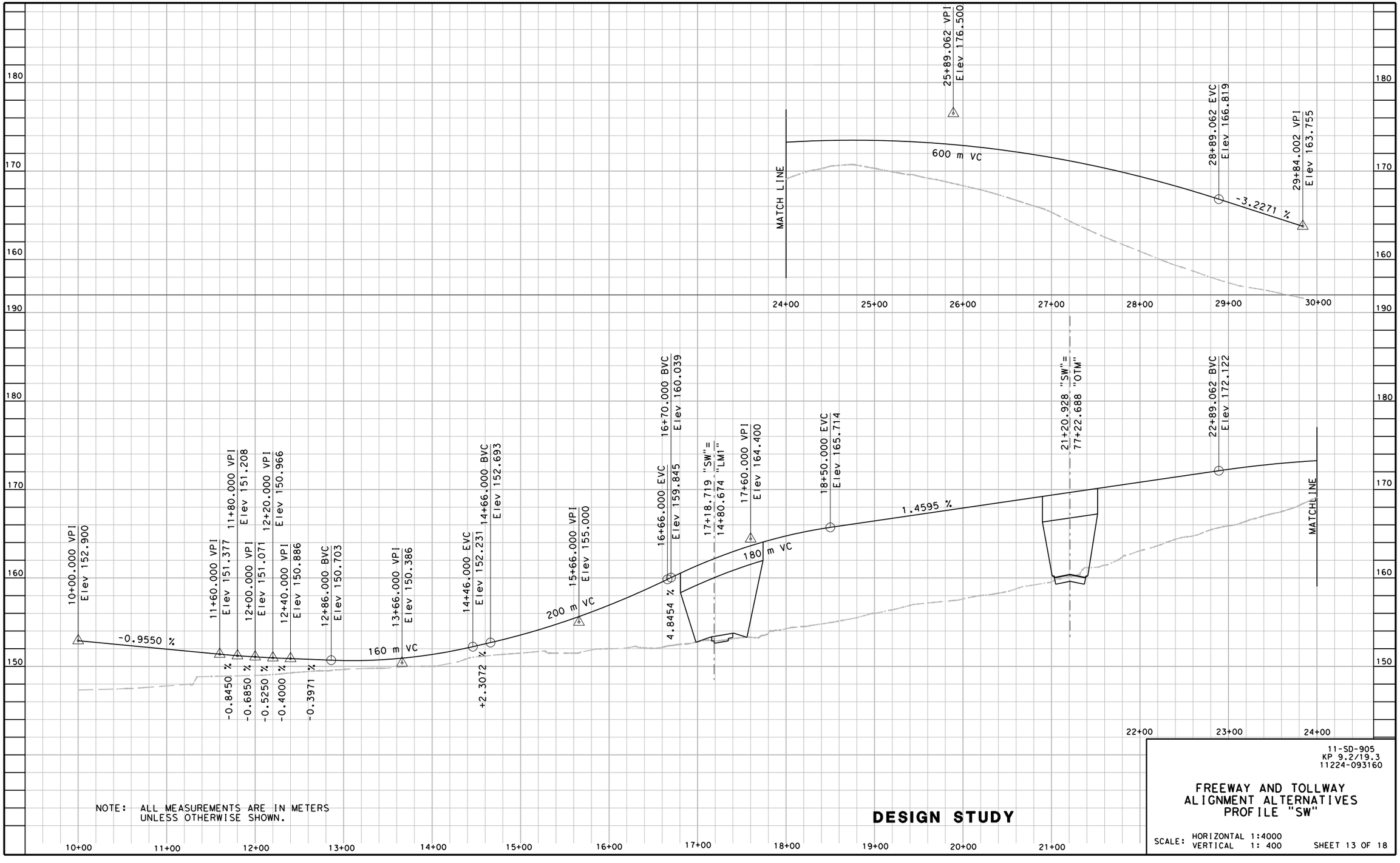
11-SD-905
KP 9.2/19.3
11224-093160

FREEWAY AND TOLLWAY
ALIGNMENT ALTERNATIVES
PROFILE "WN"

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 14 OF 18

ATTACHMENT 6



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

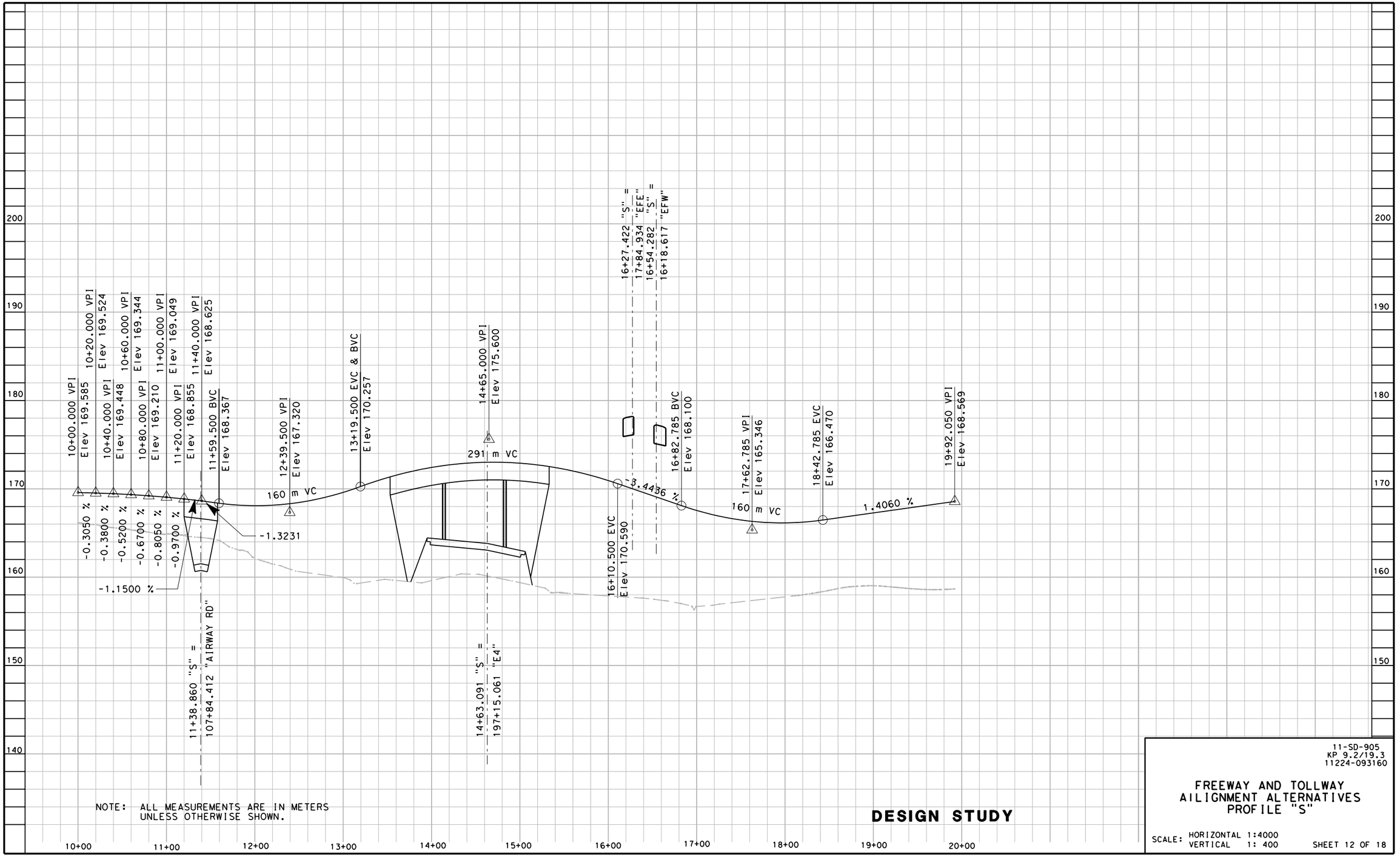
11-SD-905
KP 9.2/19.3
11224-093160

FREEWAY AND TOLLWAY
ALIGNMENT ALTERNATIVES
PROFILE "SW"

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 13 OF 18

ATTACHMENT 6



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

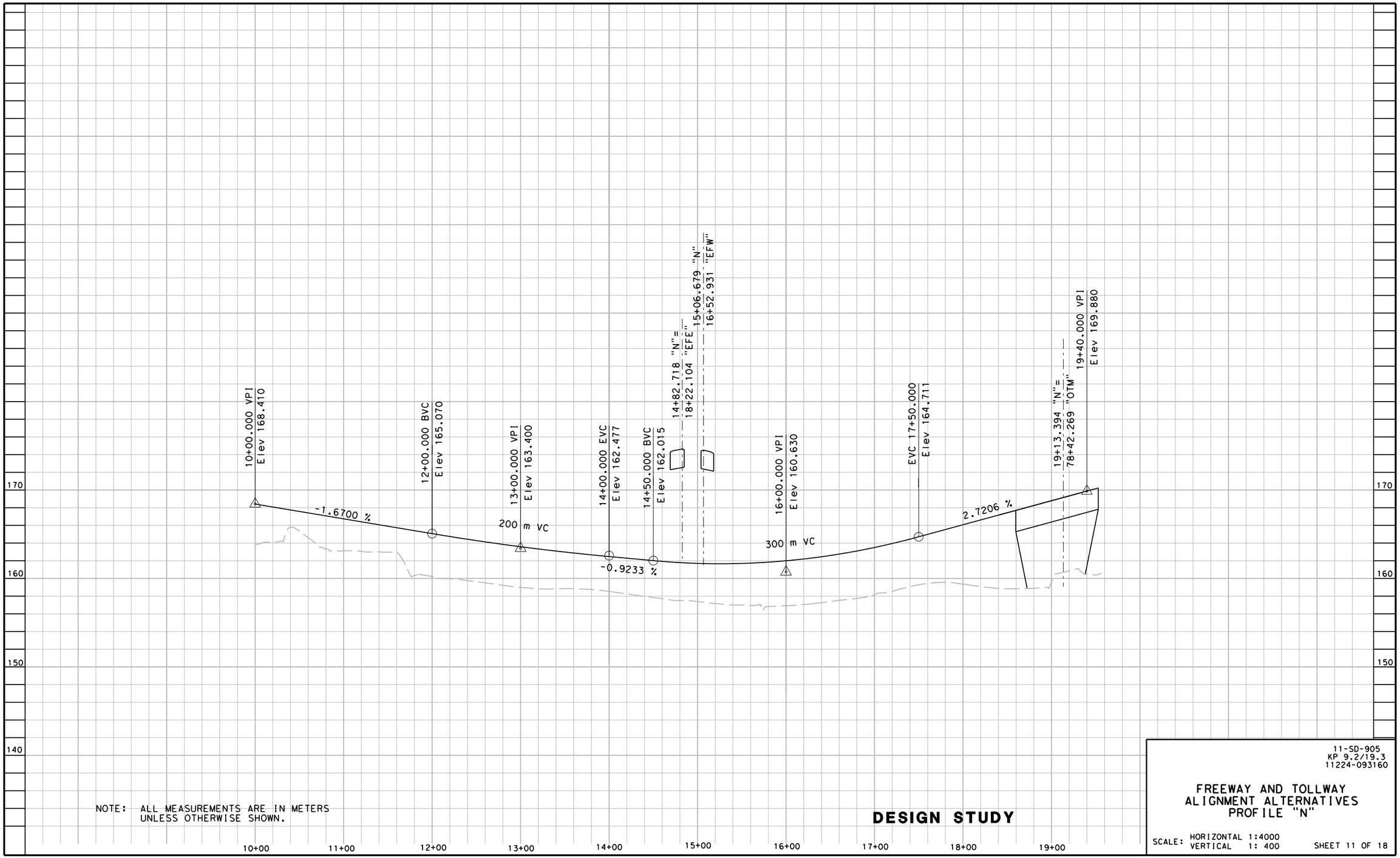
11-SD-905
KP 9.2/19.3
11224-093160

FREEWAY AND TOLLWAY
AILIGNMENT ALTERNATIVES
PROFILE "S"

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 12 OF 18

ATTACHMENT 6



NOTE: ALL MEASUREMENTS ARE IN METERS UNLESS OTHERWISE SHOWN.

DESIGN STUDY

11-SD-905
KP 9.2/19.3
11224-093160

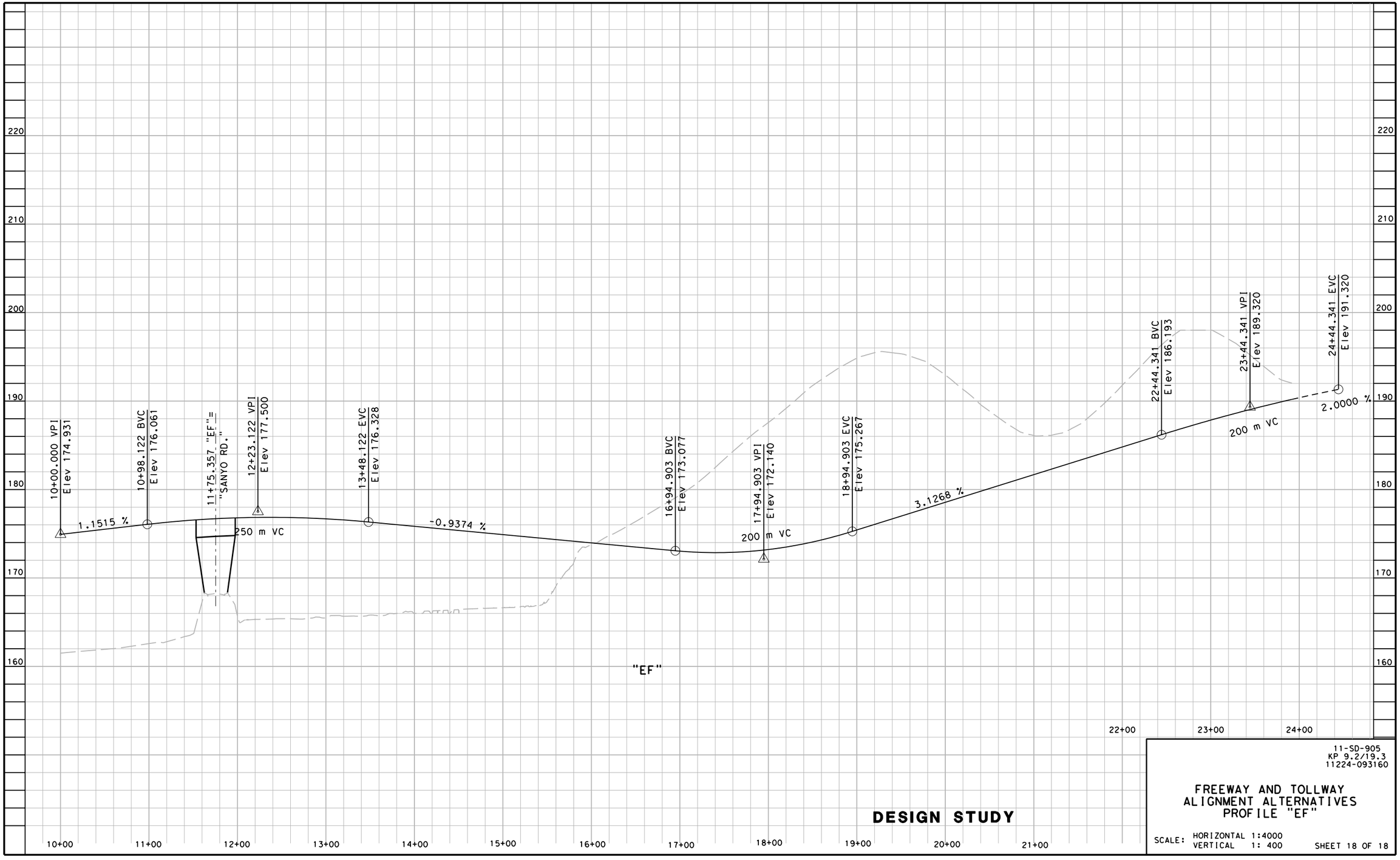
FREEWAY AND TOLLWAY
ALIGNMENT ALTERNATIVES
PROFILE "N"

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 11 OF 18

ATTACHMENT 6

MAY 14, 2004



11-SD-905
KP 9.2/19.3
11224-093160

FREEWAY AND TOLLWAY
ALIGNMENT ALTERNATIVES
PROFILE "EF"

SCALE: HORIZONTAL 1:4000
VERTICAL 1: 400

SHEET 18 OF 18

DESIGN STUDY

ATTACHMENT 6

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	905			

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

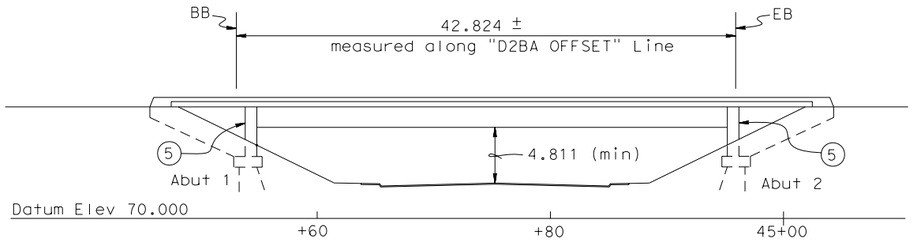
REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

INCOMPLETE PLAN FOR DESIGN STUDY PRINTED

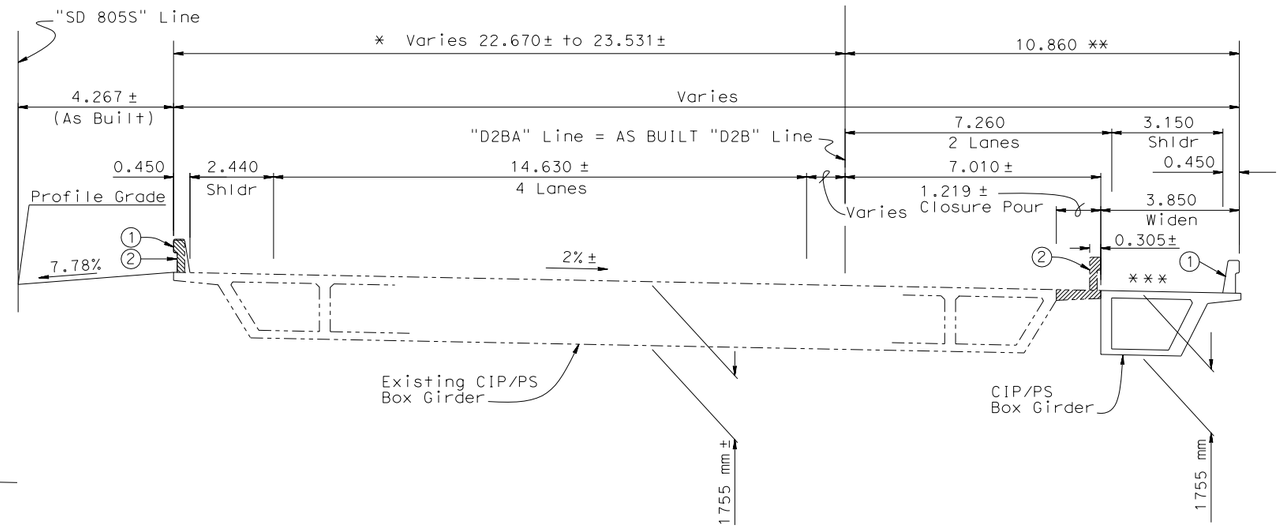
DATE:

Office of Structure Design
STATE OF CALIFORNIA

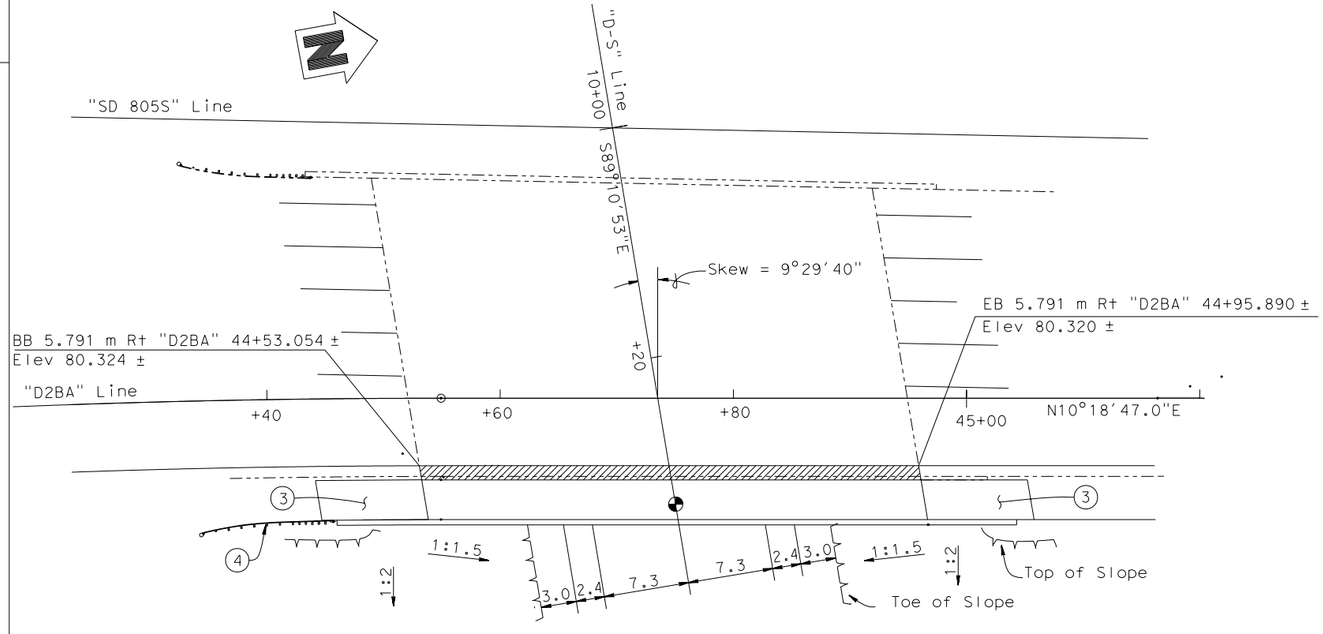


NOTE: Class 625 pile footings

ELEVATION
1:250



TYPICAL SECTION
1:80



PLAN
1:250

NOTES

① Type 736 Concrete Barrier
② Remove Existing Barrier
③ Structure Approach Type N(9D)
④ MBGR, see 'Road Plans'
⑤ Structure to be cast high and lowered into place
* Dimension measured normal to "SD805" Line
** Dimension measured normal to "D2BA" Line
*** Match Existing Cross Slope
◒ Indicates point of minimum vertical clearance.

Vehicular Traffic

1. ___ New alignment. No traffic at the site.
2. ___ Traffic will be detoured away from the site.
3. ___ Traffic will be carried on the structure. Stage construction will/will not be required.
4. ___ Traffic will pass under the structure on _____ (Name of St. or Hwy.)
   A. ___ No falsework allowed over traffic.
   B. ___ Falsework opening(s) required:

	Temporary Vertical Clearance	Width of Traffic Opening
____ Bnd		
____ Bnd		
____ Two-way		

   C. ___ Temporary traffic lane reduction needed for footing excavation.

Pedestrian Traffic

Falsework opening required on _____ (Name of St.)

Location	Height	Width

Railroad Traffic

Falsework opening required over _____ (Name of RR)

Vertical Clearance	Horizontal Clear Width

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGN	BY S. Galgiani	CHECKED	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD			
DETAILS	BY T. Nguyen	CHECKED	LAYOUT	BY S. Galgiani	CHECKED	PLANS AND SPECS COMPARED	
QUANTITIES	BY	CHECKED	SPECIFICATIONS	BY			

DESIGN ENGINEER

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
STRUCTURE DESIGN 14

BRIDGE NO. 57-1141
KILOMETER POST 3.512

DEL SOL UC
GENERAL PLAN

STRUCTURES DESIGN GENERAL PLAN SHEET (METRIC) (REV.12-1-01)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 11
EA 091831

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) 04-08-03 6-12-03 7-16-03 7-17-03 SHEET OF

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TIME PLOTTED => $TIME
DATE PLOTTED => $DATE
USERNAME => $USER

ATTACHMENT 7

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	905			

Caltrans Metric

PS&E

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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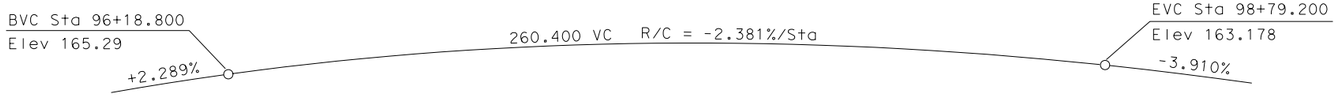
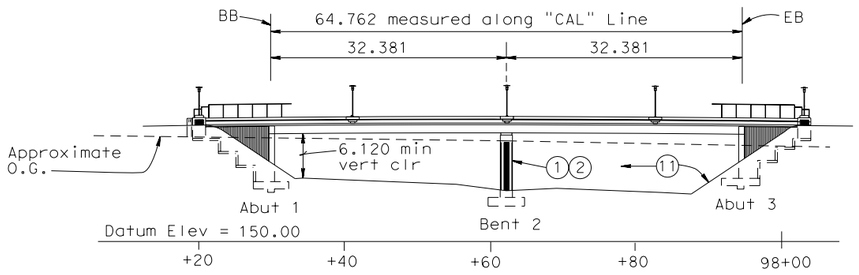
REGISTERED PROFESSIONAL ENGINEER — RONALD J. BROMENSCHENKEL — No. C47092 — Exp. 12-31-05 — CIVIL — STATE OF CALIFORNIA



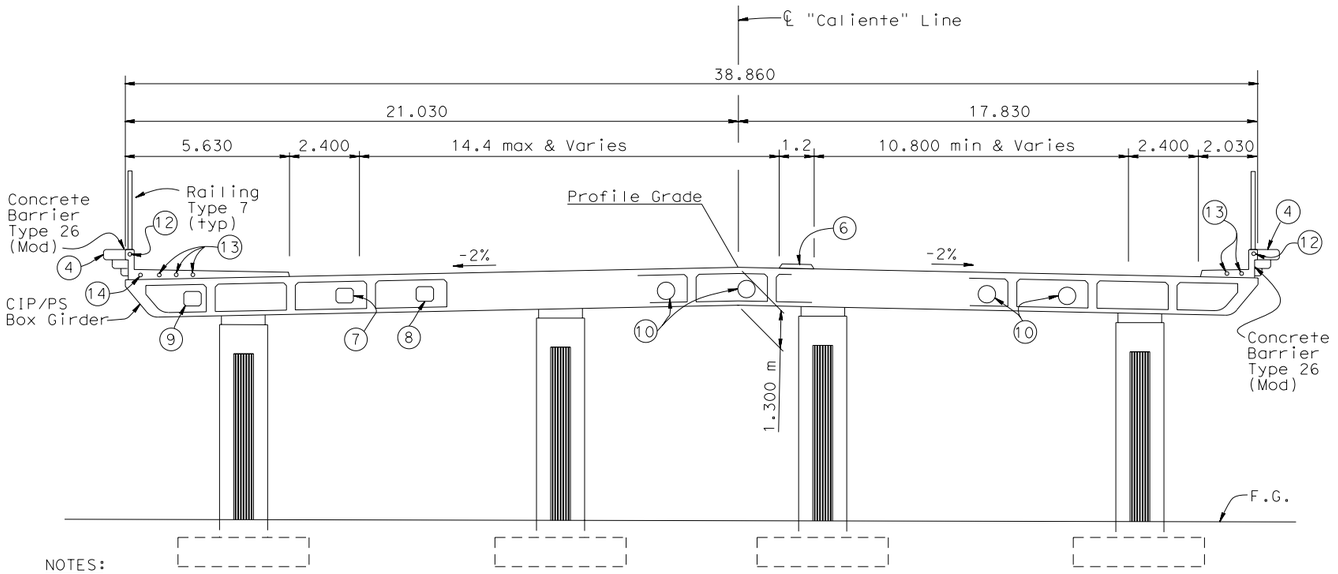
PROFILE GRADE

No Scale



ELEVATION

1:400



NOTES:

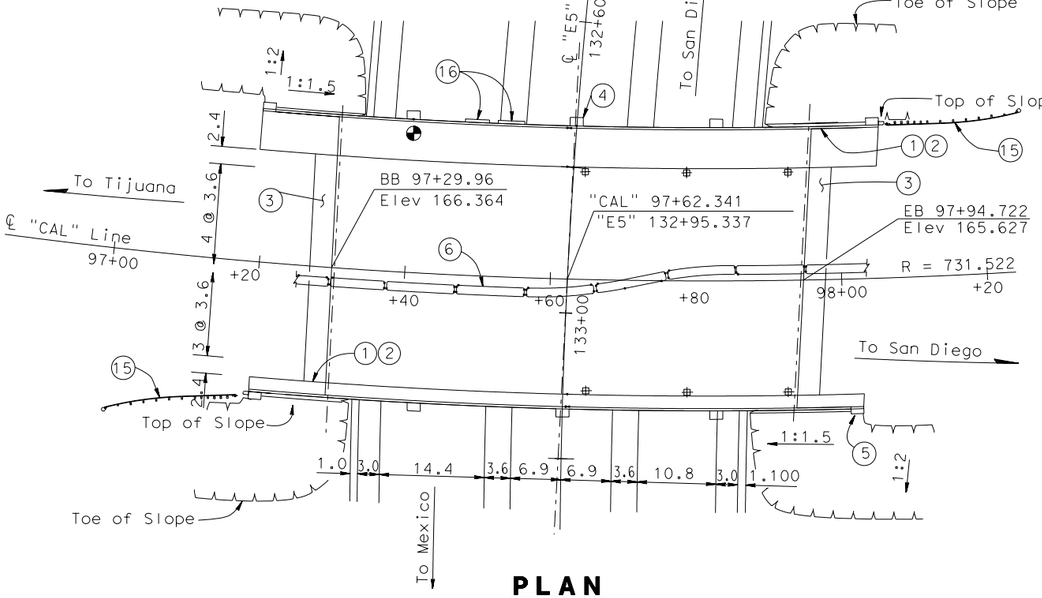
1. Paint "Caliente Avenue OC"
2. Paint "Bridge No. 57-1142"
3. Structure Approach Slab Type EQ(3)
4. Light Standard Pedestal, tot. 6
5. Light Standard Pilaster, tot. 4
6. Raised Median
7. Electric duct opening
8. Telephone duct opening
9. TV Cable duct opening
10. Water line opening
11. Slope paving
12. 53 mm ø City Lighting Conduit, see "Road Plans"
13. 53 mm ø Lighting Conduit, see "Road Plans"
14. 53 mm ø Signal Conduit, see "Road Plans"
15. MBGR, see "Road Plans"
16. Bridge mounted sign, see "Road Plans"

◐ Indicates Point of Minimum Vertical Clearance

□ Indicates Deck Drain

TYPICAL SECTION

1:100



PLAN

1:400

For General Notes, see "INDEX TO PLANS" sheet

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGN	BY S. Hegazi	CHECKED J. Han	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF STRUCTURES STRUCTURE DESIGN 14
DETAILS	BY Carlomagno P.Paclibar	CHECKED J. Han	LAYOUT	BY S. Hegazi	CHECKED J. Han		
QUANTITIES	BY J. Han	CHECKED C. Tarala	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED		

DESIGN ENGINEER

STRUCTURES DESIGN GENERAL PLAN SHEET (METRIC) (REV.12-1-01)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 11224
EA 091821

FILE => $REQUEST

BRIDGE NO.	CALIENTE AVENUE OC
57-1142	
KILOMETER POST	GENERAL PLAN
10.820	

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 03-05-04 | 03-09-04 | 04-30-04 | 05-04-04 | 05-06-04 | 2-14-04 | 02-17-04 | 03-03-04

SHEET 1 OF

ATTACHMENT 7

USERNAME => $USER DATE PLOTTED => $DATE TIME PLOTTED => $TIME

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	905			

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

RONALD J. BROMENSCHENKEL No. C47092 Exp. 12-31-04 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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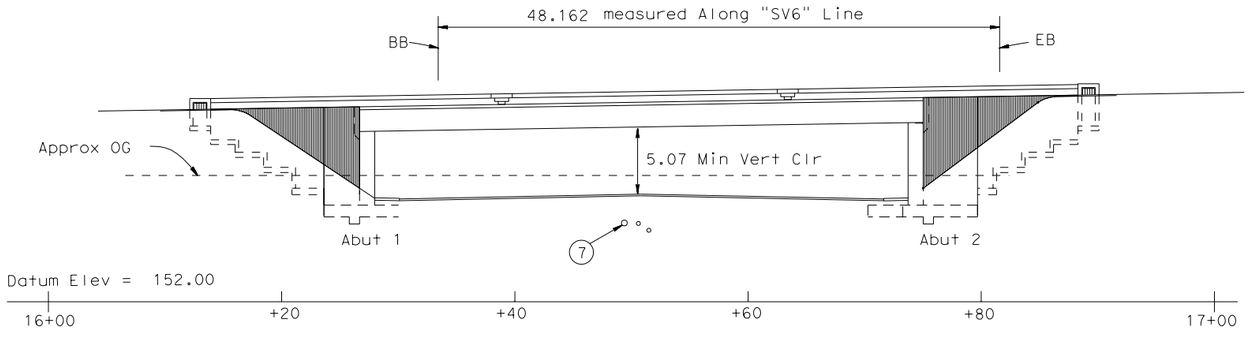
Caltrans now has a web site! To get to the web site, go to: http://www.dot.ca.gov

PROFILE GRADE

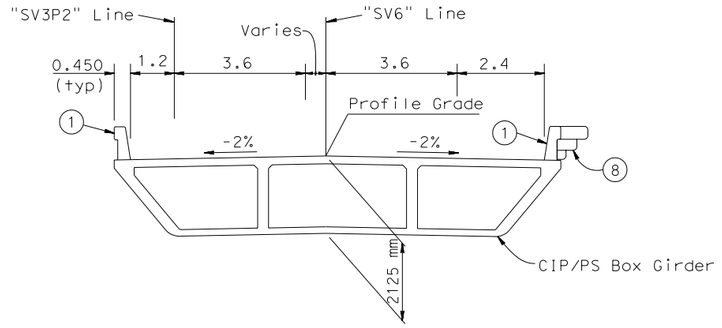
No Scale

PS&E



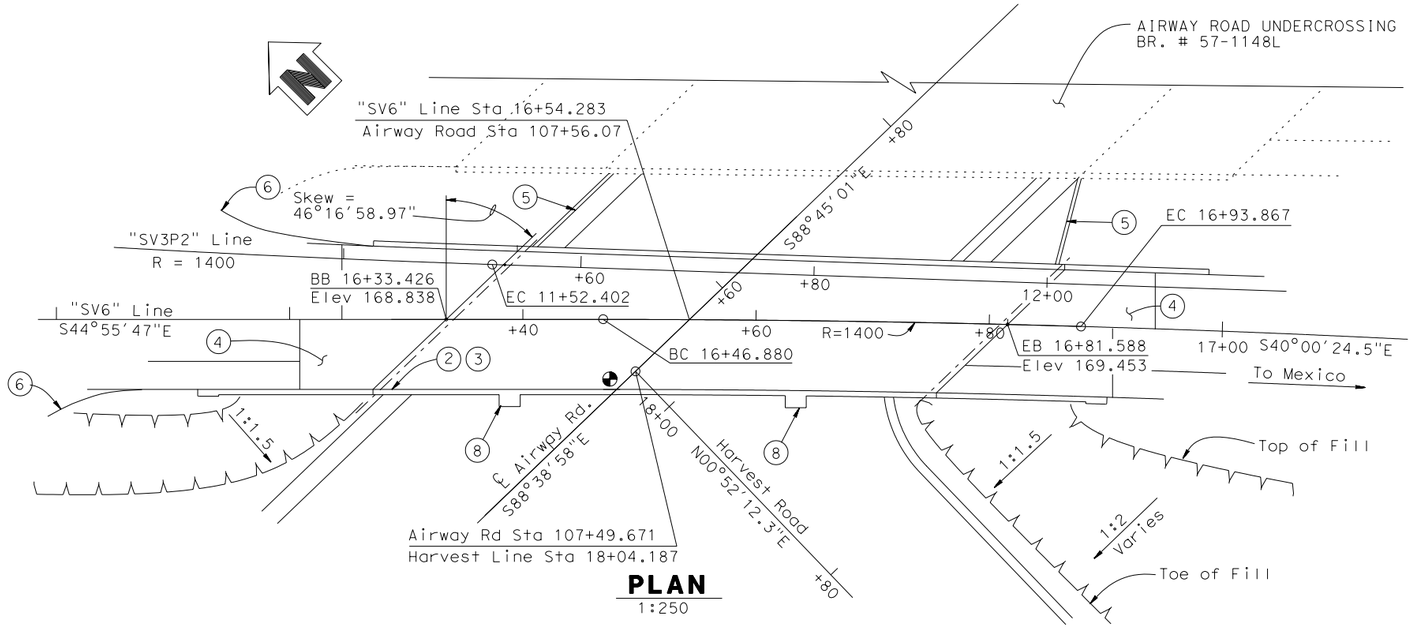
ELEVATION

1:250



TYPICAL SECTION

1:80



PLAN

1:250

CURVE DATA

SV6 LINE

R = 1400
Δ = 1°55'22.6"
L = 46.987
T = 23.495

SV3P2 LINE

R = 1400
Δ = 2°51'19"
L = 69.768
T = 34.891

NOTES:

1. Type 736 Concrete Barrier
2. Paint "Br. No. 57-1148 S
3. Paint "Airway Road UC"
4. Structural Approach, Type N(9S)
5. Retaining Wall between Structures Type 1 Modified
6. MBGR, See "Road Plans"
7. Approximate Location Water, Sewer, and Gas utilities
8. Pedestal, total 2

◒ Indicates Point of Minimum Vertical Clearance

For General Notes, see "INDEX TO PLANS" sheet

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

Caltrans Metric

	BY	CHECKED			
DESIGN	J. Lane	J. Massoomi	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD	
DETAILS	C. P. Paclibar	J. Massoomi	LAYOUT	J. Lane	J. Massoomi
QUANTITIES	J. Lane	J. Massoomi	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED

DESIGN ENGINEER

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH 14

CU 11224
EA 091821

FILE => $REQUEST

BRIDGE NO.	57-1148S
KILOMETER POST	17.597

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES: 03-16-04 | 04-14-04 | 09-24-03 | 12-05-03 | 12-16-03 | 01-05-04 | 01-06-04 | 02-03-04 | 02-17-04 | 03-03-04

SHEET 1 OF

AIRWAY ROAD RAMP
GENERAL PLAN

ATTACHMENT 7

USERNAME => $USER
DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

PS&E

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	905			

REGISTERED CIVIL ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER — RONALD J. BROMENSCHENKEL — No. C47092 — Exp. 12-31-05 — CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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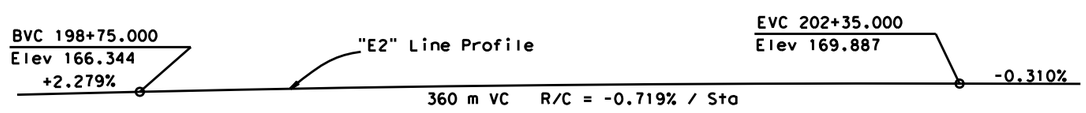

PROFILE GRADE
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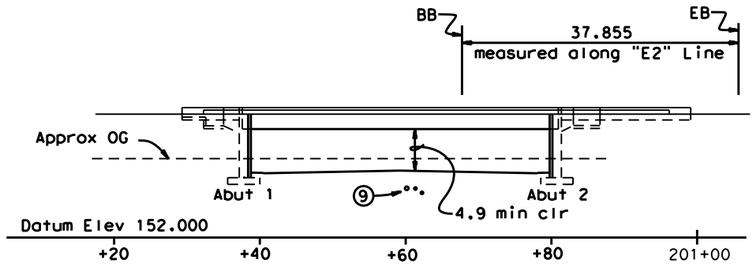
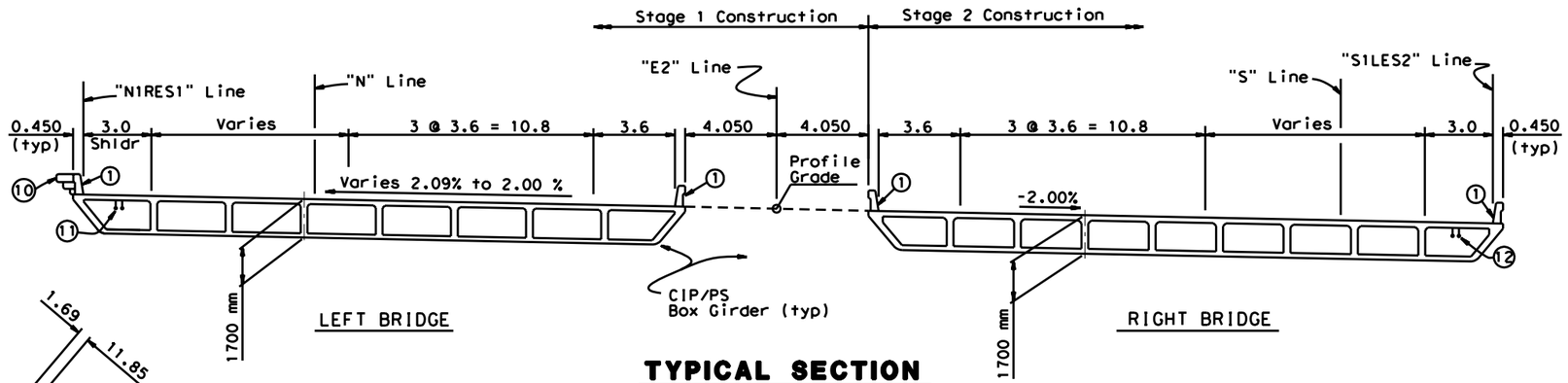
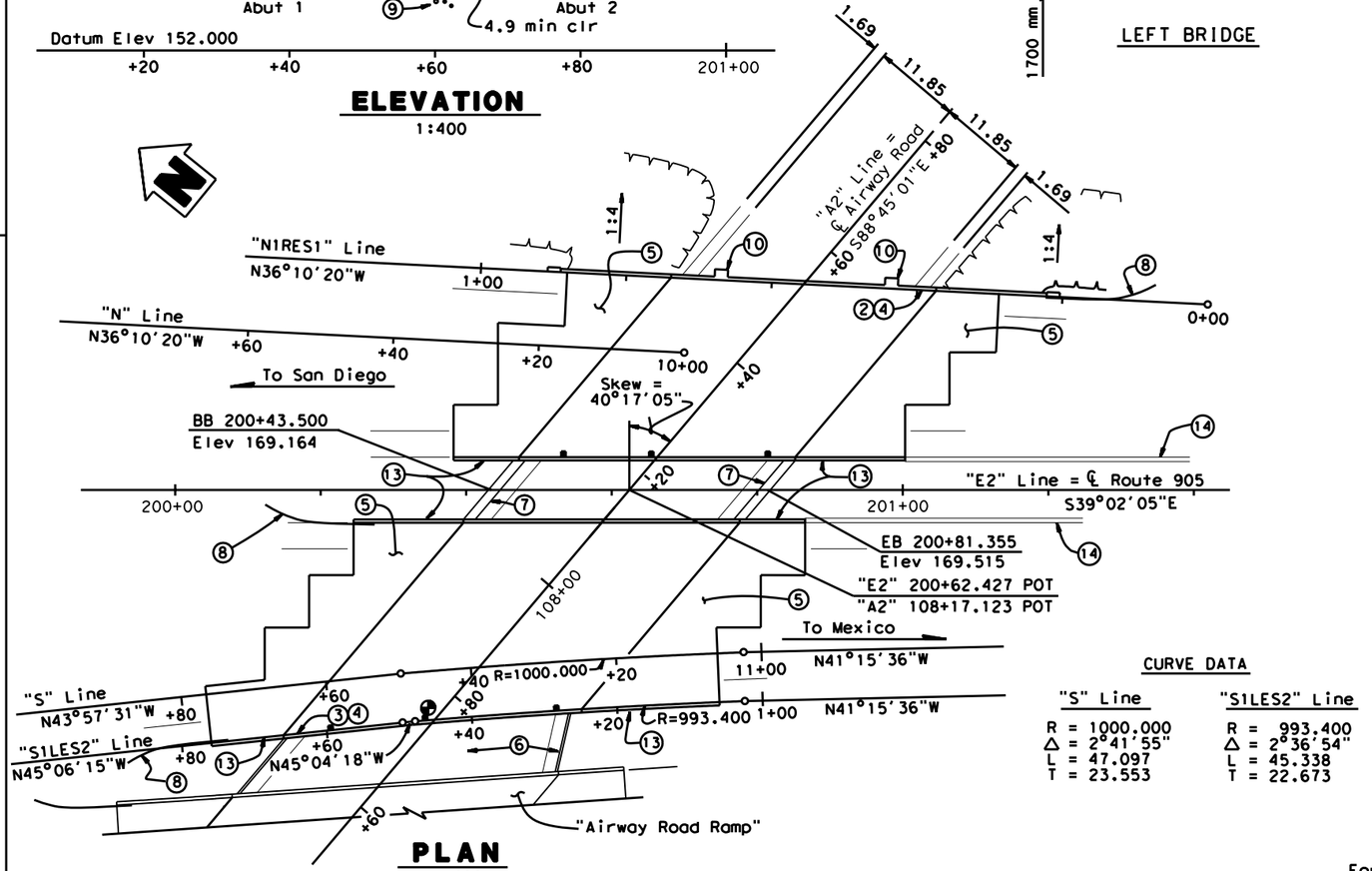


ELEVATION
1:400



TYPICAL SECTION
1:125



PLAN
1:400

CURVE DATA

"S" Line	"S1LES2" Line
R = 1000.000	R = 993.400
Δ = 2°41'55"	Δ = 2°36'54"
L = 47.097	L = 45.338
T = 23.553	T = 22.673

NOTES:

1. Concrete Barrier Type 736
2. Paint "Br. No. 57-1148 L"
3. Paint "Br. No. 57-1148 R"
4. Paint "Airway Road UC"
5. Structural Approach, Type N(9S)
6. Retaining Wall between Structures
7. Extended Abutments for Future Widening
8. MBGR, see "Road Plans"
9. Approximate Location Water, Sewer, and Gas utilities
10. Barrier Rail Pedestal, tot. 2
11. 100 mm Ø Fiberglass Fiber Optic Conduits, tot. 2
12. 100 mm Ø Landscape Conduits, tot. 2
13. Concrete Barrier Type 736A & 736B, see other plan sheets for this Bridge
14. Concrete Barrier Type 60, see "Road Plans"

⊕ Indicates Point of Minimum Vertical Clearance

• Indicates Deck Drain Type D-1

For 'General Notes', see "INDEX TO PLANS" sheet

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGN ENGINEER	DESIGN	By T. Skreslet	Checked C. Tarala	Load Factor Design	Live Loading: HS20-44 and Alternative and Permit Design Load		
	DETAILS	By Carlomagno P.Paclibar	Checked C. Tarala	Layout	By T. Skreslet	Checked C. Tarala	
	QUANTITIES	By C. Tarala	Checked T. Skreslet	Specifications	By	Plans and Specs Compared	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF STRUCTURES
STRUCTURE DESIGN 14

CU 11224
EA 091821

Bridge No. 57-1148L/R
Kilometer Post 17.597

AIRWAY ROAD UNDERCROSSING
GENERAL PLAN

STRUCTURES DESIGN GENERAL PLAN SHEET (METRIC) (REV.12-1-01)

ORIGINAL SCALE IN MILLIMETERS 0 10 20 30 40 50 60 70 80 90 100
FOR REDUCED PLANS

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY) | SHEET | OF

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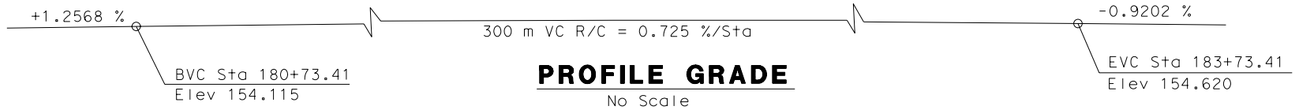
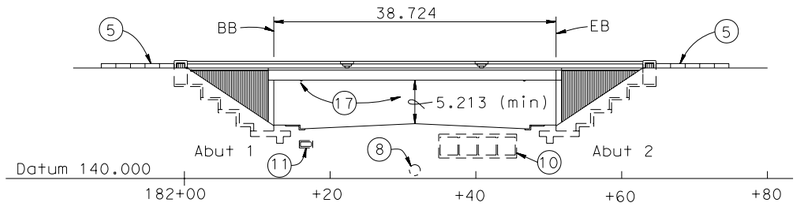
USERNAME => $USER DATE PLOTTED => $DATE TIME PLOTTED => $TIME

ATTACHMENT 7



PROFILE GRADE
No Scale



ELEVATION
1:400

PS&E

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	905			

REGISTERED CIVIL ENGINEER DATE

RONALD J. BROMENSCHENKEL No. C47092 Exp. 12-31-05 CIVIL STATE OF CALIFORNIA

PLANS APPROVAL DATE

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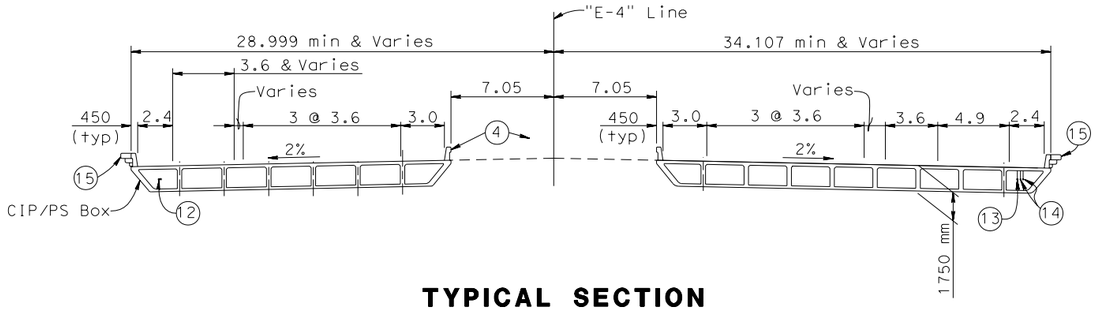
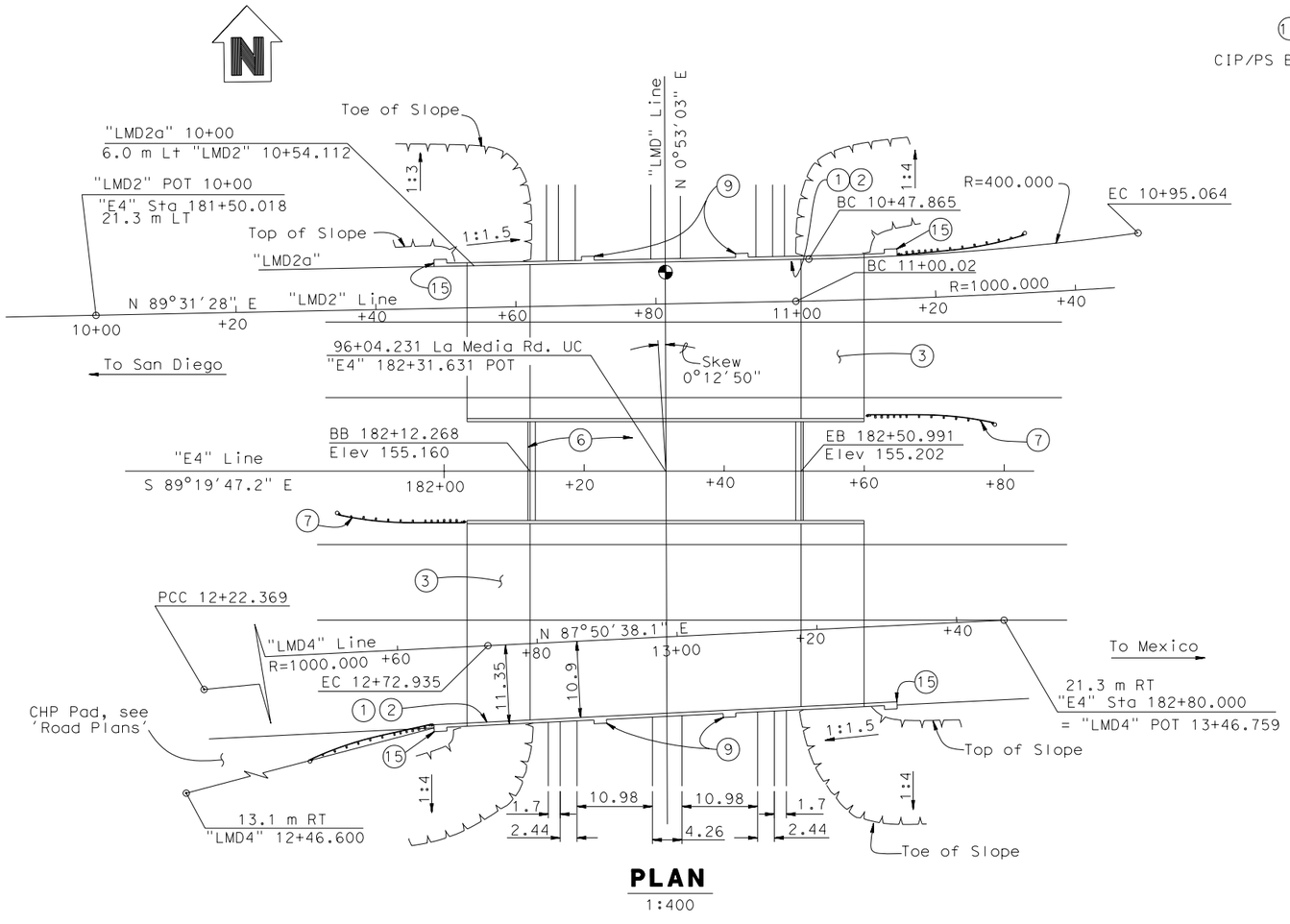


TYPICAL SECTION
1:200



PLAN
1:400

NOTES:

1. Paint "La Media Road UC"
2. Paint "Bridge No. 57-1145"
3. Structure Approach Slab Type N(9S)
4. Barrier Rail Type 736
5. Bridge Approach Guardrail (see Road Plans)
6. Extended Abutment Seat for future widening
7. MBGR, See "ROAD PLANS"
8. Existing 840 mm Ø VCP Sewer Line
9. Pedestal on outboard exterior Girders tot. 4
10. Box Culvert, see 'Road Plans'
11. Box Culvert, see 'Road Plans'
12. 2 - 100mm diameter Fiberglass Fiber Optics Conduits
13. 1 - 100mm PVC Duct for Irrigation Contrl Wires
14. 2 - 76mm Ductile Iron Water Supply Pipe
15. Barrier Rail Palisters tot. 4
16. 53 mm Ø Lighting conduit, see 'Road Plans'
17. Soffit luminaire, tot. 6

◕ Denotes Point of Minimum Vertical Clearance

For General Notes, see "INDEX TO PLANS" sheet

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGN ENGINEER	DESIGN	BY S. Galgiani	CHECKED J. Han	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD		
	DETAILS	BY Carlomagno P.Paclibar	CHECKED J. Han	LAYOUT	BY S. Galgiani	CHECKED J. Han	
	QUANTITIES	BY S. Galgiani	CHECKED J. Han	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED	

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF STRUCTURES
STRUCTURE DESIGN 14

BRIDGE NO. 57-1145L/R
KILOMETER POST 15.765

LA MEDIA ROAD UC
GENERAL PLAN

STRUCTURES DESIGN GENERAL PLAN SHEET (METRIC) (REV.12-1-01)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 11223
EA 091821

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 05-07-04 | 01-06-04 | 01-07-04 | 01-13-04 | 2-19-04 | 02-26-04 | 03-01-04 | 03-03-04 | 03-23-04

SHEET 1 OF

FILE => $REQUEST

USERNAME => $USER DATE PLOTTED => $DATE TIME PLOTTED => $TIME

ATTACHMENT 7

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	905			

PS&E

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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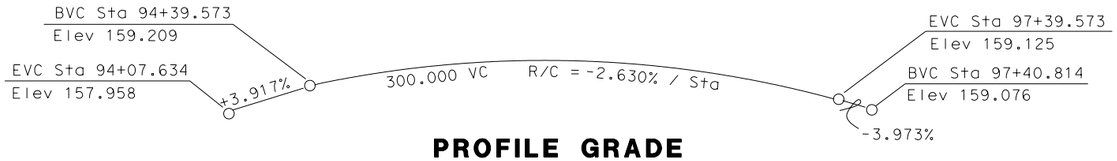
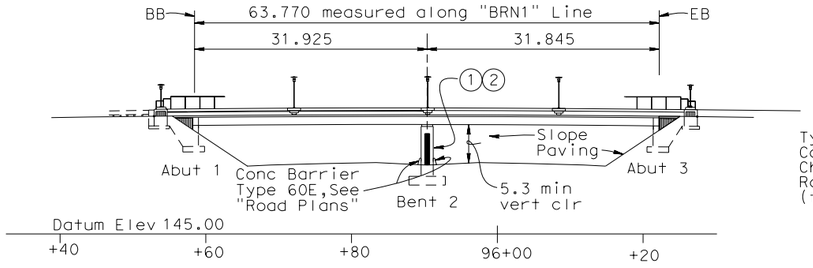
REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA



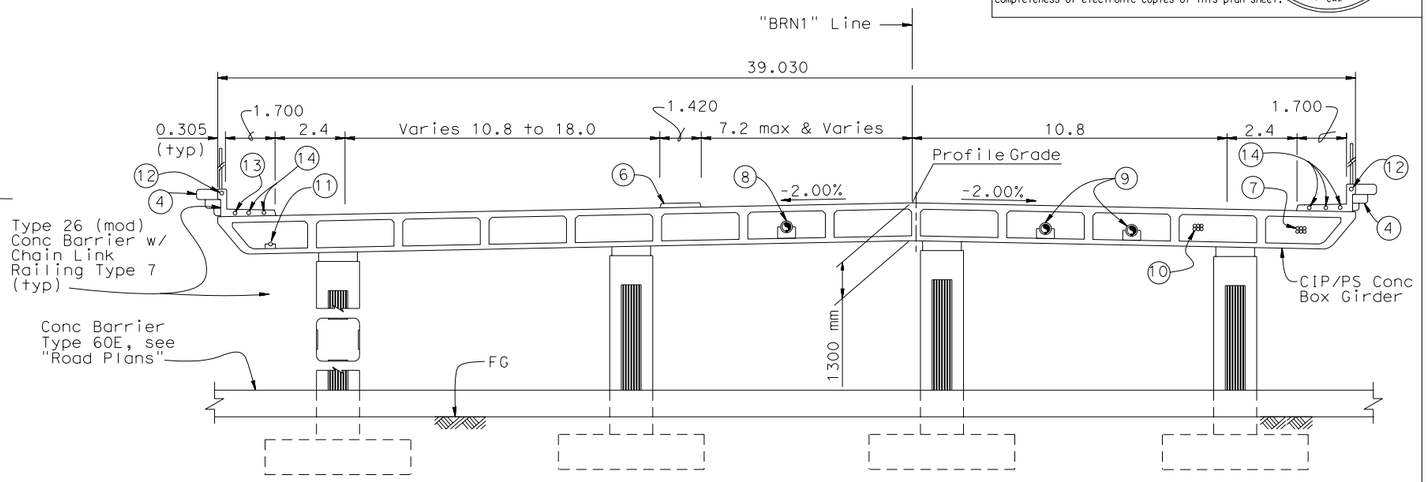
PROFILE GRADE

No Scale



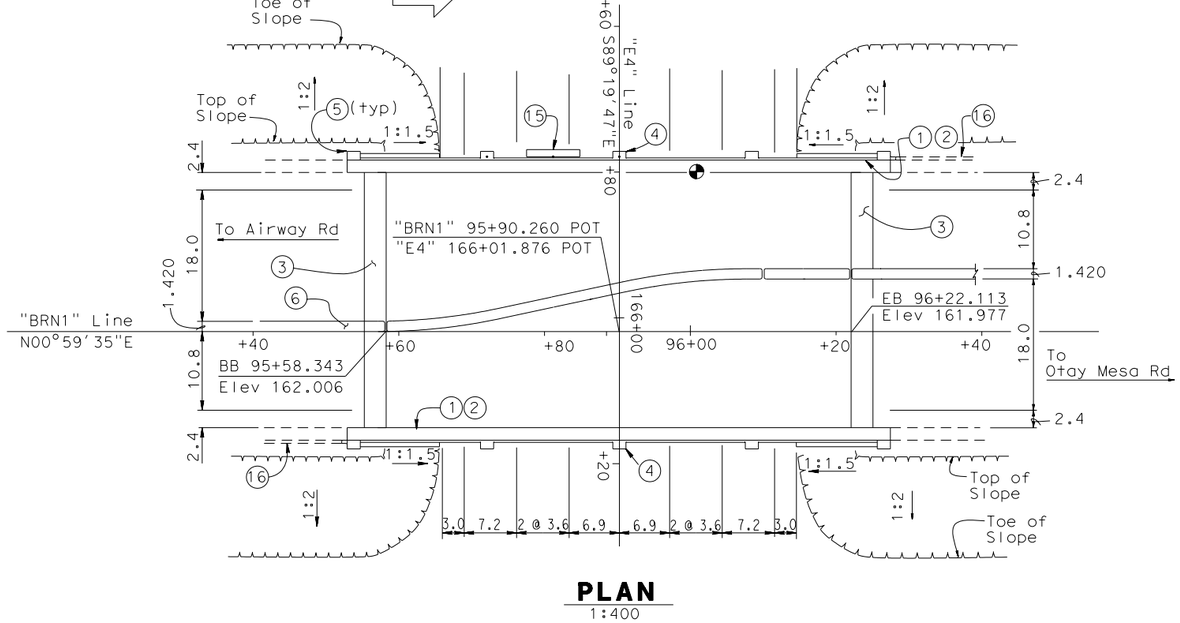
ELEVATION

1:400



TYPICAL SECTION

1:100



PLAN

1:400

NOTES:

1. Paint "Britannia Blvd OC"
2. Paint "Bridge No. 57-1144"
3. Structure Approach Slab Type EQ(3)
4. Light Standard Pedestal, tot. 6
5. Light Standard Pilaster, tot. 4
6. Raised Median
7. (6) 127 mm Ø Electric Conduits
8. 305 mm Ø OWD Recycled Water Line with 460 mm Ø casing
9. (2) 305 mm OWD Water Supply Lines with 510 mm Ø casing
10. (6) 114 mm Ø Telephone Conduits
11. Gas Line with 168 mm Ø casing
12. 53 mm Ø City Lighting Conduit, see "Road Plan"
13. 53 mm Ø Lighting Conduit, see "Road Plan"
14. 53 mm Ø Signal Conduit, see "Road Plan"
15. Bridge mounted sign, see 'Road Plans'
16. MBGR, see "Road Plans"

◒ Indicates Point of Minimum Vertical Clearance

For 'General Notes' and Standard Plans, see "INDEX TO PLANS" sheet

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGN	BY V. Ramakrishnan	CHECKED T. Skreslet	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF STRUCTURES STRUCTURE DESIGN 14
DETAILS	BY M. Johnson/C. Paclibar	CHECKED T. Skreslet	LAYOUT	BY V. Ramakrishnan	CHECKED T. Skreslet		
QUANTITIES	BY V. Ramakrishnan	CHECKED J. Prete	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED		

DESIGN ENGINEER

STRUCTURES DESIGN GENERAL PLAN SHEET (METRIC) (REV.12-1-01)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 11223
EA 091821

FILE => $REQUEST

BRIDGE NO.	BRITANNIA BLVD OVERCROSSING
57-1144	GENERAL PLAN
KILOMETER POST 14.137	

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY): 3-24-04 | 04-06-04 | 4-16-04 | 4-22-04 | 4-28-04 | 4-29-04 | 05-06-04 | | | 3-18-04

SHEET 1 OF

ATTACHMENT 7

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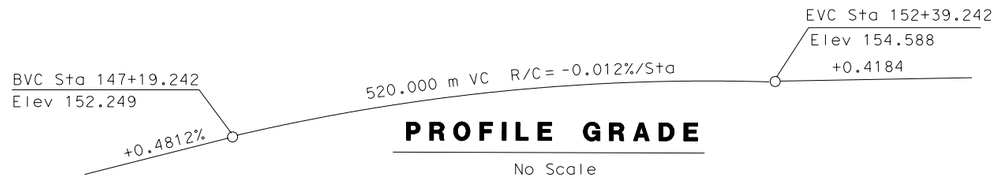
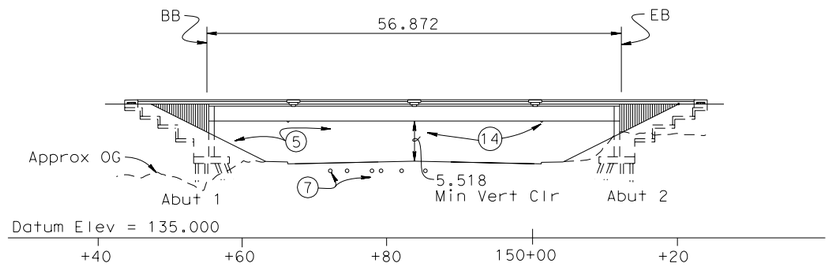
DATE PLOTTED => $DATE
USERNAME => $USER



PROFILE GRADE

No Scale



ELEVATION

1:400

PS&E

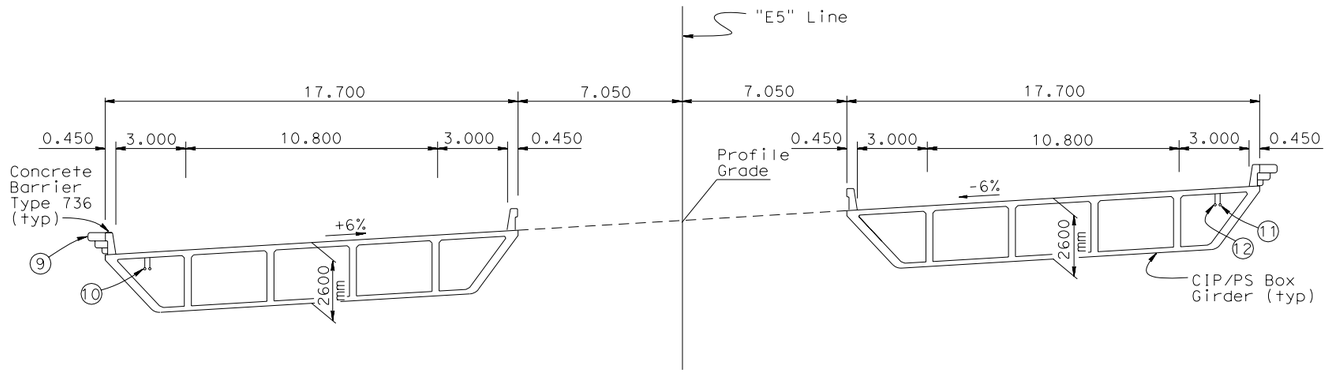
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	905			

REGISTERED CIVIL ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. STATE OF CALIFORNIA

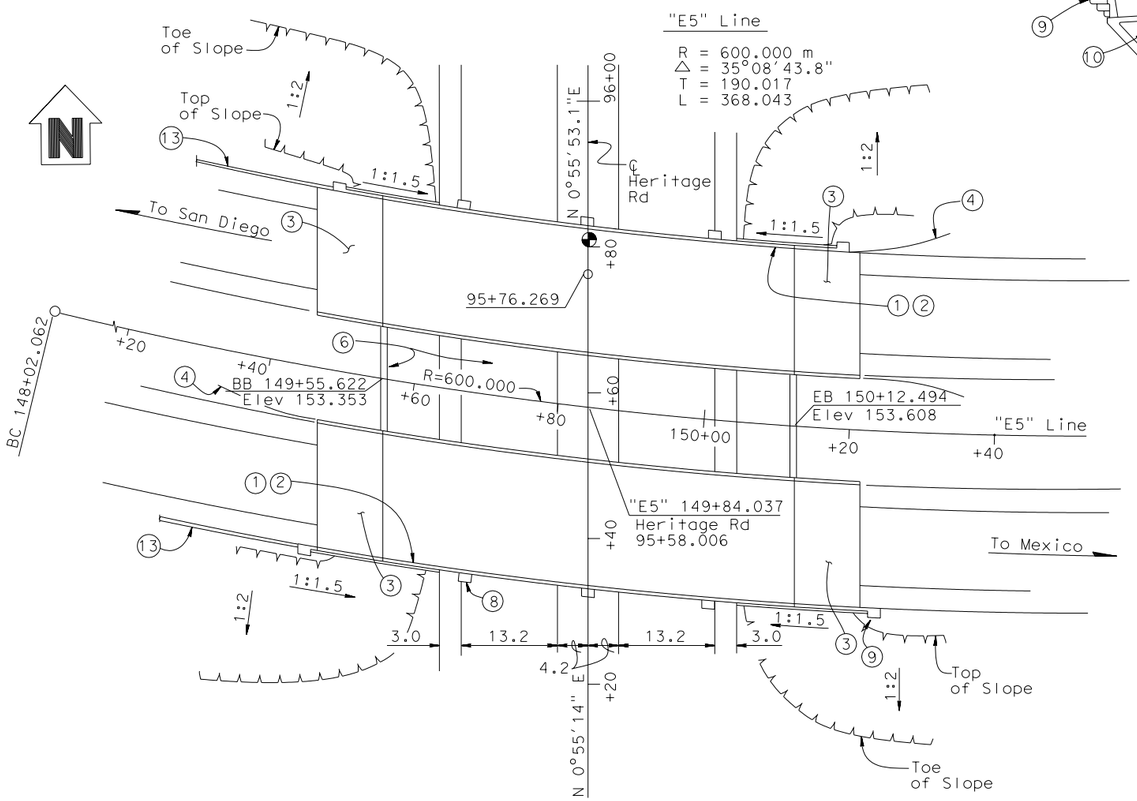
PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



TYPICAL SECTION

1:125



PLAN

1:400

NOTES:

1. Paint "Heritage Road Undercrossing"
2. Paint "Br. No. 57-1143L/R"
3. Structure Approach Slab Type N(9S)
4. MBGR, see "Road Plans"
5. Slope Paving (typ)
6. Extended Abutment Seat for Future Widening
7. Existing Sewer, Water, Telephone and Electric lines
8. Span Pilaster, tot. 6
9. Barrier Rail Pilasters, tot. 4
10. 100 mm Ø Fiber Optic Conduits, tot. 2
11. 100 mm Ø PVC duct for Irrigation Controller
12. 100 mm Ø Iron Pipe for Irrigation Water
13. Concrete Barrier, see 'Road Plans'
14. Soffit luminaire, tot. 4

◓ Indicates Point of Minimum Vertical Clearance

CENTRAL ALIGNMENT

For 'General Notes', see "INDEX TO PLAN" sheet

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGN	BY D. Vora	CHECKED R. Washington	LOAD FACTOR DESIGN	LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD			
DETAILS	BY M. Johnson	CHECKED R. Washington	LAYOUT	BY D. Vora	CHECKED R. Washington		
QUANTITIES	BY D. Vora	CHECKED L. Bahia	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED		

DESIGN ENGINEER

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
STRUCTURE DESIGN 14

CU 11222
EA 091821

BRIDGE NO.	HERITAGE ROAD UNDERCROSSING
57-1143L/R	
KILOMETER POST	GENERAL PLAN
12.508	

STRUCTURES DESIGN GENERAL PLAN SHEET (METRIC) (REV.12-1-01)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY) 03-30-04 | 1-5-04 | 01-12-04 | 01-21-04 | 2-26-04 | 3-2-04 | 03-17-04 | 03-22-04 | 03-23-04

SHEET OF

FILE => $REQUEST

ATTACHMENT 7

TIME PLOTTED => $TIME
DATE PLOTTED => $DATE
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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	905			

Caltrans Metric

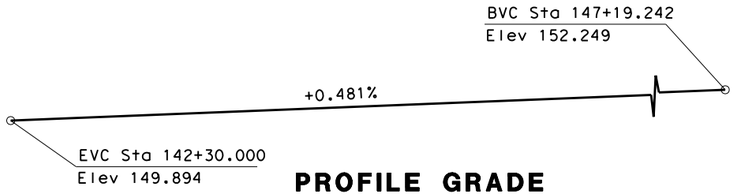
REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

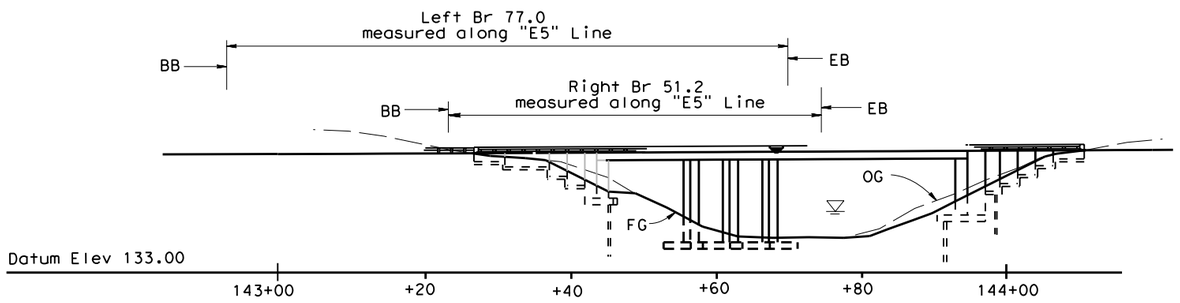
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

REGISTERED PROFESSIONAL ENGINEER — RONALD J. BROMENSCHENKEL — No. C47092 — Exp. 12-31-05 — CIVIL — STATE OF CALIFORNIA

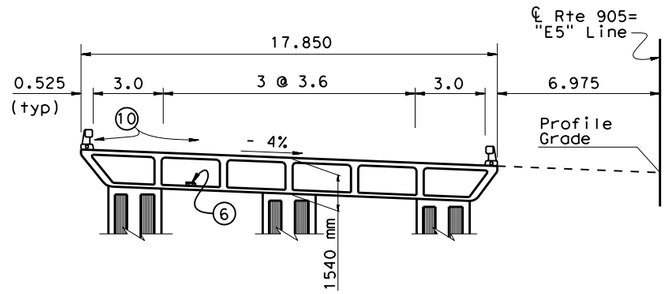
PS&E



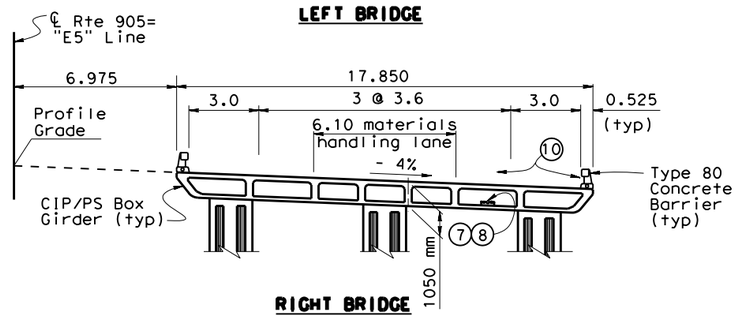
PROFILE GRADE
No Scale



ELEVATION
1:400



LEFT BRIDGE



RIGHT BRIDGE

CURVE DATA

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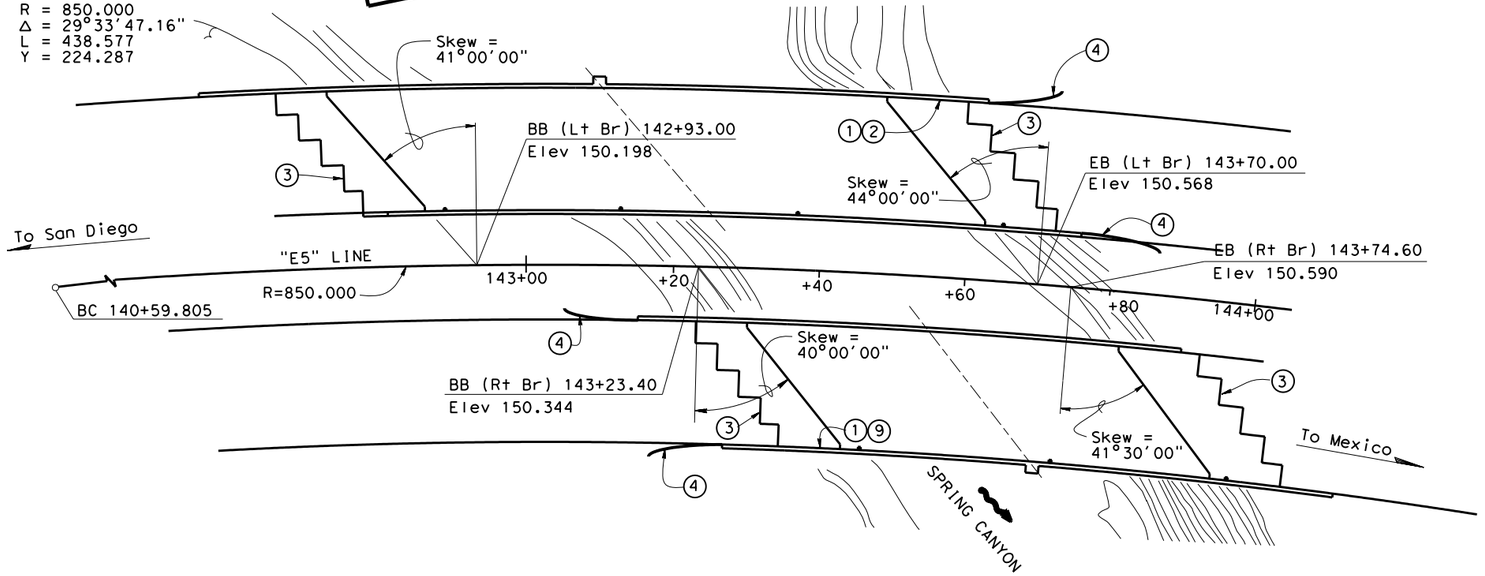
Δ = 29°33'47.16"
L = 438.577
Y = 224.287



PLAN
1:400

TYPICAL SECTION
1:125

NOTES:

1. Paint "Spring Canyon Bridge"
2. Paint "Br. No. 57-1155L"
3. Structure Approach Slab Type N(9S)
4. MBGR, see 'Road Plans'
5. 100-year flood WS Elev 141.280
6. 100 mm Ø Fiberglass Conduit for Fiber Optic Lines, tot. 2
7. 100 mm Ø PVC Duct for irrigation controller
8. 2 x 76 mm Ø Iron Pipe for irrigation water
9. Paint "Br. No. 57-1155R"
10. 53 mm Ø Lighting Conduit, see 'Road Plans'

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

For 'General Notes', see "INDEX TO PLANS" sheet.

		BY	CHECKED
DESIGN ENGINEER	DESIGN	J. Massoomi	D. Alvarez
	DETAILS	T. Nguyen	D. Alvarez
	QUANTITIES	J. Massoomi	L. Han

LOAD FACTOR DESIGN — LIVE LOADING: HS20-44 AND ALTERNATIVE AND PERMIT DESIGN LOAD AND MATERIALS HAULING EQUIPMENT LOAD (RIGHT BRIDGE ONLY).

	BY	CHECKED
LAYOUT	J. Massoomi	D. Alvarez
SPECIFICATIONS	BY	PLANS AND SPECS COMPARED

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF STRUCTURES
STRUCTURE DESIGN 14

CU 11224
EA 091831

BRIDGE NO. 57-1155L/R
KILOMETER POST 11.884

SPRING CANYON BRIDGE
GENERAL PLAN

STRUCTURES DESIGN GENERAL PLAN SHEET (METRIC) (REV.12-1-01)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 3-5-04 | 4-16-04 | 6-7-04 | 6-8-04 | | 2-9-04 | 02-16-04 | 02-17-04 | 2-25-04 | 3-3-04

SHEET OF

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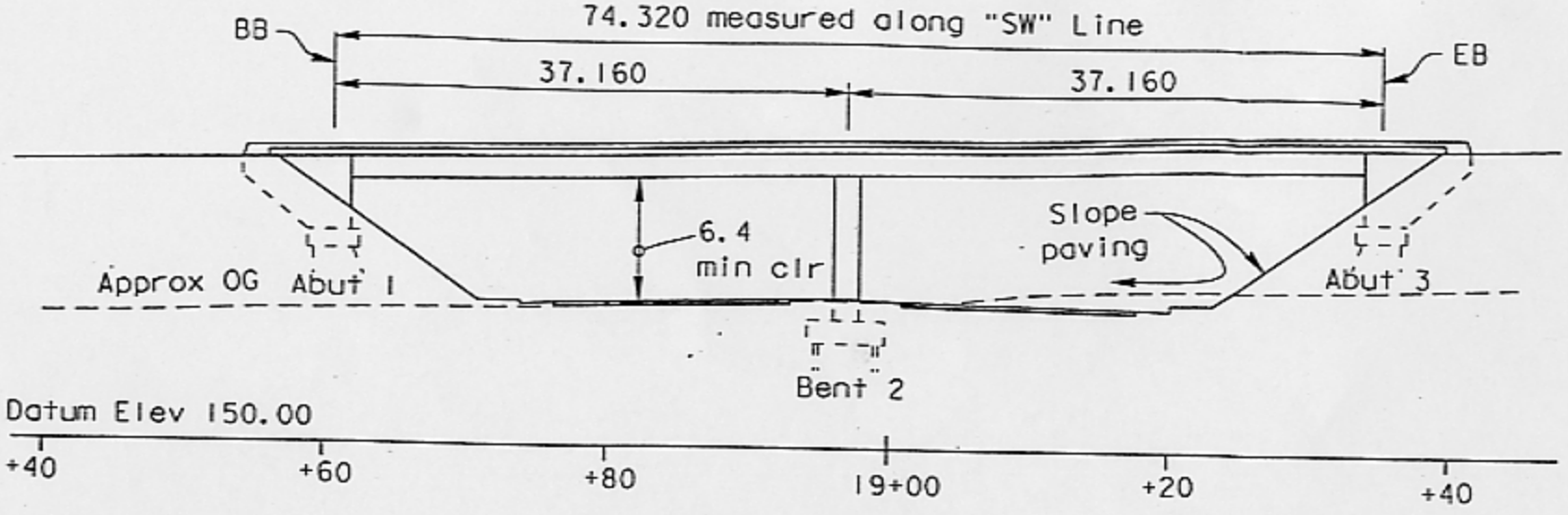
USERNAME => $USER DATE PLOTTED => $DATE TIME PLOTTED => $TIME

ATTACHMENT 7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT
11	SD	905/125	13

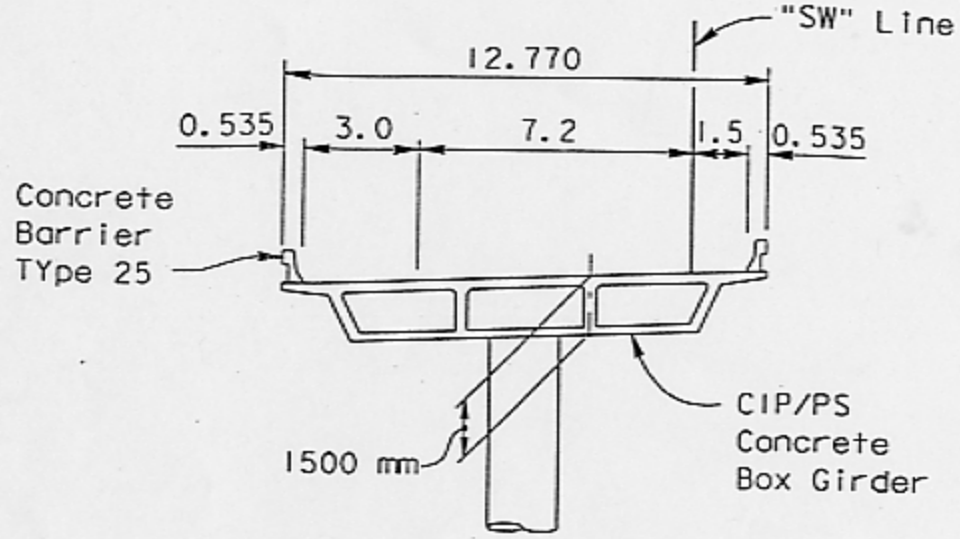
Caltrans Metric



ELEVATION

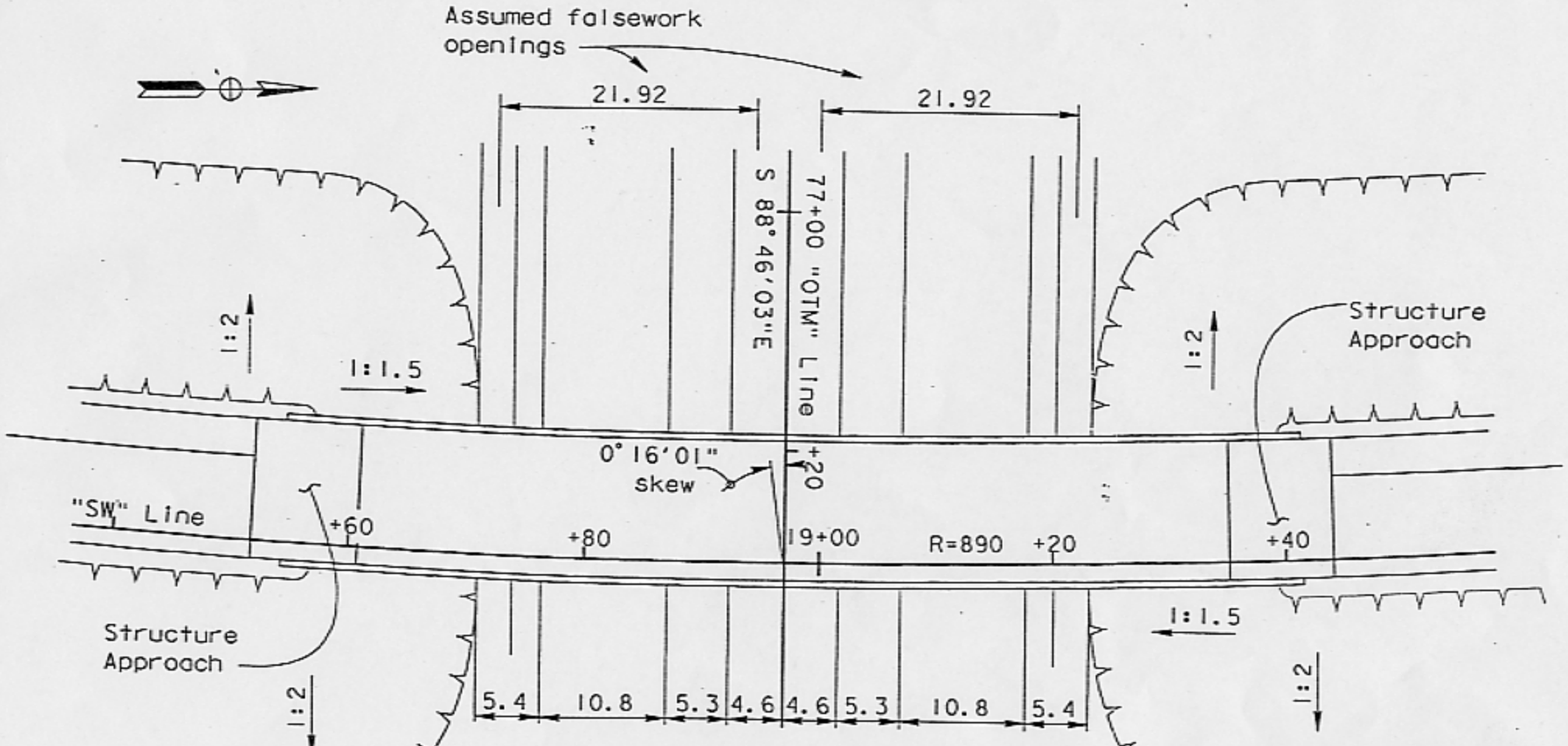
1:500

Assume Class 625 pile footings



TYPICAL SECTION

1:200



PLAN

1:500

Note: Traffic will pass through construction. (4.57 m vert clearance required under falsework.)

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGNED BY L. Good	DATE 7-98	STRUCTURE DESIGN SECTION 14	PLANNING STUDY
DRAWN BY L. Good	DATE 7-98		"SW" AT "OTM" OC
CHECKED BY Majid Madani	DATE 8-98		BRIDGE NO. CU 11226
APPROVED	DATE		SCALE: As Noted EA 093160

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DATE PLOT

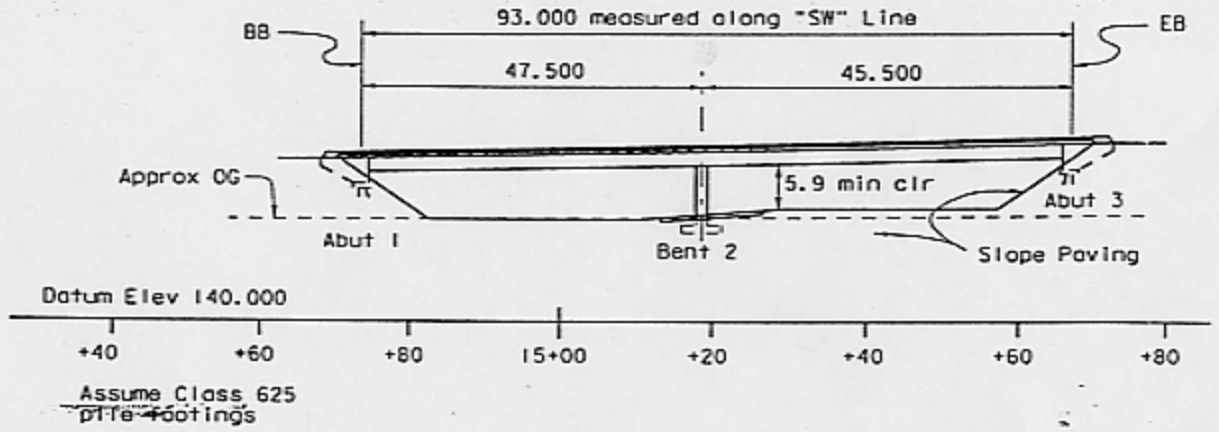
STRUCTURES PLANNING STUDY SHEET (METRIC) (REV. 3/5/97)

ATTACHMENT 7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

Caltrans Metric

DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT
11	SD	905	14



ELEVATION
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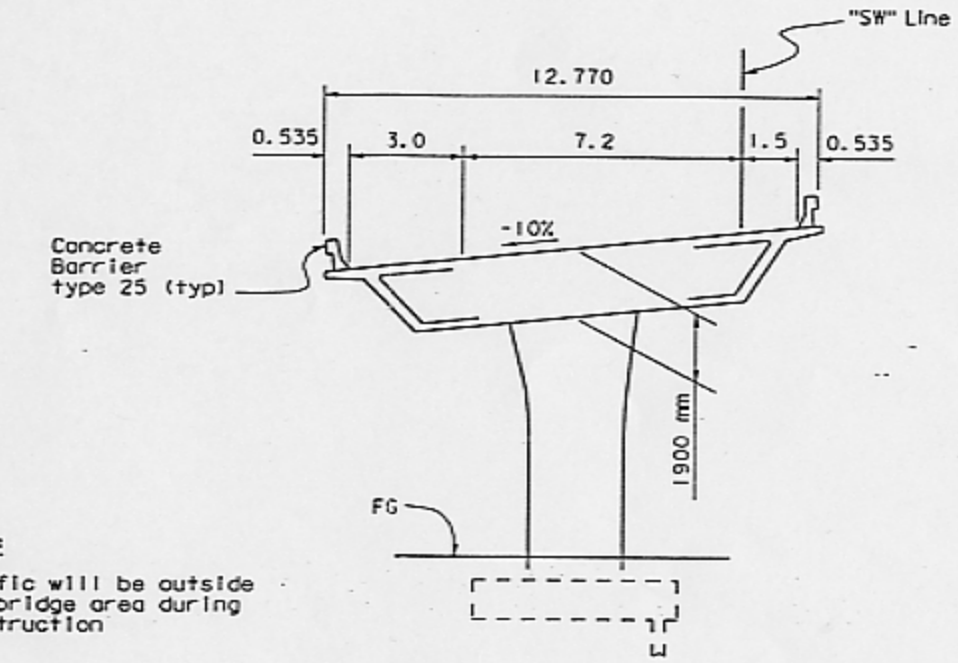
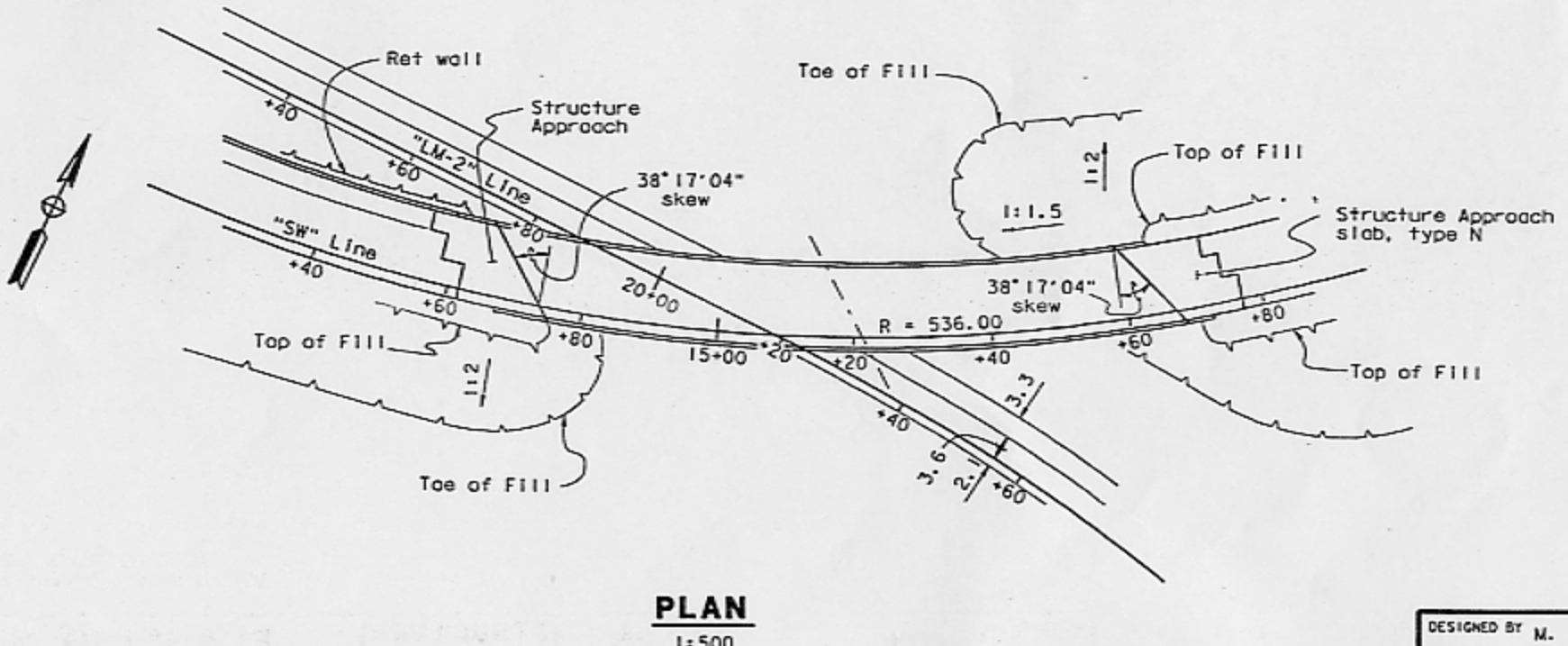


Note:

Traffic will be outside the bridge area during construction

TYPICAL SECTION
1:100



PLAN
1:500

ATTACHMENT 7

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGNED BY	M. Amirbagheri	DATE	8-98
DRAWN BY	M. Amirbagheri	DATE	8-98
CHECKED BY	Majid Madani	DATE	8-98
APPROVED		DATE	

STRUCTURE DESIGN SECTION 14

PLANNING STUDY

SW at LM-2 OC

BRIDGE NO.	CU
SCALE: As noted	EA 093160

STRUCTURES PLANNING STUDY SHEET (METRIC) (REV. 3/5/97)

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USERNAME => $USER DATE PLOTTED =

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

Caltrans Metric

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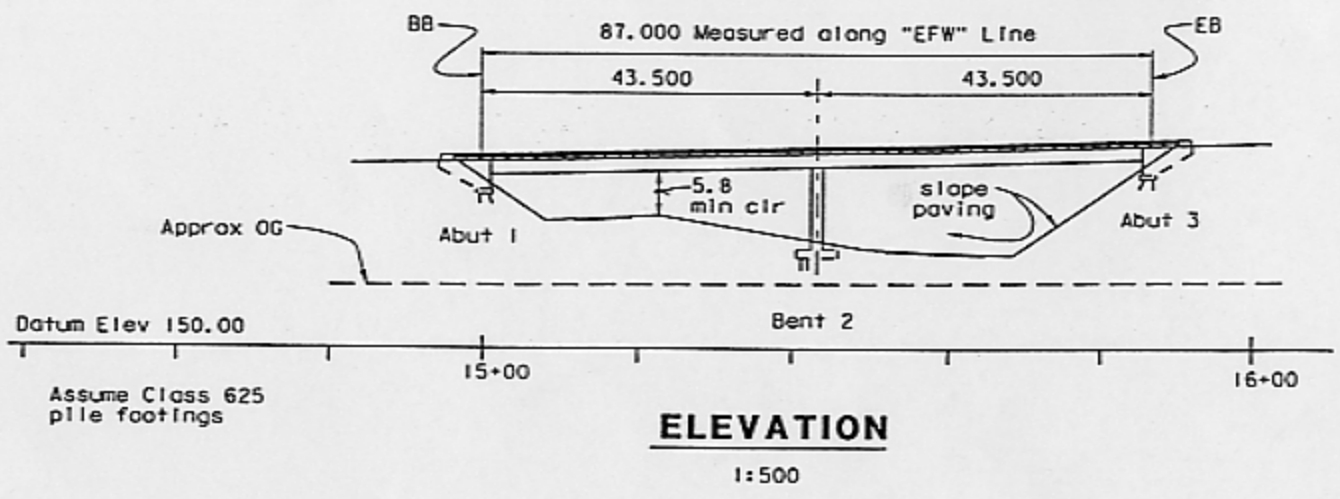
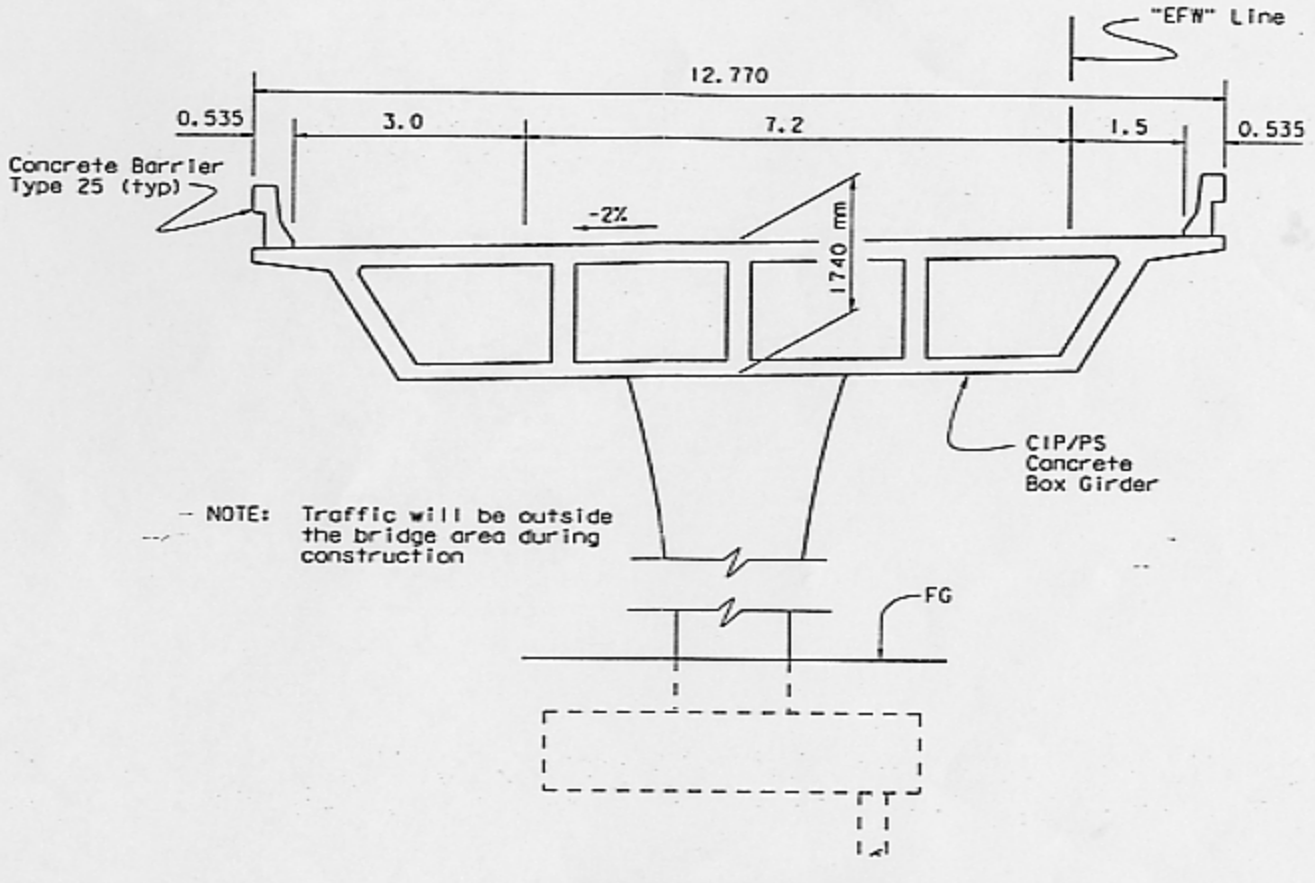
11	50	905	19



ELEVATION

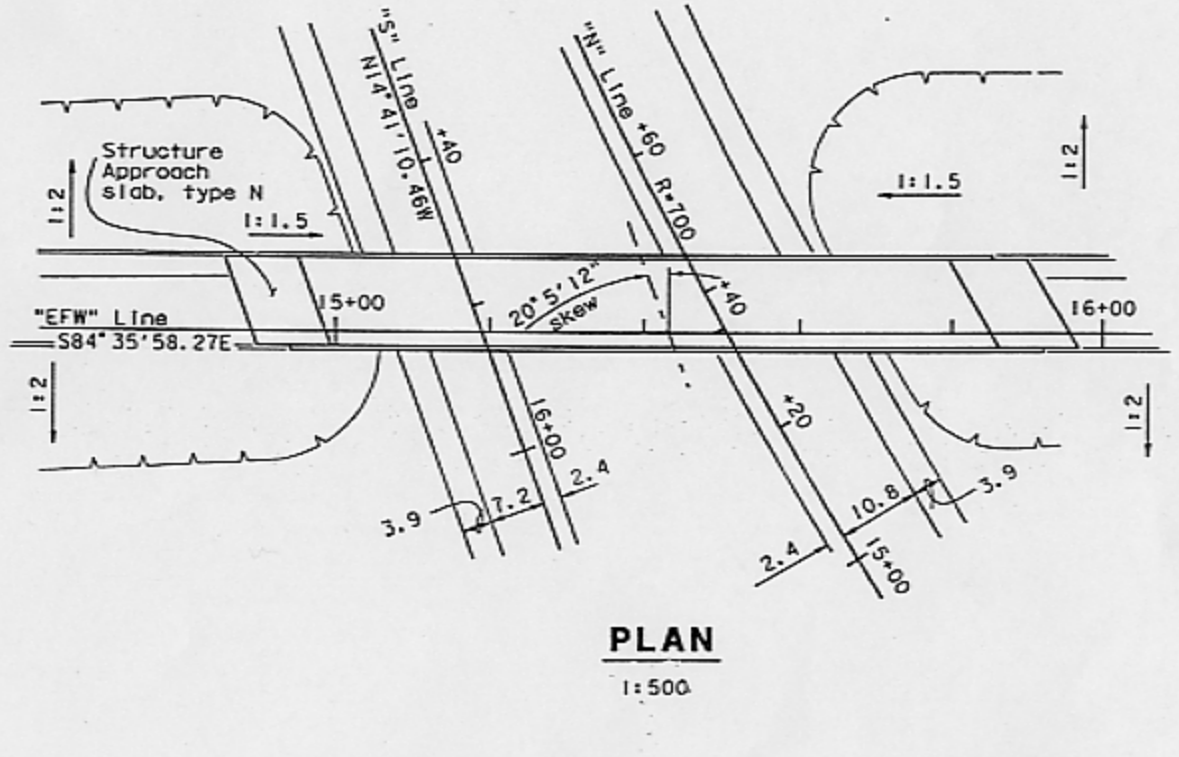
1:500



NOTE: Traffic will be outside the bridge area during construction

TYPICAL SECTION

1:50



PLAN

1:500

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ATTACHMENT 7

DESIGNED BY M. Johnson	DATE 8-98	STRUCTURE DESIGN SECTION 14	PLANNING STUDY
DRAWN BY M. Johnson	DATE 8-98		"EFW" AT "S" AND "N" OC
CHECKED BY Majid Madani	DATE 8-98		BRIDGE NO. CU 11226
APPROVED	DATE		SCALE: As Noted EA 093160

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (METRIC) (REV. 3/17/98)

FILE => $REQUEST

USERNAME => $USER DATE PLOTTED

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

Caltrans Metric

DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT
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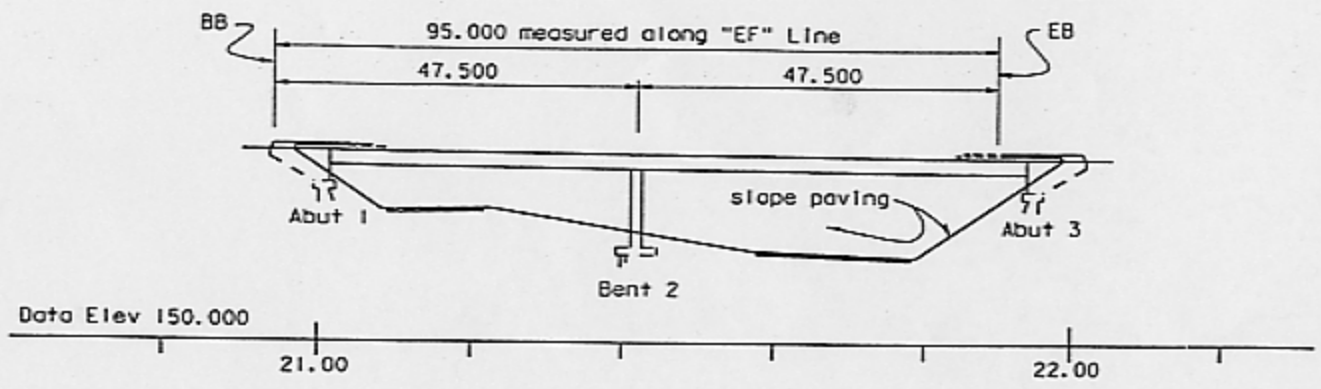
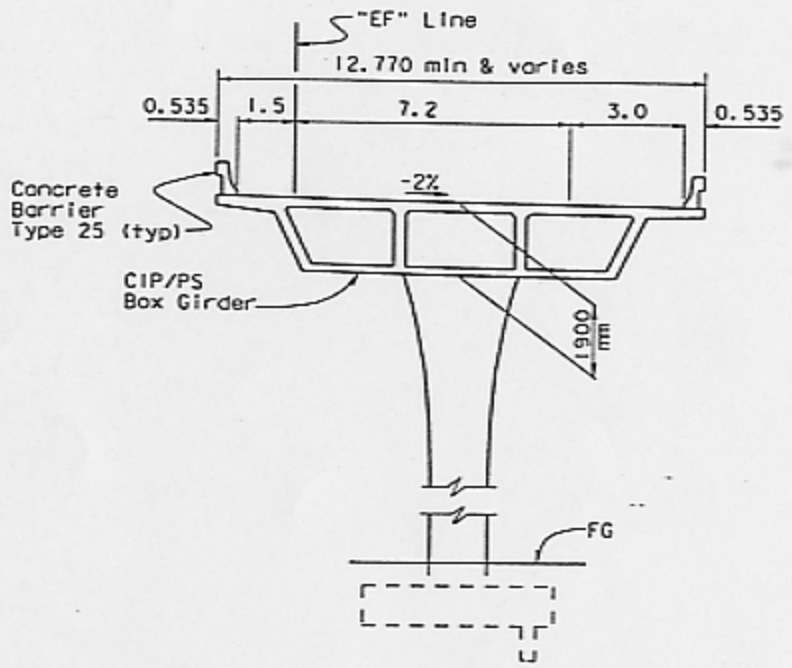


Assume Class 625 pile footings

ELEVATION

1:500

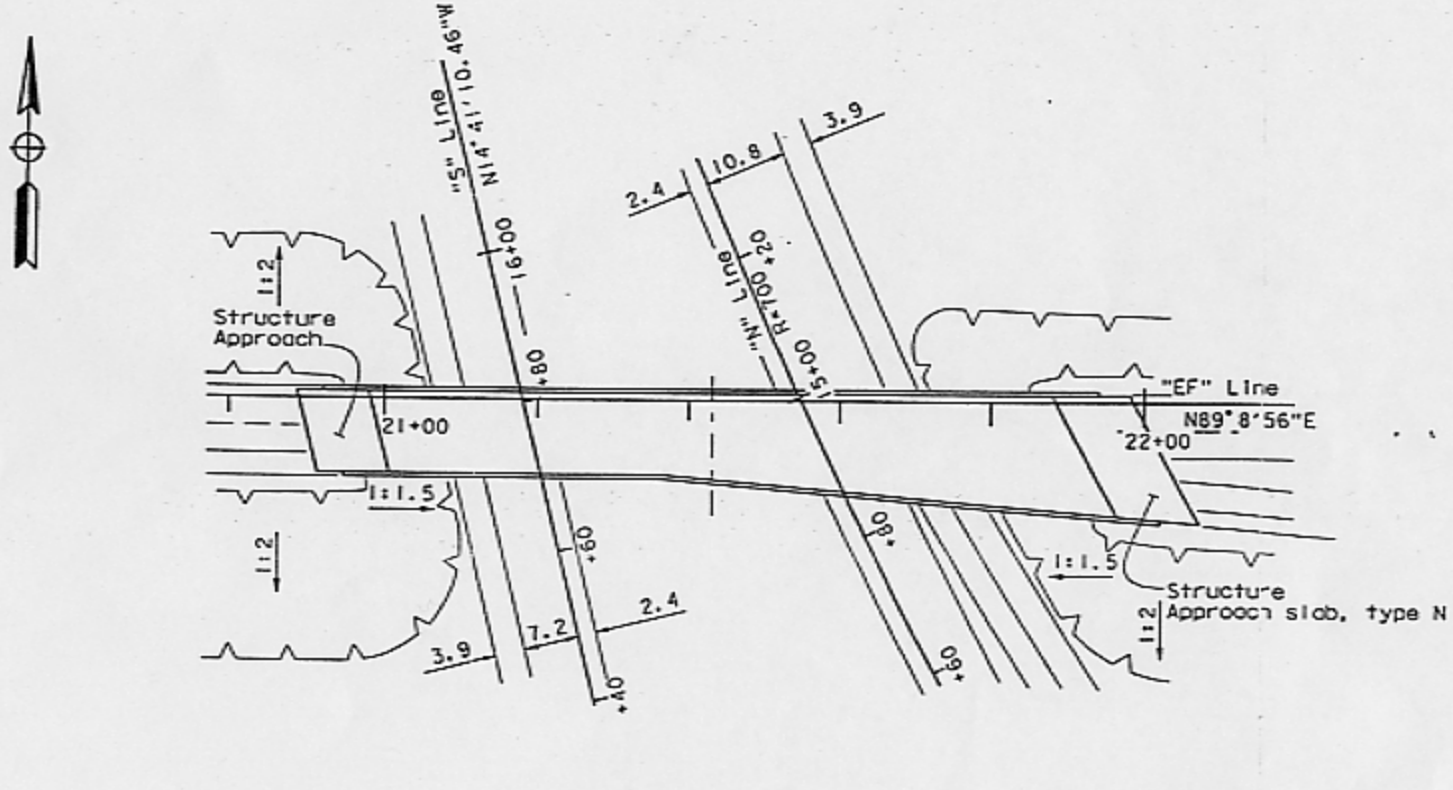


TYPICAL SECTION

1:100

NOTE:

Traffic will be outside the bridge area during construction.



PLAN

1:500

ATTACHMENT 7

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGNED BY M. Johnson	DATE 7-98	STRUCTURE DESIGN SECTION 14	PLANNING STUDY
DRAWN BY M. Johnson	DATE 7-98		"EF" AT "S" AND "N" OC
CHECKED BY Majid Madani	DATE 8-98		BRIDGE NO. CU 11226
APPROVED	DATE		SCALE: As Noted EA 093160

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (METRIC) (REV. 3/17/98)

FILE -> REQUEST

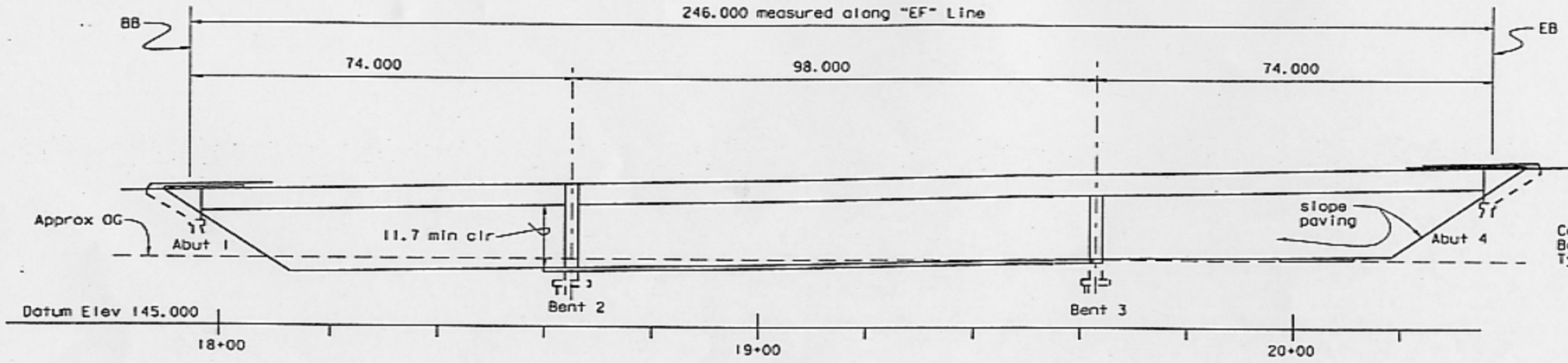
DATE PLOTTED

USERNAME -> %USE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT
11	SD	905	17

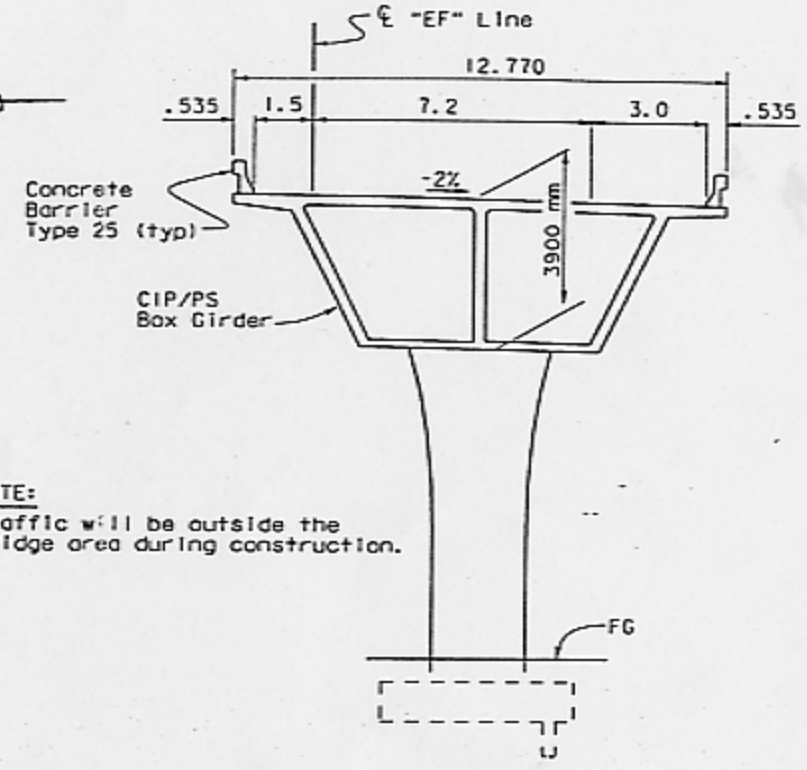
Caltrans Metric



Assume Class 625 pile footings

ELEVATION

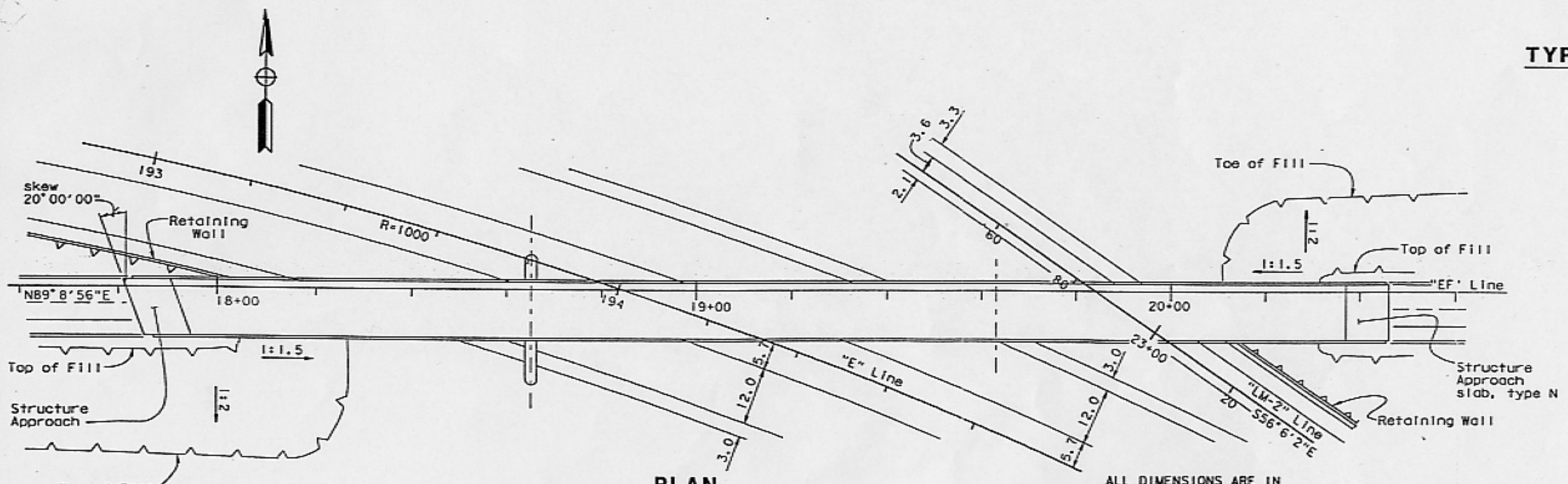
1:500



NOTE:
Traffic will be outside the bridge area during construction.

TYPICAL SECTION

1:100



PLAN

1:500

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ATTACHMENT 7

DESIGNED BY	M. Johnson	DATE	7-98
DRAWN BY	M. Johnson	DATE	7-98
CHECKED BY	Majid Madani	DATE	8-98
APPROVED		DATE	

STRUCTURE DESIGN SECTION 14

PLANNING STUDY

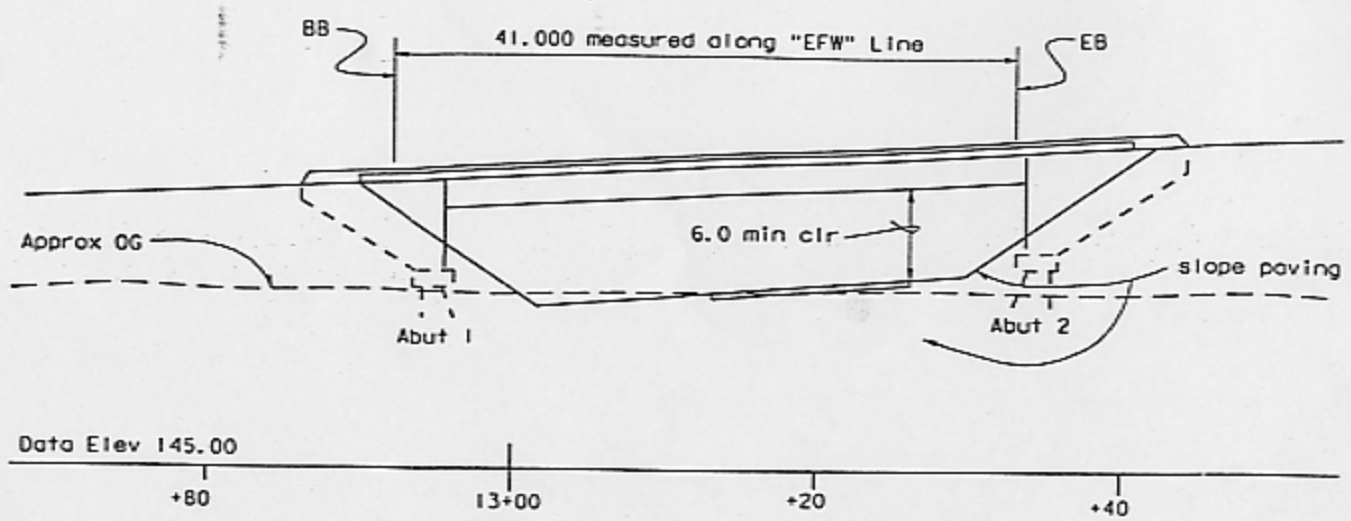
"EF" AT "E" AND "LM-2" OC

BRIDGE NO.	CU 11226
SCALE: As Noted	EA 093160

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (METRIC) (REV. 3/17/98)
FILE => REQUEST
USERNAME => %USER DATE PLOT

Caltrans Metric

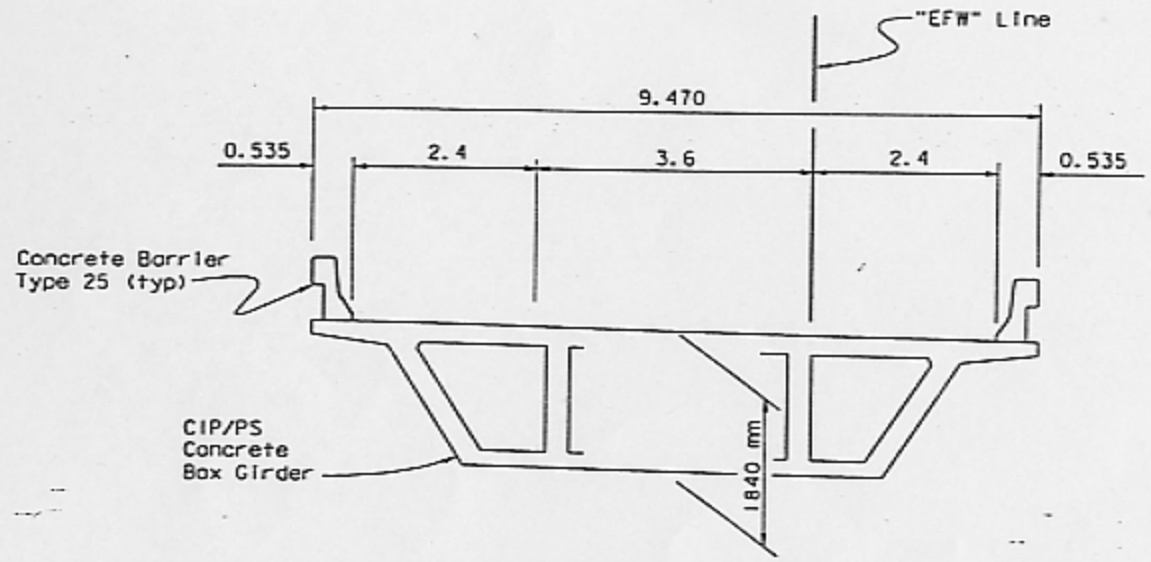
DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT
11	SD	905	16



Assume Class 625 pile footings

ELEVATION

1:250



TYPICAL SECTION

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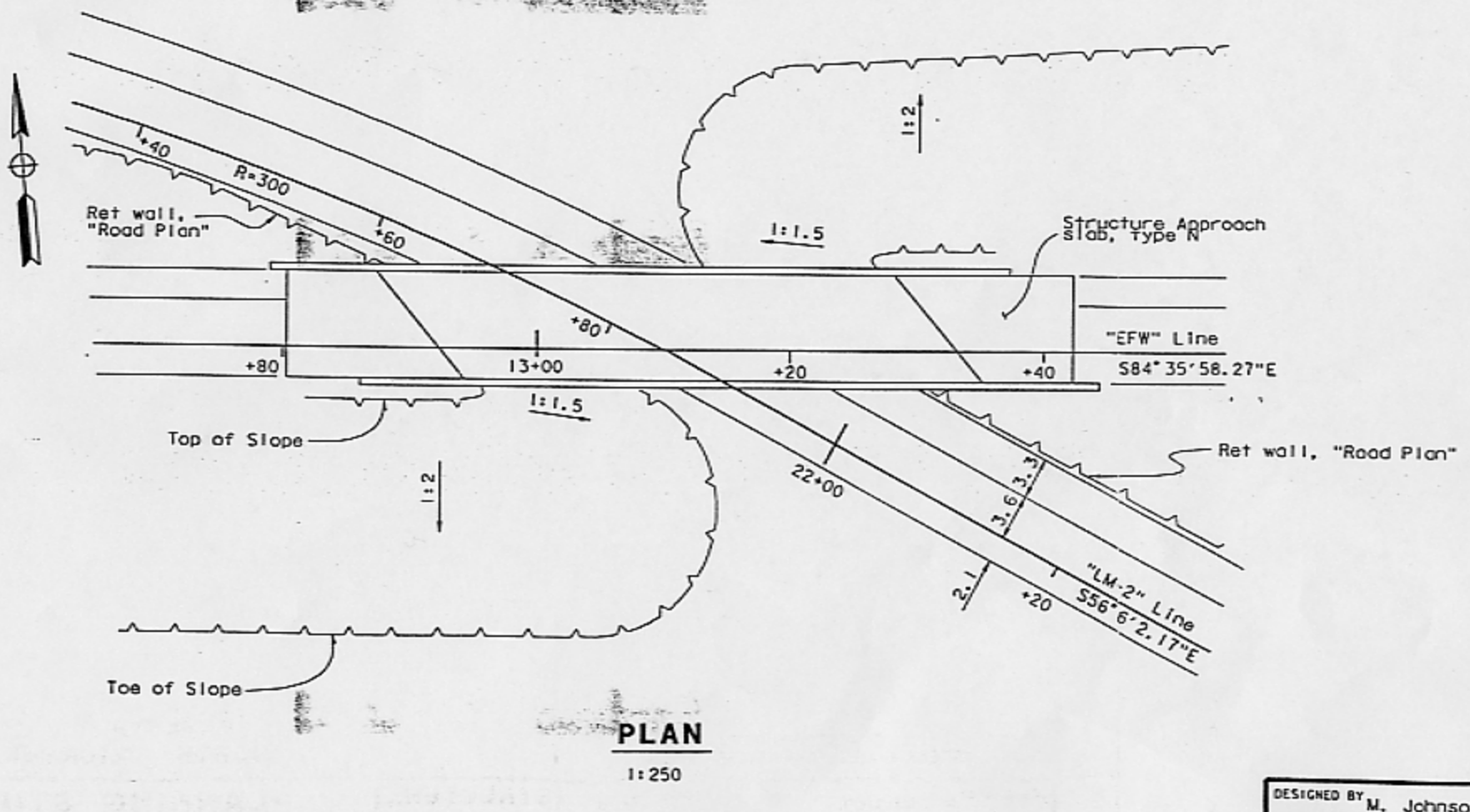


PLAN

1:250

NOTE:
Traffic will be outside the bridge area during construction.

ATTACHMENT 7

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGNED BY M. Johnson	DATE 8-98	STRUCTURE DESIGN SECTION 14	PLANNING STUDY
DRAWN BY M. Johnson	DATE 8-98		"EFW" AT "LM-2" OC
CHECKED BY Majid Madani	DATE 8-98		BRIDGE NO. CU 11226
APPROVED	DATE		SCALE: As Noted EA 093160

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (METRIC) (REV. 3/17/98)

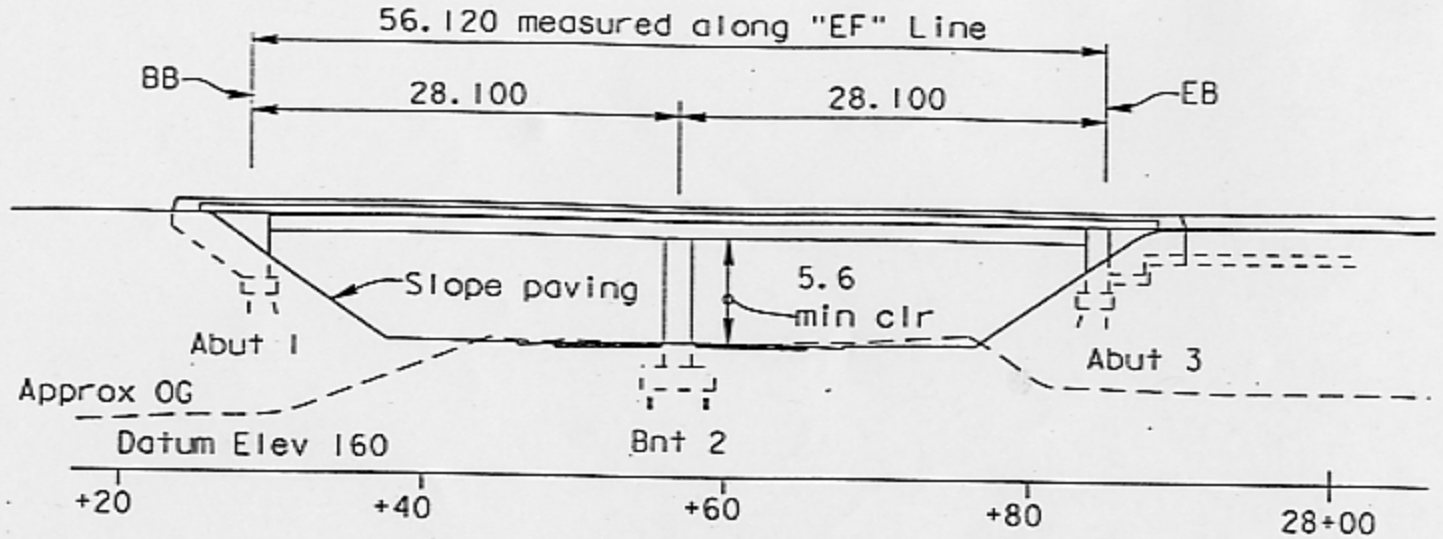
FILE ## REQUEST

USERNAME ## PLOTTE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

Caltrans Metric

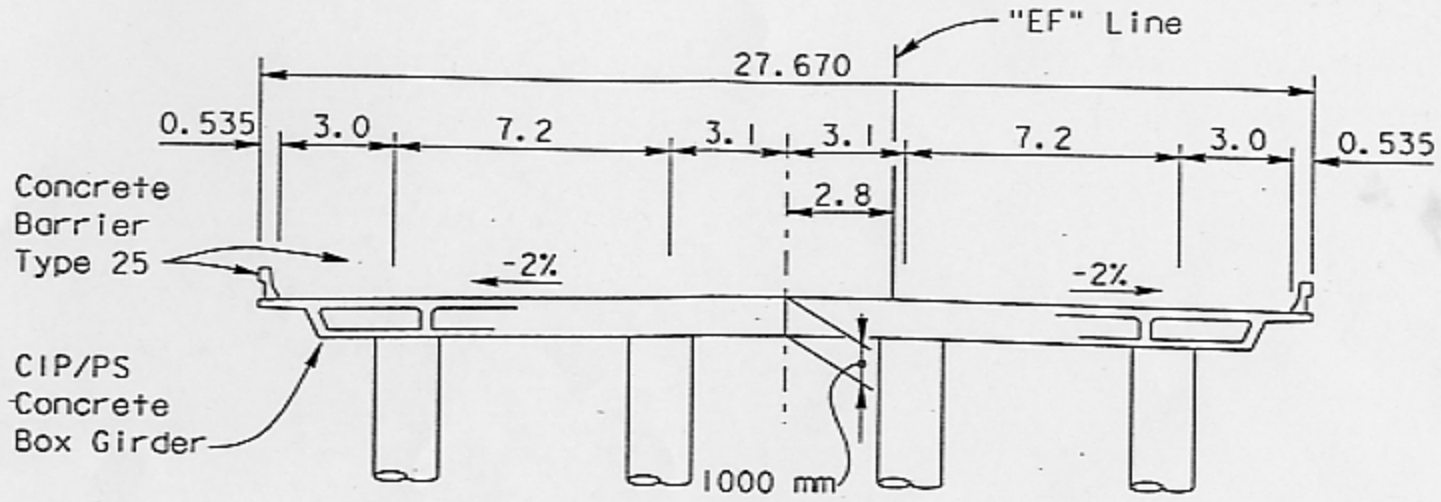
DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT
11	SD	905	15



ELEVATION

1:500

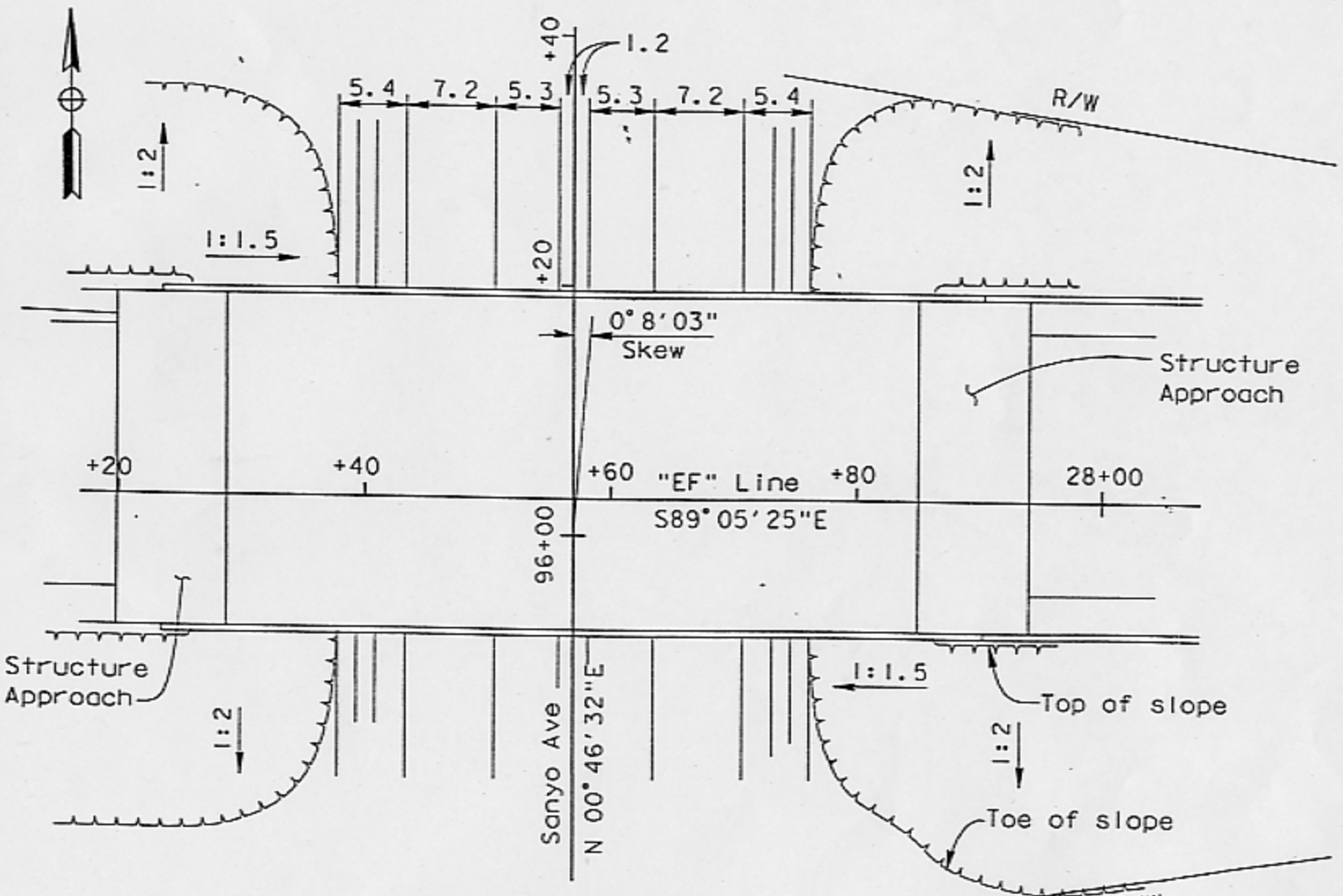
Assume Class 625 pile footing



TYPICAL SECTION

1:200

Note: Traffic will be outside the Bridge area during construction.



PLAN

1:500

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGNED BY L. Good	DATE 7-98	STRUCTURE DESIGN SECTION 14	PLANNING STUDY
DRAWN BY L. Good	DATE 7-98		"EF" AT SANYO AVE UC
CHECKED BY Majid Madani	DATE 8-98		BRIDGE NO. CU 11226
APPROVED	DATE		SCALE: As Noted EA 093160

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STRUCTURES PLANNING STUDY SHEET (METRIC) (REV. 3/5/97)

ATTACHMENT 7

Caltrans Metric

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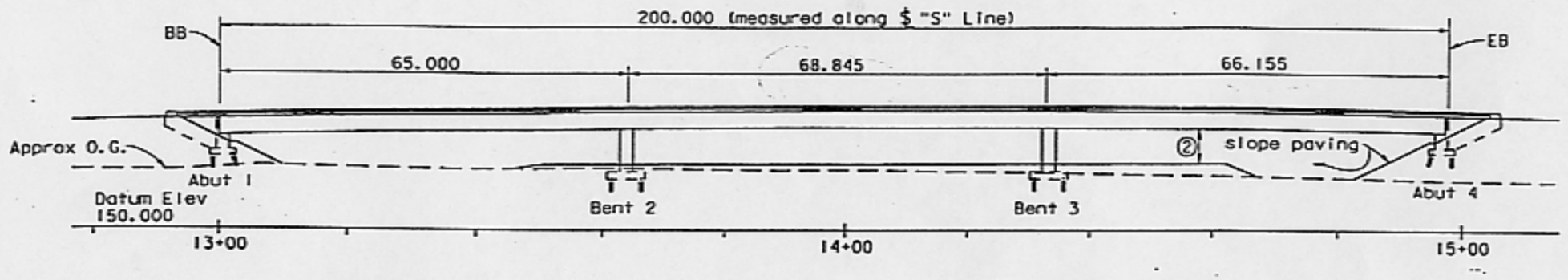
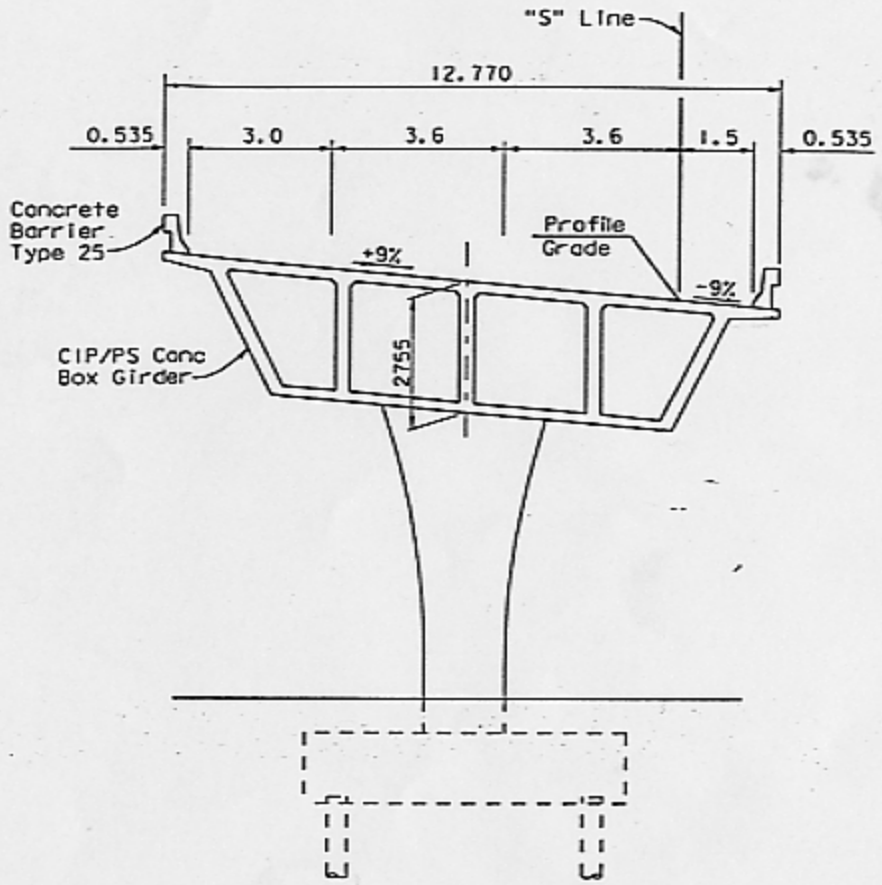
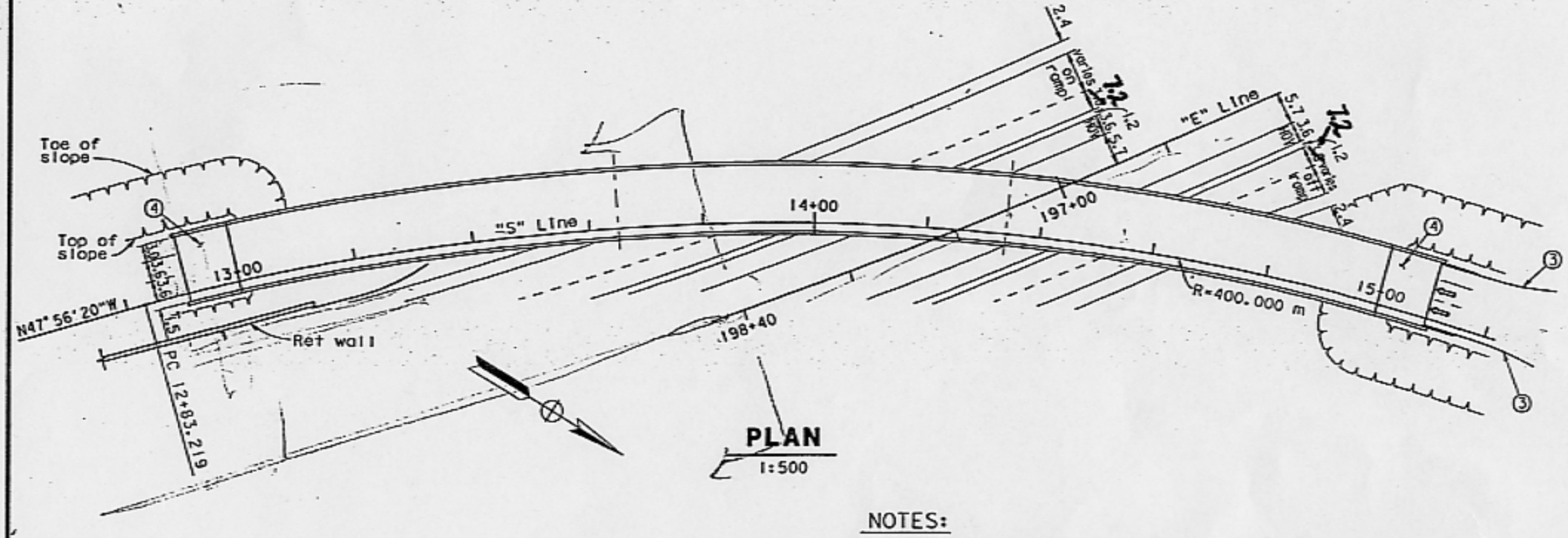


ELEVATION
1:500



TYPICAL SECTION



PLAN
1:500

NOTES:

① Traffic will be detoured around construction zone, Stage Construction will not be required.
② 5.1 m minimum clearance required under falsework.
③ MBGR, see "Road Plans".
④ Structure Approach Slab, type N.
⑤ Assume Class 900 pile footings.
⑥ Estimate does not include cost to relocate existing facilities.

ATTACHMENT 7

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

DESIGNED BY L. CHARLOT	DATE 8-24-98	STRUCTURE DESIGN SECTION 14	PLANNING STUDY
DRAWN BY L. CHARLOT	DATE 8-24-98		"S" AT "E" OC
CHECKED BY MAJID MADANI	DATE		BRIDGE NO. CU 11226
APPROVED	DATE		SCALE: AS NOTED EA 093160

DISTRICT 11
COST ESTIMATE SUMMARY

DIST-CO-ROUTE: 11-SR-805, 905
KP: 3.1/4.2, 8.4/R18.6
EA: 093160
PP NO: 374K

Type of Estimate : **PR**

Program Code : **HE 14**

Project Description **ON ROUTE 905 IN SAN DIEGO COUNTY FROM 0.1 KILOMETER EAST OF ROUTE 805 TO THE OTAY MESA BORDER CROSSING AND ON ROUTE 805 FROM 0.2 KILOMETER NORTH OF ROUTE 905 TO 0.4 KILOMETER SOUTH OF PALM AVE. OC.**

Limits : **K.P. 8.4/R18.6 (PM 5.2/R11.6)**
K.P. 3.1/4.2 (PM 1.9/2.6)

Proposed Improvement **CONSTRUCT 6 LANE FREEWAY**

Scope :

Alternative : **FREEWAY CENTRAL ALIGNMENT ALTERNATIVE**

		Current		Escalated[1]
ROADWAY ITEMS	$	111,700,000	$	115,400,000
STRUCTURE ITEMS	$	35,900,000	$	37,000,000
SUBTOTAL CONSTRUCTION COST	$	147,600,000	$	152,400,000
RIGHT OF WAY	$	118,100,000	$	118,100,000
TOTAL CAPITAL COST	$	265,700,000	$	270,500,000
PR/ED SUPPORT	$	8,500,000	$	8,700,000
PS&E SUPPORT	$	12,700,000	$	13,000,000
RIGHT OF WAY SUPPORT	$	3,400,000	$	3,500,000
CONSTRUCTION SUPPORT	$	18,400,000	$	18,800,000
TOTAL SUPPORT COST	$	43,000,000	$	44,000,000
TOTAL PROJECT COST	$	308,700,000	$	314,500,000

[1]ESCALATED PROJECT COST FY 05/06

Estimate Date = 7/22/2004
RTL Date = 7/1/2005
0.94 years

Reviewed by District 0.E. L. G. Edmonds 7/29/04 x6735
Leon G. Edmonds Date Phone

Approved by Project Manager Allen Kemp for 7/30/04 x6728
Randy Sanchez Date Phone

[1] Escalation Rates are based on the 2000 Fund Estimate, Pg A-2, of the 2000 STIP. Escalation rates are 2.3% for Support Cost and 3.5% for Capital Costs compounded annually to construction year. Escalation should only be used when a project **has not** been programmed.

Revised 10/24/00 MDR

ATTACHMENT 8

DISTRICT 11
COST ESTIMATE SUMMARY

DIST-CO-ROUTE: 11-SR-805, 905
KP: 3.1/4.2, 8.4/R18.6
EA: 093160
PP NO: 374K

Section		Cost
Earthwork	$	8,895,272
Structural Section	$	28,709,728
Drainage	$	6,294,186
Specialty Items	$	4,876,124
Environmental	$	23,577,121
Traffic Items	$	7,214,058
Detours	$	1,676,700
Minor Items	$	4,062,160
Overhead	$	9,478,372
Supplemental Work	$	3,792,000
Roadway Mobilization	$	7,582,698
State Furnished	$	410,000
Contingencies	$	5,118,321
TOTAL ROADWAY ITEMS*	$	111,686,740

Estimate Prepared By — C.W. Davis — 7/28/04 — X3156

C.W.Davis — Date — Phone

Estimate Reviewed By — Tom Guerrini — 7/28/04 — 220-7384

Tom Guerrini — Date — Phone

*Verify that total equals total on Page 8

ATTACHMENT 8

Section 1 EARTHWORK

	Unit	Quantity		Unit Price ($)		Cost
190101 Roadway Excavation	m^3	2,371,318	x	$2.00	=	$4,742,636
198050 Embankment	m^3		x		=	$0
198001 Imported Borrow	m^3	1,029,272	x	$4.00	=	$4,116,000
160101 Clearing & Grubbing	LS	1	x	$856,000	=	$856,000
170101 Develop Water Supply	LS	1	x	$161,000.00	=	$161,000
Removal or Relocation of Existing Facilities	LS	1	x	$8,000.00	=	$8,000

SUBTOTAL EARTHWORK	$	9,883,636
OVERHEAD	$	988,364
TOTAL EARTHWORK	$	8,895,272

Section 2 STRUCTURAL SECTION

	Unit	Quantity		Unit Price ($)		Cost
401000 PCC Pavement (0.26 m Depth)	m^3	0	x	140.00	=	$0
390155 Asphalt Concrete (Type A)	tonne	352,278	x	50.00	=	$17,613,895
390155 with Asphalt Price Index	tonne		x		=	$0
390171 Asphalt Concrete Base (Type A)	tonne		x		=	
390171 AC Base (Type A) with asphalt Pric	tonne	36,706	x	50.00	=	$1,835,320
290211 Asphalt Treated Permeable Base	m^3	36,331	x	48.00	=	$1,743,902
290211 with Asphalt Price Index	m^3		x		=	$0
260201 Class 2 Aggregate Base	m^3	93,527	x	55.00	=	$5,143,985
250501 Class 4 Aggregate Subbase	m^3	293,520	x	10.00	=	$2,935,200
290301 Cement Treated Permeable Base	m^3	39,436	x	45.00	=	$1,774,620
731521 Minor Concrete (Sidewalk)	m^3	2,259	x	175.00	=	$395,325
394046 Place AC Dike Type D	m	22,274	x	2.20	=	$49,003
394048 Place AC Dike Type E	m	18,979	x	2.10	=	$39,856
XXXXXX Place AC (Misc Area)	m^2		x		=	$0
1531XX Cold Plane ___mm	m^2		x		=	$0
1531XX Cold Plane ___mm	m^2		x		=	$0
68XXXX Permeable Material Blanket	m		x		=	$0
681134 80 mm Plastic Pipe (Edge drain)	m	30,716	x	12.00	=	$368,592

Note: Unit Cost for PCC pavement increased 10% to include cost for Doweled Transverse Joints

SUBTOTAL STRUCTURAL SECTION	$	31,899,698
OVERHEAD	$	3,189,970
TOTAL STRUCTURAL SECTION	$	28,709,728

Section 3 DRAINAGE

	Unit	Quantity		Unit Price ($)		Cost
Detention Facilities	LS	1	x	2,000,000.00	=	$2,000,000
650075 600 mm RCP	m	5,008	x	150.00	=	$751,200
650077 750 mm RCP	m	1,059	x	175.00	=	$185,325
650079 900 mm RCP	m	785	x	260.00	=	$204,100
650081 1050 mm RCP	m	651	x	250.00	=	$162,750
650089 1500 mm RCP	m	240	x	450.00	=	$108,000
705224 600 mm Concrete Flared End	EA	53	x	700.00	=	$37,100
705226 750 mm Concrete Flared End	EA	5	x	1000.00	=	$5,000
705227 900 mm Concrete Flared End	EA	3	x	1200.00	=	$3,600
705228 1050 mm Concrete Flared End	EA	3	x	1400.00	=	$4,200
665833 Bituminous Coated Slotted Corrugat	m	702	x	300.00	=	$210,600
510102 Class A Concrete (Structure)	m^3	5,220	x	400.00	=	$2,088,000
520101 Bar Reinforcing Steel	KG	686,478	x	1.00	=	$686,478
731502 Minor Concrete (Misc. Construction	m^3	679	x	500.00	=	$339,500
750001 Miscellaneous Iron and Steel	KG	28,874	x	3.00	=	$86,622
707470 600 mm Precast Concrete Pipe Riser	m	40	x	450.00	=	$18,000
750011 Manhole Frame and Grate	EA	13	x	550.00	=	$7,150
721009 Rock Slope Protection (facing)	m^3	53	x	225.00	=	$11,925
721024 Rock Slope Protection (1/4 Ton meth	m^3	1,620	x	50.00	=	$81,000
721023 Rock Slope Protection (1/2 Ton meth	m^3	20	x	100.00	=	$2,000
721022 Rock Slope Protection (1 Ton metho	m^3	9	x	110.00	=	$990

SUBTOTAL DRAINAGE	$	6,993,540
OVERHEAD	$	699,354
TOTAL DRAINAGE	$	6,294,186

Section 4 SPECIALTY ITEMS

	Unit	Quantity		Unit Price ($)		Cost
510060 Structural Concrete, Retaining Wall	m^3	2,699	x	475.00	=	$1,282,025
520103 Bar Reinforcing Steel (Retaining Wa	KG	177,606	x	1.55	=	$275,289
192037 Structure Excavation (Retaining Wa	m^3	3,024	x	45.00	=	$136,080
193013 Structure Backfill (Retaining Wall)	m^3	1,784	x	60.00	=	$107,040
511035 Architectural Treatment (Retaining W	m^2	3743	x	40.00	=	$149,720
203012 Erosion Control (Drill Seed)	m^2	600,533	x	0.50	=	$300,267
066520A Hazardous Waste Work	LS	1	x	658,000.00	=	$658,000
518002 Sound Wall (Masonry Block)	m^2	211	x	200.00	=	$42,200
839481 Concrete Barrier (Type 50)	m	2,071	x	65.00		$134,615
800391 Chain Link Fence (Type CL-1.8)	m	20,106	x	25.00	=	$502,650
202007 Duff	m^2	909,860	x	0.50	=	$454,930
152353 Relocate Irrigation System	LS	1	x	50,000.00	=	$50,000
197020 Earth Retaining Structure (Central A	m^2	1,893	x	700.00	=	$1,325,100

SUBTOTAL SPECIALTY SECTION	$	5,417,916
OVERHEAD	$	541,792
TOTAL SPECIALTY SECTION	$	4,876,124

Section 5 ENVIRONMENTAL

	Unit	Quantity		Unit Price ($)		Cost
5A - Mitigation						
Archeology	LS	1	x	100,000.00	=	$100,000
Coastal Sage Scrub	HA	7.6	x	24,700.00	=	$187,000
Wetland Riparian	HA	6.5	x	309,000.00	=	$1,998,000
Vernal Pool	HA	1.7	x	395,000.00	=	$686,000
Quino Habitat/Mima Mounds	HA	1.7	x	395,300.00	=	$690,000
5B - Landscaping						
202000 Planting	LS	1	x	4,000,000.00	=	$4,000,000
204099 Plant Establishment	LS	1	x	2,640,000.00	=	$2,640,000
202011 Mulch A	m^3	11,000	x	55.00	=	$605,000
202011 Mulch B	m^3	13,400	x	80.00	=	$1,072,000
202011 Mulch C	m^3	2,000	x	21.00	=	$42,000
202031 Commercial Fertilizer (Slow)	Kg	6,000	x	2.50	=	$15,000
202032 Commercial Fertilizer (Pack)	EA	204,000	x	0.50	=	$102,000
202031 Iron Sulfate	Kg	6,000	x	2.50	=	$15,000
208000 Irrigation System	LS	1	x	4,000,000.00	=	$4,000,000
208041 BPA Enclosure	EA	15	x	3,000.00	=	$45,000
208732 250 mm CHDPP Conduit (Crossover	m	3,425	x	30.00		$102,750
208731 200 mm CHDPP Conduit (Crossover	m	400	x	170.00	=	$68,000
2080XX Bridge Crossover	EA	10	x	18,000.00	=	$180,000
209801 Maintenanve Vehicle Pullout	EA	20	x	6,500.00	=	$130,000
731519 Gore Paving (Stamped Concrete)	m^2	15,071	x	35.00	=	$527,485
721810 Slope Paving (Concrete)	m^3	1,107	x	300.00	=	$332,100
5C - NPDES						
074020 Water Polution Control	LS	1	x	3,249,774.56	=	$3,249,775
074019 Prepare SWPPP	LS	1	x	18,550.00	=	$18,550
Supplemental Fund	LS	1	x	649,955	=	$649,955
Treatment BMPs	LS	1	x	4,741,186	=	$4,741,186

SUBTOTAL ENVIRONMENTAL	$	26,196,801
OVERHEAD	$	2,619,680
TOTAL ENVIRONMENTAL SECTION	$	23,577,121

Estimate Reviewed By — John Chisholm — 7-29-04 — Date — Environmental Branch Chief — 858-616-6610 Phone

Estimate Reviewed By — Tom Ham — 7-29-04 — Date — District Landscape Architect — 688-6719 #1654 Phone

Section 6 TRAFFIC ITEMS

6A - Traffic Electrical

	Unit	Quantity		Unit Price ($)		Cost
86055X Lighting & Sign Illumination	LS	1	x	$966,000	=	$966,000
860930 Traffic Monitoring Station	LS	1	x	$334,000	=	$334,000
5602XX Overhead Sign Structures	LS	1	x	$1,898,000	=	$1,898,000
860530 Changeable Meassage Sign System	LS	1	x	$300,000	=	$300,000
860415 Stage Lighting	LS	1	x	$234,000	=	$234,000
8611XX Ramp Metering System	LS	0	x	$541,000	=	$0
XXXXXXA Interconnection Facilities	LS	1	x	$26,000	=	$26,000
XXXXXXA Traffic Signal	LS	1	x	$1,200,000	=	$1,200,000
860706A 53 C Conduit (F/O)	m		x	$50	=	$0
86070XA 2-103C Conduit- Shoulder(F/O)	m		x	$120	=	$0
86070XA 2-103C Conduit-dirt(F/O)	m		x	$160	=	$0
86904XA Fiber Optic Vault/wout Enclosure	EA		x	$3,500	=	$0
867130 F/O Splice Closure	EA		x	$2,000	=	$0
867131A FOA	m		x	$22	=	$0
867136A FDU	EA		x	$1,500	=	$0
867133A FOC	m		x	$14	=	$0
XXXXXXA 53C HUB(Workgroup switch&	EA		x	$71,000	=	$0
XXXXXXA Enclosure for HUB	EA		x	$80,000	=	$0
8609XXA CCTV Pole,cabinet,foundation	EA		x	$8,000	=	$0
860992A CCTV Assembly	EA		x	$40,000	=	$0
XXXXXXA DTU	EA		x	$1,500	=	$0
XXXXXXA 3600 Multiplexer	EA		x	$60,000	=	$0
860945A Field Elements	EA		x	$2,500	=	$0
XXXXXA Hub Assembly	EA		x	$200,000	=	$0
867138A UPS 2.5 KVA	EA		x	$4,500	=	$0
XXXXXXA Adaptation Switch	EA		x	$37,000	=	$0
860993A Installation Cost (F/O Equip)	LS		x	$200,000	=	$0
86XXXXA Fiber Optic connection to City	LS		x	$100,000	=	$0
860640 Irrigation Controller Cab.	EA	15	x	4,000.00	=	$60,000
860797 Electic Service (Irrigation)	LS	1	x	145,000.00	=	$145,000

6B - Traffic Signing and Striping

566011 Ground Mounted Signs	EA	360	x	$400	=	$144,000
568016 Overhead Sign Panels	EA	40	x	$5,000	=	$200,000
840656 Permanent Pavement Delineation	LS	1	x	$573,820	=	$573,820
832001 Metal Beam Guard Railing	LS	1	x	$400,000	=	$400,000
120159 Temporary Pavement Delineation	LS	1	x	$182,500	=	$182,500
120090 Construction Area Signs	LS	1	x	$48,000	=	$48,000
129000 Temporary Railing "Type K"	m	6,000	x	$40	=	$240,000
129100 Temporary Crash Cushions Modules	EA	391	x	$300	=	$117,300
120199A Traffic Plastic Drum	EA	2,500	x	$50	=	$125,000

6C - Traffic Management Plan

Brochures and Mailers	LS	1	x	$100,000	=	$100,000
Paid Advertising	LS	1	x	$400,000	=	$400,000
128650 Portable Changeable Message Signs	LS	1	x	$40,000	=	$40,000
COZEEP	LS	1	x	$282,000	=	$282,000

SUBTOTAL TRAFFIC ITEMS	$	8,015,620
OVERHEAD	$	801,562
TOTAL TRAFFIC ITEMS	$	7,214,058

Estimate Reviewed By — Dale Wilson 7/28/04 — Dale Wilson — Date — Traffic Design — x3248 Phone

Estimate Reviewed By — for Camille 7/29/04 — Camille Abou-Fadel — Date — Traffic Operations — 858-467-4265 Phone

Section 7 DETOURS*

	Unit	Quantity		Unit Price ($)		Cost
190101 Roadway Excavation	m^3	16,000	x	20.00	=	$320,000
198050 Embankment	m^3		x		=	$0
198001 Import Borrow	m^3		x		=	$0
390155 Asphalt Concrete (Type A)	tonne	5,000	x	60.00	=	$300,000
390155 with Asphalt Price Index	tonne		x		=	$0
260201 Class 2Aggregate Base	m^3	12,000	x	40.00	=	$480,000
Temporary Drainage	LS	1	x	100,000.00	=	$100,000
129000 Temporary Railing Type "K"	m	5,000	x	50.00	=	$250,000
128601 Temporary Signals (2 phase)	EA	1	x	70,000.00	=	$70,000
128601A Temporary Signals (4 phase)	EA	1	x	100,000	=	$100,000
Misc.(15%)	LS	0.15	x	1,620,000.00	=	$243,000

* Includes constructing, maintaining, and removal

SUBTOTAL DETOURS	$	1,863,000
OVERHEAD	$	186,300
TOTAL DETOURS	$	1,676,700
SUBTOTAL SECTIONS 1-7 (With Overhead)	$	90,270,211

Section 8 MINOR ITEMS (5%-10%)

Subtotal Section 1-7 =	$	90,270,211	x	5%	=	$4,513,511

SUBTOTAL MINOR ITEMS	$	4,513,511
OVERHEAD	$	451,351
TOTAL MINOR ITEMS	$	4,062,160

Section 9 OVERHEAD

Overhead Section 1-8 = $ 9,478,372

	Unit	Quantity		Unit Price ($)		Cost
070015 Overhead	DAY	640	x	14,809.96	=	$9,478,373

TOTAL OVERHEAD	$	9,478,372

Section 10 SUPPLEMENTAL WORK (5%-10%)

Subtotal Section 1-8 =	$	94,783,722				
	$	94,783,722	x	4%	=	$3,791,349

	Unit	Quantity		Unit Price ($)		Cost
066070 Maintain Traffic	LS	1		384,000.00		$384,000
066666 Price Index For AC	LS	1	x	205,000.00	=	$205,000
066901 Water Expenses (Irrigation)	LS	1	x	408,000.00	=	$408,000
		Subtotal				$997,000

TOTAL SUPPLEMENTAL WORK	$	3,792,000

Section 11 ROADWAY MOBILIZATION**

Subtotal Section 1-8	$	94,783,722					
	$	94,783,722	x	8%	=	$7,582,698	

** If <50 Working Days (N/A)

TOTAL ROADWAY MOBILIZATION $ 7,582,698

Section 12 STATE FURNISHED

	Unit	Quantity		Unit Price ($)		Cost
066105 RE OFFICE	LS	1	x	250,000.00	=	$250,000
066610 Partnering	LS	1	x	100,000.00	=	$100,000
066202 Maintain Existing Plants	LS	1	x	20,000.00	=	$20,000
066208 Repair Existing Irrigation System	LS	1	x	20,000.00	=	$20,000
066212 Modify Existing Irrigation System	LS	1	x	20,000.00	=	$20,000
066XXX Controller Assemblies	LS		x		=	$0

TOTAL STATE FURNISHED $ 410,000

Section 13 CONTINGENCIES*

Subtotal Section 1-8

Contigencies 5%

$5,118,321

TOTAL CONTIGENCIES $ 5,118,321

TOTAL ROADWAY ITEMS $ 111,686,741

Approx # of Working Days = 640

* As a general rule use appropriate percentage per Project Development Procedures Manual (PDPM).
(Pre-PSR 30%-50%, PSR 25%, PR 20%, PAR 15%, After PAR 10%)

Contingencies could be increase or decrease depending on the accuracy of the Enginnering Estimate and in the possibility of any potential problems that could arise later on. If a contingency other that the recommentde on the PDPM is used, then a justification is required.

Justification: (Briefly explain as to why a different percentage was used)

II. STRUCTURES ITEMS

Bridge Name	Caliente	Spring Canyon	Heritage	Britannia	La Media
Bridge Number	1	2	3	4	5
Structure Type	CIP/PSBOX	CIP/RC Slab	CIP/PSBOX	CIP/PSBOX	CIP/PSBOX
Component Subtotal	$2,303,733	$3,692,295	$3,110,677	$1,700,245	$2,636,155
Mobilization(10%)	$255,970	$410,255	$345,631	$188,916	$292,906
Subtotal Bridge Items	$2,559,703	$4,102,550	$3,456,308	$1,889,161	$2,929,061
Contingencies(5%)	$127,985	$205,128	$172,815	$94,458	$146,453
Bridge total cost	$2,687,689	$4,307,678	$3,629,123	$1,983,619	$3,075,514
Bridge Aesthetics	$0	$0	$0	$0	$0
Deck Area(Sq. Meter)	2,517	2,356	2,013	2,489	1,949
Cost per Sq. Meter	$1,068	$1,829	$1,803	$797	$1,578
TOTAL COST=======	$2,688,000	$4,308,000	$3,629,000	$1,984,000	$3,076,000

Bridge Name	Airway	SW@LM-1	EF@ E &LM-1	EFW@LM-1	SW @ "OTM"
Bridge Number	6	7	8	9	10
Structure Type	CIP/PSBOX	CIP/PS BOX	CIP/PS BOX	CIP/PS BOX	CIP/PS BOX
Component Subtotal	$4,155,821	$1,824,735	$4,077,836	$558,602	$902,068
Mobilization(10%)	$461,758	$182,474	$407,784	$55,860	$90,207
Subtotal Bridge Items	$4,617,579	$2,007,209	$4,485,620	$614,462	$992,275
Contingencies(5%)	$230,879	$100,360	$224,281	$30,723	$49,614
Bridge total cost	$4,848,458	$2,107,569	$4,709,901	$645,185	$1,041,889
Bridge Aesthetics	$0				
Deck Area(Sq. Meter)	3,478	1,871	3,522	524	949
Cost per Sq. Meter	$1,394	$1,126	$1,337	$1,231	$1,098
TOTAL COST=======	$4,848,000	$2,108,000	$4,710,000	$645,000	$1,042,000

Bridge Name	EF @ "S"&"N"	"S" @ "E"	EFW @ "S"&"N"(13)	Siempre Viva	Sanyo Road
Bridge Number	11	12		14	15
Structure Type	CIP/PS BOX	CIP/PS BOX	CIP/PS BOX	CIP/PS BOX	CIP/PS BOX
Component Subtotal	$1,236,207	$1,615,127	$1,055,273	$0.00	$1,423,273
Mobilization(10%)	$123,621	$161,513	$105,527	$0	$142,327
Subtotal Bridge Items	$1,359,828	$1,776,640	$1,160,800	$0	$1,565,600
Contingencies(5%)	$67,991	$88,832	$58,040	$0	$78,280
Bridge total cost	$1,427,819	$1,865,472	$1,218,840	$0	$1,643,880
Deck Area(Sq. Meter)	1,215	1,600	1,111	3,123	1,553
Cost per Sq. Meter	$1,175	$1,166	$1,097	$0	$1,059
TOTAL COST=======	$1,428,000	$1,865,000	$1,219,000	$0	$1,644,000

Bridge Name	Del Sol Blvd.
Bridge Number	16
Structure Type	CIP/PS BOX
Component Subtotal	$535,714
Mobilization(10%)	$59,524
Subtotal Bridge Items	$595,238
Contingencies(20%)	$29,762
Bridge total cost	$625,000
Deck Area(Sq. Meter)	165
Cost per Sq. Meter	$3,788
TOTAL COST=======	$625,000

TOTAL STRUCTURES ITEMS $ 35,819,000

III. RIGHT OF WAY

Acquisition, including Excess Land Purchases, Damages to Remainder(s) & Goodwill Loss		$	$98,503,000
Acquisition of Offsite Mitigation (out to Out)		$	$ 2,753,000
Utility Relocation (State Share)		$	7,706,000
Clearance Cost		$	310,000
RAP and/or Last Resort Housing Costs		$	3,620,000
Title and Escrow Fees		$	258,000
Condemnation Settlement	5%	$	4,926,000
Design Appreciation Factor	0%	$	0
TOTAL RIGHT OF WAY		**$**	**118,080,000**
RIGHT OF WAY SUPPORT		$	3,378,285
ESCALATED RIGHT OF WAY		$	118,080,000

COMMENTS: (TOTAL ACREAGE, PARCEL COUNT, ESCALATION RATE THROUGH PROGRAMMED YEAR)

R/W Estimate Prepared By

Janet Schoffstall for
Joseph Quintero

Date 7-30-04

x6921
Phone

IV. ENGINEERING SUPPORT COST

DISTRICT 11
PRELIMINARY PROJECT SUPPORT COST ESTIMATE SUMMARY

Total Construction Cost	$ 147,600,000

SB-45 CATEGORY SUPPORT COST	Project Phase				Annual Support Cost
	PR/ED (PD,PE,PM)	PS&E (PS)	R/W (RW)	CONSTR (CM)	
FY 90/1	$ 54,430				$ 54,430
FY 91/2	$ 30,661				$ 30,661
FY 92/3	$ 68,128				$ 68,128
FY 93/4	$ 123,362				$ 123,362
FY 94/5	$ 327,363				$ 327,363
FY 95/6	$ 319,648		$ 275		$ 319,923
FY 96/7	$ 355,482		$ 13,858		$ 369,340
FY 97/8	$ 434,111		$ 12,066		$ 446,177
FY 98/9	$ 1,155,020		$ 39,498		$ 1,194,518
FY 99/00	$ 1,193,388		$ 165,885		$ 1,359,273
FY 0/1	$ 659,138		$ 137,379		$ 796,517
FY 1/2	$ 1,071,691		$ 400,871		$ 1,472,562
FY 2/3	$ 1,400,715	$ 1,705,439	$ 341,554		$ 3,447,708
FY 3/4	$ 808,935	$ 6,161,101	$ 516,899		$ 7,486,935
FY 4/5	$ 200,000	$ 4,000,000	$ 1,000,000		$ 5,200,000
FY 5/6	$ 100,000	$ 500,000	$ 500,000	$ 4,000,000	$ 5,100,000
F/Y 6/7	$ 75,000	$ 250,000	$ 250,000	$ 5,000,000	$ 5,575,000
FY 7/8	$ 50,000			$ 5,000,000	$ 5,050,000
FY 8/9				$ 2,500,000	$ 2,500,000
F/Y 9/10				$ 1,900,000	$ 1,900,000
P3 Total	$ 8,427,072	$ 12,616,540	$ 3,378,285	$ 18,400,000	$ 42,821,897
Support Ratio	5.7%	8.5%	2.3%	12.5%	29.0%

Approved by: _____ Date: 7/29/04 Phone: 688-3651

Project Control Engineer

ATTACHMENT 8

State of California **Business and Transportation Agency**

M E M O R A N D U M

To: Randy Sanchez, Project Manager

Date: July 26, 2004
File: 11-SD-905
K.P.: 8.4 / 19.3
E.A.: 093160

Alternative 1
FREEWAY CENTRAL ALTERNATIVE

Attn: Chuck Davis, Project Engineer

From: **DEPARTMENT OF TRANSPORTATION** - District 11

Subject: Right of Way Data - Construct 6 - Lane Freeway

1. **R/W Cost Estimate:**

A)	Acquisition, including Excess Land Purchase, Damages to Remainders & Goodwill Loss.		$ 98,503,000
B)	Railroad Acquisition		$ -0-
C)	Acquisition of Offsite Mitigation		$ 2,753,000
D)	Utility Relocation (State Share)		$ 7,706,000
	Potholing (Design Phase)		$ -0-
E)	Clearance Cost		$ 310,000
F)	RAP and/or Last Resort Housing Costs		$ 3,620,000
G)	Title and Escrow Costs		$ 258,000
	R/W Estimate		$ 109,650,000
H)	Condemnation Settlements	5%	$ 4,926,000
I)	Design Appreciation Factor (Items H & I applied to items A + B)	0%	$ -0-
	Total R/W Estimate (Excluding Item #8 - Hazardous Waste)		$ 118,080,000
J)	**Total R/W Estimate:**	**Escalated to Cert. Date**	$ 118,080,000
K)	Utility Relocation (Construction Cost)		$ -0-

Current Date of Right of Way Certification: March 2005

2. **Parcel Data:**

	Type	Du.App	G/W App	Utilities		RR Involvements	
X	3			U4-1-	0	None	X
A	3			-2-	0	C&M Agree	
B	40			-3-	0	Service Cont	
C	4	4	3	-4-	4	Lic/Re/Clauses	
D	28	28		U5-7-	0	Misc R/W Work:	
				-8-	0	Rap Displ	7
				-9-	4	Clear/Demo	5
						Const Permits	
Total	76	No. Excess Parcels	6			Escalation Rate	%

Areas: R/W 1,339,110 sm Excess 13,783.07 sm

Ent PMCS
1. EVENT RW SCREEN (All Data) ____/____/____
2. AGRE SCREEN (Railroad Data Only) ____/____/____

REMARKS: In addition to the 28 Type "D" parcels, the 4 Type "C" improved parcels will require dual appraisals. Goodwill Appraisals involve a recycling business, self-storage facility, and a commercial/industrial condominium building. Acquisition estimate is based on actual appraised amounts, actual prices of previously acquired parcels, and a market-based estimate of value for the remaining parcels. Design Appreciation Factor assumes design is approximately 70% complete. The Utility Relocation (State Share) accounts for 100% of the relocation costs involving SBC.

File: 11-SD-905
K.P.: 8.4 / 19.3
E.A.: 093160

3. Are there major items of construction contract work?
Yes ___ No _X_ Not determined at this time ____ (If yes, explain.)

4. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, goodwill, etc.). **The majority of parcels are zoned industrial with some zoned specialized commercial. There are impacts to the few developed parcels. Some trend to residential use noted on the western portion of the project.**

5. Is there an effect on assessed valuation? (If yes, explain.)
Yes___ No_X_

6. Are utility facilities or rights of way affected?
Yes_X_ No___ Not determined at this time____ (If yes, explain.) **Gas, electric, water, sewer, cable communications, and telephone. *Utility Relocation (State Share) estimates 100% of* the relocation involving SBC.**

7. Are railroad facilities or rights of way affected?
Yes___ No_X_ (If yes, explain.)

Name(s) of railroad(s)

When branch lines or spurs are affected, would acquisition and/or payment of damages to businesses and/or industries served by the railroad facilities be more cost effective than construction of a facility to perpetuate the rail service? (See Procedural Handbook Vol. 4a, Chap. 440 for detail.)
Yes___ No_X_ (If yes, explain.)

8. Were any previously unidentified sites with hazardous wastes and/or material found?
Yes___ * None Evident _X_
(* If yes, attach memorandum per RWPH Vol. 1, Sec. 101.026).

9. Are RAP displacements required?
Yes_X_ No___ (If yes, provide the following information.)

Number of single family ___ No. of business/nonprofit _7_

Number of multi-family ____ No. of farm ____

Based on Final Relocation Impact Statement/Study dated, 11/04/2003 it is anticipated that sufficient housing (will) be available without Last Resort Housing.

10. Are there material borrow and/or disposal sites required?
Yes_X_ No___ Not determined at this time ___ (If yes, explain.) **Fill dirt will be extracted at the east end of the system access connection.**

11. Are there potential relinquishments and/or abandonment's?
Yes___ No _X_ (If yes, explain.)

12. Are there existing and/or potential Airspace sites?
Yes___ No _X_ (If yes, explain.)

File: 11-SD-905
K.P.: 8.4 / 19.3
E.A.: 093160

13. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less than formula lead time and/or if significant pressures for project advancement are anticipated.) PYPSCAN lead time_____. Minimum Right of Way lead time requested from receipt of final maps to certification _____. [ ] See attached.

14. Is it anticipated that all Right of Way work will be performed by Caltrans staff?
Yes_X_ No___ (If no, explain.)

ASSUMPTIONS & LIMITING CONDITIONS

[ ] The mapping did not provide sufficient detail to determine the limits of the right of way required.

[ ] The transportation facilities have not been sufficiently designed so our estimator could determine the damages to any of the remainder parcels affected by the project.

[ ] Additional right of way requirements are anticipated, but are not defined due to preliminary nature of early design requirements.

[ ] See attached

Evaluations prepared by:

1. R/W Signature _____ Joseph A. Quintero Date 7, 27, 2004

2. Railroad Signature _____ Sandra L. Durbin Date July 24, 2004

3. Utilities Signature _____ for Debbie Rodriguez Date 7, 27, 04

4. Proj.Coord. Signature _____ Patrick Kipling Date 7, 27, 04

I have personally reviewed the R/W Data Sheet and supporting information. I certify that the probable highest and best use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and I find this Data Sheet complete and current.

ANNE H. MARC-AURELE
Deputy District Director
Right of Way Division

By:

JANET SCHAFFER, CHIEF
Program/Project Coordinator
Right of Way Division

State of California **Business and Transportation Agency**

M E M O R A N D U M

To: Randy Sanchez, Project Manager

Date: July 26, 2004
File: 11-SD-905
K.P.: 8.4 / 19.3
E.A.: 093160

Alternative 1
FREEWAY CENTRAL ALTERNATIVE

Attn: Chuck Davis, Project Engineer

From: **DEPARTMENT OF TRANSPORTATION** - District 11

Subject: Right of Way Data - Construct 6 - Lane Freeway

1. **R/W Cost Estimate:**

A)	Acquisition, including Excess Land Purchase, Damages to Remainders & Goodwill Loss.		$ 98,503,000
B)	Railroad Acquisition		$ -0-
C)	Acquisition of Offsite Mitigation		$ 2,753,000
D)	Utility Relocation (State Share)		$ 7,706,000
	Potholing (Design Phase)		$ -0-
E)	Clearance Cost		$ 310,000
F)	RAP and/or Last Resort Housing Costs		$ 3,620,000
G)	Title and Escrow Costs		$ 258,000
	R/W Estimate		$ 109,650,000
H)	Condemnation Settlements	5%	$ 4,926,000
I)	Design Appreciation Factor (Items H & I applied to items A + B)	0%	$ -0-
	Total R/W Estimate (Excluding Item #8 - Hazardous Waste)		$ 118,080,000
J)	**Total R/W Estimate:**	**Escalated to Cert. Date**	$ 118,080,000
K)	Utility Relocation (Construction Cost)		$ -0-

Current Date of Right of Way Certification: March 2005

2. **Parcel Data:**

	Type	Du.App	G/W App	Utilities		RR Involvements	
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A	3			-2-	0	C&M Agree	
B	40			-3-	0	Service Cont	
C	4	4	3	-4-	4	Lic/Re/Clauses	
D	28	28		U5-7-	0	Misc R/W Work:	
				-8-	0	Rap Displ	7
				-9-	4	Clear/Demo	5
						Const Permits	
Total	76	No. Excess Parcels	6			Escalation Rate	%

Areas: R/W 1,339,110 sm Excess 13,783.07 sm

Ent PMCS
1. EVENT RW SCREEN (All Data) ____/____/____
2. AGRE SCREEN (Railroad Data Only) ____/____/____

REMARKS: In addition to the 28 Type "D" parcels, the 4 Type "C" improved parcels will require dual appraisals. Goodwill Appraisals involve a recycling business, self-storage facility, and a commercial/industrial condominium building. Acquisition estimate is based on actual appraised amounts, actual prices of previously acquired parcels, and a market-based estimate of value for the remaining parcels. Design Appreciation Factor assumes design is approximately 70% complete. The Utility Relocation (State Share) accounts for 100% of the relocation costs involving SBC.

File: 11-SD-905
K.P.: 8.4 / 19.3
E.A.: 093160

3. Are there major items of construction contract work?
Yes ___ No _X_ Not determined at this time ____ (If yes, explain.)

4. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, goodwill, etc.). **The majority of parcels are zoned industrial with some zoned specialized commercial. There are impacts to the few developed parcels. Some trend to residential use noted on the western portion of the project.**

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Yes___ No_X_

6. Are utility facilities or rights of way affected?
Yes_X_ No___ Not determined at this time____ (If yes, explain.) **Gas, electric, water, sewer, cable communications, and telephone. *Utility Relocation (State Share) estimates 100% of* the relocation involving SBC.**

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Name(s) of railroad(s)

When branch lines or spurs are affected, would acquisition and/or payment of damages to businesses and/or industries served by the railroad facilities be more cost effective than construction of a facility to perpetuate the rail service? (See Procedural Handbook Vol. 4a, Chap. 440 for detail.)
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8. Were any previously unidentified sites with hazardous wastes and/or material found?
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(* If yes, attach memorandum per RWPH Vol. 1, Sec. 101.026).

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Yes_X_ No___ (If yes, provide the following information.)

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11. Are there potential relinquishments and/or abandonment's?
Yes___ No _X_ (If yes, explain.)

12. Are there existing and/or potential Airspace sites?
Yes___ No _X_ (If yes, explain.)

File: 11-SD-905
K.P.: 8.4 / 19.3
E.A.: 093160

13. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less than formula lead time and/or if significant pressures for project advancement are anticipated.) PYPSCAN lead time_____. Minimum Right of Way lead time requested from receipt of final maps to certification _____. [ ] See attached.

14. Is it anticipated that all Right of Way work will be performed by Caltrans staff?
Yes_X_ No___ (If no, explain.)

ASSUMPTIONS & LIMITING CONDITIONS

[ ] The mapping did not provide sufficient detail to determine the limits of the right of way required.

[ ] The transportation facilities have not been sufficiently designed so our estimator could determine the damages to any of the remainder parcels affected by the project.

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Evaluations prepared by:

1. R/W Signature _____ Joseph A. Quintero Date 7, 27, 2004

2. Railroad Signature _____ Sandra L. Durbin Date July 24, 2004

3. Utilities Signature _____ for Debbie Rodriguez Date 7, 27, 04

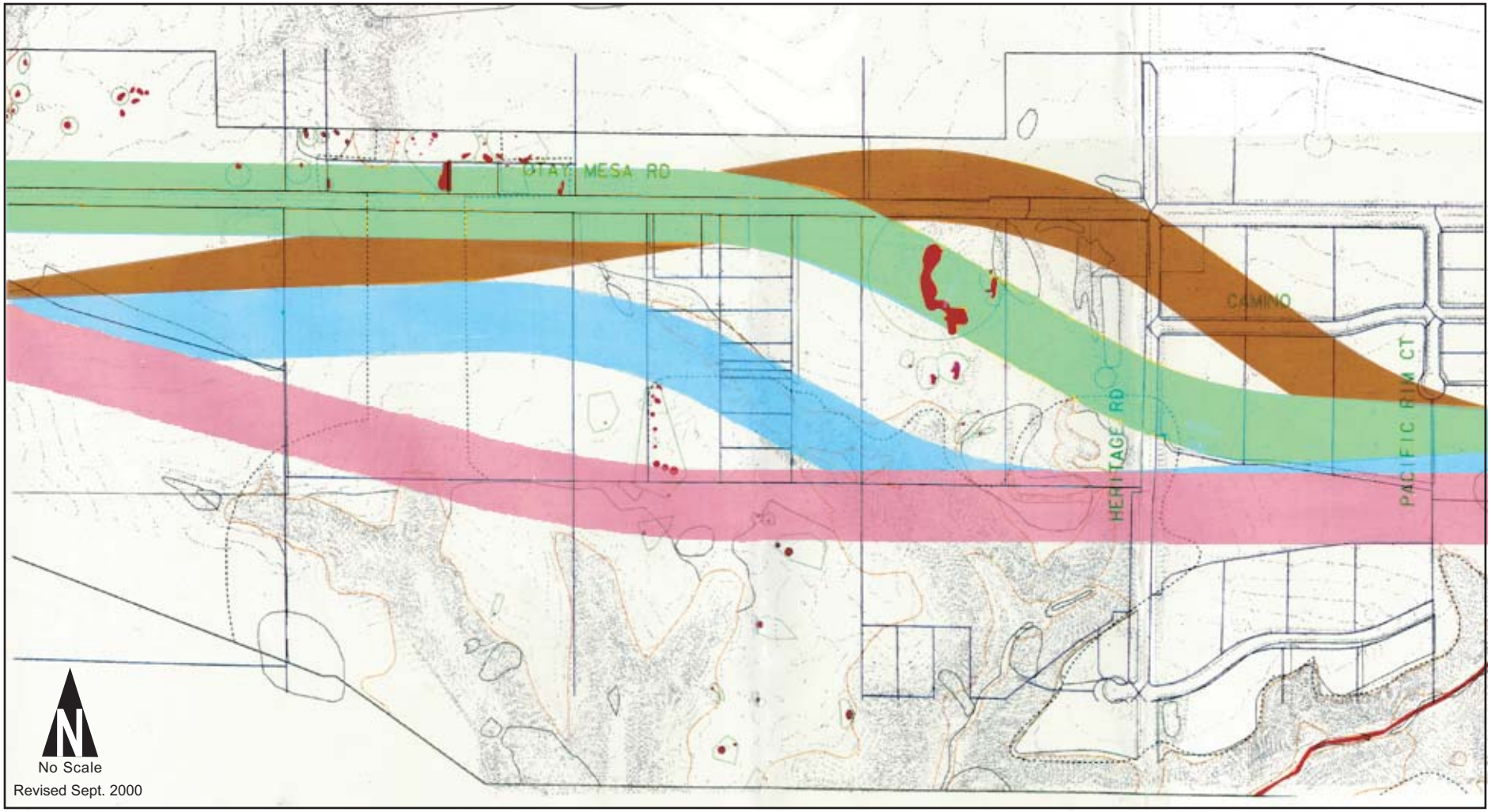
4. Proj.Coord. Signature _____ Patrick Kipling Date 7, 27, 04

I have personally reviewed the R/W Data Sheet and supporting information. I certify that the probable highest and best use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and I find this Data Sheet complete and current.

ANNE H. MARC-AURELE
Deputy District Director
Right of Way Division

By:

JANET SCHAFFER, CHIEF
Program/Project Coordinator
Right of Way Division



Note: See section 5.2.1.2.3 for a description of these alternatives

Route 905

Alternatives Studied and Presented May 11, 1995

Attachment 10

Final Value Analysis Study Report
Preliminary Conceptual Phase

PROPOSED STATE ROUTE (SR)-905/SR-125 INTERCHANGE

San Diego, California

California Department of Transportation
District 11

June 1996

Value Analysis Consultants

Lewis & Zimmerman Associates, Inc.
Walnut Creek, California

ATTACHMENT 11

EXECUTIVE SUMMARY

INTRODUCTION

This Value Analysis (VA) Study Report summarizes the events of the VA study facilitated by Lewis & Zimmerman Associates, Inc. (LZA) for District 11 of the State of California Department of Transportation (Caltrans) in San Diego, California. The subject of the study was the **Proposed State Route (SR)-905/SR-125 Interchange** to be located in the City of San Diego, San Diego County, just north of the nation's busiest commercial international border with Mexico - the Otay Mesa Port of Entry (P.O.E.).

The workshop portion of the VA study was conducted March 21-22 and March 28-29, 1996 in Caltrans' District 11 office in Old Town San Diego, California. Luis M. Venegas, PE, CVS served as the VA team leader (VATL). The team was comprised of:

Timothy L. Craggs, PE	Project Development Coordinator	Headquarters, California Department of Transportation (Caltrans)
Jose Luis Gomez, PE	SR-905 Project Engineer	District 11, Caltrans
Bob Corbin, PE	Civil Engineer	District 11, Caltrans
Laura E. Medley, PE	SR-125 Project Engineer	District 11, Caltrans c/o California Transportation Ventures, Inc.
Robert Goralka, PE	Associate Transportation Specialist	County of San Diego
Linda J. Marabian, PE	Associate Traffic Engineer Development Services Department	City of San Diego
Andrew P. Schlaefli, PE	Traffic Specialist	Urban Systems Associates, Inc.
David K. Sorenson, PE	Project Manager	Kimley-Horn Associates, Inc.
Lawrence A. Kyle, PE	Highway/Civil Engineer	HDR Engineering, Inc.

An informal presentation of results was conducted on Friday, March 29, 1996. During this presentation, the VA team provided a brief overview of the creative ideas developed into prioritized alternatives. Copies of the **Creative Idea Listing and Evaluation** and **Summary of Alternatives Sheets** were provided to all attendees.

PROJECT DESCRIPTION

Over the past decade, Caltrans, in conjunction with the County and City of San Diego, have been analyzing the feasibility of completing the San Diego Regional Outer Loop Highway System. To complete the southernmost portion of the outer loop system requires connecting Interstate Highway 805 (I-805) with a new, east/westbound freeway designated SR-905. To complete a leg of the easternmost portion of the outer loop system requires a new, north/southbound, privatized freeway/tollway designated as SR-125. These two legs are to meet at a new freeway-to-freeway interchange near the Otay Mesa International Border Point of Entry (POE). It is anticipated that once constructed, SR-905 would be designated as Interstate 905.

Two short portions of SR-905 already exist: (1) at the interchange between I-805 and SR-905 on the western edge of the proposed corridor; and (2) at the connection between the Otay Mesa P.O.E. and Otay Mesa Road on the eastern edge of the corridor. The connection of these two points, along with the interchange created between SR-905 and SR-125, comprise the completion of these portions of the San Diego Regional Outer Loop Highway System.

In addition, Caltrans and the Federal Highway Administration (FHWA) propose to have SR-905 become I-905 and part of the National Highway System. As such, principal financing for the project may stem from federal funds.;

The purpose of the overall SR-905 project is to improve safety conditions and provide for an efficient transportation system to move people, goods and services within and through Otay Mesa between I-805 and the Otay Mesa P.O.E. in San Diego County. The proposed improvements are anticipated to reduce accident rates for Otay Mesa Road, a city street, which is the only roadway presently serving local, regional and international traffic.

Preliminary cost estimates for the original concept are around $21,000,000, including right-of-way acquisition and construction.

CONCERNS AND OBJECTIVES

Numerous issues surfaced during the information and functional analysis phases of the VA study and are listed below. Those issues considered by the VA team to be of greater importance are safety, reducing congestion, local access, and operational concerns on both the freeway and local roadways.

- Safety
- Reduce Congestion
  - Local Arterial
  - Freeway
- Local Access
  - On/Off Freeway
  - Border
  - Inspection Facility
  - Commerce/Business
- Economic Impact
  - NAFTA
- State
  - City/County
  - Local Community/Business
- Accommodate Truck Route
  - Local Trips on Freeway System
  - Access to SR-125

ATTACHMENT 11

- Complete Outer Loop
- Accommodate Future Regional and International Traffic
- Standards (Highway)
- Operational Concerns on Both Freeway/Local
- Phasing of Traffic Improvements

The FHWA was invited to attend the VA process as active members of the advisory panel.

The VA team, after having thoroughly discussed the issues at hand, concentrated on those most critical and established the objectives of the VA study to be:

(1) Consensus on: (a) the method(s) of achieving viable local access to the freeway system while maintaining acceptable operational and safety levels; (b) agreement on the "acceptableness" of operations and safety levels; and

(2) Solidify the basis for the Otay Mesa area's design and planning effort.

HIGHLIGHTS OF THE STUDY

The VA team reviewed the developed alternatives and prioritized their potential for acceptance. Those alternatives designated as priority one were deemed acceptable with minimal compromise among concerned parties; priority two alternatives were judged acceptable but requiring considerable effort to implement as significant compromise would be required; and finally, those alternatives rated as priority three could only work if complex obstacles were eliminated and crucial compromises realized.

Listed below are some of the more salient points of the VA study. They are provided here as a sampling of the contents of the report:

While prioritizing the completed alternatives, it became evident to the VA team that no single alternative was deemed priority one. This stemmed from the fact that many of the alternatives, although at first appearing to be technically feasible, could not stand alone. As such, a concerted effort was made to dispense with those alternatives deemed to be a lower priority and concentrate on culling those that could be melded into a viable solution that would not only meet the VA team's objectives, but would ameliorate the major concerns of the FHWA, State, County and City.

A true consensus was sought and achieved when eight alternatives (Nos. 13, 8A, 9, 32, 39, 43 & 46, and 48 - all of which are included in the Study Result section) were combined to create a new alternative (No. 80) serving the needs of all, while requiring minimal compromise. The new alternative provides for the local access at La Media, Lonestar, Otay Mesa, and Siempre Viva Roads and Enrico Fermi Drive. It improves operations by redirecting southbound truck traffic onto a dedicated truck route while providing ample truck storage. It minimizes the impact on present land use plans and provides for "direct" system access from east Otay Mesa. The concerns regarding weaving and an excessive number of decision points due to the close proximity of interchanges have been accommodated by using connectors and eliminating various moves. It also reduces congestion on local roads due to international border traffic traveling through the Otay Mesa Community. However, it does have some disadvantages:

- It does not attain standard interchange spacing (exception approval required by FHWA/ Caltrans)
- It increases scope of the present SR-905 envelope
- It may impact border patrol operations
- It provides only partial access at Otay Mesa Road
- It increases cost over the "original concept" (extends the boundaries of the study area, thereby increasing the overall environmental evaluation, design and construction costs of the project)

The priority two alternatives (Nos. 1 and 45), although not feasible as stand-alone suggestions, could serve as springboards for further development and be combined to become viable options. Alternative No. 1 recommends moving the entire SR-905/SR-125 interchange to a point east of Sanyo Road while Alternative No. 45 proposes to provide frontage roads along the SR-905 corridor.

The remaining two alternatives were classified as priority three. As such, they have numerous disadvantages that render them unacceptable as "stand alone" alternatives in their present state of development. However, they should be seriously reviewed as portions of these alternatives could be used as seeds of new ideas for consideration. The technical panel brainstormed an additional 56 alternatives that were not pursued due to various flaws.

A **Summary of Alternatives** follows this section indicating all of the alternatives developed by the VA Team.

SUMMARY OF ALTERNATIVES

Project	PROPOSED SR-905/SR-125 INTERCHANGE	Sheet No. 1 of 1
ALT. NO.	DESCRIPTION	PRIORITY
80	Composite design alternative The basis for Alternative No. 80 was Alternative No. 13 (Provide a half diamond access at La Media, Otay Mesa and Lonestar Roads with full access at Siempre Viva Road) with pieces of Alternative Nos. 8A, 9, 32, 39, 43 & 46, and 48	1
1	Move the SR-905/SR-125 interchange east of Sanyo Avenue	2
45	Provide frontage road along SR-905	2
6	Use collector/distributor roads	3
8	Provide a full interchange at La Media Road with braided ramps	3
10	Provide full access at La Media Road and Enrico Fermi Drive with half access at Otay Mesa Road	3
16, 17, 50 & 53	Provide a separate and parallel truck facility	3
27, 51 & 52	Design and construct all or portions of SR-905 as an expressway from Caliente Boulevard/Palm Avenue to the Otay Mesa P.O.E.	3
29 & 30	End SR-125 at either La Media or Lonestar Road	3
36	Provide an exclusive southbound truck facility	3
42	Provide an off ramp to La Media Road from SR-125 only	3
44	Loop off ramp from northbound SR-125 at Otay Mesa Road to eliminate north to west movement at La Media Road	3
54	Design and construct all or portion of SR-905 as an expressway with a separate truck facility	3
61	Separate northbound traffic destined for Otay Mesa Road east of Otay Mesa Road	3
66, 67 & 70	Move SR-905/SR-125 interchange to La Media Road	3
78	Use Intelligent Transportation System (ITS) to achieve desired efficient operation based on updated standards	3

VALUE ANALYSIS ALTERNATIVE	
Project: **PROPOSED SR-905/SR-125 INTERCHANGE**	**ALTERNATIVE NO. 80**
Description: **Composite Design Alternative**	Sheet No. 1 of 3

ORIGINAL CONCEPT: (See attached sketch _____)

In order to achieve optimum safety and operation of the freeway system, Caltrans standards require local access interchanges in an urban setting to be spaced at intervals of no less than 1.5 kilometers (km) (0.93 miles), or no less than 3.0 km (1.86 miles) from a freeway-to-freeway interchange.

In the case of the SR-905/SR-125 freeway-to-freeway interchange, local planning has taken place on the basis of local access interchanges being provided at La Media and Otay Mesa Roads, 1.61 km (1.0 mile) to the west and 0.4 km (0.25 mile) to the north, respectively.

For traffic assumptions, see page 115 in the "Information Phase" section of this report.

PROPOSED CHANGE: (See attached sketch X)

- Provide access at La Media Road with provisions to: 1) have eastbound (EB) on-ramp to SR-905 as warranted by traffic or operational needs; and 2) have a northbound (NB) off-ramp from SR-905 from the Otay Mesa Port of Entry (P.O.E.)
- Provide full access at SR-125/Lonestar Road
- Provide southbound (SB) SR-125 to westbound (WB) SR-905 connector to an off-ramp at La Media Road (a designated P.O.E. destination truck route). In addition, provide a connector from SB SR-125 to WB SR-905.
- Provide half diamond at SR-125/Otay Mesa Road
- Provide system connection to Enrico Fermi Drive (both SR-905 and SR-125)
- Designate and provide separate SB truck route along border via SB La Media Road
- Provide NB truck freeway system access via Enrico Fermi Drive at "system" connection to Enrico Fermi Drive Upgrade Enrico Fermi Drive from Siempre Viva Road to Enrico Fermi Drive system connection to accommodate the NB truck route

VALUE ANALYSIS ALTERNATIVE	
Project: **PROPOSED SR-905/SR-125 INTERCHANGE**	**ALTERNATIVE NO. 80**
Description: **Composite Design Alternative**	Sheet No. 2 of 3

ADVANTAGES:

- Provides local access at La Media, Lonestar, Otay Mesa, and Siempre Viva Roads, and Enrico Fermi Drive (access provided at La Media Road due to local traffic and the SB truck route to the border)
- Improves operations due to removal of SB trucks to designated truck route while providing ample truck storage along the border
- Minimizes impacts to land use plans
- Additional direct "system" access for East Otay Mesa
- Weaving concerns and excessive number of decision points due to the close proximity of interchanges have been accommodated by using connectors and eliminating various moves
- Reduces congestion on local roads due to international border traffic traveling the Otay Mesa Community

DISADVANTAGES:

- Standard interchange (IC) spacing not attained
- Increases scope of SR-905 document
- Unknown Border Patrol operational impacts
- Full access not provided at Otay Mesa Road
- Adds cost to current proposals
- 100-year flood zone at La Media

DISCUSSION:

Accommodates most local concerns, such as:

- Caltrans standards requiring local access interchanges in an urban area setting to be spaced no less than 30 km (1.86 miles) from a freeway-to-freeway interchange
- Local access interchanges at La Media and Otay Mesa Roads, 1.61 km (1.0 mile) to the west and 0.4 km (0.25 mile) to the north, respectively, of the SR-125 interchange. Local planning has taken place assuming these access interchanges
- Local access at the southern end of the SR-905 at Siempre Viva Road

Further analysis is required to determine viability regarding operational and safety concerns on both local and regional facilities.

(This alternative is a compilation of alternative numbers 13, 8A, 9, 32, 39, 46/43, and 48. They follow immediately behind this narrative as backup data and further information.)

NOTE:

- This network (Series 8) has not been calibrated.
- The year 2020 land use reflects 50% build-out.
- Siempre Viva Road interchange at SR-905 is coded as a full interchange (as intersection)

#80

3 of 3

NORTH

OTAY MESA RD

END OTAY MESA RD
BEGIN SR-905 P.M. 0.0

OTAY MESA RD

NB SLIES TO LA MEDIA WILL BE CONSTRUCTED UNDER DW NEED

BEGIN FUTURE 905 INCORPORATE

OTAY MESA-NESTOR

SR-905

ST ANDREWS AVE

LA MEDIA RD

SANTO AVE

Loop from La Media to EB 905. IS conditioned on operational analysis and need. Alternate will be La Media NB to Lonestar.

AIRWAY RD

AIRWAY RD

6 LANE

AVD

COSTA AZUL

AVD COSTA BLANCA

AVD COSTA DEL SOL

SB TRUCK ROUTE (OU LA MEDIA)

HARVEST ROAD

PASEO DE LAS AMERICAS

SIEMPRE VIVA RD

MICHAEL FARADAY

SIEMPRE VIVA RD

OTAY CTR DR

ROCK DR

CHP TRUCK INSPEC.

VIA DE LA AMISTAD

VIA DE LA AMISTAD

CUSTOM HOUSE PLAZA

Border Truck Inspection

Truck Access

DRUKER LANE

this portion in 150' buffer area

Caltrans

ATTACHMENT 11

TABLE 10.1
PAGE 1/1

11-SD-805, 905
KP 3.1/4.2, 8.4/R18.6
11224-093160
December, '03

STRUCTURAL SECTION DESIGN - mm

LOCATION OR LINE	DESIGN R-VALUE	TRAFFIC INDEX	PCC SURFACE (mm)	AC SURFACE (mm)	AC BASE (mm)	AB CLASS 2 (mm)	AS CLASS 4 (mm)	FOUNDATION TREATMENT (mm)	TOTAL THICKNESS (mm)
ROUTE 905 MAIN LINES:									
PCC Alternate	5	12.5	260		150	215	375	200	1200
ROUTE 905 SHOULDERS:									
Inside PCC Alternate	5	8.0	260		150	215	375	200	1200
Outside PCC Alternate	5	8.0	185-260		105	120	500-515	200	1110-1200
ROUTE 905 RAMP LINES:									
AC Alternate 1	5	12.5		195		420	360		975
AC Alternate 2	5	12.5		195		750			945
PCC Alternate	5	12.5	260		150	215	375	200	1200

Calculations By: JLS

ATTACHMENT 12

Mitigation and Compliance Cost Estimate

11-SD-805, 905 KP 3.1/4.2, KP 8.4/R18.6 EA: **093160**

Project Description:

ON ROUTE 905 IN SAN DIEGO COUNTY FROM 0.1 KILOMETER EAST OF ROUTE 805 TO THE OTAY MESA BORDER CROSSING AND ON ROUTE 805 FROM 0.2 KILOMETER NORTH OF ROUTE 905 TO 0.4 KILOMETER SOUTH OF PALM AVE. OC.

Person completing form/Dist. Branch.:	C. W. Davis	D11 - Design	619-688-3156
Project Manager:	Randy Sanchez		619-688-6728
Date:	6/27/2004		

	Mitigation			Compliance
	Project Feature[1]	Enviro. Obligation[2]	Statutory Require.[3]	Permit & Agreement[4]
Fish & Game 1601 Agreement				
Coastal Development Permit	$0	$0	$0	$0
State Lands Agreement				
NPDES Permit				
COE 404 Permit - Nationwide				
COE 404 Permit - Individual				
COE Section 10 Permit				
COE Section 9 Permit				
Other:				
Noise attenuation	$406			
Special landscaping				
Archaeological		$100		
Biological	$3,715			
Historical				
Scenic resources				
Wetland/riparian	$3,010			
Other:				
TOTAL (Enter zeros if no cost)	$7,131	$100	$0	$0

*Costs are to be reported in $1000's

*Costs are to include all costs to complete the commitment including: capital outlay and staff support; cost of right-of-way or easements; long-term monitoring and reporting, and; any follow-up maintenance.

*After approval by the Project Manager a copy of the completed form is to be included in the PR/PSSR and a copy sent to Headquarters Environmental Program, attention: John Hebner

[1]Mitigation Caltrans would normally do if not required by a permit or environmental agreement.

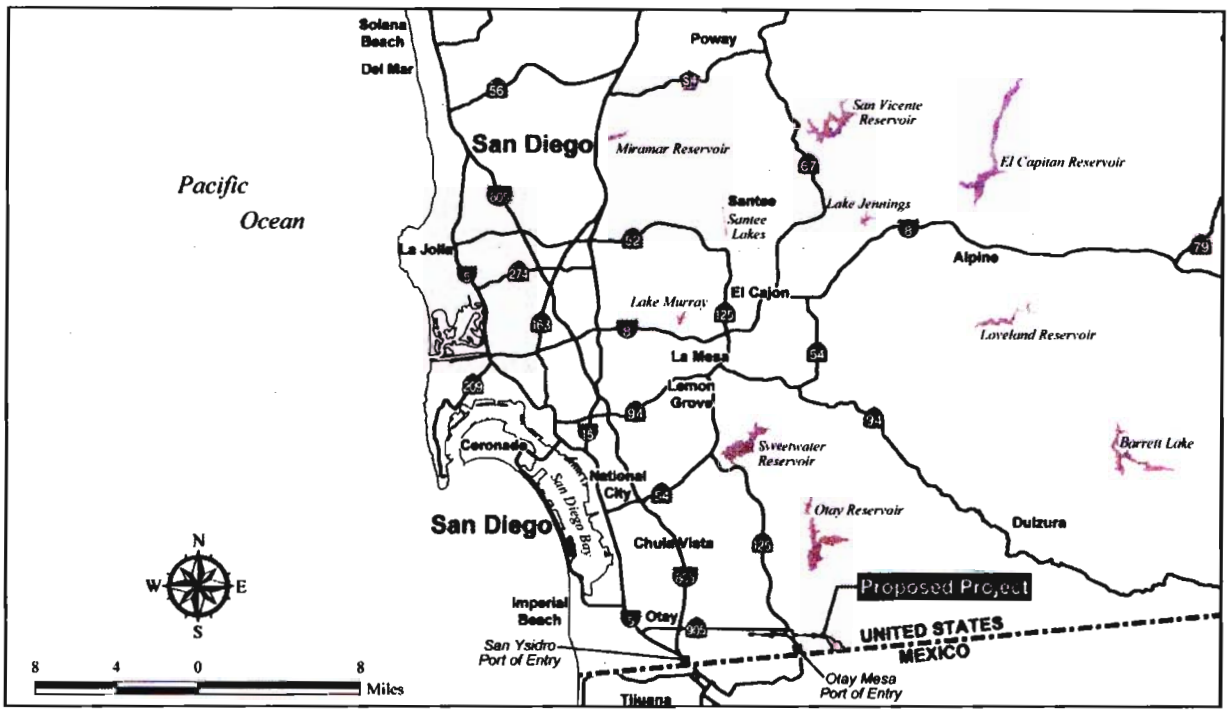
[2]Mitigation Caltrans would not normally do but is required by conditions of a permit or environmental agreement.

[3]Mitigation Caltrans would not normally do and is not required by a permit or environmental agreement but is required by law.

[4]Non-mitigation Caltrans would not normally do but is required by conditions of a permit or agreement.

11-D-11
P.M. 0.0/2.8
11-SD-905
P.M. R8.4/10.1
11-SD-125
P.M. 0.5
1100000023
EA 056310
March 2012

ROUTE 11 PROJECT REPORT



CONSTRUCTION OF A NEW STATE ROUTE AND PORT OF ENTRY IN SAN DIEGO COUNTY IN AND NEAR SAN DIEGO ON ROUTE 11 FROM ROUTE 905/11 SEPARATION TO MEXICO, AND ON ROUTE 125 FROM 0.8 MILES NORTH OF ROUTE 905/11 SEPARATION TO ROUTE 905/11 SEPARATION, AND ON ROUTE 905 FROM 0.1 MILE WEST OF BRITANNIA BOULEVARD OVERCROSSING TO ROUTE 905/11 SEPARATION.

I have reviewed the right-of-way information contained in this Project Report and the Right-of-Way Data Sheets attached hereto, and find the data to be complete, current and accurate:

Janet Schaffer, DISTRICT DIVISION CHIEF-RIGHT OF WAY

APPROVAL RECOMMENDED BY:

Nicola Bernard, DESIGN MANAGER

CONCURRED BY:

Jacqueline Appleton-Deane, PROJECT MANAGER

APPROVED BY:

Mario Orso, TCIF CORRIDOR PROJECT DIRECTOR

APPROVED BY:

Bruce April, DISTRICT DIVISION CHIEF-ENVIRONMENTAL

APPROVED BY:

Ross Cather, DEPUTY DISTRICT DIRECTOR PROJECT MANAGEMENT

This Project Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Brooke V. Emery 03/27/12

Brooke V. Emery–REGISTERED CIVIL ENGINEER, CA C77620 *DATE*

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List of Acronyms

ac	acre
BMPs	Best Management Practices
BRCA	Biological Resource Core Area
BSA	Biological Study Area
CAA	Clean Air Act
Caltrans	California Department of Transportation
CAPM	Capital Preventive Maintenance
CBIP	Coordinated Border Infrastructure Program
CBP	Customs and Border Protection
CDFG	California Department of Fish and Game
CHP	California Highway Patrol
CIA	Community Impact Assessment
COBRO	Committee on Binational Regional Opportunities
COOP	cooperative agreements
CRWQCB	California Regional Water Quality Control Board
CTC	California Transportation Commission
CVEF	Commercial Vehicle Enforcement Facility
CWA	Clean Water Act
DEMO	Demonstration
DOS	U.S. Department of State
EIR/EIS	Environmental Impact Report/Environmental Impact Statement
EO	Executive Order
EOMSP	East Otay Mesa Specific Plan
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FRTIP	Federal Regional Transportation Improvement Plan
FT	Foot
GSA	General Services Administration
HDM	Caltrans Highway Design Manual
HMA	Hot Mix Asphalt
HOV	High Occupancy Vehicle
HPP	High Priority Projects
I-5	Interstate 5
I-805	Interstate 805
IBWC	International Boundary and Water Commission
ISA	Initial Site Assessment
ITS	Intelligent Transportation Systems
JPCP	Jointed Plain Concrete Pavement
kV	Kilovolt
LCCA	Life Cycle Cost Analysis
MEP	Maximum Extent Practicable
MHPA	Multi-Habitat Planning Area
MOU/MOA	memorandums of understanding/memorandums of agreement
MPO	metropolitan planning organization
MSCP	Multiple Species Conservation Program
NADR	Noise Abatement Decision Report
NAFTA	North American Free Trade Agreement
NHS	National Highway System
NPDES	National Pollution Discharge Elimination System
O&M	Operations and Maintenance
OE/AAA	Obstruction Evaluation/Airport Airspace Analysis
PA&ED	Project Approval and Environmental Document Phase
PCR	Program Change Request
PDS	Program Development Study
PDT	Project Development Team
PEIR/PEIS	Program Environmental Impact Report/Phase I Environmental Impact Statement
POE	Port of Entry
PS&E	Plans, Specifications, and Estimate
PSR	Project Study Report
R/W	Right-of-Way
ROD	Record of Decision
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
RWQCB	San Diego Regional Water Quality Control Board
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SANDAG	San Diego Association of Governments
SB	Senate Bill
SDAB	San Diego Air Basin
SIP	State Implementation Plan
SR	State Route
SSP	Standard Special Provisions
STAA	Surface Transportation Assistance Act
SWDR	Storm Water Data Report
SWMP	Caltrans Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resource Control Board
T&RS	Traffic and Revenue Study
TCIF	Trade Corridor Improvement Fund
TMC	Transportation Management Center
TMP	Transportation Management Plan
TSM/TDM	Transportation Systems Management/Transportation Demand Management
U.S.	United States
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VA	Value Analysis
VIA	Visual Impact Assessment
WIM	Weigh-in-motion
YR	Year

1. INTRODUCTION

The project presented in this document (referred to herein as the "proposed project" or "project") includes the following major elements: State Route (SR-) 11, a United States (U.S.) Federal Port of Entry (POE), and a State of California Commercial Vehicle Enforcement Facility (CVEF). The proposed project is located in southwestern San Diego County. It is proposed to construct a new four-lane toll highway, SR-11, that would extend from the future SR-905/SR-125 Interchange approximately 2.7 miles east to the proposed Otay Mesa East POE in the City of San Diego's Otay Mesa area and in the County of San Diego's East Otay Mesa area. This project will reduce border wait times and border traffic congestion, and create a link between the U.S. regional highway system and the Mexico free and toll road systems. The estimated total cost for this project is $754.5 Million (2011 dollars).

The project is proposed to be funded from a combination of sources including the Trade Corridor Improvement Fund (TCIF) and Local Transportation Funds generated from the sale of bonds for the toll facility. This project has been assigned the Project Development Processing Category 1 because it requires access control, new right-of-way, adoption of a route location by the California Transportation Commission (CTC), and Freeway Agreements. Construction is proposed to begin in the fall of 2013.

The California Department of Transportation (Caltrans), in partnership with the San Diego Association of Governments (SANDAG), the toll authority, is responsible for project development and construction, including securing applicable funding. SANDAG would work in cooperation with the U.S. General Services Administration (GSA) and U.S. Customs and Border Protection (CBP) to develop and construct the POE. Caltrans and SANDAG would also coordinate with California Highway Patrol (CHP) to develop and construct the CVEF. Coordination with federal and state resource agencies will be sought by the Federal Highway Administration (FHWA) and Caltrans for environmental approval.

2. RECOMMENDATION

It is recommended that the project be approved using the Preferred Alternative and proceed to the Design Phase.

All affected local agencies have been consulted with respect to the recommended plan, their views have been considered, and they are in general accord with the plan as presented.

3. BACKGROUND

3.1 Project History

As population, traffic, and trade have generally shown a steady rate of growth in the San Diego-Tijuana border region, State and local transportation and land use agencies in California and Baja California have identified the need for additional access and transportation facilities to connect the regions of San Diego and Tijuana. The existing border crossings in the region are located in San Ysidro and Otay Mesa. The San Ysidro

POE provides a non-commercial crossing to approximately 33.3 million people annually using various modes of travel[1], while the Otay Mesa POE provides both commercial and non-commercial crossing to approximately 1.5 million commercial trucks and 6 million non-commercial vehicles annually.[2] These POEs frequently experience long delays for both commercial and non-commercial vehicles. Ultimate capacities are being reached and although some improvements are planned, limited available right-of-way, rugged terrain and surrounding development constrain further expansion. Improvements to the existing Otay Mesa transportation corridor (U.S. and Mexico) are constrained by adjacent residential, commercial, and industrial development. Tijuana land use agencies have indicated that the residential, commercial and industrial urbanization, along with the difficult terrain adjacent to the U.S.-Mexico border between the Pacific Ocean and the San Ysidro Mountains, have severely limited the number of remaining options for a future border crossing between San Diego and Tijuana.[3] Currently, a limited and decreasing number of sites are available in the Otay Mesa area.

The international component of a border crossing requires the coordination between the U.S. and Mexico. A Letter of Intent entitled "Binational Corridor Preservation for State Route 11 – Tijuana/Rosarito 2000 and Site Designation for the East Otay Mesa-Mesa de Otay II Port of Entry", referred to as the SR-11 Letter of Intent, included support for the creation of a new international border crossing facility designated as East Otay Mesa - Otay II. Coordination is critical to the success of delivering the U.S. and Mexico projects on similar schedules. The U.S. POE and Mexico POE, as well as a CVEF and connecting roadways on each side of the border must all be operational prior to utilization of the new crossing. The SR-11 Letter of Intent was signed in 1998 by the following agencies:

- Caltrans District 11
- County of San Diego
- City of San Diego
- SANDAG
- Municipality of Tijuana
- Municipality of Playas de Rosarito
- Secretariat of Human Systems and Public Works of the State of Baja California Human Settlements

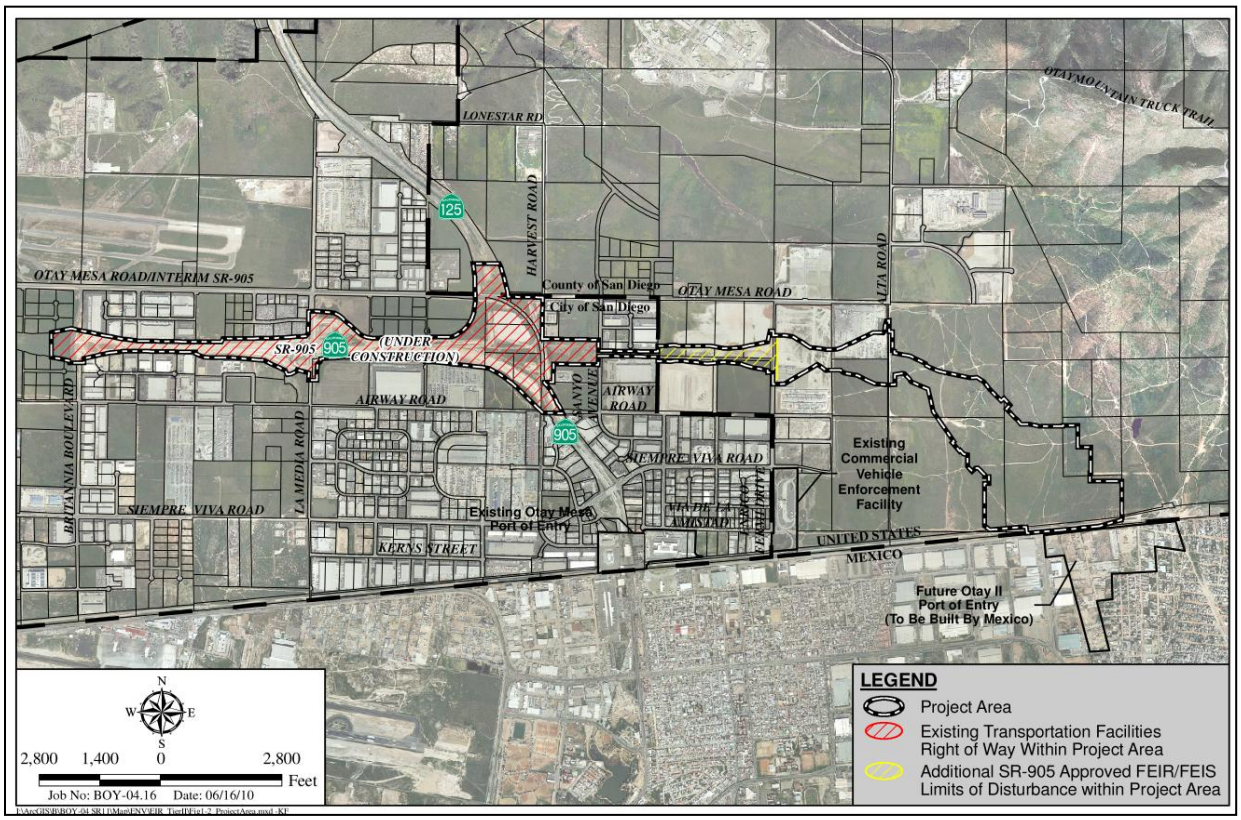
The SR-11 and Otay Mesa East POE facilities have been studied under a two-tier process: a first tier, "Phase I", programmatic level study, and a second tier, "Tier II", project level study. The two-tier process was selected because it would allow for critical milestones to be achieved earlier in the project. The milestone of an Approved Presidential Permit allowing for a crossing at the international border required environmental documentation of the proposed program. A POE would not be approved for operation without this. With a Phase I Record of Decision (ROD) dated October 3, 2008, a corridor for SR-11 was preserved, allowing San Diego County to proceed with adjacent development.

[1] SANDAG, San Ysidro Port of Entry Reconfiguration Mobility Study, January 2010
[2] CALTRANS, SR905/125 Interchange at Otay Mesa Port of Entry TBCR Program Application
[3] SANDAG, 2007 Regional Transportation Plan White Paper: Crossborder Transportation, December 2006

In Phase I, a Programmatic Environmental Impact Report/Phase I Environmental Impact Statement (PEIR/PEIS) was prepared and certified to evaluate SR-11 and the POE at a programmatic level. The purpose of Phase I was to identify the preferred SR-11 corridor and POE site, and allow for the following:

- Consideration and approval of a Presidential Permit for the location of an International Border Crossing by the U.S. Department of State (DOS)
- Facilitation of land use and circulation planning in the East Otay Mesa Specific Plan (EOMSP) area by local agencies
- Support of international cooperation efforts to pursue the development of a new Otay Mesa East POE
- Future designation of right-of-way for each facility in cooperation with local and regional jurisdictions to ensure the right-of-way is shown conceptually on planning documents

The Tier II EIR/EIS, supported by this Project Report, is scheduled to be completed Spring 2012. The study area was based on the preferred corridor identified in Phase I and modifications to the approved SR-905 project required to construct the project (see Figure 1). The Tier II Draft EIR/EIS was published on November 24, 2010 and circulated for comment.



Source: Helix Environmental, Draft Tier II Community Impact Assessment for State Route 11 and Otay Mesa East Port of Entry, July 2010

Figure 1 - Tier II Study Area

The history of the project can be summarized as follows:

- **1994** SR-11 legislated into the state highway system
- **1998** SR-11 Letter of Intent signed
- **1999** SR-11 added to the California freeway and expressway system
- **1999** SR-11 amended to the Circulation Element of the County of San Diego General Plan
- **2000** SR-11 Project Study Report (PSR) approved by Caltrans District 11
- **2005** SR-11 identified as an area of opportunity to create an effective binational planning partnership by SANDAG Borders Committee
- **2005** SR-11 included on SAFETEA-LU List of High Priority Projects in San Diego
- **2007** SR-11 included in SANDAG's 2030 Revenue Constrained Regional Transportation Plan (RTP)
- **2007** SR-11 amended into the County Specific Plan
- **2007** The Otay Mesa East-Mesa de Otay Binational Corridor Strategic Plan was approved by the SANDAG Board of Directors, the SANDAG Borders Committee on Binational Regional Opportunities (COBRO) and the Tijuana City Council
- **2008** SR-11 Phase I Project Report approved by Caltrans District 11
- **2008** ROD granted to the SR-11 Phase I EIS
- **2008** SR-11 included in the Regional Transportation Improvement Program (RTIP)
- **2008** Senate Bill (SB) 1486 approved, granting authority to SANDAG to operate a toll facility on SR-11
- **2008** Conditional Presidential Permit was granted by DOS for the "piercing of the border"

The SR-11 PSR, completed in 2000, identified three alternative alignment locations, a no build alternative, and a local road alternative. The Phase I Project Report for SR-11, completed in 2008, identified a preferred corridor, the Western Alternative, to be studied further in the Tier II process. The Tier II Draft Project Report, published in November 2010, studied multiple alternatives with several variations, with analysis resulting in the recommendation of the project described in this Project Report.

Planned project funding involves the collection of a toll or user fee for the use of SR-11. The revenue generating capability outlined in SB 1486 authorizes the project to be financed in a non-traditional way, through a public-public partnership. SANDAG will serve as the Toll Authority per SB 1486. This type of financing strategy is a mechanism whereby capital infrastructure projects are funded and built through a partnership of only public agencies through the sale of bonds. A Traffic and Revenue Study (T&RS) is currently being jointly prepared by SANDAG and Caltrans to study the revenue generating capability of the project through tolling.

3.2 Community Interaction

Due to the widespread financial and social effects of an international POE on the surrounding communities and region, efforts have been made to involve a variety of stakeholders in the project development process. The Project Development Team (PDT) for the Project includes representatives from FHWA, GSA, CBP, SANDAG, County of San Diego, and City of San Diego, as well as Caltrans. It has also included participants representing Sempra Energy/SDG&E, Regional Water Quality Control Board (RWQCB),

U.S. Border Patrol, CHP and financial institutions. The PDT was formed to facilitate and coordinate delivery of the project. The first PDT meeting was held on March 20, 2007 and continues to meet regularly.

Presentations describing the project features and planned schedule have been given to various groups and committees including but not limited to the SANDAG Borders Committee on March 23, 2007, with an updated presentation on February 25, 2011. Multiple meetings with property owners, Otay Mesa Chamber of Commerce, Otay Mesa Property Owners Association, and several organizations in Mexico have been held to maintain the flow of information to and from project stakeholders.

Public scoping meetings were held on June 6, 2007 and December 4, 2008 at Ocean View Hills Elementary School in Otay Mesa with invitations extended to government officials and resource agencies in the U.S. and Mexico, as well as to members of the local chamber of commerce, residents, and area land owners. The meetings were advertised in the San Diego Union Tribune, and two Spanish language newspapers circulated in the San Diego region. Both public scoping meetings were an open house format. The first of which included several exhibits showing the corridor alternatives being studied and various features of the project area such as land use, vegetation, wildlife, and biological resources. The second meeting included exhibits showing the alignment, footprint, and biological resources associated with the Draft Project Report Two Interchange, One Interchange and No Interchange alternatives, along with the associated variations.

Public hearings were held on February 20, 2008 and January 19, 2011 at Ocean View Hills Elementary School in Otay Mesa following release of the Phase I Draft PEIR/PEIS and Tier II Draft EIR/EIS, respectively. Exhibits depicting the alternatives and variations were displayed for discussion, and the Draft environmental documents with technical studies were available for review. Attendees generally consisted of local residents and property owners within the project vicinity. Several written comments were received at the Phase I Draft PEIR/PEIS public hearing and no written comments were received at the Tier II Draft EIR/EIS public hearing. Several follow-up presentations were given to stakeholders after the Tier II Draft EIR/EIS and Draft Project Report were published.

3.3 Existing Facilities

SR-11 is a new highway proposed in an area that is largely undeveloped and consists mainly of gently rolling natural grasslands.

The San Diego-Tijuana metropolitan border area includes two POEs, one in San Ysidro and one in Otay Mesa. The San Ysidro POE is served by I-5 and I-805, with southbound vehicles merging to six lanes prior to crossing the border. Otay Mesa is served by SR-905 and SR-125. Commercial traffic in the San Diego-Tijuana metropolitan area is restricted to the Otay Mesa POE where wait times typically exceed two hours.[4] The only current alternative commercial crossing is accessed from SR-94. SR-94 is a principle east-west route that serves outlying rural communities located in the southeastern portion of San Diego County and traverses the cities and communities of San Diego, Lemon Grove, La

[4] SANDAG, Economic Impacts of Wait Times in the San Diego-Baja California Border Region Fact Sheet, September 2007

Mesa, Spring Valley, Casa De Oro, Rancho San Diego, Jamul, Dulzura, Potrero, Campo, and Boulevard to the east. It provides access to SR-188 which provides access to the International Border at Tecate, Mexico. Vehicles in excess of 30 feet in length are restricted from utilizing this crossing due to the rugged terrain and turning movements needed to reach the POE via SR-94.

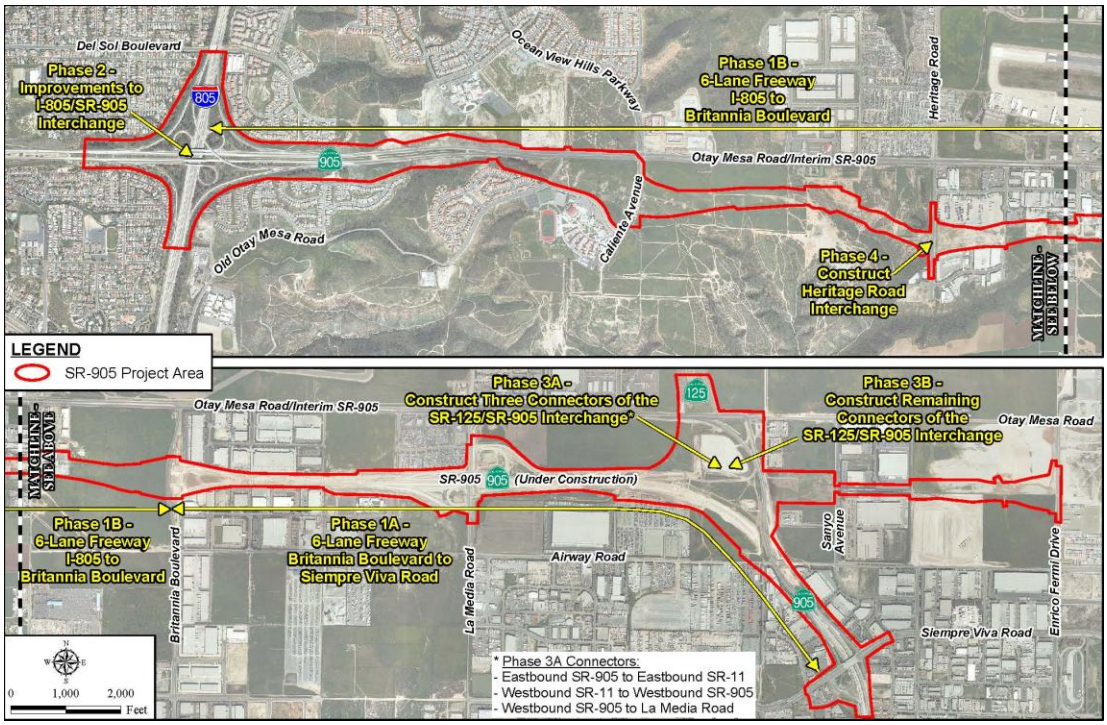
An existing CVEF located on the eastern side of Enrico Fermi Drive between Siempre Viva Road and Via de la Amistad currently serves the existing Otay Mesa POE as a CHP inspection point for northbound commercial vehicles entering the U.S.

SR-125 is a south-north four to eight lane facility from Otay Mesa Road to SR-52 that traverses the cities of San Diego, Chula Vista, La Mesa, El Cajon, Santee, and the unincorporated communities of Bonita and Spring Valley. The southern portion of SR-125 from Otay Mesa Road to SR-54 is tolled as the “South Bay Expressway”.

SR-905 is a principle east-west, six lane, twelve mile route which provides access between the developing Otay Mesa area and other destinations north via I-5 and I-805. It extends from the International Boundary near Border Field Park, 2.8 miles west of I-5, to the International Border Crossing at Otay Mesa. The SR-905 approved project environmental documents[5] include local access ramps between SR-905 and Enrico Fermi Drive. These ramps were intended for local road connection with SR-905 prior to construction of SR-11. The proposed project will replace these local access ramps with direct connectors between SR-905 and SR-11.

The SR-905 ROD (FHWA-EIS-CA-01-03-F/July 23, 2004) approved the construction of SR-905 from I-805 to the Otay Mesa POE. This project is being constructed in the following phases as shown in Figure 2.

[5] Caltrans, Route 905 Final Environmental Impact Statement/Report, July 2004



Source: Final Tier II Environmental Impact Report/Environmental Impact Statement

Figure 2 - SR-905 Construction Phases

Phase 1A: Includes construction of a new freeway from 0.6 kilometers (km) east of Cactus Road to 0.3 km west of the Mexico Border. Construction of this phase was completed in 2011.

Phase 1B: Includes construction of a new freeway from 1.2 km east of the I-805/SR-905 separation to 0.8 km east of the Britannia Boulevard overcrossing. Construction of this phase has started, and is scheduled for completion in 2012.

Phase 2: Includes improvements to the I-805/SR-905 interchange. The westbound SR-905 to northbound I-805 connector would be widened to two lanes. An auxiliary lane along northbound I-805, between SR-905 and Palm Avenue, would be constructed that would include widening of the Del Sol Boulevard undercrossing. Construction of this phase began in Spring 2011 and was completed in January 2012.

Phase 3: Includes construction of the SR-905/SR-125 interchange (see Figure 3). This phase would construct a two lane local access ramp connecting SR-905 east of La Media Road to an intersection at Enrico Fermi Drive. It also includes an undercrossing at Sanyo Avenue, freeway-to-freeway connectors between SR-905 and SR-125, and a local access ramp to Siempre Viva Road from eastbound SR-905.

Phase 4: During this phase, the Heritage Road interchange would be constructed. Should the local streets not receive all the necessary future approvals, this interchange may not be needed or constructed. Phase 4 is anticipated to be under construction no sooner than Fall 2016.

Since construction of proposed SR-11 will require modifications to Phase 3 of SR-905, it is proposed to incorporate part of this phase into the SR-11 project. The local access ramps at Enrico Fermi Drive would be replaced by the western portion of SR-11, including the connectors between SR-11 and SR-905. To this end, Phase 3 of the SR-905 project has been separated into two phases, 3A and 3B, through a Program Change Request (PCR). The PCR was approved by Caltrans Headquarters in September 2011 and by the CTC in January 2012.

Phase 3A includes three connectors; eastbound SR-905 to eastbound SR-11, westbound SR-11 to westbound SR-905 and a westbound SR-905 exit ramp to La Media Road. (An interim exit ramp from westbound SR-905 to La Media Road was included in the construction of SR-905 Phase 1A.)

Phase 3B includes the remaining connectors associated with the original SR-905 Phase 3; connectors between SR-125 and SR-905, eastbound SR-905 and westbound SR-11 connectors to northbound SR-125, and the eastbound SR-905 to Siempre Viva Road exit ramp. This part of phase 3 will remain unfunded. There is no set construction start date for this phase.

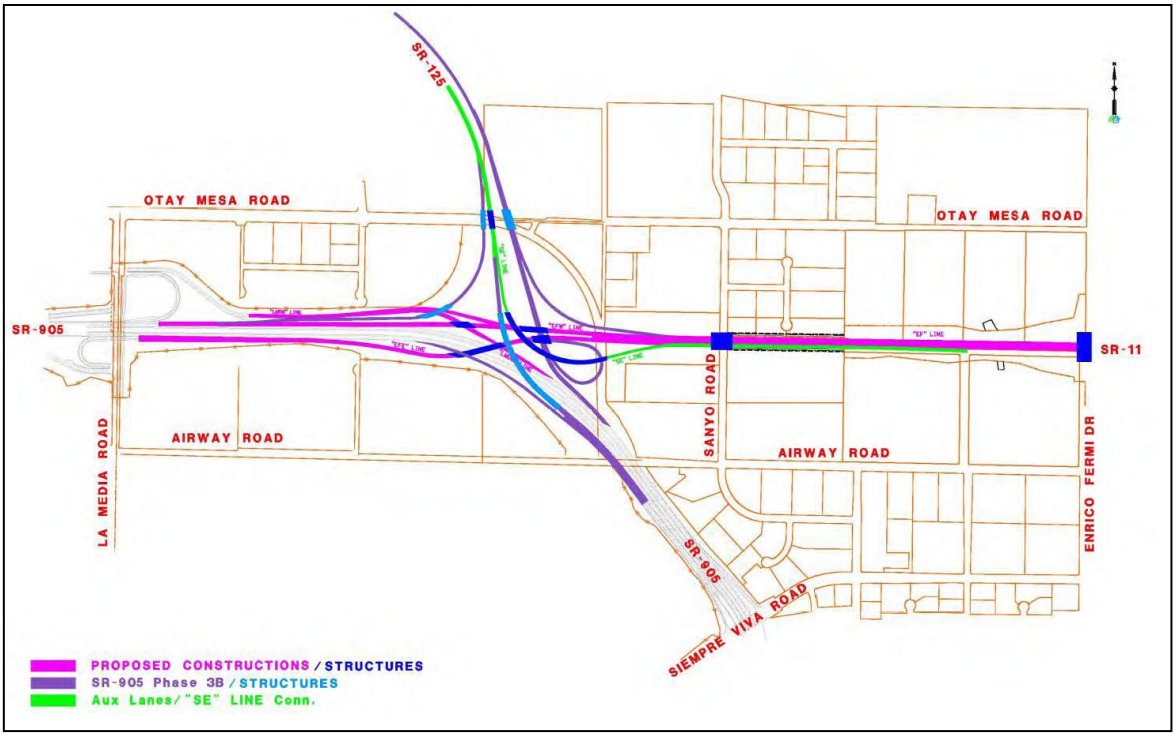


Figure 3 - SR-905/SR-125/SR-11 Interchange

An interim exit ramp from westbound SR-905 to La Media Road was included in the construction of SR-905 Phase 1A. The SR-11 project requires removing this interim ramp and placing a permanent ramp to accommodate construction of the westbound SR-11 to westbound SR-905 connector.

4. PURPOSE AND NEED

4.1 Problem, Deficiencies, Justification

To reduce congestion and facilitate increased trade and personal travel across the U.S.-Mexico border, in the San Diego-Tijuana area, there is a need for SR-11, the CVEF, and the POE.

Capacities of the existing POEs in the region are being exceeded, causing delays for commercial and non-commercial vehicles crossing the border; delays are expected to increase as trade and travel in this area grow. The long-term need for a third regional crossing has been identified by both transportation and land use planning agencies on both sides of the border.

With construction of the Otay Mesa East POE, SR-11 becomes a critical facility to connect U.S. and Mexico POEs with the regional highway system north of the border. In the absence of SR-11, the planned County Roads would not be adequate to carry the commercial and non-commercial vehicle traffic expected to flow through the new POE.

In order to insure regulatory and safety compliance all commercial vehicles entering California from Mexico are required to be weighed and inspected at a CVEF after passing through a POE and prior to travel on U.S. roadways.

A January 2006 joint SANDAG/Caltrans study, *Economic Impacts of Wait Times at the San Diego – Baja California Border,* reported that a 45-minute wait yields an annual $2.8 billion loss to the U.S. economy. Under the existing conditions, the delays at the Otay Mesa POE for commercial freight crossings generated an estimated loss for the San Diego economy that ranged from a low of $212 million in output (direct, indirect, and induced) to a high of nearly $1.2 billion in 2008. The median estimated impact was $468 million for 2008. The estimated loss in employment (direct, indirect, and induced) for the San Diego economy ranged from a low of 1,127 jobs to a high of 6,301 jobs, with the median estimate of 2,525 total jobs lost. In 2008, the delays at the San Diego County POEs for commercial truck crossings generated an estimated loss in total U.S. output that ranged from $584 million to as high as $3.2 billion. Furthermore, the estimated loss in U.S. employment ranged from 3,512 jobs to a high of 19,580 jobs in 2008.[6] Traffic delays would increase and the economic losses incurred by the regional and national economies would more than double in the next ten years unless significant improvements in border crossing and transportation infrastructure and management take place.[7]

The proposed POE, SR-11, and the CVEF are interdependent parts of the project; one cannot be constructed without the other. The Preferred Alternative includes the POE, SR-11, and the CVEF.

[6] HELIX Environmental, Final Tier II Community Impact Assessment for State Route 11 and Otay Mesa East Port of Entry, November 2010
[7] SANDAG/Caltrans, Economic Impacts of Wait Times At The San Diego – Baja California Border, January 2006

4.2 Regional and System Planning

4.2.1 Identify Systems

SR-11 was added to the State Highway System in 1994 and the California freeway and expressway system in 1999. All of proposed SR-11 could be included in the National Highway System since it would connect major population centers and international border crossings, and serve interstate and interregional travel. It is expected that proposed SR-11 would be designated as a State Terminal Access Route connecting to the National Network for Surface Transportation Assistance Act (STAA) for trucks.

The California Department of Transportation and the Federal Highway Administration (FHWA), in 1984, signed an agreement designating SR-905 as a future part of the Interstate System. Such designation will be implemented when SR-905 is constructed to Interstate standards. Until then, SR-905, from Interstate (I-) 5 to the International Border is classified as part of the National Highway System. According to 1996 statutes, it is part of the Freeway and Expressway System. From I-5 to the Otay Mesa POE, SR-905 is designated as part of the Oversize Load Highway System.

SR-125 was added to the California freeway and expressway system in 1959 and the National Highway System in 1995.

4.2.2 State Planning

Transportation and land use planning agencies on both sides of the border have identified the need for an additional border transportation corridor in the San Diego-Baja California area. Local, regional and binational land use studies have identified East Otay Mesa as the preferred general location for the new transportation corridor.

Plans to accommodate higher volumes of people and vehicles at the San Ysidro POE and Otay Mesa POE have been undertaken by GSA. Upgrades to and expansion of pedestrian and vehicular inspection facilities through a three-phase plan at the San Ysidro POE are intended to address projected increased demand. The Otay Mesa POE, located on the eastern edge of the City of San Diego, is planned to be modernized but has limited room for further expansion within existing right-of-way boundaries in the U.S. and Mexico.

The project is of statewide significance due to the international commercial traffic having local, state, national, and international (other than U.S. and Mexico) origins and destinations. SR-11 would provide access to the Tijuana-Tecate toll road, established transfer and distribution centers in San Diego and other South Bay communities, and to the State highway system.

4.2.3 Regional Planning

The Metropolitan Planning Organization (MPO) responsible for the preparation of RTPs and RTIPs in the project area is SANDAG. The applicable transportation plan and program for the proposed project are the SANDAG 2050 Revenue Constrained Highway Network of the Regional Transportation Plan (SANDAG 2011); and the 2010 Regional Transportation Improvement Program (RTIP) as amended (SANDAG 2011). The U.S. Department of

Transportation (U.S. DOT) made a finding of conformity for the 2010 RTIP and a conformity redetermination for the 2030 RTP on December 14, 2010 (U.S. DOT 2010).

The RTIP was approved by federal agencies and the U.S. DOT adopted a Clean Air Act (CAA) conformity determination for the RTIP on December 14, 2010. The proposed project is included in the 2010 RTIP on Page 3 of Amendment 2, as MPO ID CAL66 and RTIP # 10-02 (State Route 11 from Border of Mexico east of SR-905/Otay Mesa Border Crossing to Future SR-125/SR-905 junction) (SANDAG 2010). The project Capacity Status is "CI" (Capacity Increasing).

The Preferred Alternative is compatible with the design concept and scope described in the 2030 RTP and conforms to the SIP for air quality. The following table shows that the project is consistent with the regional land use plans.

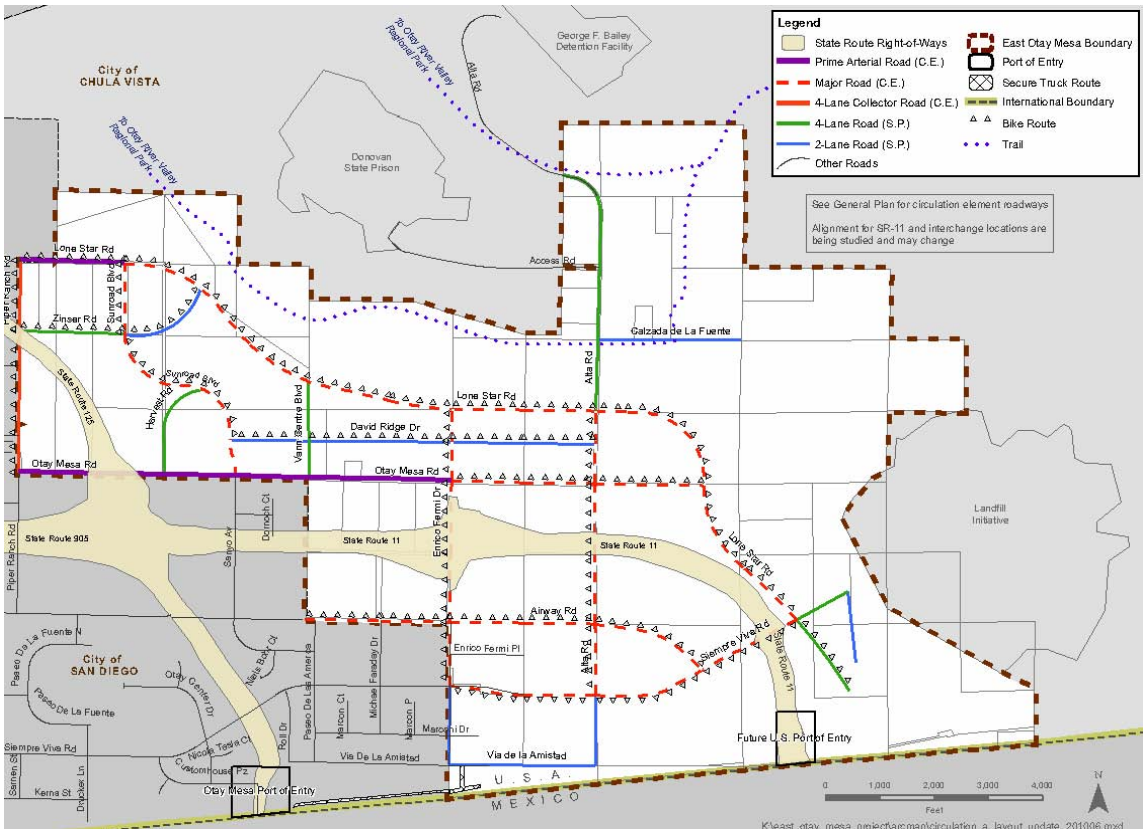
Table 1 - Summary of Regional Land Use Planning

CONSISTENCY OF PROJECT WITH REGIONAL PLANS		
Planning Document	**Description**	**Proposed Project**
Regional Comprehensive Plan	The strategic planning framework for the San Diego region. Addresses the major elements of planning for the region, including urban form, transportation, housing, healthy environment, economic prosperity, public facilities, and border issues.	Consistent
Regional Transportation Plan	The adopted long-range transportation planning document for the San Diego region. Addresses new and improved connections to more efficiently move people and goods throughout the region by providing more convenient, fast and safe travel choices for public transit, ridesharing, walking, biking, private vehicles, and freight.	Consistent
Regional Transportation Improvement Program	A five-year capital improvement program for transportation projects that is updated by SANDAG every two years and reflects the region's priorities for short-range transportation system improvements.	Consistent *

* Based on inclusion of proposed modifications of the SR-905 project in the 2010 RTIP, which is currently in process, prior to project approval.
Source: State Route 11 and Otay Mesa East Port of Entry - Tier II Draft EIR/EIS, November 2010

4.2.4 Local Planning

The project is located in the City of San Diego as well as unincorporated areas of the County of San Diego. The City limit crosses the project alignment approximately 2,000 feet east of Sanyo Avenue. The portion of the project area east of the City limit is located within the EOMSP area of unincorporated San Diego County. The EOMSP area encompasses approximately 3,013 acres of mostly undeveloped land just north of the international border. The area is bounded on the west by the City of San Diego, and on the north and east by two natural landforms, the Otay River Valley and the San Ysidro Mountains, respectively. Development of East Otay Mesa is guided by a Specific Plan (SP 93-004) that was adopted by the San Diego County Board of Supervisors on July 24, 1994. A Specific Plan Amendment (SPA 10-001) was adopted in 2010 (see Figure 4). This plan allocates 2,110 acres for high-intensity commercial and industrial use, 552 acres for low-intensity use (residential, conservation/limited use), and 351 acres for circulation corridors.



Source: East Otay Mesa Specific Plan Amendment, September 2010

Figure 4 - County EOMSP Circulation Element

The project area west of the City limit, within the City of San Diego, includes existing and planned industrial and commercial uses. The Otay Mesa Community planning area is a developing area of the City of San Diego. The area is bounded by the Otay River Valley and the City of Chula Vista on the north, the international border on the south, I-805 on the west, and the County of San Diego on the east. The planned land use of Otay Mesa includes various means of providing commercial, retail, service, and industrial employment. Residential land use is planned with the intent to accommodate a population of 32,000 residents. Presently, the Otay Mesa Community Plan, adopted in 1981, is being updated to establish a framework for future development.

Existing local access to the East Otay Mesa area is limited to four roads within the EOMSP Area: Otay Mesa Road, Airway Road, Alta Road, and Siempre Viva Road. Regional access from the north and west is provided by SR-125 and SR-905, while access from the south is limited to Boulevard Garita de Otay in Tijuana, leading to the Otay Mesa POE. As part of the future traffic circulation system, a more extensive system of roadways would be constructed both within, and adjacent to, the EOMSP area. For the purposes of this report, all adopted circulation elements in the County of San Diego are considered built. Among these are expanded Otay Mesa Road, Alta Road, Airway Road, Siempre Viva Road, and Lone Star Road. Other planned and existing roads both within, and adjacent to, the EOMSP area are shown in Figure 5, which shows the County of San Diego Specific Plan Amendment circulation element as adopted by the County Board of Supervisors in 2007. The following table shows the project is consistent with the local land use plans.

Table 2 - Summary of Local Land Use Planning

CONSISTENCY OF PROJECT WITH LOCAL PLANS		
Planning Document	**Description**	**Proposed Project**
County General Plan	Designates planned land uses that are considered appropriate for each portion of the County. Applicable elements include the Open Space, Regional Land Use, Circulation, Seismic Safety, Conservation, Public Facility, Public Safety, Scenic Highway and Noise elements.	Consistent
Otay Subregional Plan	Designates planned land uses in the Otay subregional area.	Consistent
East Otay Mesa Specific Plan	Establishes standards for development, environmental conservation, and public facilities to implement objectives of the County Diego General Plan and Otay Mesa Subregional Plan.	Consistent
City General Plan	Represents the comprehensive long-term plan for the City's physical development. Applicable elements include the Mobility Element, intended to attain a balanced, multi-modal transportation network that will accommodate forecast capacity needs and foster economic growth, and the Economic Prosperity Element, intended to support a diverse, innovative, competitive, entrepreneurial, and sustainable local economy.	Consistent
Otay Mesa Community Plan	Designates land uses and includes goals for future development, including industrial and commercial activity and international cooperation.	Consistent

Source: State Route 11 and Otay Mesa East Port of Entry - Tier II Draft EIR/EIS, November 2010

4.2.5 Transit Operator Planning

An objective of the project is to allow bicycle and transit access to the POE, including the provision of sufficient space within the overall POE footprint for possible future development of a transit center (to be designed and constructed by others), thereby preserving the opportunity to implement transit service to the POE and reduce local and cross-border personal vehicle trips.

SANDAG prepared a conceptual transit center proposal in 2008 to serve the Otay Mesa East POE. The proposal, *Service Alternatives for Otay Mesa East Port of Entry, South Bay Bus Rapid Transit Project, April 2008,* evaluated the potential extension of Bus Rapid Transit (BRT) or other alternative transit services to the Otay Mesa East POE. Options considered include a variety of alternatives services including extensions of existing or planned bus/BRT service and shuttle service to and from the existing Otay Mesa POE. Routing options considered utilizing SR-11 and Siempre Viva Road to gain access to the POE vicinity.

This project anticipates two to five acres of land would be environmentally cleared within the 100-acre POE footprint for a future transit center site. This transit center is not part of the project and further planning and environmental clearance would be needed.

4.3 Traffic

Traffic volumes and associated freeway operations discussed below are based on the detailed *Tier II Traffic Technical Report State Route 11/Otay Mesa East Land Port of Entry, October 2010* which analyzes conditions for street segments, peak hour intersections, and freeway segments for the Current (2009), Opening Year (2015) and Horizon Year (2035). The traffic volumes shown in the Report are based on the SANDAG regional transportation model Series 11, 2030-year forecast. Since the model's horizon year is 2030 and the horizon year for this project is 2035, a growth factor of 1% per year was used as is typical in the San Diego region.

The results and conclusions for the project are based primarily on roadway and intersection operations, expressed in terms of level of service (LOS). Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions as illustrated in the table below.

Table 3 – Level of Service

Level of Service (LOS)	General Description	Signalized Intersection Description
A	Primarily free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream.	< 10 Second Delay
B	Vehicles operations are reasonably unimpeded. There is only a slight restriction on the ability to maneuver within the traffic stream.	> 10 and < 20 Second Delay
C	Stable operation is provided, but flows approaching the range at which an increase in volume immediately results in a deterioration of service. Drivers are definitely restricted in making maneuvers such as lane changes.	> 20 and < 35 Second Delay
D	Operation is approaching unstable flow. Motorists are severely restricted in carrying out maneuvers such as lane changes.	> 35 and < 55 Second Delay
E	Flow at this level is unstable. Maneuvers such as lane change or merging of traffic from entrance ramps will result in a disturbance of the traffic stream.	> 55 and < 80 Second Delay
F	Operation under this level of service is under forced or breakdown conditions and uniform moving flow cannot be maintained. The flow conditions are such that the number of vehicles that can pass a point is less than the number of vehicles arriving at the point.	> 80 Second Delay

Volumes of traffic are presented as average daily traffic (ADT). ADT is the number of vehicles passing a specific point in a 24-hr period, normally measured throughout a year. The average annual daily traffic (AADT) is the standard measurement for vehicle traffic load on a section of road, and the basis for most decisions in the transportation planning process.

Traffic forecasts for the Preferred Alternative would vary only slightly from the traffic forecasts prepared for the Two Interchange Alternative with the SR-125 Connector Variation except the Preferred Alternative allows for northbound commercial vehicles to cross the international border and proceed directly from the CVEF to Siempre Viva Road

without entering SR-11. The Preferred Alternative would add approximately 1,200 daily truck trips, 119 AM peak hour truck trips, and 108 PM peak hour truck trips to Siempre Viva Road. Analysis determined that the traffic impacts would be the same as those for the Two Interchange Alternative with the SR-125 Connector Variation as reported in the Tier II Traffic Technical Report.

The Preferred Alternative would likely subtract truck trips from other locations, primarily Enrico Fermi Drive, in comparison with the Two Interchange Alternative with the SR-125 Connector Variation due to the Preferred Alternative providing northbound commercial vehicles access to Siempre Viva Road directly from the CVEF.

4.3.1 Current and Forecasted Traffic

4.3.1.1 **Current Traffic**

The Current conditions analysis is based on traffic counts conducted by VRPA Technologies in early 2009. At the time existing roadways and intersections were analyzed and traffic counts attained, the study area was experiencing substantial roadway construction activity. Conditions are expected to continue to change as SR-905 construction progresses. Results from this study indicated level of service E or F at the following locations:

Table 4 – 2009 Level of Service

Location	Peak LOS
Otay Mesa Road from SR-125 to Sanyo Avenue	E
Otay Mesa Road/Sanyo Avenue intersection*	E
Otay Mesa Road/ Alta Road intersection*	E
Airway Road/La Media Road intersection	E
Siempre Viva Road/Paseo De Las Americas intersection	F

*Unsignalized two-way stop controlled intersection. Level of service is shown for worst movement only.

4.3.1.2 **Opening Year 2015**

Based on the traffic study, Opening Year (2015) conditions assume the construction of SR-905 (Phases 1 through 3), SR-125, and three freeway-to-freeway connector ramps (southbound SR-125 to westbound SR-905, eastbound SR-905 to northbound SR-125, and westbound local access ramp from Enrico Fermi Drive to northbound SR-125). It also assumes a number of local roadways are built and development of land as indicated in the SANDAG regional transportation model.

Data in the following table summarizes highway segments on SR-11.

Table 5 – 2015 Traffic Volumes

Location	ADT	Peak Hour (veh/hr)		LOS	
		AM	PM	AM	PM

Eastbound SR-11					
SR-905/SR-125 Interchange to Enrico Fermi Drive	10,800	925	1,131	A	A
Enrico Fermi Drive to Siempre Viva Road	12,000	990	1,299	A	A
East of Siempre Viva Road (Commercial Only)	1,300	105	94	A	A
East of Siempre Viva Road (Passenger Only)	9,700	786	1,115	A	A
Westbound SR-11					
East of Siempre Viva Road (Commercial Only)	1,400	139	137	A	A
East of Siempre Viva Road (Passenger Only)	13,400	1,330	1,206	B	A
Siempre Viva Road to Enrico Fermi Drive	15,800	1,550	1,453	B	B
Enrico Fermi Drive to SR-905/SR-125 Interchange	14,600	1,399	1,381	B	B

SR-11 would be expected to carry 27,800 total vehicles per day at its most heavily traveled point between Enrico Fermi Drive and Siempre Viva Road interchanges. Roadway segments and intersections that were reported to operate at levels of service E and F for current conditions in 2009 are expected to improve to level of service D or better by 2015. No roadway segments or intersections are expected to experience traffic congestion. Roadway improvements planned in the study area between 2009 and 2015 are expected to meet or exceed the need from traffic increases.

All freeway segments on other routes, with the exception of I-805 north of SR-905, will operate at LOS D or better in 2015. I-805 north of SR-905 is forecasted to operate at a LOS F.

4.3.1.3 **Horizon Year 2035**

Horizon Year (2035) conditions are based on completion of Opening Year (2015) improvements and a number of local roadways, as well as development of land as indicated in the SANDAG regional transportation model (Series 11).

Data in the following table summarizes highway segments on SR-11.

Table 6 – 2035 Traffic Volumes

Location	ADT	Peak Hour (veh/hr)		LOS	
		AM	PM	AM	PM
Eastbound SR-11					
SR-905/SR-125 Interchange to Enrico Fermi Drive	30,000	2,805	2,884	B	C
Enrico Fermi Drive to Siempre Viva Road	26,700	2,293	2,793	B	C
East of Siempre Viva Road (Commercial Only)	2,300	186	167	A	A
East of Siempre Viva Road (Passenger Only)	17,200	1,394	1,978	B	B
Westbound SR-11					
East of Siempre Viva Road (Commercial Only)	2,500	248	225	A	A
East of Siempre Viva Road (Passenger Only)	23,600	2,342	2,124	C	C
Siempre Viva Road to Enrico Fermi Drive	33,300	3,173	3,141	C	C
Enrico Fermi Drive to SR-905/SR-125 Interchange	36,600	3,255	3,710	C	C

SR-11 would be expected to carry 66,600 total vehicles per day at its most heavily traveled point between Enrico Fermi Drive and SR-905/SR-125 interchanges. The project would generally reduce traffic or have no effect on intersection operations in the study area. Exceptions resulting in increased traffic occur at the intersections of Otay Mesa Road/La Media Road, Otay Mesa Road/Enrico Fermi Drive, and the SR-905 westbound off ramp at La Media Road.

Six freeway segments on other routes are forecasted to operate at LOS F in 2035. These segments are located on routes SR-125, SR-905, I-5 and I-805.

5. Alternatives

5.1 Viable Alternatives

Three build and one “no-build” alternative, along with several variations were proposed in the Draft Project Report: the build alternatives were identified as the Two Interchange, One Interchange and the No Interchange. The design variations included the SR-905/SR-125/SR-11 Full Interchange, the SR-125 Connector, and the Siempre Viva Road Full Interchange.

A Preferred Alternative was identified following the preparation and review of a Draft Project Report. The Preferred Alternative includes the Two Interchange Alternative with the SR-125 Connector Variation, along with an additional ramp providing a connection for northbound commercial vehicles to access Siempre Viva Road directly from the CVEF.

The Preferred Alternative includes two interchanges that would be constructed along SR-11 at Enrico Fermi Drive and Siempre Viva Road, as well as an undercrossing at Sanyo Avenue and an overcrossing at Alta Road (see Figure 5). Overcrossings would also be constructed at the Enrico Fermi Drive and Siempre Viva Road interchanges. The proposed interchange at Enrico Fermi Drive, located approximately one mile east of the future SR-905/SR-125/SR-11 Interchange, would be a full interchange and have on- and off-ramps to and from both eastbound and westbound SR-11. The proposed interchanges at Enrico Fermi Drive and Siempre Viva Road would be located approximately one mile apart. The Siempre Viva Road interchange would be a half interchange providing eastbound off-ramp and westbound on-ramp access for both commercial and non-commercial vehicles. No access is provided between Siempre Viva Road and the POE for non-commercial vehicles, and only northbound commercial vehicles exiting the CVEF will have access to Siempre Viva Road.

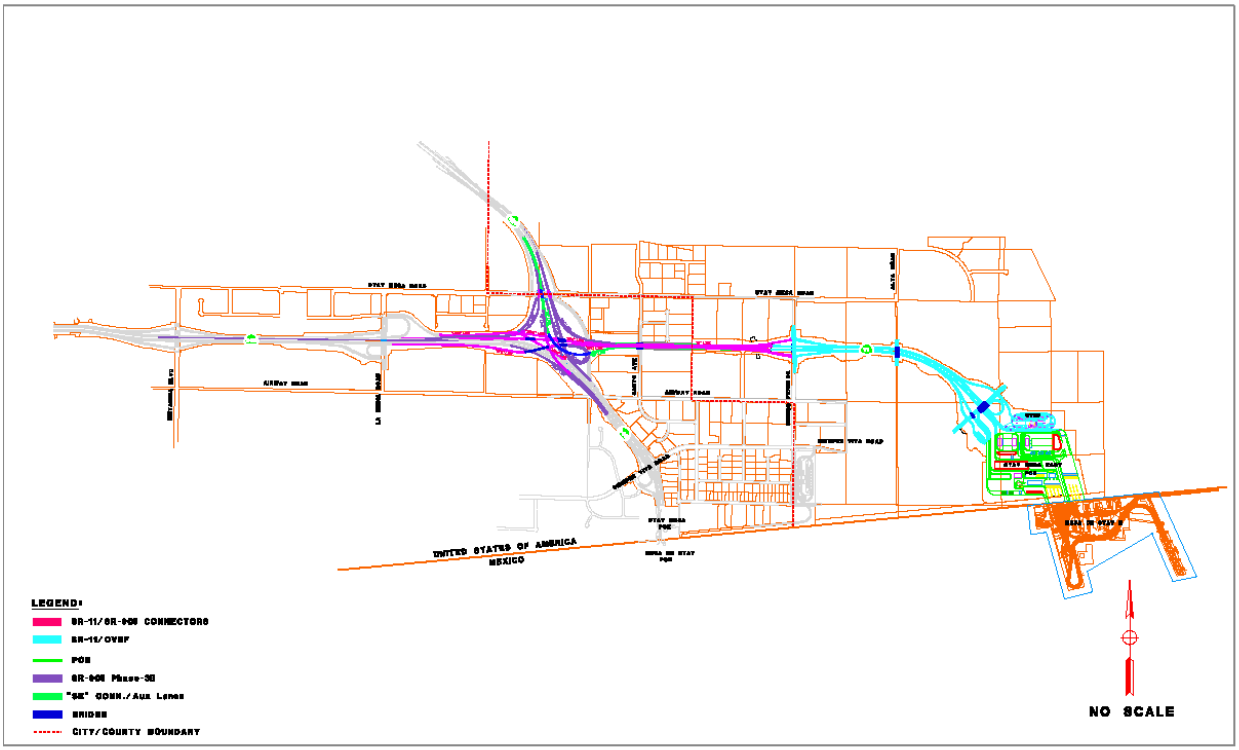


Figure 5 - Preferred Alternative Layout

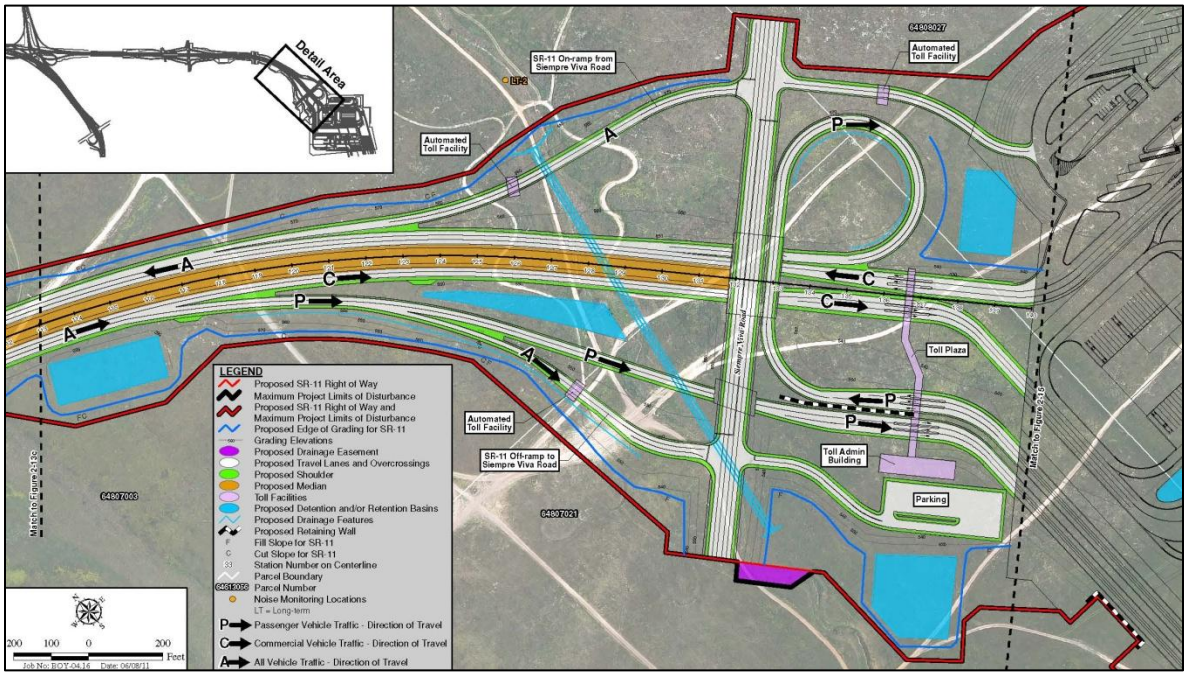
The SR-125 Connector proposes construction of the southbound SR-125 to eastbound SR-11 connector ramp. This connector is identified as part of the Preferred Alternative because southbound SR-125 users seeking access to the new POE could access SR-11 directly instead of exiting to local roads and navigating through several local intersections to access SR-11. The local access connector from Enrico Fermi Drive to northbound SR-125 connector ramp was approved as part of the SR-905 project and this connector would serve as the complementary connection between SR-11 and SR-125 (see Attachment B).

The eastern portion of SR-905 was originally approved to include ramps from SR-905, just west of the SR-905/SR-125 Interchange, to Enrico Fermi Drive along the approximate alignment of the proposed SR-11 and the SR-11/SR-905 Connectors. With implementation of SR-11, certain modifications to the approved SR-905 design would be required, and are identified as part of the Preferred Alternative. The SR-905 modifications would extend approximately 1.4 miles west of the terminus of SR-11 at PM 0.0 and would be entirely within existing SR-905 right-of-way. The connectors within the SR-905/SR-125 Interchange would operate as they were approved under the SR-905 and SR-125 projects. The local access ramps connecting SR-905 to Enrico Fermi Drive would be replaced by the SR-11/SR-905 Connectors.

The proposed easements on the developed property east of Sanyo Avenue would be wider on both sides of SR-11 for the Preferred Alternative than those identified for the Two Interchange Alternative. The Preferred Alternative includes auxiliary lanes between Enrico Fermi Drive and the SR-125 connectors. An auxiliary lane along a highway connects successive ramps, with the entrance ramp or acceleration lane from one interchange

leading to the exit ramp or deceleration lane of the next. Auxiliary lanes are also included on SR-11 between the Enrico Fermi Drive interchange and Siempre Viva Road interchange to facilitate the weaving and merging vehicles to and from the POE.

As SR-11 approaches the Otay Mesa East POE, separation of commercial vehicles from non-commercial vehicles is required prior to entering the POE.



Source: State Route 11 and Otay Mesa East Port of Entry - Tier II EIR/EIS 2011

Figure 6 - Separation of Commercial and Non-Commercial Vehicles at the POE

Figure 6 shows the highway layout near the POE. The commercial vehicle traffic flow into and out of the POE is located on the main lanes of the highway. Non-commercial vehicles diverge from the highway main lanes as they approach the POE. In the westbound direction non-commercial vehicles cross over the main lanes on a structure to a loop ramp, and then merge with the highway as they proceed westerly.

Eastbound commercial vehicles, comprised mostly of semi-trucks will need to travel in the left lanes as they approach the POE. Trucks are not typically allowed to travel in the left lanes of a highway, but this highway segment is not typical as the highway is terminating and vehicles need to slow down to enter the POE. Advance regulatory and guide signing and special pavement delineation would be included to advise commercial and non-commercial vehicles of the appropriate lane choice.

The eastern boundary of the POE was altered from the draft project report to avoid impacts to sensitive vegetation and steep slopes in the southeastern portion of the project. The POE footprint has been established in order to avoid or minimize environmental impacts and allow it to be approved as a feature of the project. A preliminary POE layout has been developed to show the feasibility of connecting to the Mexico POE, the SR-11 facility, and the CVEF (see Attachment D). Further study of the POE was conducted in the Program Development Study (PDS) completed in July 2011.The Otay Mesa East POE will

operate along with a POE on the Mexico side of the international border. The layout of the Mexico POE, Otay II, has a footprint constrained by surrounding development. The layout of Otay II dictates the location of commercial processing and inspection to be on the easterly side of the facility. In order to match this constraint on the U.S. side of the international border, the layout of the proposed Otay Mesa East POE will separate commercial vehicles into the left lanes on the eastbound approach to Mexico. In the westbound direction to the U.S., this proposed layout will allow non-commercial vehicles to merge with commercial vehicles when exiting westbound from the POE. The POE is identified with the Preferred Alternative due to its interdependent relationship with SR-11, however, it will be built by others.

After receiving clearance to enter the U.S. at the POE, westbound commercial vehicles would be routed into the CVEF facility for weight and safety inspections conducted by the CHP prior to being released onto the regional roadway system. A preliminary design for the CVEF has not been completed, however it is anticipated it will be similar to the existing CVEF at the Otay Mesa POE. The proposed CVEF site would be located east of SR-11 along the northern POE boundary and cover approximately 20 acres. The proposed site would include an administration building with associated CHP, staff, visitor and short term commercial vehicle parking facility, commercial vehicle scales with associated access lanes, commercial vehicle inspection bays with associated inspection lanes, smog inspection area, and long-term and load adjustment commercial vehicle parking. The conceptual layout for the CVEF can be found in Attachment D of this report. A *Commercial Vehicle Enforcement Facility (CVEF) Alternatives Analysis Report*, completed October 2009 (Attachment J), describes the features and composition of a CVEF facility in greater detail.

Operational Advantages. The Preferred Alternative provides an important operational advantage over the One Interchange Alternative studied as part of the Draft Project Report by maximizing the distance and weaving length for vehicles approaching the POE from the west. Commercial and non-commercial vehicles entering eastbound SR-11 at Enrico Fermi Drive with the Preferred Alternative will have approximately 1,400 feet of additional distance and weaving length compared to commercial and non-commercial vehicles entering eastbound SR-11 at Alta Road under the One Interchange Alternative. The additional length is advantageous as eastbound vehicles approach the POE. Passenger vehicles are required to separate from commercial vehicles, and commercial vehicles also may be required to merge to an appropriate specific lane depending on the type of load they are carrying.

The destinations for eastbound vehicles approaching the POE include POE commercial vehicles access, POE non-commercial vehicles access, and access to Siempre Viva Road.

'Last U.S. Exit Designation'. The Preferred Alternative provides the best option for vehicles travelling eastbound on SR-11 to safely and conveniently navigate away from the POE if they do not intend to cross the border to Mexico. Vehicles on Siempre Viva Road will not be provided an opportunity to access the POE and therefore the interchange at Siempre Viva Road will operate effectively as the 'Last U.S. Exit'.

Maximizing Local Access. One purpose of the project is to accommodate commercial goods movement and cross-border travel to and from the Otay Mesa East POE. The

Preferred Alternative has been identified as the best alternative to support commercial goods movement by providing maximum local access. Further, the Preferred Alternative provides a greater accommodation to goods movement over the Two Interchange Alternative by providing access to Siempre Viva Road for commercial vehicles from Mexico exiting the CVEF.

Minimizing Environmental Impacts. The POE boundary studied as part of the Draft Project Report was proposed to be identical for all alternatives. This boundary has been modified as part of the Preferred Alternative in order to minimize environmental impacts.

The proposed footprint for the POE has been decreased by excluding the previously proposed south-east corner of the POE for the Preferred Alternative. The result is that potential impacts to sensitive species have been minimized, including reduced impacts to Burrowing Owl habitat, Quino Checkerspot Butterfly habitat, and other critical habitat.

5.1.1 Proposed Engineering Features

SR-11 would be constructed as a four-lane toll highway. The proposed typical cross section includes four standard width 12-foot main lanes, 10-foot left and right shoulders, and a median varying in width between 22’ to 62’ (see Attachment A.) The highway width is most constrained east of the proposed Sanyo Avenue undercrossing, where existing buildings are near the proposed right-of-way in order to minimize impacts to nearby buildings. The proposed 62-foot median width in the eastern portion of SR-11 is intended to make SR-11 adaptable for potential safety and security needs, and to provide the flexibility to construct additional lanes on approach to the POE, if these are found to be necessary to meet future vehicle inspection requirements. This additional right-of-way would help ensure access to the new POE by emergency responders, facilitate evacuation of the POE if necessary, or allow southbound traffic to be turned around if the POE had to be closed for emergency security concerns.

The SR-11 corridor would be located approximately midway between Otay Mesa Road and Airway Road for most of its length, and would cross four local existing and planned surface streets: Sanyo Avenue, Enrico Fermi Drive, Alta Road, and Siempre Viva Road. The highway would extend east from the vicinity of Harvest Road, at the future SR-905/SR-125 Interchange, for approximately 1.4 miles before curving to the southeast near Alta Road and continuing on to connect with the proposed POE. The total highway length would be approximately 2.8 miles. East of Sanyo Avenue, SR-11 would be supported on each side by retaining walls in order to minimize impact to adjacent developed parcels. These walls vary in height between 15 and 30 feet. The proposed retaining walls are similar to those originally approved with the SR-905 project but would be located to accommodate the cross-section for SR-11 as part of the Preferred Alternative. Concrete barrier (type 736) would be placed at the top of the retaining walls along each side of the roadway in the Sanyo Avenue area, and an additional concrete barrier would extend along the median (type 60).

Proposed limits of grading and rights-of-way are expected to be up to 500 feet wide, with the exception of the interchange locations, which require additional area. These limits would include all required cut/fill slopes, new concrete and asphalt pavement, as well as project-related drainage facilities, lighting, signage, pavement delineation, fencing, utilities, and landscaping. Chain link fence and access gates will be placed at applicable locations

along the right-of-way. Existing slopes are generally flat (less than 10%) and the surface primarily consists of short nonnative grasslands. Five cross culverts will be needed within the SR-11 Corridor and CVEF footprint. Ten watersheds will be impacted by the project.

Three watersheds drain to the west of Enrico Fermi Drive through a series of existing natural channels and cross culverts beneath La Media Road, Airway Road, and Siempre Viva Road, ultimately discharging through a large existing culvert at the International Border, one mile west of La Media Road.

An existing concrete lined detention basin that resides within the proposed SR-11 footprint just east of Sanyo Avenue will be removed and replaced to the north of SR-11 and to the west of Sanyo Avenue. This existing concrete lined detention basin serves commercial developments along Sanyo Avenue and Dornach Court. Flows from these commercial developments that currently drain to the existing concrete lined detention basin will be directed to the new concrete lined basin by means of a separate drainage system. No additional flows will be introduced by SR-11 to the relocated concrete lined basin.

Seven watersheds drain to the east of Enrico Fermi Drive and cross the International Border fence at various locations. One of these larger watersheds will require a double 8'x4' box culvert that will cross beneath SR-11 and the future Siempre Viva Road ultimately draining into an existing natural channel which has been designated as a USACE jurisdictional area (non-wetland Waters of the U.S.).

There are two primary watersheds that will be impacted by the POE. Two cross culverts will be needed within the POE footprint. All flows from these watersheds flow south and across the US-Mexico International border and ultimately drain to the Tijuana River.

Preliminary on-site drainage calculations were conducted to determine drainage facility requirements. Generally, on-site flow generated from the SR-11 Corridor and the CVEF will be captured, treated, retained and/or detained prior to being released into the watercourse or the proposed drainage facilities under the POE (in the case of the CVEF). No additional flows from SR-11 will be conveyed to existing SR-905 detention basins.

Drainage easements may be needed near the inlets and outlets of proposed cross culverts. Future commercial developments planned within the SR-11 footprint will also need to coordinate with Caltrans to prevent potential conflicts with cross culvert locations along the SR-11 roadway.

Preliminary basin sizes and locations provided within the Hydrology and Hydraulics Report assume that all jurisdictional criteria could be met but that final basin designs will be based on the feasibility and reasonability of meeting regulatory standards (including local agency standards). Where post-developed flows and runoff volumes are increased from pre-developed conditions, retention basins are proposed to eliminate excess runoff. Where post-developed peak flow rates are increased from pre-developed conditions, detention basins are required to reduce flow rates. The preliminary basin locations provided within the Hydrology and Hydraulics Report were used to determine preliminary right-of-way limits. Basin locations may require subsurface soil treatments to facilitate infiltration, and portions may be paved to facilitate maintenance. Culvert and pipe design for the POE is to be consistent with CBP's "Security Policy & Procedure Handbook".

SR-11 would operate as a toll road under the authority of SANDAG, as granted by the Otay Mesa East Toll Facility Act, SB 1486. A toll plaza, toll administration building and parking lot would be located on the northern periphery of the POE site. It is anticipated that Electronic Toll Collection (ETC) technology and cash collection would be used to collect tolls from commercial and non-commercial vehicles traveling both westbound and eastbound on SR-11. Equipment could include overhead gantries and antennae to read transponders, changeable message signs to display the tolls, loop or laser detectors to measure traffic volume and speed to help determine toll rates, and cameras to view traffic on the facility. Tolling stations on eastbound off-ramps and westbound on-ramps from/to SR-11 would collect tolls from local users not accessing the toll plaza.

Intelligent Transportation Systems (ITS) are features that use technology to improve the function of highway and transit facilities. The ITS would be developed as part of the tolling and traffic management strategies. In addition to variable pricing, the system will include other strategies such as electronic toll collection systems, regional border wait time monitoring systems, and advanced traveler information systems. Enhanced border security features may also be included with the systems.

A concept paper entitled *Intelligent Transportation Systems (ITS) Technology Pre-Deployment Proposal for Otay Mesa East Port of Entry* is provided in Appendix C. Dynamic pricing would be utilized and obtained through an algorithm that computes the time saved and then generates the toll rate with respect to local wages and fuel consumption.

FHWA issued a grant to study border wait times and toll collection strategies for this project; once the study has been concluded, a final determination would be made regarding hardware types and locations of all toll facilities. SANDAG is in the process of developing an ITS pre-deployment study which will evaluate ITS technologies to facilitate a binational ITS concept of operations. The study will identify and evaluate technology options to enable variable toll rates, advanced traveler information, state-of-the-art toll collection technologies, enhanced border operations, and new institutional relationships to accelerate and optimize ITS deployment and operations.

After leaving the POE, commercial vehicles would enter the CVEF at the southeastern portion of the site, and would proceed to one of the two scale lanes. After being weighed, vehicles would either be cleared by CHP personnel to exit west to the westbound SR-11 access lanes or to Siempre Viva Road, or they would be routed to one of the four vehicle inspection bays for additional safety inspection. After completing the vehicle inspection, commercial vehicles would either be cleared to exit (and routed to SR-11 or to the Siempre Viva Road exit) or directed to park their vehicles for subsequent repairs.

Transportation System Management/Transportation Demand Management (TSM/TDM) measures considered for this project include: ramp metering, closed circuit television cameras (CCTV), traffic monitoring stations, inductive loop detectors, Transportation Management Center (TMC) connections, provisions for multimodal uses associated with the POE (i.e. bicycle lockers/racks, dedicated bus lanes and staging areas, access to Bus Rapid Transit service), implementation of variable congestion toll pricing, dedicated commercial and non-commercial traffic lanes, and extended hours of operation for the POE. Some features, such as changeable message signs, designed to communicate with

travelers on the Mexico side of the border, will require coordination with Mexican agencies and local authorities due to the operations and maintenance of the system in Mexico.

5.1.2 Non-Standard Mandatory and Advisory Design Features

A preliminary design was completed to identify design restrictions and potential design exceptions for this project. To minimize impacts to existing and proposed development and meet the needs of the project, mandatory and advisory design exceptions were requested.

Detailed explanations for requesting these nonstandard features are further described in the Fact Sheet Exceptions to Mandatory Design Standards and Fact Sheet Exceptions to Advisory Design Standards. The Mandatory Design Exception Fact Sheet and the Advisory Design Exception Fact Sheet for this project were approved on September 7, 2011 as shown in Attachment I.

Exceptions to Mandatory Design Standards

Listed below are the nonstandard features being requested for this project, as well as the corresponding mandatory design standards.

This project proposes less than standard interchange spacing at the following locations:

Description of Interchange Limits			Standard Interchange Spacing (miles)	Proposed Interchange Spacing (miles)
SR-905/SR-125/SR-11	to	La Media Road	2.0	1.0
SR-905/SR-125/SR-11	to	Otay Mesa Road	2.0	0.2
SR-905/SR-125/SR-11	to	Enrico Fermi Drive	2.0	1.0

The Department's *Highway Design Manual*, Index 501.3 Spacing, sets forth the following standard: The minimum interchange spacing shall be one mile in urban areas, two miles between freeway-to-freeway interchanges and local street interchanges.

This project proposes the westbound SR-11 exit ramp to La Media Road to have the following nonstandard superelevation rate.

Curve Radii	Standard Superelevation Rate	Proposed Superelevation Rate
2,100'	6%	9%

The Department's *Highway Design Manual*, Index 202.2 Standards for Superelevation, sets forth the following standard: Based on an e_{max} selected by the designer for one of the conditions, superelevation rates shall be used within the given range of curve radii.

Exceptions to Advisory Design Standards

Listed below are the nonstandard features requested for this project, as well as the corresponding advisory design standards.

This project proposes that the westbound branch connector merge from SR-11 to SR-905 have a 1,000 foot length auxiliary lane. The Department's *Highway Design Manual*, Index 504.4(6) Freeway-to-Freeway Connections (Branch Connections), sets forth the following standard: Merging branch connections should be designed as shown in Figure 504.3L of the Highway Design Manual. Figure 504.3L shows a 2,500 foot length auxiliary lane at a branch connection merge.

This project proposes the diverge from eastbound SR-905 to eastbound SR-11 provide for a minimum 1,300 foot length auxiliary lane in advance of the exit. The Department's *Highway Design Manual*, Index 504.4(6) Freeway-to-Freeway Connections (Branch Connections), sets forth the following standard: Diverging branch connections should be designed as shown in Figure 504.4 of the Highway Design Manual. Figure 504.4 shows a 2,500 foot length auxiliary lane in advance of the branch connection.

This project proposes a partial interchange at Siempre Viva Road and to maintain the partial interchange at Otay Mesa Road. The Department's *Highway Design Manual*, Index 502.2 Local Street Interchanges, sets forth the following standard: The use of isolated off ramps or partial interchanges should be avoided because of the potential for wrong-way movements and added driver confusion.

This project proposes limited access control at the Siempre Viva Road interchange. The Department's *Highway Design Manual*, Index 504.8 Access Control, sets forth the following standard: For new construction or major reconstruction, access rights should be acquired on the opposite side of the local road from ramp terminals to preclude the construction of future driveways or local roads within the ramp intersection. Accesses to the CVEF and toll facility are planned across from this partial interchange.

This project proposes a less than standard median width (22 feet to 46 feet) to be constructed from the beginning of SR-11 to the east for approximately 3,900 feet. The *Highway Design Manual*, Index 305.1 Width, sets forth the following standard: Minimum median widths for the design year should be used in order to accommodate the ultimate highway facility (type and number of lanes) and The *Highway Design Manual*, Index 305.1(1a) Width (Freeways and Expressways), sets forth the following standard: Where physical and economic limitations are such that a 46-foot median cannot be provided at reasonable cost, the minimum median width for freeways and expressways in urban areas should be 36 feet.

This project proposes no passing lane provided at the following locations:

Ramp Location	Ramp Length prior to lane addition
La Media Road exit ramp from westbound SR-905	1,586 Feet
La Media Road exit ramp from westbound SR-11	1,719 Feet

The *Highway Design Manual*, Index 504.3(5) Ramps (Single-lane Ramps), sets forth the following standard: If the length of a single lane ramp exceeds 1,000 feet, an additional lane should be provided on the ramp to permit passing maneuvers.

This project proposes the construction of embankment slopes steeper than 4:1 (H:V) in the following locations:

Location	Alignment	Description of Limits			Proposed Side Slope
1	"EFE" Line	633+00	to	635+00	2:1 or Flatter
2	"EFE" Line	641+40	to	642+00	2:1 or Flatter
3	"EFW" Line	633+00	to	635+00	2:1 or Flatter
4	"EFW" Line	637+50	to	640+00	2:1 or Flatter
5	"SEDC" Line	029+00	to	033+00	2:1 or Flatter

The *Highway Design Manual*, Index 304.1 Side Slope Standards, sets forth the following standard: For new construction, widening, or where slopes are otherwise being modified, embankment (fill) slopes should be 4:1 or flatter.

5.1.3 High Occupancy Vehicle (HOV) (Bus and Carpool) Lanes

High Occupancy Vehicle (HOV) lanes are not proposed for SR-11 per the 2050 RTP.

5.1.4 Ramp Metering

Ramp meters have been considered in the SR-11 design. Where toll collection facilities are not placed, costs for ramp metering equipment and installation have been accounted for. The location is assumed to be on the SR-11 eastbound on-ramp of the Enrico Fermi Drive Interchange.

5.1.5 California Highway Patrol (CHP) Enforcement Areas

In addition to the CVEF, standard CHP enforcement areas would be incorporated into the highway and ramp design of SR-11. These areas would be located adjacent to toll collection sites and other areas as needed. The CHP would have the authority to enforce tolls and lawful use of the facility. Costs associated with enforcement operations are not included in this report.

5.1.6 Park and Ride Facilities

This project does not propose or impact any Park and Ride facilities.

5.1.7 Utility and Other Owner Involvement

Utilities requirements for SR-11 would include water, electricity and communication services. These utilities services would be extended underground within existing or planned roadways, as well as the proposed SR-11 right of way, from existing service lines located to the west and south.

The POE and CVEF would require utility services to include potable water, wastewater conveyance, electricity, natural gas, and communications. As adjacent private development plans progress in East Otay Mesa, and the County circulation roadways are constructed, it is anticipated that utility distribution facilities will be available for connection to the POE and CVEF sites.

If POE and CVEF implementation preceded the development of utility distribution facilities, then extending utility infrastructure to the east from existing locations may be necessary. Extending utilities to the POE and CVEF site in the absence of County circulation roadways could consist of developing a utility corridor within the SR-11 project footprint, or extending utilities along the proposed alignment of local roads. Current environmental planning and project cost estimates assume that utility distribution facilities will be available within County circulation roadways constructed prior to or concurrent with the project. It may be necessary for one or more utility owners to obtain a longitudinal encroachment permit in order to fully develop utilities in the East Otay Mesa area.

Utility coordination meetings between Caltrans and utility owners have been, and continue to be held to resolve utility conflicts. Delivery of the utility service to the POE has been analyzed and multiple solutions have been drafted.

A variety of existing utilities, including natural gas, telephone, water, sewer, and both overhead and underground electric are in the project area. Several utility conflicts have been identified and relocation is proposed where possible. The estimated relocation cost is included in the Right-of-Way Data Sheets, shown in Attachment G. Utility conflicts have been identified and are presented in the following table:

Table 7 – Utility Conflicts

Utility	Owner	Conflict Location
24-inch gas line	Calpine	Crossing the proposed CVEF and Otay Mesa East POE sites
12-inch sewer line	City of San Diego	Utility corridor east of Sanyo Avenue
10-inch sewer line	City of San Diego	Utility corridor east of Dornoch Court
10-inch water line	Otay Water District	Utility corridor east of Sanyo Avenue
18-inch water line	Otay Water District	Crossing the SR-11 right-of-way from north to south, located east of Sanyo Ave and west of Enrico Fermi Drive
8-inch and 12-inch water lines	Otay Water District	Enrico Fermi Drive
16-inch and 24-inch water lines	Otay Water District	Alta Road

12-inch water line	Otay Water District	Crossing the SR-11 right-of-way near the proposed extension of Siempre Viva Road
2-inch gas line	San Diego Gas and Electric Company	Utility corridor east of Sanyo Avenue
12 kV underground electric lines	San Diego Gas and Electric Company	Utility corridor east of Sanyo Avenue
12 kV underground electric lines	San Diego Gas and Electric Company	Crossing the SR-11 right-of-way 750 feet east of Enrico Fermi Drive
30-inch gas line	San Diego Gas and Electric Company	Adjacent to the U.S.-Mexico international border and crossing the proposed Otay Mesa East POE site
30-inch gas line	San Diego Gas and Electric Company	Sanyo Avenue
69kV overhead power lines	San Diego Gas and Electric Company	West of Sanyo Avenue
8-inch and 6-inch private sewer lines	Private	East of Enrico Fermi Drive

5.1.8 Railroad Involvement

According to SANDAGs Airport Multimodal Accessibility Plan, scheduled to be finalized later this year, a high speed rail extension is proposed to operate along the I-5 corridor from downtown San Diego, turn east at San Ysidro and terminate at the existing Otay Mesa POE. This project does not involve railroad and will not affect these plans.

No light rail is proposed within the project limits.

5.1.9 Highway Planting

Highway planting will concur with the appropriate mitigation measures identified in the final environmental document for this project. For detailed impacts and mitigation measures please refer to section 6.6.1, Visual Impacts and Landform Alterations, in this report and/or the State Route 11 and the Otay Mesa East Port of Entry Final Tier II Environmental Impact Report/Environmental Impact Statement.

The landscape palette and aesthetic treatment of structures (overcrossings, undercrossings, etc.) would be compatible with that developed for SR-905 and SR-125 (south portion) and coincide with the guidelines provided in the EOMSP.

Highway planting will be accomplished by a separate project after the highway construction is completed.

5.1.10 Erosion Control

On July 15, 1999 State Water Resources Control Board (SWRCB) adopted Order 99-06 DWQ, National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from Caltrans properties, facilities, and activities. This project will be designed in conformance with the NPDES Permit requirements and Caltrans Project Planning and Design Guide (PPDG).

The Construction General Permit (Order No. 2009-0009-DWQ) requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP) for projects disturbing one acre or

greater of soil. The SWPPP identifies avoidance and/or minimization measures that have to be implemented by the contractor to effectively eliminate or reduce potential water quality impacts during construction.

Potential water quality impacts from construction operations related to erosion and the discharge of other pollutants will effectively be avoided or minimized through the implementation of sediment control, soil stabilization, waste management, tracking control, and wind control best management practices (BMPs) as outlined in Caltrans Construction BMP Manual. This includes BMPs such as temporary construction entrances, drainage inlet protection, street sweeping, temporary fiber rolls and temporary concrete washouts.

The Storm Water Data Report (SWDR) has been completed for this phase of the project. Energy dissipation devices such as rock slope protection will be designated at culverts that discharge into unlined channels to prevent scour. Flared end sections will be incorporated where possible. Slope and disturbed surface protection on this project will include slope rounding, and benches. The concentrated flow will propagate through concrete lined channels, ditches, dikes, biofiltration swales and detention basins. The report documents Construction Site BMPs, Design Pollution Prevention BMPs, and Treatment BMPs that will be considered for incorporation into the project (see Attachment L).

Highway planting for erosion control purposes will be included in the project design. The project will include a variety of ground covers and plantings for permanent erosion control, such as native and drought tolerant species, as well as a variety of rock mulch to provide soil stability and reduce runoff. Erosion control measures include implementation of sediment control BMPs after the completion of construction until vegetation is established.

5.1.11 Noise Barriers

According to the Noise Study Report (NSR), noise impacts at the Southwestern College Higher Education Facility will exceed the Noise Abatement Criteria (NAC) and noise barriers are the only form of abatement considered feasible. The NSR states a noise control barrier of 10 feet in height approximately 591 feet in length would fulfill the criteria of providing a minimum 5-dBA reduction in noise at this location. Implementation of this noise barrier, while technically feasible, would not be reasonable from a cost perspective, and is not included in the Preferred Alternative. Therefore, this mitigation measure will not be implemented.

For additional information, see the *Noise Abatement Decision Report* (NADR), completed in August of 2010 (Attachment M).

5.1.12 Non-motorized and Pedestrian Features

Pedestrians, bicyclists, and public transit riders are considered throughout the design process with respect to the POE and local interchanges. Pedestrian facilities are included on Sanyo Avenue, Enrico Fermi Drive, Alta Road, and Siempre Viva Road.

According to the *County of San Diego Bicycle Transportation Plan*, October 2008, there are various existing bikeways in the project vicinity. There are Class II bicycle lanes on Otay Mesa Road west of SR-905, on Siempre Viva Road between La Media Road and

Enrico Fermi Drive, on Airway Road between SR-905 and Heinrich Hertz Drive, on Heinrich Hertz Drive between Airway Road and Paseo de Las Americas, and along Paseo de Las Americas south of Heinrich Hertz Drive. Additionally, there are several planned bikeways for the project area: east of the East Otay Mesa boundary, Airway Road, Siempre Viva Road, Lone Star Road, and Otay Mesa Road are planned to include Class II bicycle lanes. Enrico Fermi Drive and Alta Road are also planned to include Class II bicycle lanes between Lone Star Road and Siempre Viva Road.

Pedestrians and bicyclists require easy access to and from the proposed POE and the public transit system. Bicyclists will require public transit buses to be equipped with bicycle racks, and a facility outside the scope of this project could provide bicycle lockers, racks, or other storage facilities for these types of users. Pedestrians and bicyclists also will require access to and from non-commercial vehicles and the proposed POE.

Siempre Viva Road is expected to be the closest location to the new POE on the local street system. The PDS for the POE has conceptually identified a site for future pick-up and drop-off of pedestrian border crossers that is within the POE development footprint, but separated physically and operationally from the Otay Mesa East POE. Although this area for mass transit and privately owned vehicle passenger loading would provide pedestrians and bus travelers potential connections to Otay Mesa and San Diego, future study of traffic and revenue projections may not justify the expense associated with bus and pedestrian processing facilities for the POE on opening day. The PDS studied the POE in terms of Opening Day and Full Build Phases. The Opening Day Phase for the POE may restrict traffic to commercial and non-commercial vehicles only. Bus, bicycle and pedestrian users may not have access to the POE for the Opening Day Phase, but will have access in the Full Build Phase.

It is expected that ADA-compliant pedestrian walkways would be provided between the POE and Siempre Viva Road, including the identified pedestrian drop off/loading location, and that ADA-compliant sidewalks would be provided along Siempre Viva Road to convey pedestrians between the POE and local destinations.

5.1.13 Needed Roadway Rehabilitation and Upgrading

Rehabilitation of the existing roadway is not needed in conjunction with the proposed project. Project improvements will construct new pavement for SR-11, POE, and CVEF facilities. Roadway improvements will join existing pavement for ramp connections to SR-905 and SR-125. The existing paved surfaces of SR-905 and SR-125 are less than five years old, and rehabilitation of existing paved surfaces is not expected.

5.1.14 Needed Structure Rehabilitation and Upgrading

No structure rehabilitation or upgrading is considered applicable to the project.

5.1.15 Cost Estimates

The roadway, structure construction, and right of way costs were developed for the project and included in an eleven-page cost estimate (see Attachment E). The cost breakdown can be seen in the following Table.

Table 8 – Estimated Project Costs

	Construction	Support	R/W	Total
SR-11 & CVEF	$249,100,000	$82,600,000	$81,500,000	$413,200,000
POE	$253,000,000	$48,500,000	$39,800,000	$341,300,000
			TOTAL PROJECT COST	**$754,500,000**

5.1.16 Right of Way Data

Right of way acquisitions are required for this project. Estimated costs for these Right of Way acquisitions are shown on the Right of Way Data sheet (see Attachment G). Appropriate permits to enter will be obtained as necessary.

5.2 Rejected Alternatives

The rejected alternatives presented in this Project Report are for the highway only. CVEF alternatives have been analyzed independently (see Attachment J), and POE alternatives have been developed in a separate document, the PDS, completed in July 2011 by GSA.

5.2.1 Alternatives Previously Considered and Rejected

5.2.1.1 **Central Alternative**

The Central Alternative would have extended further east than the selected Western Alternative, requiring more earthwork and the commitment of nearly 25 acres more right of way from currently undeveloped land to transportation related uses than the Western Alternative. Due to the anticipated additional impacts related to sensitive biological resources and grading requirements with associated higher costs, the Central Alternative was eliminated from further consideration at the conclusion of the Phase I PEIR/PEIS.

5.2.1.2 **Eastern Alternative**

The Eastern Alternative would have extended farther east than either the Central Alternative or the selected Western Alternative. Based on the potential for greater impacts to biological and cultural resources, greater right-of-way and construction costs, as well as potential complications associated with impacting an existing Sempra Energy utility easement, the Eastern Alternative was eliminated from further consideration in Phase I during the scoping of the PEIR/PEIS.

5.2.1.3 **One Interchange Alternative**

The One Interchange Alternative included a single interchange at Alta Road, approximately 1.4 miles east of the SR-905/SR-125/SR-11 Interchange. An undercrossing at Sanyo Avenue, and overcrossings at Alta Road, Enrico Fermi Drive and Siempre Viva

Road would be constructed. Siempre Viva Road at SR-11 would be constructed with no access to or from SR-11, but ramps would be provided to connect the POE with the highway. The One Interchange alternative was not identified as preferred based on the operational issues resulting from a shortened distance between the Alta Road interchange and the POE.

5.2.1.4 **No Interchange Alternative**

The No Interchange Alternative included no interchanges along the proposed alignment of SR-11. Overcrossings would be built at Enrico Fermi Drive, Alta Road, and Siempre Viva Road and an undercrossing at Sanyo Avenue. There would be no local road access to or from SR-11 under this alternative. SR-11 would connect the POE with SR-905. The No Interchange Alternative was not identified as preferred based on non-compatibility with the community plan which includes local access from SR-11.

5.2.1.5 **No Build Alternative**

The No Build Alternative would have resulted in not building SR-11, the CVEF, or the POE. Instead, a future phase of the SR-905 project would proceed as approved per the SR-905 EIR/EIS. The No Build alternative was not identified as preferred due to the lack of conformance to the project need and purpose of reducing border crossing wait time and decreasing congestion.

5.2.1.6 **Local Road Alternative**

The Local Road Alternative would have provided for a limited-access and non-controlled-access facility, expanding and extending an existing road to access the POE site. Three variations of this alternative were identified in the SR-11 PSR that involved the extension of Otay Mesa Road, Airway Road or Siempre Viva Road (Caltrans 2000). The PSR determined that since local roadways and intersections were not designed to accommodate the anticipated high volume of commercial traffic, the Local Road Alternative would have disrupted local traffic circulation and access, and resulted in higher vehicle emissions. This failing condition is observed at existing POEs where queues effectively bisect the community and block access for long periods. The Local Road Alternative was eliminated from further consideration in Phase I during the scoping of the PEIR/PEIS.

5.2.1.7 **TSM/TDM Only Alternative**

The TSM/TDM Only Alternative involved the use of TSM/TDM measures as a “stand alone” alternative to the proposed SR-11, POE and CVEF facilities, and would have either constructed a new POE with TSM/TDM measures without SR-11, or incorporated TSM/TDM measures at existing regional POEs only. The TSM/TDM Only Alternative was evaluated, and based on the rejection of the Local Road Alternative and anticipated increase in cross-border traffic volumes, it was determined that the TSM/TDM Only Alternative would not meet the project need and purpose. The TSM/TDM Only Alternative was not considered to be a viable option and was not carried forward for impact analysis in the Tier II Draft EIR/EIS.

5.2.1.8 **CVEF Alternatives**

As part of the CVEF feature of this project, several alternatives to provide CHP with the facilities to inspect commercial vehicles were considered. Each alternative was developed for the purpose of providing the CHP with the means of performing inspection of commercial vehicles prior to travel on the State highway system including access to a weigh-in-motion (WIM) scale and garage bays to perform detailed inspection of trucks as needed. The recommended alternative for further study according to the *CVEF Alternatives Analysis Report* is a new CVEF immediately adjacent the proposed POE. The *CVEF Alternatives Analysis Report* can be found in Attachment J.

5.2.2 Variations to Preferred Alternative Previously Considered and Rejected

In addition to the recommended SR-125 Connector Variation, four design variations that augment the project were considered: Siempre Viva Road Full Interchange, SR-905/SR-125/SR-11 Full Interchange, 46-foot Expanded Median, and No Toll. The Siempre Viva Road Full Interchange, was applicable to the Two Interchange alternative only. All other variations were considered applicable to any of the build alternatives.

5.2.2.1 **Siempre Viva Road Full Interchange**

The Siempre Viva Road Full Interchange variation proposed a full interchange on SR-11 at Siempre Viva Road including westbound on- and off-ramps, and eastbound on- and off-ramps. Full access would have been provided between Siempre Viva Road, SR-11, and the Otay Mesa East POE/CVEF for non-commercial and commercial vehicles under this variation.

This variation was not recommended due to multiple issues. The Siempre Viva Road Full Interchange variation would have more environmental impacts than half an interchange at Siempre Viva Road due to the increased right-of-way required, the additional impact to streambeds in the California Department of Fish and Game (CDFG) jurisdiction, burrowing owl habitat and non-native grassland. Implementation would also affect local traffic. The lack of queue storage capacity would create conflicts as the users merge to access the POE and need to cross multiple lanes in a short distance as they leave the POE. A major shortfall of this variation is that no mitigation measures can be implemented to address these traffic issues due to project physical constraints.

The additional requirement of separating the commercial and non-commercial vehicles complicates intersection geometry; which in this case cannot accommodate anticipated demand within design constraints including the close proximity of a local street intersection at Siempre Viva Road and Airway Road.

5.2.2.2 **SR-905/SR-125/SR-11 Full Interchange**

The SR-905/SR-125/SR-11 Full Interchange variation would have added the following freeway-to-freeway connector ramps: southbound SR-125 to eastbound SR-11, westbound SR-11 to eastbound SR-905, and westbound SR-905 to eastbound SR-11. The addition of these three connectors would complete the planned SR-905/SR-125/SR-

11 Interchange, and provide full connectivity between the three highways. The SR-905/SR-125/SR-11 Full Interchange variation was not recommended due to cost and low forecasted traffic volumes.

5.2.2.3 **46-foot Expanded Median**

The 46-foot Expanded Median variation, in lieu of the 22-foot median section, proposes a standard width median in the vicinity of Sanyo Avenue. This variation requires more right-of-way to be purchased as well as additional cost associated with earthwork. It would place earth retaining structures closer to adjacent buildings. It is not identified as part of the preferred alternative due to the increased impact to the adjacent parcels.

5.2.2.4 **No Toll**

The No Toll variation had assumed that SR-11 would not operate as a tollway, and would instead operate as a traditional freeway. The principal design difference under this variation was the lack of toll-related structures, such as toll administration and FasTrak tolling facilities. Although state legislation has approved SANDAG as the tolling agency for future SR-11, this variation was included to evaluate the potential for toll-related impacts, especially with respect to Environmental Justice populations, per EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations.*

The No Toll variation was not recommended since it would eliminate the source of revenue to fund the project. The elimination of the funding source results in not delivering the project. SR-11 as a non-tolled facility would be inconsistent with regional planning documents

6. CONSIDERATIONS REQUIRING DISCUSSION

6.1 Hazardous Waste

Two Initial Site Assessments (ISAs) (Ninyo & Moore 2009, 2007b), and two soil sampling reports (Ninyo & Moore 2010a, Ninyo & Moore 2010b) were prepared for the project. The western portion of the proposed project area (west of the SR-905/SR-125 Interchange) was evaluated as part of the ISA conducted for the previously approved SR-905 project (Ninyo & Moore 1999b). An area of approximately 6.0 acres located south of the POE site and within U.S. Border Patrol jurisdiction is within the project impact footprint for the Preferred Alternative. Because this area was not available for access during project investigation, it was not included in the ISA. Portions of the described area have also been previously developed for construction of a border fence, and may therefore have been subject to associated hazardous materials investigation and (if applicable) remediation.

Commonly encountered conditions/materials that may represent environmental concerns within the study area include the presence of (1) treated wood that may contain chemical preservatives; (2) asbestos containing materials such as insulation for subsurface pipelines and buildings; (3) lead based paint on facilities such as curbs, poles and roadway striping; and (4) mercury-containing switches/fluorescent lights, and polychlorinated biphenols (PCB)-containing lights and associated ballasts. Based on the information presented in the referenced investigations, which included visual site

reconnaissance and owner/operator interviews as well as regulatory agency file and database review, the following existing conditions related to hazardous wastes/materials were observed within the study area:

- The majority of the study area had previously been used for agricultural operations. Contaminated soils could potentially be present in the association with previous activities such as pesticide storage, mixing and/or disposal, and vehicle/equipment fueling and maintenance.
- A number of industrial properties are present in the study area, including an industrial storage lot, a power plant, and numerous manufacturing/business park facilities. Based on the nature of these sites, such locations may represent hazardous or non-hazardous waste related concerns.
- Several truck/freight parking and/or storage sites are present in the study area, generally near SR-905 south of Airway Road, that encompass petroleum staining on unpaved areas and/or distressed (e.g., cracked) pavement surfaces that may be associated with vehicle fueling operations (potentially including underground storage tanks).
- A vehicle auction yard is present in the eastern study area on Parcel No. 648-070-13. Soils impacted with petroleum hydrocarbons and containing low concentrations of metals were identified during the hazardous waste investigation, and represent non-hazardous wastes.
- Several sites with no recorded unauthorized release in the study area are identified as potential hazardous waste concerns due to on-site use/storage of hazardous materials and the lack of access during field investigation.

An Initial Site Assessment (ISA) Checklist was prepared for the project to evaluate whether it could be affected by any recorded or visible hazardous waste problems. The ISA was completed in accordance with Caltrans ISA guidance within the limitations of existing permit-to-enter agreements, and availability of individual representatives of privately-owned properties to schedule interviews. The ISA stated the following potential environmental concerns within the project area:

- There is potential for the presence of pesticides, herbicides, fertilizer and biosolids due to agriculturally-related constituents in the project area.
- Agricultural staging areas may correspond to features of potential environmental concern, such as fueling areas and/or pesticide mixing areas.
- Several industrial use properties are associated with the use and storage of hazardous materials/wastes located within the project area.
- There is potential for the presence of petroleum hydrocarbons in shallow soil due to storage and auto salvage uses in the project area.

It was recommended that in the event discolored soil or other potential environmental issues are encountered during subsurface disturbance activities in the future, further assessment should be performed at the site. References regarding the potential to encounter contaminated soil should be included in the construction specifications. A soil management plan and community health and safety plan should be prepared prior to initiation of soil disturbance to manage potential health and safety hazards to workers and the public. Further details of the soil sampling can be found in the *SR-11 Initial Site Assessment Report*, September 2, 2010.

6.2 Value Analysis

A Value Analysis (VA) Study was performed on November 12, 13, and 17 through 20, 2008 for the project at the Caltrans District 11 offices in San Diego, California. The VA participants included representatives from various Caltrans functional groups, GSA, FHWA, SANDAG, the County of San Diego, and the City of San Diego.

The VA study was successful in refining the features to increase performance and determine which user needs were at a higher priority to be addressed. This resulted in identifying the following objectives:

- Separate the eastbound non-commercial vehicles and the commercial trucks further to the west to prevent longer queuing that would block access to the POE.
- Eliminate access to Siempre Viva Road from the POE and from Siempre Viva Road to the POE to avoid congestion of the local streets in the vicinity of the POE.
- Provide a direct connection for the westbound non-commercial traffic from the POE to SR-11, and eliminate the necessity of using Siempre Viva Road for highway access.
- Create the opportunity to develop a consolidated toll plaza for efficient collection of tolls by capturing all traffic to and from the POE at a single location.

6.3 Constructability Review

A constructability review was completed during the Draft Project Report phase of the project (August 8, 2010.) Minimal comments were received. Those resulting comments have been addressed and any applicable changes incorporated.

6.4 Resource Conservation

If applicable, features affecting energy requirement and energy use efficiencies for the various stages of construction, operation, and maintenance will be used to reduce wasteful, inefficient, and unnecessary consumption of energy and nonrenewable resources. Some project conservation features may include:

- Construction Best Management Practices: installation of construction fencing, and monitoring construction limits to limit soil erosion and avoid additional impacts to adjacent environmentally sensitive areas outside the proposed project right-of-way
- Mitigation to expand impacted natural preserves in other areas so equivalent levels of conservation are provided
- Use of reclaimed water for landscape irrigation purposes
- Planting native vegetation to reduce water use
- Reduction of the amount of import and export by balancing cut and fill volumes, to the extent possible
- Allowance of concrete and base material preparation at on-site batch plants to reduce haul distances
- Minimization of lighting by placing it only where needed for safety or security reasons
- Maximize use of local disposal sites

- Possible reduction of emissions of construction equipment through contract specifications

6.5 Right-of-Way Issues

6.5.1 Right of Way Required

Right-of-way acquisition estimated to be necessary for the project is listed in the following table. For more information see Attachment G, Right-of-Way Data Sheets.

Table 9 - Right-of-Way Acquisition

Use	Area (Acres)
SR-11 & CVEF	136
POE	100
Temporary Construction Easements	1
Utility/Drainage/Retaining Wall Easements	3
Total	**240**

6.5.2 Relocation Impact Studies

Relocation impact studies are not required for this project as there will be no impacts to residential or business structures that will result in relocation of any kind.

6.5.3 Airspace Lease Areas

Airspace lease areas are not required for this project.

Due to the proximity of the project to Brown Field Airport, an Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) is required by the Federal Aviation Administration (FAA). Any construction or alteration within 20,000 feet of a public use or military use airport exceeding a 100:1 surface from any point on the runway requires the FAA be notified of the project. This coordination typically occurs in the PS&E phase of a project, as project details are not defined in earlier phases. General features of the project have been identified and submitted in February of 2010 to the FAA via their web site.

http://oeaaa.faa.gov/oeaaa/external/portal.jsp

6.6 Environmental Issues

6.6.1 Visual Impacts and Landform Alterations

A Visual Impact Assessment (VIA) has been prepared for the project. Per the VIA, the proposed project impacts to visual character and quality can be summarized by stating

that the semi-rural character of the project site and surrounding area would become noticeably more urban. The currently undeveloped open space comprised of a few unpaved roads at the foot of the San Ysidro Mountains will have a new highway and associated interchanges, walls, grading (cut/fill slopes), and buildings after construction begins.

Caltrans recommends a qualitative aesthetic approach be taken to mitigate for negative visual quality impacts in the project area. Consequently, mitigation for adverse project visual impacts will consist of adhering to design requirements developed in consultation with the Caltrans District 11 Landscape Architect. All visual mitigation project features will be designed and implemented with the concurrence of the Caltrans Landscape Architect. Implementation of mitigation measures will reduce negative impacts of the project to an acceptable level. Depending on the particular view, mitigation measures will vary. Such measures include: various highway planting concepts, treatments for retaining walls or different types of aesthetically pleasing walls, architectural enhancements for structures, various types of median and edge barriers, manufactured slopes to allow for planting or non-living landscaping, various types of lighting and signage, unobtrusive access control fences, and water quality facilities.

6.6.2 Socioeconomic Impacts

A Community Impact Assessment (CIA) has been prepared for the project. Per the CIA, socioeconomic issues were analyzed. Socioeconomic issues include land use, residential or business impacts, community access impacts, and expenditure impacts. There are direct industrial, commercial, and land use impacts, as well as indirect impacts on planned and approved industrial developments. These impacts and their required mitigation are detailed in the Tier II EIR/EIS (see http://www.dot.ca.gov/dist11/envir.htm).

6.6.2.1 **Benefit to Local Community**

The construction costs for the Preferred Alternative, net of right-of-way acquisition costs and the cost of furniture, fixtures, and equipment, are considered to contribute to the local economic structure by creating jobs and providing local consumption of building materials. The local community might be expected to benefit marginally from these employment opportunities generated by the proposed project.

6.6.2.2 **Land Use**

Land uses surrounding the proposed SR-11, CVEF, and POE are dominated by undeveloped land and industrial uses, along with several vehicle storage lots. To date, existing and proposed development in the land use study area consists of industrial and transborder support uses, many of which were established with the expectation that facilities provided by the proposed project will be developed.

6.6.3 Biological Concerns

The Project will impact the natural communities in the Biological Study Area (BSA). Biology impacts and planned mitigation include:

- Measures that would avoid, mitigate or reduce potentially significant environmental impacts to below a level of significance.
- Impacts will be mitigated in accordance with the Mitigation Plan for this project (see Tier II EIR/EIS document at http://www.dot.ca.gov/dist11/envir.htm). The mitigation plan will be developed in coordination with CDFG, the United States Fish and Wildlife Service (USFWS), the United States Army Corps of Engineers (USACE), and California Regional Water Quality Control Board (CRWQCB).
- Impacts to state listed species will require a permit for incidental take from the CDFG under Sections 2081(b) and (c) of the California ESA.
- For all impacts to federally listed endangered or threatened species and their habitats (see Tier II EIR/EIS document at http://www.dot.ca.gov/dist11/envir.htm), an informal Section 7 consultation with USFWS has been completed (as of November 23, 2011) with mitigation measures finalized in the Biological Opinion.
- Salvage and transplantation of sensitive plant species, including small-flowered morning glory, San Diego barrel cactus, and planting of seed or container stock of decumbent goldenbush at the Lonestar Ridge West parcel would be conducted to the maximum extent practicable.
- No avoidance or minimization efforts were determined feasible for USACE and/or CDFG jurisdictional areas because of the locations of these features that are entirely within, or traverse through, the necessary right-of-way. Unavoidable impacts will be mitigated by preservation, restoration and enhancement of habitat as described in the Natural Environment Study (NES) and Jurisdictional Delineation Report for SR-11 and the Otay Mesa East POE.
- No further avoidance or minimization efforts were determined feasible for small-flowered morning glory, San Diego barrel cactus, decumbent goldenbush, and San Diego marsh-elder because of their location within the necessary right-of-way. Unavoidable impacts will be mitigated by preservation, creation, restoration and enhancement of habitat as described in the Natural Environment Study (NES) and Jurisdictional Delineation Report for SR-11 and the Otay Mesa East POE.
- No avoidance or minimization efforts were determined feasible for mule fat scrub-disturbed, native grassland, non-native grassland, and grassland restoration habitats because of the location of these communities within the necessary right-of-way. Unavoidable impacts will be mitigated by preservation, creation, restoration and enhancement of habitat as described in the Natural Environment Study (NES) and Jurisdictional Delineation Report for SR-11 and the Otay Mesa East POE.
- No avoidance or minimization efforts were determined feasible for San Diego fairy shrimp critical habitat because of its location within the necessary right-of-way. The final mitigation for critical habitat impacts has been negotiated during the Section 7 consultation with the USFWS.
- No avoidance or minimization efforts were determined feasible for the Quino checkerspot butterfly because of its locations (i.e., observations prior to 2006 but none in 2006 or 2009). The final mitigation for critical habitat impacts will be negotiated during the Section 7 consultation with the USFWS.
- No avoidance or minimization efforts were determined feasible for the burrowing owl because of its locations (i.e., observations prior to 2006 and 2009 identified 9

locations of burrowing owl within the Preferred Alternative). The final mitigation for impacts will be negotiated with the CDFG.

- No avoidance or minimization efforts were determined feasible for non-listed, special status species, with the exception of special status birds, since they occur throughout the eastern portion of the necessary right-of-way. Avoidance and minimization measures for special status birds are proposed as described in the NES.
- All sensitive habitats outside the impact areas will be designated as environmentally sensitive areas. Such areas will be temporarily fenced with orange plastic exclusionary fencing and no personnel, debris, or equipment are allowed in the environmentally sensitive areas. These areas will be monitored during construction activities.

6.6.4 Multiple Species Conservation Program (MSCP)

Mitigation for the loss of natural communities of special concern is proposed to occur on the Lonestar parcels to be acquired by Caltrans in Otay Mesa. A portion of the parcels lie within the City of San Diego Multi-Habitat Planning Area (MHPA), and some of it is also designated as Multiple Species Conservation Program (MSCP) Biological Resource Core Area (BRCA).

Potential impacts will be offset by the preservation, creation, restoration, and enhancement of vernal pools on the Lonestar parcels, as well as through the preservation of San Diego fairy shrimp critical habitat, which overlaps with proposed critical habitat for spreading navarretia, on these parcels. The final mitigation for critical habitat impacts has been negotiated during the Section 7 consultation with the USFWS.

Mitigation for impacts to other special status plant and animal species will be mitigated via preservation or creation, restoration, and enhancement of habitat and/or the translocation/planting of affected plant species. Impacts to the burrowing owl are proposed to be mitigated through the preservation of non-native grassland, and to ensure suitable burrow opportunities are present. Artificial burrows will be created at a 5:1 ratio for each burrow impacted. Impacts to burrowing owls during construction will be minimized by avoiding disturbance near burrows during the breeding season (September 1 through January 3) and by not impacting active burrows outside the breeding season.

Impacts to USACE and CDFG jurisdictional areas require permitting and mitigation. Proposed compensatory mitigation is via the restoration and preservation of USACE non-wetland WUS/CDFG streambed at Johnson Canyon, a drainage that extends onto one of the Lonestar parcels and supports jurisdictional features.

6.6.5 Water Quality

Water quality standards within the project limits are set by the State Water Resource Control Board (SWRCB), specifically the San Diego Regional Water Quality Control Board (RWQCB). Existing surface water quality varies depending on the pollutant loading to the various streams within the hydrologic unit, originating mainly from rainfall and irrigation.

The proposed project will have potential short-term impacts to storm water runoff quality (during construction) due to the type of construction activities that have the potential to contribute pollutants and the type of construction materials that will be used. Examples of construction activities include clearing and grubbing, grading, utility excavations, and landscaping operations. Vehicle fluids, such as oil, grease and petroleum, concrete curing compounds, asphaltic emulsions associated with asphalt concrete paving operations, paints, solvents and thinners, and base and sub base materials are examples of construction materials that have the potential to contribute pollutants to storm water discharges, if not contained properly.

The project will also have potential long-term impacts (post construction) on the receiving water body's quality due to the contribution of pollutants from the operation of project facilities, such as total suspended solids, nutrients, pesticides, metals and litter. Bioswales will be provided where feasible for treatment of runoff. On-site and off-site waters will be kept separate whenever feasible and reasonable.

Although discharges from the project will not directly reach water quality sensitive areas, the Project will ultimately discharge to the Tijuana River in Mexico. The Tijuana River is classified as a 303(d) listed water body where it re-enters the U.S., west of the project limits. According to the 2006 303(d) list, pollutants of concern for the Tijuana River impaired segment (911.11) include eutrophic, indicator bacteria, low dissolved oxygen, sediment (TSS/Turbidity), pesticides, solids, trash, trace elements, and synthetic organics. There are no listed pollutants of concern for the unnamed intermittent streams located in HSA 911.12.

The short-term potential impacts will be avoided/minimized during the construction phase by deploying temporary Best Management Practices (BMPs), while implementing permanent BMPs (Design Pollution Prevention and Treatment BMPs) to the Maximum Extent Practicable (MEP) to minimize the long-term potential impacts. Maintenance BMPs will also be implemented by Caltrans maintenance forces during their operations. Once these measures (temporary and permanent BMPs) are adequately implemented, this project will not have significant impacts to water quality.

A Water Quality Technical Report has been completed and is an attachment to the EIR/EIS. A Storm Water Data Report has also been completed for the project (see Attachment L).

6.7 Air Quality Conformity

An Air Quality Technical Report, dated June 2010, was prepared for the project and indicates that implementation of the project will not adversely impact existing air quality at representative sensitive receptors within the project area. The project will not violate any state or federal carbon monoxide (CO) standards and as such, no mitigation measures are needed. Furthermore, the project fully conforms to the State Implementation Plan's (SIP) purpose of attaining and maintaining national ambient air quality standards, and meets all criteria for a finding of conformity with the SIP. A project level conformity determination was submitted and approved by FHWA in May 2011.

6.8 Title VI Considerations

The proposed project includes elements for accessibility of pedestrian and other non-motorized traffic in compliance with Title VI of the Civil Rights Act of 1964 and related statutes. Caltrans ensures that no person in the State of California shall be denied the benefits of, or subject to discrimination under any program or activity because of race, color, religion, national origin, gender, age, or handicap.

The project design will incorporate the standards of the Americans with Disabilities Act and the State Building Code for accessibility for persons with disabilities. Design guidelines to encourage the development of transit and pedestrian friendly communities, such as minor concrete sidewalks, curb ramps and gutters, will be included in the design and installed during project construction. Though SR-11 will be a tolled facility, low-income populations will not be precluded from crossing the border because there are two nearby facilities that are not tolled.

6.9 Life Cycle Cost Analysis (LCCA)

6.9.1 Methodology

FHWA encourages the use of LCCA for the evaluation of all major investment decisions in order to increase the effectiveness of those decisions. It is Caltrans' policy that the cost impacts of a project's life-cycle are fully taken into account when making project-level decisions for pavements. *RealCost,* a macro inside EXCEL, developed by FHWA, was chosen by Caltrans as the official software for evaluating the cost effectiveness of alternative pavement designs for new roadways and existing roadways requiring Capital Preventive Maintenance (CAPM), rehabilitation, or reconstruction. The *RealCost* data and LCCA form have been completed for SR-11 pavement structural section selection and included in Attachment F.

The analysis period of 55 years was used for the comparison of differing pavement design lives of different pavement materials. Construction costs, maintenance costs, and cost to the user due to loss of utility during maintenance operations were included in this analysis. Traffic Data utilized in the LCCA assumed 85% cars and 15% trucks, with an annual growth rate for traffic as 1.3%.

The proposed structural section (see Attachment A) was determined using the Life Cycle Cost Analysis (LCCA). LCCA is an analytical technique that uses economic principles to evaluate long-term alternative investment options. The LCCA form (see Attachment F) shows hot mix asphalt (HMA) to be less expensive for initial construction, but maintenance cost is greater than that of Jointed Plain Concrete Pavement (JPCP). Therefore, JPCP has been identified to be used on this project.

6.9.2 Section Alternative Description

Two alternatives for pavement were included: (1) Jointed Plain Concrete Pavement (JPCP) Structural Section for new four-lane highway (40-year Pavement Design Life), (2) Hot Mix Asphalt (HMA) Structural Section for new four-lane highway (20-year Pavement Design Life). JPCP is a common type of rigid pavement engineered with longitudinal and

transverse joints to control where cracking occurs in the slabs. It does not contain steel reinforcement beyond tie bars and dowels between slabs for load transfer. HMA consists of a mixture of asphalt binder and a graded aggregate ranging from coarse to very fine particles.

Two rehabilitation cycles are expected for the JPCP alternative, and five are expected for the HMA alternative. All costs are entered as base-year amounts in today's dollars; the LCCA method escalates all amounts to their future year of occurrence and discounts them back to the base date to convert them to present values. The LCCA also uses the time sensitive nature of cost to calculate an Equivalent Uniform Annual Cost. The table below provides a cost comparison.

Table 10 - Comparative Cost Results of LCCA over 55-Year Period

Total Cost	Alternative 1: JPCP - 40 YR design life		Alternative 2: HMA – 20 YR design life	
	Agency Cost ($1000)	User Cost ($1000)	Agency Cost ($1000)	User Cost ($1000)
Undiscounted Sum	$50,777	$253	$59,759	$1,009
Present Value	$49,133	$43	$51,224	$276
Equivalent Uniform Annual Cost	$2,222	$2	$2,317	$13

The results show JPCP to have a lower annualized cost to both the user and the agency. Agency cost is primarily comprised of material, labor, and maintenance. User cost considers cost associated with delay. Speed reduction, idling, and stopping due to construction of repairs and maintenance would differ depending on the material chosen. HMA has over six times the cost to the user due to the frequency of maintenance required.

7. OTHER CONSIDERATIONS AS APPROPRIATE

7.1 Public Hearing Process

During the public circulation of the Tier II Draft EIR/EIS, a public hearing was held on January 19, 2011, at Ocean View Hills Elementary in Otay Mesa. No oral or written comments were received at the meeting. During the public review, 28 comment letters were received from individuals and agencies. These public and agency comment letters have formal responses included in the Final Environmental Document.

7.2 Route Matters

7.2.1 Freeway Agreements

Freeway agreements between the State of California and the City of San Diego, and between the State of California and the County of San Diego, to document the planned traffic circulation features, are required. These agreements will address access to the proposed facilities.

7.2.2 Route Adoption

The alignment of SR-11 is eligible for adoption by the CTC upon approval of the Tier II environmental document.

7.2.3 Relinquishments

There are no known relinquishments required for this project.

7.3 Permits

The following permits and/or approvals were acquired during or immediately following the completion of Phase I studies.

- U.S. Department of State-Conditional Presidential Permit for the POE, November 2008
- U.S. General Services Administration-Approval of POE site, following the Phase I PEIR/PEIS ROD

The following permits and/or approvals from the following State and Federal Agencies will be required to construct this project. Efforts to secure the permits will begin pending receipt of the Tier II ROD and must be in place prior to beginning construction.

- U.S. Department of State-Presidential Permit for the POE
- United States Army Corps of Engineers (USACE) – 404 Nationwide Permit for filling waters of the U.S.
- United States Fish and Wildlife Service (USFWS) – Endangered Species Act Section 7 Consultation Ended with the receipt of the Biological Opinion (BO) on November 23, 2011.
- California Regional Water Quality Control Board – 401 Water Quality Certification and conformance with NPDES Caltrans Statewide Permit
- California Department of Fish and Game (CDFG) – Code 1602 Agreement for Streambed Alteration and Section 2080.1 Agreement for threatened and endangered species
- State Water Resources Control Board – Conformance with statewide Caltrans NPDES Permit and NPDES General Construction Permit

7.4 Cooperative Agreements and Contribution Agreements

The anticipated cooperative agreements (COOP) and contribution agreements by project phase are shown in the following table, although additional agreements are expected.

Table 11 – Cooperative and Contribution Agreements by Project Phase

Phase	Agency	Agreement Description
PA&ED	SANDAG, Caltrans	HPP Fund Transfer, 2008

Phase	Agency	Agreement Description
PA&ED, PS&E	CBP, GSA, Caltrans, SANDAG	Project Development Costs
PA&ED	SANDAG, Caltrans	Toll Financial Strategy, $200,000 to SANDAG, 2009
PA&ED	GSA, Caltrans	Transfer Funds, $300,000, to GSA for guidance and oversight of LPOE PDS, 2009
PS&E, R/W	CBP, GSA, Caltrans, SANDAG	POE Design and R/W - Fund Transfer
PS&E, R/W	Caltrans, SANDAG	SR-11 Design and R/W - Fund Transfer
PS&E, R/W	CHP, Caltrans, SANDAG	CVEF Design and R/W - Fund Transfer
Construct	CBP/GSA, Caltrans, SANDAG	POE Construction - Fund Transfer
Construct	Caltrans, SANDAG	SR-11 Construction - Fund Transfer
Construct	CHP, Caltrans, SANDAG	CVEF Construction - Fund Transfer

Legend
PA&ED: Project Approval and Environmental Document
PS&E: Plans, Specifications, and Estimate
R/W: Right-of-Way Acquisition
Construct: Construction
HPP: High Priority Projects
CBIP: Coordinated Border Infrastructure Program
DEMO: Demonstration

7.5 Memorandum of Understanding/Memorandum of Agreements (MOU/MOA)

The anticipated memorandums of understanding/ memorandums of agreement (MOU/MOA), by project phase are shown in the following table, although additional agreements are expected.

Table 12 – MOU/MOA Agreements by Project Phase

Phase	Agency	Description
PA&ED, PS&E	CBP, GSA, SANDAG, FHWA	General MOU-SR11 and LPOE 05631, 2009
O&M	CBP, GSA, CHP, SANDAG	POE O&M
O&M	Caltrans, SANDAG	SR-11 O&M
O&M	CHP, Caltrans, SANDAG	CVEF O&M

Legend
PA&ED: Project Approval and Environmental Document
PS&E: Plans, Specifications, and Estimate
O&M: Operations and Maintenance

7.6 Cost Sharing Agreements

Portions of the SR-905/SR-125/SR-11 Interchange have previously been considered during the development of SR-905 and SR-125. Costs of delivering several of the freeway connector ramps are covered by the *Toll Road/SR-905 Interchange Cost Sharing Agreement by and between San Diego Expressway Limited Partnership and State of California, Department of Transportation regarding State Route 125 South Toll Road*. This cost sharing agreement was effective May 22, 2003 and included the following connector ramps:

- Southbound SR-125 to eastbound SR-905 ("S" Line per the agreement)
- Westbound SR-905 to northbound SR-125 ("N" Line per the agreement)
- Eastbound SR-905 to northbound SR-125 ("EN" Line per the agreement)
- Westbound access to northbound SR-125 from Enrico Fermi Drive ("WN" Line per the agreement)

On December 21, 2011, SANDAG acquired SR-125. The current cost sharing agreement is being updated to reflect SANDAG as the new operator of SR-125. Maintenance Agreements, as well as any other necessary agreements, will be prepared and executed as required by the project.

7.7 Miscellaneous Agreements

Miscellaneous agreements by project phase are shown in the following table.

Table 13 – Miscellaneous Agreements by Project Phase

Phase	Agency	Description
PA&ED	SANDAG, Caltrans	Feasibility Study, 2009
PA&ED, PS&E	Caltrans	General Cooperative Agreement Report (CAR)

Legend
PA&ED: Project Approval and Environmental Document
PS&E: Plans, Specifications, and Estimate

7.8 Involvement with a Navigable Waterway

There is no involvement with a Navigable waterway for this project.

7.9 Transportation Management Plan for Use During Construction

Temporary closures of SR-905, Enrico Fermi Drive and Alta Road will be required to construct SR-11. Therefore, temporary detours will be necessary. Sanyo Avenue will serve as the main detour when Enrico Fermi Drive and Alta Road are closed. During construction of the project, falsework will be constructed over Sanyo Avenue, thereby closing the Sanyo Avenue detour for approximately two weeks that will include one lane

closure with a flagman during the day and complete closure at night. During this intermittent closure of Sanyo Avenue, traffic will be redirected along Airway Road, La Media Road, and Otay Mesa Road. It is assumed that the detour utilizing Sanyo Avenue will be required throughout the majority of the project's construction period. Enrico Fermi Drive will need complete closure for five days and a new at-grade detour will be built adjacent to the new bridge site that will remain open for six months.

Falsework will also be constructed over SR-905 for the eastbound SR-905 connector to SR-11 and will require a temporary detour for approximately four nights to construct and remove falsework. When this closure occurs, both the eastbound and westbound SR-905 will be detoured along Siempre Viva Road and La Media Road where there are SR-905 interchanges at both local roads.

As part of the Preferred Alternative the southbound SR-125 to eastbound SR-11 connector will require a temporary closure of Otay Mesa Road for three nights to construct and remove falsework. When this occurs, the detour will be along Harvest Road, Airway Road and La Media Road.

Reasonable access to businesses along the detours should be maintained throughout the duration of the Project's construction. The Project expects the main detour to be operational throughout the duration of construction and assumes no modifications are necessary to any streets.

In order to plan for minimizing motorist delays while implementing projects on the State highway system, a *Preliminary Transportation Management Plan* (TMP) has been developed in conjunction with this Project Report (Attachment K). The TMP addresses closures and other requirements to complete the project in a cost effective and timely manner with minimal interference with the traveling public. Specific objectives of the TMP are:

- Reduce traffic delay or time spent in the queue to less than 15 minutes above normal recurring traffic delay.
- Maintain traffic flow throughout the SR-905 corridor and the surrounding areas.
- Provide a safe environment for the work force and motoring public.

The TMP recommends that the following elements be implemented to meet the aforementioned objectives:

- A public awareness campaign to educate the public about potential construction plans and scheduling.
- Motorist Information Strategies such as Portable Changeable Message signs, ground mounted signs, and information on the Caltrans Highway Information Network (CHIN), a 24-hour information hotline and website, to divert traffic volume from the construction site.
- Incident Management including a Construction Zone Enhanced Enforcement Program (COZEEP), Freeway Service Patrol, and a Traffic Management Team that would station CHP Officers and Traffic Management Team units at construction sites to facilitate safer construction and traffic conditions and respond quickly to incidents.

- Construction Strategies of selectively closing freeway main lanes, ramps, and connectors to coordinate potential conflicts with other projects and special events without creating substantial delays to motorists, and A+B Bidding.
- Contingency Plans for instances in which the timely opening of lanes is deemed unachievable.
- Alternate Route Strategies that would temporarily detour traffic, mainly utilizing Sanyo Avenue, to allow construction activities while maintaining reasonable access to businesses.

7.10 Stage Construction

Construction of the project is expected to begin in 2013 and last approximately two to three years. During that time, construction staging is necessary to maintain traffic circulation. Construction is assumed to occur in one phase, with SR-11 and the POE/CVEF being constructed simultaneously, although multiple phases may be required based on funding constraints. The staging of construction will be closely coordinated with the TMP.

7.11 Accommodation of Oversize Loads

The proposed structure improvements for the project would not reduce the existing permanent vertical clearances along the SR-905 and SR-125 corridors. The minimum vertical clearance to any major structure is 16.5 ft over the roadbed of the state facility. The minimum vertical clearance would be provided for new structures constructed as part of the project.

7.12 Graffiti Control

The project vicinity has been identified as a graffiti-prone area. Adequate access restrictions shall be established to limit the potential for graffiti. Measures to reduce graffiti will be incorporated into the project and may include:

- Densely spaced vine planting sufficient to cover retaining walls to act as a graffiti deterrent
- Graffiti guards on bridge mounted signs
- Anti-climb measures on pole-mounted signs

7.13 U.S. International Boundary and Water Commission Requirements (IBWC)

The IBWC is a bi-national organization that oversees projects along the U.S. - Mexico Border with the potential to generate impacts involving political, economic, and environmental or infrastructure issues. With respect to water quality, IBWC guidelines identify requirements including prevention of pollution; and meeting applicable environmental laws, regulations and other pertinent requirements. For the proposed project, this would entail designing the storm drain system to ensure that there is no net increase in post-development flows from the project site, as well as conforming with appropriate elements of the federal Clean Water Act (CWA) and related requirements.

The IBWC jurisdiction extends 60 feet north from the international border, with the principal mission of the agency to provide solutions for issues related to the application of U.S.-Mexico treaties, including hydrology and flood control. Portions of the proposed POE facilities extend into the IBWC jurisdictional area and are subject to associated regulatory oversight. While none of the proposed SR-11 and CVEF facilities are located within the noted 60-foot zone, treated and detained runoff from the project area would be discharged into watersheds that eventually enter IBWC jurisdiction. The IBWC guidelines identify a number of hydrologic and hydraulic requirements for projects within or potentially affecting their jurisdiction, including assessment of applicable soil characteristics (e.g., infiltration rates), drainage conditions, flow regulation, and drainage facility maintenance. Final design of the POE will require the continued development of strategies and the identification of specific storm water control devices to satisfy the IBWC guidelines.

7.14 Hydraulics and Hydrology

Preliminary hydrology and hydraulics studies have been prepared for the project. The *Preliminary Hydrology and Hydraulics Report State Route 11 Corridor and Commercial Vehicle Enforcement Facility* was completed March of 2010 with a separate study completed for the POE in February of 2010. An August 2010 addendum to the report analyzed a Siempre Viva Road Full Interchange Variation.

7.15 Project Phasing

A PCR has been approved to split this project into four separate phases for design and construction. These phases will include (A) SR-905, (B) SR-11, (C) POE and (D) SR-125 Connector. The SR-905 phase will include all work west of Enrico Fermi Drive as described in the preferred alternative with the exception of the southbound SR-125 to eastbound SR-11 connector. The SR-11 phase will include the remainder of the highway work as described in the preferred alternative along with the CVEF. The POE will be constructed with a separate contract which is anticipated to be administered by SANDAG. The SR-125 phase will include the southbound SR-125 to eastbound SR-11 connector. The CTC approved this change in January 2012.

Senate Bill 1486 includes provisions for the entire project to utilize non-traditional delivery methods. The highway phases are anticipated to be delivered by method of Design-Sequencing, The POE will be delivered by method of Design-Build to deliver it simultaneously with the highway. This split is scheduled to take place at the onset of the “Begin Design” milestone as shown in the table below. The goal of this split is to facilitate the project delivery to attain the scheduled “Begin Construction” milestone set for September 1, 2013. As the SR 905/SR-11 connectors were environmentally cleared under the SR-905 project, EA 11-093160, there was opportunity to begin design of these connectors immediately. Therefore, design on the SR-905 phase began in the summer of 2011.

8. PROGRAMMING

8.1 Programming

This project is included in the SANDAG 2010 RTIP. It is funded in part by the State Transportation Improvement and Interregional Improvement Program (STIP-IIP), federal funds from the Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and the Coordinated Border Infrastructure Program (CBIP), the Trade Corridors Improvement Fund (TCIF - 20.20.723.000), which is a portion of State Proposition 1B passed by California voters in 2006, and local funds made up of bond revenue secured with future tolls. It should be noted that additional funds from local, regional, state, federal and private resources will also be pursued. Existing and proposed programmed amounts are shown in the following tables by fund type and phase:

Table 14 – Programmed Funding (in thousands of $)

FUNDING SOURCE	TOTAL	PA&ED	PS&E	R/W	CON
CBIP	$4,900	$4,900			
Federal – *HPP (SAFETEA-LU)*	$800	$800			
Local Funds	$626,420		$42,690	$80,380	$503,350
STIP-IIP NHS	$6,882	$6,882			
STIP-IIP Prior State Cash	$5,200	$5,200			
STIP-IIP State Cash	$919	$919			
State – *TCIF*	$75,000				$75,000
TOTAL	*$720,121*	*$18,701*	*$42,690*	*$80,380*	*$578,350*

Table 15 – Proposed Funding to be Programmed (in thousands of $)

FUNDING SOURCE	TOTAL	PA&ED	PS&E	R/W	CON
CBIP	$50,400	$4,900	$39,200	$6,300	
Federal – *HPP (SAFETEA-LU)*	$800	$800			
Local Funds	$615,000		2,600	$121,300	$491,400
STIP-IIP NHS	$6,882	$6,882			
STIP-IIP Prior State Cash	$5,200	$5,200			
STIP-IIP State Cash	$919	$919			
State – *TCIF*	$75,000				$75,000
TOTAL	*$754,201*	*$18,701*	*$41,800*	*$127,600*	*$566,400*

8.2 Funding

To determine the financial feasibility of constructing and operating SR-11 and the Otay Mesa East POE as a toll- or fee-based facility, a financial feasibility study was completed for the SR-11 Toll Road and Otay Mesa East POE project in 2006. The study indicated that the project was viable and that the projected revenues were sufficient to limit debt-

service coverage risk to only a few initial years. Traffic, revenue, cost, and financial risk models were developed for this analysis. Key findings of the study concluded that the toll facility was potentially a good investment and that public participation will be necessary to attract sufficient bond capital and to finance construction of the Project. The financial feasibility study further concluded that further financial analyses will be needed to explore the potential of non-toll revenues, such as development fees and interest earnings on operating reserves, to make up potential revenue shortfalls. A financial team has been assembled by SANDAG to access the marketability of selling revenue bonds for the project. A Traffic and Revenue Study (T&RS) is currently being pursued by SANDAG and Caltrans. This study will include an assessment of economic costs and benefits of the project based on revenue generated from tolling commercial and non-commercial vehicles. This study will complement a similar analysis that is currently underway in Mexico for the proposed Otay II POE and connecting roads in Tijuana.

8.3 Schedule

This project is following an accelerated schedule due to the constraints of the TCIF funding. According to the funding requirements per the CTC, construction of the project must begin by the end of 2013 or risk losing the TCIF funding. The following is a list of project milestones:

The following is the proposed delivery schedule for each phase:

Table 16 – Proposed Delivery Schedule by Phase

	(A) SR-905	(B) SR-11	(C) POE	(D) SR-125 Connector
Project Study Report Approved				
Begin Environmental (PA&ED) Phase		05/30/07	05/30/07	05/30/07
Circulate Draft Environmental Document		12/11/10	12/11/10	12/11/10
Draft Project Report	07/27/01	12/11/10	12/11/10	12/11/10
End Environmental Phase (PA&ED Milestone)	09/23/04	10/31/11	10/31/11	10/31/11
Begin Design (PS&E) Phase	07/01/11	11/01/11	11/01/11	11/01/13
End Design Phase (RTL)	04/01/13	07/01/13	07/01/13	07/01/15
Begin Right of Way Phase	11/01/11	11/01/11	11/01/11	11/01/13
End Right of Way Phase (Right of Way Certification Milestone)	04/01/13	07/01/13	07/01/13	07/01/15
Begin Construction Phase (Contract Award Milestone)	07/15/13	10/01/13	09/01/13	09/01/15
End Construction Phase (Construction Contract Acceptance Milestone)	03/31/16	06/20/16	03/30/16	03/30/18
Begin Closeout Phase	04/01/16	10/30/16	04/30/16	04/30/18
End Closeout Phase (Closeout Report)	04/01/18	10/30/18	04/30/18	04/30/20

9. REVIEWS

Manuel Sanchez, FHWA, reviewed project on October 21, 2011.

Luis Betancourt, Caltrans Headquarters Geometric Reviewer, reviewed project on October 26, 2011.

This Project Report was reviewed by the following:

Mario Orso	Caltrans District 11, TCIF Corridor Director
Jacqueline Appleton-Deane	Caltrans District 11, Project Manager
Nicola Bernard	Caltrans District 11, Design Manager
Michael Webster	Caltrans District 11, Design Manager
Sandra Lavender	Caltrans District 11, Environmental Planning

10. PROJECT PERSONNEL

Caltrans District 11
Jacqueline Appleton-Deane, Project Manager
Nicola Bernard, Design Manager
Juan Carlos Cortez, Project Engineer
Brooke Emery, Project Engineer
Olga Estrada, Environmental Manager
Sandra Lavender, Environmental Planner

AECOM Technology Services, Inc.
Kirk Bradbury, Consultant Project Manager
Andrea Thomas, Consultant Project Engineer

VRPA Technology, Inc.
Erik Ruehr, Consultant Traffic Engineer

LIST OF ATTACHMENTS

Attachment A – Preferred Alternative Cover Sheet and Typical Sections

Attachment B – Preferred Alternative Layout Sheets

Attachment C – Preferred Alternative Profile Sheets

Attachment D – Preliminary Otay Mesa East POE with CVEF Layout

Attachment E – Cost Estimates

Attachment F – LCCA Data Sheets

Attachment G – Right-of-Way Data Sheets

Attachment H– Structures Advanced Planning Studies

Attachment I – Fact Sheet Exceptions

Attachment J – Commercial Vehicle Enforcement Facility (CVEF) Alternatives Analysis Report

Attachment K – Transportation Management Plan

Attachment L - Storm Water Data Report (SWDR)

Attachment M – Noise Abatement Decision Report (NADR)

12. LIST OF APPENDICES

Appendix A. Senate Bill 1486 Otay Mesa East Toll Facility Act, Senator Ducheny, February 2008

Appendix B. Economic Impacts of Wait Times at the San Diego-Baja California Border, SANDAG, Caltrans District 11, January 19, 2006

Appendix C. Technology Pre-Deployment Proposal for Otay Mesa East Port of Entry: A Clean, Green, and Smart Border, SANDAG, 2009

Attachment A – Preferred Alternative Cover Sheet and Typical Sections

INDEX OF PLANS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

STATE OF CALIFORNIA

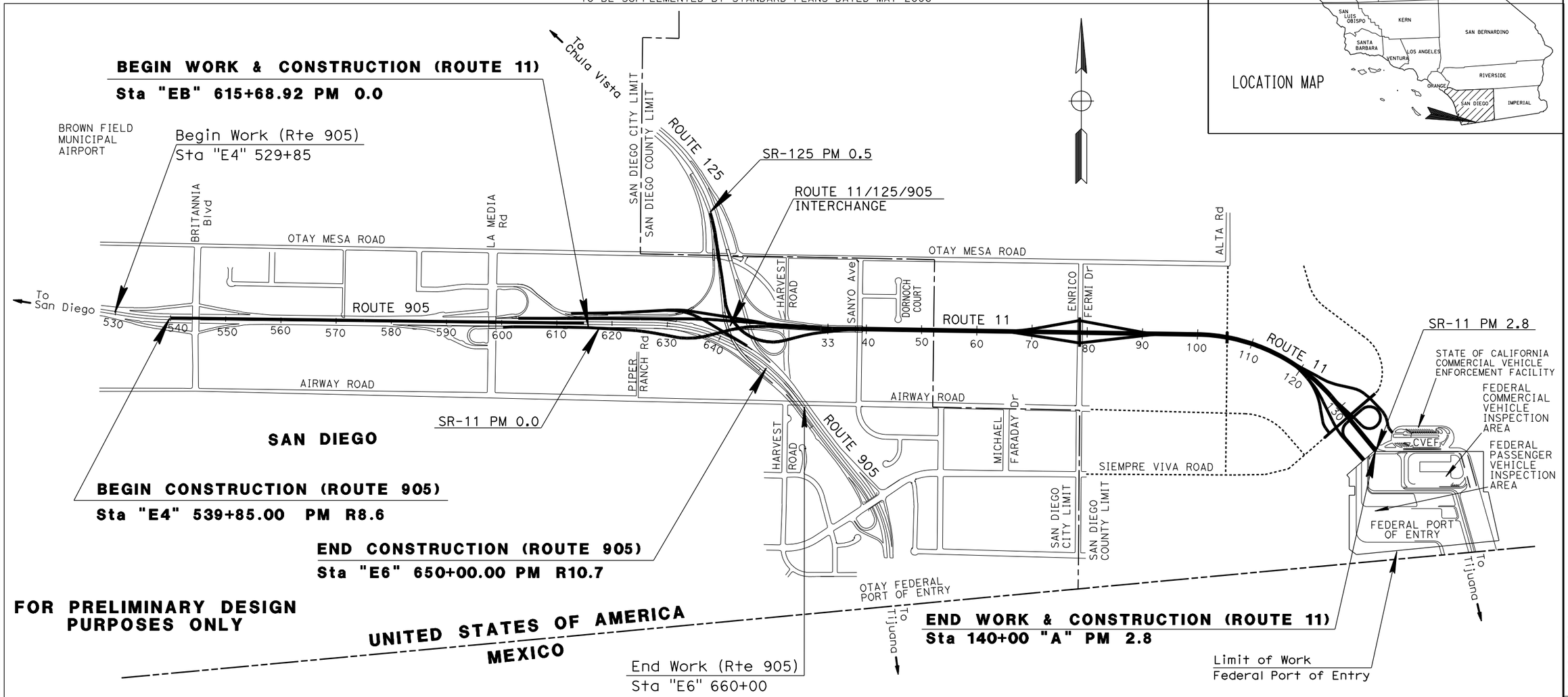
DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON

STATE HIGHWAY

CONSTRUCTION OF A NEW STATE ROUTE AND PORT OF ENTRY IN SAN DIEGO COUNTY IN AND NEAR SAN DIEGO ON ROUTE 11 FROM ROUTE 905/11 SEPARATION TO MEXICO, AND ON ROUTE 125 FROM 0.8 MILES NORTH OF ROUTE 905/11 SEPARATION TO ROUTE 905/11 SEPARATION, AND ON ROUTE 905 FROM 0.1 MILE WEST OF BRITANNIA BOULEVARD OVERCROSSING TO ROUTE 905/11 SEPARATION

TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006



PREFERRED ALTERNATIVE

PROJECT MANAGER

DESIGN ENGINEER

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LAST REVISION 06-02-11

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1. DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED ON THE STANDARD SPECIFICATIONS.

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- 0.25 FT HMA (TYPE A)
- 0.65 FT CLASS II AGGREGATE BASE
- 0.65 FT FOUNDATION TREATMENT

[2]
- 0.90 FT JPCP
- 0.25 FT HMA (TYPE A)
- 0.65 FT CLASS II AGGREGATE BASE
- 0.65 FT FOUNDATION TREATMENT

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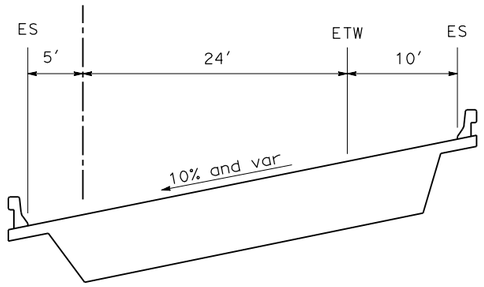

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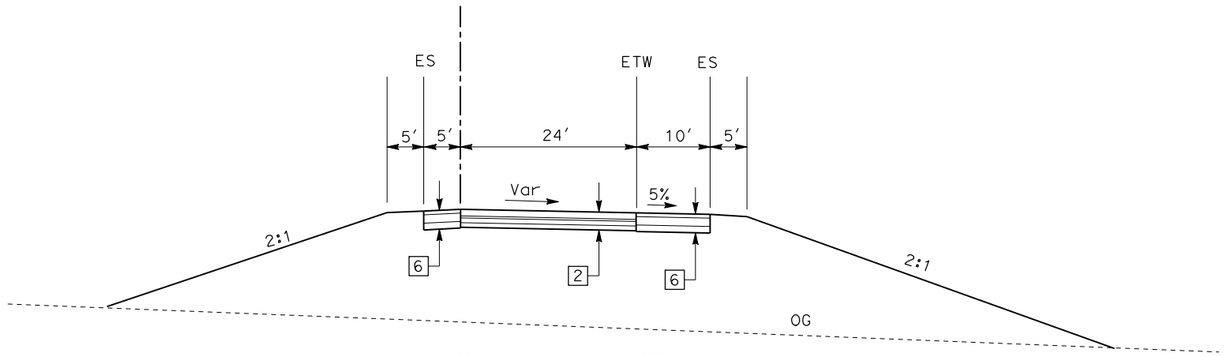

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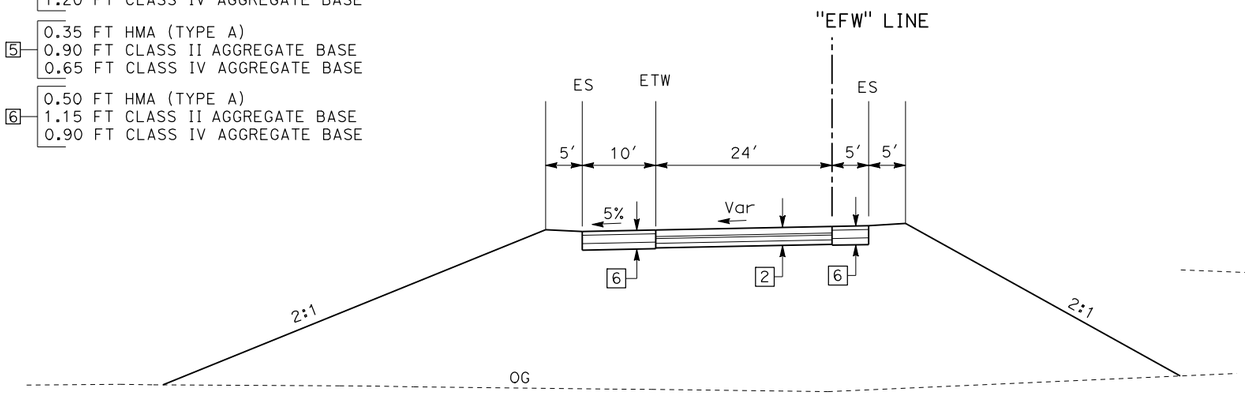

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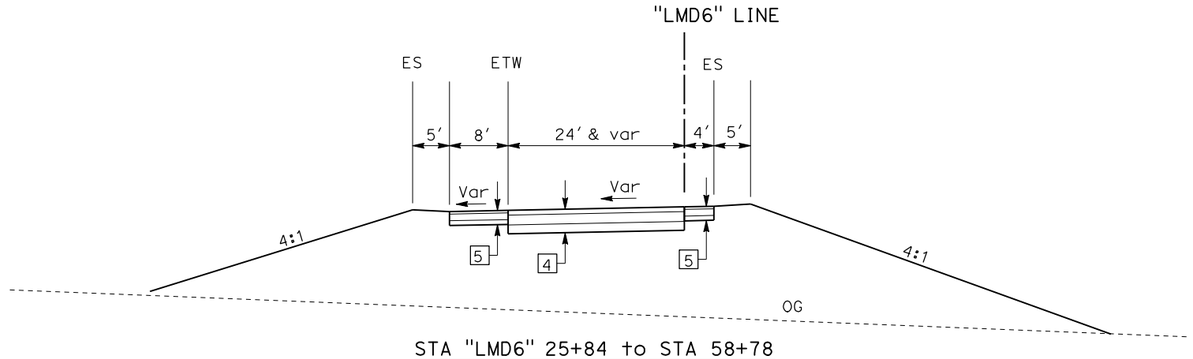

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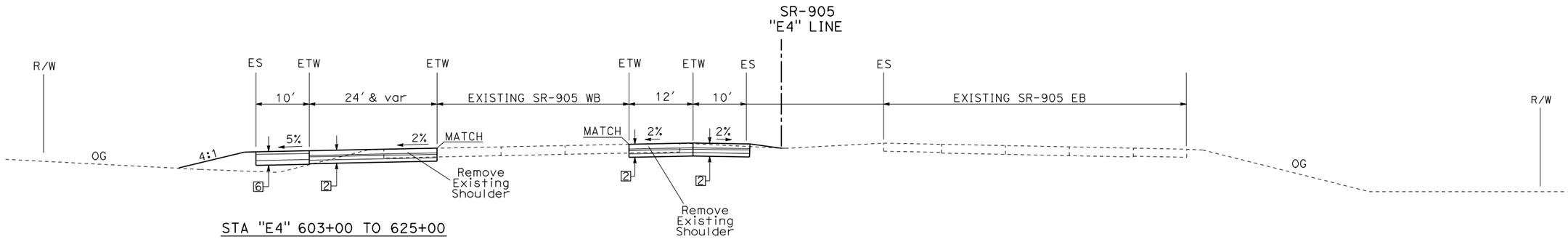

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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
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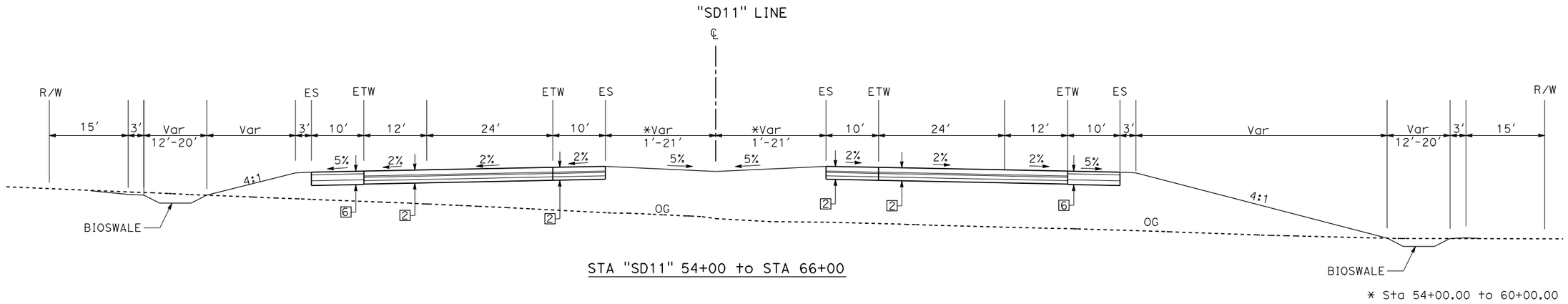

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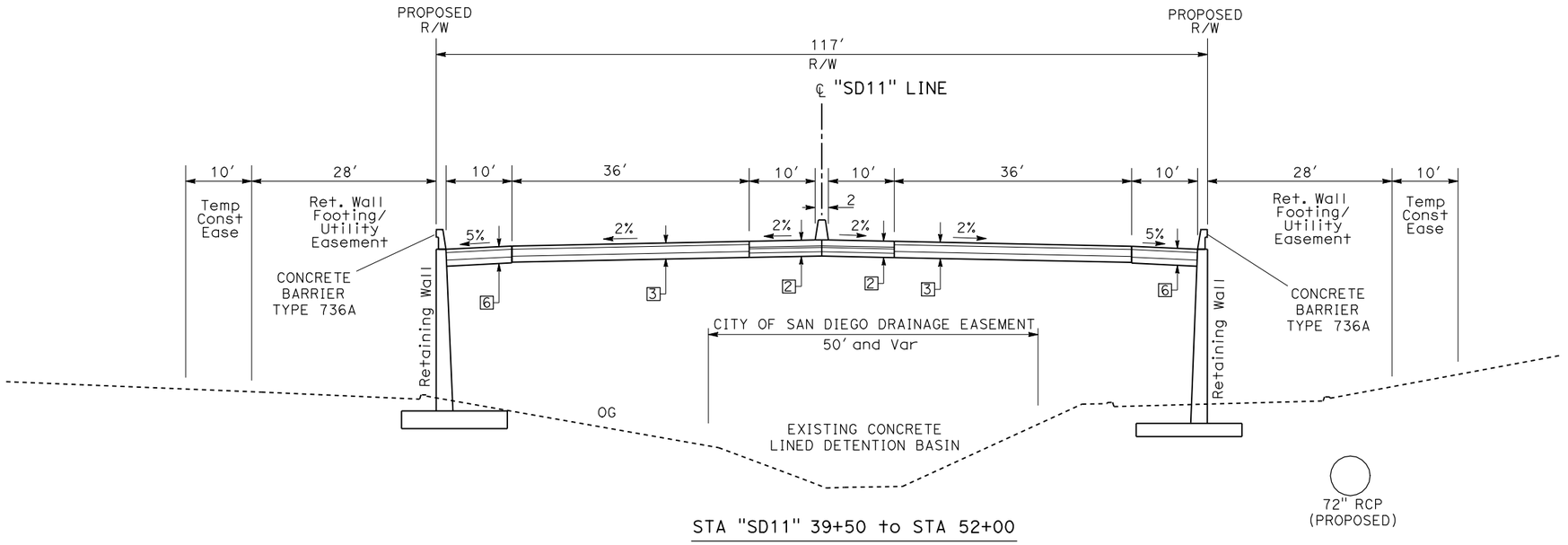

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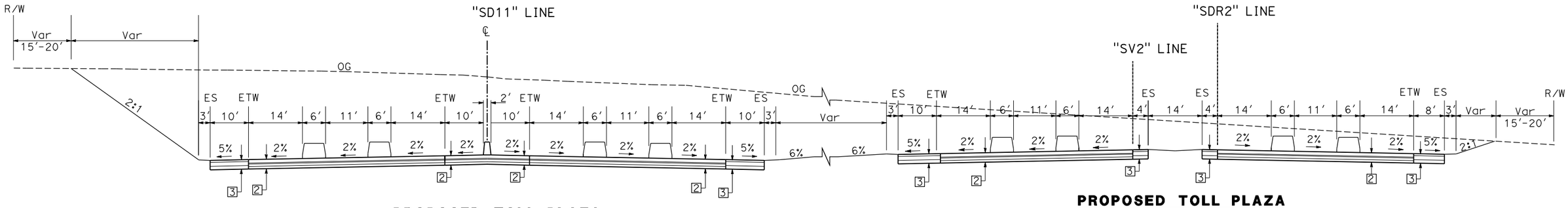

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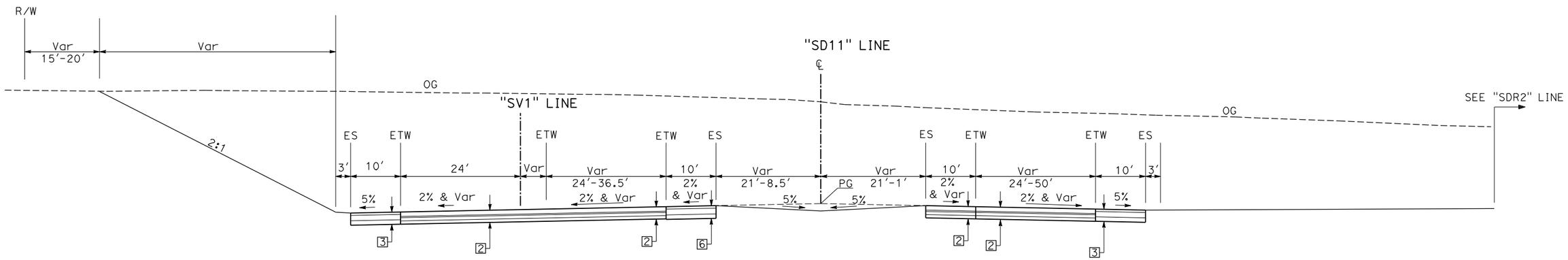
PROPOSED TOLL PLAZA

STA "SD11" 137+50



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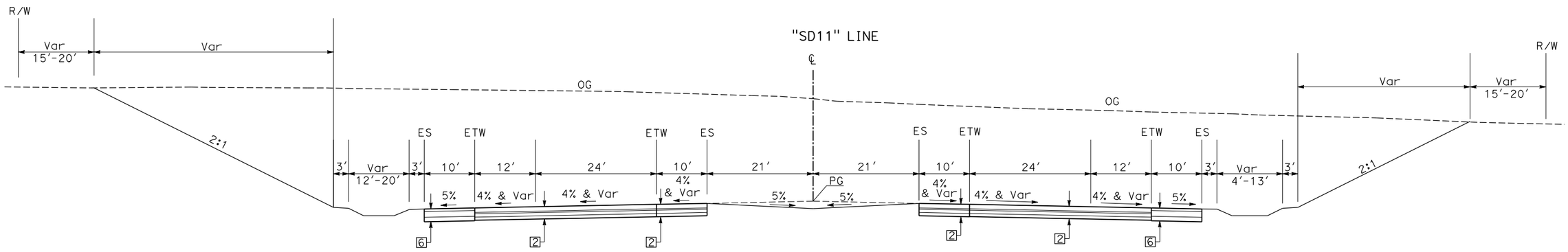

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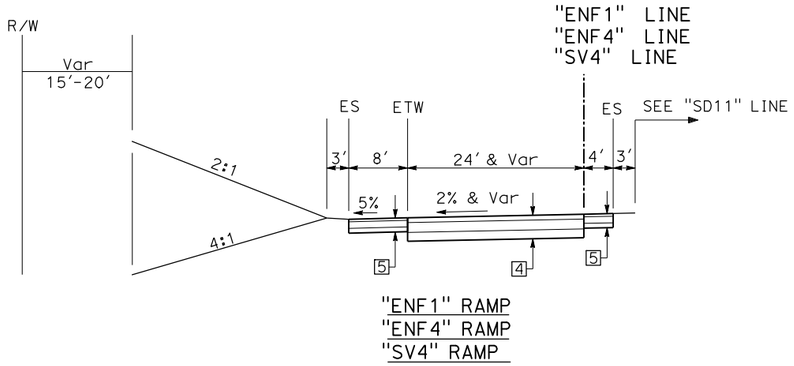

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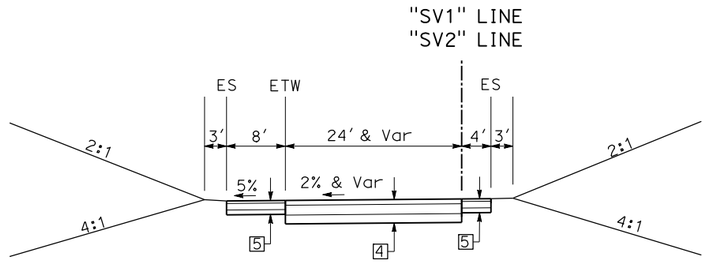

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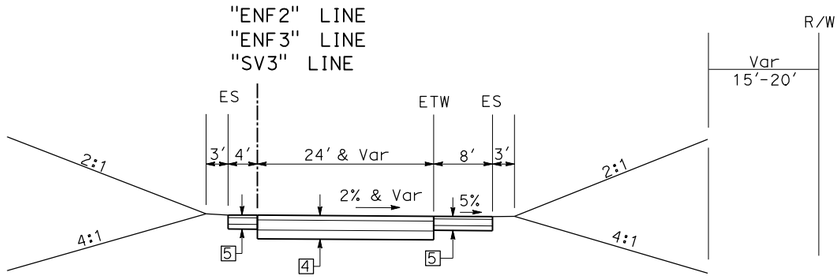

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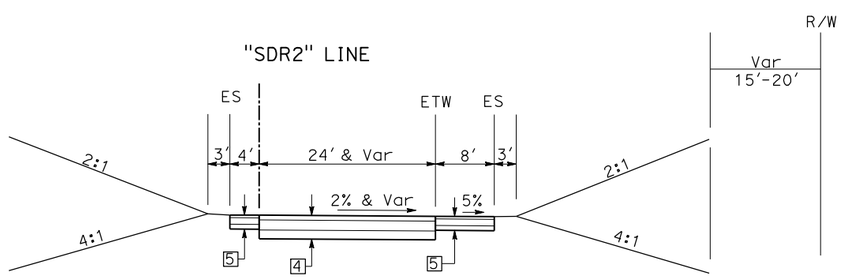

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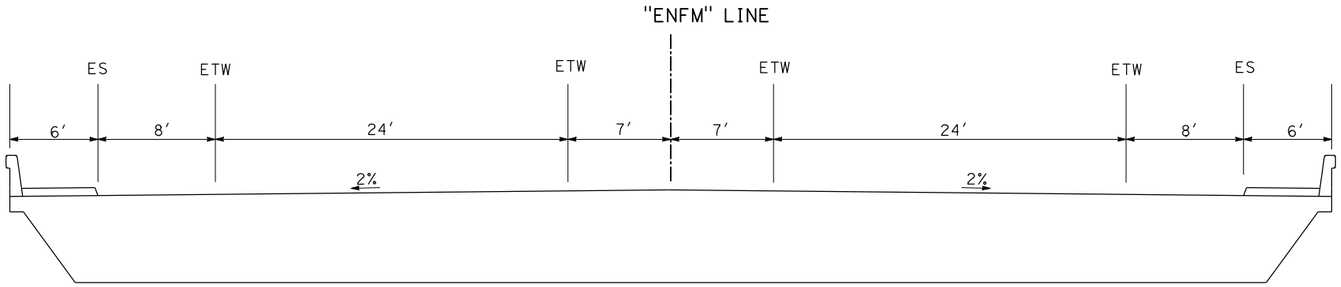

ENRICO FERMI DR

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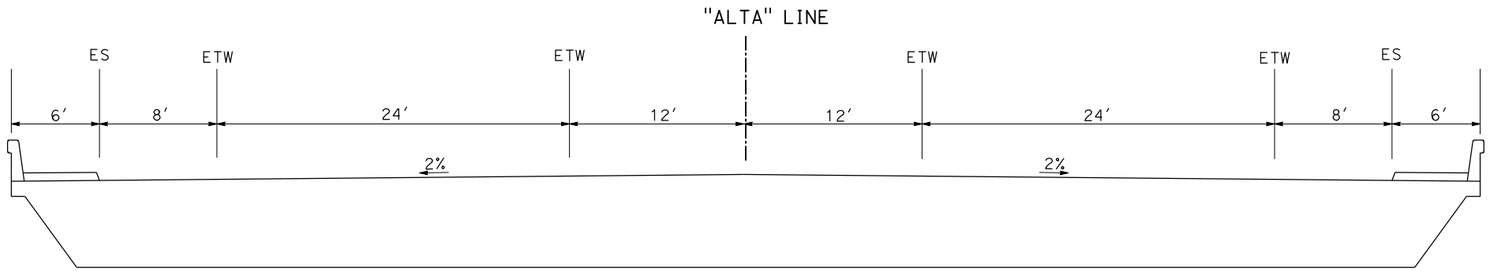
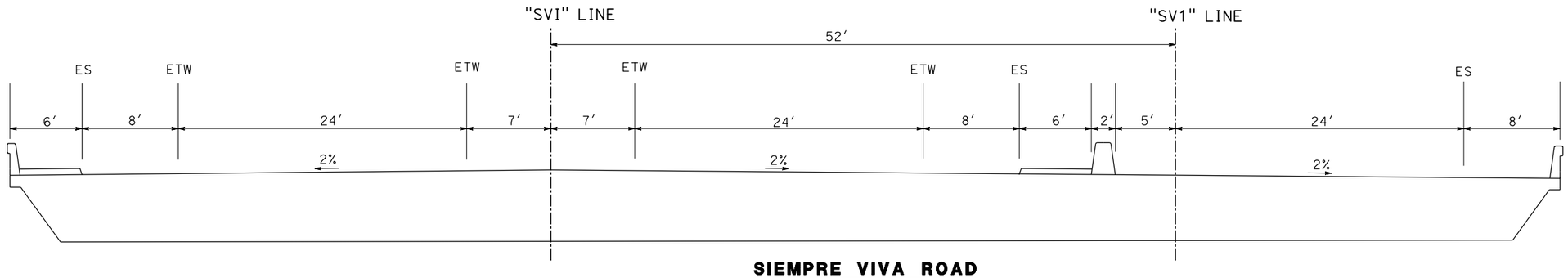


ALTA ROAD

STA "ALTA" 31+50 to STA 35+00 OVERCROSSING STRUCTURE



SIEMPRE VIVA ROAD

STA "SVI" 103+00 to STA 105+20

STA "SV1" 145+00 to STA 147+20

FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

NO SCALE

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

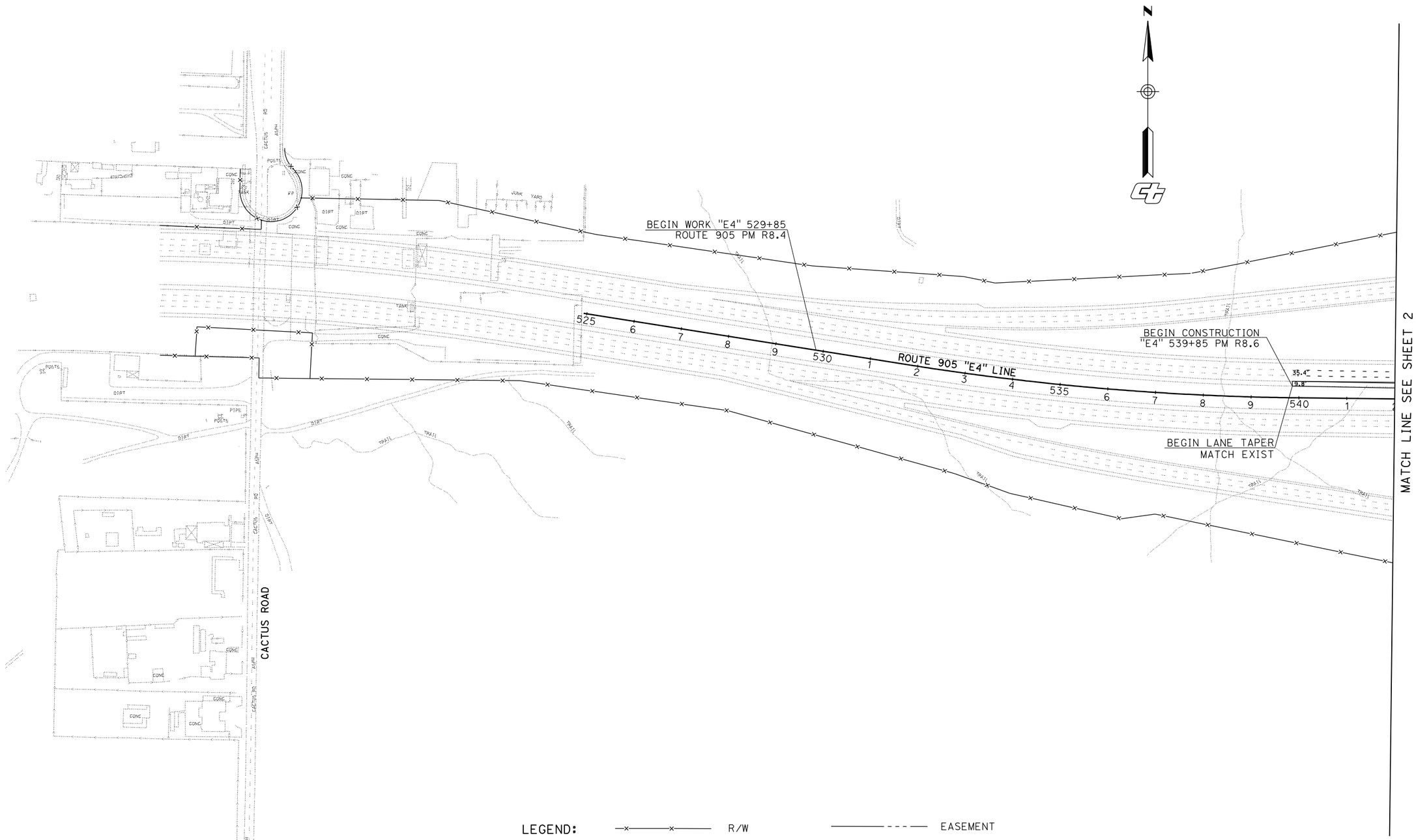
USERNAME => s132966
DGN FILE => b056300ca005.dgn
DATE PLOTTED => 16:16 28-MAR-2012

TYPICAL CROSS SECTIONS

SHEET 5 OF 5

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

Attachment B – Preferred Alternative Layout Sheets



FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

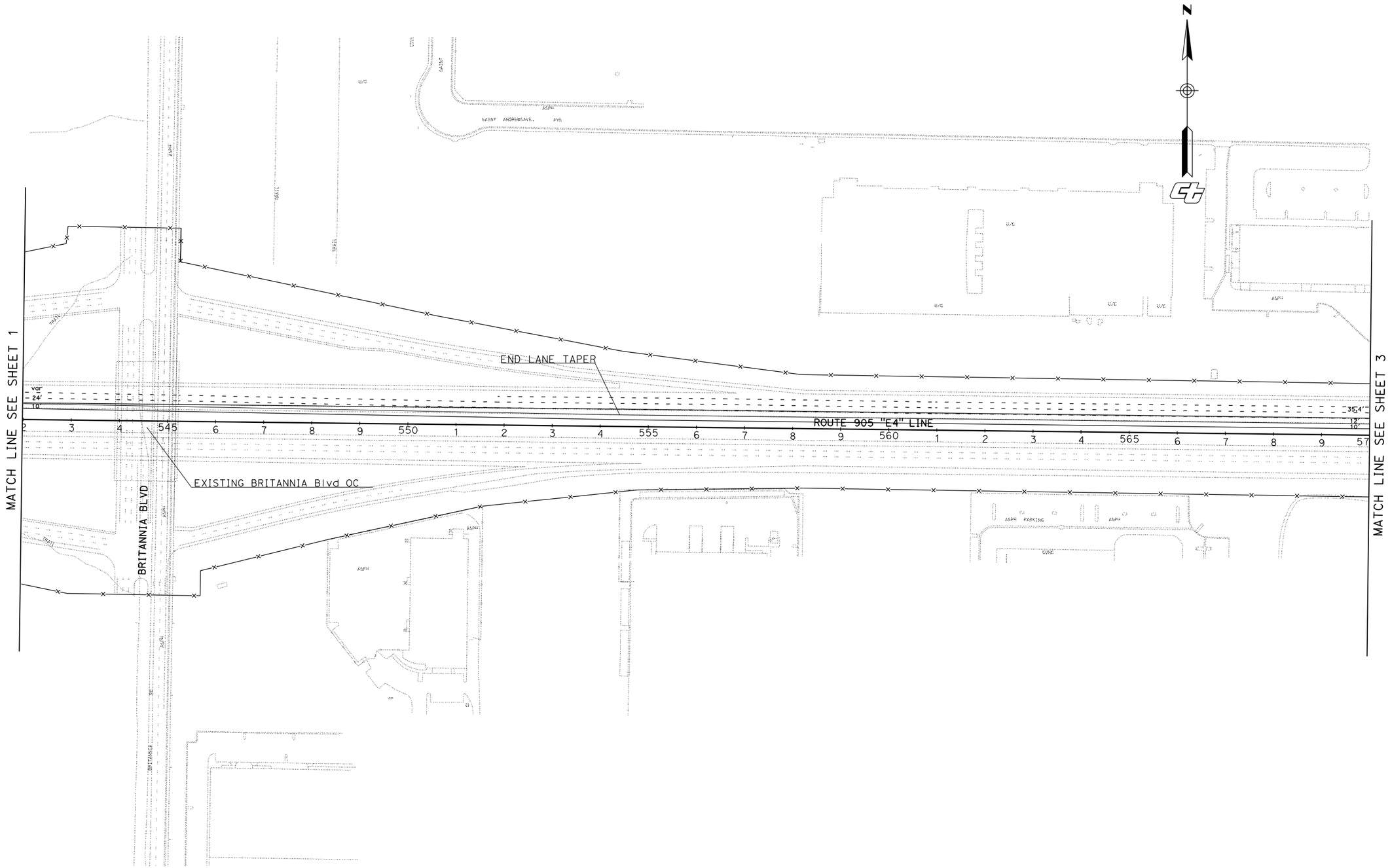
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
DGN FILE => b056300ea001.dgn
DATE PLOTTED => 15:40 28-MAR-2012

LAYOUT

SHEET 1 OF 12

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

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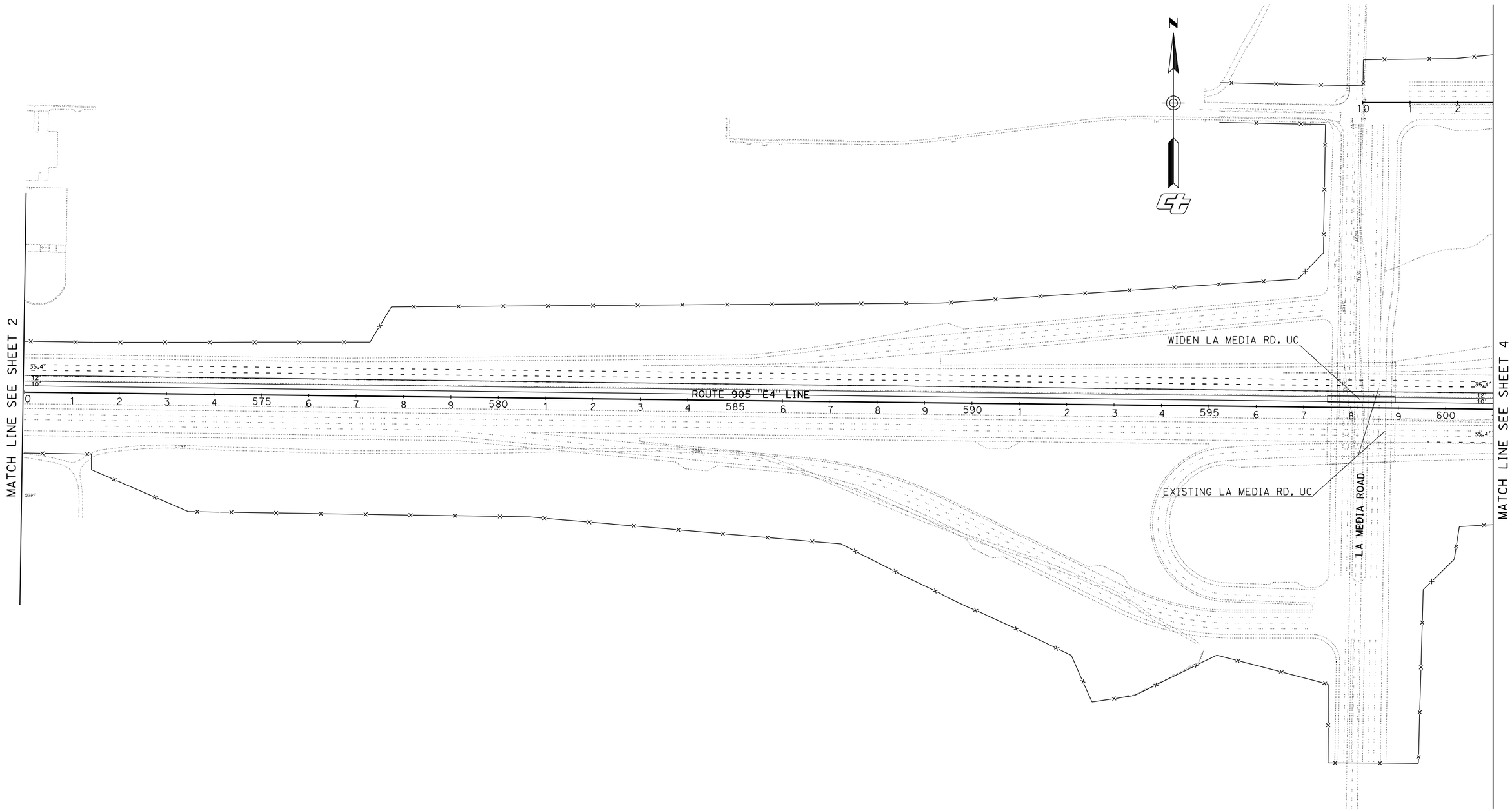
DATE PLOTTED => 15:40 28-MAR-2012

LAYOUT

SHEET 2 OF 12

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
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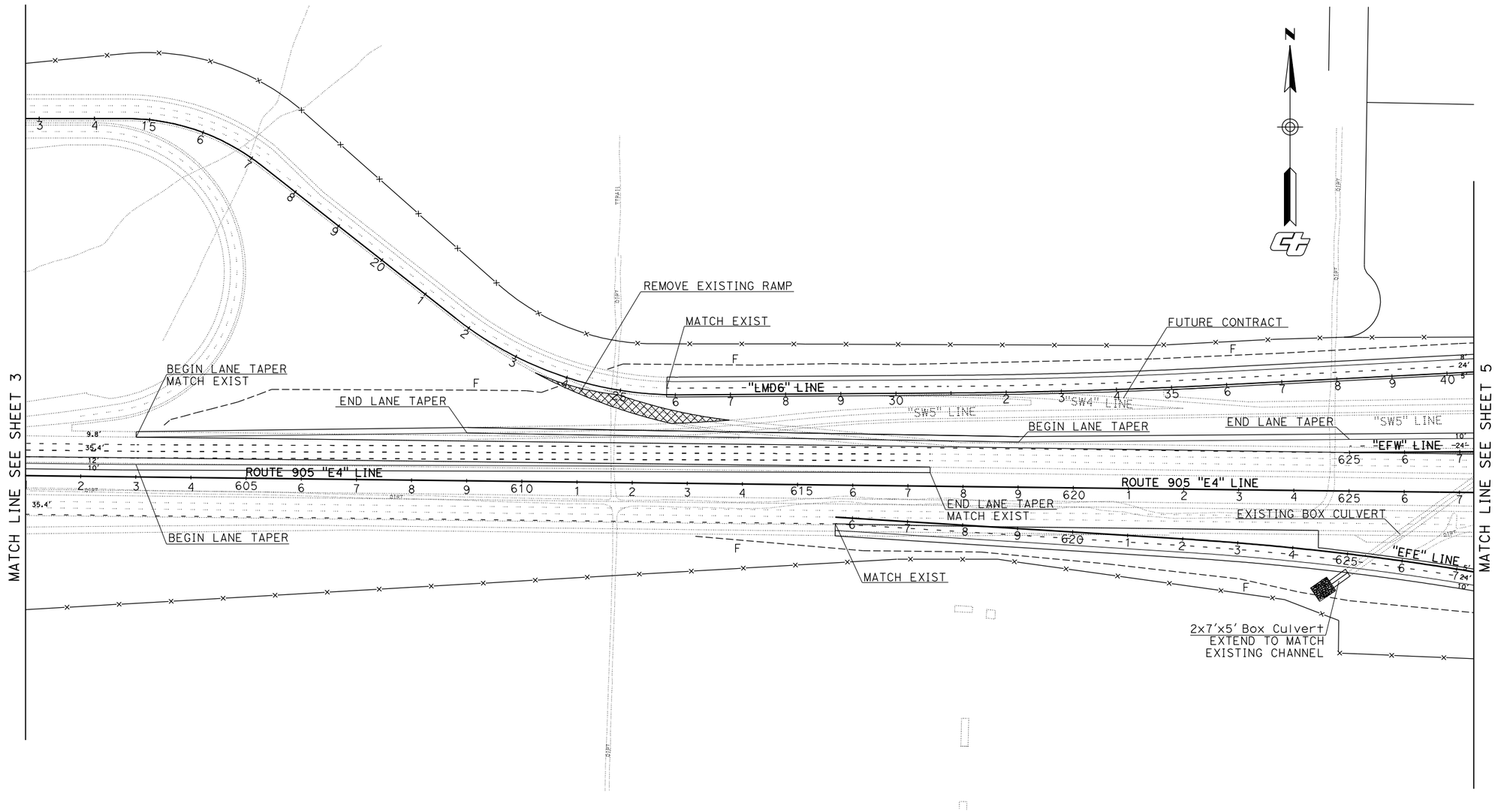
DATE PLOTTED => 15:41 28-MAR-2012

LAYOUT

SHEET 3 OF 12

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
DGN FILE => b056300ea004.dgn
DATE PLOTTED => 15:41 28-MAR-2012

LAYOUT

SHEET 4 OF 12

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

MATCH LINE SEE SHEET 6

FUTURE CONTRACT

FUTURE CONTRACT

FUTURE CONTRACT

FUTURE CONTRACT

"SEDC7" LINE

ROUTE 125

"S" LINE

"SWS" LINE

"N" LINE

"WN" LINE

DETENTION BASIN

DETENTION BASIN

Beg Ret WALL

END Ret WALL

"LMD9" LINE

Beg Ret Wall

"LMD6" LINE

2x7'x5' Box Culvert

CONCRETE LINED DETENTION BASIN

"EFW" LINE

EXISTING BOX CULVERT

END Ret Wall

ROUTE 905 "E6" LINE

Beg Ret Wall

END Ret Wall

"LMD9" LINE

Beg Conc Barrier

"EFW" LINE

ROUTE 11 "SD11" LINE

"EFE" LINE

2x6'x4' Box Culvert

"EN" LINE

FUTURE CONTRACT

"SEDC7" LINE

END Ret Wall

"EFE" LINE

"LMD6" LINE

EXISTING DETENTION BASIN

Beg Ret Wall

"SV6" LINE

FUTURE CONTRACT

"N" LINE

FUTURE CONTRACT

"S" LINE

MATCH LINE SEE SHEET 4

MATCH LINE SEE SHEET 7

FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
DGN FILE => b056300ea005.dgn
DATE PLOTTED => 15:41 28-MAR-2012

LAYOUT

SHEET 5 OF 12

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

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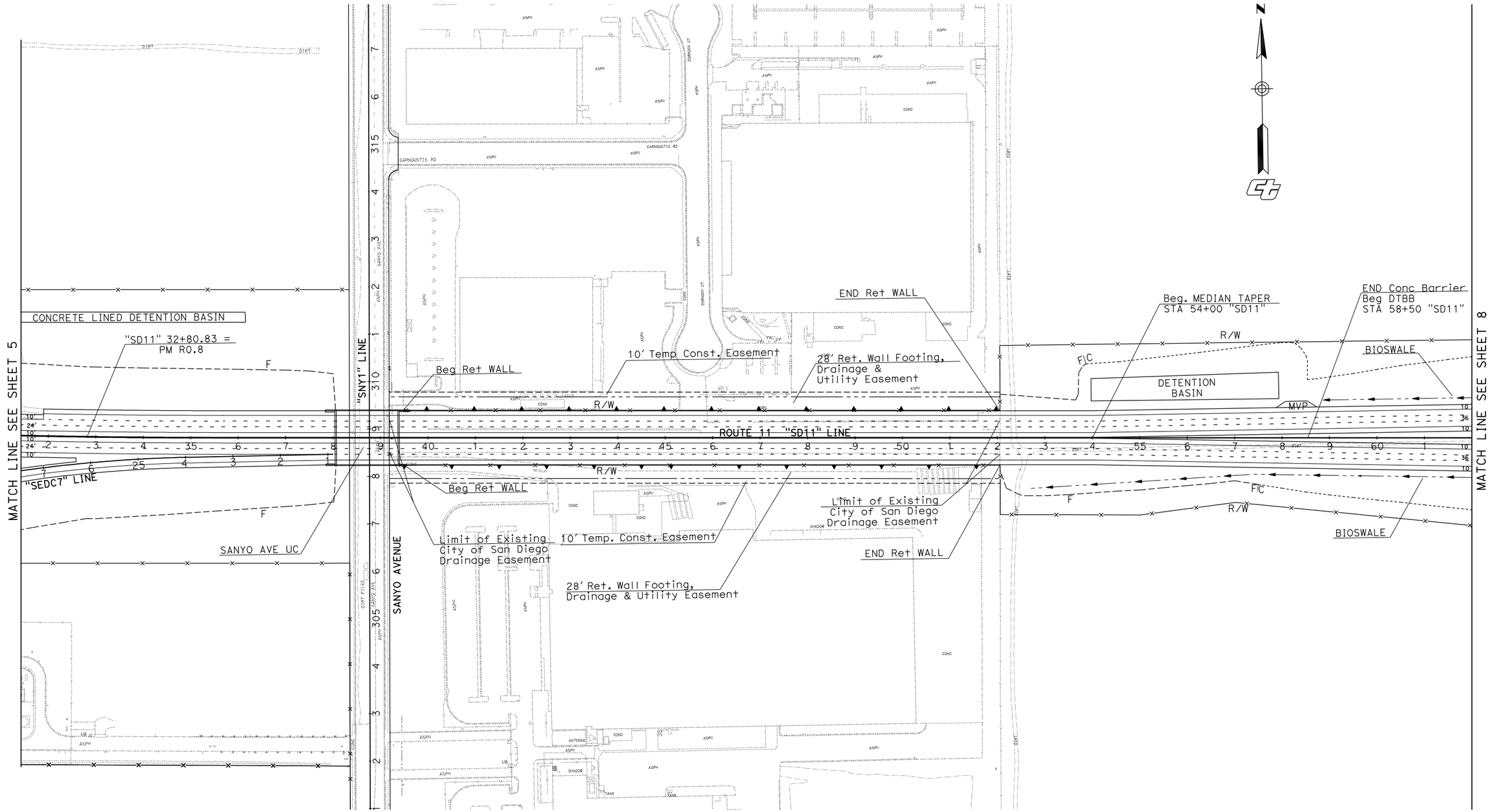
DATE PLOTTED => 15:41 28-MAR-2012

LAYOUT

SHEET 6 OF 12

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN



FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

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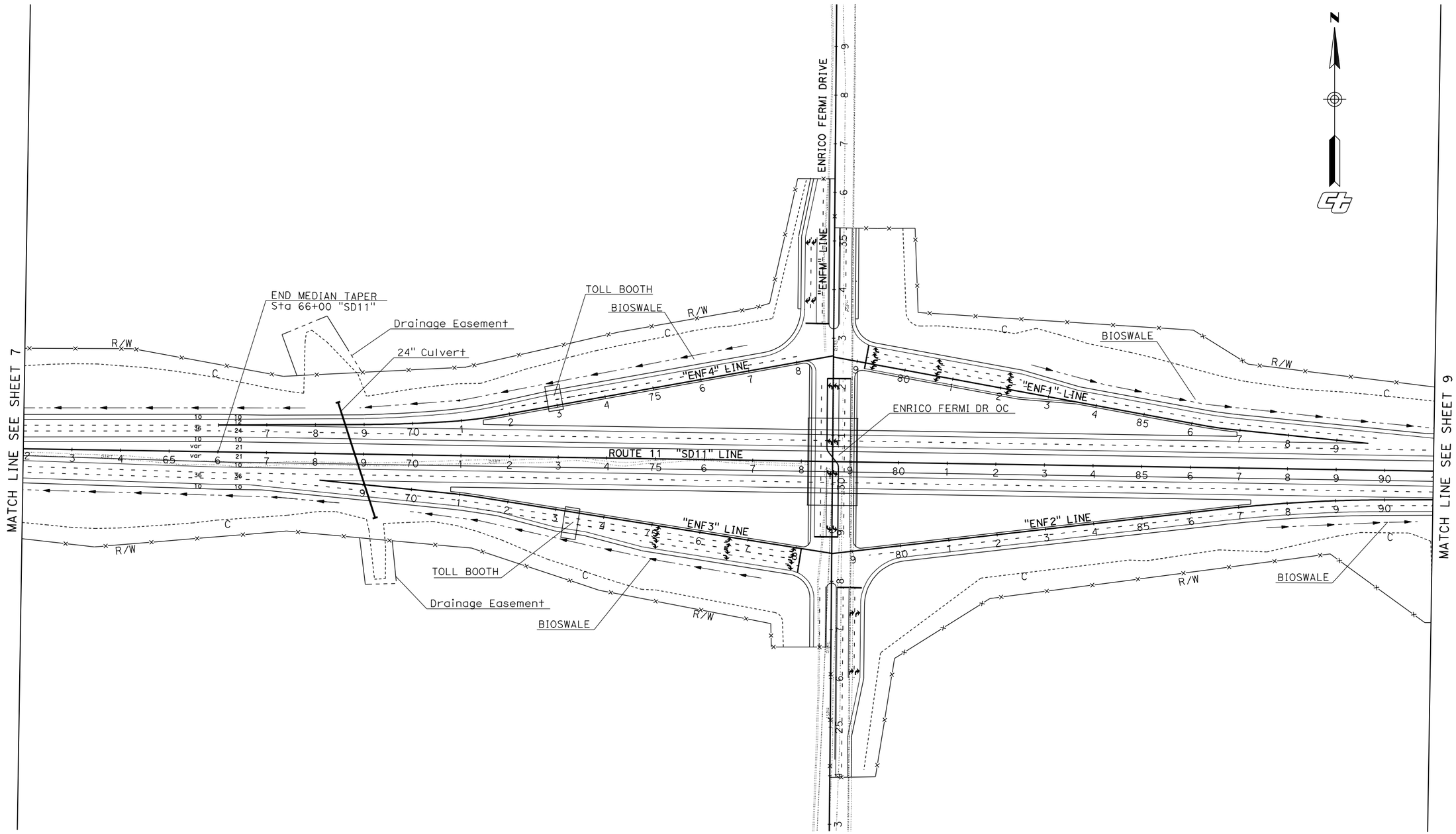
DATE PLOTTED => 15:41 28-MAR-2012

LAYOUT

SHEET 7 OF 12

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

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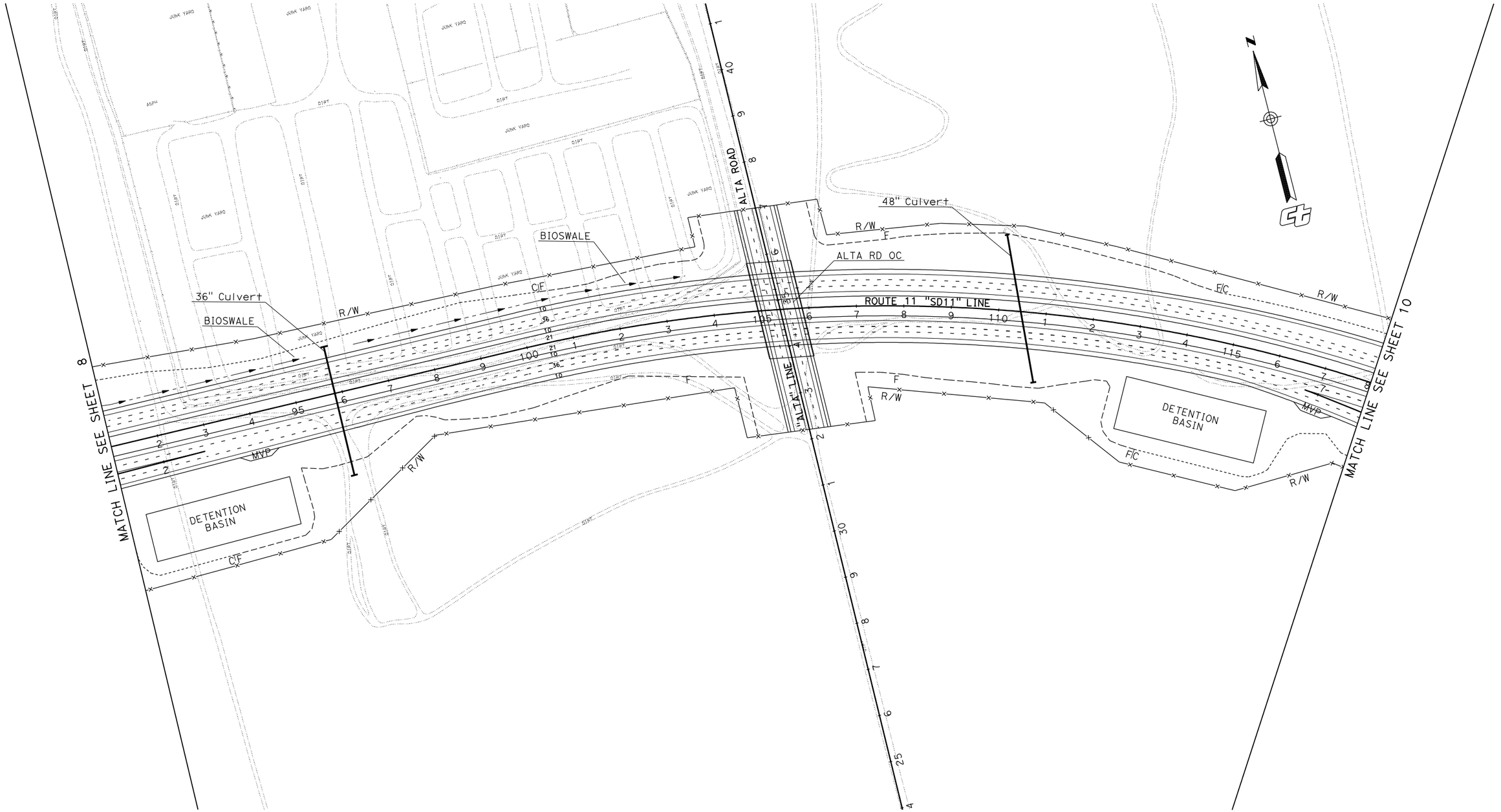
DGN FILE => b056300ea008.dgn
DATE PLOTTED => 15:41 28-MAR-2012

LAYOUT

SHEET 8 OF 12

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN



FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
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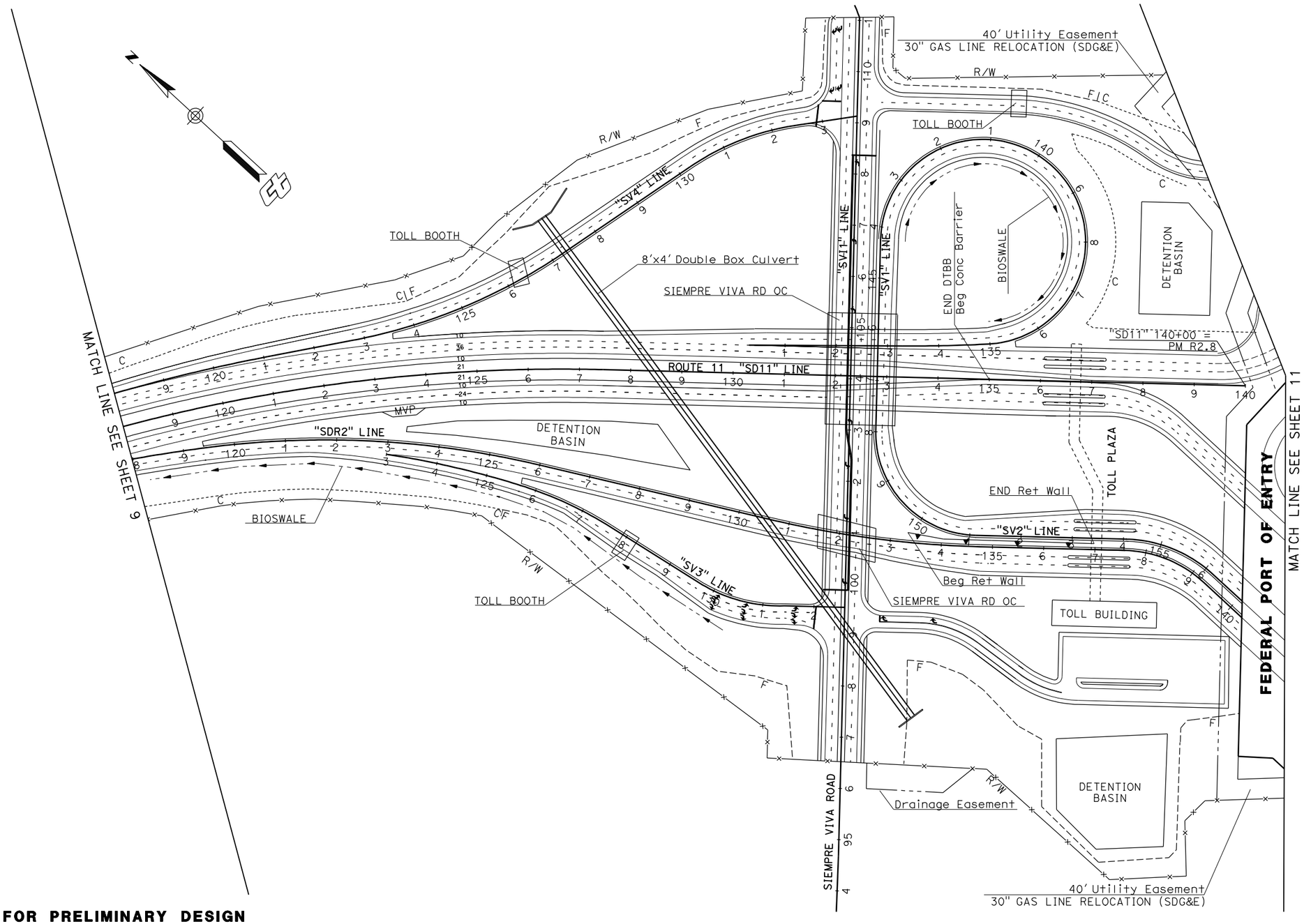
DATE PLOTTED => 15:41 28-MAR-2012

LAYOUT

SHEET 9 OF 12

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN



FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

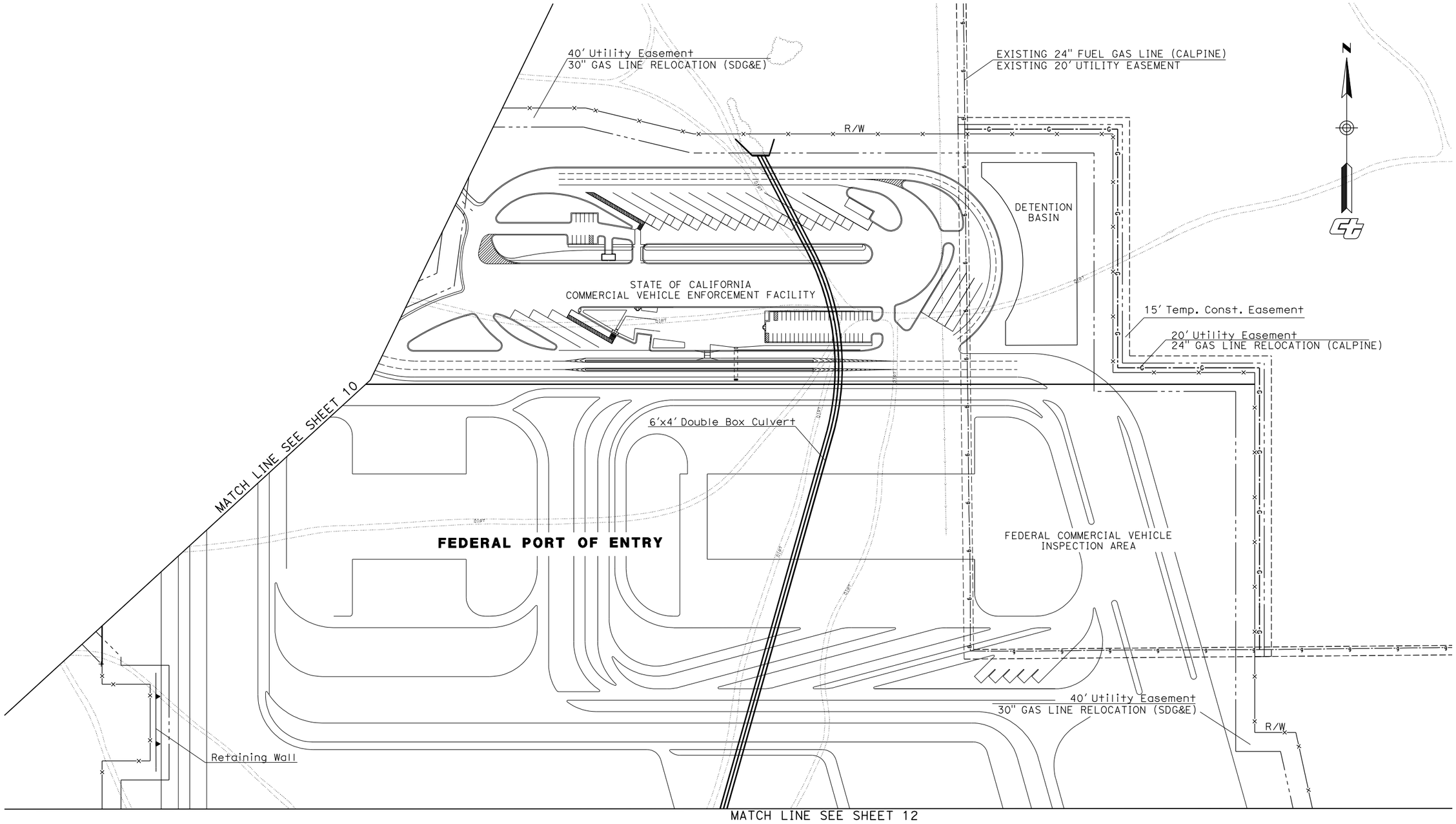
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
DGN FILE => b056300ea010.dgn
DATE PLOTTED => 15:42 28-MAR-2012

LAYOUT

SHEET 10 OF 12

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN



FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

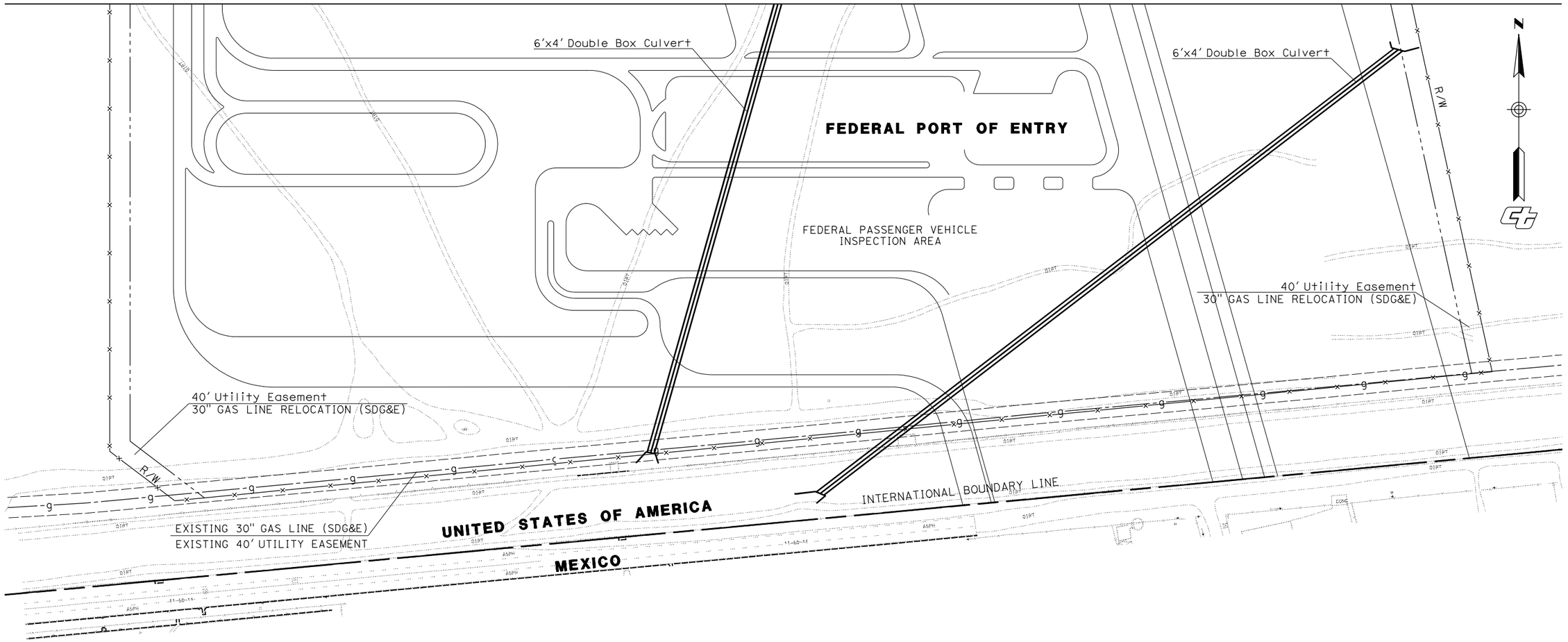
USERNAME => s132966
DGN FILE => b056300ea011.dgn
DATE PLOTTED => 15:42 28-MAR-2012

LAYOUT

SHEET 11 OF 12

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

MATCH LINE SEE SHEET 11



FOR PRELIMINARY DESIGN PURPOSES ONLY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

STATE ROUTE 11
11000000230

PREFERRED ALTERNATIVE

SCALE: 1":100'

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
DGN FILE => b056300ea012.dgn
DATE PLOTTED => 15:42 28-MAR-2012

LAYOUT

SHEET 12 OF 12

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

Attachment C – Preferred Alternative Profile Sheets

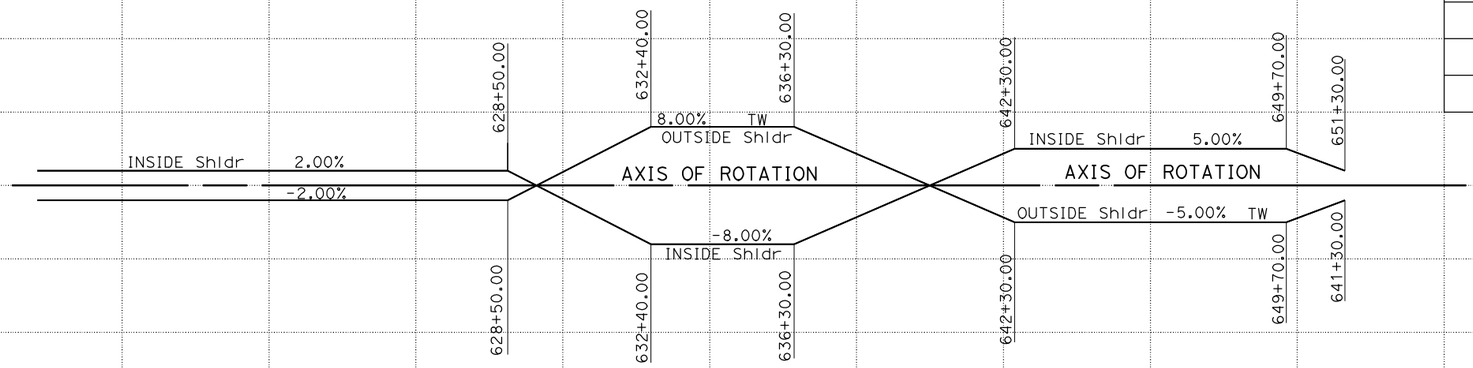
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

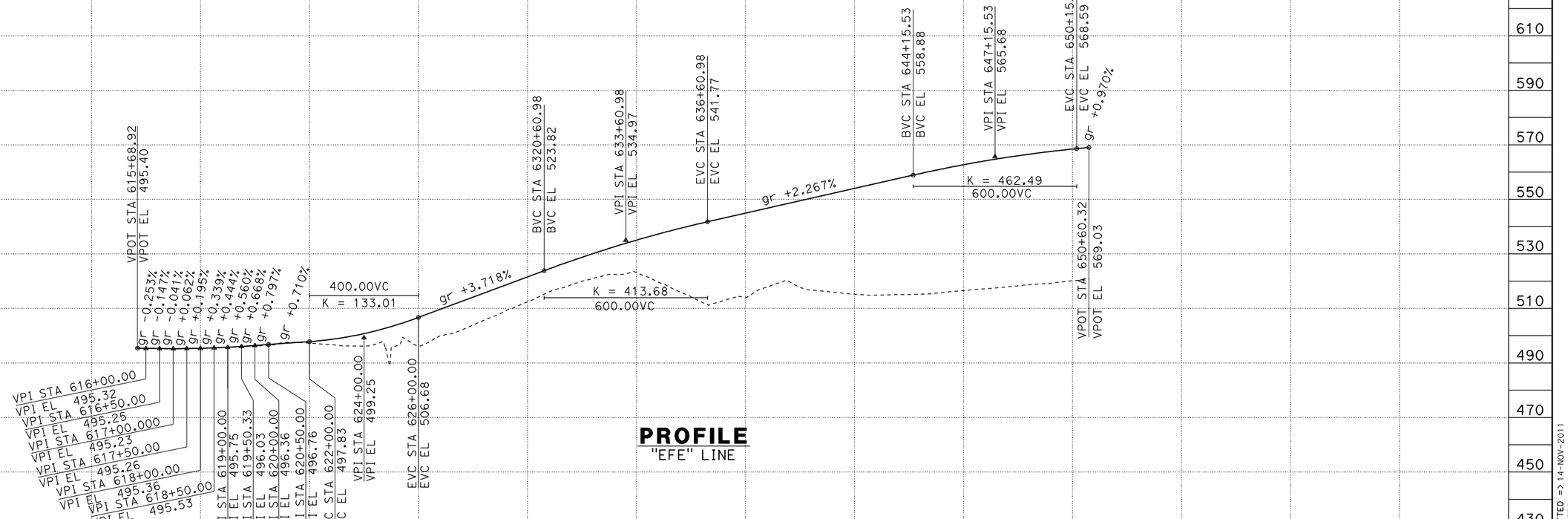
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



SUPERELEVATION DIAGRAM
"EFE" LINE



PROFILE
"EFE" LINE

FOR PRELIMINARY DESIGN PURPOSES ONLY

SCALE: Horiz 1"=200' Vert 1"=5'

SHEET 1 OF 20

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

STATION	610	614	618	622	626	630+00	634	638	642	646	650+00	654	658	662	TOTAL
CY Exc															
CY Emb															

+10% +5% +0% -5% -10%

610 590 570 550 530 510 490 470 450 430

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 06-06-11 | DATE PLOTTED => 14-NOV-2011 | TIME PLOTTED => 08:46

BORDER LAST REVISED 7/2/2010 | USERNAME => s132966 | DGN FILE => b056310fa001.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 2774 | PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

PLANS APPROVAL DATE

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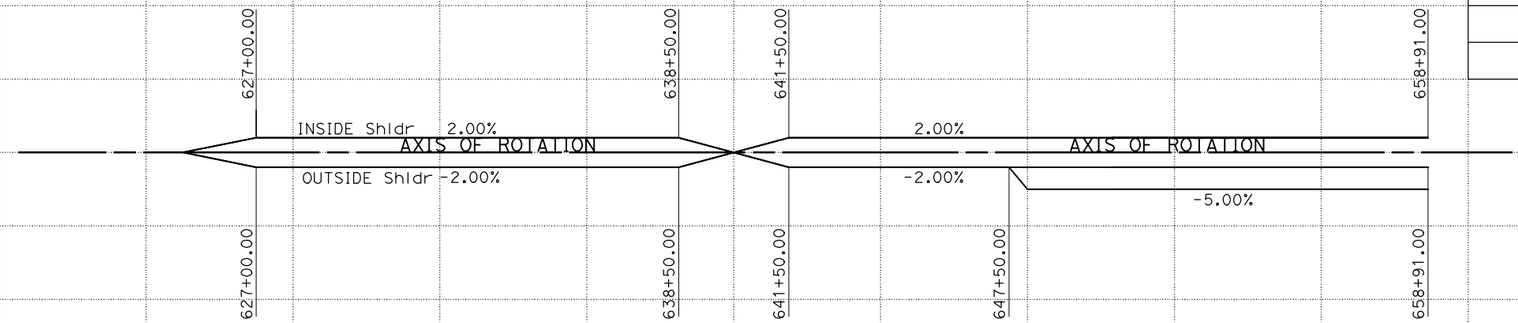
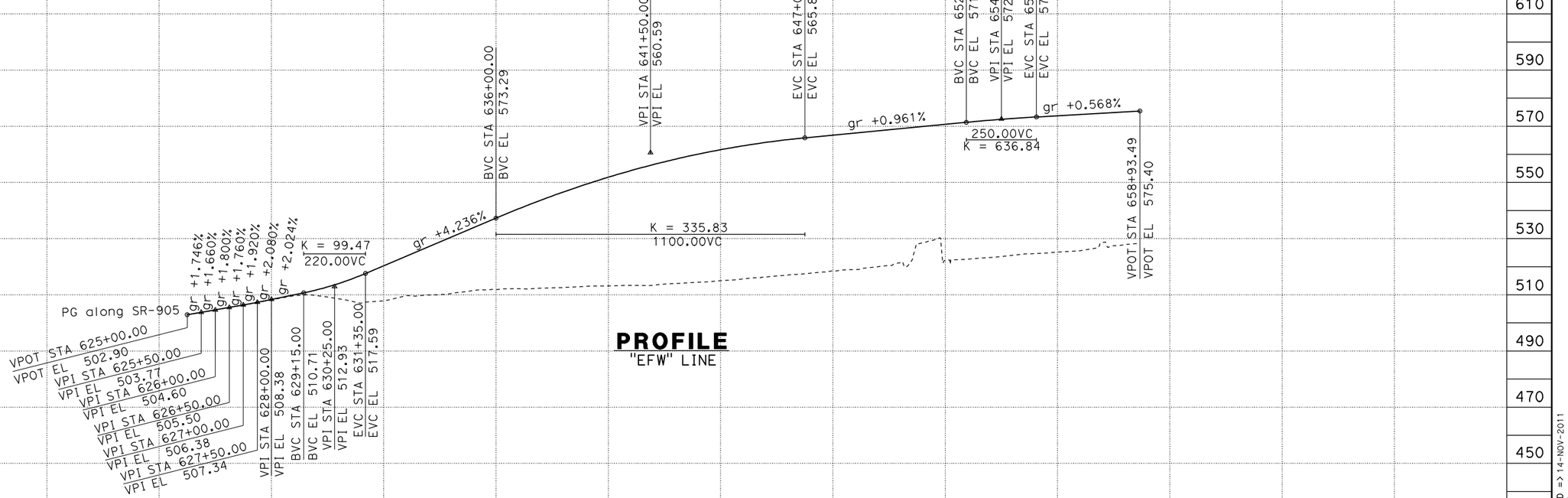


SUPERELEVATION DIAGRAM
"EFW" LINE



PROFILE
"EFW" LINE

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

SCALE: Horiz 1"=200'
Vert 1"=5'

SHEET 2 OF 20

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION DATE PLOTTED => 14-NOV-2011
TIME PLOTTED => 08:46
06-06-11

BORDER LAST REVISED 7/2/2010

USERNAME => s132966
DGN FILE => b056310fa002.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 2774

PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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REVISED BY | DATE REVISED

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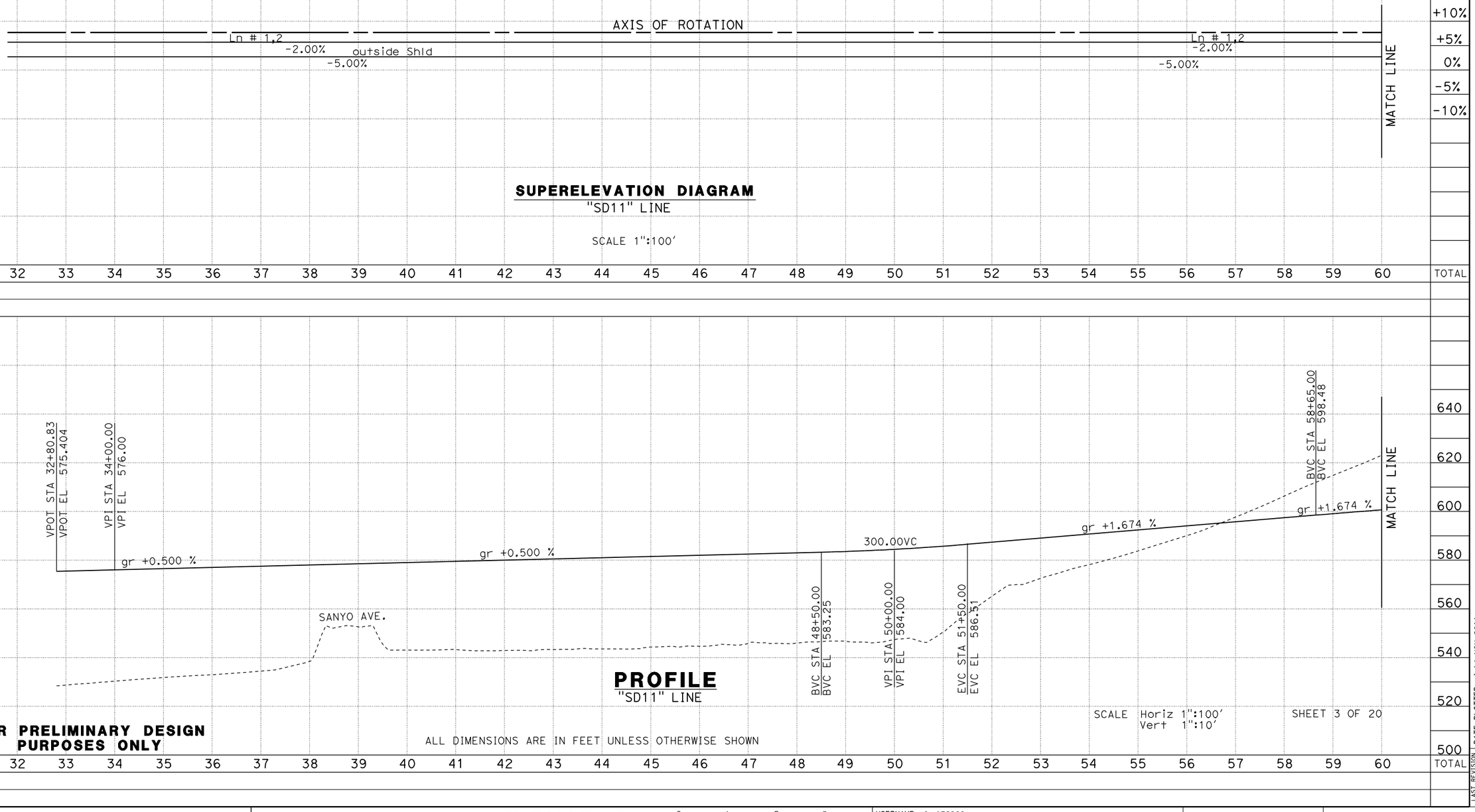
FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans



SUPERELEVATION DIAGRAM
"SD11" LINE

SCALE 1":100'

STATION	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL
CY Exc																														
CY Emb																														

PROFILE
"SD11" LINE

SCALE Horiz 1":100'
Vert 1":10'

SHEET 3 OF 20

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

STATION	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL
CY Exc																														
CY Emb																														

LAST REVISION 06-03-11 | DATE PLOTTED => 14-NOV-2011 | TIME PLOTTED => 08:47

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
DGN FILE => b056310fa003.dgn

CU 2774

PROJECT 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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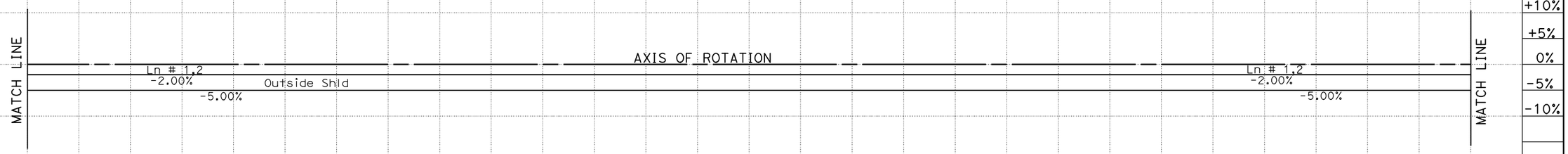
REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

FUNCTIONAL SUPERVISOR

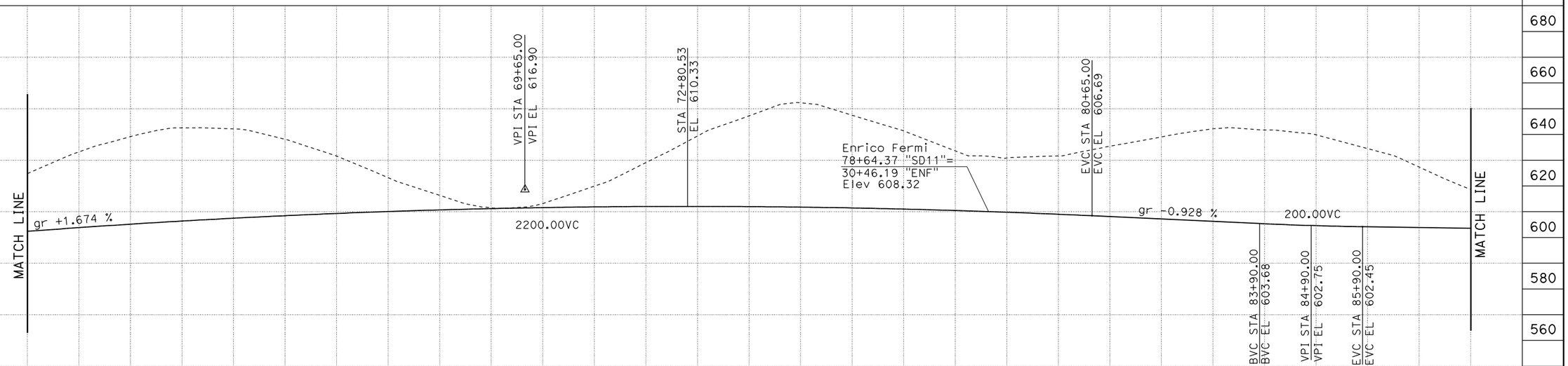
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans



SUPERELEVATION DIAGRAM
"SD11" LINE
SCALE 1":100'

STATION	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	TOTAL
CY Exc																														
CY Emb																														



PROFILE
"SD11" LINE

SCALE Horiz 1":100'
Vert 1":10'

SHEET 4 OF 20

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

STATION	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	TOTAL
CY Exc																														
CY Emb																														

LAST REVISION 06-03-11
DATE PLOTTED => 14-NOV-2011
TIME PLOTTED => 08:47

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
DGN FILE => b056310fa004.dgn

CU 2774

PROJECT 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

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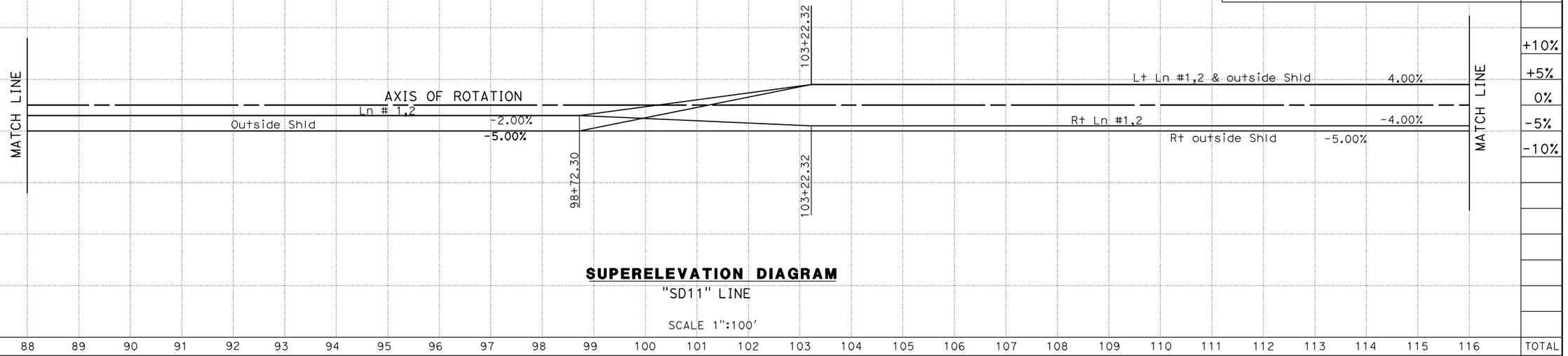
REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

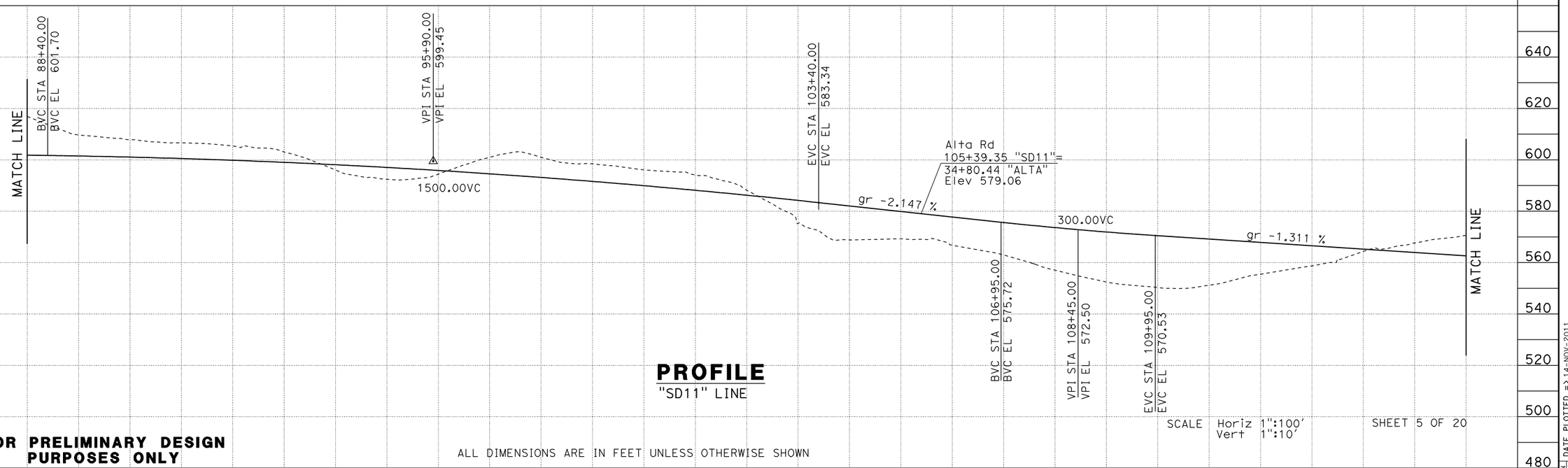


SUPERELEVATION DIAGRAM

"SD11" LINE

SCALE 1":100'

STATION	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	TOTAL
CY Exc																														
CY Emb																														



PROFILE

"SD11" LINE

SCALE Horiz 1":100'
Vert 1":10'

SHEET 5 OF 20

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

STATION	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	TOTAL
CY Exc																														
CY Emb																														

LAST REVISION 06-03-11 | DATE PLOTTED => 14-NOV-2011 | TIME PLOTTED => 08:47

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
DGN FILE => b056310fa005.dgn

CU 2774

PROJECT 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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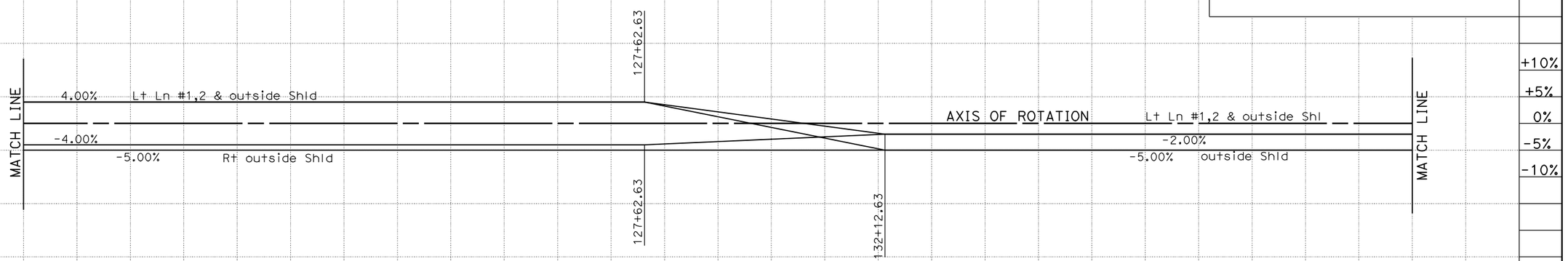
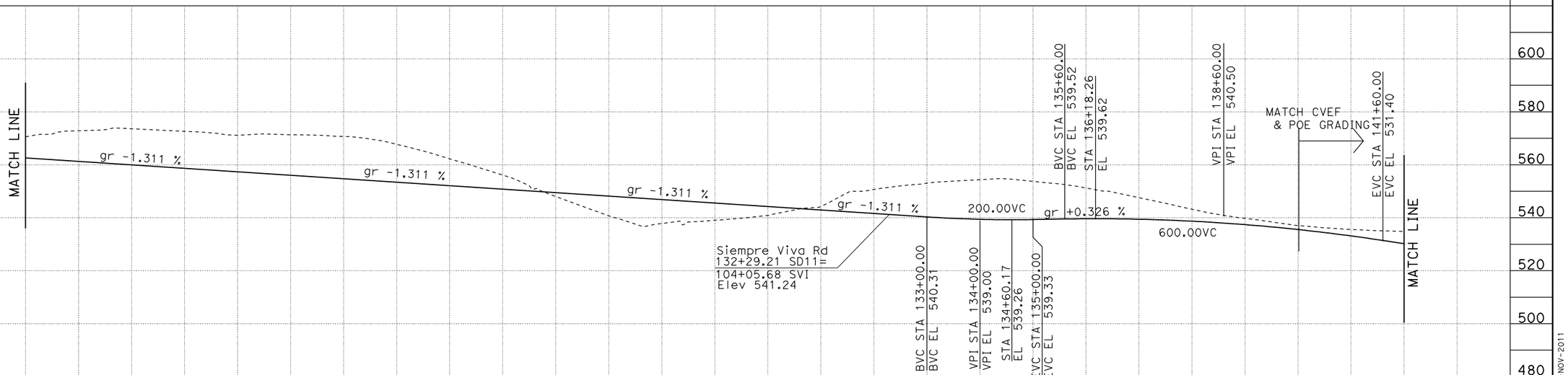


SUPERELEVATION DIAGRAM
"SD11" LINE

SCALE 1":100'

STATION	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	TOTAL
CY Exc																														
CY Emb																														



PROFILE
"SD11" LINE

SCALE Horiz 1":100'
Vert 1":10'

SHEET 6 OF 20

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

STATION	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	TOTAL
CY Exc																														
CY Emb																														

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Caltrans

LAST REVISION 06-03-11 | DATE PLOTTED => 14-NOV-2011 | TIME PLOTTED => 08:47

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s132966 | DGN FILE => b056310fa006.dgn | CU 2774 | PROJECT 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

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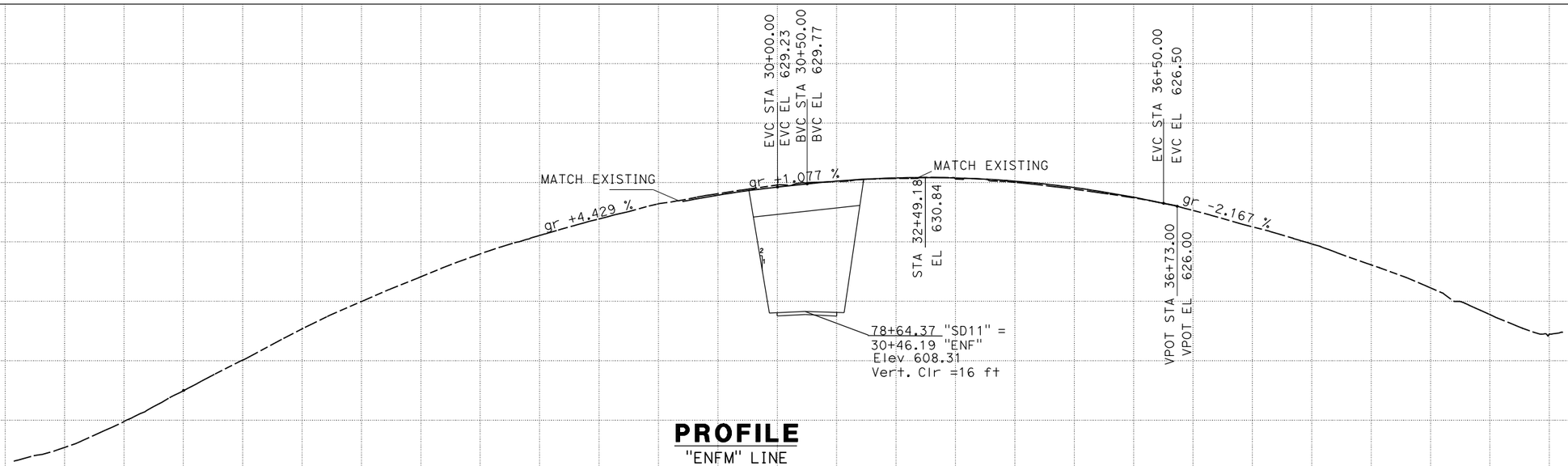
STATION																									TOTAL
CY	Exc																								
	Emb																								



PROFILE

"ENFM" LINE

SCALE Horiz 1":100'
Vert 1":10'

SHEET 7 OF 20

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

STATION	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	TOTAL
CY	Exc																											
	Emb																											

LAST REVISION 06-03-11 | DATE PLOTTED => 14-NOV-2011 | TIME PLOTTED => 08:47

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

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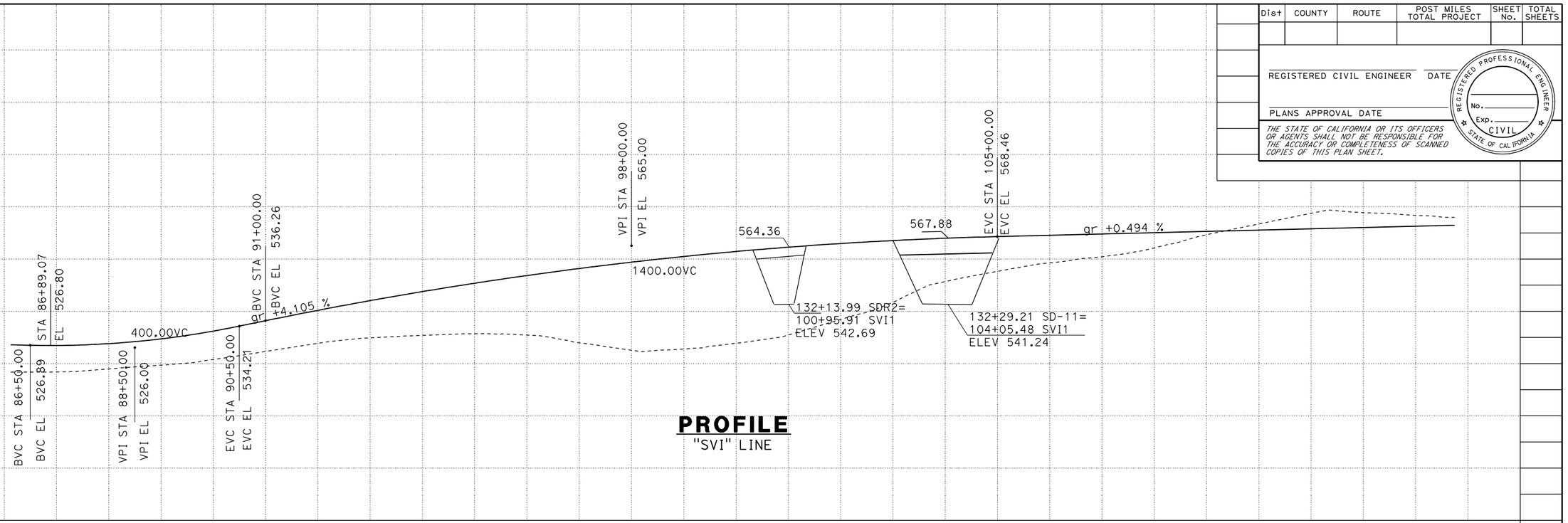

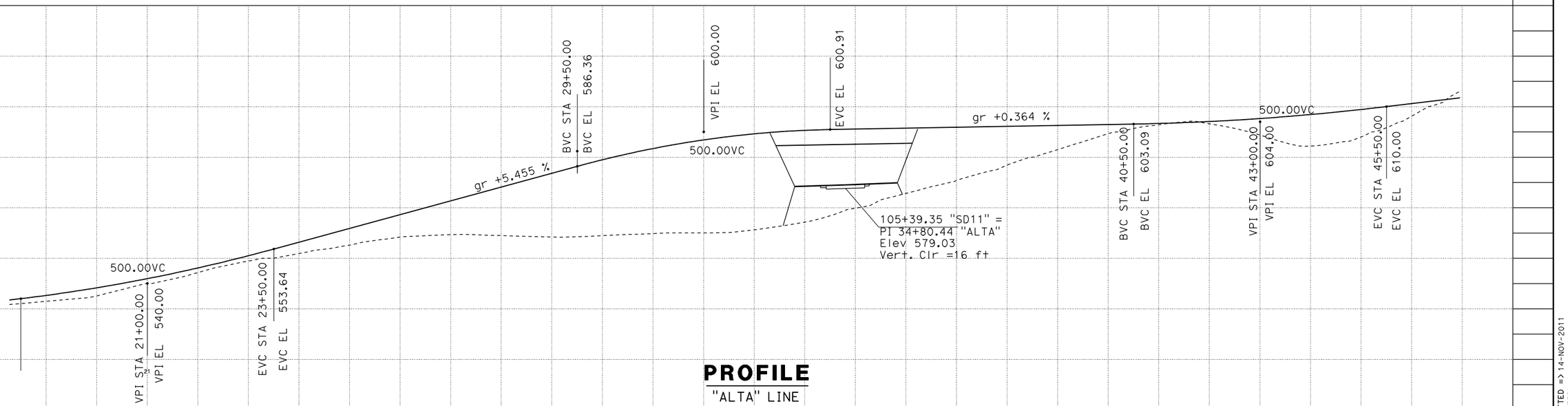

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

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BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s132966
DGN FILE => b056310fa008.dgn

CU 2774

PROJECT 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

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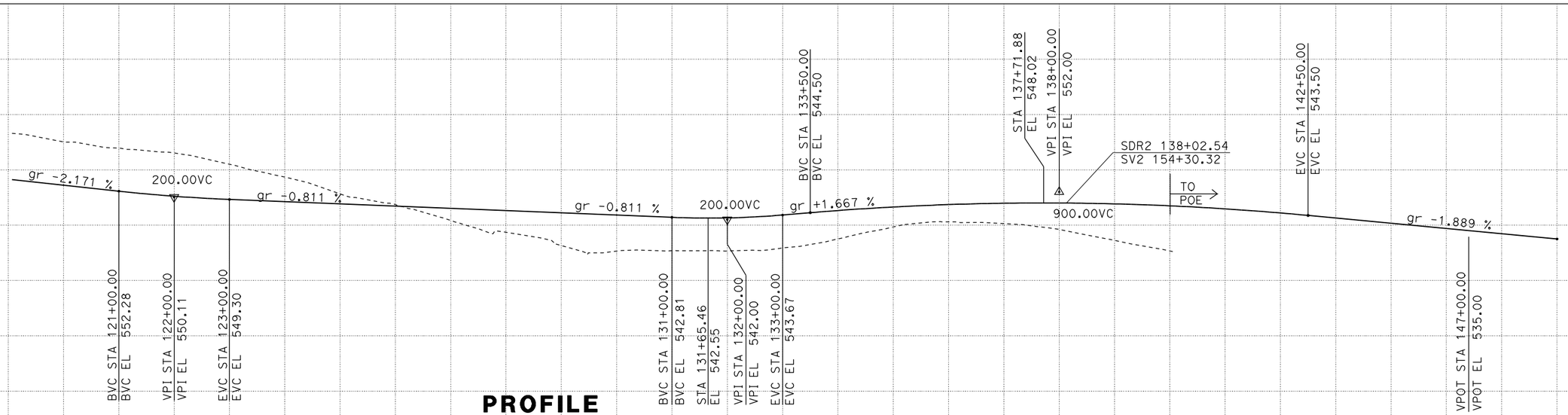
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

STATION	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	TOTAL
CY Exc																														
CY Emb																														



PROFILE

"SDR2" LINE

SCALE Horiz 1":100'
Vert 1":10'

SHEET 9 OF 20

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

STATION	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	TOTAL
CY Exc																														
CY Emb																														

LAST REVISION 06-03-11 | DATE PLOTTED => 14-NOV-2011 | TIME PLOTTED => 08:47

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

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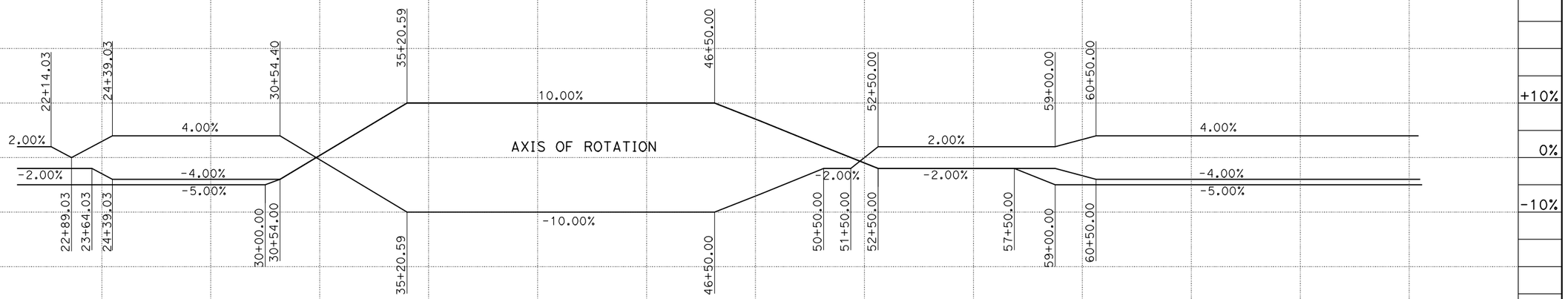
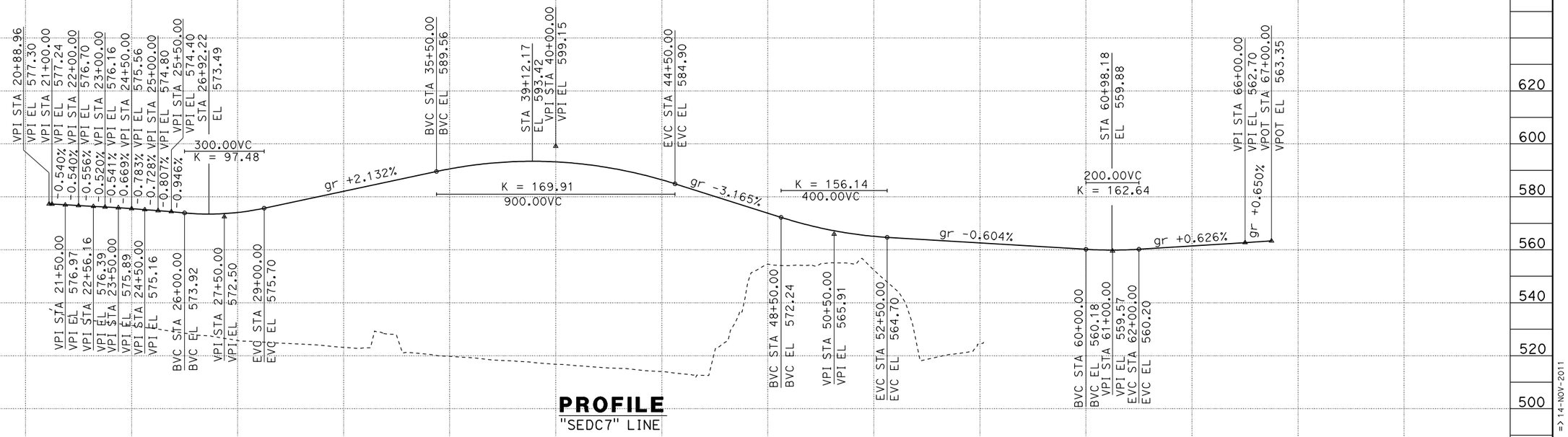


SUPERELEVATION DIAGRAM
"SEDC7" LINE



PROFILE
"SEDC7" LINE

SCALE: Horz 1"=200'
Vert 1"=5 '

SHEET 10 OF 20

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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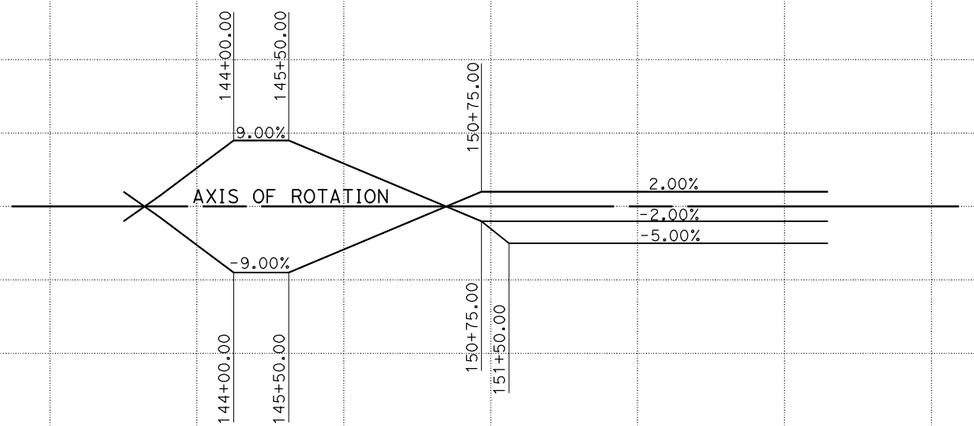
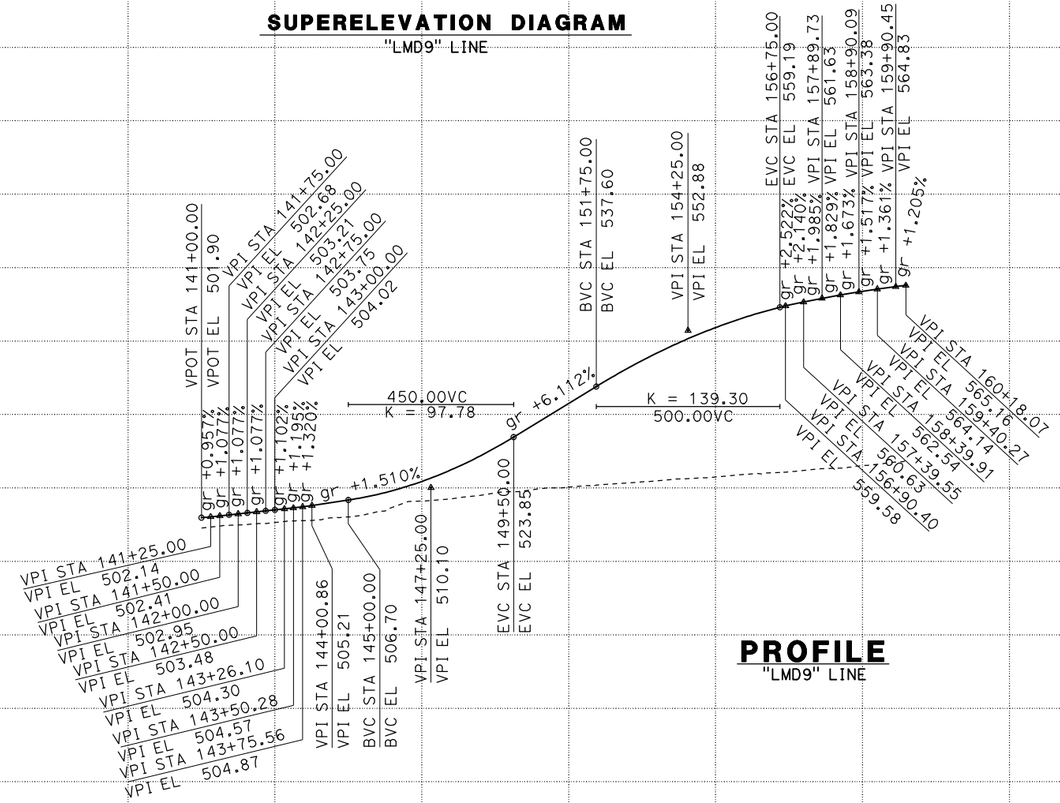


SUPERELEVATION DIAGRAM
"LMD9" LINE



PROFILE
"LMD9" LINE

SCALE: Horiz 1"=200'
Vert 1"=5'

SHEET 11 OF 20

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

STATION	139	143	147	151	155	159	163	TOTAL
CY Exc								
CY Emb								

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LAST REVISION 06-06-11

DATE PLOTTED => 14-NOV-2011
TIME PLOTTED => 08:48

BORDER LAST REVISED 7/2/2010

USERNAME => s132966
DGN FILE => b056310fa011.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 2774

PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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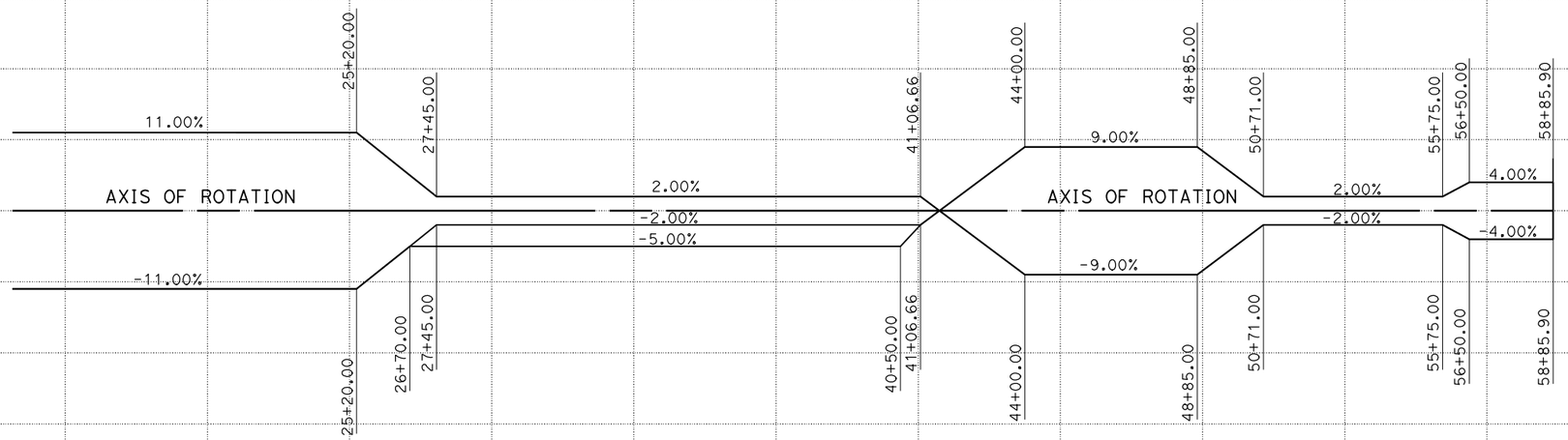
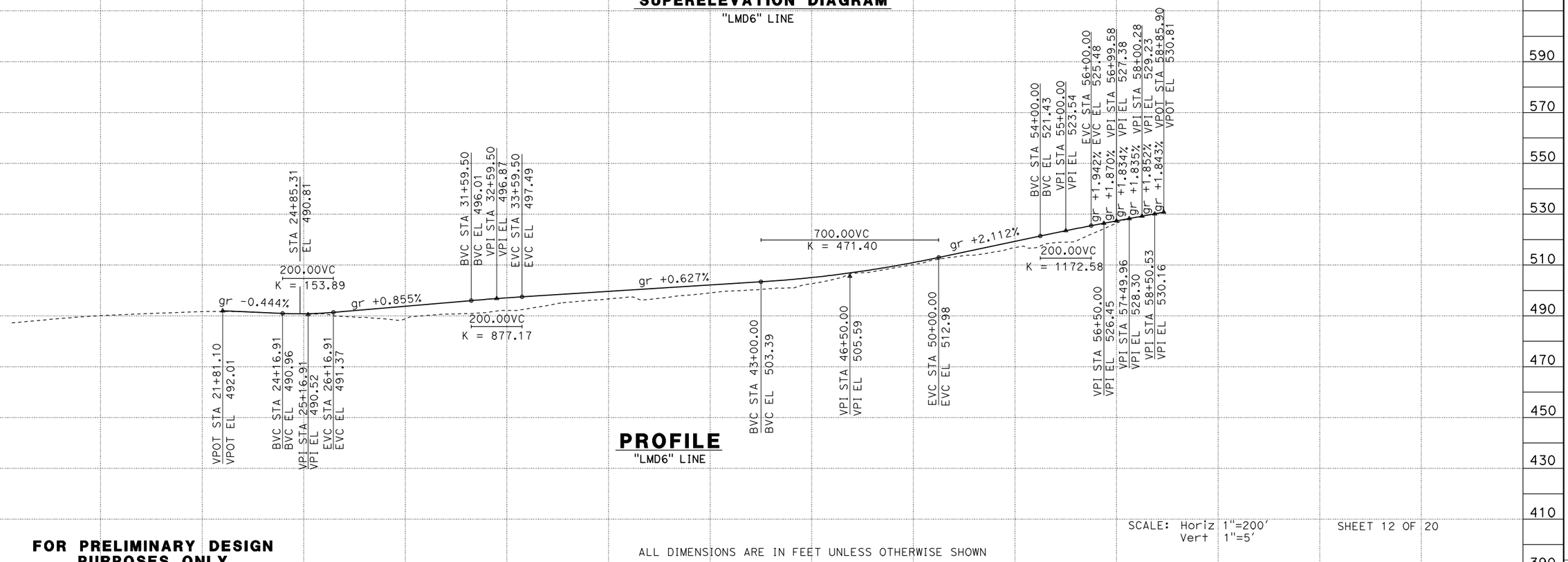


SUPERELEVATION DIAGRAM

"LMD6" LINE



PROFILE

"LMD6" LINE

SCALE: Horiz 1"=200'
Vert 1"=5'

SHEET 12 OF 20

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

STATION	17	21	25	29	33	37	41	45	49	53	57	61	65	69	TOTAL
CY Exc															
CY Emb															

LAST REVISION | DATE PLOTTED => 14-NOV-2011
06-06-11 | TIME PLOTTED => 08:48

BORDER LAST REVISED 7/2/2010

USERNAME => s132966
DGN FILE => b056310fa012.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 2774

PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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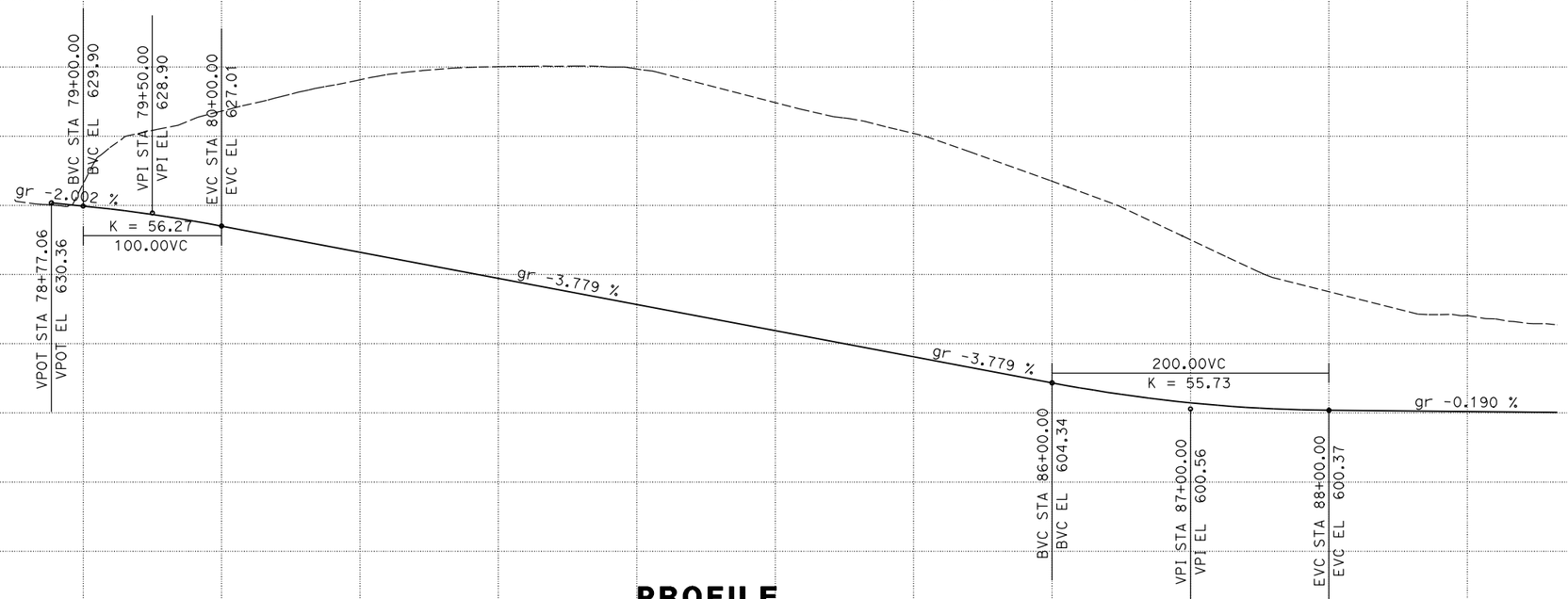

PROFILE

"ENF1" LINE

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

SCALE Horiz 1"=100'
Vert 1"=10'

SHEET 13 OF 20

STATION	9	80+00	1	2	3	4	85+00	TOTAL
CY Exc								
CY Emb								

LAST REVISION 10-10-11
DATE PLOTTED => 14-NOV-2011
TIME PLOTTED => 08:48

BORDER LAST REVISED 7/2/2010

USERNAME => s132966
DGN FILE => b056310fa013.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 2774

PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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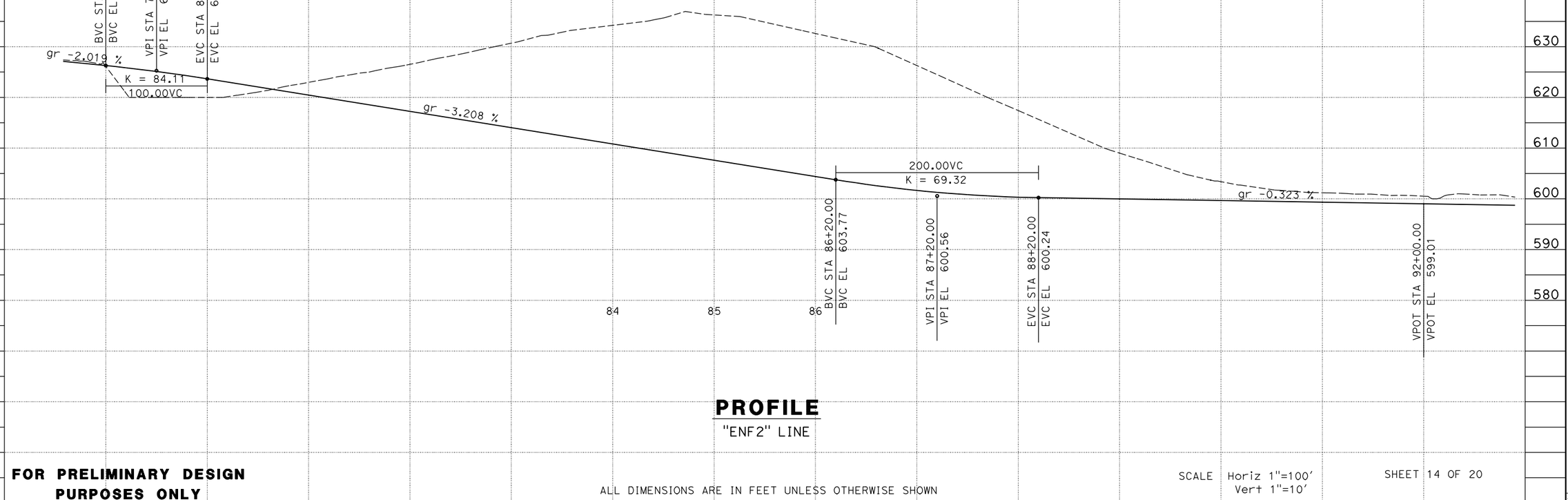

PROFILE

"ENF2" LINE

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

SCALE Horiz 1"=100'
Vert 1"=10'

SHEET 14 OF 20

STATION	9	80+00	1	2	3	4	85+00	6	7	8	9	90+00	1	2	TOTAL
CY Exc															
CY Emb															

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TIME PLOTTED => 08:48

BORDER LAST REVISED 7/2/2010

USERNAME => s132966
DGN FILE => b056310fa014.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 2774

PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

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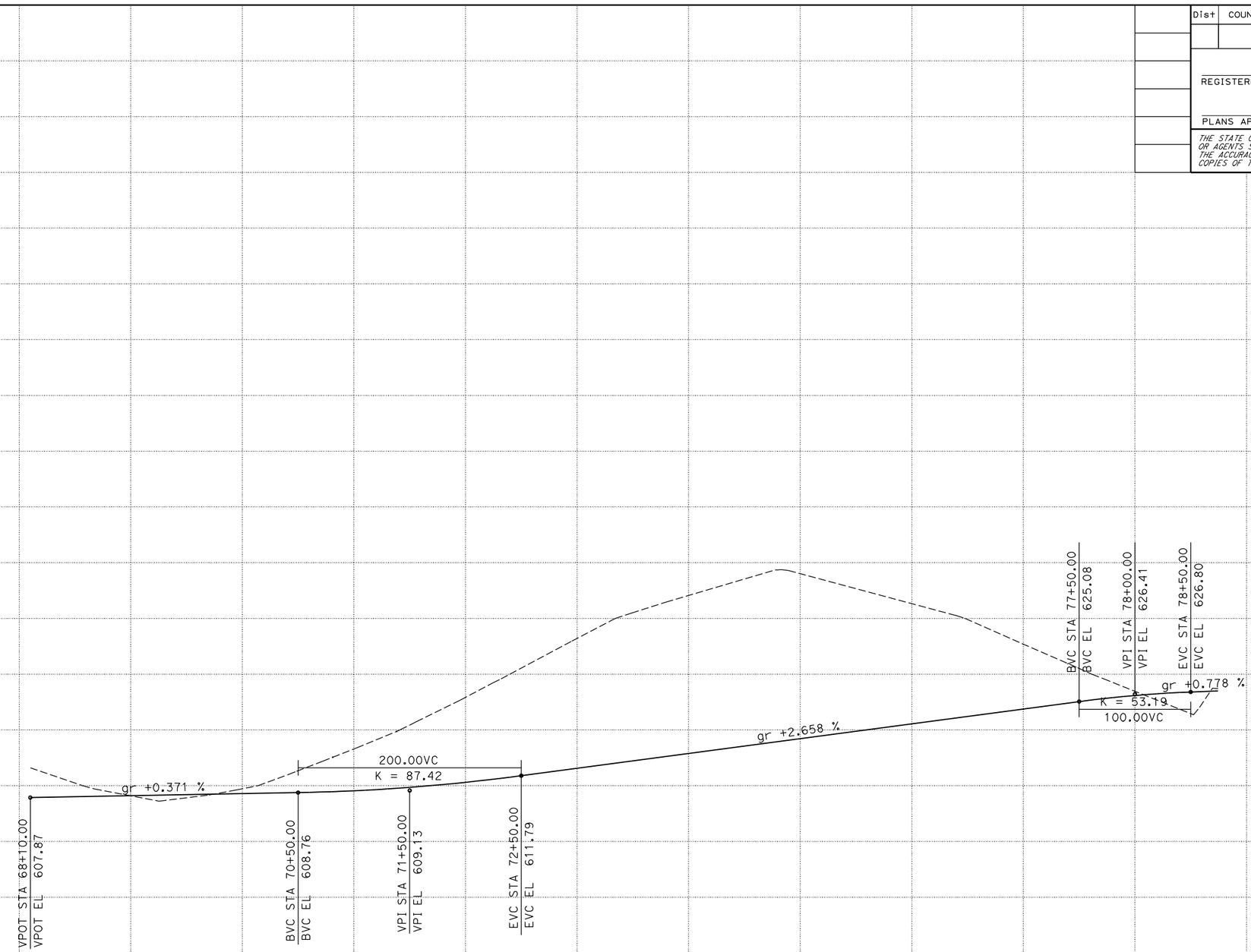

PROFILE

"ENF3" LINE

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

SCALE Horiz 1"=100'
Vert 1"=10'

SHEET 15 OF 20

STATION	7	8	9	70+00	1	2	3	4	75+00	6	7	8	9	80+00	TOTAL
CY Exc															
CY Emb															

LAST REVISION 10-10-11
DATE PLOTTED => 14-NOV-2011
TIME PLOTTED => 08:48

BORDER LAST REVISED 7/2/2010

USERNAME => s132966
DGN FILE => b056310fa015.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 2774

PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

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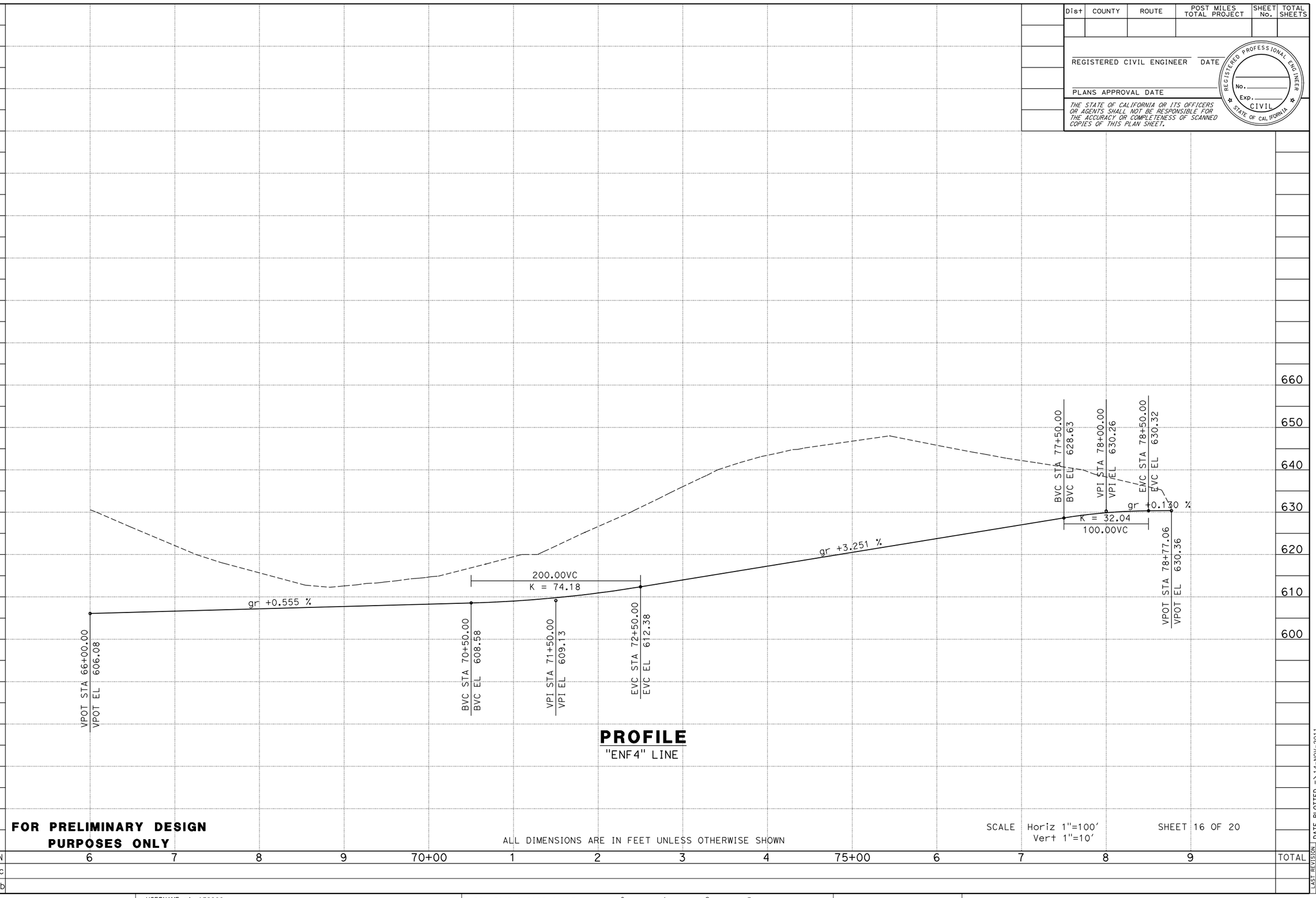

PROFILE

"ENF4" LINE

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

SCALE Horiz 1"=100'
Vert 1"=10'

SHEET 16 OF 20

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DATE PLOTTED => 14-NOV-2011
TIME PLOTTED => 08:48

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USERNAME => s132966
DGN FILE => b056310fa016.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UC 2774

PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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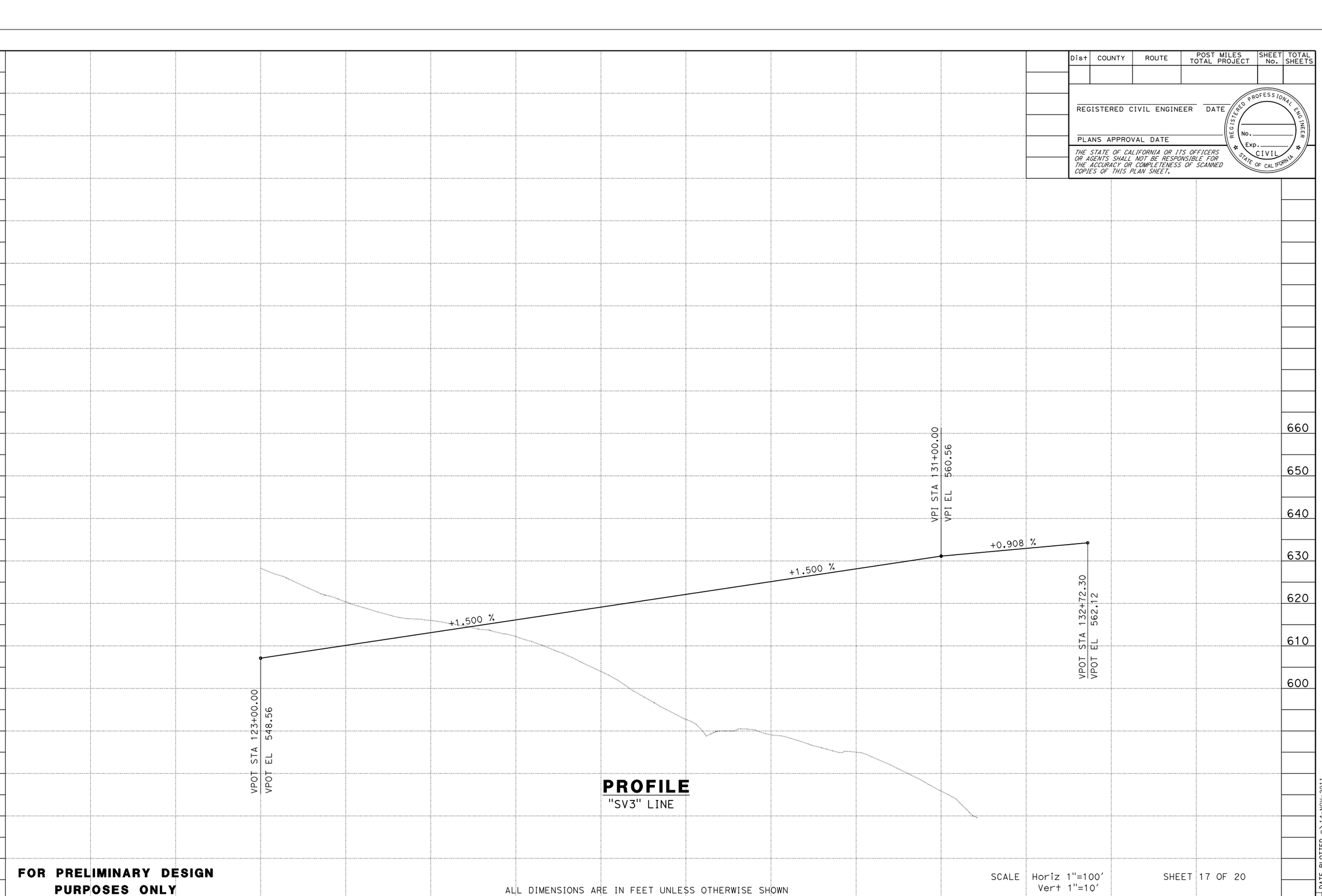

PROFILE

"SV3" LINE

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

SCALE Horiz 1"=100'
Vert 1"=10'

SHEET 17 OF 20

STATION	22	23	24	125+00	26	27	28	29	130+00	31	32	33	TOTAL
CY Exc													
CY Emb													

LAST REVISION 11-07-11

DATE PLOTTED => 14-NOV-2011
TIME PLOTTED => 08:48

BORDER LAST REVISED 7/2/2010

USERNAME => s132966
DGN FILE => b056310fa017.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UC 2774

PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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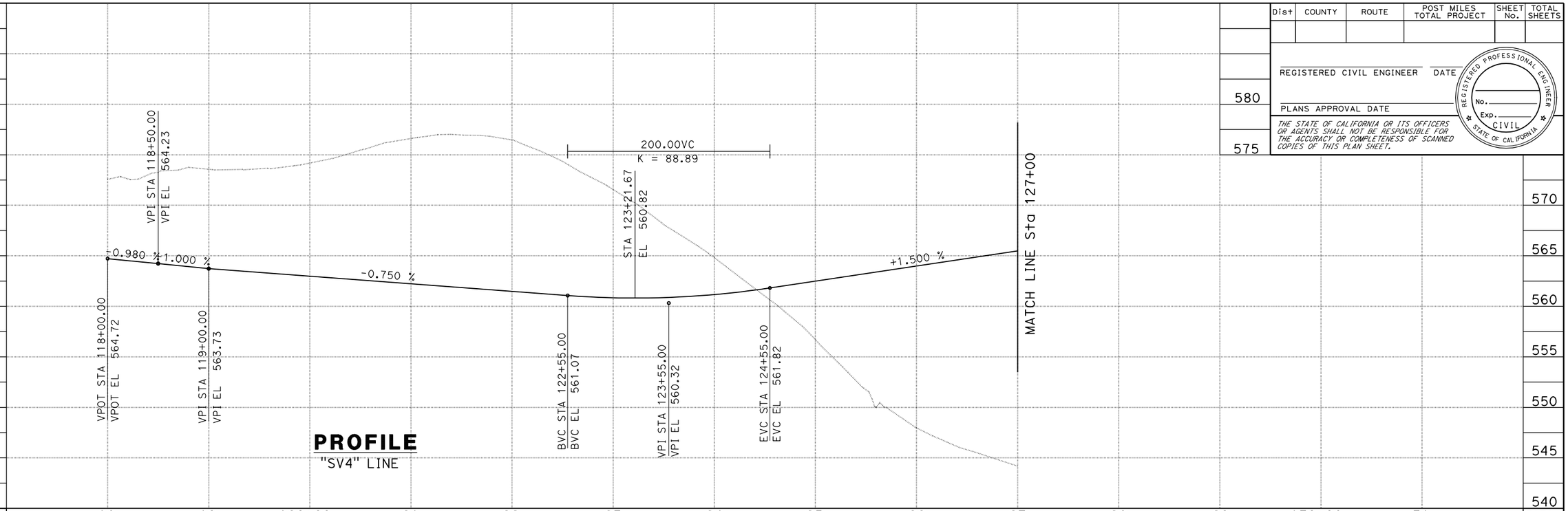
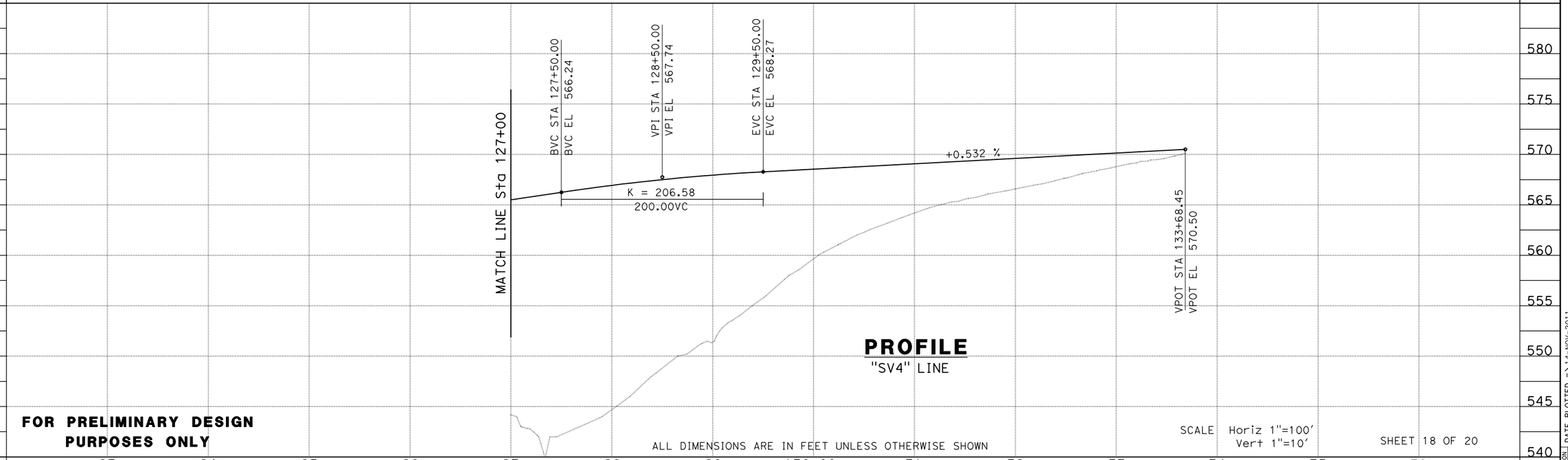


PROFILE
"SV4" LINE



PROFILE
"SV4" LINE

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

SCALE Horiz 1"=100'
Vert 1"=10'

SHEET 18 OF 20

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BORDER LAST REVISED 7/2/2010

USERNAME => s132966
DGN FILE => b056310fa018.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UC 2774

PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. 60600 Exp. CIVIL STATE OF CALIFORNIA

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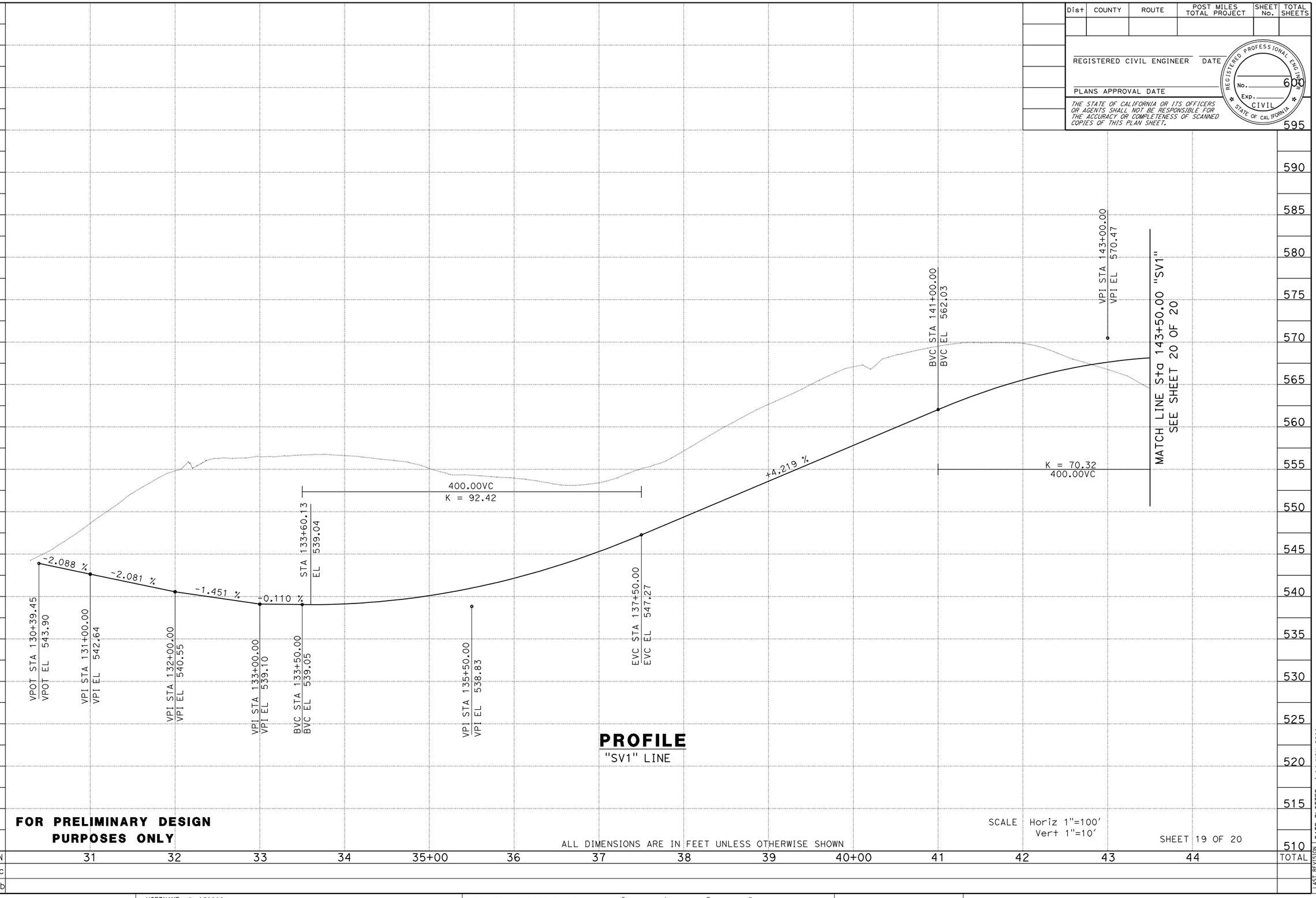

PROFILE
"SV1" LINE

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

SCALE Horiz 1"=100'
Vert 1"=10'

SHEET 19 OF 20

STATION	31	32	33	34	35+00	36	37	38	39	40+00	41	42	43	44	TOTAL
CY Exc															
CY Emb															

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 11-07-11 DATE PLOTTED => 14-NOV-2011 TIME PLOTTED => 08:48

BORDER LAST REVISED 7/2/2010 | USERNAME => s132966 DGN FILE => b056310fa019.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UC 2774 | PROJECT NUMBER & PHASE 11000000230

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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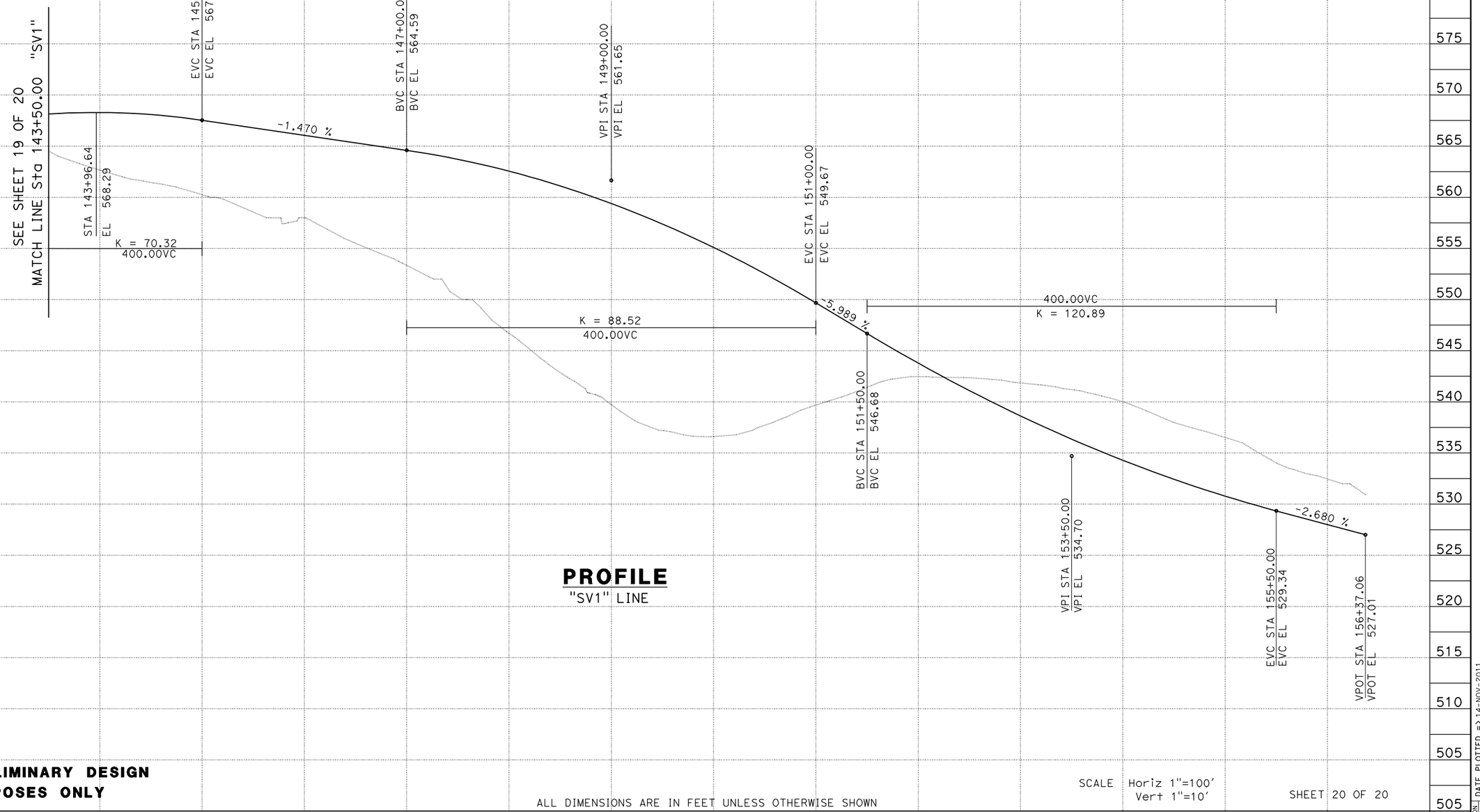


PROFILE

"SV1" LINE

FOR PRELIMINARY DESIGN PURPOSES ONLY

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

SCALE Horiz 1"=100'
Vert 1"=10'

SHEET 20 OF 20

STATION	43	44	45+00	46	47	48	49	50+00	51	52	53	54	55+00	56	TOTAL
CY Exc															
CY Emb															

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY | FUNCTIONAL SUPERVISOR

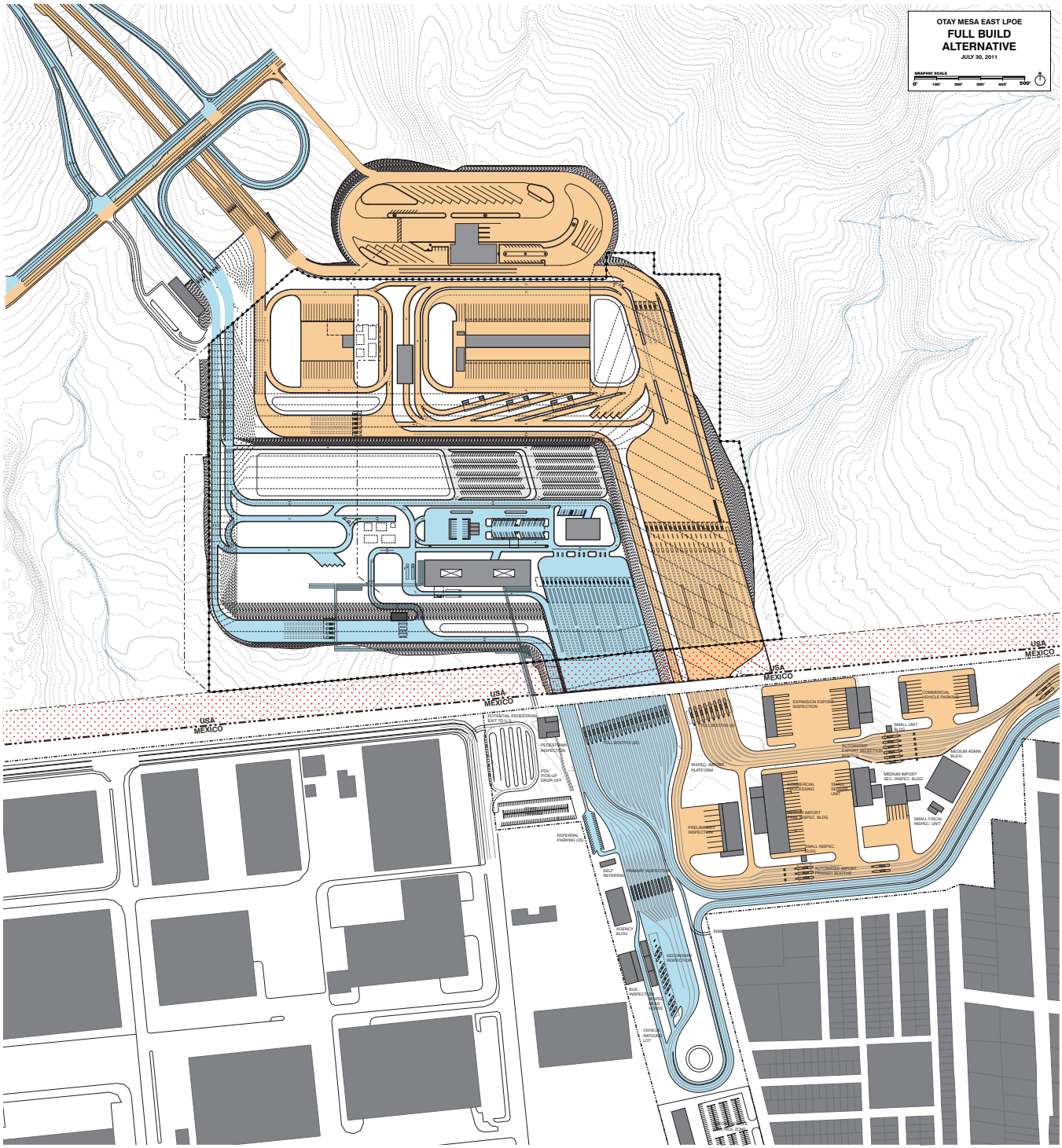
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION DATE PLOTTED => 14-NOV-2011
11-07-11 TIME PLOTTED => 08:49

BORDER LAST REVISED 7/2/2010 | USERNAME => s132966 | DGN FILE => b056310fa020.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UC 2774 | PROJECT NUMBER & PHASE 11000000230

Attachment D – Preliminary Otay Mesa East POE and CVEF Layout


OTAY MESA EAST LPOE
FULL BUILD ALTERNATIVE
JULY 30, 2011
GRAPHIC SCALE
0' 100' 200' 300' 400' 500'
USA
MEXICO
POTENTIAL PEDESTRIAN EXIT TO U.S.
PEDESTRIAN INSPECTION
POV PICK-UP/ DROP-OFF
REFERRAL PARKING (20)
FULL BOOTHS (22)
SELF REFERRAL
PRIMARY INSPECTION
SECONDARY INSPECTION
AGENCY BLDG
BUS INSPECT.
VEHICLE IMPOUND LOT
EXPANSION EXPORT INSPECTION
COMMERCIAL VEHICLE PARKING
SMALL UNIT BLDG
AUTOMATED EXPORT SELECTION BOOTHS
MEDIUM ADMIN BLDG
INSPECT. BAY PLATFORM
COMMERCIAL PROCESSING
SMALL EXPORT UNIT
MEDIUM IMPORT SEC. INSPEC. BLDG
PRELIMINARY INSPECTION
SMALL FISCAL INSPEC. UNIT
SMALL INSPEC. BLDG
AUTOMATED IMPORT PRIMARY BOOTHS
EMD
LPOE PERIMETER FENCE
NON-COMMERCIAL
COMMERCIAL
PARKING
PEDESTRIAN

Attachment E – Cost Estimates

11- PAGE ESTIMATE

11000000230

Type of Estimate : Project Report
Program Code : HE14
Project Limits : 11-SD-11 PM 0.0/2.8, 11-SD-905 PM R8.4/10.1, 11-SD-125 PM 0.5

Description: **Construction of a new State Route and Port of Entry in San Diego County in and near San Diego on Route 11 from Route 905/11 Separation to Mexico, and on Route 125 from 0.8 miles north of Route 905/11 Separation to Route 905/11 Separation, and on Route 905 from 0.1 mile west of Britannia Boulevard Overcrossing to Route 905/11 Separation**

Scope : Construct EB and WB SR-905/SR -11 Direct Connector Ramps, WB SR-905 to La Media Rd. Offramp, WB SR-11 to La Media Rd. Offramp, SB-125 to EB SR-11 Direct Connector Ramp, SR-11 Toll Road with interchange at Enrico Fermi Dr., partial interchange at Siempre Viva Rd. and a CVEF

Alternative : **Preferred Alternative**

	Current Cost	Escalated Cost
ROADWAY ITEMS	$ 200,484,300.00	$ 210,131,692.00
STRUCTURE ITEMS	$ 48,549,254.68	$ 50,885,466.00
SUBTOTAL CONSTRUCTION COST	$ 249,033,554.68	$ 261,017,158.00
RIGHT OF WAY	$ 81,530,332.00	$ 85,071,000.00
TOTAL CAPITAL COST	$ 330,564,000.00	$ 346,089,000.00
PR/ED SUPPORT	$ 18,700,000.00	$ 19,261,000.00
PS&E SUPPORT	$ 27,400,000.00	$ 29,030,100.00
RIGHT OF WAY SUPPORT	$ 4,200,000.00	$ 4,558,300.00
CONSTRUCTION SUPPORT	$ 32,300,000.00	$ 37,290,000.00
TOTAL SUPPORT COST	$ 82,600,000.00	$ 90,139,400.00
TOTAL PROJECT COST	$ 413,200,000.00	$ 437,000,000.00

	month	year
Date (Month/Year) of Estimate	3	/ 2012
Estimated Date (Month/Year) of Construction	10	/ 2013
Number of Months of Escalation	19	
Number of Years of Escalation	1.59	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days	800	
Number of Plant Establishment Days	1200	

Estimated Project Schedule

PID Approval	September-00
PA/ED Approval	March-12
PS&E	November-12
RTL	July-13
Begin Construction	October-13

Reviewed by District 0.E. Leon G. Edmonds 3/27/12 (619) 688-6735
Leon G. Edmonds, District 11 Office Engineer — Date — Phone

Approved by Project Manager 3/27/12 (619) 491-3080
Jacqueline Appleton-Deane, Project Manager — Date — Phone
for Jacqueline Appleton-Deane

[2] Escalation rates used on this estimate for Support Cost are 3% for FY 10/11 and each year beyond. Escalation rates used in this estimate for Highway Construction Capital Costs are 5.0% compounded annually to Construction year.

DISTRICT 11
PRELIMINARY
PROJECT COST ESTIMATE

I. ROADWAY ITEMS

Section			Cost
1	Earthwork		$ 13,862,100
2	Structural Section		$ 19,994,100
3	Drainage		$ 17,278,700
4	Specialty Items		$ 22,551,100
5	Environmental		$ 11,869,200
	5A Environmental Mitigation	$ 3,625,200	
	5B Landscape and Irrigation	$ 5,245,000	
	5C NPDES	$ 2,998,978	
6	Traffic Items		$ 40,395,400
	6A Electrical	$ 37,200,000	
	6B Signing and Striping	$ 2,904,344	
	6C Traffic Management Plan	$ 30,000	
	6D Traffic Control	$ 261,000	
7	Detours		$ 191,000
8	Minor Items		$ 12,614,200
9	Roadway Mobilization		$ 11,100,500
10	Supplemental Work		$ 8,829,000
11	State Furnished		$ 580,500
12	Contingencies		$ 31,853,200
13	Overhead		$ 9,365,300

TOTAL ROADWAY ITEMS	$ 200,484,300

Estimate Prepared By : Ronda L. Sisson T.E. 3/26/12 619-688-3144
Name and Title | Date | Phone

Estimate Reviewed By : Brock V. Emery T.E. 03-26-12 619-220-7398
Name and Title | Date | Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1 EARTHWORK

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	CY	2,500,000	x	5.00	=	$	12,500,000
190103	Roadway Excavation (Type Y) ADL	CY		x		=	$	-
190105	Roadway Excavation (Type Z-2) ADL	CY		x		=	$	-
194001	Ditch Excavation	CY		x		=	$	-
198001	Imported Borrow	CY		x		=	$	-
198007	Imported Material (Shoulder Backing)	TON		x		=	$	-
192037	Structure Excavation (Retaining Wall)	CY	4,500	x	15.00	=	$	67,500
193013	Structure Backfill (Retaining Wall)	CY	16,800	x	40.00		$	672,000
193031	Pervious Backfill Material (Retaining Wall)	CY	1,900	x	65.00	=	$	123,500
160101	Clearing & Grubbing	LS	1	x	404,100.00	=	$	404,100
170101	Develop Water Supply	LS	1	x	95,000.00	=	$	95,000

TOTAL EARTHWORK SECTION ITEMS $ 13,862,100

Section 2 STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
401050	Jointed Plain Concrete Pavement	CY	67,000	x	160.00	=	$	10,720,000
404092	Seal Pavement Joint	LF		x		=	$	-
404094	Seal Longitudinal Isolation Joint	LF		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	LF		x		=	$	-
401108	Replace Concrete Pavement (Rapid Strength Concrete)	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON	84,000	x	60.00	=	$	5,040,000
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON						
393003	Geosynthetic Pavement Interlayer	SQYD		x		=	$	-
260201	Class 2 Aggregate Base	CY	78,800	x	30.00	=	$	2,364,000
290201	Asphalt Treated Permeable Base	CY		x		=	$	-
250401	Class 4 Aggregate Subbase	CY	78,300	x	15.00	=	$	1,174,500
374002	Asphaltic Emulsion (Fog Seal Coat)	TON	18	x	800.00	=	$	14,400
397005	Tack Coat	TON	41	x	750.00	=	$	30,750
377501	Slurry Seal	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
365001	Sand Cover	TON		x		=	$	-
731530	Minor Concrete (Textured Paving)	SQFT	5,000	x	10.00	=	$	50,000
731502	Minor Concrete (Misc. Const)	CY		x		=	$	-
394071	Place Hot Mix Asphalt Dike	LF	88,220	x	1.00	=	$	88,220
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
150860	Remove Base and Surfacing	CY		x		=	$	-
1532XX	Remove Concrete (type)	CY		x		=	$	-
394090	Place Hot Mix Asphalt (Misc. Area)	SQYD		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD		x		=	$	-
39405X	Shoulder Rumber Strip *(HMA, Type XX Indentation*	STA		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
390136	Minor Hot Mix Asphalt	TON	1,605	x	82.00	=	$	131,610
731504	Minor Concrete (Curb and Gutter)	CY	267	x	213.00	=	$	56,871
731516	Minor Concrete (Driveway)	CY	200	x	192.00	=	$	38,400
731521	Minor Concrete (Sidewalk)	CY	166	x	377.00	=	$	62,582
731626	Minor Concrete (Curb and Curb Ramp)	CY	3	x	772.00	=	$	2,316
731656	Ramp Detectiable Warning Surface	SQFT	36	x	46.00	=	$	1,656
731510	Minor Concrete (Curb, Gutter and Sidewalk)	CY	446	x	490.00	=	$	218,540
842000	Parking Bumper (Precast Concrete)	EA	4	x	47.00	=	$	188

TOTAL STRUCTURAL SECTION ITEMS $ 19,994,100

SECTION 3 DRAINAGE

Item code		Unit	Quantity		Price		Amount
150206	Abandon Culvert	LF	200	x	25.00	=	$ 5,000
150805	Remove Culvert	LF	1,220	x	15.00	=	$ 18,300
150820	Remove Inlet	EA	12	x	800.00	=	$ 9,600
150821	Remove Headwall	EA	1	x	1,500.00	=	$ 1,500
192025	Structure Excavation (Culvert)	CY	20,200	x	20.00	=	$ 404,000
193004	Structure Backfill (Culvert)	CY	6,050	x	30.00	=	$ 181,500
510502	Minor Concrete (Minor Structure)	CY	555	x	1,000.00	=	$ 555,000
510413	Class 1 Concrete (Box Culvert)	CY	5,032	x	650.00	=	$ 3,270,800
520107	Bar Reinforcing Steel (Box Culvert)	LB	848,500	x	0.80	=	$ 678,800
650018	24" Reinforced Concrete Pipe	LF	13,400	x	60.00		$ 804,000
650026	36" Reinforced Concrete Pipe	LF	7,240	x	120.00	=	$ 868,800
650030	42" Reinforced Concrete Pipe	LF	400	x	200.00	=	$ 80,000
650034	48" Reinforced Concrete Pipe	LF	320	x	250.00	=	$ 80,000
650046	66" Reinforced Concrete Pipe	LF	150	x	300.00	=	$ 45,000
650092	72" Reinforced Concrete Pipe	LF	1,760	x	400.00	=	$ 704,000
665024	24" Corrugated Steel Pipe	LF	350	x	80.00	=	$ 28,000
690124	24" Corrugated Steel Downdrain	LF	55	x	100.00	=	$ 5,500
705206	24" Concrete Flared End Section	EA	7	x	700.00	=	$ 4,900
705210	36" Concrete Flared End Section	EA	6	x	1,400.00	=	$ 8,400
721006	Rock Slope Protection (1/2 Ton Method B)	CY	1,160	x	110.00	=	$ 127,600
721010	Rock Slope Protection Backing (No.1 Method B)	CY	3,360	x	80.00	=	$ 268,800
721024	Rock Slope Protection (1/4 Ton Method B)	CY	480	x	110.00	=	$ 52,800
721420	Concrete (Ditch and Channel Lining)	CY	850	x	350.00	=	$ 297,500
750001	Miscellaneous Iron and Steel	LB	52,600	x	1.50	=	$ 78,900
XXXXXX	SB-125 to EB SR-11 Connector Ramp Drainage	LS	1	x	300,000	=	$ 300,000
XXXXXX	CVEF Drainage	LS	1	x	400,000.00		$ 400,000
XXXXXX	Sanitary Sewer	LS	1	x	8,000,000.00		$ 8,000,000
					TOTAL DRAINAGE ITEMS		**$ 17,278,700**

SECTION 4 SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)		Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	45,000.00	=	$ 45,000
518002	Sound Wall (Masonry Block)	SQFT		x		=	$ -
510524	Minor Concrete (Sound Wall)	CY		x		=	$ -
153250	Remove Sound Wall	SQFT		x		=	$ -
190110	Lead Compliance Plan	LS		x		=	$ -
1532XX	Remove Barrier *(Insert Type)*	LF		x		=	$ -
150662	Remove Metal Beam Guard Railing	LF	7,200	x	6.20	=	$ 44,640
150668	Remove Terminal Systems	EA		x		=	$ -
518009	Access Gate	EA	6	x	2,500.00	=	$ 15,000
800361	Chain Link Fence *(Type CL-6, Vinyl Clad)*	LF	312,330	x	23.00	=	$ 7,183,590
802520	Chain Link Gate *(Type CL-6)*	EA	28	x	1,000.00	=	$ 28,000
832001	Metal Beam Guard Railing	LF	12,250	x	15.00	=	$ 183,750
839301	Single Thrie Beam Barrier	LF		x		=	$ -
839310	Double Thrie Beam Barrier	LF		x		=	$ -
839521	Cable Railing	LF	520	x	21.00	=	(619) 491-3080
8395XX	Terminal System (Type CAT)	LF		x		=	$ -
839585	Alternative Flared Terminal System	EA	20	x	2,000.00	=	$ 40,000
8395XX	Alternative In-line Terminal System	EA		x		=	$ -
49XXXX	CIDH Concrete Piling *(Insert Diameter)*	LF		x		=	$ -
839XXX	Crash Cushion *(Insert Type)*	EA		x		=	$ -
839701	Concrete Barrier *(Type 60)*	LF	2,870	x	50.00	=	$ 143,500
839720	Concrete Barrier *(Type 736)*	LF	3,030	x	70.00	=	$ 212,100
83XXXX	Remove Concrete Barrier	LF		x		=	$ -
520103	Bar Reinf. Steel (Ret. Wall)	LB	728,400	x	1.00	=	$ 728,400
510408	Class 1 Concrete (Retaining Wall)	CY	5,930	x	500.00	=	$ 2,965,000
510133	Class 2 Concrete (Retaining Wall)	CY		x		=	$ -
510060	Structural Concrete (Retaining Wall)	CY		x		=	$ -
513553	Retaining Wall (Masonry Wall)	CY		x		=	$ -
5110XX	Architectural Treatment *(Insert Type)*	SQFT		x		=	$ -
511047	Anti-Graffiti Coating	SQFT		x		=	$ -
5136XX	Reinforced Concrete Crib Wall *(Insert Type)*	SQFT		x		=	$ -
83954X	Transition Railing *(Insert Type)*	EA		x		=	$ -
XXXXXX	Commercial Vehicle Enforcement Facility Bldg.	LS	1	x	6,446,700.00	=	$ 6,446,700
XXXXXX	CVEF Canopies (2)	SF	2,584	x	69.50	=	$ 179,588
8395XX	CVEF Fire Protection System	LS	1	x	318,500.00	=	$ 318,500
XXXXXX	CVEF Communication Tower and Building	LS	1	x	428,800.00	=	$ 428,800
XXXXXX	CVEF Site Work	LS	1	x	3,184,500.00	=	$ 3,184,500
XXXXXX	CVEF Adaptable Radiation Area Monitoring Sys	LS	1	x	392,000.00	=	$ 392,000
XXXXXX	Replace Sanyo Business Access	LS	1	x	12,000.00	=	$ 12,000
					TOTAL SPECIALTY ITEMS		**$ 22,551,100**

Section 5 ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code	11-SD-11 PM 0.0/2.8, 11-SD-905 PM		Quantity		Price		Amount
	Biological Mitigation	LS	1	x	3,500,000.00	=	$ 3,500,000
071325	Temporary Fence (Type ESA)	LF	4,200	x	6.00	=	$ 25,200
	Cultural/Paleontology Monitoring	LS	1	x	100,000.00	=	$ 100,000

Subtotal Environmental $ 3,625,200

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Price		Amount
200001	Highway Planting	LS	1	x	500,000.00	=	$ 500,000
208000	Irrigation System	LS	1	x	100,000.00	=	$ 100,000
204099	Plant Establishment Work	LS	1	x	25,000.00	=	$ 25,000
204101	Extend Plant Establishment (4 Years)	LS	1	x	1,254,000.00	=	$ 1,254,000
200101	Imported Topsoil	CY	36,800	x	28.00	=	$ 1,030,400
20XXXX	XXX" (*Insert Type*) Conduit *(Use for Irrigation x-overs)*	LF		x		=	$ -
20XXXX	Extend XXX" *(Insert Type)* Conduit *(Use for Extension of Irrigation x-overs)*	LF		x		=	$ -
203025	Compost (Incorporate)	SQYD	16,400	x	6.00	=	$ 98,400
017154	Rock Mulch	SQYD	51,700	x	20.00	=	$ 1,034,000
203030	Erosion Control (PSFM)	AC	20	x	4,000.00	=	$ 80,000
209801	Maintenance Vehicle Pullout	EA	8	x	9,150.00	=	$ 73,200
208304	Water Meter	EA	11	x	75,000.00	=	$ 825,000
203021	Fiber Rolls	LF	75,000	x	3.00	=	$ 225,000

Subtotal Landscape and Irrigation $ 5,245,000

5C - NPDES

Item code		Unit	Quantity		Price		Amount
074019	Prepare SWPPP	LS	1	x	336,910.00	=	$ 336,910
074017	Prepare WPCP	LS		x		=	$ -
074016	Construction Site Management	LS	1	x	2,000,000.00	=	$ 2,000,000
XXXXXX	Temporary Erosion Control			x		=	$ -
074027	Temporary Erosion Control Blanket	EA	5	x		=	$ -
074033	Temporary Construction Entrance	EA	18	x	2,976.00	=	$ 53,568
074028	Temporary Fiber Roll	LF	155,000	x	2.00	=	$ 310,000
074057	Storm Water Annual Report	EA	4	x	2,000.00	=	$ 8,000
074056	Rain Event Action Plan	EA	86	x	500.00	=	$ 43,000
074058	Storm Water Sampling and Analysis***	EA	26	x	500.00	=	$ 13,000
074035	Temporary Check Dam	LF		x		=	$ -
074038	Temp. Drainage Inlet Protection	EA	10	x	200.00	=	$ 2,000
074041	Street Sweeping	LS	1	x	225,000.00	=	$ 225,000
074032	Temporary Concrete Washout (Facility)	EA		x	2,000.00	=	$ -
074042	Temporary Concrete Washout (Portable)	EA	5	x	1,500.00	=	$ 7,500
Supplemental Work for NPDES							(619) 491-3080
066595	Water Pollution Control Maint. Sharing*	LS	1	x	100,000.00	=	$ 100,000
066596	Additional Water Pollution Control Work**	LS	1	x	25,000.00	=	$ 25,000
066597	Storm Water Sampling Analysis***	LS	1	x	45,000.00	=	$ 45,000
XXXXXX	Drainage Inlet Stenciling	LS	1	x	100.00	=	$ 100

Subtotal NPDES (Without Supplemental Work) $ 2,998,978

* Applies only to project with SWPPP's

TOTAL ENVIRONMENTAL $ 11,869,200

Section 6 TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
86055X	Lighting & Sign Illumination	LS	1	x	860,000.00	=	$	860,000
860XXX	Signals & Lighting	LS	1	x	600,000.00	=	$	600,000
86XXXX	Fiber Optic Conduit System	LS	1	x	200,000.00	=	$	200,000
8611XX	Ramp Metering System (Location X)	LS	1	x	30,000.00	=	$	30,000
861234A	Changeable Message Sign System	EA	5	x	500,000.00	=	$	2,500,000
861235A	Border Wait Monitoring System	LS	3	x	1,000,000.00	=	$	3,000,000
861236A	Tolling Equipment	LS	1	x	4,000,000.00	=	$	4,000,000
861237A	Automated Vehicle Enforcement	LS	1	x	1,000,000.00	=	$	1,000,000
8607XX	Interconnection Facilities	LS		x			$	-
5602XX	Furnish Sign Structure	LB		x		=	$	-
5602XX	Install Sign Structure	LS	1	x	400,000.00	=	$	400,000
56XXXX	XXX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
XXXXXX	Closed Circuit Television Cameras (CCTV)	LS	1	x	240,000.00	=	$	240,000
860810	Inductive Loop Detectors	EA	75	x	400.00	=	$	30,000
8609XX	Traffic Monitoring Stations	LS	1	x	40,000.00	=	$	40,000
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
860090	Maintain Existing Traffic Management System	LS	1	x	300,000.00	=	$	300,000
XXXXXX	ITS Costs	LS	1	x	24,000,000.00	=	$	24,000,000

Subtotal Traffic Electrical $ 37,200,000

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
566011	Roadside Sign (One Post)	LS	1	x	65,456.00	=	$	65,456
566012	Roadside Sign (Two Post)	LS	1	x	11,488.00	=	$	11,488
560218	Furnish Sign Structure (Truss)	LS	1	x	1,566,000.00	=	$	1,566,000
560219	Install Sign Structure (Truss)	LS	1	x	174,000.00	=	$	174,000
560213	Furnish Sigh Structure (Lightweight)	LS	1	x	128,000.00	=	$	128,000
560214	Install Sign Structure (Lightweight)	LS	1	x	20,000.00	=	$	20,000
560203	Furnish Sign Structure (Bridge Mtdw/walkway)	LS	1	x	58,000.00	=	$	58,000
560204	Install Sign Structure (Bridge Mtdw/walkway)	LS	1	x	20,000.00	=	$	20,000
561016	60" CIDH Pile (Sign Foundation)	LS	1	x	260,000.00	=	$	260,000
561005	36" CIDH Pile (Sign Foundation)	LS	1	x	86,000.00	=	$	86,000
560244	Furnish Laminated Sign Panels	LS	1	x	188,000.00	=	$	188,000
560248	Furnish Single Sheet Aluminum Sign	LS	1	x	54,000.00	=	$	54,000
562002	Metal Barrier Mounted Sign	LS	1	x	5,000.00	=	$	5,000
150711	Remove Painted Traffic Stripe	LS	1	x	20,000.00	=	$	20,000
150718	Remove Thermoplastic Traffic Stripe/Pvt Mrkng	LS	1	x	15,000.00	=	$	15,000
820107	Delineator (Class 1)	LS	1	x	46,000.00	=	$	46,000
840656	Permanent Pavement Delineation	LS	1	x	100,000.00	=	$	100,000
120090	Construction Area Signs	LS	1	x	47,000.00	=	$	47,000
840515	Thermoplastic Pavement Marking	LS	1	x	30,000.00	=	$	30,000
840519	Thermoplastic Crosswalk and Pavement Marki	LS		x	5.00	=	$	-
840656	Paint Traffic Stripe (2-Coat)	LF	5,200	x	2.00	=	$	10,400

(619) 491-3080
Jacqueline Appleton-Deane, Project Manager

Subtotal Traffic Signing and Striping $ 2,904,344

6C - Traffic Management Plan

Item code		Unit	Quantity		Unit Price ($)			Cost
128650	Portable Changeable Message Signs	EA	6	x	5,000.00	=	$	30,000

Subtotal Traffic Management Plan $ 30,000

6D - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
129099A	Traffic Plastic Drum	EA		x		=	$	-
12016X	Channelizer	EA		x		=	$	-
120120	Type III Barricade	EA		x		=	$	-
129100	Temp. Crash Cushion Module	EA	70	x	300.00	=	$	21,000
120100	Traffic Control System	LS	1	x	150,000.00	=	$	150,000
839603A	Temporary Crash Cushion (ADIEM)	EA	2	x	10,000.00	=	$	20,000
129000	Temporary Railing (Type K)	LF	7,000	x	10.00	=	$	70,000
120143	Temporary Pavement Delineation	LF		x		=	$	-

Subtotal Stage Construction and Traffic Handling $ 261,000

TOTAL TRAFFIC ITEMS $ 40,395,400

Section 7 DETOURS*

Item code	11-SD-11 PM 0.0/2.8, 11-SD-905 PM		Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	CY	1,000	x	25.00	=	$	25,000
198050	Embankment	CY		x		=	$	-
198001	Imported Borrow	CY		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON	700	x	125.00	=	$	87,500
260201	Class 2 Aggregate Base	CY	686	x	75.00	=	$	51,450
394071	Place Hot Mix Asphalt Dike	LF		x		=	$	-
07XXXX	Temporary Drainage	LS		x			$	-
129000	Temporary Railing (Type K)	LF	700	x	20.00	=	$	14,000
1286XX	Temporary Signals	EA		x		=	$	-
120143	Temporary Pavement Delineation	LF	2,600	x	5.00	=	$	13,000
0713XX	Temporary Fence (Type X)	LF		x		=	$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS $ 191,000

Section 8 MINOR ITEMS (Use Appropriate percentage between 5%-10%)

Total of Section 1-7	126,141,600	x	10%	=	$ 12,614,160

TOTAL MINOR ITEMS $ 12,614,200

Section 9 ROADWAY MOBILIZATION*

Item code							
999990	Total Section 1-8	$	138,755,800	x	8%	=	$ 11,100,464

TOTAL MOBILIZATION $ 11,100,500

* For Project less than 50 Working Days "Mobilization" is not required as a separate contract item, however contract item prices should take into consideration mobilization as part of the price.

Note: If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

Section 10 SUPPLEMENTAL WORK

Total Section 1-8 =	$	138,755,800	5%	=	$ 6,937,790

Item code					Unit Price ($)			Cost
066670	Compensation Adjustment for Price Index Fluctuations of Paving Asphalt	LS	1	x	1,134,000.00	=	$	1,134,000
066094	Value Analysis	LS	1	x	10,000.00	=	$	10,000
066070	Maintain Traffic	LS	1	x	434,000.00	=	$	434,000
066919	Dispute Resolution Board	LS	1	x	30,000.00	=	$	30,000
066015	Federal Trainee Program	LS	1	x	23,200.00	=	$	23,200
066610	Partnering	LS	1	x	90,000.00	=	$	90,000
066204	Remove Rock & Debris	LS		x		=	$	-
066222	Locate Existing Cross-Over	LS		x		=	$	-

NPDES *Supplemental Work specified in Section 5C* = $ 170,000

TOTAL SUPPLEMENTAL WORK $ 8,829,000

Section 11 STATE FURNISHED MATERIALS

Item code		Unit	Quantity		Unit Price ($)		Cost
066105	RE Office	LS	1	x	263,000.00	=	$263,000
066063	Public Information	LS	1	x	42,500.00	=	$42,500
066901	Water Expenses	LS	1	x	30,000.00	=	$30,000
06684X	Ramp Meter Controller Assembly	LS	1	x	25,000.00	=	$25,000
06684X	TMS Controller Assembly	LS	1	x	20,000.00	=	$20,000
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
066062A	COZEEP Expenses	LS	1	x	100,000.00	=	$100,000
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
XXXXXX	Freeway Service Patrol	LS	1	x	100,000.00		$100,000

TOTAL STATE FURNISHED $580,500

Section 12 CONTINGENCY

Use appropriate percentage based on the detail of estimate. Anything other than the suggested contingency in the PDPM needs to be *justified. (Pre-PSR 30%-50%, PSR 25%, PR 20%, PAR 15%, After PAR 10%)

Total Section 1-11 $ 159,265,800 x 20% = $31,853,160

TOTAL CONTINGENCY $31,853,200

*Justification:

Section 13 OVERHEAD

Item code		Unit	Quantity		Unit Price ($)		Cost
070018	Time Related Overhead (TRO)	WD	800	X	11706.625	=	$9,365,300

Note: If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.

TOTAL OVERHEAD $9,365,300

II. STRUCTURES ITEMS

	Bridge 1	Bridge 2	Bridge 3	Bridge 4
DATE OF ESTIMATE	08/04/10	09/02/10	08/31/10	08/03/10
Bridge Name	EB Connector over 905	EB Connector over 125	WB Connector over 125	WB Connector over LMD6
Bridge Number	57-XXX	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Feet) [out to out]	42.00 LF	42.00 LF	41.80 LF	42.00 LF
Total Bridge Length (Feet)	601.00 LF	298.00 LF	303.00 LF	224.00 LF
Total Area (Square Feet)	25242.00 SQFT	12516.00 SQFT	12665.40 SQFT	9408.00 SQFT
Structure Depth (Feet)	0.00 LF	0.00 LF	0.00 LF	0.00 LF
Footing Type (pile or spread)	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Foot	$180.00	$200.00	$195.00	$175.00
COST OF EACH STRUCTURE	**$4,543,560.00**	**$2,503,200.00**	**$2,469,753.00**	**$1,646,400.00**

	Bridge 5	Bridge 6	Bridge 7	Bridge 8
DATE OF ESTIMATE	05/01/09	10/27/09	10/27/09	10/27/09
Bridge Name	SEDC -Otay Mesa Rd	SEDC-Flyover	SR11-Sanyo Rd	SR11-Enrico Fermi DR
Bridge Number	57-XXX	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Feet) [out to out]	42.00 LF	42.00 LF	117.00 LF	100.00 LF
Total Bridge Length (Feet)	205.00 LF	1356.00 LF	152.00 LF	210.00 LF
Total Area (Square Feet)	8610.00 SQFT	56952.00 SQFT	17784.00 SQFT	21000.00 SQFT
Structure Depth (Feet)	0.00 LF	6.00 LF	3.75 LF	4.25 LF
Footing Type (pile or spread)	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Foot	$135.00	$140.00	$189.52	$149.60
COST OF EACH STRUCTURE	**$1,162,350.00**	**$7,973,280.00**	**$3,370,423.68**	**$3,141,600.00**

	Bridge 9	Bridge 10	Bridge 1	Building 1
DATE OF ESTIMATE	10/27/09	10/27/09	08/24/09	08/24/09
Bridge Name	SR11-Alta Rd	SR11-Siempre Viva Rd	SR11_Siempre Viva Ramp	Toll Plaza
Bridge Number	57-XXX	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Feet) [out to out]	90.00 LF	152.00 LF	112.00 LF	0.00 LF
Total Bridge Length (Feet)	210.00 LF	218.00 LF	70.00 LF	0.00 LF
Total Area (Square Feet)	18900.00 SQFT	33136.00 SQFT	7840.00 SQFT	0.00 SQFT
Structure Depth (Feet)	4.25 LF	LF	0.00 LF	0.00 LF
Footing Type (pile or spread)	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Foot	$162.44	$212.85	$410.66	$8,396,000.00
COST OF EACH STRUCTURE	**$3,070,116.00**	**$7,052,997.60**	**$3,219,574.40**	**$8,396,000.00**

TOTAL COST OF BRIDGES	$40,153,254.68
TOTAL COST OF BUILDINGS	$8,396,000.00
TOTAL COST OF STRUCTURES[1]	**$48,549,254.68**

Estimate Prepared By: _____ _____
XXXXXXXXXXXXXXXX —— Division of Structures — Date

[1]Structure's Estimate Includes Overhead and Mobilization.

III. RIGHT OF WAY

A)	Acquisition, including Excess Lands, Fees, Damages, Goodwill, Mitigation, SB-1210, Expert Witness, and Railroad	$	79,151,000
	11-SD-		
B)	Utility Relocation (State Share) + Potholing (Design Phase)	$	1,864,000
C)	Utility - Advance Engineering Estimate	$	0
D)	RAP and/or Last Resort Housing	$	0
E)	Clearance & Demolition	$	465,332
F)	Title and Escrow	$	50,000

G)	**TOTAL R/W ESTIMATE:**	**$81,530,332.00**
H)	**TOTAL R/W ESTIMATE: Escalated to Certification Date**	**$85,071,000.00**
I)	Utility Relocation (Construction Cost)	$ 0
J)	**RIGHT OF WAY SUPPORT:**	**$4,200,000.00**

Support Cost Estimate Prepared By	Project Coordinator[1]	688-3359 Phone
Utility Estimate Prepared By	Utility Coordinator[2]	220-7304 Phone
R/W Acquistion Estimate Prepared By	Right of Way Estimator[3]	688-7519 Phone

[1] When estimate has Support Costs only [2] When estimate has Utility Relocation [3] When R/W Acquisition is required

IV. SUPPORT COST ESTIMATE SUMMARY

SB-45 CATEGORY SUPPORT COST	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	P3 Subtotal
PR/ED (PD,PE,PM)										0
PS&E (PS)										0
R/W (RW)										0
CONSTRUCTION (CM)										0
Total Support Cost:	0	0	0	0	0	0	0	0	0	

SB-45 CATEGORY SUPPORT COST	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	P3 Total	Support Ratio
PR/ED (PD,PE,PM)		18,700,000								18,700,000	0.05656998
PS&E (PS)		9,968,813	8,963,963	8,467,141						27,400,000	0.08288864
R/W (RW)		0	1,700,000	1,800,000	700,000					4,200,000	$0
CONSTRUCTION (CM)					12,451,678	12,202,644	7,645,579			32,300,000	0.09771179
Total Support Cost:	0	28,668,813	10,663,963	10,267,141	13,151,678	12,202,644	7,645,579	0	0	82,600,000	

Total Capital Cost:	**$330,564,000**
Overall Percent Support Cost:	**0.24987597**

Approved by: Sandra Drobek
Project Control Engineer

3/26/12
Date

ESTIMATE

11000000230

Type of Estimate : Preliminary Estimate for Project Report

Program Code :

Project Limits :

Description: **Construction of a new State Route and Port of Entry in San Diego County in and near San Diego on Route 11 from Route 905/11 Separation to Mexico, and on Route 125 from 0.8 miles north of Route 905/11 Separation to Route 905/11 Separation, and on Route 905 from 0.1 mile west of Britannia Boulevard Overcrossing to Route 905/11 Separation**

Scope : POE (not included in Preferred Alternative 11 Page Estimate)

Alternative : **POE**

	Current Cost	Escalated Cost
ROADWAY ITEMS	**$ 252,900,000.00**	**$ 265,069,658.00**
STRUCTURE ITEMS	**$ -**	**$ -**
SUBTOTAL CONSTRUCTION COST	**$ 252,900,000.00**	**$ 265,069,658.00**
RIGHT OF WAY	**$ 39,836,500.00**	**$ 42,054,000.00**
TOTAL CAPITAL COST	**$ 292,737,000.00**	**$ 307,124,000.00**
PR/ED SUPPORT	**$ -**	**$ -**
PS&E SUPPORT	**$ 14,400,000.00**	**$ 15,245,700.00**
RIGHT OF WAY SUPPORT	**$ 2,100,000.00**	**$ 2,289,000.00**
CONSTRUCTION SUPPORT	**$ 32,000,000.00**	**$ 36,903,200.00**
TOTAL SUPPORT COST	**$ 48,500,000.00**	**$ 54,437,900.00**
TOTAL PROJECT COST	**$ 341,300,000.00**	**$ 362,000,000.00**

	month	year
Date (Month/Year) of Estimate	3	/ 2012
Estimated Date (Month/Year) of Construction	10	/ 2013
Number of Months of Escalation	19	
Number of Years of Escalation	1.59	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days	500	
Number of Plant Establishment Days	0	

NOTE: TO BE BUILT BY OTHERS

[2] Escalation rates used on this estimate for Support Cost are 3% for FY 10/11 and each year beyond. Escalation rates used in this estimate for Highway Construction Capital Costs are 5.0% compounded annually to Construction year.

Attachment F – LCCA Data Sheets

Life Cycle Cost Analysis Form

Alternative 1 : Preferred Alternative

JPCP Structural Section for new Four-Lane freeway

Pavement Design Life:	40 Years		
Initial Construction Costs:	$ 48,668,000		
Initial Project Support Costs:	$		
Future Maintenance & Rehabilitation Costs:**	$ 465,550		
TOTAL AGENCY COSTS:		$	49,133,550
USER COSTS:		$	42,590
TOTAL LIFE-CYCLE COSTS:		$	49,176,140

Alternative 2:*

Hot Mix Asphalt Structural Section, for new Four-Lane freeway

Pavement Design Life:	20 Years		
Initial Construction Costs:	$ 47,462,000		
Initial Project Support Costs:	$		
Future Maintenance & Rehabilitation Costs:**	$ 3,761,650		
TOTAL AGENCY COSTS:		$	51,223,650
USER COSTS:		$	276,420
TOTAL LIFE-CYCLE COSTS:		$	51,500,070

Reason that this is not Alternative 1:

In addition to overall cost being less, the JPCP performs better with anticipated truck traffic.

* Repeat as often as needed, with appropriate numbering, to cover all pavement alternatives investigated.

RealCost Input Data

1. Economic Variables	
Value of Time for Passenger Cars ($/hour)	$10.46
Value of Time for Single Unit Trucks ($/hour)	$27.83
Value of Time for Combination Trucks ($/hour)	$27.83

2. Analysis Options	
Include User Costs in Analysis	Yes
Include User Cost Remaining Service Life Value	Yes
Use Differential User Costs	Yes
User Cost Computation Method	Calculated
Include Agency Cost Remaining Service Life Value	Yes
Traffic Direction	Both
Analysis Period (Years)	55
Beginning of Analysis Period	2013
Discount Rate (%)	4.0

3. Project Details and Quantity Calculations	
State Route	SR-11
Project Name	SR-11 EA 056310
Region	DISTRICT 11
County	SAN DIEGO
Analyzed By	FB
Mileposts	
Begin	0.00
End	2.70
Length of Project (miles)	2.70
Comments	CONSTRUCT FREEWAY FROM SANYO TO POE

4. Traffic Data	
AADT Construction Year (total for both directions)	27,300
Cars as Percentage of AADT (%)	85.0
Single Unit Trucks as Percentage of AADT (%)	7.0
Combination Trucks as Percentage of AADT (%)	8.0
Annual Growth Rate of Traffic (%)	1.3

Speed Limit Under Normal Operating Conditions (mph)	65
No of Lanes in Each Direction During Normal Conditions	2
Free Flow Capacity (vphpl)	1950
Rural or Urban Hourly Traffic Distribution	Urban
Queue Dissipation Capacity (vphpl)	1530
Maximum AADT (total for both directions)	193,220
Maximum Queue Length (miles)	4.0

Alternative 1

Initial Construction	JPCP (40 yr design life)	
Agency Construction Cost ($1000)	$48,668.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	0	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	45.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	8.64	
Work Zone Length (miles)	4.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Rehabilitation #1	CAPM (CPR C) grinding & minor slab replacementl	
Agency Construction Cost ($1000)	$962.00	

User Work Zone Costs ($1000)		
Work Zone Duration (days)	25	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	5.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	32.4	
Work Zone Length (miles)	4.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		
Outbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		

Rehabilitation #2	CAPM (CPR B)	
Agency Construction Cost ($1000)	$1,145.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	54	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	10.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	16.2	
Work Zone Length (miles)	4.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		
Outbound	Start	End

First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		

Rehabilitation #3		
Agency Construction Cost ($1000)	$0.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	77	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	0.0	
Maintenance Frequency (years)	0	
Agency Maintenance Cost ($1000)	33.4	
Work Zone Length (miles)	4.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		
Outbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		

Rehabilitation #4		
Agency Construction Cost ($1000)	$0.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	77	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	0.0	
Maintenance Frequency (years)	0	
Agency Maintenance Cost ($1000)	33.4	
Work Zone Length (miles)	4.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	

Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		
Outbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		

Rehabilitation #5		
Agency Construction Cost ($1000)	$0.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	3	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	0.0	
Maintenance Frequency (years)	0	
Agency Maintenance Cost ($1000)	0	
Work Zone Length (miles)	4.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Rehabilitation #6		
Agency Construction Cost ($1000)	$0.00	
User Work Zone Costs ($1000)		

Work Zone Duration (days)	3	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	0.0	
Maintenance Frequency (years)	0	
Agency Maintenance Cost ($1000)	0	
Work Zone Length (miles)	3.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Alternative 2

Initial Construction	0.75 HMA,	
Agency Construction Cost ($1000)	$47,462.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	0	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	20.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	35.6	
Work Zone Length (miles)	4.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		

Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Rehabilitation #1	CAPM HMA 5 YR	
Agency Construction Cost ($1000)	$1,274.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	40	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	5.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	11.9	
Work Zone Length (miles)	4.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		
Outbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		

Rehabilitation #2	REHAB HMA 10 YR	
Agency Construction Cost ($1000)	$3,434.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	77	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	10.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	28.1	

Work Zone Length (miles)	3.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		
Outbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		

Rehabilitation #3	CAPM HMA 5 YR	
Agency Construction Cost ($1000)	$1,274.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	40	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	5.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	11.9	
Work Zone Length (miles)	4.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		
Outbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		

Rehabilitation #4	REHAB HMA 10 YR	
Agency Construction Cost ($1000)	$3,434.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	77	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	10.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	59.4	
Work Zone Length (miles)	3.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		
Outbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		

Rehabilitation #5	CAPM HMA 5 YR	
Agency Construction Cost ($1000)	$1,274.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	40	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	5.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	11.9	
Work Zone Length (miles)	4.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	21	24
Second period of lane closure	0	5
Third period of lane closure		
Outbound	Start	End
First period of lane closure	21	24

Second period of lane closure	0	5
Third period of lane closure		

Rehabilitation #6		
Agency Construction Cost ($1000)	$0.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	15	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	5.0	
Maintenance Frequency (years)	0	
Agency Maintenance Cost ($1000)	100	
Work Zone Length (miles)	3.00	
Work Zone Speed Limit (mph)	35	
Work Zone Capacity (vphpl)	1200	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Deterministic Results

Total Cost	**Alternative 1: JPCP - 40 YR design life**		**Alternative 2: HMA**	
	Agency Cost ($1000)	User Cost ($1000)	Agency Cost ($1000)	User Cost ($1000)
Undiscounted Sum	$50,777.08	$253.07	$59,758.71	$1,008.63
Present Value	$49,133.55	$42.59	$51,223.65	$276.42
EUAC	$2,222.37	$1.93	$2,316.91	$12.50

Probabilistic Results

Total Cost (Present Value)	Alternative 1: JPCP - 40 YR design life		Alternative 2: HMA	
	Agency Cost ($1000)	User Cost ($1000)	Agency Cost ($1000)	User Cost ($1000)
Mean				
Standard Deviation				
Minimum				
Maximum				

Tornado Graphs

Attachment G – Right-of-Way Data Sheets

State of California — Business and Transportation Agency

M E M O R A N D U M

REVISED

To: Jacqueline Appleton Dean, Project Manager

Attn: Nicola Bernard, Project Engineer

Date: August 16, 2011
File: 11-SD -11
P.M.: 0.00 / 2.80
E.A.: 11-056310
ProjectID: 1100000023

Alternative: 905/125 to POE (POE not included)

From: DEPARTMENT OF TRANSPORTATION - District 11 Right of Way

Subject: RIGHT OF WAY DATA – Right of Way Data – Construct SR-11 Fwy and Port of Entry from 905/125 to US/Mexico Border.

Programmed Amount: $ - 0 -

1. **R/W Cost Estimate:**

	Current Value Future Use	Escalation Rate	Escalated Value
A) Acquisition, including Excess Land, Fees, Damages, Goodwill, Mitigation & Railroad	$ 79,151,000	2 %	$ 82,317,000
B) Utility Relocation (State Share) + Potholing (Design Phase)	$ 1,864,000	10 %	$ 2,237,000
C) Utility- Advance Engineering Estimate (Encumber with State Only Funds)	$ 0	0 %	$ 0
D) RAP and/or Last Resort Housing	$ 0	0 %	$ 0
E) Clearance & Demolition	$ 465,332	0 %	$ 465,000
F) Title and Escrow Costs	$ 50,000	2 %	$ 52,000
Total R/W Estimate (Excluding Item #8 -Hazardous Waste)	**$ 81,530,332**	**Escalated**	**$ 85,071,000**

Condemnation Factor: 20 %
Design Appreciation Factor: 20 %
(Above two factors included in Acq. Escalation Rate)

Number of Years to Certification: 2

2. **Parcel Data:**

	Type	Du. App	G/W App
X			
A			
B			
C			
D	14	10	
Total	14	Excess Parcels	2

Utilities	
U4-1	
U4-2	
U4-3	
U4-4	5
U5-7	
U5-8	
U5-9	5

Railroad Involvements	
None	X
C & M Agreements	
Service Contracts	
Lic/Re/Clauses	
Misc R/W Work	
Rap Displacements	
Clearance/Demolitions	4
Construction Permits	

Areas: R/W Fee: 136.824 Acres Excess:
R/W Easements: 4.218 Acres

Entered PMCS
1. EVENT RW SCREEN (All Data) / /
2. AGRE SCREEN (Railroad Data Only) / /

REMARKS: This revision was necessary to split the project into two Alternatives. This Alternative does not include the POE portion and covers the fee/easement areas, acquisition values and Utility costs associated with the R/W from the POE to the 905/125 connection. This revision indicates a consideration for damages and the latest market activity.

File: 11-SD-11
P.M.: 0.00 / 2.80
E.A.: 11-056310
Project ID: 1100000023

3. Are there major items of construction contract work?
Yes _____ No _____ Not determined at this time __X__ (If yes, explain.)

4. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, goodwill, etc.). **UNIMPROVED LAND WITH INDUSTRIAL LAND USE DESIGNATION.**

5. Is there an effect on assessed valuation?
Yes _____ No __X__ (If yes, explain.)

6. Are utility facilities or rights of way affected?
Yes __X__ No _____ Not determined at this time _____ (If yes, explain.) **OTAY WATER-WATER, CITY OF SD-SEWER, SDG&E, CALPEAK 69KV**

7. Are railroad facilities or rights of way affected?
Yes _____ No __X__ (If yes, explain.)

Name(s) of railroad(s)

When branch lines or spurs are affected, would acquisition and/or payment of damages to businesses and/or industries served by the railroad facilities be more cost effective than construction of a facility to perpetuate the rail service? (See Procedural Handbook Vol. 4a, Chap. 440 for detail.)
Yes _____ No _____ (If yes, explain.)

8. Were any previously unidentified sites with hazardous wastes and/or material found?
Yes _____ * None Evident __X__ (* If yes, attach memorandum per RWPH Vol. 1, Sec. 101.026).

9. Are RAP displacements required?
Yes _____ No __X__ (If yes, provide the following information.)

Number of single-family _____ Number of business/nonprofit _____
Number of multi-family _____ Number of farm _____

Based on Relocation Impact Statement/Study dated, it is anticipated that sufficient housing will be available without Last Resort Housing.

10. Are there material borrow and/or disposal sites required?
Yes _____ No __X__ Not determined at this time _____ (If yes, explain.)

11. Are there potential relinquishments and/or abandonment's?
Yes _____ No __X__ (If yes, explain.)

12. Are there existing and/or potential Airspace sites?
Yes _____ No __X__ (If yes, explain.)

13. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less than formula lead time and/or if significant pressures for project advancement are anticipated.)
PYPSCAN lead time _____. Minimum Right of Way lead time requested from receipt of final maps to certification _____. [ ] See attached.

14. Is it anticipated that all Right of Way work would be performed by Caltrans staff?
Yes__X__ No _____ (If no, explain.)

File: 11- SD-11
P.M.: 0.00 / 2.80
E.A.: 11-056310
Project ID: 1100000023

ASSUMPTIONS & LIMITING CONDITIONS

[ ] The mapping did not provide sufficient detail to determine the limits of the right of way required.

[X] The transportation facilities have not been sufficiently designed so our estimator could determine the damages to any of the remainder parcels affected by the project.

[ ] Additional right of way requirements are anticipated, but are not defined due to preliminary nature of early design requirements.

[ ] See attached

Evaluations prepared by:

1. R/W Signature Andrew C. Bartlett Date 8/16/2011
   Andrew C. Bartlett

2. Railroad Signature Date 8/16/2011
   Brian Finkbeiner

3. Utilities Signature Date 8/16/2011
   Laura Farah

4. Project Coordinator Signature Debbie Fleming Date 8/16/11
   Debbie Fleming

I have personally reviewed the R/W Data Sheet and supporting information. I certify that the probable highest and best use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and I find this Data Sheet complete and current.

By:

JANET SCHAFFER
Deputy District Director
Right of Way Division

AMY LAMOTT VARGAS, CHIEF
Project Coordination & Estimating/
Local Programs/Railroad Branch
Right of Way Division

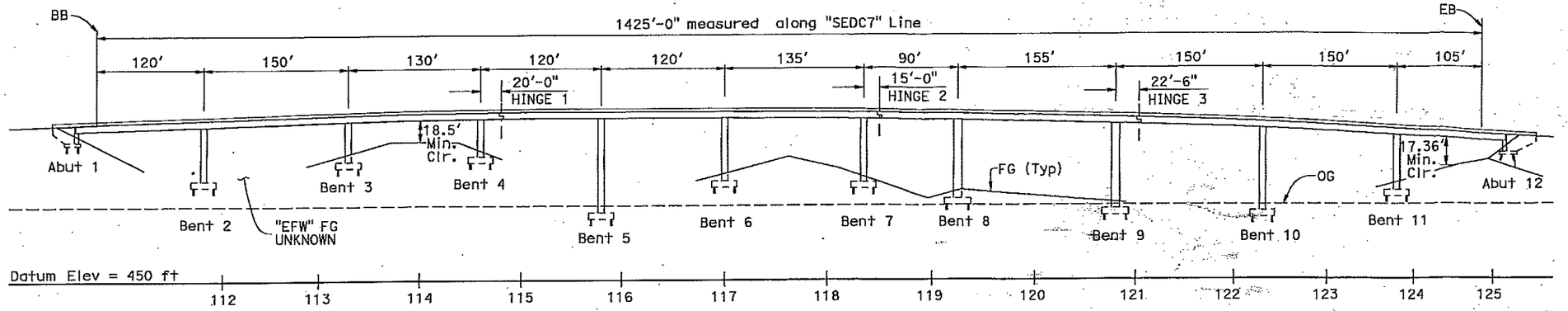
Attachment H – Structures Advanced Planning Studies

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

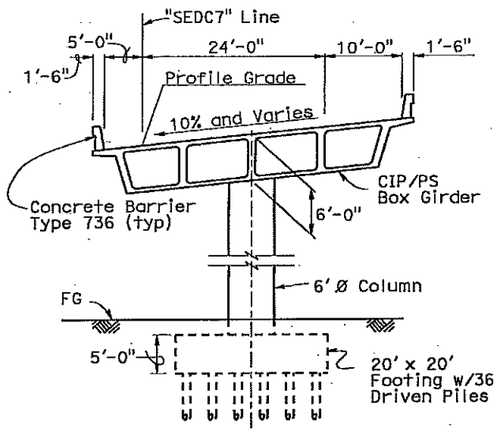
INCOMPLETE PLAN FOR DESIGN STUDY PRINTED
DATE: 20-AUG-2009
Office of Structure Design
STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILE
11	SD	11	

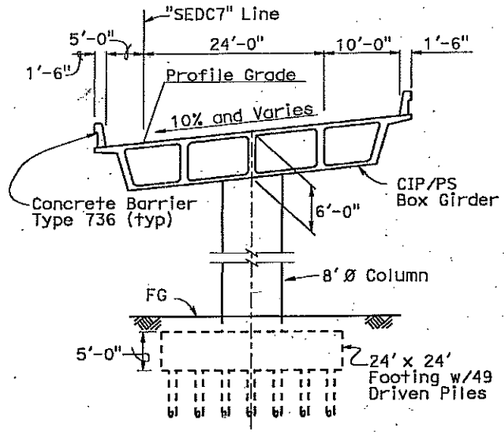
To get to the Caltrans web site, go to: http://www.dot.ca.gov



ELEVATION
1" = 60'



TYPICAL SECTION (BENTS 2 to 7, 10 & 11)
1" = 10'



TYPICAL SECTION (BENTS 8 & 9)
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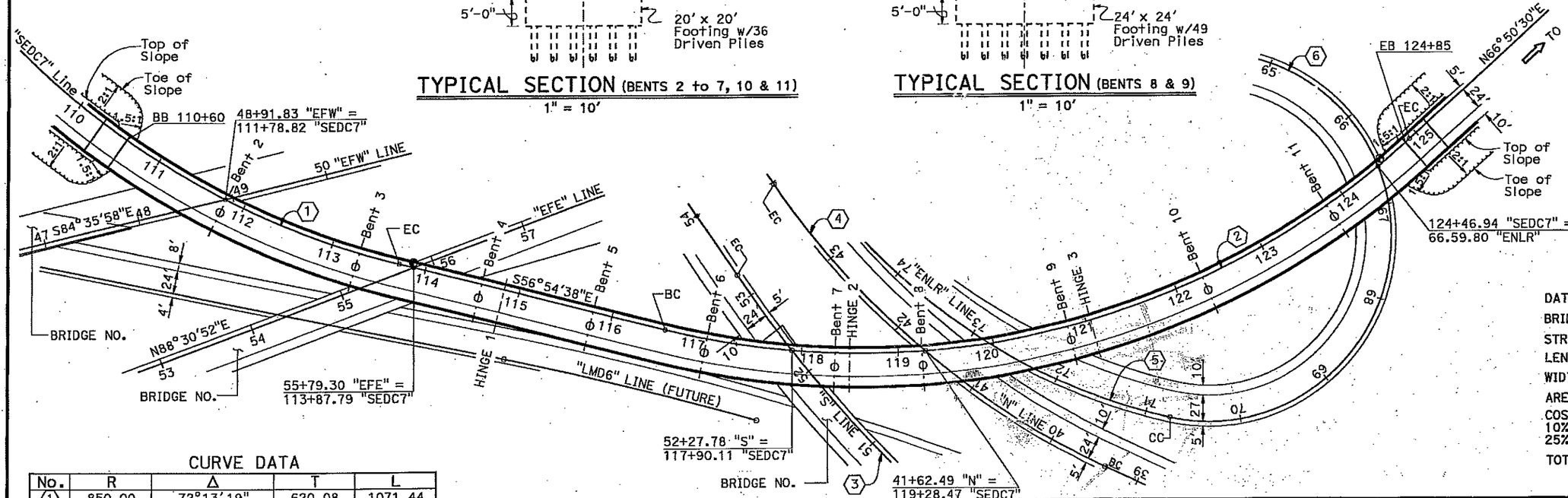

PLAN
1" = 60'

CURVE DATA

No.	R	Δ	T	L
1	850.00	72°13'19"	620.08	1071.44
2	850.00	56°14'51"	454.31	834.45
3	1394.35	28°53'22"	359.17	703.06
4	853.02	30°53'23"	235.68	459.89
5	630.00	38°48'40"	191.48	371.77
6	190.00	208°13'31"	755.71	690.50

ASSUMPTIONS:

1. Corrosive soils at the site.
2. Class 140 driven piles.
3. Existing traffic will be detoured around the site.
4. Restrictions on falsework spans or depths.
5. "EFW" Line profile unknown.

LEGEND

(1) Structure Approach, Type N(30S)

Indicates point of minimum vertical clearance

DATE OF ESTIMATE	10-23-2009
BRIDGE REMOVAL	= N/A
STRUCTURE DEPTH	= 6'-0"
LENGTH	= 1425'
WIDTH	= 42'
AREA	= 59,850
COST/ SQ FT INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	= $135.68
TOTAL COST	= $8,120,000

DESIGNED BY	W. Hsia	DATE	08-20-09
DRAWN BY	H. Mahboobi	DATE	08-20-09
CHECKED BY	C. Lomicka	DATE	08-20-09
APPROVED	M. Ravanipour	DATE	08-20-09

STRUCTURE DESIGN BRANCH 19

PLANNING STUDY

SR-125/SR-11 SB CONN

BRIDGE NO. 57-XXXX	CU 11
SCALE: As Shown	EA 056310

FILE => 57-0000-aps-gp04.dgn

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 10/25/05)

USERNAME => s136387 DATE PLOTTED => 20-AUG-2009 TIME PLOTTED => 14:59

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

INCOMPLETE PLAN FOR DESIGN STUDY PRINTED
DATE: 28-OCT-2009
Office of Structure Design
STATE OF CALIFORNIA

DIST.	COUNTY	ROUTE	POST MILE
11	SD	11	15

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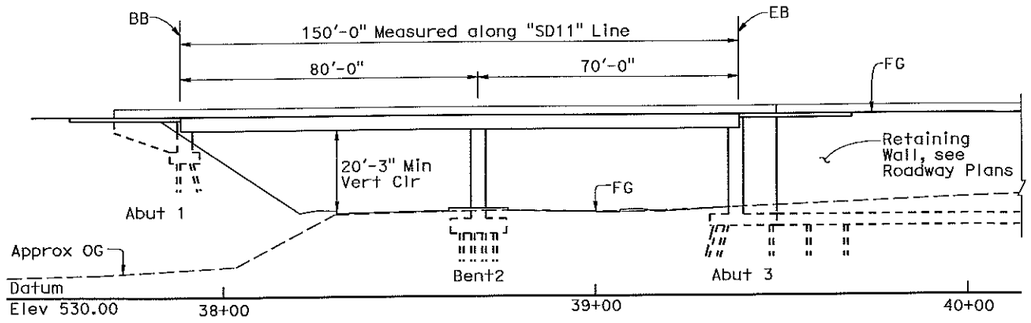
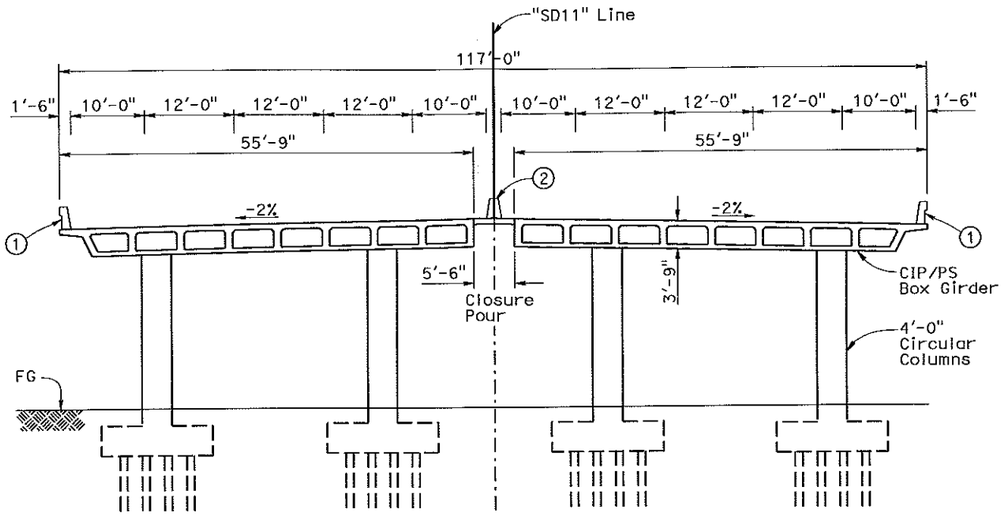
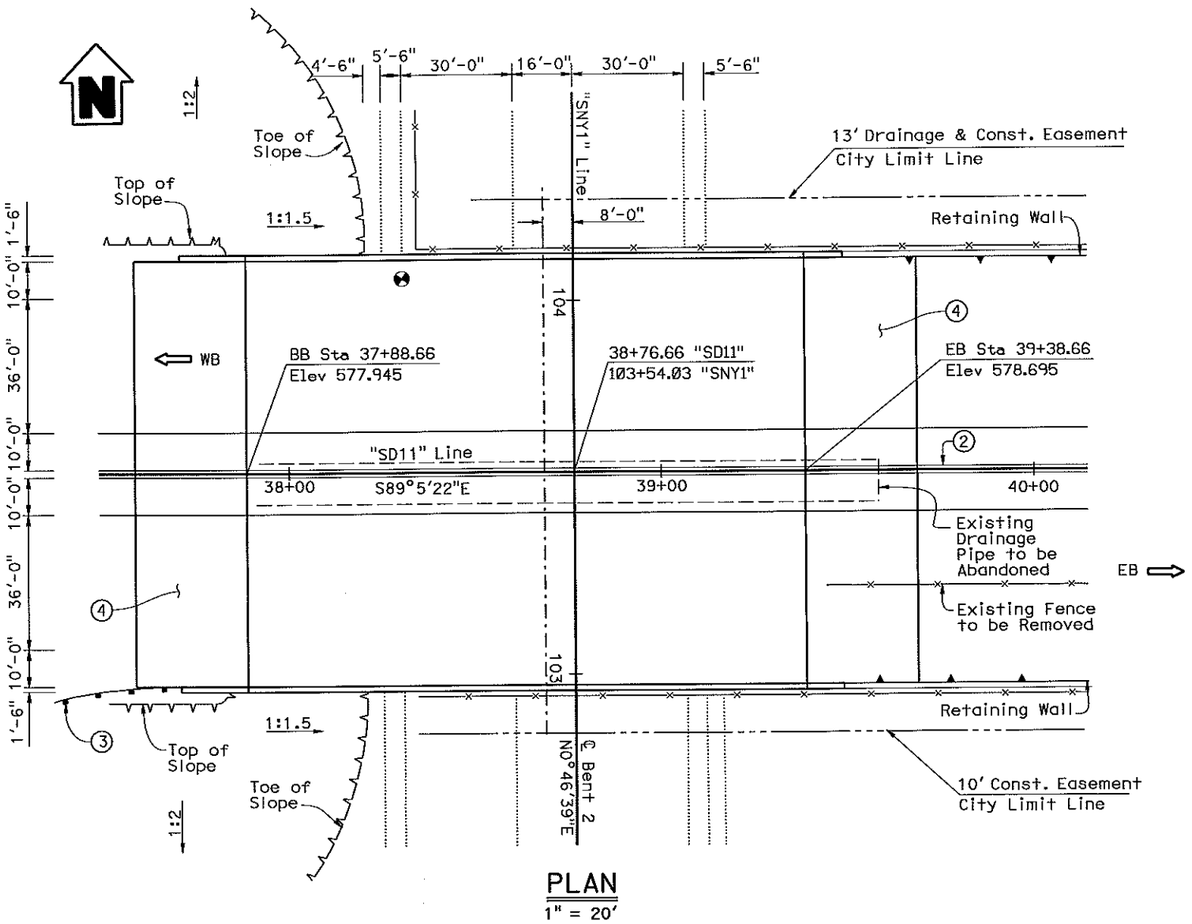


ELEVATION
1" = 20'



TYPICAL SECTION
1" = 10'



PLAN
1" = 20'

LEGEND

1. Concrete Barrier Type 736
2. Concrete Barrier Type 60
3. MBGR, see Road Plans
4. Structure Approach, Type N(30S)

Indicates point of minimum vertical clearance

ASSUMPTIONS:

1. Corrosive soils at the site.
2. Structure Excavation Type D at Bent 2 and Abutment 3.
3. Class 140 driven piles.
4. Traffic will pass under structure.
5. Length of Piles are 30 ft.

DATE OF ESTIMATE		10-23-2009
BRIDGE REMOVAL	=	NONE
STRUCTURE DEPTH	=	3'-9"
LENGTH	=	152'-0"
WIDTH	=	117'-0"
AREA	=	17,784 SF
COST/ ☐ FT INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	=	$189.52
TOTAL COST	=	$3,370,000

DESIGNED BY	C. Sanchez	DATE	08-18-09
DRAWN BY	H. Mahboobi	DATE	08-18-09
CHECKED BY	C. Lomicka	DATE	08-18-09
APPROVED	M. Ravanipour	DATE	08-18-09

STRUCTURE DESIGN BRANCH 19

PLANNING STUDY
SANYO AVENUE UC

BRIDGE NO. 57-xxxxx	CU 11
SCALE: As Shown	EA 056310

FILE => 57-0000-aps-gp03.dgn

USERNAME => s136387 DATE PLOTTED => 28-OCT-2009 TIME PLOTTED => 14:02

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 10/25/05)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

INCOMPLETE PLAN FOR DESIGN STUDY PRINTED
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STATE OF CALIFORNIA

DIST.	COUNTY	ROUTE	POST MILE
11	SD	11	1.5

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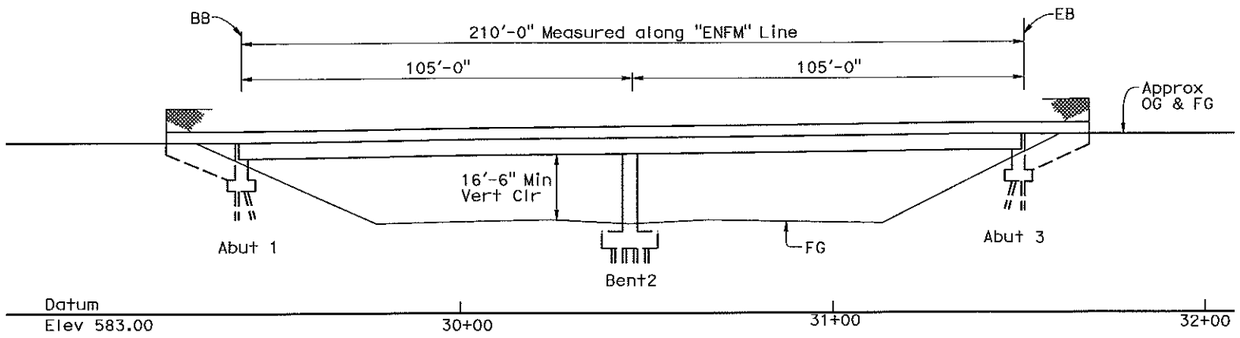

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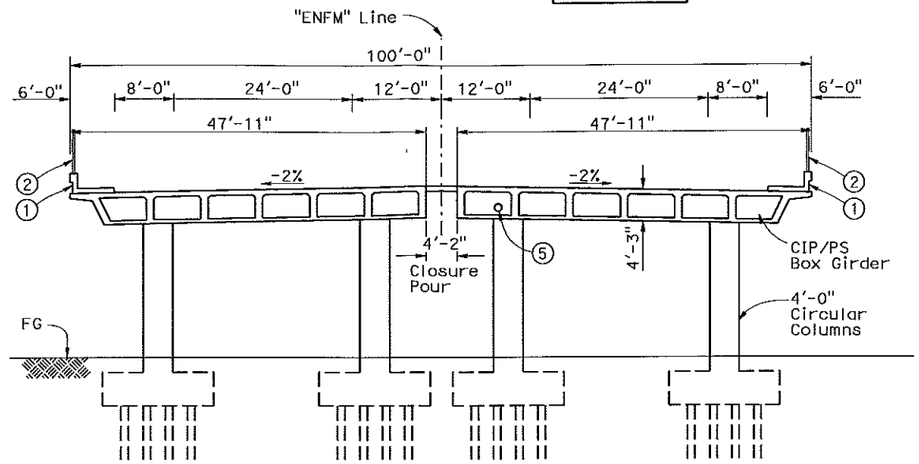

TYPICAL SECTION
1" = 10'

PLAN
1" = 20'

LEGEND

1. Concrete Barrier Type 26
2. Chain Link Railing Type 7
3. MBGR, see Road Plans
4. Structure Approach, Type N(30S)
5. 12" PVC Water line

Indicates point of minimum vertical clearance

ASSUMPTIONS:

1. Corrosive soils at the site.
2. Structure Excavation Type D at Bent 2.
3. Class 140 driven piles.
4. Existing traffic will be detoured around the site.
5. No restrictions on falsework spans or depths.
6. Water line location approximate

DATE OF ESTIMATE		10-23-2009
BRIDGE REMOVAL	=	NONE
STRUCTURE DEPTH	=	4'-3"
LENGTH	=	210'-0"
WIDTH	=	100'-0"
AREA	=	21,000 SF
COST/ ☐ FT INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	=	$149.60
TOTAL COST	=	$3,142,000

ALTERNATIVE 1

DESIGNED BY	C. Lomicka	DATE	08-18-09
DRAWN BY	H. Mahboobi	DATE	08-18-09
CHECKED BY	W. Hsia	DATE	08-18-09
APPROVED	M. Ravanipour	DATE	08-18-09

STRUCTURE DESIGN BRANCH 19

PLANNING STUDY

ENRICO FERMI DRIVE OC

BRIDGE NO. 57-xxxxx	CU X
SCALE: As Shown	EA 056310

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 10/25/05)

FILE => 57-0000-aps-gp01-Alt1.dgn

USERNAME => s136387 DATE PLOTTED => 28-OCT-2009 TIME PLOTTED => 14:01

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

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STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILE
11	SD	11	1.5

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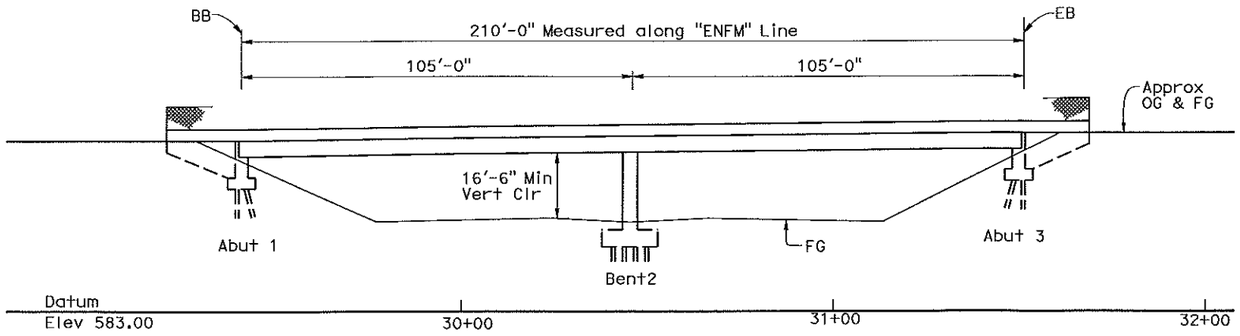

ELEVATION
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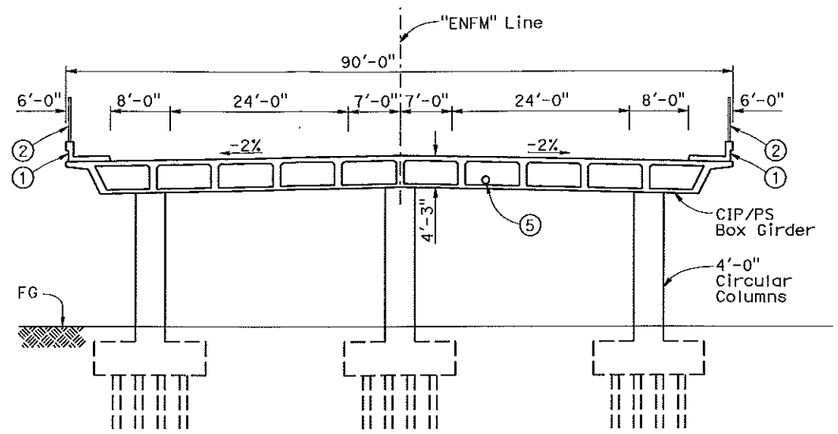

TYPICAL SECTION
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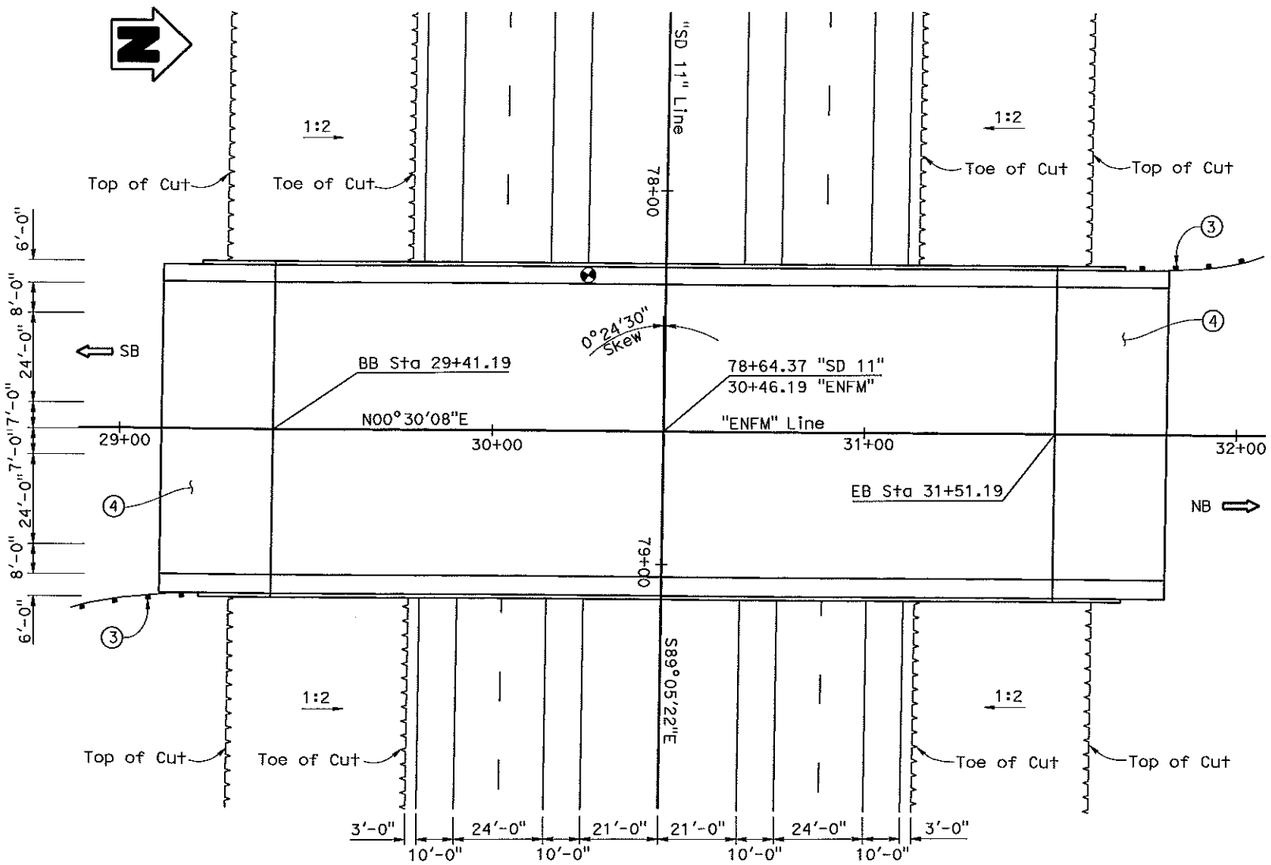

PLAN
1" = 20'

LEGEND

1. Concrete Barrier Type 26
2. Chain Link Railing Type 7
3. MBGR, see Road Plans
4. Structure Approach, Type N(30S)
5. 12" PVC Water line

Indicates point of minimum vertical clearance

ASSUMPTIONS:

1. Corrosive soils at the site.
2. Structure Excavation Type D at Bent 2.
3. Class 140 driven piles.
4. Existing traffic will be detoured around the site.
5. No restrictions on falsework spans or depths.
6. Water line location approximate

DATE OF ESTIMATE		10-23-2009
BRIDGE REMOVAL	=	NONE
STRUCTURE DEPTH	=	4'-3"
LENGTH	=	210'-0"
WIDTH	=	90'-0"
AREA	=	18,900 SF
COST/ ☐ FT INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	=	$140.03
TOTAL COST	=	$2,647,000

ALTERNATIVE 2

DESIGNED BY	C. Lomicka	DATE	08-18-09
DRAWN BY	H. Mahboobi	DATE	08-18-09
CHECKED BY	W. Hsia	DATE	08-18-09
APPROVED	M. Ravanipour	DATE	08-18-09

STRUCTURE DESIGN BRANCH 19

PLANNING STUDY

ENRICO FERMI DRIVE OC

BRIDGE NO. 57-xxxxx	CU X
SCALE: As Shown	EA 056310

USERNAME => a1363387 DATE PLOTTED => 28-OCT-2009 TIME PLOTTED => 14:01

FILE => 57-0000-aps-gp01-Alt2.dgn

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

INCOMPLETE PLAN FOR DESIGN STUDY PRINTED
DATE: 28-OCT-2009
Office of Structure Design
STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILE
11	SD	11	2.0

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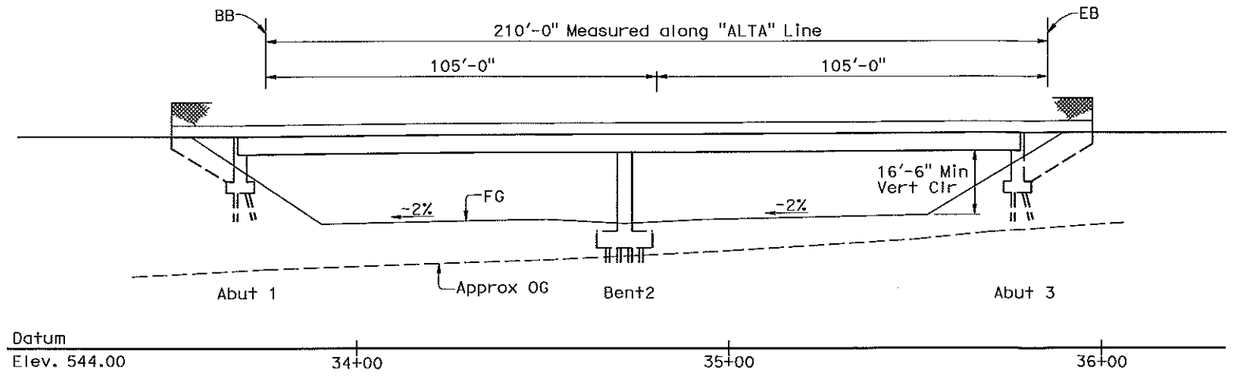
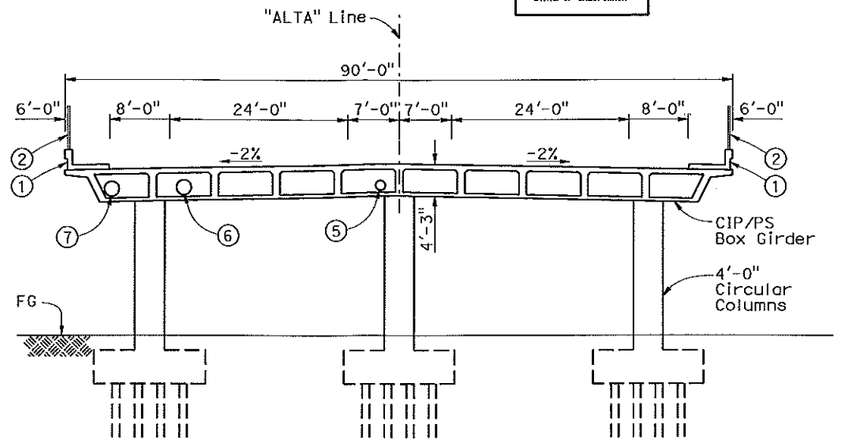


ELEVATION
1" = 20'



TYPICAL SECTION
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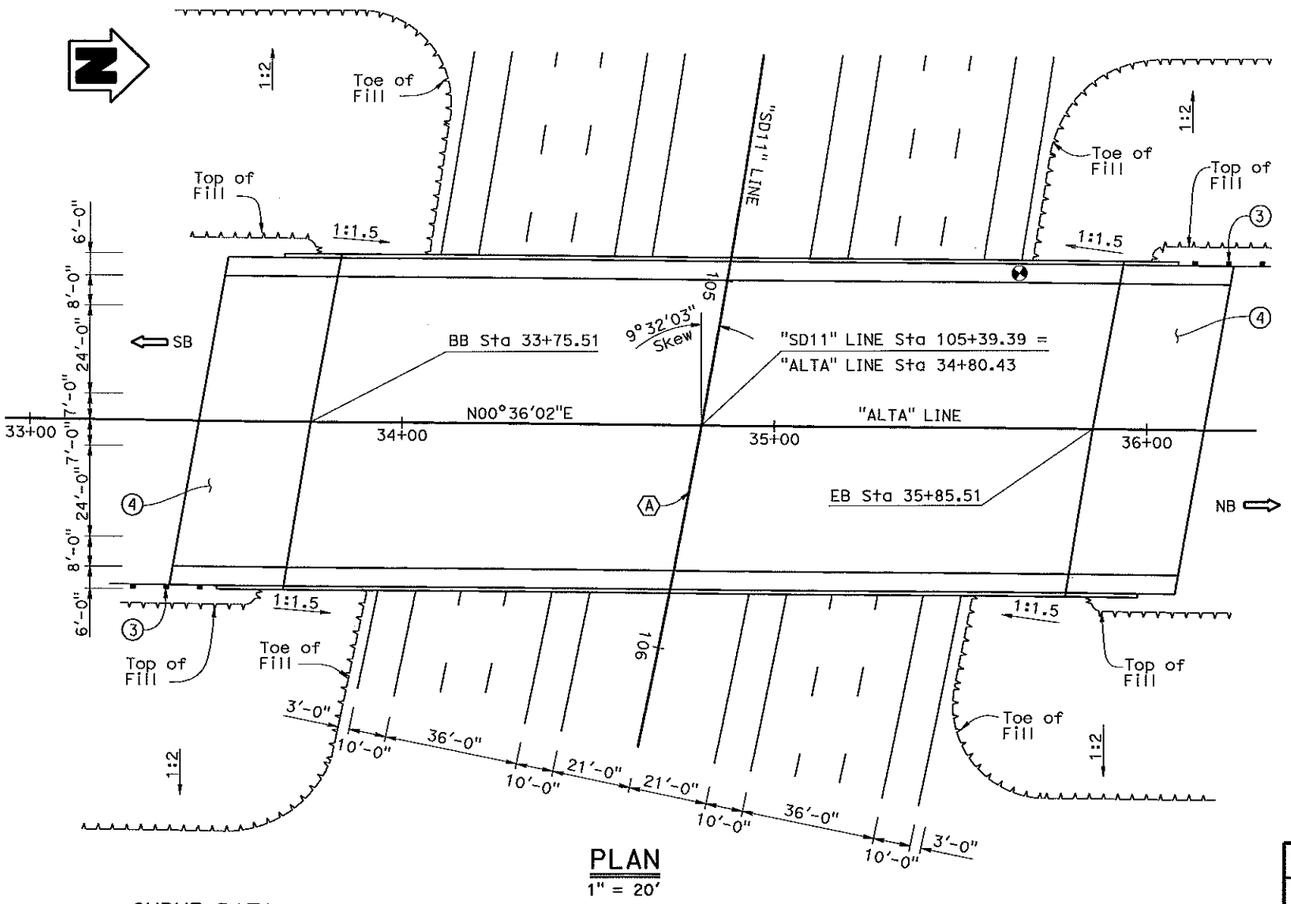

PLAN
1" = 20'

LEGEND

1. Concrete Barrier Type 26
2. Chain Link Railing Type 7
3. MBGR, see Road Plans
4. Structure Approach, Type N(30S)
5. 16" Water line in 21" welded steel pipe casing
6. 24" Water line in 29" welded steel pipe casing
7. Proposed 24" Recycled Water line in 29" welded steel pipe casing

Indicates point of minimum vertical clearance

ASSUMPTIONS:

1. Corrosive soils at the site.
2. Structure Excavation Type D at Bent 2.
3. Class 140 driven piles.
4. No existing traffic at the site.
5. No restrictions on falsework spans or depths..
6. Water line locations approximate.

ALTERNATIVE 1

DATE OF ESTIMATE		10-23-2009
BRIDGE REMOVAL	=	NONE
STRUCTURE DEPTH	=	4'-3"
LENGTH	=	210'-0"
WIDTH	=	90'-0"
AREA	=	18,900 SF
COST/ ☐ FT INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	=	$162.44
TOTAL COST	=	$3,070,000

CURVE DATA

No.	R	Δ	T	L
(A)	3300.00'	47°50'42"	1463.91'	2755.67'

ALTERNATIVE 1

DESIGNED BY	C. Lomicka	DATE	08-18-09
DRAWN BY	H. Mahboobi	DATE	08-18-09
CHECKED BY	W. Hsia	DATE	08-18-09
APPROVED	M. Ravanipour	DATE	08-18-09

STRUCTURE DESIGN BRANCH 19

PLANNING STUDY

ALTA ROAD OC

BRIDGE NO. 57-xxxxx	CU X
SCALE: As Shown	EA 056310

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 10/25/05)

FILE => 57-0000-aps-gp02-Alt1.dgn

USERNAME => s136387 DATE PLOTTED => 28-OCT-2009 TIME PLOTTED => 14:01

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

INCOMPLETE PLAN FOR DESIGN STUDY PRINTED
DATE: 28-OCT-2009
Office of Structure Design
STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILE
11	SD	11	2.0

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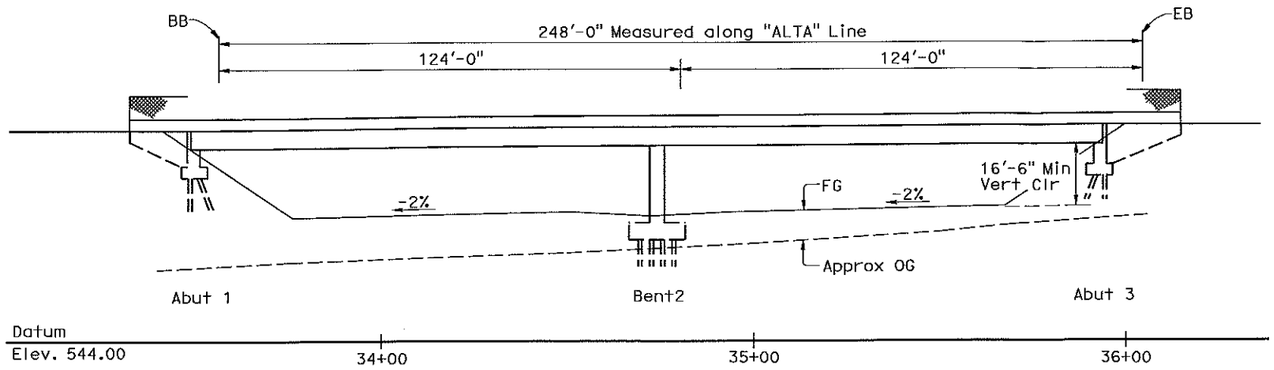
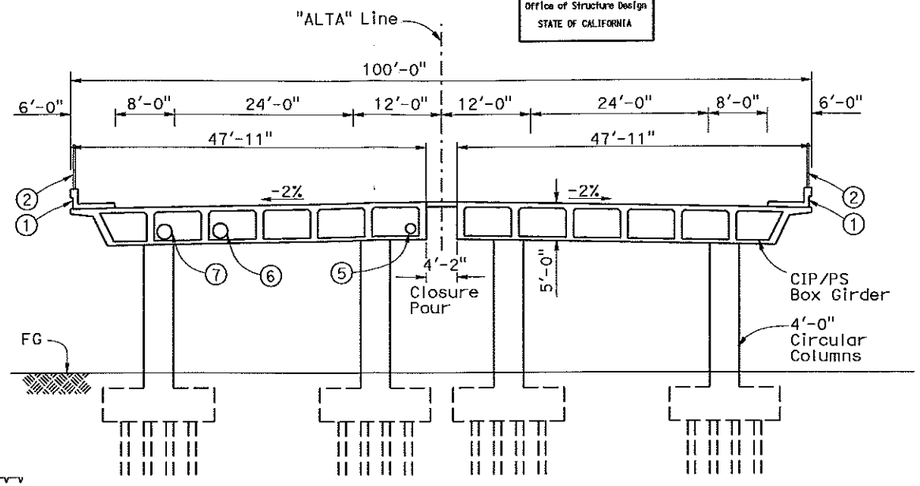
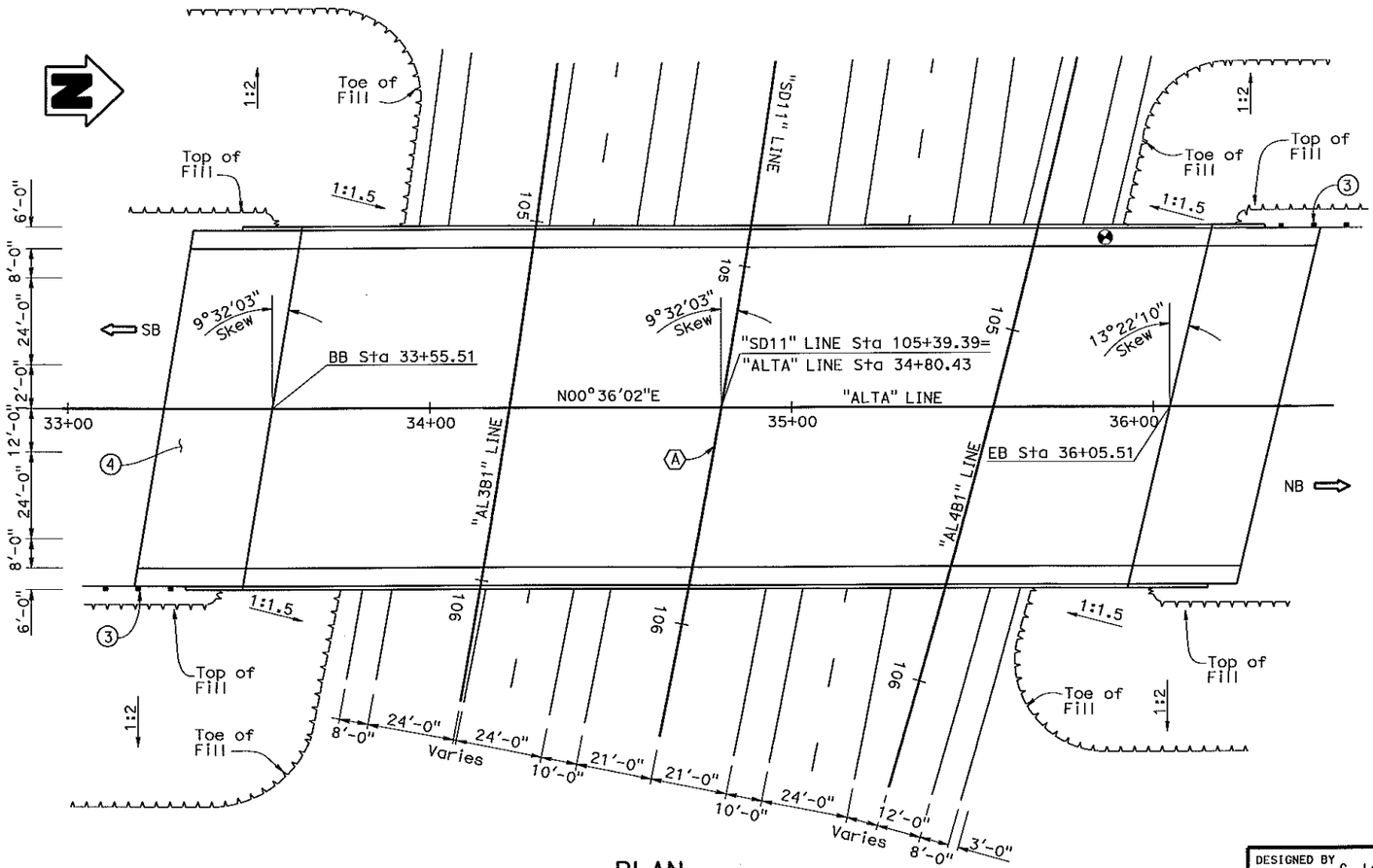


ELEVATION
1" = 20'



TYPICAL SECTION
1" = 10'



PLAN
1" = 20'

CURVE DATA

No.	R	Δ	T	L
⟨A⟩	3300.00'	47°50'42"	1463.91'	2755.67'

LEGEND

1. Concrete Barrier Type 26
2. Chain Link Railing Type 7
3. MBGR, see Road Plans
4. Structure Approach, Type N(30S)
5. 16" Water line in 21" welded steel pipe casing
6. 24" Water line in 29" welded steel pipe casing
7. Proposed 24" Recycled Water line in 29" welded steel pipe casing

Indicates point of minimum vertical clearance

ASSUMPTIONS:

1. Corrosive soils at the site.
2. Structure Excavation Type D at Bent 2.
3. Class 140 driven piles.
4. No existing traffic at the site.
5. No restrictions on falsework spans or depths..
6. Water line locations approximate.

ALTERNATIVE 2

DATE OF ESTIMATE		10-23-2009
BRIDGE REMOVAL	=	NONE
STRUCTURE DEPTH	=	5'-0"
LENGTH	=	248'-0"
WIDTH	=	100'-0"
AREA	=	24 800 SF
COST/ ☐ FT INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	=	$161.03
TOTAL COST	=	$3,994,000

ALTERNATIVE 2

DESIGNED BY	C. Lomicka	DATE	08-18-09
DRAWN BY	H. Mahboobi	DATE	08-18-09
CHECKED BY	W. Hsia	DATE	08-18-09
APPROVED	M. Ravanipour	DATE	08-18-09

STRUCTURE DESIGN BRANCH 19

PLANNING STUDY

ALTA ROAD OC

BRIDGE NO. 57-xxxxx	CU
SCALE: As Shown	EA 056310

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 10/25/05)

FILE => 57-0000-aps-gp02-Alt2.dgn

USERNAME => s136387 DATE PLOTTED => 28-OCT-2009 TIME PLOTTED => 14:02

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11	SD	11	

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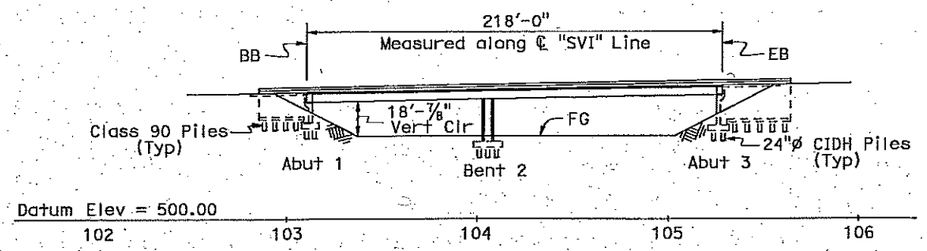
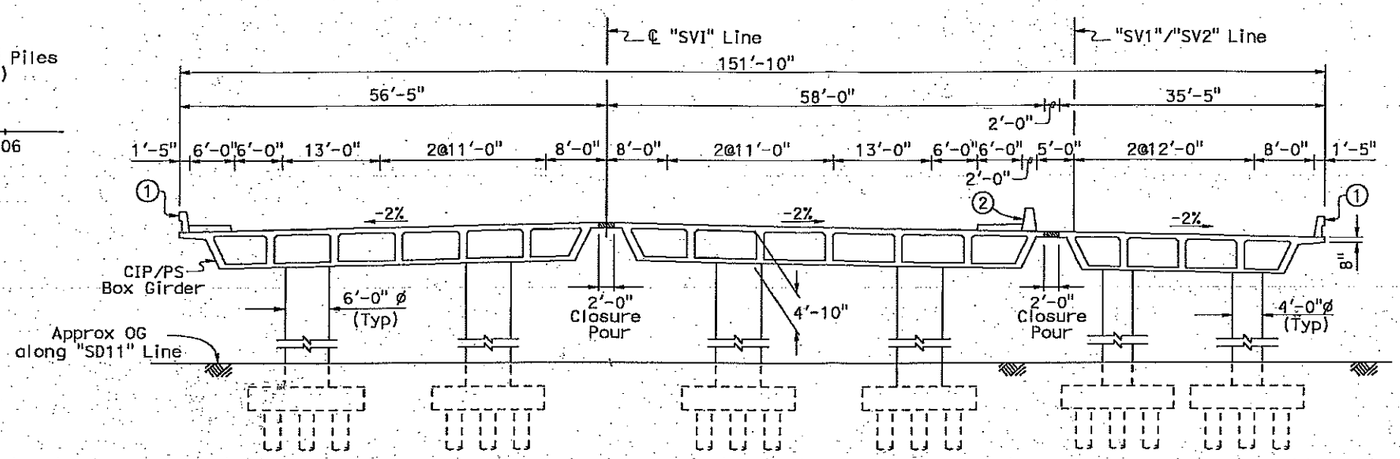


ELEVATION
1" = 40'-0"



TYPICAL SECTION
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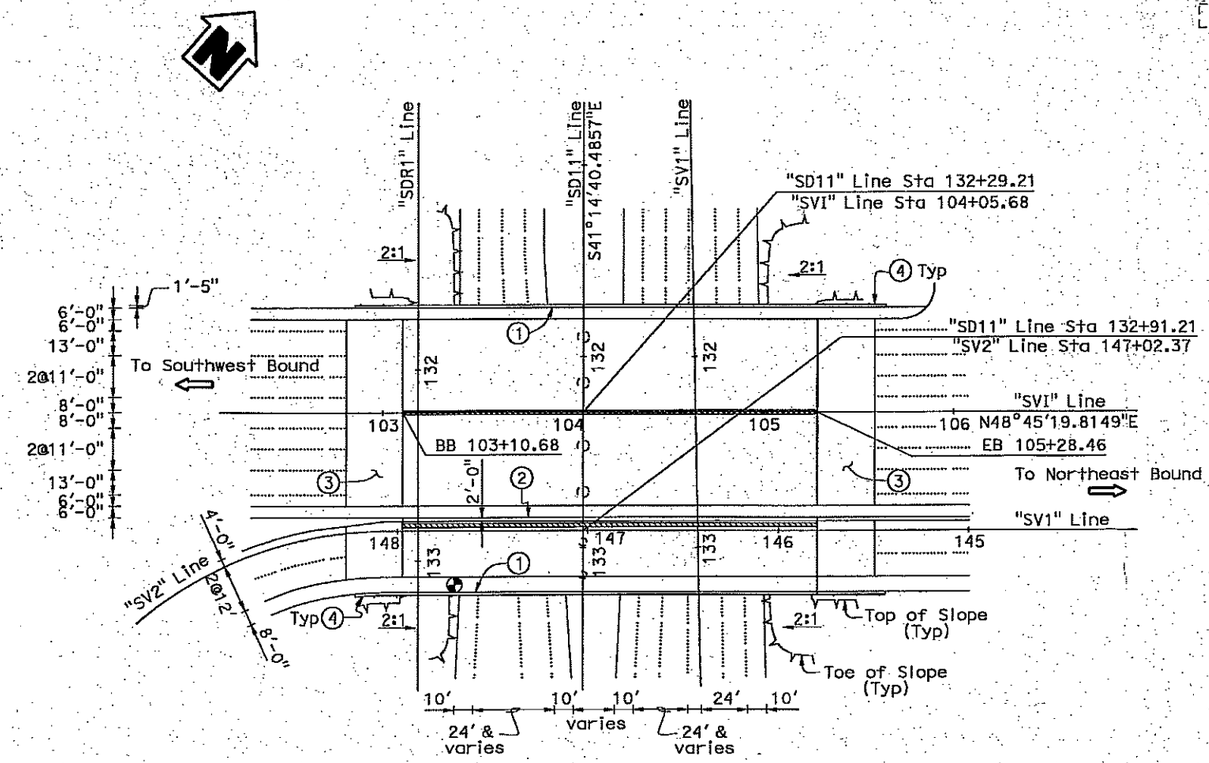

PLAN
1" = 40'

NOTES:

① Concrete Barrier Type 732.
② Construct Concrete Barrier Type 60.
③ Structure Approach Slab Type N(30S).
④ Retaining Wall Type 1.

LEGEND

——— Indicates New Structure.
◕ Minimum Vertical Clearance.
⇨ Denotes Traffic Direction.
▨ 2'-0" Closure Pour.

ASSUMPTIONS:

1. 24"ø CIDH Piles at all Abutments and Bents.
2. The Liquefaction potential and lateral spreading are low.

DATE OF ESTIMATE	10-23-2009
BRIDGE REMOVAL	=
STRUCTURE DEPTH	= 4'-10"
LENGTH	= 218'
WIDTH	= 152'
AREA	= 33,136 SQFT
COST/ □FT INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	= $212.85
TOTAL COST	= $7,053,000

DESIGNED BY	Chad Lim	DATE	08/24/09
DRAWN BY	Antonette L. Ong	DATE	08/24/09
CHECKED BY	Mina Pezeshpour	DATE	X
APPROVED	Paul Chung	DATE	X

STRUCTURE DESIGN BRANCH 22

PLANNING STUDY

SIEMPRE VIVA RD (OC)

BRIDGE NO. 57-NEW	CU X
SCALE: X	EA X

FILE => 57-NEW-aps-gp04V8.dgn

USERNAME => s136853 DATE PLOTTED => 25-AUG-2009 TIME PLOTTED => 14:46

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

DIST.	COUNTY	ROUTE	POST MILE
11	SD	11	

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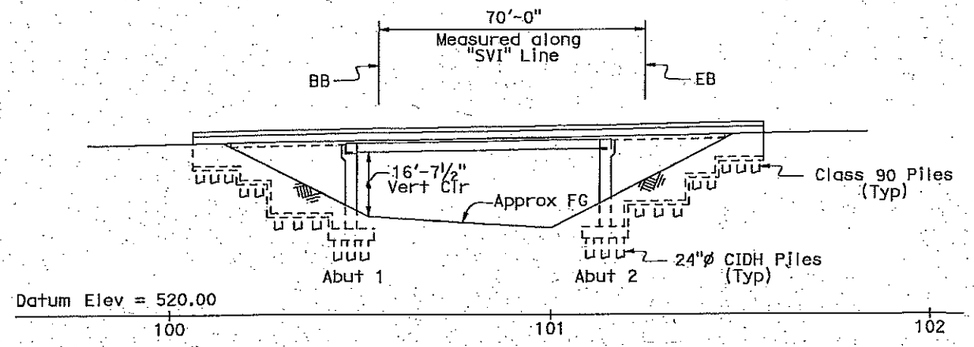
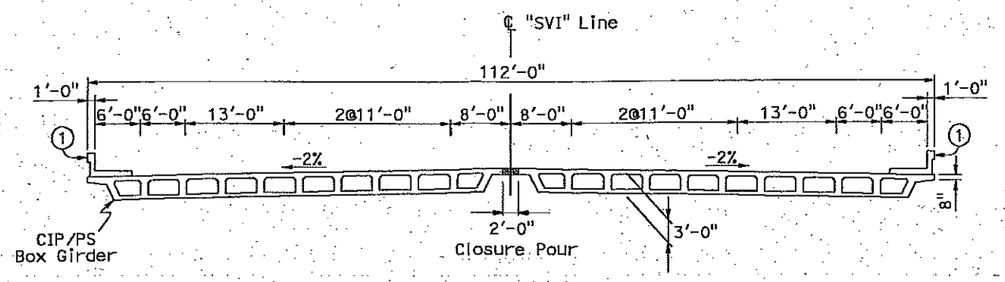
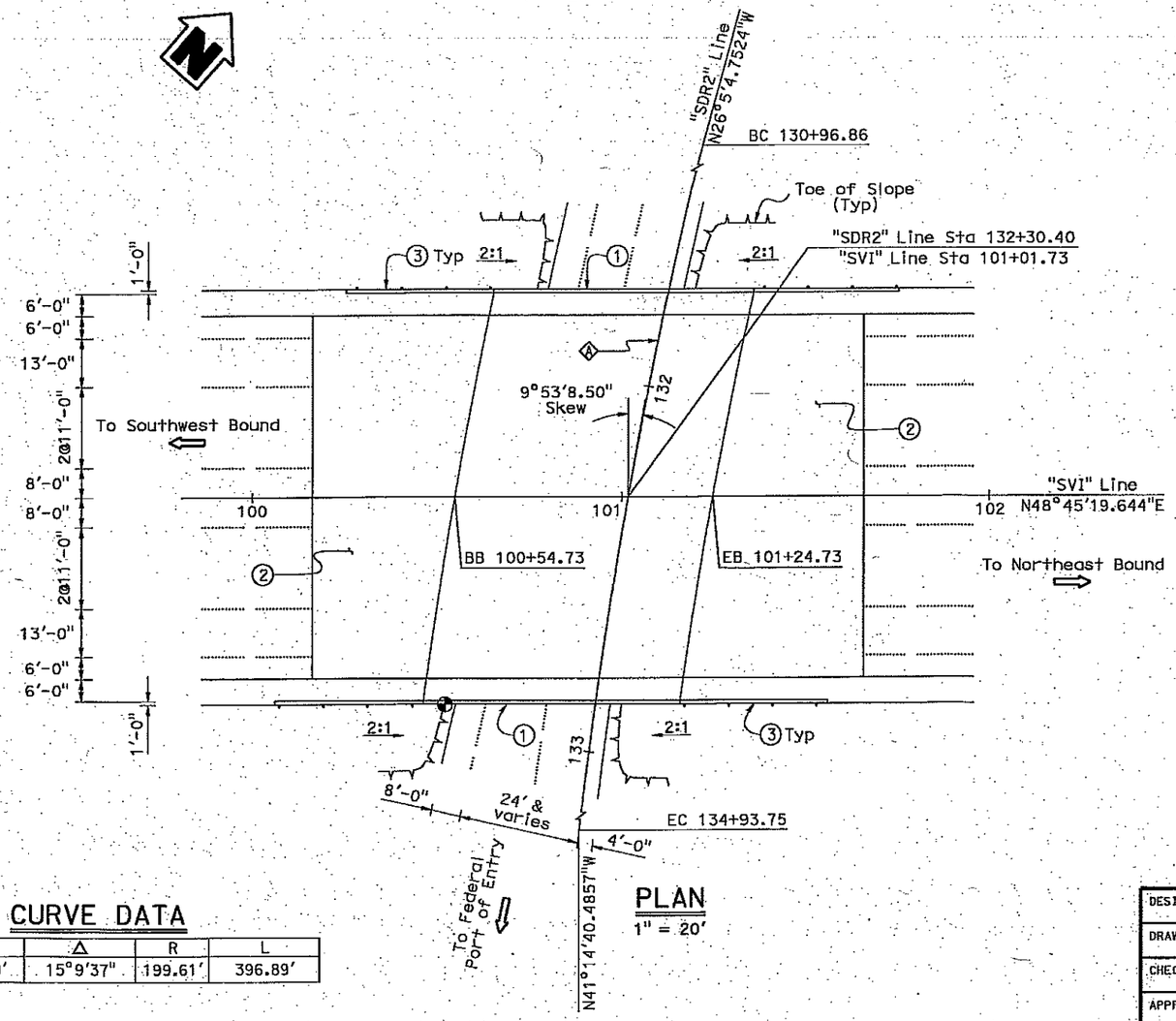


ELEVATION
1" = 20'-0"



TYPICAL SECTION
1" = 10'-0"

DATE OF ESTIMATE	10-23-2009
BRIDGE REMOVAL	=
STRUCTURE DEPTH	= 3'
LENGTH	= 70'
WIDTH	= 112'
AREA	= 7840 SQFT
COST/ □FT INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	= $410.66
TOTAL COST	= $3,220,000



PLAN
1" = 20'

CURVE DATA

No.	R	Δ	R	L
④	1499.99'	15°9'37"	199.61'	396.89'

LEGEND

- Indicates New Structure.
- Minimum Vertical Clearance.
- Denotes Traffic Direction.
- 2'-0" Closure Pour.

NOTES:

① Concrete Barrier Type 26.
② Structure Approach Slab Type N(30S).
③ Retaining Wall Type 1.

ASSUMPTIONS:

1. 24"ø CIDH Piles at Abutments.
2. The Liquefaction potential was not evaluated at the time of this study.

DESIGNED BY	Chad Lim	DATE	08/24/09
DRAWN BY	Antonette L. Ong	DATE	08/24/09
CHECKED BY	Mina Pezeshpour	DATE	X
APPROVED	Paul Chung	DATE	X

STRUCTURE DESIGN BRANCH 22

ALTERNATIVE 1

PLANNING STUDY

SIEMPRE VIVA RD. (RAMP) OC

BRIDGE NO. 57-NEW	CU X
SCALE: X	EA X

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 10/25/05)

FILE => Alt 1&2-57-NEW-aps-gp03v8.dgn

USERNAME => s136853 DATE PLOTTED => 25-AUG-2009 TIME PLOTTED => 14:49

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF STRUCTURES

DIST	COUNTY	ROUTE	POST MILE
11	SD	11	

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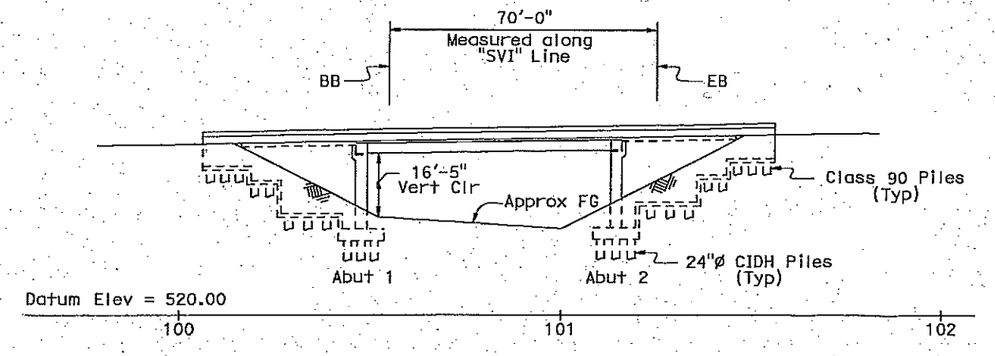
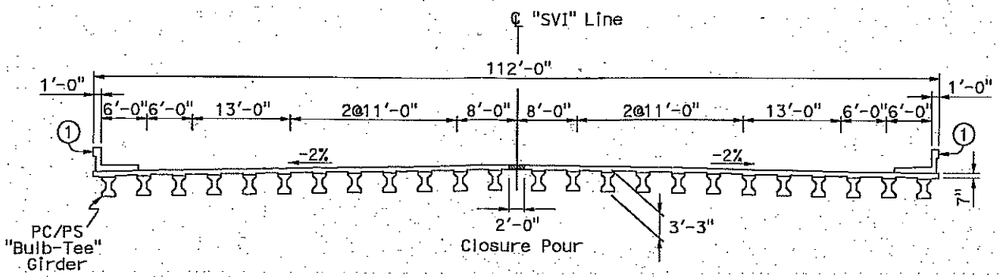


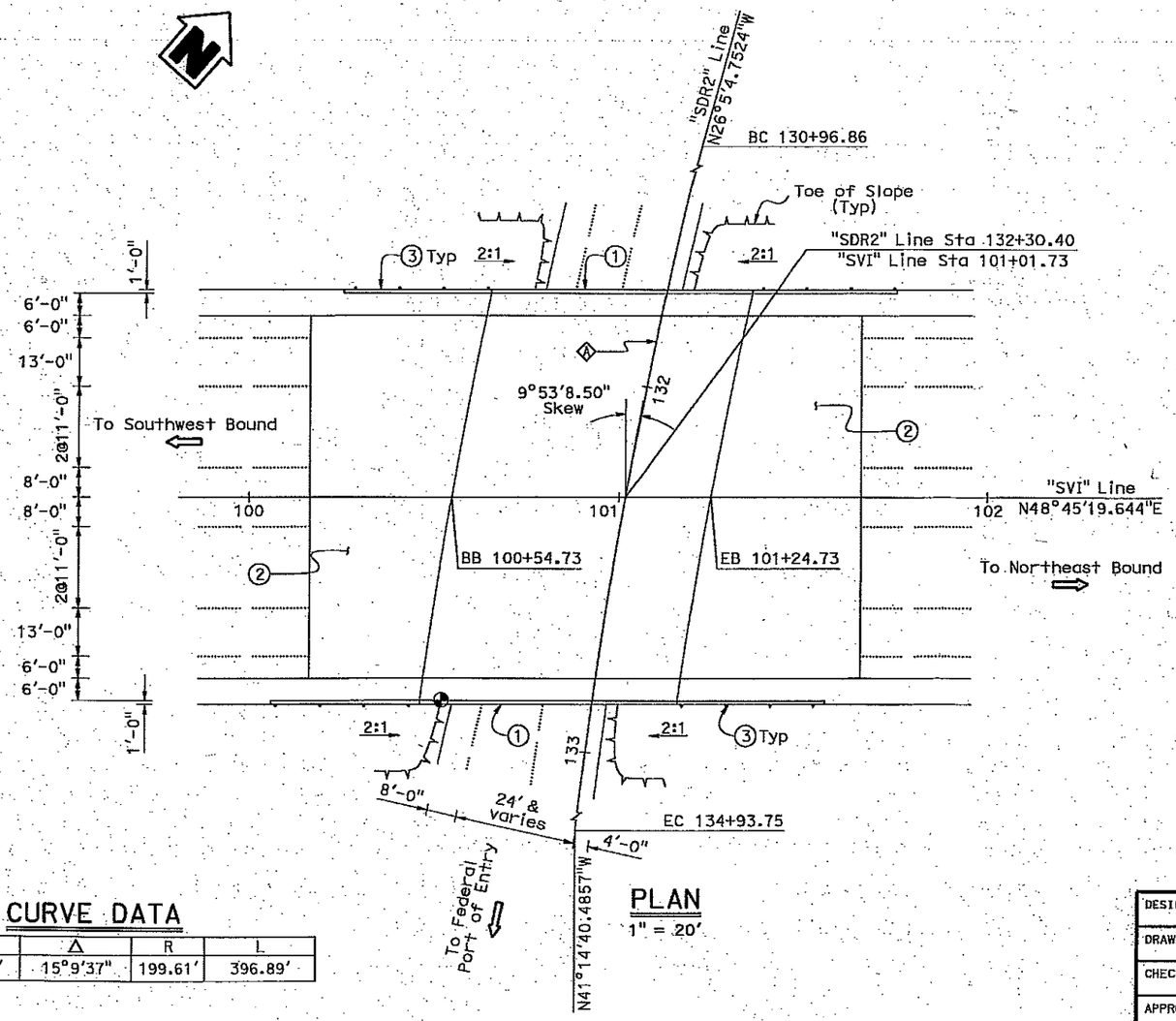
ELEVATION

1" = 20'-0"



TYPICAL SECTION

1" = 10'-0"



PLAN

1" = 20'

CURVE DATA

No.	R	Δ	R	L
④	1499.99'	15°9'37"	199.61'	396.89'

DATE OF ESTIMATE	10-23-2009
BRIDGE REMOVAL	=
STRUCTURE DEPTH	= 3'-3"
LENGTH	= 70'
WIDTH	= 112'
AREA	= 7840 SQFT
COST/ SQFT INCLUDING 10% MOBILIZATION & 25% CONTINGENCY	= $433.09
TOTAL COST	= $3395,000

LEGEND

- Indicates New Structure.
- Minimum Vertical Clearance.
- Denotes Traffic Direction.
- 2'-0" Closure Pour.

NOTES:

① Concrete Barrier Type 26.
② Structure Approach Slab Type N(30S).
③ Retaining Wall Type 1.

ASSUMPTIONS:

1. 24"ø CIDH Piles at Abutments.
2. The Liquefaction potential was not evaluated at the time of this study.

DESIGNED BY	Chad Lim	DATE	08/24/09
DRAWN BY	Antonette L. Ong	DATE	08/24/09
CHECKED BY	Mina Pezeshpour	DATE	X
APPROVED	Paul Chung	DATE	X

STRUCTURE DESIGN BRANCH 22

ALTERNATIVE 2

PLANNING STUDY

SIEMPRE VIVA RD. (RAMP) OC

BRIDGE NO. 57-NEW	CU X
SCALE: X	EA X

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 10/25/05)

FILE => Alt 1&2-57-NEW-aps-gp03v8.dgn

USERNAME => s136853 DATE PLOTTED => 25-AUG-2009 TIME PLOTTED => 14:50

Attachment I – Fact Sheet Exceptions

11 – SD – 11, PM 00.0/02.8
11-SD-905, PM 08.4/10.1
11-SD-125, PM 0.45
11 - 056310
$754,500,000.00

Fact Sheet Exceptions to Mandatory Design Standards

Prepared by:

Juan Carlos Cortez, Registered Civil Engineer

Submitted by _____ 08/26/11 (619) 688-6708
Nicola Bernard, Design Manager — Date — Telephone

Recommended for Approval _____ 8/31/11 (619) 491-3080
Jacqueline Appleton-Deane, Project Manager — Date — Telephone

Concurrence by _____ 9/1/11 (619) 688-2561
Mario Orso, TCIF Director — Date — Telephone

Concurrence by _____ 9/7/11 (619) 688-6611
Gary Vettese, Deputy District Director, Design — Date — Telephone

Approved by _____ 9/7/11
Luis Betancourt, Design Coordinator, HQ Division of Design — Date

1. PROPOSED PROJECT

A. Project Description:

The proposed project includes State Route (SR-) 11, a United States Federal Land Port of Entry (POE), a State of California Commercial Vehicle Enforcement Facility (CVEF) and freeway-to-freeway connections from westbound SR-11 to westbound SR-905, eastbound SR-905 to eastbound SR-11, and southbound SR-125 to eastbound SR-11. A local interchange would be provided at Enrico Fermi Drive and a partial interchange at Siempre Viva Road. In addition, ramps to La Media Road from westbound SR-11 and westbound SR-905 would be constructed.

Proposed SR-11 would construct a four-lane toll highway that would extend from the future SR-905/SR-125/SR-11 interchange approximately 2.7 miles east to the proposed Otay Mesa East POE at the international border with Mexico, in the City of San Diego's Otay Mesa area and in the County of San Diego's East Otay Mesa area.

The Project is located in an area that is currently, largely undeveloped. Both the City of San Diego and San Diego County have plans outlined for the development of this area. This project conforms to the City and County circulation plans.

B. Existing Facilities:

SR-11 is a new, four-lane freeway connecting a new POE at the Mexico border with SR-905.

SR-905 is a principal east-west, partially constructed six lane, twelve mile route which serves commuter traffic between the developing Otay Mesa area and other destinations north via I-5 and I-805. It extends from the International Boundary near Border Field Park, 2.8 miles west of I-5, to the International Border Crossing at Otay Mesa. This border crossing is the only crossing in the urban San Diego region that permits commercial vehicles to enter Mexico.

SR-94 is a principal east-west route that serves outlying rural communities located in the southeastern portion of San Diego County. SR-94 traverses the cities of San Diego, Lemon Grove, La Mesa, Spring Valley, Casa De Oro, Rancho San Diego, Jamul, Dulzura, Potrero, Campo and Boulevard to the east. The western portion of the route serves as a major commuter route. It also provides access to SR-188 which allows for vehicular travel to the International Border at Tecate, Mexico. This is the only current alternative commercial crossing and restricts vehicles to a maximum of 30 feet in length as a result of the rugged terrain and turning movements needed to traverse the route.

SR-125 is a four to eight lane facility from Otay Mesa Road to SR-52 that traverses the cities of San Diego, Chula Vista, La Mesa, El Cajon, Santee, and the unincorporated communities of Bonita and Spring Valley. The southern portion of SR-125 from Otay Mesa Road to SR-54 is tolled as the "South Bay Expressway". The South Bay Expressway toll road opened on November 19, 2007, extending SR-125 southward from SR-54 to Otay Mesa Road. The partial interchange at Otay Mesa Road is currently the beginning of SR-125 and provides access to and from the north. The interchange connecting SR-125 with SR-905 is currently unfunded and plans to construct it are

currently pending. It is assumed that construction will occur sometime after the Project is completed.

C. Safety Improvements:

SR-11 will be constructed in a mostly undeveloped area in accordance with the current safety standards. The addition of SR-11 and the Otay Mesa East POE, will provide an additional route into and out of Mexico providing connectivity with the existing highway network, reducing congestion on existing and future local roadways.

D. Total Project Cost:

The estimate for this project is as follows:

Roadway	$200,400,000.00
Structures	$42,400,000.00
POE	$304,800,000.00
Support	$125,500,000.00
Right of Way	$81,400,000.00
Total Project Cost	$754,500,000.00

2. FEATURES REQUIRING AN EXCEPTION

A. Design Exception Feature #1

Nonstandard Feature(s):

This project proposes less than standard interchange spacing at the following locations (see Attachment 2A):

Description of Interchange Limits			Standard Interchange Spacing (miles)	Proposed Interchange Spacing (miles)
SR-11/SR-905/SR-125	to	La Media Road	2.0	1.0
SR-11/SR-905/SR-125	to	Otay Mesa Road	2.0	0.2
SR-11/SR-905/SR-125	to	Enrico Fermi Drive	2.0	1.0

Standard For Which Exception Is Requested:

From the *Highway Design Manual*, Index 501.3 Spacing, - **"The minimum interchange spacing shall be one mile in urban areas, two miles between freeway-to-freeway interchanges and local street interchanges**."

This index also states that Design Information Bulletin Number 77 criteria be fulfilled prior to requesting an exception to the standard quoted above. It should be noted that SR-11 is not a part of the Interstate Highway System. As such, Conceptual Approval by the Federal Highway Administration (FHWA) is not required.

Reason For Requesting Exception:

The future East Otay Mesa POE has been identified by state and local governments in the United States and Mexico as necessary to alleviate congestion at existing POEs and accommodate future growth in trade and traffic between San Diego, California and Tijuana, Mexico. Given the need for a new POE, SR-11 is necessary to provide adequate connectivity between the regional highway system and this future border crossing through a mostly undeveloped area. As shown in the table above, there are locations where proposed interchange spacing does not meet Caltrans design standards. Below are the details associated with the impacts of relocating or eliminating interchanges at each location.

La Media Road Interchange:

La Media Road is the southbound truck route to the existing Otay Mesa POE for commercial vehicles entering Mexico. It is an existing and recently constructed interchange and a very important link to the commercial activities in the border area. This truck route for commercial vehicles going to Mexico is highly traveled and growth in the area has been developed to support this route. To achieve standard interchange spacing, either the La Media Road interchange or the proposed freeway-to-freeway interchange connecting SR-11, SR-125 and SR-905 would need to be eliminated. Elimination of either would disrupt the developed and planned urbanization of the area.

If the La Media Road interchange were eliminated, traffic would likely utilize the Britannia Boulevard interchange located one mile west of the La Media Road interchange. The ramp capacity at the Britannia Boulevard interchange may need to be upgraded to handle the additional traffic.

The concerns about the placement of this interchange relative to the planned SR 125/SR 905 interchange was a major item of discussion in the *Value Analysis Study for the SR 125/SR 905 Interchange* in 1996. Participants included representatives of the FHWA, State, City of San Diego and the County of San Diego, as well as private citizens interested in the development of Otay Mesa. The location and configuration of the La Media Road interchange was selected by the VA Study for incorporation into the planning for SR 905 and SR 125. A weave analysis was completed for SR-905 between the connectors with SR-11 and the La Media Road interchange. This analysis concludes eastbound SR-905 will operate at Level of Service (LOS) C or better and westbound SR-905 would operate at LOS D or better. Affirming the proposed design would be adequate for peak hour conditions and accommodate the design year traffic. At the point the mainline of westbound SR-905 narrows to three westbound lanes, the LOS becomes E or F.

Otay Mesa Road Interchange:

Otay Mesa Road (OMR) is a major east-west road serving Otay Mesa and is critical to local circulation. There is an existing partial interchange providing access with SR-125 to and from the north at Otay Mesa Road. There are currently no future plans to construct the additional ramps making this a full interchange. With the completion of the newly constructed SR-905 freeway, traffic must utilize Otay Mesa Road and adjoining surface streets to travel between SR-125 and SR-905.

This project proposes to connect SR-125 to SR-11 via a southbound SR-125 to eastbound SR-11 connector. The proposed location is the only viable place for this connector. To achieve standard interchange spacing, either the Otay Mesa Road interchange or the proposed freeway-to-freeway interchange would need to be eliminated. Elimination of either would disrupt the developed and planned urbanization of the area.

The freeway-to-freeway connectors between SR-125 and SR-905 and westbound SR-11 to northbound SR-125, have been cleared environmentally, but a project has not been programmed. Eliminating access to Otay Mesa Road will limit southbound SR-125 traffic to either travel eastbound onto the SR-11 toll highway or exit just over five miles north of Otay Mesa Road, at the Birch Road interchange, to access Otay Mesa. Vehicles would access northbound SR-125 from Birch Road, whereby creating approximately five miles of tolled highway between Otay Mesa Road and Birch Road inaccessible and temporarily unused.

Enrico Fermi Drive Interchange:

To accommodate the needs of local traffic and the County's Circulation Plan, at least one local-road interchange is needed on SR-11. Local interchange locations are constrained by existing and future local roadways. These roadways include Siempre Viva Road, Alta Road and Enrico Fermi Drive. The East Otay Mesa Specific Plan includes interchanges at both Enrico Fermi Drive and Siempre Viva Road. A full interchange at Siempre Viva road was considered and rejected partially due to the lack of queue storage capacity which would create conflict as users access the POE and when merging after leaving the POE from the need to cross multiple lanes in a short distance. A partial interchange at Siempre Viva Road provides a "last chance" exit prior to entering Mexico without the geometric issues and safety concerns associated with a full interchange at this location. With a partial interchange at Siempre Viva Road and no interchange at Enrico Fermi Drive, vehicles entering the US from Mexico would not be provided local access to the area until La Media Road which is already a highly traveled road since it is the designated truck route for commercial vehicles crossing at the existing Otay Mesa POE. The purpose of the project is to alleviate existing congestion at both the San Ysidro and Otay Mesa POE's and to accommodate future vehicle and commercial traffic caused by trade growth.

Relocating the interchange from Enrico Fermi Drive to Alta Road would increase the length between interchanges from 1.0 miles to 1.4 miles, yet still not meet the design standard. This would also preclude construction of any interchange at Siempre Viva Road as these local interchanges would be spaced less than one mile apart.

The local community has been in support of and expecting an interchange at Enrico Fermi Drive. An interchange at Enrico Fermi Drive would provide direct access from the existing CVEF to SR-11 and also maximizes the distance between this interchange and the border, offering commercial and passenger vehicles more opportunity to get to the correct lanes prior to accessing the POE as compared to an interchange at Alta Road.

The proposed interchange location at Enrico Fermi Drive is the only existing street to have an interchange proposed on SR-11. Elimination of this interchange would not comply with the East Otay Mesa Specific Plan. Auxiliary lanes between Enrico Fermi Drive and the SR-125 connectors at SR-11 have been incorporated into the project. A weaving analysis concluded that these auxiliary lanes will mitigate the shorter distance

between interchanges. A queuing analysis was completed looking at vehicles queuing on the eastbound off ramp at Enrico Fermi Drive from vehicle paying a cash toll. Several assumptions were made for this analysis including the percentage of vehicles utilizing this ramp without transponders, the amount of time a cash transaction would take, the cash toll collection would occur in the left lane and no change would be provided. Based on the analysis completed, the proposed design would accommodate the peak hour traffic in the design year. It was determined a queue length of approximately 400 feet would develop in advance of the toll facility in the peak hour. The ramp length is designed to accommodate this queue. A Traffic and Revenue study is currently underway for this project. Once this study is complete, the ITS System requirements will be compared to the queuing analysis assumptions and can be modified if necessary. Possible mitigation measures, if required, may include locating the cash toll collection facility in the right lane, increasing the toll rate in the peak hour to assure no back up into the main lanes occurs, lengthening the ramp or not providing an option lane at this ramp.

Added Cost to Make Standard:

The locations of these interchanges are based on operational need and not cost. The added costs to make standard are difficult to estimate, as the locations of the existing interchanges are fixed and the location of the Enrico Fermi Drive interchange is set due to existing development and future planning.

Removing the existing local interchanges at Otay Mesa Road and La Media Road would cause a major disruption to the local traffic patterns, adding long term costs to the local and regional economy much greater than the cost of construction to remove them.

There is no additional cost associated with making the Enrico Fermi Drive interchange standard since the only way to achieve this is to eliminate the interchange altogether which will not meet the needs of the project. The proposed project complies with both the City of San Diego and San Diego County plans outlined for the development of this area.

B. Design Exception Feature #2

Nonstandard Feature(s):

This project proposes the westbound SR-11 exit ramp to La Media Road to have a nonstandard superelevation rate (see Attachment 2B & 2C).

Curve Radii	Standard Superelevation Rate	Proposed Superelevation Rate
2,100’	6%	9%

Standard For Which Exception Is Requested:

From the *Highway Design Manual*, Index 202.2 Standards for Superelevation, - **“Based on an e_{max} selected by the designer for one of the conditions, superelevation rates**

from Table 202.2 shall be used within the given range of curve radii. If less than standard superelevation rates are approved (see Index 82.1), Figure 202.2 shall be used to determine superelevation based on the curve radius and maximum comfortable speed."

Reason For Requesting Exception:

The westbound SR-11 exit ramp to La Media Road parallels the westbound SR-905 exit ramp to La Media Road and eventually merges with it. Due to right of way constraints and environmental concerns these ramps meet at the end of a horizontal curve with radii of 2,100 feet and 1,100 feet respectively. The curve of the SR-905 ramp has a superelevation rate of 9% which is a greater superelevation rate than the required 6% superelevation rate for the SR-11 ramp. The increase in the superelevation rate of the SR-11 ramp to 9% is not in accordance with the tabular data shown in Figure 202.5A. This also has an effect on the superelevation runoff which is designed to match the transition of the SR-905 ramp. Increasing this rate from 6% to 9%, matching the SR-905 ramp, allows for a smooth pavement transition through the gore and out of the curve to meet driver expectations while maintaining the maximum level of comfort to the driver. In addition, having the ramps on the same plane through this curve is advantageous for constructability and aesthetics.

Added Cost to Make Standard:

This request is based on providing a smooth transition without a pavement break between lanes and not cost. There would be no additional cost to make standard.

3. TRAFFIC DATA

According to the *Tier II Traffic Technical Report* dated October 2010, forecasted traffic data for the Horizon Year (2035) is as follows:

Segment	ADT		AM Peak Hour Volumes		PM Peak Hour Volumes	
	EB	WB	EB	WB	EB	WB
Mainline Freeway Segment						
Between La Media Road and SR-11 connectors at SR-905	53,400	56,800	4,535	4,972	4,963	5,601
Between SR-125/SR-905 Interchange and Enrico Fermi Drive	30,000	36,600	2,805	3,255	2,884	3,710
Between Enrico Fermi Drive and Siempre Viva Road	25,700	33,300	2,205	3,173	2,712	3,141
Between SR-905 and SR-11	28,600	29,500	2,512	2,680	2,809	2,929
Between SR-125 and SR-11	7,100	n/a	703	n/a	639	n/a
Ramps						
On SR-905 from La Media Road	1,800	11,300	147	814	156	1,119
On SR-11 from La Media Road	3,400	n/a	227	n/a	359	n/a
Off to La Media from SR-905	11,300	1,800	994	159	915	146
Off to La Media from SR-11	n/a	1,600	n/a	141	n/a	130

On from Enrico Fermi Drive	10,300	13,600	834	1,102	1,133	1,496
Off to Enrico Fermi Drive	10,600	10,300	1,082	1,020	981	927
On from Siempre Viva Road	n/a	7,200	n/a	583	n/a	792
Off to Siempre Viva Road	6,200	n/a	625	n/a	567	n/a

4. ACCIDENT ANALYSIS

This is a new freeway facility and no TASAS Accident Data exists. This segment of freeway is projected to carry 15% trucks. The proposed project will improve congestion at the San Ysidro and Otay Mesa POEs by providing an additional nearby POE along the California/Mexico border in the San Diego area.

5. INCREMENTAL IMPROVEMENTS

There are no incremental improvements for this exception.

6. FUTURE CONSTRUCTION

Future construction will include freeway-to-freeway connections linking SR-125 to SR-905 and SR-11. In particular, connectors from northbound SR-905 to northbound SR-125, southbound SR-125 to southbound SR-905, westbound SR-11 to northbound SR-125 and southbound SR-125 westbound SR-905.

7. PROJECT REVIEWS, CONCURRENCE

Reviewer	Title	Concurrence
Luis Betancourt	HQ Design Coordinator	07/28/2011
Laurie Espinoza	HQ Design Reviewer (Acting)	07/25/2011
Ken Cozad	HQ Traffic Liaison	04/06/2011

8. ATTACHMENTS

Vicinity Map
Location Maps

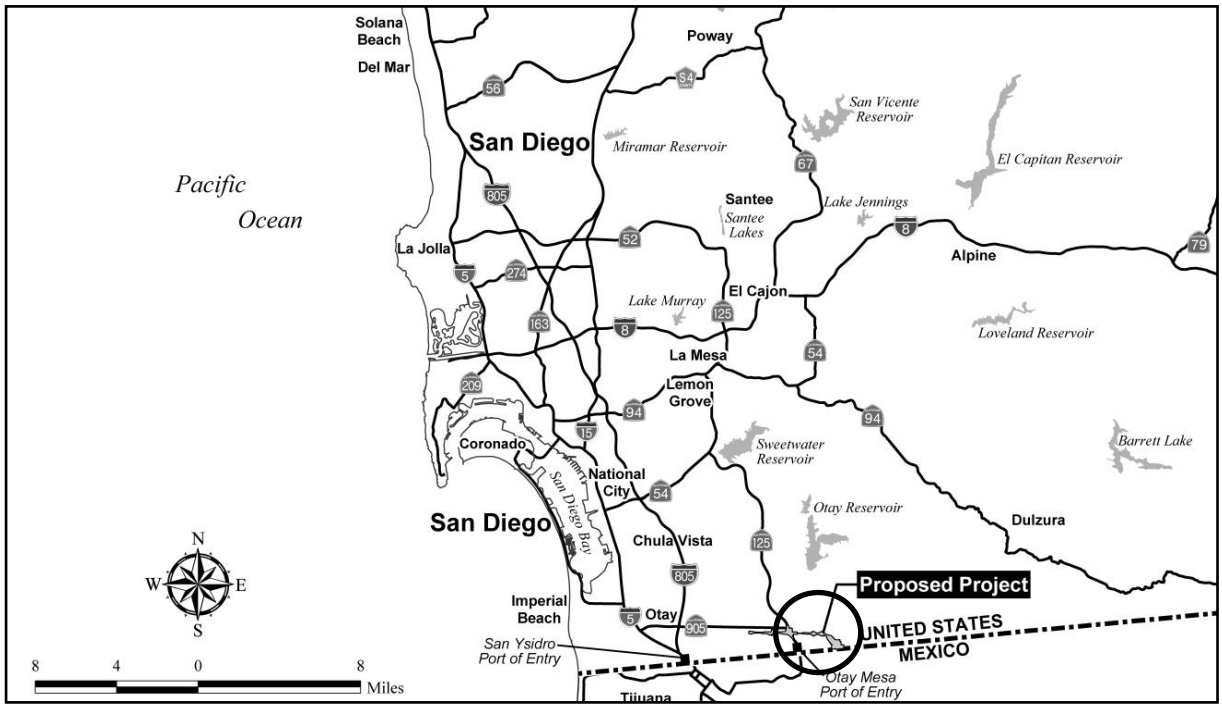


EXHIBIT A – PROJECT VICINITY MAP

CONSTRUCTION OF A NEW STATE ROUTE AND PORT OF ENTRY IN AND NEAR SAN DIEGO ON ROUTE 905 FROM 0.1 MILE WEST OF BRITANNIA BOULEVARD OVERCROSSING TO ROUTE 905/11 SEPARATION AND ON ROUTE 11 FROM ROUTE 905/11 SEPARATION TO MEXICO BORDER

DESIGN EXCEPTION #1
HDM 501.3
MINIMUM INTERCHANGE SPACING SHALL BE 2 MILES

To Chula Vista

INTERCHANGE SPACING BETWEEN
LA MEDIA ROAD AND FREEWAY-TO-FREEWAY
IS 1.00 MILE

INTERCHANGE SPACING BETWEEN
FREEWAY-TO-FREEWAY AND ENRICO FERMI DRIVE
IS 1.00 MILE

CITY OF SAN DIEGO
COUNTY OF SAN DIEGO

SR-125

OTAY MESA ROAD

INTERCHANGE SPACING
BETWEEN OTAY MESA ROAD
AND FREEWAY-TO-FREEWAY
IS 0.24 MILE

SR-905

SR-11

LA MEDIA ROAD

ROUTE 905/125/11 INTERCHANGE

SANYO ROAD

AIRWAY ROAD

ENRICO FERMI DR

ALTA ROAD

HARVEST ROAD

SR-905

SIEMPRE VIVA ROAD

CITY OF SAN DIEGO
COUNTY OF SAN DIEGO

OTAY MESA CVEF

OTAY MESA EAST
FEDERAL PORT OF ENTRY

OTAY MESA FEDERAL
PORT OF ENTRY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

11-SD-11
11-056310

SR-905/SR-125/SR-11 INTERCHANGE GEOMETRICS

CALCULATED-
DESIGNED BY

RELATIVE BORDER SCALE
IS IN INCHES 0 1 2 3

USERNAME => s132966
DGN FILE => DE_ATT2A_InterSpacing_110804.dgn
DATE PLOTTED => 10:53 22-AUG-2011

ATTACHMENT 2A

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

DESIGN EXCEPTION #2
HDM 202.2
SUPERELEVATION RATES FROM TABLE 202.2
SHALL BE USED WITHIN THE GIVEN CURVE RADII

RADIUS = 2,100 FEET

RADIUS = 1,100 FEET

"LMD1A" LINE

"LMD1B" LINE

"WB" LINE

"EB" LINE

"SW" LINE

"S" LINE

"SE" LINE

"N" LINE

"NW" LINE

"EN" LINE

"SVB" LINE

ROUTE 905

EC

BC

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

11-SD-11
11-056310

SUPERELEVATION RATE EXHIBIT

SCALE: 1":100'

CALCULATED-DESIGNED BY		RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3	USERNAME => s132966 DGN FILE => DE_ATT2B_Super Rate_110707.dgn DATE PLOTTED => 08:30 04-AUG-2011

ATTACHMENT 2B

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

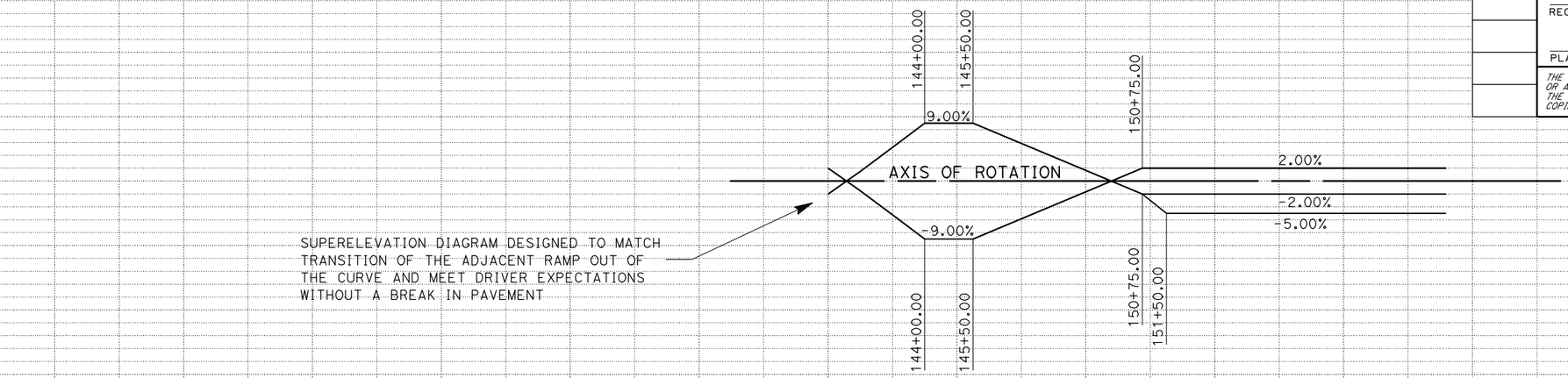
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905			

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

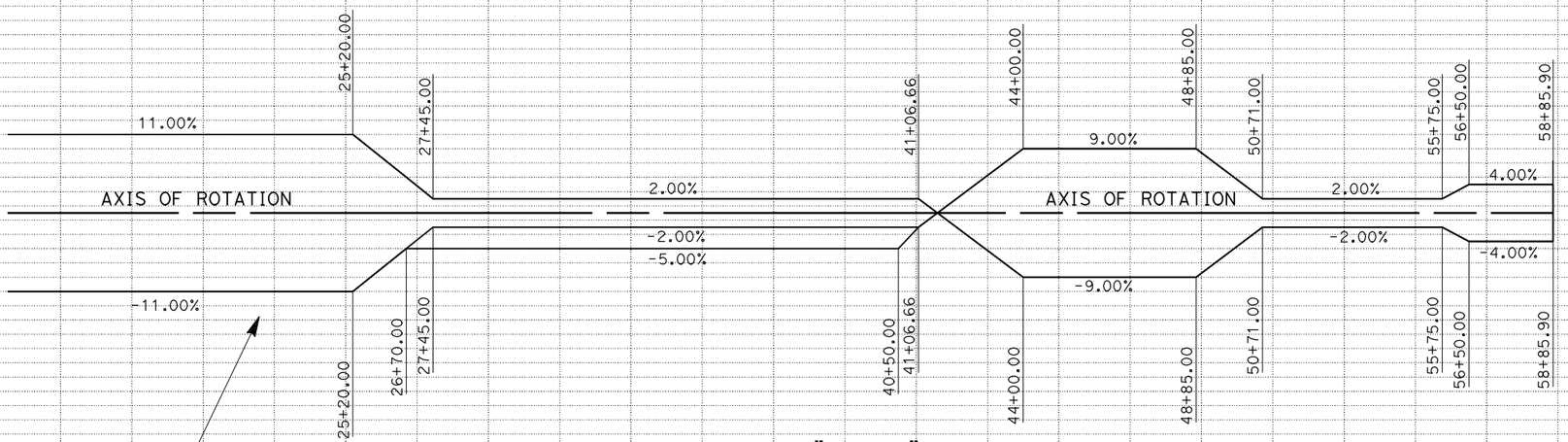
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



SUPERELEVATION DIAGRAM DESIGNED TO MATCH TRANSITION OF THE ADJACENT RAMP OUT OF THE CURVE AND MEET DRIVER EXPECTATIONS WITHOUT A BREAK IN PAVEMENT

"LMD1B" Line

LA MEDIA ROAD EXIT RAMP FROM WESTBOUND SR-11



"LMD1A" Line

LA MEDIA ROAD EXIT RAMP FROM WESTBOUND SR-905

ADJACENT RAMP

DRAFT
FOR DESIGN PURPOSES ONLY

SUPERELEVATION DIAGRAM

SCALE: Horiz 1"=200'
Vert 1"=5'

ATTACHMENT 2C

+10% +5% +0% -5% -10%

STATION 147 151 155 159 163 TOTAL

CY Exc
Emb

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 07-07-11 | DATE PLOTTED => 04-AUG-2011 | TIME PLOTTED => 08:31

BORDER LAST REVISED 7/2/2010 | USERNAME => s132966 | DGN FILE => DE_ATT2C_Superelev_110707.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 2774 | PROJECT NUMBER & PHASE 11000000231

11-SD-11 PM 00.0/02.8
11-SD-905 PM 08.4/10.1
11-SD-125 PM 0.45
11 – 056310
20.XX.025.700/20.10.400.300
$754,500,000.00
August 17, 2011

Fact Sheet Exceptions to Advisory Design Standards

http://www.dot.ca.gov/hq/oppd/design/m092500.htm

Prepared by:

Juan Carlos Cortez, Registered Civil Engineer

Submitted by: Nicola Bernard, Design Manager — 8/26/11 (Date) — (619) 688-6708 (Telephone)

Recommended for Approval: Jacqueline Appleton-Deane, Project Manager — 08/31/11 (Date) — (619) 491-3080 (Telephone)

Approved by: Gary Vettese, Deputy District Director, Design — 9/7/11 (Date) — (619) 688-6617 (Telephone)

1. PROPOSED PROJECT

A. Project Description:

The proposed project would construct State Route (SR-) 11, a United States Federal Land Port of Entry (POE), a State of California Commercial Vehicle Enforcement Facility (CVEF) and freeway-to-freeway connections from westbound SR-905 to westbound SR-11, eastbound SR-11 to eastbound SR-905, and southbound SR-125 to eastbound SR-11. A local interchange would be provided at Enrico Fermi Drive and a partial interchange at Siempre Viva Road. In addition, ramps to La Media Road from westbound SR-11 and westbound SR-905 would be constructed.

The proposed SR-11 would construct a four-lane toll highway that would extend from the future SR-905/SR-125 Interchange approximately 2.7 miles east to the proposed Otay Mesa East POE at the international border with Mexico, in the City of San Diego's Otay Mesa area and in the County of San Diego's East Otay Mesa area.

The SR-11 alignment is located in an area that is largely undeveloped. Both the City of San Diego and San Diego County have plans outlined for the development of this area. This project conforms to the requirements of these entities as concerns the location and configuration of their proposed local arterials and of their approved land usage plans.

B. Existing Highway:

SR-11 is a new, four-lane freeway connecting a new POE at the Mexico border with SR-905.

SR-905 is a principal east-west, partially constructed six lane, twelve mile route which serves commuter traffic between the developing Otay Mesa area and other destinations north via I-5 and I-805. It extends from the International Boundary near Border Field Park, 2.8 miles west of I-5, to the International Border Crossing at Otay Mesa.

SR-125 is a four to eight lane facility from Otay Mesa Road to SR-52 that traverses the cities of San Diego, Chula Vista, La Mesa, El Cajon, Santee, and the unincorporated communities of Bonita and Spring Valley. The southern portion of SR-125 from Otay Mesa Road to SR-54 is tolled as the "South Bay Expressway". The South Bay Expressway toll road opened on November 19, 2007, extending SR-125 southward from SR-54 to Otay Mesa Road. Otay Mesa Road is a city street that parallels the SR-905 alignment. The partial interchange at Otay Mesa Road is currently the beginning of SR-125 and provides access to and from the north. The interchange connecting SR-125 with SR-905 is currently unfunded and plans to construct it are not progressing to date.

C. Safety Improvements:

SR-11 will be constructed in a mostly undeveloped area in accordance with the current design standards. The addition of SR-11 and the Otay Mesa East POE, will provide an additional route into and out of Mexico providing connectivity with the existing highway network, reducing congestion on existing and future local roadways.

D. Total Project Cost:

The estimated cost for the full project, including the bridge work, is as follows:

Roadway	$200,400,000.00
Structures	$42,400,000.00
POE	$304,800,000.00
Support	$125,500,000.00
Right of Way	$81,400,000.00
Total Project Cost	$754,500,000.00

2. ADVISORY FEATURES REQUIRING AN EXCEPTION

A. Advisory Design Exception Feature #1:

Nonstandard Features:
This project proposes that the westbound branch connector merge from SR-11 to SR-905 have a 1,000 foot length auxiliary lane (See attachment 2A).

Advisory Standard for Which Exception Is Requested:

The Department's *Highway Design Manual*, Index 504.4(6) Freeway-to-Freeway Connections (Branch Connections), sets forth the following standard:

Merging branch connections should be designed as shown in Figure 504.3L.

Figure 504.3L shows a 2,500 feet auxiliary lane.

Reason For Requesting Exception:

An exception for a non standard merging branch connection is requested to drop both lanes of the branch connector in 2,200 feet. This includes two standard lane drops of 600 feet spaced 1,000 feet apart.

According to the *Tier II Traffic Technical Report* (October 2010), the Horizon Year (2035) design volume is forecasted at 2,799 vehicles per hour (vph) utilizing this

connector and merge with a forecasted 2,486 vph traveling west on SR-905 during the peak hour. Assuming 1% growth per year, as used in the technical report, five years after the 20 year design period projects 5,555 vph will utilize this facility in the peak hour which is still under capacity. A weave analysis was completed, which concluded this facility would operate at Level of Service (LOS) D or better using a 1,000 foot length auxiliary lane and the proposed design would be adequate for peak hour conditions. At the point SR-905 mainline narrows to three westbound lanes, the LOS becomes E or F. Index 504.4(6) Freeway-to-Freeway Connections (Branch Connections) states, "At a branch merge, a 2,500-foot length of auxiliary lane should be provided beyond the merge of one lane of the inlet, except where it does not appear that capacity on the freeway will be reached until five or more years after the 20 year design period. In this case the length of auxiliary lane should be a minimum of 1,000 feet." With the volume projected to be less than the design capacity, a 1,000 foot length auxiliary lane is considered adequate.

As SR-905 is in a curve, transitioning from north to west in the vicinity, this connector cannot be moved to a point further south to allow for additional length or be designed exactly as shown in Figure 504.3L. In addition, it cannot be moved to a point further west as it is constrained by the La Media Road interchange.

To accommodate the merging branch connection auxiliary lane will require striping the freeway to shift the newly constructed westbound lanes towards the median on SR-905 from just prior to the merge with westbound SR-11 traffic to just west of Britannia Boulevard. This shift would be accomplished over a length of 1.5 miles and include widening into the SR-905 median and replacing the La Media Road undercrossing structure.

Added Cost to Make Standard:

The major issue with the non-standard design is right-of-way costs and impacts to existing facilities. An additional $3,500,000 is the preliminary total construction cost estimate required to make the merging branch connection standard.

B. Advisory Design Exception Feature #2:

Nonstandard Feature:

This project proposes the diverge from eastbound SR-905 to eastbound SR-11 provide 1,800 foot length of auxiliary lane in advance of the exit (See attachment 2A).

Standard For Which Exception Is Requested:

The Department's *Highway Design Manual*, Index 504.4(6) Freeway-to-Freeway Connections (Branch Connections), sets forth the following standard:

Diverging branch connections should be designed as shown in Figure 504.4.

Figure 504.4 shows a 2,500 feet auxiliary lane in advance of the gore.

Reason For Requesting Exception:

An exception for a nonstandard auxiliary lane of approximately 1,800 feet in advance of the connector is proposed to avoid impacts to the newly constructed SR-905 and the La Media Road undercrossing. The existing La Media Road interchange location and the alignment of SR-905 combine to prevent the eastbound connector from having the standard 2,500 feet in advance of the diverge.

According to the *Tier II Traffic Technical Report* (October 2010), the Horizon Year (2035) design volume is forecasted at 4,963 vph on SR-905 between La Media Road and the connector during the peak hour. Assuming 1% growth per year, as used in this technical report, five years after the 20 year design period projects 5,216 vph in the peak hour, so less than capacity conditions beyond the design year are anticipated. A weave analysis on this diverge shows this area will operate at LOS C or better in the peak hours with the proposal of this non standard length for the auxiliary lane. This result was confirmed using the visual simulation provided by the CORSIM model. If the auxiliary lane were to be lengthened to meet the 2,500 feet per standard, the existing SR-905 median and La Media Road undercrossing would have to be widened and traffic shifted. Index 504.4(6) Freeway-to-Freeway Connections (Branch Connections) states, "For diverging connection where less than capacity conditions beyond the design year are anticipated, the length of auxiliary lane in advance of the exit should be 1,300 feet." Taking the above into consideration, to design the auxiliary lane per standard is not recommended and a minimum of 1,300 feet of auxiliary lane in advance of the exit is proposed and meets the criteria for diverging connections where less than capacity conditions beyond the design year are anticipated.

Since SR-905 is in a curve, transitioning from east to south in the vicinity, this connector cannot be moved to a point further east to allow for additional length. To accommodate the design standard will require striping the freeway to shift the newly constructed westbound lanes towards the median on SR-905 just east of the La Media Road exit ramp to just east of the gore with the eastbound SR-11 connector. This shift would be accomplished over a length of 1.3 miles and include widening into the SR-905 median and replacing the La Media Road undercrossing structure.

Added Costs to Make Standard:

The major issue with the non-standard design is not a matter of cost but impacts to existing facilities and traffic operations. An additional $3,900,000 is the preliminary total construction cost estimate required to make this design standard.

C. Advisory Design Exception Feature #3:

Nonstandard Feature:

This project proposes a less than standard median width (22 feet) to be constructed from the beginning of SR-11 to the east for approximately 3,900 feet (See Attachment 2B).

Standard For Which Exception Is Requested:

The *Highway Design Manual*, Index 305.1 Width, sets forth the following standard:

Minimum median widths for the design year (as described below) should be used in order to accommodate the ultimate highway facility (type and number of lanes):

and

The *Highway Design Manual*, Index 305.1(1a) Width (Freeways and Expressways), sets forth the following standard:

However, where physical and economic limitations are such that a 46-foot median cannot be provided at reasonable cost, the minimum median width for freeways and expressways in urban areas should be 36 feet.

Reason For Requesting Exception:

The proposed design separates the east and west bound lanes, at the alignments most constrained location, with a 22 foot wide median (two standard shoulders and a concrete barrier). The alignment of proposed SR-11 traverses between existing commercial buildings through this location. The proposed design has the least impact on existing businesses in the vicinity. Design year traffic projections are 3,710 vph in the peak hour and direction, therefore 2 lanes satisfy the ultimate condition. Future HOV lanes are not planned. Beyond this 3,900 foot section of freeway, the median does meet the standard width.

Added Costs to Make Standard:

To accommodate for a 46 foot median an additional 1.4 acres of right-of-way will need to be acquired. The added construction cost is approximately $1,200,000.00. The right-of-way costs are not included as they are undetermined at this time. The minimum cost for right-of-way acquisition is estimated to be $1,000,000 but could rise substantially if a full take of a business parcel needs to be acquired.

D. Advisory Design Exception Feature #4:

Nonstandard Feature:

This project proposes a partial interchange at Siempre Viva Road and Otay Mesa Road (see Attachment 2C).

Standard For Which Exception Is Requested:

The *Highway Design Manual*, Index 502.2 Local Street Interchanges, sets forth the following standard:

The use of isolated off ramps or partial interchanges should be avoided because of the potential for wrong-way movements and added driver confusion.

Reason For Requesting Exception:

Siempre Viva Road Interchange

SR-11 ends approximately 720 feet southeast of Siempre Viva Road at the POE. The length of queue storage available between the Siempre Viva Road interchange and the POE is limited due to right-of-way and environmental constraints. The need to toll vehicles and the requirement for separation of commercial from non-commercial vehicles at the POE complicates the geometry of this interchange. The geometry would be complicated further if all moves were constructed. By providing access to and from the west, vehicles are provided an opportunity to exit and remain in the U.S. just prior to entering the POE. Non-commercial vehicles wanting to access Siempre Viva Road from the POE will access it from Enrico Fermi Drive. Due to the additional environmental impacts, increased right of way requirements and complicated intersection geometry, a partial interchange is proposed for this local access point.

Otay Mesa Road Interchange

SR-125 currently terminates at Otay Mesa Road with a partial diamond interchange. This interchange provides for southbound access to Otay Mesa Road and northbound access from Otay Mesa Road. It currently serves as one end of the highway. Otay Mesa Road was formally interim SR-905. Freeway-to-freeway connectors to the new SR-905 have been cleared environmentally, but a project has not been programmed. This project does not propose to construct these new connector ramps. Given that this interchange is located 0.24 mile from the proposed SR-905/SR-125/SR-11 interchange, this project proposes to maintain existing access to Otay Mesa Road and maintain the partial interchange in its current state.

Added Costs to Make Standard:

The added cost to make a full interchange at Siempre Viva Road is approximately $20,700,000. This includes $6,300,000 of which are right-of-way costs.

E. Advisory Design Exception Feature #5:

Nonstandard Feature:

This project proposes limited access control at the Siempre Viva Road interchange (See Attachment 2D).

Location	Description
1	Driveway to toll facility building
2	Access road to CVEF

Standard For Which Exception Is Requested:

The *Highway Design Manual*, Index 504.8 Access Control, sets forth the following standard:

For new construction or major reconstruction, access rights should be acquired on the opposite side of the local road from ramp terminals to preclude the construction of future driveways or local roads within the ramp intersection.

Reason For Requesting Exception:

SR-11 will be constructed as a toll facility that will terminate at the Otay Mesa East POE. A partial diamond interchange will be constructed at Siempre Viva Road which is approximately 720 feet from the end of SR-11. This interchange will provide SR-11 with eastbound access to Siempre Viva Road and westbound access from Siempre Viva Road.

Location 1: A toll facility building and parking lot is planned to be provided adjacent to the POE. This building/lot will be accessed via a driveway from Siempre Viva Road across from the eastbound SR-11 exit ramp. The driveway location is restricted due to the location of the toll facilities, the location of an outlet structure for offsite drainage and a proposed detention basin.

Location 2: A CVEF will be constructed adjacent to the POE for commercial vehicle inspections. Upon exiting the CVEF, commercial vehicles will be given the option to access either SR-11 or Siempre Viva Road via an access road. This access road will be constructed across from the westbound SR-11 on ramp. It will also provide employee's access to and from the CVEF.

To avoid additional environmental impacts and design exceptions, these ramps were designed across from each other. Placement of the partial interchange ramps at Siempre Viva Road across from these proposed points of access will improve traffic operations by not creating additional closely spaced intersections. Mitigation for wrong way movements at these two locations may include additional signage, raised medians to limit turning movements, and signalizing the intersections. Lanes of the driveway may also be offset to not line up with those of the SR-11 exit ramp to Siempre Viva Road. This would force

vehicles exiting the toll facility driveway to make a correction should a wrong way movement be initiated.

Added Costs to Make Standard:

The major issue with this non-standard design is not a matter of cost but of traffic operations and the efficiency of the interchange as vehicles move in and out of the POE. The added right-of-way costs are not included as they are undetermined at this time.

F. Advisory Design Exception Feature #6:

Nonstandard Feature:

This project proposes no passing lane provided at the following locations (See Attachment 2E):

Ramp Location	Alignment	Ramp Length prior to lane addition
La Media Road exit ramp from westbound SR-905	"LMD1A"	1,586 Feet
La Media Road exit ramp from westbound SR-11	"LMD1B"	1,719 Feet

Standard For Which Exception Is Requested:

The *Highway Design Manual*, Index 504.3(5) Ramps (Single-lane Ramps), sets forth the following standard:

If the length of a single lane ramp exceeds 1,000 feet, an additional lane should be provided on the ramp to permit passing maneuvers.

Reason For Requesting Exception:

La Media Road is the southbound truck route to the existing Otay Mesa POE for commercial vehicles entering Mexico. It is an existing and recently constructed interchange and a very important link to the commercial activities in the border area. This truck route is highly traveled and growth in the area has been developed to support this route.

Access to La Media Road from westbound SR-905 is proposed at a location further east than the existing ramp to accommodate for the westbound SR-905 branch connector from SR-11. This proposed exit location occurs prior to SR-11 merging with SR-905, yielding access to La Media Road from SR-11 to be provided from the branch connector.

The La Media Road exit ramp from westbound SR-905 will not have a passing lane for approximately the first 1,586 feet, where it then merges with the La Media Road exit

ramp from westbound SR-11. From this merge west to La Media Road, two lanes are maintained. Widening prior to this merge is not desirable operationally since the lane passing lane would need to drop prior to the merge due to right of way constraints. The distance from gore to gore on these ramps is less than 900 feet.

Both ramps have low forecasted Horizon Year (2035) traffic volumes with projected peak hour volumes of 159 vph and 141 vph exiting from SR-905 and SR-11 respectively. Due to the low projected peak hour volumes, it is not reasonable to allow for passing maneuvers on either of these ramps prior to them merging.

Added Costs to Make Standard:

To make the westbound SR-905 exit ramp to La Media Road the standard two lanes, the SR-11 exit ramp to La Media Road would need to be eliminated. It would also require lengthening the proposed westbound SR-11 to SR-905 freeway-to-freeway structure crossing over this ramp. The estimated construction cost to make standard is $200,000. The cost from impacts to the community due to eliminating the other ramp cannot be calculated.

G. Advisory Design Exception Feature #7:

Nonstandard Feature:

This project proposes the construction of side slopes will be steeper than 4:1 (H:V) in the following locations (See Attachment 2F):

Location	Alignment	Description of Limits			Proposed Side Slope
1	"EB" Line	633+00.00	to	635+00.00	2:1 or Flatter
2	"EB" Line	641+40.00	to	642+00.00	2:1 or Flatter
3	"WB" Line	633+00.00	to	635+00.00	2:1 or Flatter
4	"WB" Line	637+50.00	to	640+00.00	2:1 or Flatter
5	"SE" Line	029+00.00	to	033+00.00	2:1 or Flatter

Standard For Which Exception Is Requested:

The *Highway Design Manual*, Index 304.1Side Slope Standards, sets forth the following standard:

For new construction, widening, or where slopes are otherwise being modified, embankment (fill) slopes should be 4:1 or flatter.

Reason For Requesting Exception:

The majority of the proposed project is on embankment and goes through mostly undeveloped and gently sloping ground.

Location 1: On the eastbound SR-905 to eastbound SR-11, a 2:1 or flatter slope will allow for the minimum clear recovery area on SR-905 and prevent the need for a retaining wall. To make this design standard would mean constructing a wall approximately 210 feet in length and up to 10 feet in height.

Location 2: On the eastbound SR-905 to eastbound SR-11, a 2:1 or flatter slope will prevent the need for a retaining wall. To make this design standard would mean lengthening the wall at Location 4 approximately an additional 420 feet.

Location 3 and 4: The skew of the La Media Road exit ramp from westbound SR-905 under the westbound SR-11 to westbound SR-905 connector dictate the use of retaining walls at these locations. To make this design standard would mean increasing the wall height at both locations. The wall at Location 3 is designed up to 15 feet in height and would increase up to 20 feet in height. Location 4 is designed up to 8 feet in height and would also increase up to 20 feet in height.

Location 5: The limited right of way on the southbound SR-125 to eastbound SR-11 at this location dictates the use of a retaining wall, approximately 150 feet long and 18 feet in height. To make this design standard would mean additional right of way acquisition or lengthening the wall approximately an additional 850 feet and increasing the wall up to a height of 38 feet.

Added Costs to Make Standard:

Assuming no additional right of way was purchased, the estimated added construction cost is approximately $5,300,000.00.

3. TRAFFIC DATA

According to the *Tier II Traffic Technical Report* dated October 2010, forecasted traffic data for the Horizon Year (2035) is as follows:

Segment	ADT		AM Peak Hour Volumes		PM Peak Hour Volumes	
	EB	WB	EB	WB	EB	WB
Mainline Freeway Segment						
Between La Media Road and SR-11 connectors at SR-905	53,400	56,800	4,535	4,972	4,963	5,601
Between SR-125/SR-905 Interchange and Enrico Fermi Drive	30,000	36,600	2,805	3,255	2,884	3,710
Between Enrico Fermi Drive and Siempre Viva Road	25,700	33,300	2,205	3,173	2,712	3,141

Between SR-905 and SR-11	28,600	29,500	2,512	2,680	2,809	2,929
Between SR-125 and SR-11	7,100	n/a	703	n/a	639	n/a
Ramps						
On SR-905 from La Media Road	1,800	11,300	147	814	156	1,119
On SR-11 from La Media Road	3,400	n/a	227	n/a	359	n/a
Off to La Media from SR-905	11,300	1,800	994	159	915	146
Off to La Media from SR-11	n/a	1,600	n/a	141	n/a	130
On from Enrico Fermi Drive	10,300	13,600	834	1,102	1,133	1,496
Off to Enrico Fermi Drive	10,600	10,300	1,082	1,020	981	927
On from Siempre Viva Road	n/a	7,200	n/a	583	n/a	792
Off to Siempre Viva Road	6,200	n/a	625	n/a	567	n/a

The traffic forecasts shown above are based on total vehicles (autos plus trucks). Trucks comprise 15% of the ADT.

4. ACCIDENT ANALYSIS

This is a new freeway facility and no TASAS Accident Data exists. This segment of freeway is projected to carry 15% trucks. The proposed project will improve congestion at the San Ysidro and Otay Mesa POEs by providing an additional nearby POE along the California/Mexico border.

5. INCREMENTAL IMPROVEMENTS

There are no incremental improvements for this exception.

6. FUTURE CONSTRUCTION

The improvements proposed in the SR-11 project will accommodate future interchange connections.

7. PROJECT REVIEWS, CONCURRENCE

Reviewer	Title	Concurrence
Gary Vettese	Deputy District Director	07/28/2011
Luis Betancourt	HQ Design Coordinator	07/28/2011
Laurie Espinoza	HQ Design Reviewer (Acting)	07/25/2011

8. ATTACHMENTS

Location/Vicinity Map
Cross Sections/Details

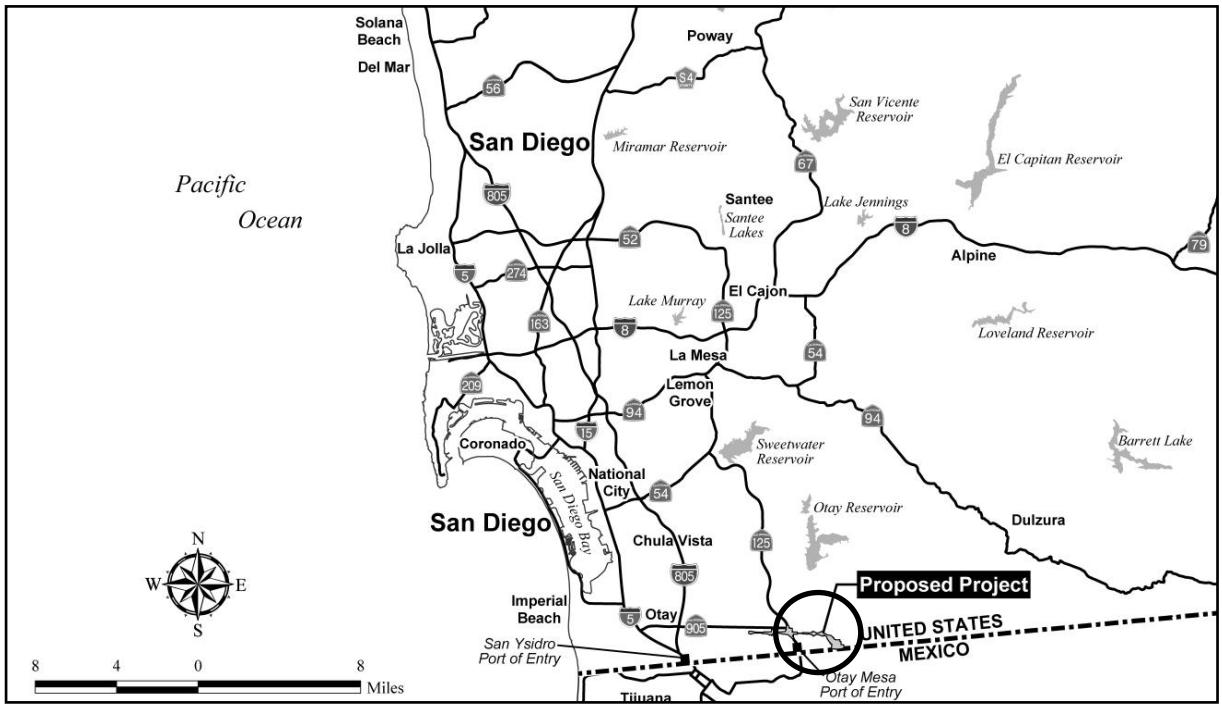
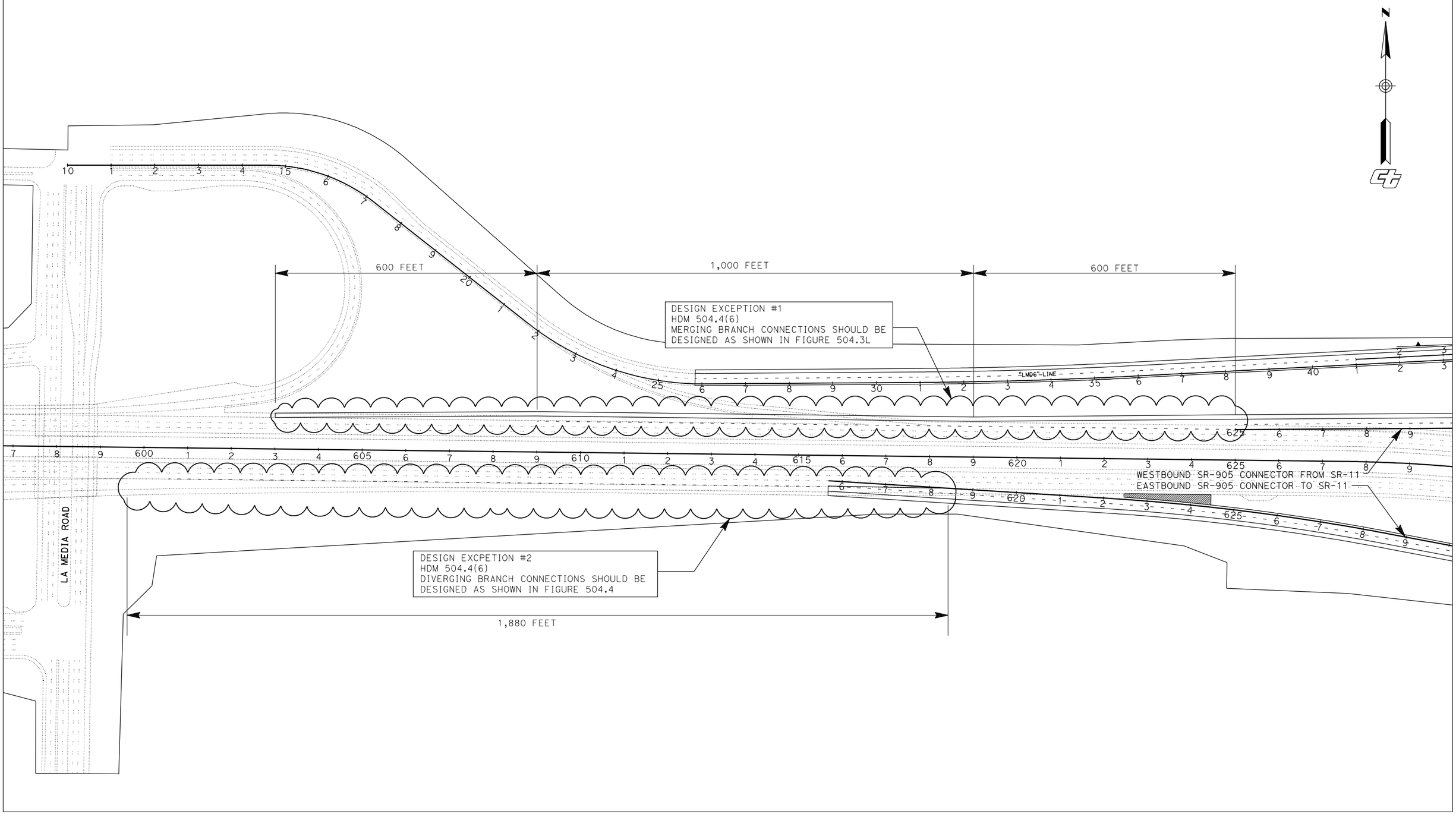


EXHIBIT A – PROJECT VICINITY MAP

CONSTRUCTION OF A NEW STATE ROUTE AND PORT OF ENTRY IN AND NEAR SAN DIEGO ON ROUTE 905 FROM 0.1 MILE WEST OF BRITANNIA BOULEVARD OVERCROSSING TO ROUTE 905/11 SEPARATION AND ON ROUTE 11 FROM ROUTE 905/11 SEPARATION TO MEXICO BORDER



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

11-SD-11
11-056310

MERGING/DIVERGING BRANCH CONNECTION EXHIBIT

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ATTACHMENT 2A

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UNLESS OTHERWISE SHOWN

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TYPICAL CROSS SECTION

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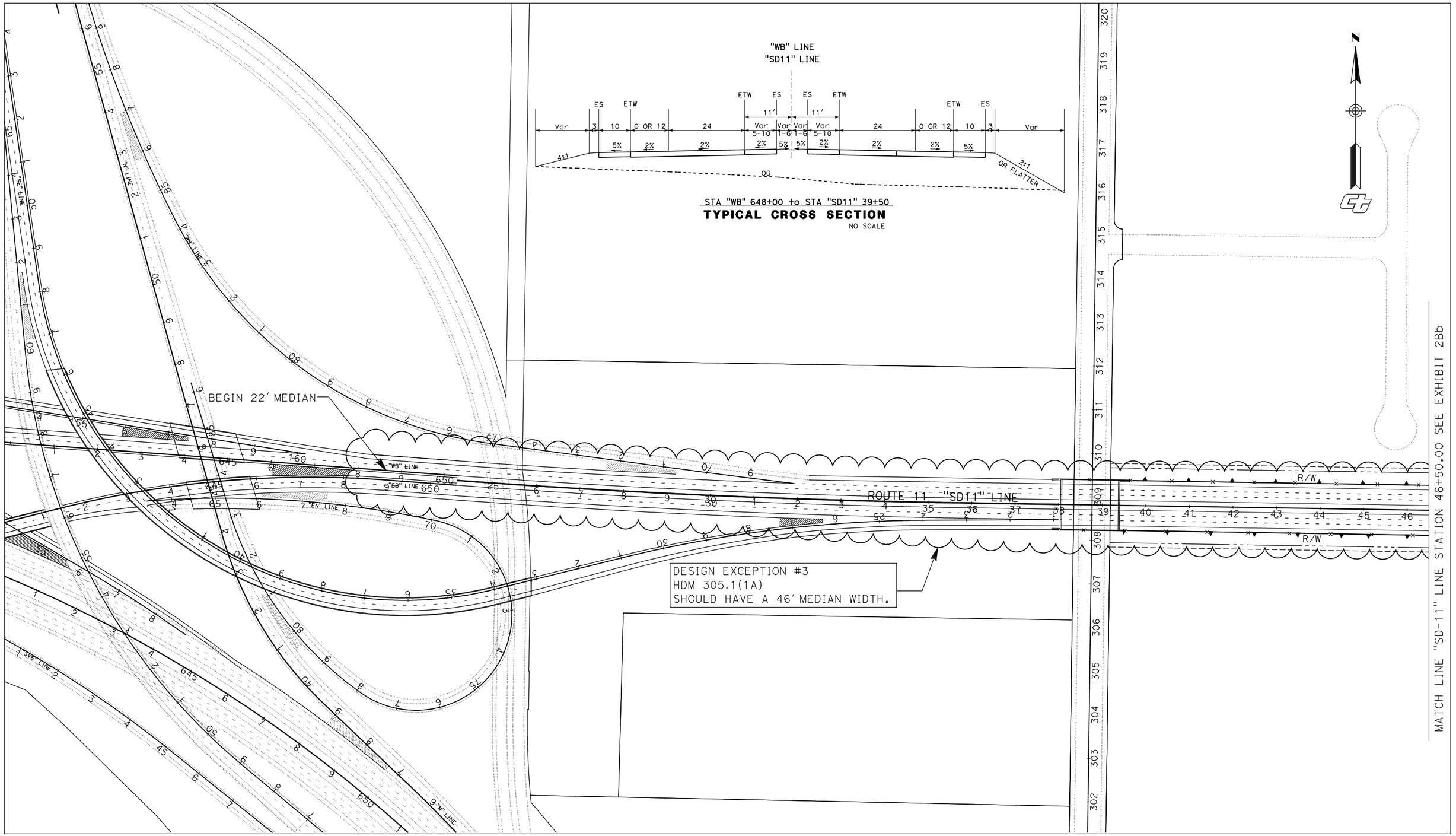

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

11-SD-11
11-056310

NON STANDARD MEDIAN EXHIBIT

SCALE: 1":100'

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ATTACHMENT 2Ba

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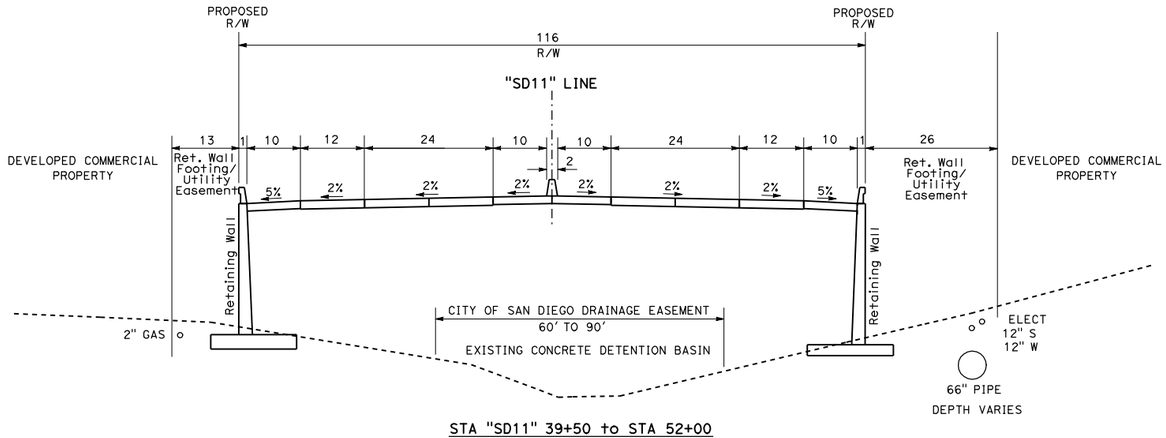

STA "SD11" 39+50 to STA 52+00

TYPICAL CROSS SECTION

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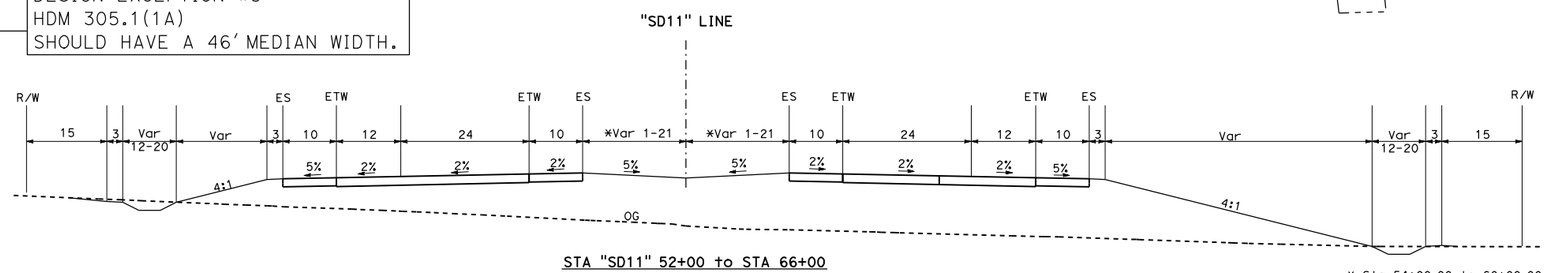
MATCH LINE "SD-11" LINE STATION 46+50.00 SEE EXHIBIT 2Ba



STA "SD11" 52+00 to STA 66+00

TYPICAL CROSS SECTION

NO SCALE

* Sta 54+00.00 to 60+00.00

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION **DISTRICT 11**	11-SD-11 11-056310	**NON STANDARD MEDIAN EXHIBIT** SCALE: 1":100'	**ATTACHMENT 2Bb** ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN
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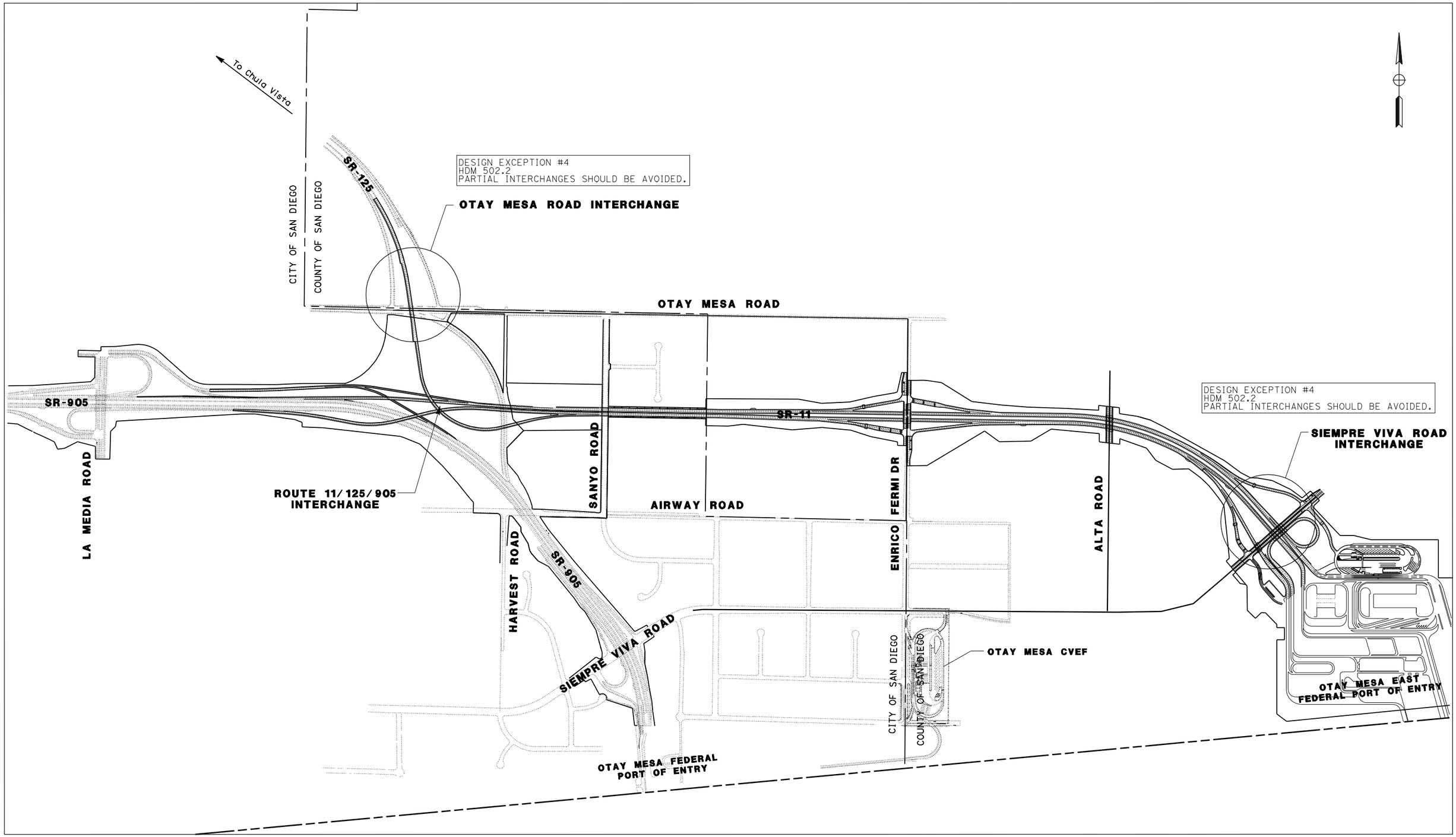

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

11-SD-11
11-056310

PARTIAL INTERCHANGE GEOMETRICS EXHIBIT

CALCULATED-
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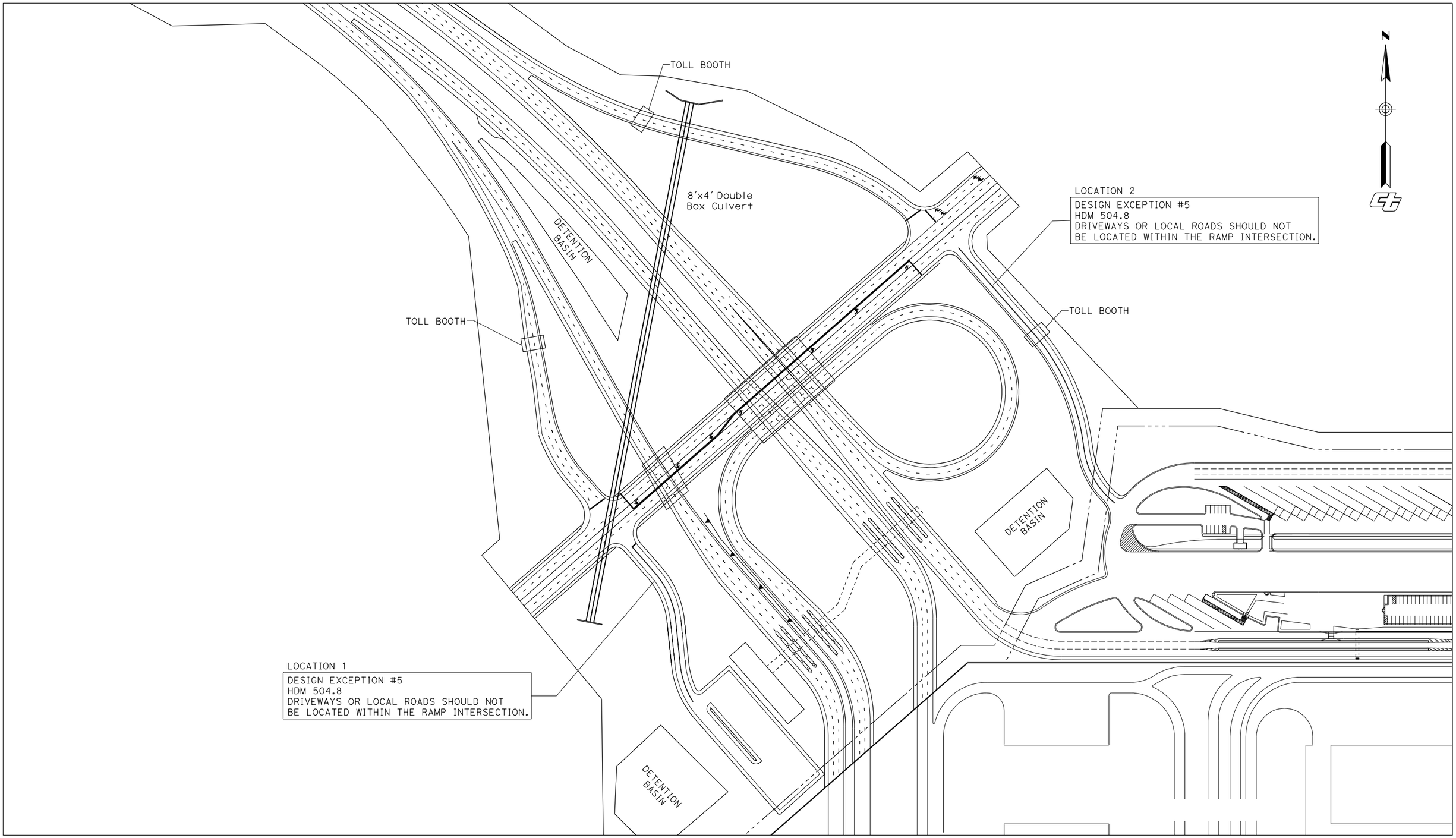

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

11-SD-11
11-056310

SIEMPRE VIVA ROAD INTERCHANGE
ACCESS CONTROL EXHIBIT

SCALE: 1":100'

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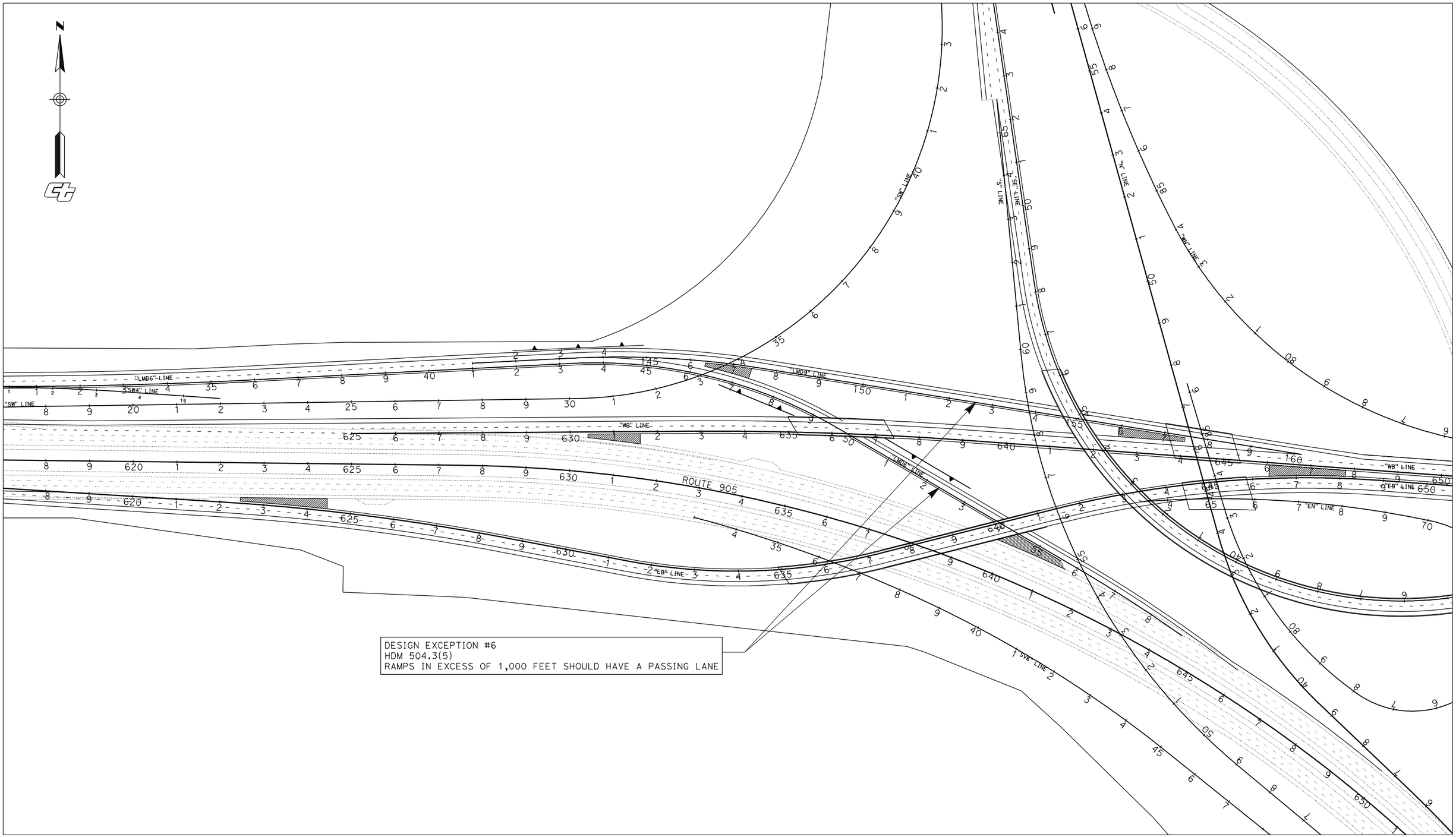

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

11-SD-11
11-056310

NO PASSING LANE EXHIBIT

SCALE: 1":100'

CALCULATED-DESIGNED BY

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ATTACHMENT 2E

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DESIGN EXCEPTION #7
HDM 304.1
FILL SLOPES SHOULD BE 4:1 OR FLATTER

N

LOCATION 1

LOCATION 2

LOCATION 3

LOCATION 4

LOCATION 5

ROUTE 11 "SD11" LINE

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DISTRICT 11

11-SD-11
11-056310

NEGATIVE SIDE SLOPES STEEPER THAN 4:1 EXHIBIT

SCALE: 1":100'

CALCULATED-
DESIGNED BY

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ATTACHMENT 2F

ALL DIMENSIONS ARE IN FEET
UNLESS OTHERWISE SHOWN

Attachment J – Commercial Vehicle Enforcement Facility (CVEF) Alternatives Analysis Report

Commercial Vehicle Enforcement Facility (CVEF) Alternatives Analysis Report
(Serving Otay Mesa East POE)

Caltrans

Project Manager	Mark Baza
Design Manager	Nicola Bernard, P.E.

AECOM Transportation

Project Manager	Kirk Bradbury, P.E.
Project Engineer	Brett Stephens
AECOM Staff	Andrea Thomas, P.E. Andrea Fitzgerald

October 14, 2009

AECOM

7807 Convoy Court, Suite 200 San Diego, CA 92111

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Appendix B – State Inspection Facility Location Map

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Introduction

Project Background

The proposed State Route 11 (SR-11) and Otay Mesa East Port of Entry (POE) Project (Project) is anticipated to be a four to six-lane highway from the proposed State Route 905/State Route 125 junction to a proposed future international border crossing serving commercial and non-commercial vehicles. The proposed POE would service passenger and commercial vehicle traffic into and out of the United States. No interchanges and one or two local interchanges along SR-11 are proposed in order to provide access to planned industrial, commercial, and residential development in the East Otay Mesa Specific Plan area of San Diego County.

The primary international entry point in the San Diego metropolitan area for commercial vehicles is the existing Otay Mesa POE. It is the second largest commercial POE on the United States-Mexico border. In 2007, the northbound cargo facility processed approximately 3,000 laden trucks per day, and the queue of northbound commercial vehicles entering the United States from Mexico lasted two or more hours during peak periods. Forecasts show the volume of commercial trucks will increase over the next 20 years.

All commercial vehicles entering the United States must stop and submit to an inspection by the California Highway Patrol (CHP), and will be subject to a safety monitoring system by the Federal Motor Carrier Safety Administration (FMCSA), U.S. Department of Transportation.

The California Vehicle Code outlines who must stop at weigh stations and inspection stations.[1] Section 2813 states:

> Every driver of a commercial vehicle shall stop and submit the vehicle to an inspection of the size, weight, equipment, and smoke emissions of the vehicle at any location where members of the California Highway Patrol are conducting tests and inspections of commercial vehicles and when signs are displayed requiring the stop. Every driver who fails or refuses to stop and submit the vehicle to an inspection when signs are displayed requiring that stop is guilty of a misdemeanor.

The Code of Federal Regulations (CFR) under Title 49 – Transportation, §385.103 - Safety monitoring system states:[2]

> (a) General. Each Mexico-domiciled carrier operating in the United States will be subject to an oversight program to monitor

[1] http://www.dmv.ca.gov/pubs/vctop/d02/vc2813.htm, accessed on September 1, 2009.

[2] http://edocket.access.gpo.gov/cfr_2008/octqtr/pdf/49cfr385.103.pdf, accessed on September 1, 2009.

> its compliance with applicable Federal Motor Carrier Safety Regulations (FMCSRs), Federal Motor Vehicle Safety Standards (FMVSSs), and Hazardous Materials Regulations (HMRs).
> (b) Roadside monitoring. Each Mexico-domiciled carrier that receives provisional operating authority or a provisional Certificate of Registration will be subject to intensified monitoring through frequent roadside inspections.
> (c) CVSA decal. Each Mexico-domiciled carrier granted provisional operating authority under part 365 of this subchapter must have on every commercial motor vehicle it operates in the United States a current decal attesting to a satisfactory inspection by a Commercial Vehicle Safety Alliance (CVSA) inspector.
> (d) Safety audit. The FMCSA will conduct a safety audit on a Mexico-domiciled carrier within 18 months after the FMCSA issues the carrier a provisional Certificate of Registration under part 368 of this subchapter.
> (e) Compliance review. The FMCSA will conduct a compliance review on a Mexico-domiciled carrier within 18 months after the FMCSA issues the carrier provisional operating authority under part 365 of this subchapter.

The State of California's existing Commercial Vehicle Enforcement Facility (CVEF) adjacent the existing Otay Mesa POE would need to be expanded or a new facility would need to be built in order to successfully accommodate the expected increase in daily commercial vehicle traffic crossing the international border. All commercial vehicles must submit to an inspection by CHP to allow them to legally operate on California highway facilities. A Value Analysis study was performed by the California Department of Transportation (Caltrans) (preliminary report dated March 2007) to determine the most efficient and cost-effective location for state commercial vehicle inspection assuming construction of the proposed Otay Mesa East POE. Six commercial vehicle alternatives, including design/operational, and location alternatives were developed. This CVEF Alternatives Analysis Report includes five alternatives: one alternative proposes a new CVEF, three alternatives propose modifications to the existing inspection process, and one alternative is a "No Build" Alternative.

Project Objective

The purpose of this report is to develop and analyze five alternatives addressing the need for commercial vehicle inspection at the Otay Mesa East POE as required by the CHP. Each alternative has been evaluated on the basis of the following criteria: Cost, Environmental Resources, Serves CHP's Mission,

Provides Adequate Capacity for Commercial Vehicles, Provides Acceptable Commercial Vehicle Travel Time between Otay Mesa East POE and State Inspection, and Right of Way (ROW) Acquisition Needs. A matrix is included Appendix A that summarizes the CVEF alternatives criteria evaluation. This report provides documentation and justification to assist decision-makers in identifying a preferred alternative.

CVEF Overview

The primary purpose of commercial vehicle enforcement facilities is to monitor vehicle weight. Highway pavement damage due to overweight commercial vehicles can decrease the lifecycle of a highway facility resulting in extra costs in repairs and replacement. In the case of an international POE, this mission has expanded to include vehicle safety, operator credentialing, and other services unique to commercial vehicle traffic.

According to the "2001 Weigh Station Inventory of Needs" prepared by the CHP, the commercial vehicle enforcement facilities across the state have been classified into five categories: Class "A", Class "B", Class "C", Class "D", and mini-sites. Each classification is dependent upon its primary function, staffing needs, size, location and physical configuration. A map from the Caltrans Division of Traffic Operations showing the location and classification of inspection facilities within the state can be found in Appendix B.

If a new CVEF is constructed adjacent the proposed Otay Mesa East POE, it would likely be a Class "A" facility, which would be similar to the existing facilities serving the Otay Mesa POE and Calexico East POE in Imperial County. A Class "A" facility has the ability to operate 24 hours per day, 7 days per week depending on service demands. It can also be utilized by others such as the FMCSA, Air Resources Board, Board of Equalization and Department of Motor Vehicles at the discretion of the CHP commander. Class "A" facilities generally have Weigh-in-Motion (WIM) and static scales for the weighing of vehicles, as well as covered areas for the inspection of vehicle equipment. The inspection area generally has three or more inspection bays and an open storage area for legalizing loads, parking, and sufficient area allowing for the turning of trucks for reweighing.

Class "A" facilities are commanded by 1 lieutenant and staffed by 4 sergeants, 18-22 officers, 18-22 Commercial Vehicle Inspection Specialists, 2 clerks, and 1 maintenance worker/janitor. These staffing levels are contingent upon budgetary considerations and operational needs.

A No-Build alternative would require the existing CVEF to be used for the existing Otay Mesa POE and the proposed Otay Mesa East POE, as all commercial vehicles entering the United States by way of the United States-Mexico border are inspected by the CHP after passing through United States Customs.

Overview of Alternatives

Alternative A - New CVEF Adjacent the Otay Mesa East POE

Alternative A includes building a new Class "A" CVEF adjacent to the proposed Otay Mesa East POE. The existing CVEF would remain operational in its current location and continue serving the northbound commercial vehicles that pass through the existing Otay Mesa POE. The proposed CVEF would be the same size as the existing facility, and is expected to serve approximately 38 percent of the northbound commercial vehicles forecasted per day in the year 2035 for the San Diego metropolitan area. The existing CVEF is expected to serve the remaining 62 percent of commercial vehicles crossing the international border in this region. Under Alternative A, a CVEF would be located adjacent to each of the existing and proposed ports of entry in Otay Mesa.

Alternative A would allow the CHP to inspect commercial vehicles the shortest distance from where U.S. Customs and Border Protection (CBP) have completed cargo inspection. Additionally, it is anticipated that a new CVEF would be configured to allow intermittent inspection of southbound commercial vehicles. The new CVEF's location would allow northbound commercial vehicles to enter surrounding roadway facilities immediately after being inspected by the CHP, thereby decreasing the driving distance and travel time of each commercial vehicle. They would be able to proceed directly to their United States destination without significant time and travel delays.

A conceptual layout of this alternative is shown in Appendix C.

Alternative B - Secured Access Road to Existing CVEF

Alternative B includes a secured access road to the existing CVEF from the proposed Otay Mesa East POE. The access road would be secure for commercial vehicles, and would likely be a one-way, two-lane road with a 10-foot inside shoulder for emergency vehicle access and an 8-foot outside shoulder. The secured road would likely include concrete barriers on either side, or CBP-approved fencing. The proximity of the proposed road to the international border would dictate what security measures would need to be installed.

This alternative would route commercial traffic to County streets from the existing CVEF following release by CHP. Because of this, the SR-905 and SR-11 interchanges in closest proximity would need to accommodate the high commercial traffic demand for access to state highway facilities. The secured road is expected to bisect existing parcels and may require extensive right-of-way acquisition to the south of the access road if the proposed alignment "landlocks" private parcels and reduces their development value. As part of Alternative B, the existing CVEF would need to be expanded to not only accommodate increasing numbers of commercial vehicles, but also adjustments in traffic circulation patterns. Under this alternative, commercial vehicles would enter the existing CVEF on the south side from the existing POE and on the east side from the proposed POE.

If the access road described above would bisect parcels and restrict access to the parcels south of the proposed roadway, Alternative B could include grade separated structure(s) to provide roadway access to the affected parcels. Cost estimates for Alternative B do not include ROW acquisition costs for 'landlocked' parcels or construction costs for grade separated structures.

A conceptual layout of this alternative and access road typical cross-section are shown in Appendix C.

Alternative C - WIM Station -- Access to Existing CVEF via Public Roads

Alternative C includes two WIM inspection stations adjacent the Otay Mesa East POE with a tracking system for commercial vehicles en route to inspection at the existing CVEF via public roads. After being weighed, commercial vehicles not requiring further inspection would have immediate access to SR-11. Commercial vehicles attempting to cross the United States-Mexico border at the proposed Otay Mesa East POE are required by law (California Vehicle Code Section 2813) to proceed to inspection by the CHP after the CBP inspection, and would use an existing roadway, Siempre Viva Road, to travel to the CVEF for additional inspection. Commercial vehicles requiring additional inspection after passing through the WIM inspection would be affixed with an electronic vehicle tracking device to ensure lawful compliance by commercial vehicles required for further inspection at the existing CVEF.

CBP agents would first inspect the cargo carried by the commercial vehicles. After CBP agents complete their inspection, the commercial vehicles would proceed to the WIM station for CHP weight inspection. Finally, commercial vehicles requiring further inspection would proceed to the CVEF along the designated public road.

A conceptual layout of this alternative and a typical cross-section of the access road from Siempre Viva Road to the existing CVEF are shown in Appendix C.

Alternative D - WIM Station -- Secured Access Road to Existing CVEF

Alternative D is similar to Alternative C; it includes a WIM inspection station adjacent to the Otay Mesa East POE, but includes a secured access road for trucks en route to inspection by the CHP at the existing CVEF. The secured access road would likely include concrete barriers or CBP-approved fencing to restrict access to commercial vehicles and approved personnel. The secured access road would likely be a one-way, one-lane road with a 10-foot inside shoulder for emergency vehicle access and an 8-foot outside shoulder. The proximity of the proposed road to the international border would likely dictate what security measures would be needed.

As in Alternative C, CBP agents would inspect the cargo as the commercial vehicles pass through the Otay Mesa East POE leading to CHP's WIM inspection station. Immediately after WIM, direct access to SR-11 is provided. The commercial vehicles requiring further inspection would travel along the secured access road to inspection and for enforcement by the CHP at the existing CVEF.

A conceptual layout of this alternative and access road typical cross-section are shown in Appendix C.

Alternative E – No Build

Alternative E represents not building a new CVEF at the proposed Otay Mesa East POE, not building an access road from the proposed POE to the existing CVEF, and not expanding the existing CVEF. The No Build alternative does not provide a means to inspect commercial vehicles passing northbound through the proposed Otay Mesa East POE.

Evaluation of Alternatives

Evaluation Process

The evaluation process developed by the project team in conjunction with Caltrans was used for each alternative. The process included criteria for comparison that were developed by the project team and then applied consistently to the alternatives. The following criteria were used in the evaluation of the alternatives:

- *Cost* – Total project costs were estimated including construction costs associated with each improvement alternative, engineering support costs, and right-of-way acquisition costs that would be required. Operations and maintenance costs have not been evaluated at this time.

- *Environmental Resources* - This indicates the known environmental resources within the footprint of each alternative.

- *Serves CHP's Mission* – This evaluates how each alternative meets the CHP's mission. "The mission of the CHP is to provide the highest level of safety, service, and security to the people of California. This is accomplished through five departmental goals:
    - **Prevent Loss of Life, Injuries, and Property Damage** - To minimize the loss of life, personal injury, and property damage resulting from traffic collisions through enforcement, education, and engineering. To enforce the provisions of the California Vehicle Code and other laws to prevent crime.
    - **Maximize Service to the Public and Assistance to Allied Agencies** - To maximize service to the public in need of aid or information, and to assist other public agencies when appropriate.
    - **Manage Traffic and Emergency Incidents** - To promote the safe and efficient movement of people and goods throughout California, and to minimize exposure of the public to unsafe conditions resulting from emergency incidents and highway impediments.
    - **Protect Public and State Assets** - To protect the public, their property, state employees, and the state's infrastructure. To collaborate with local, state, and federal public safety agencies to protect California.
    - **Improve Departmental Efficiency** - To continuously look for ways to increase the efficiency and/or effectiveness of departmental operations. "[3]

- *Provides Adequate Capacity for Commercial Vehicles* - This estimates whether or not each alternative would provide adequate capacity for commercial vehicles.

- *Provides Acceptable Commercial Vehicle Travel Time between Otay Mesa East POE and State Inspection* - This includes the effectiveness of each alternative in keeping waiting times and

[3] http://www.chp.ca.gov/html/mission.html, accessed on August 24, 2009.

travel times for the state inspection process as low as possible for commercial vehicles in order to expedite commercial vehicles to their United States destination quickly and efficiently.

- *ROW Acquisition Needs* – This evaluates how much ROW is needed for each alternative.

Using these criteria, an evaluation was conducted for each of the identified improvement alternatives. The evaluation process was comparative in nature, and the complete criteria matrix summarizing the following section can be found in Appendix A.

Alternatives Evaluation

Alternative A - New CVEF Adjacent the Otay Mesa East POE

Alternative A includes the construction of a new CVEF near the proposed Otay Mesa East POE. The estimated Cost of this alternative is $44,250,000 (2009 dollars). This includes approximately 21 acres of ROW that must be acquired. A new CVEF, along with the existing CVEF facility at the Otay Mesa POE, would provide the highest capacity serving the forecasted increase in commercial traffic crossing the border.

The overall mission of the CHP is served well with this alternative because the enforcement facility would be adjacent to the Otay Mesa East POE, which would promote the efficient movement of goods. This alternative would also lessen travel times for commercial vehicles as they would be able to enter state highway facilities immediately after inspection at the enforcement facility.

Alternative B - Secured Access Road to Existing CVEF

Alternative B includes a secured access road to the existing CVEF from the proposed Otay Mesa East POE. The estimated Cost of this alternative is $29,950,000 (2009 dollars). This includes approximately 15 acres of ROW acquisition for the secured access road. This alternative would include expansion and modifications to the existing CVEF in order to accommodate additional truck traffic entering from the secured access road. Two additional lanes would be required to support two new WIM stations at the existing CVEF.

Due to the proposed secured road that would distribute the commercial vehicles between the proposed POE and the existing CVEF, and the additional modifications that increase the capacity at the existing CVEF, this alternative would provide adequate capacity. However, this would make commercial vehicle travel times longer due to the increased distance they would need to travel from the proposed POE to the existing CVEF. This alternative does not provide commercial vehicles direct access to SR-11.

Alternative C - WIM Station -- Access to Existing CVEF via Public Roads

Alternative C includes a WIM inspection station adjacent to the proposed Otay Mesa East POE with a tracking system for commercial vehicles traveling on public roads directed by CHP for additional inspection at the existing CVEF. The estimated Cost of this alternative is $9,000,000 (2009 dollars). This includes approximately 5 acres of right-of-way acquisition for the WIM station and a new access roadway connecting to Siempre Viva Road.

This Alternative has potential to serve the overall mission of the CHP, although enforcement concerns would need to be addressed. Commercial vehicles traveling on unsecured public roads to the existing CVEF would require a tracking system that receives CHP acceptance. A meeting with CHP Lieutenant John Marinez (Otay Mesa CVEF) stated Alternative C was least preferred due to a lack of control of commercial vehicles on public roadways before inspection is complete.[4]

The existing CVEF would need a signalized intersection on Siempre Viva Road for access to commercial vehicles requiring additional inspection at the existing CVEF originating from the new POE. Additionally, Alternative C would increase the travel time for commercial vehicles required to undergo additional inspection because they would be required to travel on existing roadways with public traffic, which can lead to delays. However, most commercial vehicles would have direct access to SR-11, thereby decreasing overall travel times. Also, the additional WIM station located adjacent to the new POE would increase capacity for commercial traffic.

The County of San Diego may have concerns with Alternative C due to a portion of northbound commercial vehicles being directed to County roads prior to a thorough state commercial vehicle inspection.

Alternative D - WIM Station -- Secured Access Road to Existing CVEF

Alternative D includes a WIM station at the proposed Otay Mesa East POE with a secured access road for commercial traffic traveling to the existing CVEF for inspection. The estimated Cost of this alternative is $24,450,000 (2009 dollars). This includes approximately 14 acres of right-of-way acquisition for the WIM station as well as for the proposed secured roadway. Due to the additional WIM station, the majority of commercial vehicles inspected at the new POE would not need to travel the secured access road.

This alternative serves the CHP's mission for the majority of commercial vehicles that efficiently access the WIM stations at the new POE. This alternative does provide commercial vehicles direct access to SR-11, thus decreasing travel times. For commercial traffic that requires additional inspection, travel

[4] Meeting occurred on May 5, 2009 at the Caltrans District 11 Office.

times would be longer due to the increased distance they would need to travel from the proposed POE to the existing CVEF.

Alternative E – No Build

Alternative E proposes a "no build" scenario in which neither a new CVEF nor expanding the existing CVEF with a secured access road from the proposed POE to the existing CVEF would be constructed. This would allow direct access for commercial vehicles to SR-11 without undergoing commercial inspection; therefore, Alternative E does not serve the CHP's mission of promoting safe and efficient movement of goods, minimizing property damage, and protecting the public, their property, and the State's infrastructure.

Due to the reasons stated above, Alternative E has been eliminated from further consideration.

Alternative Comparisons

The following analysis is based on the preceding Alternatives Evaluation, which included the following six criteria: Cost, Environmental Resources, Serves CHP's Mission, Provides Adequate Capacity for Commercial Vehicles, Provides Acceptable Commercial Vehicle Travel Time between Otay Mesa East POE and State Inspection, and ROW Acquisition Needs. These six criteria are compared qualitatively among the four remaining Alternatives. Finally, a recommended alternative is concluded.

Cost

Alternative A would require the greatest project cost in order to construct a new CVEF while Alternative C is the least expensive alternative as it would only construct a new WIM Station and rely on public roads for access to the existing CVEF for inspections. Below is a table showing the overall cost of each alternative, in order of least expensive to most expensive.

Alternative	Estimated Project Cost (2009 Dollars)
C	$9,000,000
D	$24,450,000
B	$29,950,000
A	$44,250,000

Environmental Resources

The Alternatives with the largest footprint area are Alternatives A, B, and D with a footprint size of 18 acres, 12 acres, and 9 acres, respectively. Alternative C has the smallest footprint area at 4 acres. However, Alternative C relies on public roads proposed and developed by local municipalities such as the County of San Diego, which may result in environmental impacts similar to the other Alternatives. The table below lists specific biological resources within or nearby the footprint to each alternative:

	ALTERNATIVE			
	A	B	C	D
Non-Native Grassland	X	X	X	X
Diegan Coastal Sage Scrub	X	X	X	X
Tamarisk Scrub	X			
Vernal Pools Nearby		X		X
Pools with Fairy Shrimp Nearby		X		X

As is shown in the table, each Alternative would affect the biological resources in different ways and therefore no preferred alternative for this criteria has been determined.

Serves CHP's Mission

Alternatives A, B, and D serve the CHP's Mission. Alternative C has potential to serve the overall mission of the CHP, although enforcement concerns would need to be addressed. Commercial vehicles traveling on unsecured public roads to the existing CVEF would require a tracking system that receives CHP acceptance. Further, a meeting with CHP Lieutenant John Marinez (Otay Mesa CVEF) stated Alternative C was the least preferred due to a lack of control of commercial vehicles on public roadways before inspection is complete.[5] Lieutenant Marinez also stated that Alternative A was preferred from an inspection perspective because a complete inspection occurs at one location.

Therefore, Alternative A is preferred as it would best serve the CHP's mission by most efficiently allowing the movement of goods while protecting public and state assets via commercial vehicle inspection at a new CVEF.

Provides Adequate Capacity for Commercial Vehicles

When evaluating each alternative's ability to provide adequate capacity for commercial vehicles, it should be noted that commercial vehicle capacity is a criteria that would be investigated during the design process of the new POE and accommodated for whichever alternative is ultimately chosen.

[5] Meeting occurred on May 5, 2009 at the Caltrans District 11 Office.

Therefore, each of these alternatives would equally provide adequate capacity for commercial vehicles and there is no preferred alternative.

Provides Acceptable Commercial Vehicle Travel Time between Otay Mesa East POE and State Inspection

The table below presents likely travel times to both the WIM stations and CVEF Inspection Facility for each alternative based upon the following assumption: the average speed commercial vehicles would be traveling from the new POE to the WIM stations and CVEF respectively. Finally, the average speed assumed for Alternative C takes into account possible stoppage time due to traffic signals during the trip from the new POE to the CVEF Inspection Facility.

Alternative	Average Speed Assumed for Each Alternative (MPH)	Travel Time From POE to WIM Station (Minutes)	Travel Time From POE to CVEF Inspection Facility (Minutes)	Maximum Travel Time (Minutes)
Alternative A	35	1.4	1.4	1.4
Alternative B	35	3.6	3.6	3.6
Alternative C	25	1.3	5.5	5.5
Alternative D	35	1.2	3.6	3.6

Note: All travel times include a 30 second period to reach full speed and a 30 second period to come to a complete stop.

As is shown in the table above, Alternative A provides the shortest maximum travel time to both the WIM station and the CVEF Inspection Facility.

ROW Acquisition Needs

Alternative C requires the least ROW acquisition (5 acres) while Alternative A would require the most ROW acquisition (21 acres). Alternative B and Alternative D have 'landlock' issues as a secured access road would isolate the southern part of the affected parcels or require grade separated crossing structures. Regarding ROW acquisition needs, Alternative C would be preferred as it requires the least amount of ROW acquisition.

Recommended Alternative

Upon review, Alternative C has been identified as the least expensive alternative in regards to Cost. Additionally, Alternative C requires the least amount of ROW acquisition. Alternative C has potential to serve the overall mission of the CHP, although enforcement concerns would need to be addressed. Commercial vehicles traveling on unsecured public roads to the existing CVEF would require a tracking system that receives CHP acceptance. For these reasons, along with the inability to control commercial

vehicles on public roadways before inspection is complete, Alternative C has been eliminated as the preferred alternative.

All alternatives are equal in regards to providing adequate capacity as whichever alternative is chosen would be designed and constructed to meet this criteria. Additionally, nearby Environmental Resources were identified for the different alternative's; however, the scope of this report did not evaluate environmental impacts. Therefore, further environmental impact analysis will be necessary for the recommended alternative.

Alternative A ranks highest in regards to the remaining criteria of Serves CHP's Mission and Provides Acceptable Commercial Vehicle Travel Time between Otay Mesa East POE and State Inspection. Therefore, as a result of the preceding analysis, it is recommended that Alternative A, a new CVEF adjacent to the Otay Mesa East POE, be further studied and carried forward with the project's environmental process.

Appendix

Appendix A – Criteria Matrix

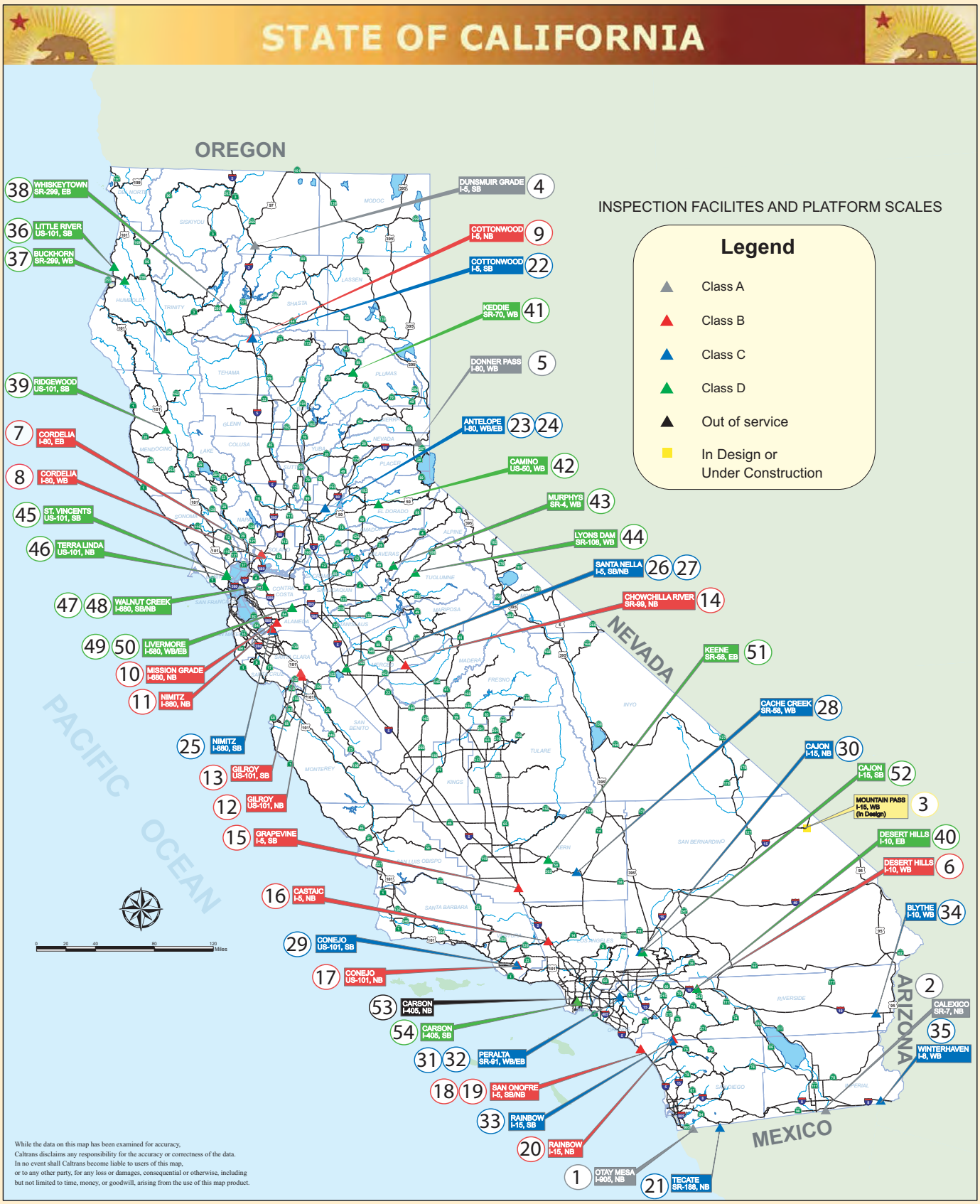
SR 11 – CVEF ALTERNATIVES

Analysis Criteria / Comparison Matrix

Evaluation Criteria	Cost (in millions) (2009)	Environmental Resources	Serves CHP's Mission	Provides Adequate Capacity for Commercial Vehicles	Provides Acceptable Commercial Vehicle Travel Time between Otay Mesa East POE and State Inspection	ROW Acquisition Needs
Alternative A New CVEF Adjacent the Otay Mesa East POE	Total Project Costs $44,250,000 (Operations and Maintenance Costs not evaluated at this time)	Footprint of Alternative equals approximately 18 acres. Biological resources within footprint include nonnative grassland, Diegan Coastal Sage Scrub, and Tamarisk Scrub.	Yes: New CVEF would be a full-functioning state of the art facility constructed adjacent to the Otay Mesa East POE and configured to accommodate both northbound and southbound commercial vehicles.	Yes: A new CVEF facility operating concurrently with the existing CVEF provides adequate capacity for state inspection of commercial vehicles.	This alternative provides the shortest overall travel time duration for northbound commercial vehicles between the Otay Mesa East POE and state commercial vehicle inspection. The maximum travel time to the proposed CVEF adjacent the new Otay Mesa East POE was calculated to be 1.4 minutes.	Alternative requires approximately 21 acres of ROW acquisition for new CVEF.
Alternative B Secured Access Road from the Otay Mesa East POE to Existing CVEF and Expansion of the Existing CVEF	Total Project Costs $30,300,000 (Operations and Maintenance Costs not evaluated at this time)	Footprint of Alternative equals approximately 12 acres. Biological resources within footprint include nonnative grassland and Diegan Coastal Sage Scrub. Nearby are vernal pools and pools with fairy shrimp, but direct impacts are not expected.	Yes: All northbound commercial vehicles would be directed to the existing (expanded) CVEF via a secured access road to undergo inspection.	Yes: Existing CVEF is expanded to increase scale capacity, although unknown at this time if additional garage inspection bays would be necessary. Discussions with CHP recommended.	Traversing a new secured access road from the new POE to the existing CVEF results in increased travel time relative to Alternative A for northbound commercial vehicles. The maximum travel time from the new POE to the existing CVEF was calculated to be 3.6 minutes.	Alternative requires approximately 15 acres of ROW acquisition for secure access road to existing CVEF. Alternative has the potential to result in ROW issues if private parcels become 'landlocked' or if grade-separated crossing structures to the 'landlocked' parcels are needed.
Alternative C A WIM inspection station at the OME POE with a tracking system on public roads for trucks to secondary inspection at the existing CVEF	Total Project Costs $9,150,000 (Operations and Maintenance Costs not evaluated at this time)	Footprint of Alternative equals approximately 4 acres. Biological resources within footprint include nonnative grassland and Diegan Coastal Sage Scrub. This alternative relies upon development of public roads by others, which may result in environmental impacts.	This alternative has potential to serve the overall mission of the CHP, although enforcement concerns would need to be addressed. Commercial vehicles traveling on unsecured public roads to the existing CVEF would require a tracking system that receives CHP acceptance.	Yes: Two new WIM weigh stations adjacent the Otay Mesa East POE provide adequate scale capacity for the new POE, although unknown at this time if additional garage inspection bays would be necessary at existing CVEF. Discussions with CHP recommended. Additionally, unknown if planned public roads would provide adequate truck capacity to the existing CVEF.	This alternative provides a low travel time from the new Otay Mesa East POE to the proposed WIM station (1.3 minutes); however, commercial vehicles requiring further inspection would yield higher travel times to the existing CVEF via public roads (5.5 minutes).	Alternative requires approximately 5 acres of ROW acquisition, the least ROW required for all alternatives. However, CHP and/or County of San Diego may object to commercial vehicles accessing public right of way prior to comprehensive commercial vehicle inspection, if required.
Alternative D A WIM inspection station at the OME POE with a secured access road for trucks to secondary inspection at the existing CVEF	Total Project Costs $24,700,000 (Operations and Maintenance Costs not evaluated at this time)	Footprint of Alternative equals approximately 9 acres. Biological resources within footprint include nonnative grassland and Diegan Coastal Sage Scrub. Nearby are vernal pools and pools with fairy shrimp, but direct impacts are not expected.	Yes: Conveys commercial traffic directly from new WIM weigh station at Otay Mesa East POE to existing CVEF on secure road, as needed.	Yes: Two new WIM weigh stations adjacent the Otay Mesa East POE provides adequate scale capacity for the new POE. Unknown at this time if additional garage inspection bays would be necessary at the existing CVEF. Discussions with CHP recommended.	This alternative provides similar travel time between the Otay Mesa East POE and state's commercial vehicle weight inspection (1.2 minutes) as Alternative C; however, longer travel times would result for those commercial vehicles directed to the existing CVEF over the secured access road (3.6 minutes).	Alternative requires approximately 14 acres of ROW acquisition for WIM station and secure access road to existing CVEF. Alternative has the potential to result in ROW issues if private parcels become 'landlocked' or if grade-separated crossing structures to the 'landlocked' parcels are needed.

Appendix B – State Inspection Facility Location Map

STATE OF CALIFORNIA

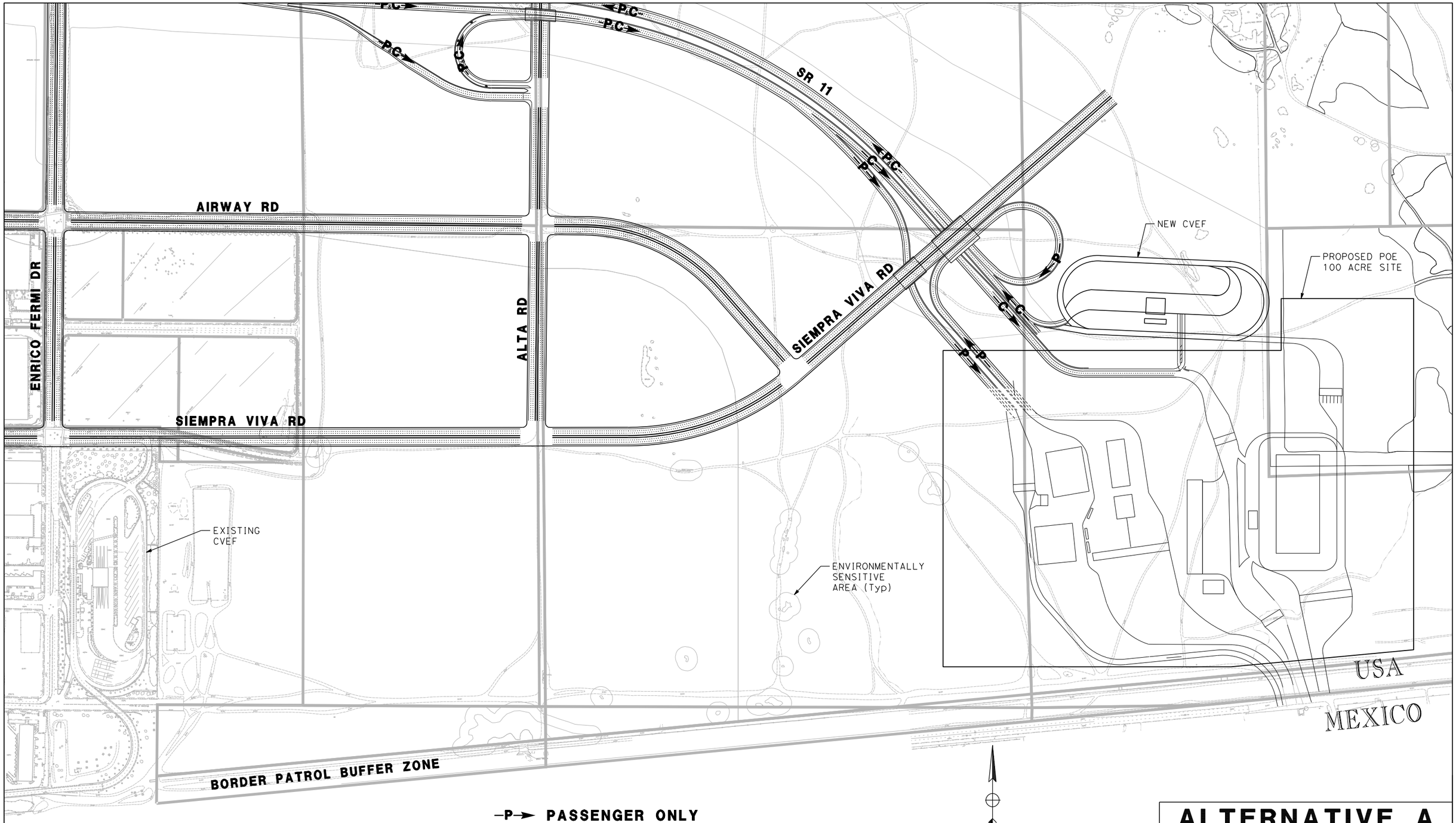


While the data on this map has been examined for accuracy, Caltrans disclaims any responsibility for the accuracy or correctness of the data. In no event shall Caltrans become liable to users of this map, or to any other party, for any loss or damages, consequential or otherwise, including but not limited to time, money, or goodwill, arising from the use of this map product.

Commercial Vehicle Enforcement Facilities

Department of Transportation
Division of Traffic Operations GIS
June 2009

Appendix C – Layouts



-P→ **PASSENGER ONLY**

-C→ **COMMERICAL ONLY**

-P&C→ **PASSENGER & COMMERCIAL**

NOTE: SR-11 ALTERNATIVE SHOWN IS CURRENTLY UNDER CONSIDERATION.

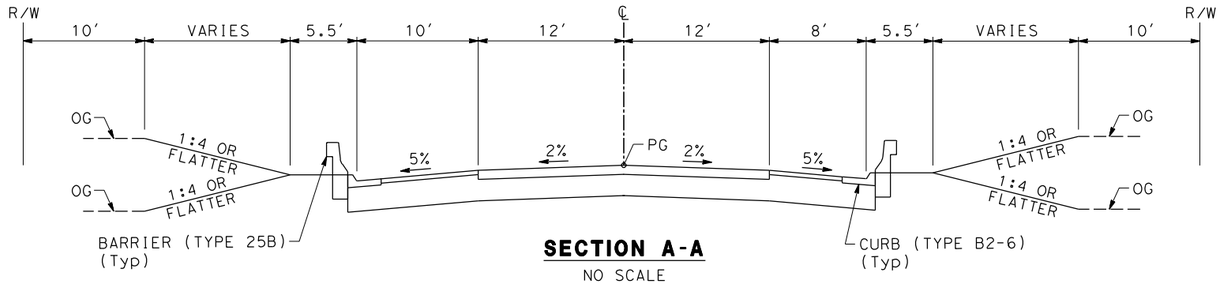
0 500 1000 1500

SCALE 1"=500'

ALTERNATIVE A

NEW CVEF

3/17/2009 3:21:30 PM MozaffarianB H:\Caltrans\2208300\Cad\CVEF\Alt A.dgn



SECTION A-A
NO SCALE

AIRWAY RD
ENRICO FERMI DR
ALTA RD
SIEMPRA VIVA RD
SR 11
SIEMPRA VIVA RD
PROPOSED POE
100 ACRE SITE
EXISTING CVEF
ADDITIONAL 2 LANES WITH 2 ADDITIONAL WEIGH IN MOTION SYSTEMS
SECURED ACCESS ROAD TO EXISTING CVEF
ENVIRONMENTALLY SENSITIVE AREA (Typ)
A
A
USA
MEXICO
BORDER PATROL BUFFER ZONE

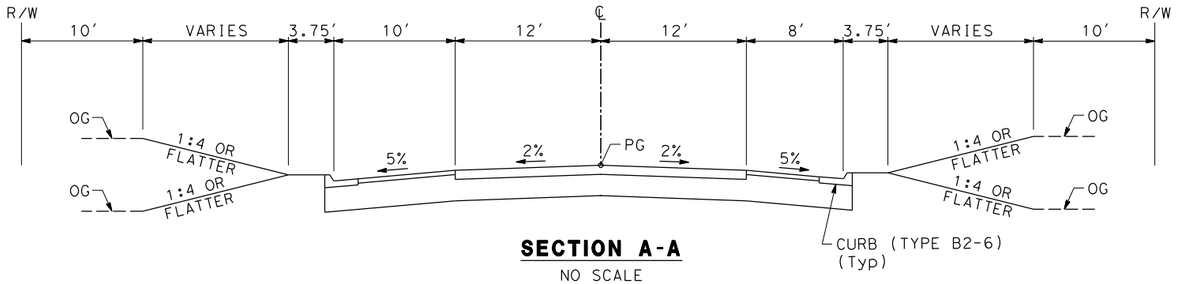
-P→ **PASSENGER ONLY**
-C→ **COMMERICAL ONLY**
-P&C→ **PASSENGER & COMMERCIAL**

NOTE: SR-11 ALTERNATIVE SHOWN IS CURRENTLY UNDER CONSIDERATION.

0 500 1000 1500
SCALE 1"=500′

ALTERNATIVE B

SECURED ACCESS ROAD TO EXISTING CVEF



SECTION A-A
NO SCALE

AIRWAY RD

ENRICO FERMI DR

ALTA RD

SIEMPRA VIVA RD

SR 11

SIEMPRA VIVA RD

WIM TO PUBLIC ROADS

2 WEIGH IN MOTION SYSTEMS

PROPOSED POE 100 ACRE SITE

EXISTING CVEF

ENVIRONMENTALLY SENSITIVE AREA (Typ)

USA

MEXICO

BORDER PATROL BUFFER ZONE

–P→ PASSENGER ONLY

–C→ COMMERICAL ONLY

–P&C→ PASSENGER & COMMERCIAL

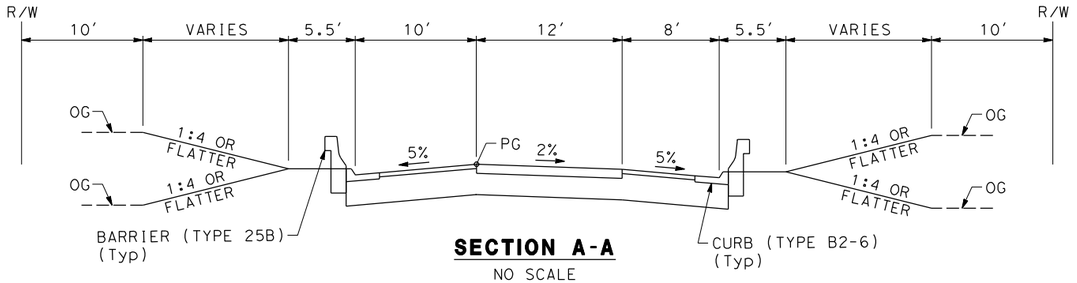
NOTE: SR-11 ALTERNATIVE SHOWN IS CURRENTLY UNDER CONSIDERATION.

0 500 1000 1500

SCALE 1"=500'

ALTERNATIVE C

WIM USING PUBLIC ROADS TO EXIST CVEF



SECTION A-A
NO SCALE

AIRWAY RD
ENRICO FERMI DR
ALTA RD
SIEMPRA VIVA RD
SR 11
SIEMPRA VIVA RD
2 WEIGH IN MOTION SYSTEMS
PROPOSED POE 100 ACRE SITE
EXISTING CVEF
SECURED ACCESS ROAD TO EXISTING CVEF
A
A
ENVIRONMENTALLY SENSITIVE AREA (Typ)
USA
MEXICO
BORDER PATROL BUFFER ZONE

-P→ **PASSENGER ONLY**
-C→ **COMMERICAL ONLY**
-P&C→ **PASSENGER & COMMERCIAL**

NOTE: SR-11 ALTERNATIVE SHOWN IS CURRENTLY UNDER CONSIDERATION.

0 500 1000 1500
SCALE 1"=500'

ALTERNATIVE D

WIM AT NEW POE AND NEW ACCESS ROAD

Appendix D – Cost Estimates

11- PAGE ESTIMATE

11-EA

Type of Estimate : Project Report and EIR/EIS

Program Code :

Project Limits : Proposed SR-11 from the connection to SR-905 at Enrico Fermi Dr. to the proposed Otay Mesa East POE (US/Mexico Border)

Description: **Otay Mesa East CVEF**

Scope : Construct a four-lane highway to connect the proposed POE to the State Highway System for regional connectivity, including interchanges at Alta Road, and grade separated structures.

Alternative : Alternative A - New CVEF

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	30,193,300.00	$	34,952,519.00
STRUCTURE ITEMS	$	-	$	-
SUBTOTAL CONSTRUCTION COST	$	30,193,300.00	$	34,952,519.00
RIGHT OF WAY	$	6,420,000.00	$	6,420,000.00
TOTAL CAPITAL COST	$	36,614,000.00	$	41,373,000.00
PR/ED SUPPORT	$	-	$	-
PS&E SUPPORT	$	3,019,400.00	$	3,975,700.00
RIGHT OF WAY SUPPORT	$	64,200.00	$	85,800.00
CONSTRUCTION SUPPORT	$	4,529,000.00	$	6,422,100.00
TOTAL SUPPORT COST	$	7,612,600.00	$	10,483,600.00
TOTAL PROJECT COST	$	44,250,000.00	$	51,900,000.00

	month	year
Date (Month/Year) of Estimate	9	/ 2009
Estimated Date (Month/Year) of Construction	9	/ 2012
Number of Months of Escalation	36	
Number of Years of Escalation	3.00	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days	500	
Number of Plant Establishment Days		

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Reviewed by District 0.E. (619) 688-6735

Leon G. Edmonds District 11 Office Engineer **Date** **Phone**

Approved by Project Manager

Project Manager **Date** **Phone**

[2] Escalation rates used on this estimate for Support Cost are 12% for FY 07/08, 6% for FY 08/09, and 3% for FY 09/10 and each year beyond. Escalation rates used in this estimate for Highway Construction Capital Costs are 5.0% compounded annually to Construction year. These rates are different than the suggested 2006 STIP of 8.3% for fiscal year 05/06 and 3.0% thereafter. The decision to use 5.0% for this estimate was as per the Office of Office Engineer. (REV081909

11- PAGE ESTIMATE

11-EA

Type of Estimate : Project Report and EIR/EIS

Program Code :

Project Limits : Proposed SR-11 from the connection to SR-905 at Enrico Fermi Dr. to the proposed Otay Mesa East POE (US/Mexico Border)

Description: **Otay Mesa East CVEF**

Scope : Construct a four-lane highway to connect the proposed POE to the State Highway System for regional connectivity, including interchanges at Alta Road, and grade separated structures.

Alternative : Alternative B - Secured Road to Existing CVEF

	Current Cost	Escalated Cost
ROADWAY ITEMS	$ 17,119,800.00	$ 19,818,309.00
STRUCTURE ITEMS	$ 3,082,000.00	$ 3,567,801.00
SUBTOTAL CONSTRUCTION COST	$ 20,201,800.00	$ 23,386,110.00
RIGHT OF WAY	$ 4,620,000.00	$ 4,620,000.00
TOTAL CAPITAL COST	$ 24,822,000.00	$ 28,007,000.00
PR/ED SUPPORT	$ -	$ -
PS&E SUPPORT	$ 2,020,180.00	$ 2,162,900.00
RIGHT OF WAY SUPPORT	$ 46,200.00	$ 49,500.00
CONSTRUCTION SUPPORT	$ 3,030,270.00	$ 3,244,300.00
TOTAL SUPPORT COST	$ 5,096,650.00	$ 5,456,700.00
TOTAL PROJECT COST	$ 29,950,000.00	$ 33,500,000.00

	month	year
Date (Month/Year) of Estimate	9	/ 2009
Estimated Date (Month/Year) of Construction	9	/ 2012
Number of Months of Escalation	36	
Number of Years of Escalation	3.00	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days	500	
Number of Plant Establishment Days		

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Reviewed by District 0.E.

Leon G. Edmonds District 11 Office Engineer **Date** **Phone**

Approved by Project Manager

Date **Phone**

[4] Escalation rates used on this estimate for Support Cost are 12% for FY 07/08, 6% for FY 08/09, and 3% for FY 09/10 and each year beyond. Escalation rates used in this estimate for Highway Construction Capital Costs are 5.0% compounded annually to Construction year. These rates are different than the suggested 2006 STIP of 8.3% for fiscal year 05/06 and 3.0% thereafter. The decision to use 5.0% for this estimate was as per the Office of Office Engineer. (REV081909

11- PAGE ESTIMATE

11-EA

Type of Estimate : Project Report and EIR/EIS

Program Code :

Project Limits : Proposed SR-11 from the connection to SR-905 at Enrico Fermi Dr. to the proposed Otay Mesa East POE (US/Mexico Border)

Description: **Otay Mesa East CVEF**

Scope : Construct a four-lane highway to connect the proposed POE to the State Highway System for regional connectivity, including interchanges at Alta Road, and grade separated structures.

Alternative : Alternative C - WIM at existing POE using public roads to exist CVEF

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	5,938,700.00	$	6,874,788.00
STRUCTURE ITEMS	$	-	$	-
SUBTOTAL CONSTRUCTION COST	$	5,938,700.00	$	6,874,788.00
RIGHT OF WAY	$	1,560,000.00	$	1,560,000.00
TOTAL CAPITAL COST	$	7,499,000.00	$	8,435,000.00
PR/ED SUPPORT	$	-	$	-
PS&E SUPPORT	$	593,870.00	$	635,800.00
RIGHT OF WAY SUPPORT	$	15,600.00	$	16,800.00
CONSTRUCTION SUPPORT	$	890,805.00	$	953,700.00
TOTAL SUPPORT COST	$	1,500,275.00	$	1,606,300.00
TOTAL PROJECT COST	$	9,000,000.00	$	10,050,000.00

	month	year
Date (Month/Year) of Estimate	9	/ 2009
Estimated Date (Month/Year) of Construction	9	/ 2012
Number of Months of Escalation	36	
Number of Years of Escalation	3.00	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days	500	
Number of Plant Establishment Days		

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Reviewed by District 0.E.

Leon G. Edmonds District 11 Office Engineer **Date** **Phone**

Approved by Project Manager

Date **Phone**

[2] Escalation rates used on this estimate for Support Cost are 12% for FY 07/08, 6% for FY 08/09, and 3% for FY 09/10 and each year beyond. Escalation rates used in this estimate for Highway Construction Capital Costs are 5.0% compounded annually to Construction year. These rates are different than the suggested 2006 STIP of 8.3% for fiscal year 05/06 and 3.0% thereafter. The decision to use 5.0% for this estimate was as per the Office of Office Engineer. (REV081909

11- PAGE ESTIMATE

11-EA

Type of Estimate : Project Report and EIR/EIS

Program Code :

Project Limits : Proposed SR-11 from the connection to SR-905 at Enrico Fermi Dr. to the proposed Otay Mesa East POE (US/Mexico Border)

Description: **Otay Mesa East CVEF**

Scope : Construct a four-lane highway to connect the proposed POE to the State Highway System for regional connectivity, including interchanges at Alta Road, and grade separated structures.

Alternative : Alternative D - WIM at new POE and new access road

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	13,763,400.00	$	15,932,856.00
STRUCTURE ITEMS	$	2,278,000.00	$	2,637,070.00
SUBTOTAL CONSTRUCTION COST	$	16,041,400.00	$	18,569,926.00
RIGHT OF WAY	$	4,320,000.00	$	4,320,000.00
TOTAL CAPITAL COST	$	20,362,000.00	$	22,890,000.00
PR/ED SUPPORT	$	-	$	-
PS&E SUPPORT	$	1,604,140.00	$	1,717,400.00
RIGHT OF WAY SUPPORT	$	43,200.00	$	46,300.00
CONSTRUCTION SUPPORT	$	2,406,210.00	$	2,576,100.00
TOTAL SUPPORT COST	$	4,053,550.00	$	4,339,800.00
TOTAL PROJECT COST	$	24,450,000.00	$	27,250,000.00

	month	year
Date (Month/Year) of Estimate	9	/ 2009
Estimated Date (Month/Year) of Construction	9	/ 2012
Number of Months of Escalation	36	
Number of Years of Escalation	3.00	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days	500	
Number of Plant Establishment Days		

Estimated Project Schedule

PID Approval
PA/ED Approval
PS&E
RTL
Begin Construction

Reviewed by District 0.E.

Leon G. Edmonds District 11 Office Engineer **Date** **Phone**

Approved by Project Manager

Date **Phone**

[2] Escalation rates used on this estimate for Support Cost are 12% for FY 07/08, 6% for FY 08/09, and 3% for FY 09/10 and each year beyond. Escalation rates used in this estimate for Highway Construction Capital Costs are 5.0% compounded annually to Construction year. These rates are different than the suggested 2006 STIP of 8.3% for fiscal year 05/06 and 3.0% thereafter. The decision to use 5.0% for this estimate was as per the Office of Office Engineer. (REV081909

Attachment K – Transportation Management Plan

Preliminary Transportation Management Plan (TMP)

Constructing State Route 11 from State Route 905 to the Otay Mesa East Port Of Entry

---

Caltrans

Project Manager	Jacqueline Appleton-Deane, P.E.
Design Manager	Nicola Bernard, P.E.

AECOM Transportation

Project Manager	Kirk Bradbury, P.E.
Project Engineer	Andrea Thomas, P.E.

.

Project ID: 1100000023
EA: 056310

11-SD-11 PM 0.0 to 2.8
11-SD-905 PM R8.4 to 10.1

July 2011

Constructing State Route 11 From State Route 905 to the Otay Mesa East Port Of Entry

This Transportation Management Plan has been prepared under the direction of the following engineers. The registered Civil Engineer attests to the technical information contained therein and has judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

Nicola Bernard, P.E.
Design Manager

Approval Recommended By:

Allen Holden, P.E.
TMP Manager

Foroud Khadem, P.E.
District Traffic Manager

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Appendices

Appendix A

Appendix B

Introduction

The Transportation Management Plan (TMP) is designed to minimize motorist delays when implementing projects on the State freeways and highways system. This should be accomplished without compromising public or worker safety, or the quality of the work being performed.

This Preliminary TMP addresses a proposal for construction of State Route 11 (SR-11), Commercial Vehicle Enforcement Facility (CVEF), and the Otay Mesa East Port of Entry (OME POE). SR-11 is planned as a four-lane highway connecting the State Route 905(SR-905)/SR-11 freeway-to-freeway interchange to the proposed OME POE at the international border with Mexico.

The TMP elements recommended in this report are:

- Public Information
- Motorist Information Strategies
- Incident Management
- Construction Strategies
- Contingency Plans
- Alternate Route Strategies

The intent of the TMP is to implement these elements to effectively achieve the following goals and objectives:

- Reduce traffic delay or time spent in the queue to less than 15 minutes above normal recurring traffic delay.
- Maintain traffic flow throughout the corridor and the surrounding areas.
- Provide a safe environment for the work force and motoring public.

The total cost to implement the TMP elements and to achieve the goals and objectives is estimated to be **$239,500**.

Project Description

The project presented in this document (referred to herein as the "proposed project" or "project") includes the following major elements: State Route 11 (SR-11), a United States (U.S.) federal Port of Entry (POE) at the international border with Mexico, and a State of California Commercial Vehicle Enforcement Facility (CVEF). The proposed project is located in southwestern San Diego County. It is proposed to construct a new four-lane toll highway, SR-11, that would extend from the future State Route 905/State Route 125 Interchange approximately 2.7 miles east to the proposed Otay Mesa East POE in the City of San Diego's Otay Mesa area and in the County of San Diego's East Otay Mesa area. This project will reduce border wait times and border traffic congestion, and create a link between the U.S. regional highway system and the Mexico free and toll road systems.

The proposed project entails the highway connecting SR-905 to the CVEF and the Otay Mesa East POE as well as a southbound SR-125 to eastbound SR-11 connector. SR-11 will cross four local roadways: Sanyo Avenue, Enrico Fermi Drive, Alta Road, and the proposed extension of Siempre Viva Road. Sanyo Avenue would be a grade-separated undercrossing and Alta Road would be a grade-separated overcrossing. A full interchange would be constructed at Enrico Fermi Drive and a partial interchange at Siempre Viva Road. This partial interchange will provide access to and from the west. Northbound commercial vehicles will have access to Siempre Viva Road directly from the CVEF.

At the northwestern end of the Project, two connector roadways to SR-905 are proposed. The first connector begins from westbound SR-11 and terminates approximately 500 feet west of the SR-905/SR-11 freeway-to-freeway interchange (Interchange) where it merges onto SR-905. This connector is anticipated to cross over the westbound SR-905 off-ramp to La Media Road before merging onto SR-905. The westbound SR-905 off-ramp to La Media Road originates from westbound SR-905 and is anticipated to extend approximately 4000 feet while running parallel with SR-905 before terminating at the intersection with La Media Road.

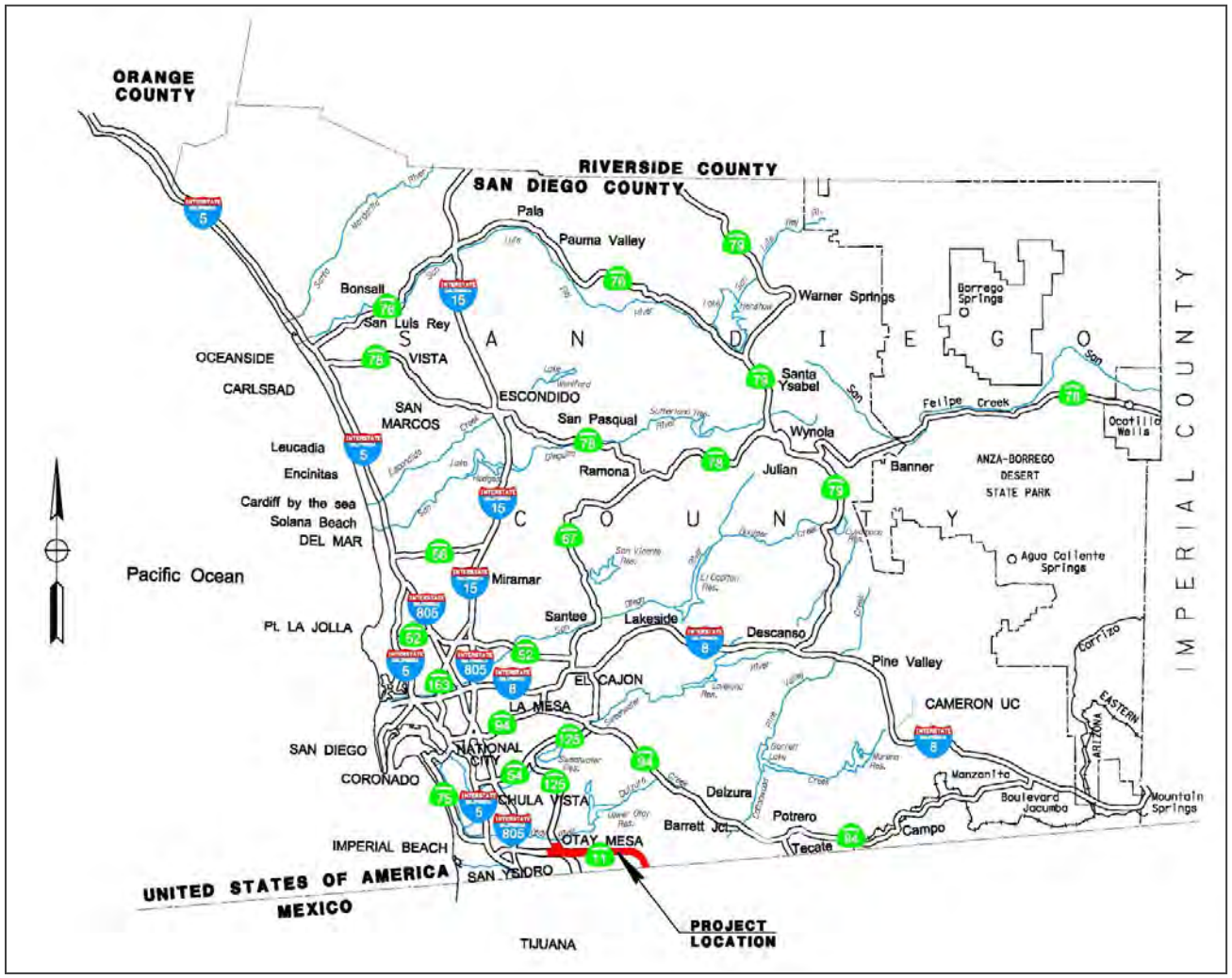
The second connector with SR-905 begins at the SR-905 eastbound off-ramp to SR-11, located immediately west of the Interchange, and transitions to SR-11. This connector is anticipated to cross over SR-905 and the SR-905 westbound off-ramp to La Media Road before transitioning onto eastbound SR-11.

The proposed OME POE is located at the southeastern end of the Project and will service passenger and commercial vehicle traffic in to and out of the United States. Two connecting roadways to the OME POE are proposed. The eastbound connection begins from eastbound SR-11 and terminates at the OME POE. Eastbound SR-11 will split commercial traffic and passenger traffic into separate roadways before passing under the proposed extension of Siempre Viva Road and terminating at the OME POE. The proposed interchange with Siempre Viva Road is located immediately northwest of the OME POE.

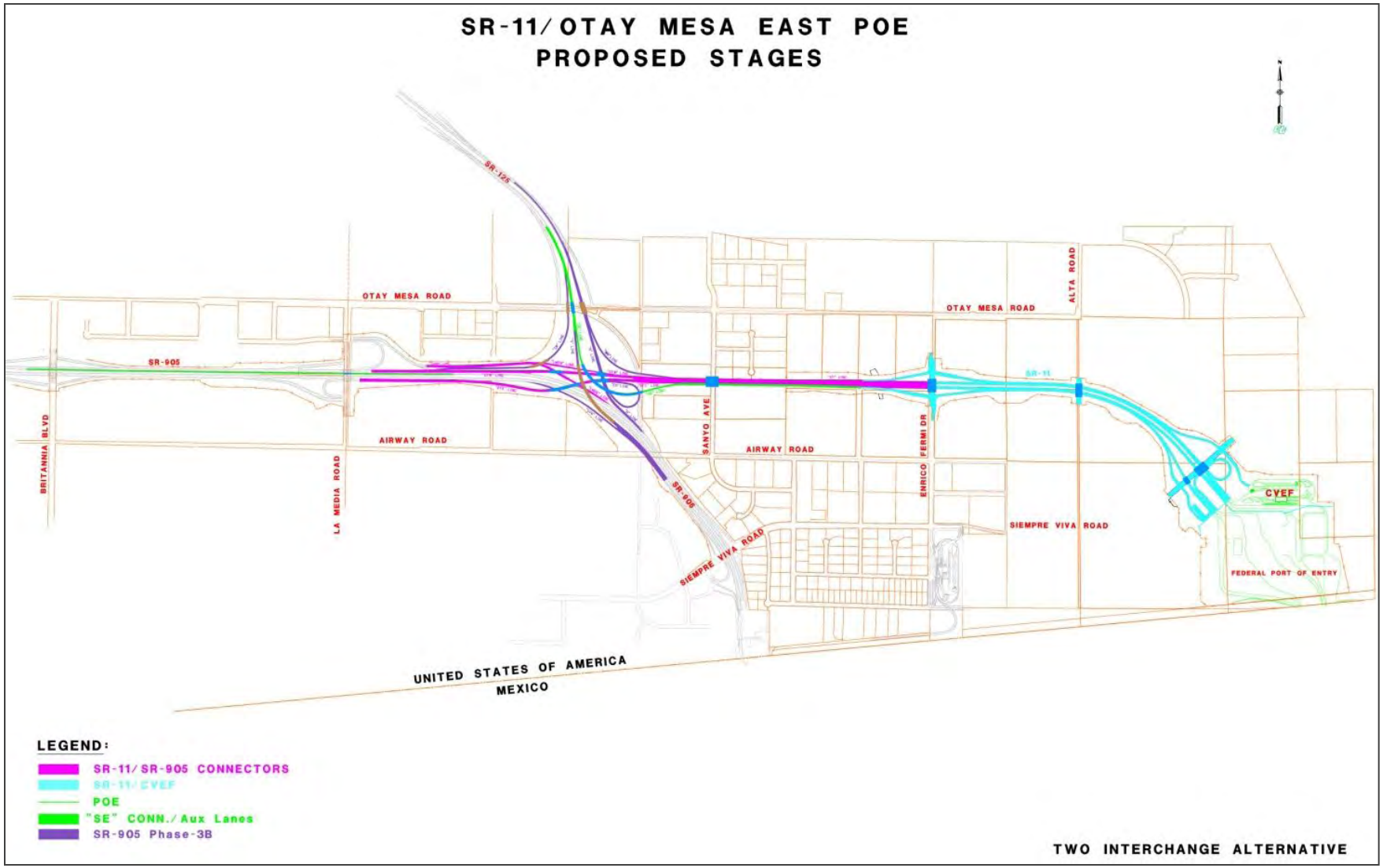
The westbound connection begins at the OME POE as two separate roadways and terminates as the northbound commercial and northbound passenger roadways merge onto SR-11. The northbound commercial roadway begins at the planned CVEF located adjacent to the north side of the OME POE. The passenger roadway begins at the northwest side of the OME POE and ascends to cross over both the southbound and northbound commercial roadways at grade with the Siempre Viva Road overcrossing. It then descends, looping 270 degrees to merge with the northbound commercial roadway. As both the commercial and passenger roadways merge, they cross under Siempre Viva Road, beginning westbound SR-11.

The Project will impact a business area immediately east of Sanyo Avenue as SR-11 passes between existing businesses along an entire developed block. Retaining walls are proposed to lessen the impacts of the Project within this area. Additionally, it is assumed that the various utility and drainage structures that will need to be relocated and reconstructed will occur within the Project's assumed two-year construction timeframe. See Figure 3 at the end of this section for a map of the freeway-to-freeway interchange.

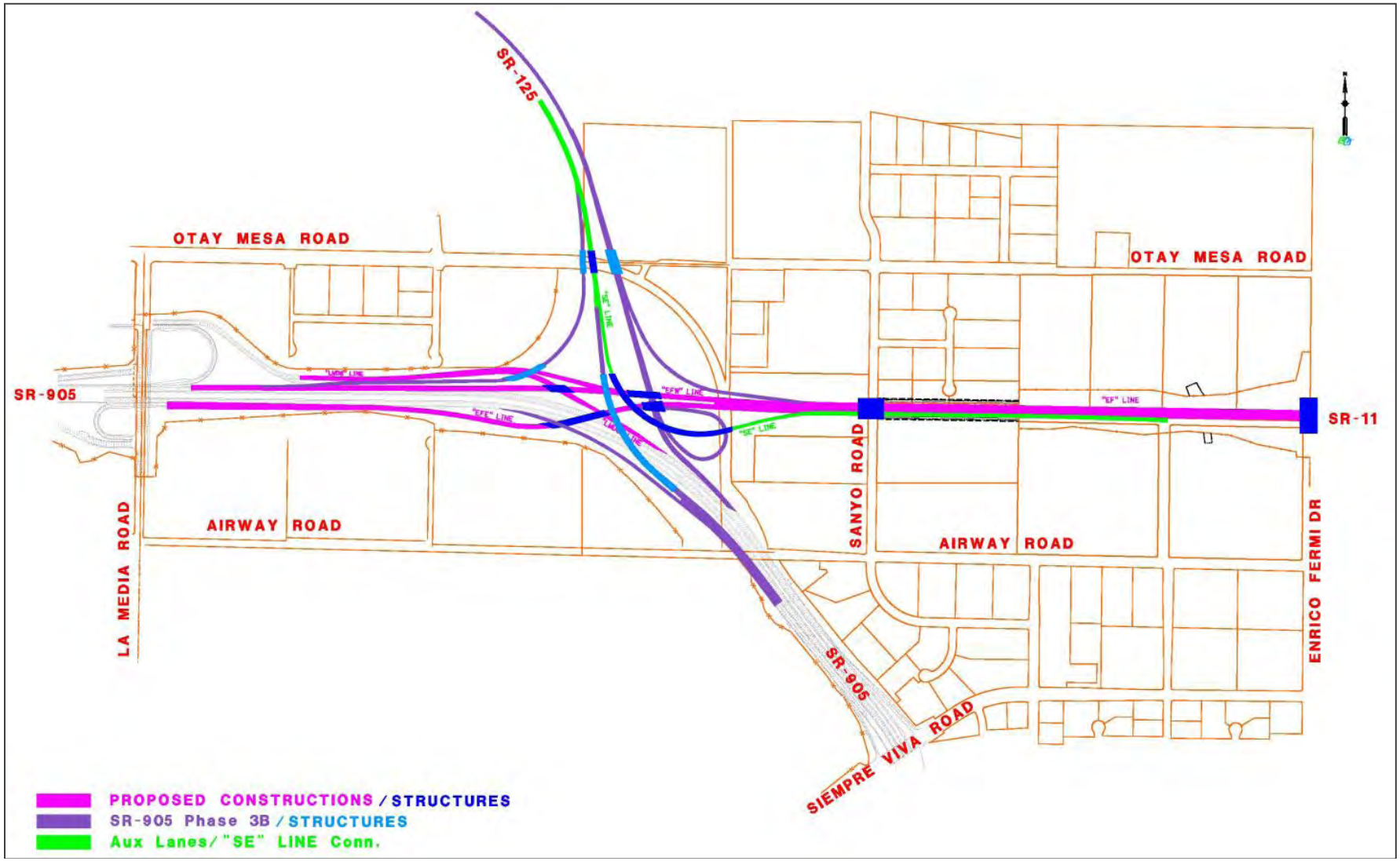
The Project is in the Project Approval and Environmental Document (PA&ED) phase. A Tier II EIR/EIS is under development. The Project is scheduled to break ground for construction late 2013, and opening day anticipated late 2015. A Location Map, Vicinity Map, and a Freeway-To-Freeway Interchange Map are located in Figures 1, 2, and 3, respectively.



Location Map
Figure 1



Vicinity Map
Two Interchange Alternative
Figure 2



Freeway-To-Freeway Interchange Map
Western portion of the Project
Figure 3

Existing Facilities

There are several significant facilities adjacent to the Project. The existing San Diego/Tijuana metropolitan border transportation infrastructure consists of two existing POEs: one in San Ysidro and one in Otay Mesa (See Figures 1, 2, and 3 preceding this section). The San Ysidro POE is served by two freeways, Interstate 5 (I-5) and Interstate 805 (I-805), which merge together into six lanes in each direction before crossing the border. The Otay Mesa POE is served by SR-905 and SR-125. Cross-border commercial traffic is restricted to the Otay Mesa POE. The nearest alternate commercial cross border corridor is located in Tecate, which is approximately 18 miles to the east geographically, and 43 miles by road, the majority of which is a two-lane highway through mountainous terrain.

State Route 905

Presently under construction, SR-905 will be a six-lane conventional highway, upon completion, connecting the Otay Mesa POE to both I-5 and I-805. In the project area, SR-905 will be heavily utilized by trucks and passenger vehicles crossing the International Border both into and out of Mexico. The area immediately surrounding SR-905 at the Otay Mesa POE is an active business area with many warehouses and industrial facilities. A large percentage (15%) of the daily traffic is comprised of trucks, including those with destinations well beyond the State and those which operate entirely within the roadway network surrounding the border crossing. Presently, SR-905 uses Otay Mesa Road a six-lane conventional road just north of Airway Road to connect to SR-125 and also to connect to I-5 and I-805 west of Britannia Blvd. It is assumed that SR-905 will be complete and fully functional before construction of SR-11 begins.

State Route 125

The SR-125 highway is a two-stage project that includes the 12.5 miles of highway from SR-54 near the Sweetwater Reservoir to SR-905 in Otay Mesa near the international border. The project is divided into three segments. The first two segments (Stage One) of the project are the Connector (a 3.2-mile publicly funded section from SR-54 to San Miguel Road in Bonita) and the Gap (a freeway-to-freeway interchange involving the reconstruction and expansion of an existing section of SR-54 where it intersects with the new route of SR-125). The remaining 9.3 miles of the project (Stage Two) connecting to SR-905 near the Otay Mesa border crossing is a state-of-the-art toll road. SR-125 opened initially as a four-lane highway with interchanges at SR-54, future Mount Miguel Road, East H Street, Otay Lakes/Telegraph Canyon Road, Olympic Parkway, future Birch Parkway and Otay Mesa Road/SR-905. SR-125 is designed so that it may be expanded with additional interchanges, carpool lanes and/or transit facilities constructed as future regional growth and transportation needs dictate. To date the south end of SR-125 terminates at Otay Mesa Road. The interchange connecting SR-125 with SR-905 is currently unfunded and plans to construct it are not progressing to date. It is assumed that construction will occur sometime after the Project is completed.

Traffic Management Plan

Project Goals and Objectives of the TMP

The policy for creating the Traffic Management Plan (TMP), according to Deputy Directive-60 (DD-60), is to minimize motorist delays when implementing projects or performing other activities on the State highway and freeway systems. This is accomplished without compromising public or worker safety, or the quality of the work being performed.

The TMP will address closures and other requirements to complete the project in a cost effective and timely manner with minimal interference with the traveling public.

The goals and objectives of this TMP are to:

- Reduce traffic delay or time spent in the queue to less than 15 minutes above normal recurring traffic delay.
- Maintain traffic flow throughout the corridor and the surrounding areas.
- Provide a safe environment for the work force and motoring public.

As a living document, the TMP remains active throughout the highway project. Evaluation of the success of TMP elements during the project is critical. Every effort should be made in advance to create a plan that will work effectively to minimize traffic delays. The TMP must be updated when material change to the project scope occurs affecting the function or adequacy of the TMP, or if TMP elements need to be adjusted to adequately address congestion at the project site.

TMP Elements: An Overview

The following TMP elements are considered the most important with respect to reducing traveler delay and enhancing traveler safety:

1) Public Awareness Campaign (PAC)
2) Motorist Information Strategies
    a. Portable Changeable Message Signs (PCMS)
    b. Ground Mounted Signs
    c. Highway Advisory Radio
    d. Caltrans Highway Information Network (CHIN)
3) Incident Management
    a. Construction Zone Enhanced Enforcement Program (COZEEP)

b. Freeway Service Patrol

c. Traffic Management Team (TMT)

4) Construction Strategies

a. Main Lane, Ramp, and Connector Closures

b. Total Facility Closure

c. Conflicts with Other Projects and Special Events

d. A+B Bidding

5) Contingency Plans

a. Traffic Contingency Plan

b. Contractor Contingency Plan

6) Alternate Route Strategies

a. Detour Traffic

The cost estimates for the above TMP elements are listed in the Transportation Management Plan Data Sheet (Appendix A). These TMP elements are discussed in the following sections.

1) Public Awareness Campaign (PAC)

The primary goal of a PAC is to educate motorists, merchants, residents, elected officials and governmental agencies about potential construction plans and schedule. The PAC is an important tool for reaching target audiences with important construction project information.

An effective PAC will enhance public acceptance, tolerance and cooperation. In addition, public awareness is expected to reduce the traffic demand in the construction zone by encouraging motorists to take alternate routes or to travel outside of closure hours.

In general, the PAC is designed to meet the following objectives:

- Identify target audiences that will be impacted by construction activities.
- Serve as the focal point for project-related questions regarding construction activities, road closures, noise, and dust.
- Inform the public about the construction project and how it could affect their travel through the SR-11 project area.

- Promote alternate routes and modes of transportation.

Specific elements that may be used to inform motorists about construction activities include hand delivered brochures, press releases as needed, paid advertising, public meeting/speakers bureau, and construction bulletins.

District 11 has an existing website where project information is posted. This website (www.dot.ca.gov/dist11) should be included in the PAC to inform motorists about construction activities.

The Project is located immediately north and east of the busy area of the Otay Mesa Port of Entry. There should be at least one public meeting before the start of this project. Several branches of law enforcement operate in the vicinity and their operations may be affected by the work being done. The San Diego Police Department, San Diego County Sheriff's Department, United States Customs and Border Protection (CBP), California Highway Patrol (CHP), and the United States Border Patrol should be notified of construction activities well in advance of its beginning. The Otay Mesa Chamber of Commerce, emergency services and the California Trucking Association should also be kept informed of construction activities and available detours. Additionally, construction bulletin brochures should be sent to all employers in the project area that have staff working nights. These notices should also be sent to all prisons in the area. Newspaper advertisements in the San Diego Union Tribune may be needed as this area of the county continues to grow. Radio advertisements may be substituted for newspaper advertisements.

2) Motorist Information Strategies

The effective implementation of this element is crucial in order to divert the desired volume of traffic away from the construction site. It also enables motorists to make informed decisions about their own travel plans and options with information that is as close as possible to being real-time. Consideration has been given to portable changeable message signs, ground mounted signs, and the Caltrans Highway Information Network (CHIN).

a. Portable Changeable Message Signs (PCMS's)

PCMS's are considered one of the most effective methods to alert motorists of construction activities prior to reaching the work zone, thereby encouraging them to take an alternate route.

- The project estimate calls for a total of six PCMS's. These should be visible to motorists on westbound and eastbound SR-905 to inform them of approaching construction activities.

- During construction, all PCMS's should be checked daily, and fixed or replaced as needed to ensure that they are in proper working condition and that their visibility is not compromised.

- Suitable locations and messages for the PCMS's will be developed jointly by the District Traffic Manager (DTM) Branch and Construction.

b. Ground Mounted Signs

Ground mounted signs are another effective method of getting information about construction and detours to motorists.

- Ground mounted signs should be placed at visible locations in the streets around the main detour along Sanyo Avenue. These should be placed at decision-making points on routes approaching the detour to inform motorists about the options that exist for avoiding construction areas and for other alternate routes that may allow them to avoid the detour as well.

- A ground mounted sign should be used at the existing CVEF to help inform trucks leaving the CVEF of a detour to the north side of the Project along Sanyo Avenue.

- Signs should be in English and Spanish.

- Ground mounted signs should be maintained and updated to keep information current and accurate.

c. Caltrans Highway Information Network (CHIN)

Caltrans maintains a 24-hour information hotline (1-800-427-ROAD) as well as website (http://www.dot.ca.gov/cgi-bin/roads.cgi) with the latest information regarding the conditions of the California State Highway System. The hotline is available for free from any touchtone phone, cellular phone or pay phone. The information provided covers incidents that cause significant delays to the normal flow of traffic including, but not limited to, full closures, one-way traffic controls, lane closures, construction, maintenance projects, and emergencies.

3) Incident Management

a. Construction Zone Enhanced Enforcement Program (COZEEP)

COZEEP refers to the planned presence of CHP Officers stationed at a construction area. Their presence during active lane closures will decrease the response time of incident management and will also help reduce speeds in the work zone, thereby creating a safer environment by reducing the risk of accidents. Fifty nights of COZEEP are estimated to be utilized during placement and removal of K-rail along the SR-905/SR-11 interchange, restriping of the lanes, and falsework construction over SR-905.

b. Freeway Service Patrol

Freeway Service Patrol (FSP) should be provided whenever there are shoulders on existing SR-905 which are narrowed or eliminated. Availability of towing services, especially for large trucks, is

critical to the smooth and continuous operation of the freeway system. The San Diego Association of Government's (SANDAG) freeway service patrol should be made available to serve the Otay Mesa area. The FSP provided by SANDAG operates in the peak periods of weekdays only. Additional FSP would ensure that there is dedicated FSP coverage all day on weekdays and on Saturdays (not Sundays or Federal holidays). The cost to provide this additional FSP coverage is $1,468 per weekday and $949 per Saturday. Their contact information should be made available to CHP and San Diego Police working in the area. This service should be called at the earliest opportunity, as the response time may vary.

c. Transportation Management Team (TMT)

The TMT should be scheduled whenever construction activities are expected to cause a traffic queue on the freeway. The TMT units are to be requested by the Resident Engineer whenever a major lane closure or full freeway closure is planned. The TMT helps to prevent accidents (queue protection) by providing advanced warning to the motorists of abnormal downstream traffic congestion on the freeway. It can also help evaluate signs for detours out in the field and provide advance warning to the motorists in case of an accident or non-recurring congestion. Additionally, the TMT will direct traffic to alternate routes as traffic conditions dictate. The Construction Traffic Manager (CTM) and TMT staff will communicate on-site traffic conditions to the Transportation Management Center (TMC) in District 11 and help develop effective messages for portable and fixed CMS's. The TMT will also recommend changes in TMP elements that will be used to manage traffic.

The CTM and District Traffic Manager (DTM) will be responsible for overseeing the traffic management operation in this corridor. The TMT will assist with the monitoring of traffic conditions (i.e. traffic delays which approach the District's 15-minute delay threshold). Therefore, it is recommended that the TMT monitor planned lane closures for any delays that go beyond the 15-minute threshold and inform the Caltrans Construction Resident Engineer/Inspector.

The TMT will also assess potential problem areas and assist in implementing solutions. Due to the fact that the TMTs are equipped with truck-mounted changeable message signs, the CTM can deploy TMT units very quickly to provide end-of-queue signing to prevent accidents from occurring when nonrecurring congestion develops.

In order to provide these services, the TMT and CTM may need to be resourced for their efforts from this project EA. These services should only be used for mainline closures of construction operations which can be quickly and efficiently removed from the roadway without risking the safety of either workers or the traveling public.

The TMT service will be provided by Caltrans out of the TMC and will be responsible for facilitating communication between construction personnel, CHP personnel, and freeway service patrol. By acting as the primary communications center, the TMC will help expedite the correction of minor and major incidents, help make decisions concerning the closing and opening of on-ramps, manage traffic using the PCMS's and fixed changeable message signs, and provide traffic information to the media.

4) Construction Strategies

a. Lane, Ramp, and Connector Closures

In order to connect SR-11 and SR-905, two freeway-to-freeway connectors are proposed: eastbound and westbound. Both connectors will impact existing traffic as each connector is constructed connecting to SR-905. To allow placement of removable barriers (K-rail), a temporary lane shift is proposed for both directions of SR-905. Lane closures are anticipated during placement of K-rail and restriping operations. A temporary lane shift reduces existing lane widths by one foot so removable barriers can be placed to protect workers that are constructing the eastbound and westbound connectors. A temporary lane shift may reduce the existing three lanes on SR-905 from 12 feet wide to 11 feet wide, which will allow for a three-foot offset from the outer lane. K-rail, which has a width of two feet, will be placed on the three-foot offset. The remaining one foot of space from the outer edge of the outer lane will allow for a workable area to construct the freeway-to-freeway connectors. The reduced and restriped lane widths are expected to operate at design capacity and speed, and may be in place during the expected two-year duration of construction.

b. Total Facility Closure

In general, the Otay Mesa POE remains open 24 hours per day for non-commercial vehicles, but is closed each night between ten p.m. and six a.m for commercial vehicles. This will facilitate construction at the Interchange when full freeway closure is needed. Full closure of SR-905 is anticipated to last for four nights due to falsework construction for the eastbound and westbound SR-11 connectors. The closure requirements will be provided during the PS&E phase of the Project. The DTM and TMP Coordinator should be notified as far in advance of the needed closures as possible. Reasonable access to the border crossing facility should be provided to law enforcement as required.

c. Conflicts with Other Projects and Special Events

Concurrent construction with overlapping project limits should be anticipated in advance and may require a review of TMP elements during construction to avoid unanticipated impacts to traffic flow. A joint effort between the DTM/CTM and Construction must be made to check whether there will be any projects scheduled concurrently with the Project. To date, no major projects appear to be in a material or direct conflict. It is assumed that SR-905 will be completed before the Project begins construction. Also, it is assumed that SR-125 will not have any construction activity during construction of the Project.

5) Contingency Plans

a. Traffic Contingency Plan

The DTM Branch shall be available on an as-needed basis to aid in providing assistance if redirecting traffic volumes is required. Such efforts may require additional cooperation on the part of

Caltrans Public Affairs, CHP COZEEP units, TMP coordinator, TMC personnel, TMT units, and/or maintenance personnel.

This plan is to be activated whenever the contractor's contingency plan is anticipated to fail and opening of lanes on time is deemed unachievable by Resident Engineer/field inspectors.

Early notification to the following is recommended:

- TMC personnel
- Public Information Officer
- District Traffic Manager Branch
- CHP
- TMT
- Maintenance
- Freeway Service Patrol

TMC personnel have access to contact numbers of all branches listed above and can assist in communications if required by field personnel.

It is highly recommended that both a Contractor Contingency Plan and a Caltrans Contingency Plan be reviewed prior to any lane closure activity.

b. Contractor Contingency Plan

Contract special provisions typically require the contractor to provide a Contingency Plan to the Resident Engineer. When developed for the Project, this plan should be submitted by the contractor and reviewed by the engineer. Back-up equipment and material should be on site for any item of work in which a failure may cause a late pick up of a lane closure.

6) Alternate Route Strategies

a. Detour

Temporary closures of SR-905, Enrico Fermi Drive and Alta Road will be required to construct SR-11. Therefore, temporary detours will be necessary to provide access to both sides of these local roadways. Sanyo Avenue will serve as the main detour when Enrico Fermi Drive and Alta Road are closed. During construction of the Project, falsework will be constructed over Sanyo Avenue, thereby closing the Sanyo Avenue detour for approximately two weeks that will include one lane

closure with a flagman during the day and complete closure at night. During this intermittent closure of Sanyo Avenue, the detour will be redirected along Airway Road, La Media Road, and Otay Mesa Road. It is assumed that the Sanyo Avenue detour will exist throughout the Project's two-year construction time frame. Enrico Fermi Drive will need complete closure for five days and a new at-grade detour will be built adjacent to the new bridge site that will remain open for six months.

Falsework will also be constructed for the eastbound connector to SR-905, and will require a temporary detour for approximately four nights to construct and remove falsework. When this closure occurs, both the eastbound and westbound SR-905 will be detoured along Siempre Viva Road and La Media Road where there are SR-905 interchanges at both local roads.

As part of the preferred alternative the southbound SR-125 to eastbound SR-11 connector will require a temporary closure of Otay Mesa Road for three nights to construct and remove falsework. When this occurs, the detour will be along Harvest Road, Airway Road and La Media Road.

The main detour throughout the Project's two-year construction duration will utilize Sanyo Avenue. Several minor detours will exist as falsework is constructed above Sanyo Avenue, and SR-11 is constructed.

Reasonable access to businesses along the main and minor detours should be maintained throughout the duration of the Project's construction. The Project expects the main detour to be operational throughout the duration of construction and assumes no modifications are necessary to any streets.

APPENDICES

Appendix (A) – TMP Data Sheet

TRANSPORTATION MANAGEMENT PLAN DATA SHEET
(Preliminary TMP Elements and Costs)

Co/Rte/KP SD/11/0.0 to 2.8 and SD/905/R8.4 to 10.1 EA 11 0000 0023 056310 Alternative No. Rev. 1

Project Limit SR-125/SR-905 to the Otay Mesa East Port of Entry

Project Description Construction of SR-11

Expected Construction Schedule 2013-2015

1) Public Information

☒	a. Brochures and Mailers	$6,000
☒	b. Press Release	
☒	c. Paid Advertising	$20,000
☐	d. Public Information Center/Kiosk	$
☒	e. Public Meeting/Speakers Bureau	
☐	f. Telephone Hotline	
☒	g. Internet	
☒	h. Others Construction Bulletins	$16,500

2) Motorists Information Strategies

☐	a. Changeable Message Signs (Fixed)	$
☒	b. Changeable Message Signs (Portable)	$30,000
☒	c. Ground Mounted Signs	$17,000
☒	d. Highway Advisory Radio	$
☒	e. Caltrans Highway Information Network (CHIN)	
☐	f. Others	$

3) Incident Management

☒	a. Construction Zone Enhanced Enforcement Program (COZEEP)	$50,000
☒	b. Freeway Service Patrol	$100,000
☐	c. Traffic Management Team	
☐	d. Helicopter Surveillance	$
☐	e. Traffic Surveillance Stations (Loop Detector and CCTV)	$
☐	f. Others	$

4) Construction Strategies

- [x] a. Lane Closure Chart
- [ ] b. Reversible Lanes
- [ ] c. Total Facility Closure
- [ ] d. Contra Flow
- [ ] e. Truck Traffic Restrictions $ _____
- [ ] f. Reduced Speed Zone $ _____
- [x] g. Connector and Ramp Closures
- [ ] h. Incentive and Disincentive Clause $ _____
- [ ] i. Moveable Barrier $ _____
- [ ] j. Others _____ $ _____

5) Demand Management

- [ ] a. HOV Lanes/Ramps (New or Convert) $ _____
- [ ] b. Park and Ride Lots $ _____
- [ ] c. Rideshare Incentives $ _____
- [ ] d. Variable Work Hours
- [ ] e. Telecommute
- [ ] f. Ramp Metering (Temporary Installation) $ _____
- [ ] g. Ramp Metering (Modify Existing) $ _____
- [ ] h. Others _____ $ _____

6) Alternative Route Strategies

- [ ] a. Add Capacity to Freeway Connector $ _____
- [ ] b. Street Improvement (widening, traffic signal... etc) $ _____
- [ ] c. Traffic Control Officers $ _____
- [ ] d. Parking Restrictions
- [x] e. Others Detour Traffic $ _____

7) Other Strategies

- [ ] a. Application of New Technology $ _____
- [ ] e. Others _____ $ _____

TOTAL ESTIMATED COST OF TMP ELEMENTS = $239,500

Project Notes:

Assumptions/ Comments:

1. Entire project will take approximately 520 working days to construct.

2. Current dollar values used. Inflation was not factored into the estimate.

3. Traffic Control/Maintain Traffic costs were not provided. Please consult with the OE or Construction office for this estimate.

4. Portable CMS specified for this project by this estimate are designated for congestion relief as outlined by DD-60. Portable CMS required for other purposes should be included under other specifications. Six portable CMS are assumed here ($5,000 each).

5. The COZEEP specified for this project by this estimate is designated for congestion relief as outlined by DD-60. The COZEEP required for other purposes should be included under other specifications.

6. There should be at least one public meeting before the start of the project. The Otay Mesa Chamber of Commerce should be notified of all closures affecting their members. Construction Bulletin brochures should be sent to employers that have staff working nights. These notices should also be sent to all of the prisons in the area. Newspaper ads in the San Diego Union may be needed as this area of the county continues to grow. Radio ads may be substituted for newspaper ads. Tweets for each closure will be sent out. In addition, emergency services shoud be notified as well as the CA trucking association.

Note 1: All projects who's contract value is $5 million or more, and/or meet certain other criteria should be evaluated for applicability of A+B Bidding. Consult the OE for more details about A+B Bidding.

Note 2: As outlined in Deputy Directive 60, this TMP is a living document, subject to change as required by changing circumstances. If there is material change to the project scope which will affect the function or adequacy of the TMP, then changes to the TMP must be addressed. If traffic conditions at the project site demonstrate that TMP elements need to be adjusted to adequately address congestion, then the TMP shall be altered accordingly.

Note 3: Hospitals with emergency services and fire stations that may require access through work zones at all hours should be accommodated. Schools, major venues, shopping malls, and other heavily utilized areas should also be notified of construction activities that may impact their services.

PREPARED BY Allen Holden DATE 7/19/11

APPROVED BY Foroud Khadem DATE 7/19/11

Appendix (B) – Deputy Directive 60

Deputy Directive

Number: DD-60-R1

Refer to Director's Policy: DP-03 Safety and Health
DP-05 Multimodal Alternatives Analysis
DP-08 Freeway System Management

Effective Date: September 2007

Supersedes: DD-60 (06-15-00)

TITLE Transportation Management Plans

POLICY

The California Department of Transportation (Department) minimizes disruption to the traveling public during construction or other planned activities necessary on the State Highway System. The Department uses innovative means to accelerate completion of highway work activities while taking necessary steps to maintain public and worker safety and the quality of the work being performed.

Transportation Management Plans are required for all planned activities on the State Highway System. Transportation Management Plan measures and associated road user costs and additional construction costs are considered during the project initiation or planning stage to the fullest extent feasible. Transportation Management Plans include strategies that strive to minimize work-related traffic delays while reducing overall duration of work activities where appropriate. Strategies that may result in a net reduction of overall delay for motorists include: full facility closures, extended weekend closures, continuous weekday closures, A+B contract specifications, and performance-based traffic handling specifications.

BACKGROUND

The Department's major emphasis on transportation projects has largely shifted from new construction to reconstruction, operation, and maintenance of existing facilities. With the ever-increasing traffic volumes on California's State Highway System and more complex project corridors, the need to actively manage the State's highway facilities has become critical.

In order to prevent unreasonable traffic delays resulting from planned work, Transportation Management Plans must be carefully developed and implemented to maintain acceptable levels of service and safety during all work activities on the State Highway System.

The Federal Highway Final Rule, 23 Code of Federal Regulations 630, Subpart J, referred to as "Work Zone Safety and Mobility" requires the Department to adopt a policy that implements Transportation Management Plans on all federally-funded highway projects. Transportation Management Plans are to be consistent with the Final Rule guidelines for developing and implementing that policy.

Transportation Management Plans are to be consistent with Deputy Directive-64, "Accommodating Non-Motorized Travel."

DEFINITIONS

Transportation Management Plan is a program of activities for alleviating or minimizing work-related traffic delays by the effective application of traditional traffic handling practices and an innovative combination of various strategies. These strategies encompass public awareness campaigns, motorist information, demand management, incident management, system management, construction methods and staging, and alternate route planning. Depending on the complexity of the work or magnitude of anticipated traffic impacts, a Transportation Management Plan may provide lane closure charts, Standard Special Provisions for maintaining traffic, traffic control plans, and for a major project, a separate comprehensive report. The Department's "Transportation Management Plan Guidelines" provide more information on the recommended level of detail for Transportation Management Plans.

Major Lane Closures are those that are expected to result in *significant traffic impacts* despite the implementation of Transportation Management Plans.

Significant Traffic Impact is defined as being an individual traffic delay of 30 minutes or more above normal recurrent travel time on the existing facility. Transportation Management Plan strategies are designed to maintain additional delays below this maximum threshold, i.e. less than 15 or 20 minutes. This 30 minute maximum delay may be exceeded with approval by the District Lane Closure Review Committee.

District Lane Closure Review Committee is comprised of the Deputy District Directors of Construction, Design, Maintenance and Traffic Operations, and the District Public Information Officer (PIO).

Headquarters Lane Closure Review Committee is comprised of the Division Chiefs of Construction, Design, Maintenance and Traffic Operations, and the Deputy Director of External Affairs. The California Highway Patrol (CHP) will be called upon to participate as appropriate at the District or Headquarters Level.

RESPONSIBILITIES

District Directors:

- Enforce Transportation Management Plans and lane closure policies to ensure compliance with established procedures, guidelines, and policies.
- Ensure that resources for all Transportation Management Plan activities are provided.

Chief, Division of Traffic Operations:

- Develops, implements, and maintains statewide policy regarding Transportation Management Plans.
- Provides direction and assistance to District staff on all Transportation Management Plan activities as well as resources for training of District staff involved in Transportation Management Plans.
- Ensures consistency among the Districts on the development and implementation of Transportation Management Plans.

Deputy District Directors, Construction, Design, Project Management, Maintenance and Traffic Operations:

- Require all staff involved in Transportation Management Plan activities to participate in Transportation Management Plan training.
- Ensure that staff involved in highway work activities consider alternatives that will strike a balance between reducing the overall construction duration and minimizing disruption to the traveling public.

Chief District PIO:

- Participates in the project development phase of appropriate projects as determined by the Project Development Team to provide input on the cost of public awareness campaigns, which should be included in the construction contract allotment under State Furnished Materials and Expenses.
- Attends preconstruction or planning meetings as needed and prepare a project plan for community outreach strategies.
- Works with the District Project Manager to ensure that Transportation Management Plan funding for community outreach strategies is planned accordingly as well as expended appropriately, and that personnel time is included in the Work Breakdown Structure for the project.
- Assists or be the lead in implementation of a project's public awareness campaign.

- Develops and maintains liaisons with the media, affected local jurisdictions and legislators, and other external partners both prior to and during the construction period, as needed.

District Lane Closure Review Committee:

- Reviews proposed work activities and approves or makes recommendations in a timely manner when planned activities are expected to 1) result in significant traffic impacts, or 2) be of an interregional, statewide, or otherwise sensitive nature.
- When the District Lane Closure Review Committee determines that consultation or approval by the Headquarters Lane Closure Review Committee is appropriate, requests through the District Traffic Manager that the Headquarters committee convene to discuss a specific project and its anticipated impacts.

District Transportation Management Plan Managers:

- Act as single focal points for planning and development of Transportation Management Plans. Participate in the evaluation of design, potential traffic impacts and mitigation measures for project alternatives and in the preparation of Project Study Reports, Project Reports, Plans, Specifications, and Estimates. The Transportation Management Plan Manager should involve District Traffic Manager, members of the Planning, Maintenance and Construction Divisions and the Project Development Team in the planning and development of the Transportation Management Plan to address all pertinent issues, including multi-modal strategies, roadway maintenance during temporary closures, and constructability review.
- Work with the District Traffic Manager, District Design, Project Manager, Construction and PIO as appropriate to determine the extent of a Transportation Management Plan and ensure that the Transportation Management Plans are updated during all phases of a project. Facilitate review, approval, modification or disapproval of all Transportation Management Plan measures.
- Consider the cumulative impact of multiple projects as well as other activities that may create or generate an increase in traffic demand within the limits and during the work period. Oversee implementation and coordination of inter-regional Transportation Management Plans between corridors, districts, neighboring states and Mexico.
- Ensure that Transportation Management Plan planning and implementation is coordinated with the CHP and other local and regional transportation stakeholders as appropriate.

District Project Managers:

- Require Transportation Management Plans to be considered in the earliest stages of development for all projects and activities performed on the State Highway System.
- Identify needed project resources for all Transportation Management Plan measures and activities.
- Schedule projects to combine with other work activities to the extent possible.
- Encourage the use of innovative construction staging and contracting methods to accelerate project completion when appropriate.
- Include the District Transportation Management Plan Manager, the District Traffic Manager, and the PIO as needed on Project Development Teams from project initiation through completion of construction and provide adequate project information for review.
- Coordinate development of Transportation Management Plans with affected local and regional transportation stakeholders as needed.

District Traffic Managers:

- Consult with the Transportation Management Plan Manager during the planning and development of the Transportation Management Plan.
- Responsible with the District Construction Engineers, Resident Engineers, Encroachment Permit Inspectors, Maintenance Supervisors/Superintendents and PIO to ensure implementation of the Transportation Management Plan and make changes to the Transportation Management Plan if needed during conduct of the work.
- Determine when review of work activities by the District Lane Closure Review Committee or Headquarters Lane Closure Review Committee is required or necessary.
- Responsible for the day-to-day traffic decisions pertaining to traffic impacts from planned activities on the State Highway System.
- Coordinate with the Transportation Management Center or District Communication Center staff to respond with appropriate measures when significant travel delays occur on the State Highway System.
- Facilitate review, approval, modification, or disapproval of planned lane closure requests on the State Highway System.
- Recommend termination or modification of active planned lane closure operations without compromising the safety of the public or workers, when traffic impact becomes significant.
- Review construction contingency plans.

District Design, Office Engineer, Maintenance, and Encroachment Permit Engineers:

- Ensure Transportation Management Plan measures are fully incorporated in the development of a project.

- Coordinate with the District Traffic Manager and the District Transportation Management Plan Manager to consider alternative strategies as appropriate to determine the best alternatives for balancing traffic impact cost, and construction duration and cost.
- Ensure that impacts of Transportation Management Plan options are fully considered during the development of work schedules and cost estimates.
- Coordinate with District Traffic Management and District Transportation Management Plan Manager if changes in Transportation Management Plan strategies are warranted during all phases of the work. Ensure that Transportation Management Plan content is up-to-date by obtaining certification of the Transportation Management Plan by District Traffic Manager and District Transportation Management Plan Manager before submittal to the Office Engineer at Ready-to-List phase.
- Develop project information in consultation with the Project Manager, District Traffic Manager and Transportation Management Plan Manager to present to the District Lane Closure Review Committee or Headquarters Lane Closure Review Committee when deemed appropriate.

District Construction Engineers, Resident Engineers, Encroachment Permit Inspectors, and Maintenance Supervisors/Superintendents:

- Ensure full implementation of approved Transportation Management Plans in close coordination with the District Traffic Manager so that disruption to the traveling public is minimized.
- Work with the District Traffic Manager to ensure that project activities conform to the Transportation Management Plan, contingency plans are implemented if necessary, and disruption to the traveling public is minimized and does not exceed limits established in the Transportation Management Plan.
- Include the District Transportation Management Plan Manager, the District Traffic Manager, and the PIO as appropriate in preconstruction or work planning meetings.
- Determine when a construction contingency plan from the contractor is required.
- Ensure contractor is prepared to comply with Transportation Management Plans as related to work performance.
- Notify District Communication Centers or Transportation Management Centers when unforeseen traffic impacts result from planned work.
- Notify the District Communication Center or Traffic Management Centers to report the status of all lane closures in a timely manner (when closures are put in place and when they are picked up) so that accurate information is provided to the public. When reporting, provide specific details, particularly when a planned lane closure may be picked up late and significant traffic impacts are expected to result.

- Coordinate work activities with the CHP and other local and regional transportation stakeholders as appropriate.

Traffic Management Center Staff:

- Status lane closures in the statewide Lane Closure System.
- Activate Transportation System Management elements in support of the Transportation Management Plan.
- Inform the District Traffic Manager when notified of potential significant impacts due to planned highway activities.

APPLICABILITY

All departmental employees involved in Transportation Management Plan activities.

Randell H. Iwasaki

RANDELL H. IWASAKI
Chief Deputy Director

September 28, 2007
Date Signed

Attachment L - Storm Water Data Report (SWDR)

Long Form - Storm Water Data Report

Caltrans

Dist-County-Route: 11 – SD – 11, 905

Post Mile (Kilometer Post) Limits: SR11 PM 00.0/02.7
SR 905 PM R8.4/R10.1

Project Type: Construct New Four Lane Facility

EA: 11 - 056310

RU: 11-236

Program Identification: STIP

Phase: ☐ **PID** ☒ **PA/ED** ☐ **PS&E**

Regional Water Quality Control Board(s): San Diego (Region 9)

Is the project required to consider incorporating Treatment BMPs? ☒ Yes ☐ No

If yes, can Treatment BMPs be incorporated into the project? ☒ Yes ☐ No

If No, a Technical Data Report must be submitted to the RWQCB at least 60 days prior to PS&E Submittal. List submittal date: _____

Total Disturbed Soil Area: No Interchange Alternative. – 246 Acres, One Interchange Alternative – 263.4 acres, Two Interchange Alternative – 264.3 Acres

Estimated Construction Start Date: 10/2013 Construction Completion Date: 10/2015

Notification of Construction (NOC) Date to be submitted: 3/2013

Notification of ADL reuse (if Yes, provide date) ☐ Yes Date: _____ ☒ No

Separate Dewatering Permit (if Yes, permit number) ☐ Yes Permit #: _____ ☒ No

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the data upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Fardad Behboody, Registered Project Engineer — Date: 11-1-2010

I have reviewed the storm water quality design issues and find this report to be complete, current, and accurate:

Jacqueline Appleton-Deane, Project Manager — Date: 11-1-2010

Terry Kloepfer, Designated Maintenance Representative — Date: 11/01/2010

David Strickland, Designated Landscape Architect Representative — Date: 11/02/10

STAMP
[Required for PS&E only]

May Z. Alsheikh, District/Regional SW Coordinator or Designee — Date: 11-1-2010

STORM WATER DATA INFORMATION

1. Project Description

- Proposed State Route 11 (SR-11) would extend generally east and south for approximately 2.8 miles from the east side of the approved SR-905/SR-125 interchange (near Harvest Road), extending through the Otay Mesa East Port of Entry (POE)/Commercial Vehicle Enforcement Facility (CVEF) sites and terminating at the U.S.-Mexico border. Extending west of Harvest Road, the project would include approximately 2.1 miles of connectors and auxiliary lanes linking SR-11 to SR-905. Existing development within the SR-11 limits of disturbance includes portions of an industrial park (in the area just east of Sanyo Avenue), a vehicle auction yard near the southwestern corner of the Otay Mesa Road/Alta Road intersection, and an adjoining parcel to the west of this, which has been graded and is currently being used for truck parking. The remaining portions of the proposed SR-11 limits of disturbance encompass areas of native and non-native vegetation, previously graded (but undeveloped) sites, and a number of unpaved roads and trails. Modifications to SR-905 to accommodate its connections with SR-11 would occur between the SR-905/SR-125/SR-11 Interchange and the SR-905/Britannia Boulevard Interchange, and would be entirely within the existing R/W for SR-905. Industrial, undeveloped and educational (Southwestern College satellite campus) land abuts this segment of SR-905.

  The combined POE/CVEF footprint would extend from the eastern/southern terminus of proposed SR-11 to the U.S.-Mexico international border. The proposed POE and CVEF sites are currently undeveloped, and encompass primarily non-native vegetation, with several unpaved roads and trails.

  SR-11 would be constructed and operated as a toll facility under all of the build alternatives, with SANDAG as the approved tolling agency under authorizing State legislation.

  Two Interchange Alternative:

  Under the Two Interchange Alternative, SR-11 would be constructed as a four-lane toll highway, with two lanes in each direction, plus auxiliary lanes and connectors. It would extend east from the vicinity of Harvest Road (at the future SR-905/SR-125 Interchange) for approximately 1.5 miles, before curving to the southeast near Alta Road and continuing for approximately 0.6 mile to connect with the proposed POE/CVEF site. Proposed SR-11 would be located midway between Otay Mesa and Airway roads for most of its length, and would cross four local surface streets: Sanyo Avenue, Enrico Fermi Drive, Alta Road, and Siempre Viva Road. An undercrossing structure would be built at Sanyo Avenue, an overcrossing would be provided at Alta Road, and local interchanges would be constructed at Siempre Viva Road (half interchange) and Enrico Fermi Drive. To link SR-11 to SR-905, it would be necessary to modify the western portion of SR-905 that is currently under construction, including the replacement of the approved one to two lane local access connections to Enrico Fermi Drive with two-lane connectors between SR-11 and SR-905, as well as associated modifications to SR-905 to accommodate the connectors.

  SR-905 was originally approved (and is now under construction between SR-125 and Britannia Boulevard) as a six-lane highway (three lanes in each direction), with a median wide enough to accommodate four additional lanes, two of which could function as high occupancy vehicle (HOV) lanes. The eastern portion of approved SR-905 includes one- and two-lane ramps from SR-905, just east of the SR-905/SR-125 interchange, to Enrico Fermi Drive, along the approximate alignment of what is now proposed to be SR-11 and SR-11/SR-905 connectors. With implementation of SR-11, certain modifications to the approved SR-905 design would be required, and are included as part of the proposed project. These modifications are described below for the Two Interchange Alternative, but would be the same under the One and No Interchange Alternatives.

  The previously approved on-/off-ramps from SR-905 to Enrico Fermi Drive would be replaced by the western portion of SR-11 (east of Harvest Road), as well as two-lane connectors in each direction (west of Harvest Road) for the entire distance linking SR-905 and SR-11, along the same alignment as the previously approved on-/ off-ramps.

On the eastbound side of SR-905, an additional auxiliary lane would be extended between La Media Road and the SR-11 connector, requiring a slight widening in this area.

To accommodate weaving movements on the westbound side of SR-905, the two SR-11 connecting lanes would join the three approved SR-905 travel lanes, tapering to the approved three-lane cross-section over approximately 1.7 miles. To accommodate the SR-11 connecting lanes, the proposed project would slightly widen SR-905 on its northern boundary between the SR-905/SR-125/SR-11 interchange and the La Media Road interchange, and would narrow the median from just east of La Media Road to just west of Britannia Boulevard.

The SR-905 modifications to accommodate SR-11 connections would extend approximately 2.1miles west of the terminus of SR-11 itself, at approximately Harvest Road, and would be entirely within existing SR-905 R/W. All other connectors within the SR-905/SR-125/SR-11 Interchange would remain as they were approved under the SR-905 and SR-125 projects.

One Interchange Alternative:

Under the One Interchange Alternative, the designs of the SR-905/SR-125/SR-11 Interchange, the SR-11/SR-905 connectors, the Otay Mesa East POE (including the potential future transit center site), and the CVEF would be the same as described above for the Two Interchange Alternative. The proposed SR-11 would be constructed with a single interchange at Alta Road, approximately 1.4 miles east of the SR-905/SR-125/SR-11 Interchange. This would be a full interchange. SR-11 would have an undercrossing structure at Sanyo Avenue and overcrossings at Enrico Fermi Drive and Siempre Viva Road.

In contrast to the Two Interchange Alternative, SR-11 at Siempre Viva Road would be constructed as an overcrossing, with no access to or from SR-11, under this alternative. Ramps would still be provided in this location to connect the POE and SR-11.

No Interchange Alternative:

The designs of the SR-905/SR-125/SR-11 Interchange, Otay Mesa East POE (including the potential future transit center site), CVEF, and SR-11 connectors to SR-905 and associated modifications to SR-905 extending to the Britannia Boulevard Interchange would be the same under this alternative as described above for the Two Interchange Alternative.

Under the No Interchange Alternative, no interchanges would be constructed along proposed SR-11. An undercrossing structure would be provided at Sanyo Avenue, and overcrossings would be constructed at Enrico Fermi Drive, Alta Road, and at Siempre Viva Road. As in the case of the One Interchange Alternative, the No Interchange Alternative would have a slightly smaller footprint between Sanyo Avenue and Enrico Fermi Drive than would the Two Interchange Alternative, due to the elimination of the Enrico Fermi Drive Interchange and its associated auxiliary lanes; the design of the Sanyo Avenue undercrossing would be similar to that described above for the previous two build alternatives. In addition, SR-11 under this alternative would exhibit narrower construction and R/W limits at Enrico Fermi Drive and Alta Road than those described for the build alternatives with interchanges at these locations, with consequently lesser partial property acquisitions. The design of the Enrico Fermi Drive and Siempre Viva Road overcrossings would be as described under the One Interchange Alternative, while the Alta Road overcrossing would be as described under the Two Interchange Alternative.

- The total limits of disturbance for SR-11 under the Two Interchange Alternative would be 264.3 acres. This includes acreage along SR905, along the "flyover" as well as the along the entire new SR-11 corridor and the CVEF. This number excludes the acreage for the POE, as it is a separate, Federal facility.

  The total limits of disturbance for SR-11 under the One Interchange Alternative would be 263.4 acres.

  The total limits of disturbance for SR-11 under the No Interchange Alternative would be 246 acres.

- The existing impervious surface area is 51 acres. The future impervious surface area for SR-11, including tying into SR 905 and the CVEF and excluding the POE, will be as follows: 75.3 acres for the No Interchange Alternative, 83.9 acres for the One Interchange Alternative, 85.1 acres for the Two Interchange Alternative.
- This Project falls within the Municipal Separate Storm Sewer System (MS4) of the County of San Diego.

2. Define Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

- The entirety of the SR-11 Project is located in the Tijuana River Watershed. The project is roughly 1.8 miles from the Tijuana River, the receiving body in the watershed. Any Project discharge will have an indirect influence on the Tijuana River.
- The Tijuana River is on the 303(d) list and has a priority rating of four. The Hydraulic Area is Tijuana Valley. The Sub Area is 911.12 and is called Water Tanks. The pollutant impairments in the receiving body are eutrophic conditions, indicator bacteria, low dissolved oxygen, pesticides, solids, synthetic organics, trace elements and trash. The identified beneficial uses of the river are: non-contact recreation, warm freshwater aquatic habitat, wildlife habitat, and terrestrial wildlife habitat for non-threatened and threatened endangered species. The potential uses of the river include water-contact recreational applications and industrial service supply.
- Any discharge or runoff from the Project will not directly enter the Tijuana River, as the Project is at least 1.8 miles north of the Tijuana River. There are, however, unnamed, southwest trending ephemeral creeks in the area. A collection of vernal pools is also located both within, and just outside of, the proposed State Right-of-Way. A 401 Water Quality Certification will be required and will be obtained in the future.
- There are no reservoirs or recharge facilities within the Project limits. The Tijuana River Watershed does have alluvial deposits and the San Diego County Water Authority (SDCWA), as one of the potential sites, is studying the region for Aquifer Storage and Recharge Projects. The SDCWA work is in the "study stage" and specific sites have not yet been chosen. Since the appropriate sites for SDCWA facilities are locations containing the San Diego Formation, a proposed site would most likely not be in the area of the project since a search of the Department of Agriculture's Web Soil Survey reveals that virtually no San Diego Formation is found in the project area.
- Currently, the Total Minimum Daily Loads (TMDL) for the Tijuana River watershed has not been established. However, there are special requirements for trash.
- There are no described local agency requirements or concerns for this Project.
- The average annual rainfall on the mesa is about 10.5 inches a year, with nearly all of that falling between the designated rainy season for San Diego County of October 1st through May 1st. The annual mean temperature in San Diego is about 63° Fahrenheit. The Web Soil Survey shows that the topography within the Project area consists of gently rolling terrain with elevations ranging from 525 to 650 feet above sea level.
- Soils in the area are from the following formations: Diablo Clay, Huerhuero Loam, Salinas Clay, and Stockpen Gravelly Clay Loam. Slopes in the area are all less than 15% and Diablo Clay makes up over 75% of the soil formation in the area. The rest of the formations, each less than 10% of the whole, make up the rest. These soils belong to Group D. Mima mounds and vernal pools are associated with some of these soil types. There are both mounds and pools in a small area outside the far southwestern corner of the State's portion of the project. Within the project footprint, a few vernal pools and ephemeral streams exist.
- There will be no reuse of soil containing Aerially Deposited Lead.
- The Right of Way costs for the Best Management Practice (BMP) is expected to be minimal since the right of way in the area where the connectors will be constructed has been purchased and the project plans have been designed to fit within that footprint.
- Measures for avoiding or reducing potential storm water impacts include the following: staging work so soil disturbance in the rainy season is avoided, disturbing existing slopes only when necessary, minimizing cut and fill areas, incorporating retaining walls, preserving existing vegetation where possible (or re-vegetating where not possible), acquiring right of way easements, collecting concentrated flows in stabilized drains and

channels, rounding and benching slopes, avoiding difficult-to-stabilize soil formations and utilizing BMPs. Additionally, many of the permanent BMP can be implemented early in the project.

- There are existing treatment BMPs along SR 905. Except for a City owned detention basin at Sanyo Avenue that will be relocated, the Project will not impact the existing BMPs. Along the SR 11, there are no existing treatment BMPs.

3. Regional Water Quality Control Board Agreements

- This Project lies within the jurisdiction of the San Diego Regional Water Quality Control Board (Region 9).
- There are no negotiated understandings or agreements with the SDRWQCB pertaining to this Project.

4. Describe Proposed Design Pollution Prevention BMPs to be used on the Project.

Downstream Effects Related to Potentially Increased Flow, Checklist DPP-1, Parts 1 and 2

- Impervious area within the project limits will increase and downstream increased velocities will be mitigated. This will be achieved through numerous detention devices to decrease peak flows to pre-development rates.
- The drainage design and its affect on pre- and post-development flow are discussed in detail in the Preliminary Hydrology and Hydraulics Report for SR-11 and the CVEF.
- Potential sediment loading will be prevented/minimized by stabilizing all disturbed slopes with permanent planting and hydroseeding.
- The Project will cross or cause hydraulic changes to natural channels and streams and runoff will be conveyed through culverts running beneath the roadway. The potential impacts caused by these changes will be mitigated to the extent it is reasonable and feasible.
- Energy dissipation devices such as rock slope protection will be designated at culverts that discharge into unlined channels. Flared end sections will be incorporated where possible.

Slope/Surface Protection Systems, Checklist DPP-1, Parts 1 and 3

- This Project consists mainly of fill. There is minimal cut. Slopes will be constructed at 4:1 or flatter where feasible and should not be steeper than 2:1.
- The existing topography has gently rolling hills covered in brush. Proposed slopes will be stabilized and vegetated by native and drought tolerant plants, seed mixtures, mulch, tackifier and fertilizers as recommended per the District Landscape Architect.
- Permanent Erosion Control per the Erosion Control Plan will be incorporated in the Project to protect disturbed slopes.
- The project will utilize slope rounding.

Concentrated Flow Conveyance Systems, Checklist DPP-1, Parts 1 and 4

- The concentrated flow will propagate through concrete lined channels, ditches, dikes, biofiltration swales and detention basins. In addition there will be drainage systems. The locations of these systems is shown in the Preliminary Hydrology and Hydraulics Report of SR0-11 and the CVEF.
- There will be outlet protection, overside drains, flared end sections.

Preservation of Existing Vegetation, Checklist DPP-1, Parts 1 and 5

- All "clearing and grubbing" areas within the Project limits will be identified and defined in the contract plans.
- All areas to be preserved will be identified in the plans as an "Environmentally Sensitive Area" (ESA) and will be fenced off during construction.

5. Describe Proposed Permanent Treatment BMPs to be used on the Project

Treatment BMP Strategy, Checklist T-1

- The affected water body is the Tijuana River, a water body on the 303(d) listed for trash. The Project also includes BMPs to address non-targeted, yet common constituents of highway runoff such as sediments and metals.
- The goal is to treat all of the Water Quality Volume to the maximum extent practicable.
- The main treatment BMP strategy is the implementation of biofiltration swales and detention basins. GSRDs and other types of treatment BMPs will be evaluated in detail in the design phase and will be implemented when reasonable and feasible.

Biofiltration Swales/Strips, Checklist T-1, Parts 1 and 2

- Multiple biofiltration swales will be installed within the Project limits. Design of the bioswales will intercept, capture convey and treat freeway runoff. The precise locations and sizes of these swales and strips are still being determined, but will be used where reasonable and feasible. The preliminary widths of the bioswales range from four to thirteen feet and all have side slope ratios of 1:4. Appropriate vegetation mixes will be determined during the design phase. The preliminary locations and lengths of each of the bioswales are as follows:

1.	South side of "SR11" Line station 52+56 to "ENF3" Line station 78+00	Length = 2,539 feet
2.	North side of "SR11" Line station 56+06 to "ENF4" Line station 78+00	Length = 2,173 feet
3.	South side of "ENF2" Line station 87+30 to 92+80	Length = 554 feet
4.	South side of "SD11" Line station 96+27 to 101+81	Length = 552 feet
5.	North side of "ENF1" Line station 82+41 to "SD11" Line station 103+28	Length = 2,090 feet
6.	South side of "SDR2" Line station 118+17 to 130+50	Length = 1,207 feet
7.	"SV1" Line station 135+00 to 145+50	Length = 731 feet
8.	"SVI" Line station 96+15 to 98+41	Length = 331 feet

Dry Weather Diversion, Checklist T-1, Parts 1 and 3

- Dry weather flows generated by Caltrans are not anticipated.

Infiltration Devices – Checklist T-1, Parts 1 and 4

- Infiltration Devices will not be incorporated into this Project, as they would not be appropriate due to the low permeability of the type D soils within the Project limits. Other methods will be used to detain flows. Please see the Hydro Geologic Site Assessment Report for SR-11.

Detention Devices, Checklist T-1, Parts 1 and 5

- Seven detention basins are proposed within the Project limits. All detention basins will have 4:1 side slope ratios, longitudinal slopes of 1% to 2% and reach a depth of four to six feet. The preliminary design locations and sizes of each basin are as follows:
  1. "SD11" Line station 54+00 = 32,550 ft^2
  2. "SD11" Line station 95+00 = 29,532 ft^2
  3. "SD11" Line station 109+00 = 10,240 ft^2
  4. "SVI" Line station 97+00 = 67,600 ft^2
  5. CVEF = 24,835 ft^2
  6. "WSLR" Line station 168+00 = 27,410 ft^2
  7. "WNDC" Line = 84,420 ft^2
- No groundwater exists within the Project limits.

Gross Solids Removal Devices (GSRDs), Checklist T-1, Parts 1 and 6

- The Tijuana River is on the 303(d) list for trash however TMDLs have not been established by the RWQCB. The feasibility of the use of GSRDs in this project will be evaluated during the design phase.

Traction Sand Traps, Checklist T-1, Parts 1 and 7

- Traction sand traps are not necessary for this Project since the Project is not located in a mountain region. Thus traction sand is not applied to the roads.

Media Filters, Checklist T-1, Parts 1 and 8

- Media Filters will not be incorporated into the Project since sufficient hydraulic head to operate by gravity is not available.
- The local vector control agency does not permit for a permanent pool of water to be established.
- In addition, since the project is required to incorporate detention basins to maintain pre-development flows and volumes, the basins will be designed to treat the runoff.

Multi-Chambered Treatment Trains (MCTTs), Checklist T-1, Parts 1 and 9

- The MCTT needs to maintain a permanent pool of water, which is not permitted by the local vector control agency. Therefore, MCTTs are not feasible for this Project.

Wet Basins, Checklist T-1, Parts 1 and 10

- According to the Preliminary Geotechnical Report Supplement dated October 7, 2009, no groundwater exists within the Project limits and no groundwater has been observed in the Otay Formation. Since this Project site does not have a permanent source of water to maintain a pool to be considered as a source of water, and since a permanent pool of water is not permitted by the local vector control agency, a wet basin is not feasible for this Project.

6. Describe Proposed Temporary Construction Site BMPs to be used on Project

- Temporary fiber rolls will be provided as slope interrupter devices to protect slopes. To prevent tracking of sediments into public roads or Otay Mesa Road, street sweeping and stabilized construction entrances/exits will be placed as shown on the water pollution control plan sheets. Temporary drainage inlet protection will be used to protect the existing and new drainage inlets from sediment due to construction activities and temporary concrete washouts (portable and facilities) will be provided throughout the Project limits to contain concrete waste.
- The disturbed slopes will also be stabilized with temporary erosion control if they are not active for 14 days or before a predicted rain event.
- No dewatering is anticipated during the construction of the Project.

The approximate cost for temporary construction BMP's is found in the project's 11-page estimate and is based on a percentage of the total construction cost. The estimate also accounts for the new construction general permit requirements assuming the project will be a Risk Level 2

7. Maintenance BMPs (Drain Inlet Stenciling)

- Drainage inlet stenciling will be required within the Project limits in areas that are pedestrian accessible.

REQUIRED ATTACHMENTS

⇒ **Vicinity Map**
⇒ **Evaluation Documentation Form (EDF)**
⇒ **Treatment BMP Summary Spreadsheets (required, if Treatment BMPs are incorporated into Project)**

SUPPLEMENTAL ATTACHMENTS

Note: Supplement Attachments are to be supplied during the SWDR approval process; where noted, some of these items may only be required on a project-specific basis.

- ⇒ Storm Water BMP Cost Summary
- ⇒ Checklist SW-1, Site Data Sources
- ⇒ Checklist SW-2, Storm Water Quality Issues Summary
- ⇒ Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs
- ⇒ Checklists DPP-1, Parts 1–5 (Design Pollution Prevention BMPs) [only those parts that are applicable]
- ⇒ Checklists T-1, Parts 1–10 (Treatment BMPs) **[only those Parts that are applicable]**
- ⇒ Calculations and cross sections related to BMPs (if requested by District/Regional Storm Water Coordinator)
- ⇒ Conceptual Drainage Map or Drainage Plans, if available (if requested by District/Regional Storm Water Coordinator for review)

DATE: 08/02/10

See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPS

EA: 11-056310

NO.	CRITERIA	YES	NO	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	☒		Go to 2
2.	Is this an emergency project?	☐	☒	If **Yes**, go to 11. If **No**, continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.	☐	☒	If **Yes**, contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 10 or 4. MA. *(Dist./Reg. SW Coordinator initials)* If **No**, continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	☒	☐	If **Yes**. (*San Diego County*), go to 5. If **No**, document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	☒	☐	If **Yes**, continue to 6. If **No**, go to 11.
6.	Is this a new facility or major reconstruction?	☒	☐	If **Yes**, continue to 8. If **No**, go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?	☐	☐	If **Yes**, continue to 8. If **No**, go to 11.
8.	Does the project result in a net increase of one acre or more of new impervious surface?	☒	☐	If **Yes**, continue to 10. If **No**, go to 9. *Net increase in acres: No Int Alt. 75.3; One Int. Alt. 83.9; Two Int. Alt. 85.1*
9.	Is the project part of a Common Plan of Development?	☐	☐	If **Yes**, continue to 10. If **No**, go to 11.
10.	Project is required to consider approved Treatment BMPs.	☒	See Sections 2.4 and either Section 5.5 or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.	
11.	Project is not required to consider Treatment BMPs. MA. *(Dist./Reg. SW Coord. Initials)* *(Project Engineer Initials)* Nov. 2, 10 *(Date)*	☐	Document for Project Files by completing this form, and attaching it to the SWDR.	

See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs

Construction Site BMP Consideration Form

DATE: Not required

Project Evaluation Process for the Consideration of Construction Site BMPs EA: _____

NO.	CRITERIA	YES	NO	SUPPLEMENTAL INFORMATION
1.	Will construction of the project result in areas of disturbed soil as defined by the Project Planning and Design Guide (PPDG)?	☐	☐	If **Yes**, Construction Site BMPs for Soil Stabilization (SS) will be required. Complete CS-1, Part 1. Continue to 2. If **No**, Continue to 3.
2.	Is there a potential for disturbed soil areas within the project to discharge to storm drain inlets, drainage ditches, areas outside the right of way, etc?	☐	☐	If **Yes**, Construction Site BMPs for Sediment Control (SC) will be required. Complete CS-1, Part 2. Continue to 3.
3.	Is there a potential for sediment or construction related materials and wastes to be tracked offsite and deposited on private or public paved roads by construction vehicles and equipment?	☐	☐	If **Yes**, Construction Site BMPs for Tracking Control (TC) will be required. Complete CS-1, Part 3. Continue to 4.
4.	Is there a potential for wind to transport soil and dust offsite during the period of construction?	☐	☐	If **Yes**, Construction Site BMPs for Wind Erosion Control (WE) will be required. Complete CS-1, Part 4. Continue to 5.
5.	Is dewatering anticipated or will construction activities occur within or adjacent to a live channel or stream?	☐	☐	If **Yes**, Construction Site BMPs for Non-Storm Water Management (NS) will be required. Complete CS-1, Part 5. Continue to 6.
6.	Will construction include saw-cutting, grinding, drilling, concrete or mortar mixing, hydro-demolition, blasting, sandblasting, painting, paving, or other activities that produce residues?	☐	☐	If **Yes**, Construction Site BMPs for Non-Storm Water Management (NS) will be required. Complete CS-1, Part 5. Continue to 7.
7.	Are stockpiles of soil, construction related materials, and/or wastes anticipated?	☐	☐	If **Yes**, Construction Site BMPs for Waste Management and Materials Pollution Control (WM) will be required. Complete CS-1, Part 6. Continue to 8.
8.	Is there a potential for construction related materials and wastes to have direct contact with precipitation; storm water run-on, or stormwater runoff; be dispersed by wind; be dumped and/or spilled into storm drain systems?	☐	☐	If **Yes**, Construction Site BMPs for Waste Management and Materials Pollution Control (WM) will be required. Complete CS-1, Part 6. Continue to 9.
9.	End of checklist.	☐	Document for Project Files by completing this form, and attaching it to the SWDR.	

PE to initialize after concurrence with Construction (PS&E only) *Date*

Checklist SW-1, Site Data Sources

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

PM (KP): SR11 PM 00.0/02.8 SR905 PM R08.6/10.1 EA: 11-056310

RWQCB: Regional Water Quality Board – San Diego

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect any available documents pertaining to the category and list them and reference your data source. For specific examples of documents within these categories, refer to Section 5.5 of this document. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Topographic	
• Web Soil Survey (//websoilsurvey.nrcs.usda.gov)	Various
• teraserver.com	Various
•	
Hydraulic	
• Draft Preliminary Hydrology/Hydraulics Report by AECOM	April 2010
•	
•	
Soils	
• Web Soil Survey (//websoilsurvey.nrcs.usda.gov)	Various
• Current Distribution and Historical Extent of Vernal Pools in Southern California and Northern Baja California, Mexico www.vernalpools.org/proceedings/bauder.pdf	
• Proposed State Route 11 Extension: Supplementary District Preliminary Geotechnical Report	10/07/09
Climatic	
• Sandiego.org	10/09
• Sdcwa.org/manage/resources-rainfall.phtml	10/09
• www.wrcc.dri.edu/cgi-bin/cliMONtavt.pl?casand	10/09
Water Quality	
• www.projectcleanwater.org/html/ws_tijuana.html	
• www.swrcb.ca.gov/rwqcb9/water_issues/programs/basin_plans /index.shtml	
• sdcwa.org/manage/groundwater-storage.phtml	
Other Data Categories	
•	
•	
•	
•	
•	
•	

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905
PM (KP): SR11 PM 00.0/02.8 SR905 PM R08.6/10.1 EA: 11-056310
RWQCB: Regional Water Quality Board – San Diego

The following questions provide a guide to collecting critical information relevant to project stormwater quality issues. Complete responses to applicable questions, consulting other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Storm Water Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR.

1. Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	☒Complete	☐NA
2. For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	☒Complete	☐NA
3. Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas.	☒Complete	☐NA
4. Determine the RWQCB special requirements, including TMDLs, effluent limits, etc.	☒Complete	☐NA
5. Determine regulatory agencies seasonal construction and construction exclusion dates or restrictions required by federal, state, or local agencies.	☒Complete	☐NA
6. Determine if a 401 certification will be required.	☒Complete	☐NA
7. List rainy season dates.	☒Complete	☐NA
8. Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	☒Complete	☐NA
9. If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	☒Complete	☐NA
10. Determine contaminated or hazardous soils within the project area.	☒Complete	☐NA
11. Determine the total disturbed soil area of the project.	☒Complete	☐NA
12. Describe the topography of the project site.	☒Complete	☐NA
13. List any areas outside of the Caltrans right-of-way that will be included in the project (e.g. contractor's staging yard, work from barges, easements for staging, etc.).	☒Complete	☐NA
14. Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much?	☒Complete	☐NA
15. Determine if a right-of-way certification is required.	☒Complete	☐NA
16. Determine the estimated unit costs for right-of-way should it be needed for Treatment BMPs, stabilized conveyance systems, lay-back slopes, or interception ditches.	☒Complete	☐NA
17. Determine if project area has any slope stabilization concerns.	☒Complete	☐NA
18. Describe the local land use within the project area and adjacent areas.	☒Complete	☐NA
19. Evaluate the presence of dry weather flow.	☒Complete	☐NA

Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905
PM (KP): 1SR11 PM 00.0/02.8 SR905 PM R08.6/10.1 EA: 11-056310
RWQCB: Regional Water Quality Board – San Diego

The PE must confer with other functional units, such as Landscape Architecture, Hydraulics, Environmental, Materials, Construction and Maintenance, as needed to assess these issues. Summarize pertinent responses in Section 2 of the SWDR.

Options for avoiding or reducing potential impacts during project planning include the following:

1. Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?	☐Yes	☐No	☒NA
2. Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	☐Yes	☐No	☒NA
3. Can any of the following methods be utilized to minimize erosion from slopes:			
a. Disturbing existing slopes only when necessary?	☒Yes	☐No	☐NA
b. Minimizing cut and fill areas to reduce slope lengths?	☒Yes	☐No	☐NA
c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?	☒Yes	☐No	☐NA
d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes?	☒Yes	☐No	☐NA
e. Avoiding soils or formations that will be particularly difficult to re-stabilize?	☒Yes	☐No	☐NA
f. Providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates?	☒Yes	☐No	☐NA
g. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?	☒Yes	☐No	☐NA
h. Rounding and shaping slopes to reduce concentrated flow?	☒Yes	☐No	☐NA
i. Collecting concentrated flows in stabilized drains and channels?	☒Yes	☐No	☐NA
4. Does the project design allow for the ease of maintaining all BMPs?	☒Yes	☐No	
5. Can the project be scheduled or phased to minimize soil-disturbing work during the rainy season?	☒Yes	☐No	
6. Can permanent storm water pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction storm water impacts?	☒Yes	☐No	☐NA

Design Pollution Prevention BMPs
Checklist DPP-1, Part 1

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

PM : SR11 PM 00.0/02.8 SR905 PM R08.6/10.1 EA: 11-056310

RWQCB: Regional Water Quality Board – San Diego

Consideration of Design Pollution Prevention BMPs

1. Consideration of Downstream Effects Related to Potentially Increased Flow [to streams or channels]?				
(a) Will project increase velocity or volume of downstream flow?	☒Yes	☐No	☐NA
(b) Will the project discharge to unlined channels?	☒Yes	☐No	☐NA
(c) Will project increase potential sediment load of downstream flow?	☐Yes	☒No	☐NA
(d) Will project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?	☐Yes	☒No	☐NA
If Yes was answered to any of the above questions, consider ***Downstream Effects Related to Potentially Increased Flow***, complete the DPP-1, Part 2 checklist.			
2. Slope/Surface Protection Systems			
(a) Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA
If Yes was answered to the above question, consider ***Slope/Surface Protection Systems***, complete the DPP-1, Part 3 checklist.			
3. Concentrated Flow Conveyance Systems			
(a) Will the project create or modify ditches, dikes, berms, or swales?	☒Yes	☐No	☐NA
(b) Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA
(c) Will it be necessary to direct or intercept surface runoff?	☒Yes	☐No	☐NA
(d) Will cross drains be modified?	☐Yes	☒No	☐NA
If Yes was answered to any of the above questions, consider ***Concentrated Flow Conveyance Systems***; complete the DPP-1, Part 4 checklist.			
4. Preservation of Existing Vegetation			
a) It is the goal of the Storm Water Program to maximize the protection of desirable existing vegetation to provide erosion and sediment control benefits on all projects.	☒Complete		
Consider ***Preservation of Existing Vegetation***, complete the DPP-1, Part 5 checklist.			

Design Pollution Prevention BMPs
Checklist DPP-1, Part 2

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

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Downstream Effects Related to Potentially Increased Flow

1.	Review total paved area and reduce to the maximum extent practicable.	☒Complete
2.	Review channel lining materials and design for stream bank erosion control.	☒Complete
	(a) See Chapters 860 and 870 of the HDM.	☒Complete
	(b) Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.	☒Complete
3.	Include, where appropriate, energy dissipation devices at culvert outlets.	☒Complete
4.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.	☒Complete
5.	Include, if appropriate, peak flow attenuation basins to reduce peak discharges.	☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 3

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905
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Slope / Surface Protection Systems

1. What are the proposed areas of cut and fill? (attach plan or map) ☒Complete

2. Were benches or terraces provided on high cut and fill slopes to reduce concentration of flows? ☐Yes ☒No

3. Were slopes rounded and/or shaped to reduce concentrated flow? ☒Yes ☐No

4. Were concentrated flows collected in stabilized drains or channels? ☒Yes ☐No

5. Are slopes > 1:4 vertical: horizontal (V:H))? ☒Yes ☐No

   If Yes, District Landscape Architecture must prepare or approve an erosion control plan.

6. Are slopes > 1:2 (V:H)? ☐Yes ☒No

   If Yes, Geotechnical Services must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Storm Water Coordinator for slopes steeper than 1:2 (V:H).

7. Estimate the change to the impervious areas that will result from this project: 75.3 acres No Inter Alt., 83.9 acres for One Inter. Alt., 85.1 acres for Two Inter. Alt. ☒Complete

VEGETATED SURFACES

1. Identify existing vegetation. ☒Complete
2. Evaluate site to determine soil types, appropriate vegetation and planting strategies. ☒Complete
3. How long will it take for permanent vegetation to establish? ☒Complete
4. Minimize overland and concentrated flow depths and velocities. ☒Complete

HARD SURFACES

1. Are hard surfaces required? ☒Yes ☐No

   If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations. See plan sheets. ☒Complete

Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems. ☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 4

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

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RWQCB: Regional Water Quality Board – San Diego

Concentrated Flow Conveyance Systems

Ditches, Berms, Dikes and Swales

1. Consider Ditches, Berms, Dikes, and Swales as per Chapters 813, 836, and 860 of the HDM. ☒Complete
2. Evaluate risks due to erosion, overtopping, flow backups or washout. ☒Complete
3. Consider outlet protection where localized scour is anticipated. ☒Complete
4. Examine the site for run-on from off-site sources. ☒Complete
5. Consider channel lining when velocities exceed scour velocity for soil. ☒Complete

Overside Drains

1. Consider downdrains, as per Index 834.4 of the HDM. ☒Complete
2. Consider paved spillways for side slopes flatter than 1:4 V:H. ☒Complete

Flared Culvert End Sections

1. Consider flared end sections on culvert inlets and outlets as per Chapter 827 of the HDM. ☒Complete

Outlet Protection/Velocity Dissipation Devices

1. Consider outlet protection/velocity dissipation devices at outlets, including cross drains, as per Chapters 827 and 870 of the HDM. ☒Complete

Review appropriate SSPs for Concentrated Flow Conveyance Systems. ☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 5

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

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Preservation of Existing Vegetation

1.	Review Preservation of Property, Standard Specifications 16.1.01 and 16-1.02 (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation.	☒Complete
2.	Has all vegetation to be retained been coordinated with Environmental, and identified and defined in the contract plans?	☒Yes ☐No
3.	Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling?	☒Complete
4.	Have impacts to preserved vegetation been considered while work is occurring in disturbed areas?	☒Yes ☐No
5.	Are all areas to be preserved delineated on the plans?	☒Yes ☐No

Treatment BMPs

Checklist T-1, Part 1

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

PM (KP): SR11 PM 00.0/02.8 SR905 PM R08.6/10.1 EA: 11-056310

RWQCB: Regional Water Quality Board – San Diego

Consideration of Treatment BMPs

This checklist is used for projects that require the consideration of Approved Treatment BMPs, as determined from the process described in Section 4 (Project Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each watershed and sub-watersheds within the project. Supplemental data will be needed to verify siting and design applicability for final incorporation into a project.

Complete this checklist for each phase of the project, when considering Treatment BMPs. Use the responses to the questions as the basis when developing the narrative in Section 5 of the Storm Water Data Report to document that Treatment BMPs have been appropriately considered.

Answer all questions, unless otherwise directed.

1. Dry Weather Flow Diversion

   (a) Are dry weather flows generated by Caltrans anticipated to be persistent? ☐Yes ☒No

   (b) Is a sanitary sewer located on or near the site? ☒Yes ☐No

   (c) Is the connection to the sanitary sewer possible without extraordinary plumbing, features or construction practices? ☒Yes ☐No

   (d) Is the domestic wastewater treatment authority willing to accept flow? ☐Yes ☒No

   If Yes was answered to <u>all</u> of these questions consider Dry Weather Flow Diversion, complete and attach Part 3 of this checklist

2. Is the receiving water on the 303(d) list for litter/trash or has a TMDL been issued for litter/trash? ☒Yes ☐No

   If Yes, consider Gross Solids Removal Devices (GSRDs), complete and attach Part 6 of this checklist. Note: Biofiltration Systems, Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins also can capture litter – consult with District/Regional NPDES if these devices should be considered to meet litter/trash TMDL.

3. Is project located in an area (e.g., mountain regions) where traction sand is applied more than twice a year?
   If Yes, consider ***Traction Sand Traps***, complete and attach **Part 7** of this checklist. ☐Yes ☒No

4. (a) Are there local influent limits for infiltration or Basin Plan restrictions or other local agency prohibitions that would restrict the use of the infiltration devices? ☐Yes ☒No

(b) Would infiltration pose a threat to local groundwater quality as determined by the District/Regional Storm Water Coordinator? ☐Yes ☒No

If the answer to either part of Question 4 is Yes, then Infiltration Devices are infeasible and the consideration of Infiltration Devices should not be made when completing Questions 5 through 17.

5. (a) Does the project discharge to any 303(d) listed water body? ☒Yes ☐No
If No, go to Question 17, General Purpose Pollutant Removal

(b) If Yes, is the identified pollutant(s) considered a Targeted Design Constituent (TDC) (check all that apply):

__X__ phosphorus, __X__ nitrogen, ___ total copper, ___ dissolved copper,
__X__ total lead __X__ dissolved lead, ___ total zinc, ___ dissolved zinc,
___ sediments, ___ general metals [unspecified metals].

(c) If only one TDC is checked above, continue to Question 6. ☐Complete

(d) If more than one TDC is checked, contact your District/Regional NPDES Coordinator to determine priority before continuing with this checklist. ☒Complete

6. Consult with the District/Regional Storm Water Coordinator to determine whether Treatment BMP selection will be affected by any existing or future TMDL requirements. ☐Complete

The following questions show the approved Treatment BMPs in order of preference based on load reduction (performance) for the listed constituent and lifetime costs for the device, excluding right-of-way. Note that a line separates Treatment BMPs into groups of approximately equal effectiveness and within each grouping; any of the Treatment BMPs may be selected for placement if meeting site conditions. In the space provided next to the BMP, use Yes or a check mark to indicate a positive response.

If none of the listed Treatment BMPs for a specific constituent of concern (TDC) can be sited, go to Step #17 (General Purpose Pollutant Removal) to determine whether another Treatment BMP can be incorporated into the project.

***For the SWDRs developed for the PID and PA/ED phases of a project:* Consider all approved Treatment BMPs listed that can be reasonably incorporated into the project for each TDC.**

***For the SWDR developed for the PS&E phase:* Indicate (Yes or check mark) only those BMPs that will be incorporated into the project.**

7. Is phosphorus the TDC? [Use this constituent if "eutrophic" or "nutrients" is the TDC for the water body.] If Yes, consider: ☒Yes ☐No

__X__ Infiltration Devices
_____ Austin Sand Filters

8. Is nitrogen the TDC? If Yes, consider: ☒Yes ☐No

- X Infiltration Devices
- ___ Austin Sand Filters
- ___ Delaware Filter
- X Detention Device
- ___ MCTT

9. Is copper (total) the TDC? If Yes for total Copper, consider: ☐Yes ☒No

- ___ Infiltration Devices
- ___ Wet Basins
- ___ Biofiltration Strips
- ___ Detention Device
- ___ Biofiltration Swales
- ___ Austin Sand Filter
- ___ Delaware Filter
- ___ MCTT

10. Is copper (dissolved) the TDC? If Yes for dissolved Copper, consider: ☐Yes ☒No

- ___ Infiltration Devices
- ___ Biofiltration Strips
- ___ Wet Basin
- ___ Biofiltration Swale

11. Is lead (total) the TDC? If Yes for total Lead, consider: ☒Yes ☐No

- X Infiltration Devices
- ___ Wet Basin
- ___ Biofiltration Strips
- ___ Austin Sand Filter
- ___ **Delaware Filter**
- X Detention Device
- X Biofiltration Swales
- ___ MCTT

12. Is lead (dissolved) the TDC? If Yes for dissolved Lead, consider: ☒Yes ☐No

- X Infiltration Devices
- ___ Biofiltration Strips
- ___ Wet Basin
- X Detention Device
- X Biofiltration Swales
- ___ Austin Sand Filter

13. Is zinc (total) the TDC? If Yes for total Zinc, consider: ☐Yes ☒No

- ___ Infiltration Devices
- ___ Delaware Filter
- ___ Wet Basin
- ___ Biofiltration Strips
- ___ Biofiltration Swales
- ___ Austin Sand Filter
- ___ MCTT
- ___ Detention Devices

14. Is zinc (dissolved) the TDC? If Yes for dissolved Zinc, consider: ☐Yes ☒No

    ____ Infiltration Devices
    ____ Delaware Filter
    ____ Biofiltration Strip
    ____ Biofiltration Swale
    ____ Austin Sand Filter
    ____ MCTT

15. Is sediment (total suspended solids [TSS]) the TDC? If Yes for TSS, consider: ☐Yes ☒No

    ____ Infiltration Devices
    ____ Austin Sand Filter
    ____ Delaware Filter
    ____ Wet Basin
    ____ Detention Device
    ____ Biofiltration Strip
    ____ MCTT
    ____ Biofiltration Swale

16. Are "General Metals" or (unspecified) "Metals" the TDC? If Yes for General Metals, consider: ☐Yes ☒No

    ____ Infiltration Devices
    ____ Biofiltration Strips
    ____ Wet Basin
    ____ Biofiltration Swale
    ____ Austin Sand Filter
    ____ Delaware Filter
    ____ MCTT

17. General Purpose Pollutant Removal: When it is determined that there are no TDCs, consider the Treatment BMPs in the order listed below. ☒Yes ☐No

    ____ Infiltration Devices
    __X__ Biofiltration Strips
    ____ Wet Basin
    __X__ Biofiltration Swale
    ____ Austin Sand Filter
    __X__ Detention Device
    ____ Delaware Filter
    ____ MCTT

18. Biofiltration
    (a) Are site conditions and climate favorable to allow suitable vegetation to be established? ☒Yes ☐No

    (b) Have Biofiltration strips and swales been considered to the extent practicable? Note: Biofiltration BMPs should be considered for all projects, even if other Treatment BMPs are placed. ☒Yes ☐No

    If No to (a) or (b), document justification in Section 5 of the SWDR.

19. After completing the above, complete and attach the checklists shown below for every Treatment BMP under consideration ☒Complete

- X Biofiltration Strips and Biofiltration Swales: Checklist T-1, Part 2
- ___ Dry Weather Diversion: Checklist T-1, Part 3
- ___ Infiltration Devices: Checklist T-1, Part 4
- X Detention Devices: Checklist T-1, Part 5
- X GSRDs: Checklist T-1, Part 6
- ___ Traction Sand Traps: Checklist T-1, Part 7
- ___ Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8
- ___ Multi-Chambered Treatment Train: Checklist T-1, Part 9
- ___ Wet Basins: Checklist T-1, Part 10

20. (a) Estimate what percentage of WQV/WQF will be treated by the preferred Treatment BMP(s): ☒Complete

(b) Have Treatment BMPs been considered for use in parallel or series to increase this percentage? ☒Yes ☐No

21. Prepare cost estimate, including right-of-way, for selected Treatment BMPs and include as supplemental information for SWDR approval. ☒Complete

Treatment BMPs

Checklist T-1, Part 2

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

PM (KP): SR11 PM 00.0/02.8 SR905 PM R08.6/10.1 EA: 11-056310

RWQCB: Regional Water Quality Board – San Diego

Biofiltration Swales / Biofiltration Strips

Feasibility

1. Do the climate and site conditions allow vegetation to be established? ☒Yes ☐No

2. Are flow velocities < 4 fps (i.e. low enough to prevent scour of the vegetated bioswale as per HDM Table 873.3E)? ☒Yes ☐No

   If No to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.

3. Are Biofiltration Swales proposed at sites where known hazardous soils or contaminated groundwater plumes exist? ☐Yes ☒No
   If Yes, consult with District/Regional NPDES Coordinator about how to proceed.

4. Does adequate area exist within the right-of-way to place biofiltration device(s)? ☒Yes ☐No
   If Yes, continue to the Design Elements section. If No, continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration Devices and how much right-of way would be needed to treat WQF? _____ acres ☐Yes ☐No
   If Yes, continue to Design Elements section. If No, continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Has the District Landscape Architect provided vegetation mixes appropriate for climate and location? * ☐Yes ☒No

2.	Can the bioswale be designed as a conveyance system under any expected flows > the WQF event, as per HDM Chapter 800? * (e.g. freeboard, minimum slope, etc.)	☒Yes	☐No
3.	Can the bioswale be designed as a water quality treatment device under the WQF while meeting the required HRT, depth, and velocity criteria? (Reference Appendix B, Section B.2.3.1)*	☒Yes	☐No
4.	Is the maximum length of a biostrip ≤300 ft? *	☐Yes	☒No
5.	Has the minimum width (in the direction of flow) of the invert of the bioswale received the concurrence of Maintenance? *	☒Yes	☐No
6.	Can bioswales be located in natural or low cut sections to reduce maintenance problems caused by animals burrowing through the berm of the swale? **	☒Yes	☐No
7.	Is the biostrip sized as long as possible in the direction of flow? **	☒Yes	☐No
8.	Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train? **	☒Yes	☐No

Treatment BMPs
Checklist T-1, Part 3

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

PM (KP): SR11 PM 00.0/02.8 SR905 PM R08.6/10.1 EA: 11-056310

RWQCB: Regional Water Quality Board – San Diego

Dry Weather Flow Diversion

Feasibility

1. Is dry-weather flow diversion acceptable to a Publicly Owned Treatment Works (POTW)? ☐Yes ☐No
2. Would a connection require ordinary (i.e., not extraordinary) plumbing, features or construction methods to implement? ☐Yes ☐No

   If No to either question above, Dry Weather Flow Diversion is not feasible.

3. Does adequate area exist within the right-of-way to place Dry Weather Flow Diversion devices? ☐Yes ☐No
   If Yes, continue to Design Elements sections. If No, continue to Question 4.
4. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Dry Weather Flow Diversion devices and how much right-of way would be needed? _____ (acres) ☐Yes ☐No
   If Yes, continue to the Design Elements section.

   If No, continue to Question 5.
5. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Does the existing sanitary sewer pipeline have adequate capacity to accept project dry weather flows, or can an upgrade be implemented to handle the anticipated dry weather flows within the project's budget and objectives? * ☐Yes ☐No
2. Can the connection be designed to allow for Maintenance vehicle access? * ☐Yes ☐No
3. Can gate, weir, or valve be designed to stop diversion during storm events? * ☐Yes ☐No
4. Can the inlet be designed to reduce chances of clogging the diversion pipe or channel? * ☐Yes ☐No
5. Can a back flow prevention device be designed to prevent sanitary sewage from entering storm drain? * ☐Yes ☐No

Treatment BMPs
Checklist T-1, Part 4

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905
PM (KP): SR11 PM 00.0/02.8 SR905 PM R08.6/10.1 EA: 11-056310
RWQCB: Regional Water Quality Board – San Diego

Infiltration Devices

Feasibility

1. Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality as determined by the District/Regional NPDES Storm Water Coordinator? ☐Yes ☐No
2. Does infiltration at the site compromise the integrity of any slopes in the area? ☐Yes ☐No
3. Per survey data or U.S. Geological Survey (USGS) Quad Map, are existing slopes at the proposed device site >15%? ☐Yes ☐No
4. At the invert, does the soil type classify as NRCS Hydrologic Soil Group (HSG) D, or does the soil have an infiltration rate < 0.5 inches/hr? ☐Yes ☐No
5. Is site located over a previously identified contaminated groundwater plume? ☐Yes ☐No

   If Yes to any question above, Infiltration Devices are not feasible; stop here and consider other approved Treatment BMPs.

6. (a) Does site have groundwater within 10 ft of basin invert? ☐Yes ☐No

   (b) Does site investigation indicate that the infiltration rate is significantly greater than 2.5 inches/hr? ☐Yes ☐No

   If Yes to either part of Question 6, the RWQCB must be consulted, and the RWQCB must conclude that the groundwater quality will not be compromised, before approving the site for infiltration. ☐Yes ☐No
7. Does adequate area exist within the right-of-way to place Infiltration Device(s)? If Yes, continue to Design Elements sections. If No, continue to Question 8. ☐Yes ☐No
8. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Infiltration Devices and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No

   If Yes, continue to Design Elements section.

   If No, continue to Question 9.
9. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements – Infiltration Basin

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Has a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐Yes	☐No
2.	Has an overflow spillway with scour protection been provided? *	☐Yes	☐No
3.	Is the Infiltration Basin size sufficient to capture the WQV while maintaining a 40-48 hour drawdown time? (Note: the WQV must be ≥4,356 ft^3 [0.1 acre-feet]) *	☐Yes	☐No
4.	Can access be placed to the invert of the Infiltration Basin? *	☐Yes	☐No
5.	Can the Infiltration Basin accommodate the Water Quality freeboard above the WQV elevation (reference Appendix B.1.3.1)? *	☐Yes	☐No
6.	Can the Infiltration Basin be designed with interior side slopes no steeper than 1:4(V:H) (may be 1:3 [V:H] with approval by District Maintenance)? *	☐Yes	☐No
7.	Can vegetation be established in the Infiltration Basin? **	☐Yes	☐No
8.	Can diversion be designed, constructed, and maintained to bypass flows exceeding the WQV? **	☐Yes	☐No
9.	Can a gravity-fed Maintenance/Emergency Drain be placed? **	☐Yes	☐No

Design Elements – Infiltration Trench

* **Required** Design Element – (see definition above)
** **Recommended** Design Element – (see definition above)

1.	Has a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐Yes	☐No
2.	Is the surrounding soil within Hydrologic Soil Groups (HSG) Types A or B? *	☐Yes	☐No
3.	Is the volume of the Infiltration Trench equal to at least the 2.85x the WQV, while maintaining a drawdown time of ≤72 hours? (Note: the WQV must be ≥4,356 ft^3 [0.1 acre-feet], unless the District/Regional NPDES Coordinator will allow a volume between 2,830 ft^3 and 4,356 ft^3 to be considered.) *	☐Yes	☐No
4.	Is the depth of the Infiltration Trench ≤13 ft, and is the depth < the width? *	☐Yes	☐No
5.	Can an observation well be placed in the trench? *	☐Yes	☐No
6.	Can access be provided to the Infiltration Trench? *	☐Yes	☐No
7.	Can pretreatment be provided to capture sediment in the runoff (such as using Biofiltration)? *	☐Yes	☐No
8.	Can flow diversion be designed, constructed, and maintained to bypass flows exceeding the Water Quality Event? **	☐Yes	☐No
9.	Can a perimeter curb or similar device be provided (to limit wheel loads upon the trench)? **	☐Yes	☐No

Treatment BMPs
Checklist T-1, Part 5

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

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RWQCB: Regional Water Quality Board – San Diego

Detention Devices

Feasibility

1. Is there sufficient head to prevent objectionable backwater conditions in the upstream drainage systems? ☒Yes ☐No

2. 2a) Is the volume of the Detention Device equal to at least the WQV? (Note: the WQV must be ≥4,356 ft^3 [0.1 acre-feet]) ☒Yes ☐No

   Only answer (b) if the Detention Device is being used also to capture traction sand.

   2b) Is the total volume of the Detention Device at least equal to the WQV and the anticipated volume of traction sand, while maintaining a minimum 12 inch freeboard (1 ft)? ☐Yes ☐No

3. Is basin invert ≥10 ft above seasonally high groundwater or can it be designed with an impermeable liner? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.) ☒Yes ☐No

If No to any question above, then Detention Devices are not feasible.

4. Does adequate area exist within the right-of-way to place Detention Device(s)?

   If Yes, continue to the Design Elements section. If No, continue to Question 5. ☒Yes ☐No

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Detention Device(s) and how much right-of way would be needed to treat WQV? _____ acres
   If Yes, continue to the Design Elements section. If No, continue to Question 6. ☐Yes ☐No

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Has the geotechnical integrity of the site been evaluated to determine potential impacts to surrounding slopes due to incidental infiltration? If incidental infiltration through the invert of an unlined detention device is a concern, consider using an impermeable liner. *	☒Yes ☐No
2.	Has the location of the Detention Device been evaluated for any effects to the adjacent roadway and subgrade? *	☒Yes ☐No
3.	Can a minimum freeboard of 12 inches be provided above the WQV? *	☒Yes ☐No
4.	Is an overflow outlet provided? *	☒Yes ☐No
5.	Is the drawdown time of the Detention Device within 24 to 72 hours? *	☒Yes ☐No
6.	Is the Detention Device outlet designed to minimize clogging (minimum outlet orifice diameter of 0.5 inches)? *	☒Yes ☐No
7.	Are the inlet and outlet structures designed to prevent scour and re-suspension of settled materials, and to enhance quiescent conditions? *	☒Yes ☐No
8.	Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? Note: Detention Basins may be lined, in which case no vegetation would be required for lined areas. *	☒Yes ☐No
9.	Has sufficient access for Maintenance been provided? *	☒Yes ☐No
10.	Is the side slope 1:4 (V:H) or flatter for interior slopes? ** (Note: Side slopes up to 1:3 (V:H) allowed with approval by District Maintenance.)	☒Yes ☐No
11.	If significant sediment is expected from nearby slopes, can the Detention Device be designed with additional volume equal to the expected annual loading? **	☒Yes ☐No
12.	Is flow path as long as possible (≥ 2:1 length to width ratio at WQV elevation is recommended)? **	☒Yes ☐No

Treatment BMPs
Checklist T-1, Part 6

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

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RWQCB: Regional Water Quality Board – San Diego

Gross Solids Removal Devices (GSRDs)

Feasibility

1. Is the receiving water body downstream of the tributary area to the proposed GSRD on a 303(d) list or has a TMDL for litter been established? ☐Yes ☐No

2. Are the devices sized for flows generated by the peak drainage facility design event or can peak flow be diverted? ☐Yes ☐No

3. Are the devices sized to contain gross solids (litter and vegetation) for a period of one year? ☐Yes ☐No

4. Is there sufficient access for maintenance and large equipment (vacuum truck)? ☐Yes ☐No

   If No to any question above, then Gross Solids Removal Devices are not feasible. Note that Biofiltration Systems, Infiltration Devices, Detention Devices, Dry Weather Flow Diversion, MCTT, Media Filters, and Wet Basins may be considered for litter capture, but consult with District/Regional NPDES if proposed to meet a TMDL for litter.

5. Does adequate area exist within the right-of-way to place Gross Solids Removal Devices? ☐Yes ☐No
   If Yes, continue to Design Elements section. If No, continue to Question 6.

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Gross Solids Removal Devices and how much right-of way would be needed? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section. If No, continue to Question 7.

7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements – Linear Radial Device

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Does sufficient hydraulic head exist to place the Linear Radial GSRD? * ☐Yes ☐No
2. Was the litter accumulation rate of 10 ft^3/ac/yr (or a different rate recommended by Maintenance) used to size the device? * ☐Yes ☐No
3. Were the standard detail sheets used for the layout of the devices? **
   If No, consult with Headquarters Office of Storm Water Management and District/Regional NPDES. ☐Yes ☐No
4. Is the maximum depth of the storage within 10 ft of the ground surface, or another depth as required by District Maintenance? * ☐Yes ☐No

Design Elements – Inclined Screen

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Does sufficient hydraulic head exist to place the Inclined Screen GSRD? * ☐Yes ☐No
2. Was the litter accumulation rate of 10 ft^3/ac/yr (or a different rate recommended by Maintenance) used to size the device? * ☐Yes ☐No
3. Were the standard details sheets used for the layout of the devices? **
   If No, consult with Headquarters Office of Storm Water Management and District NPDES. ☐Yes ☐No
4. Is the maximum depth of the storage within 10 ft of the ground surface, or another depth as required by District Maintenance? * ☐Yes ☐No

Treatment BMPs
Checklist T-1, Part 7

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RWQCB: Regional Water Quality Board – San Diego

Traction Sand Traps

Feasibility

1. Can a Detention Device be sized to capture the estimated traction sand and the WQV from the tributary area?
   If Yes, then a separate Traction Sand Trap may not be necessary. Coordinate with the District/Regional Storm Water Coordinator and also complete Checklist T-1, Part 5. ☐Yes ☐No

2. Is the Traction Sand Trap proposed for a site where sand or other traction enhancing substances are applied to the roadway at least twice per year? ☐Yes ☐No

3. Is adequate space provided for Maintenance staff and equipment access for annual cleanout? ☐Yes ☐No

4. Has the local RWQCB agreed that the proposed Traction Sand Trap would not be classified as a regulated underground injection well? ☐Yes ☐No

   If the answer to any one of Questions 2, 3 or 4 is No, then a Traction Sand Trap is not feasible.

5. Does adequate area exist within the right-of-way to place Traction Sand Traps? ☐Yes ☐No
   If Yes, continue to Design Elements section. If No, continue to Question 6.

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Traction Sand Traps and how much right-of way would be needed? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section. If No, continue to Question 7.

7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Was the local Caltrans Maintenance Station contracted to provide the amount of traction sand used annually at the location? * (Detention Device or CMP type) List application rate reported. _____ yd^3 ☐Yes ☐No

2. Does the Traction Sand Trap have enough volume to store settled sand over the winter using the formula presented in Appendix B, Section B.5? * (Detention Device or CMP type) ☐Yes ☐No

3. Is the invert of the Traction Sand Trap a minimum of 3 ft above seasonally high groundwater? * (CMP type) ☐Yes ☐No

4. Is the maximum depth of the storage within 10 ft of the ground surface, or another depth as required by District Maintenance? * (CMP type) ☐Yes ☐No

5. Has the District/Regional NPDES Storm Water Coordinator been contacted to ensure that the traction sand trap is not classified as a regulated underground injection well? * (CMP type) ☐Yes ☐No

6. Can peak flow be diverted around the device? ** (CMP type) ☐Yes ☐No

7. Within the tributary area, have the unstabilized areas (that would contribute sediment in addition to traction sand) been minimized as much as possible?**(Detention Device or CMP type) ☐Yes ☐No

8. Is 6 inches separation provided between the top of the captured traction sand and the outlet from the device, in order to minimize re-suspension of the solids? ** (CMP type) ☐Yes ☐No

Treatment BMPs
Checklist T-1, Part 8

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RWQCB: Regional Water Quality Board – San Diego

Media Filters

Caltrans has approved two types of Media Filter: Austin Sand Filters and Delaware Filters. Austin Sand filters are typically designed for larger drainage areas, while Delaware Filters are typically designed for smaller drainage areas. The Austin Sand Filter is constructed with an open top and may have a concrete or earthen invert, while the Delaware is always constructed as a vault. See Appendix B, Media Filters, for a further description of Media Filters.

Feasibility – Austin Sand Filter

1. Is the volume of the Austin Sand Filter equal to at least the WQV using a 40 to 48 hour drawdown? (Note: the WQV must be ≥4,356 ft^3 [0.1 acre-feet]) ☐Yes ☐No

2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? ☐Yes ☐No

3. If initial chamber has an earthen bottom, is initial chamber invert ≥3 ft above seasonally high groundwater? ☐Yes ☐No

4. If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? ☐Yes ☐No

   If No to any question above, then an Austin Sand Filter is not feasible.

5. Does adequate area exist within the right-of-way to place an Austin Sand Filter(s)? ☐Yes ☐No
   If Yes, continue to Design Elements sections. If No, continue to Question 6.

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section.

   If No, continue to Question 7.

7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐ Complete

   If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.

Feasibility- Delaware Filter

1. Is the volume of the Delaware Filter equal to at least the WQV using a 40 to 48 hour drawdown? (Note: the WQV must be ≥4,356 ft^3 [0.1 acre-feet], consult with District/Regional NPDES if a lesser volume is under consideration.) ☐Yes ☐No

2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? ☐Yes ☐No

3. Would a permanent pool of water be allowed by the local vector control agency? ☐Yes ☐No

If No to any question, then a Delaware Filter is not feasible

4. Does adequate area exist within the right-of-way to place a Delaware Filter (s)? ☐Yes ☐No
   If Yes, continue to Design Elements sections. If No, continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section. If No, continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐ Complete

   If a Delaware Filter is still under consideration, continue to the Design Elements – Delaware Filter section.

Design Elements – Austin Sand Filter

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Is the drawdown time of the 2nd chamber 24 hours? * ☐Yes ☐No

2. Is access for Maintenance vehicles provided to the Austin Sand Filter? * ☐Yes ☐No

3. Is a bypass/overflow provided for storms > WQV? * ☐Yes ☐No

4. Is the flow path length to width ratio for the sedimentation chamber of the "full" Austin Sand Filter ≥2:1? ** ☐Yes ☐No

5. Can pretreatment be provided to capture sediment and litter in the runoff (such as using biofiltration)? ** ☐Yes ☐No

6. Can the Austin Sand Filter be placed using an earthen configuration? ** ☐Yes ☐No
   If No, go to Question 9.

7. Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥10 ft? * ☐Yes ☐No
   If No, design with an impermeable liner.
8. Are side slopes of the earthen chamber 1:3 (V:H) or flatter? * ☐Yes ☐No
9. Is maximum depth ≤13 ft below ground surface? * ☐Yes ☐No
10. Can the Austin Sand Filter be placed in an offline configuration? ** ☐Yes ☐No

Design Elements – Delaware Filter

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Can the first chamber be sized for the WQV? * ☐Yes ☐No
2. Is the drawdown time of the 2nd chamber between 40 and 48 hours? * ☐Yes ☐No
3. Is access for Maintenance vehicles provided to the Delaware Filter? * ☐Yes ☐No
4. Is a bypass/overflow provided for storms > WQV? ** ☐Yes ☐No
5. Can pretreatment be provided to capture sediment and litter in the runoff (such as using biofiltration)? ** ☐Yes ☐No
6. Can the Delaware Filter be placed in an offline configuration? ** ☐Yes ☐No
7. Is maximum depth ≤13 ft below ground surface? *

Treatment BMPs
Checklist T-1, Part 9

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MCTT (Multi-chambered Treatment Train)

Feasibility

1. Is the proposed location for the MCTT located to serve a "critical source area" (i.e. vehicle service facility, parking area, paved storage area, or fueling station)? ☐Yes ☐No
2. Is the WQV ≥4,356 ft³ (0.1 acre-foot)? ☐Yes ☐No
3. Is there sufficient hydraulic head (typically ≥6 feet) to operate the device? ☐Yes ☐No
4. Would a permanent pool of water be allowed by the local vector control agency? ☐Yes ☐No
   If No to any question above, then an MCTT is not feasible.
5. Does adequate area exist within the right-of-way to place an MCTT(s)? ☐Yes ☐No
   If Yes, continue to Design Elements sections. If No, continue to Question 6.
6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
   If Yes, continue to Design Elements section. If No, continue to Question 7.
7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Is the maximum depth of the 3rd chamber ≤13 ft below ground surface and has Maintenance accepted this depth? * ☐Yes ☐No
2. Is the drawdown time in the 3rd chamber between 24 and 48 hours? * ☐Yes ☐No
3. Is access for Maintenance vehicles provided to all chambers of the MCTT? * ☐Yes ☐No
4. Is there sufficient hydraulic head to operate the device? * ☐Yes ☐No
5. Has a bypass/overflow been provided for storms > WQV? * ☐Yes ☐No
6. Can pretreatment be provided to capture sediment and litter in the runoff (such as using biofiltration)? ** ☐Yes ☐No

Treatment BMPs
Checklist T-1, Part 10

Prepared by: Rosita Ramos Date: 08/02/10 District-Co-Route: 11-SD-11, 905

PM (KP): SR11 PM 00.0/02.8 SR905 PM R08.6/10.1 EA: 11-056310

RWQCB: Regional Water Quality Board – San Diego

Wet Basin

Feasibility

1. Is the volume of the Wet Basin above the permanent pool equal to at least the WQV using a 24 to 72 hour drawdown (40 to 48 hour drawdown preferred)? (Note: the WQV must be ≥4,356 ft^3 [0.1 acre-feet] and the permanent pool must be at least 3x the WQV.) ☐Yes ☐No

2. Is a permanent source of water available in sufficient quantities to maintain the permanent pool for the Wet Basin? ☐Yes ☐No

3. Is proposed site in a location where naturally occurring wetlands do not exist? ☐Yes ☐No

Answer either question 4 or question 5:

4. For Wet Basins with a proposed invert above the seasonally high groundwater, are NRCS Hydrologic Soil Groups [HSG] C and D at the proposed invert elevation, or can an impermeable liner be used? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.) ☐Yes ☐No

5. For Wet Basins with a proposed invert below the groundwater table: Can written approval from the local Regional Water Quality Control Board be obtained to place the Wet Basin in direct hydraulic connectivity to the groundwater? ☐Yes ☐No

6. Is Water Quality freeboard provided ≥1 foot? ☐Yes ☐No

7. Is the maximum impoundment volume < 14.75 acre-feet? ☐Yes ☐No

8. Would a permanent pool of water be allowed by the local vector control agency? ☐Yes ☐No

If No to any question above, then a Wet Basin is not feasible.

9. Is the maximum basin width ≤49 ft as suggested in Section B.10.2? ☐Yes ☐No

If No, consult with the local vector control agency and District Maintenance.

10. Does adequate area exist within the right-of-way to place a Wet Basin? ☐Yes ☐No

If Yes, continue to Design Elements sections.

If No, continue to Question 10.

11. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No

12. If Yes, continue to Design Elements section.

    If No, continue to Question 8.

13. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐ Complete

Design Elements

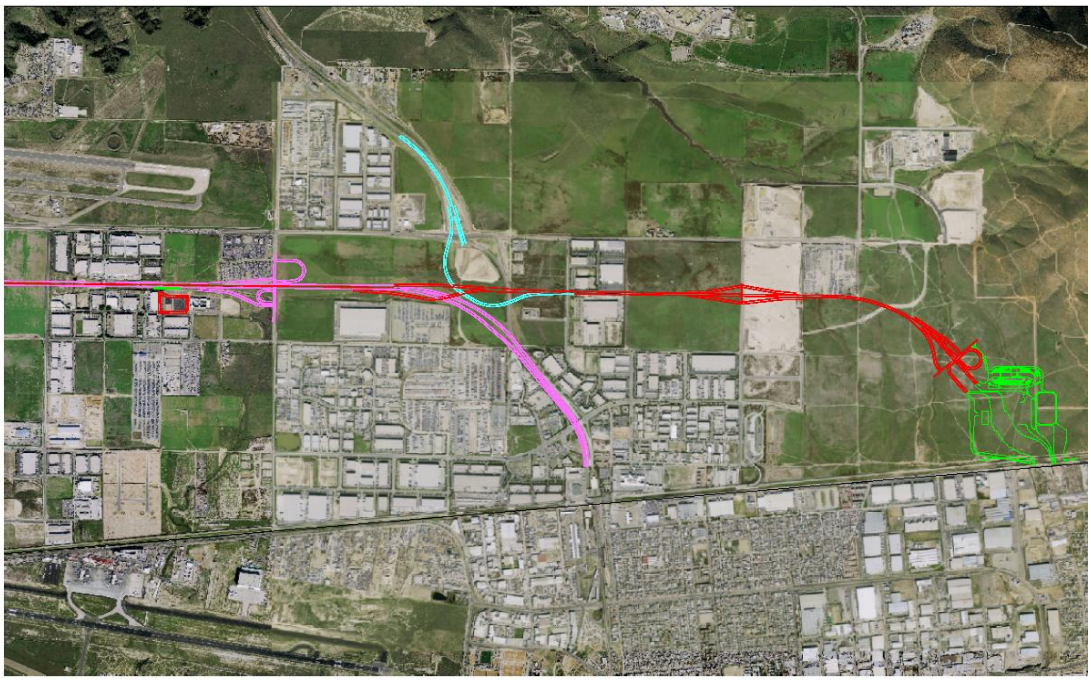
* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Can a controlled outlet and an overflow structure be designed for storm events larger than the Water Quality event? * ☐Yes ☐No
2. Is access for Maintenance vehicles provided? * ☐Yes ☐No
3. Is the drawdown time for the WQV between 24 and 72 hours? * ☐Yes ☐No
4. Has appropriate vegetation been selected for each hydrologic zone? * ☐Yes ☐No
5. Can all design elements required by the local vector control agency be incorporated? * ☐Yes ☐No
6. Has a minimum flow path length-to-width ration of at least 2:1 been provided? ** ☐Yes ☐No
7. Has an upstream bypass been provided for storms > WQV? ** ☐Yes ☐No
8. Can pretreatment be provided to capture sediment and litter in the runoff (such as using biofiltration, or a forebay)? ** ☐Yes ☐No
9. Can public access be restricted using a fence if proposed at locations accessible on foot by the public? ** ☐Yes ☐No
10. Is the maximum depth ≤10 ft? * ☐Yes ☐No

Attachment M – Noise Abatement Decision Report (NADR)

STATE ROUTE 11 *NADR*



Noise Abatement Decision Report

From Britannia Blvd. on SR 905 to the Border of Mexico East of SR 905/Otay Mesa Border Crossing

Construction of 4-Lane Freeway

11-SD-905-PM R8.4-10.1 and 11-SD-11-PM 0.0-2.1

EA 056310

November 2010

Caltrans

Noise Abatement Decision Report

From Britannia Blvd. on SR 905 to the Border of Mexico East of

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Construction of 4-Lane Freeway

11-SD-905-PM R8.4-10.1 and 11-SD-11-PM 0.0-2.1

EA 056310

November 2010

Approved By: _____ Date: November 30, 2010

Nicola Bernard,
District 11

List of Abbreviated Terms

Caltrans	California Department of Transportation
dB	A measure of sound pressure level on a logarithmic scale
dBA	A-weighted sound pressure level
FHWA	Federal Highway Administration
Leq	Equivalent sound level (energy averaged sound level)
Leq[h]	A-weighted, energy average sound level during a 1-hour period
Benefited residence	A dwelling unit expected to receive a noise reduction of at least 5 dBA from the proposed abatement measure
Critical design receiver	The design receiver that is impacted and for which the absolute noise levels, build vs. existing noise levels, or achievable noise reduction will be at a maximum where noise abatement is considered
Planned, designed, and programmed	A noise-sensitive land use is considered planned, designed, and programmed when it has received final development approval (generally the issuance of a building permit) from the local agency with jurisdiction
Date of public knowledge	The date that a project is approved—approval of the final environmental documentation (e.g., Record of Decision) is complete
NSR	Noise study report
NADR	Noise Abatement Decision Report
NAC	Noise abatement criteria
ED	Environmental document
Reasonable allowance	A single dollar value—a reasonable allowance per benefited residence that embodies five reasonableness factors
POE	Port of Entry
CVEF	Commercial Vehicle Enforcement Facility
HOV	High Occupancy Vehicle

Executive Summary

The Caltrans Traffic Noise Analysis Protocol (Protocol) specifies that Caltrans must address issues arising due to noise impacts produced by State projects. The Noise Study Report (NSR) is the source of the project noise level information used for this Noise Abatement Decision Report (NADR) and is hereby incorporated, in its entirety, by reference. The NADR represents the preliminary decision regarding noise abatement for the State Route 11 (SR-11) Project and is presented to the public for comment prior to final decision.

The SR-11 is to be located in southern portion of the City and County of San Diego in the community of Otay Mesa. The purpose of the project is to provide access, via a four-lane highway, to a new Port of Entry to be built concurrent with the SR-11 project. The project extends from 0.2 mile west of Britannia Boulevard along State Route 905 (SR-905) and then proceeds east and south, along the new SR-11 alignment, to the border. There are three build alternatives under consideration. However, each alternative ties into SR-905 and makes similar changes to that segment of the project. Southwestern College Higher Education Facility, the site shown in the NSR as having noise impacts greater than 12-dBA, is located along this segment of the project.

The preliminary noise abatement decision is based on the *feasibility* of evaluated abatement and the *preliminary reasonableness determination.* Noise abatement is considered to be acoustically feasible if it provides noise reduction of at least 5-dBA at receivers subject to noise impacts. The preliminary reasonableness determination is made by calculating an allowance that is considered to be a reasonable amount of money, per benefited residence, to spend on abatement. This *reasonable allowance* is then compared to the engineer's cost estimate for the abatement. If the engineer's cost estimate is less than the allowance, the preliminary determination is that the abatement is reasonable**.** If the cost estimate is higher than the allowance, the preliminary determination is that the abatement is not reasonable.

The NSR showed that there were no sites along the SR-11 portion of the project that required noise barriers for any of the design alternatives. Along the SR-905 portion of the project, noise impacts were recorded at the track at Southwestern College Higher Education Facility. No matter which design alternative is ultimately selected, the noise impact at the college exceeds 12-dBA and a noise barrier must be looked at. The NSR states that a wall that is 591 feet long and 10 or more feet high would achieve a 5-dBA reduction in noise and thus, is acoustically feasible. Walls in increasing two-foot increments between 6 feet and 16 feet were evaluated. The walls shorter that 10 feet were not feasible and the walls taller than 10 feet added only one more decibel of relief, which is not considered to be a reasonable tradeoff compared to the increase in cost. An engineer's cost estimate was prepared for this project. The estimate was more than double the cost allowance. It is therefore the preliminary decision to not construct the sound wall.

1. Introduction

The Noise Abatement Decision Report (NADR) presents the preliminary noise abatement decision as defined in the Caltrans Traffic Noise Analysis Protocol (Protocol). This report has been approved by a California licensed professional civil engineer. The project level Noise Study Report (NSR) (March 2010) prepared for this project is hereby incorporated by reference.

1.1. Noise Abatement Assessment Requirements

Title 23, Code of Federal Regulations (CFR), Part 772 of the Federal Highway Administration (FHWA) standards (23 CFR 772) and the Caltrans Traffic Noise Analysis Protocol (Protocol) require that noise abatement be considered for projects that are predicted to result in traffic noise impacts. A traffic noise impact is considered to occur when future predicted design-year noise levels with the project "approach or exceed" Noise Abatement Criteria (NAC) defined in 23 CFR 772 or when the predicted design-year noise levels with the project substantially exceed existing noise levels. A predicted design-year noise level is considered to "approach" the NAC when it is within 1-dB of the NAC. A substantial increase is defined as being a 12-dB increase above existing conditions.

23 CFR 772 requires that noise abatement measures that are reasonable and feasible and are likely to be incorporated into the project be identified before adoption of the final environmental document.

The Protocol establishes a process for assessing the reasonableness and feasibility of noise abatement. Before publication of the draft environmental document, a *preliminary noise abatement decision* is made. The preliminary noise abatement decision is based on the *feasibility* of evaluated abatement and the *preliminary reasonableness determination.* Noise abatement is considered to be acoustically feasible if it provides noise reduction of at least 5-dBA at receivers subject to noise impacts. Other nonacoustical factors relating to geometric standards (e.g., sight distances), safety, maintenance, and security can also affect feasibility.

The preliminary reasonableness determination is made by calculating an allowance that is considered to be a reasonable amount of money, per benefited residence, to spend on abatement. This *reasonable allowance* is then compared to the engineer's cost estimate for the abatement. If the engineer's cost estimate is less than the allowance, the preliminary determination is that the abatement is reasonable. If the cost estimate is higher than the allowance, the preliminary determination is that abatement is not reasonable.

The NADR presents the preliminary noise abatement decision based on acoustical and nonacoustical feasibility factors and the relationship between noise abatement allowances and the engineer's cost estimate. The NADR does not present the final decision regarding noise abatement; rather, it presents key information on abatement to be considered throughout the environmental review process, based on the best available information at the time the draft environmental document (ED) is published. The final overall reasonableness decision will take this information into account, along with other reasonableness factors identified during the environmental review process. These factors may include:

- impacts of abatement construction
- public and local agency input,
- life cycle of abatement measures,
- views/opinions of impacted residents, and
- social, economic, environmental, legal, and technological factors.

At the end of the public review process for the draft ED, the final noise abatement decision is made and is indicated in the final ED. The preliminary noise abatement decision will become the final noise abatement decision unless compelling information received during the environmental review process indicates that it should be changed.

1.2. Purpose of the Noise Abatement Decision Report

The purpose of the NADR is to:

- summarize the conclusions of the NSR relating to acoustical feasibility and the reasonable allowances for abatement evaluated,
- present the engineer's cost estimate for evaluated abatement,
- present the engineer's evaluation of nonacoustical feasibility issues,
- present the preliminary noise abatement decision, and
- present preliminary information on secondary effects of abatement (impacts on cultural resources, scenic views, hazardous materials, biology, etc.).

The NADR does not address noise barriers or other noise-reducing treatments required as remediation for significant adverse environmental effects identified under the California Environmental Quality Act (CEQA).

1.3. Project Description

State Route 11 (SR-11) is proposed as a four-lane facility on a new alignment. Its purpose is to serve the new the Port of Entry (POE) at Otay Mesa East and the new California Vehicle Enforcement Facility (CVEF). The San Diego Association of Governments will operate the highway as a toll road. The project is partly situated in the City of San Diego and the rest is in the County of San Diego. Despite the fact that the project is located in a major metropolitan area, the area is largely undeveloped.

There are currently three build alternatives and several design variations on those alternatives. Aside from the CVEF and POE at Otay Mesa East, the common constituents to each alternative and variation are two lanes in each direction, seven bridges and three retaining walls. Except for Sanyo Avenue, all the bridges are overcrossings. A toll plaza will also be built as part of the project and will be located adjacent to the POE. Transportation Systems Management and Transportation Demand Management measures will be incorporated into the project. The proposed overall POE footprint would include space to accommodate a potential future transit center adjacent to the POE. The transit center is not part of the proposed project, and would be designed and constructed by others.

State Route 905 is currently under construction between Britannia Boulevard and State Route 125. It is a six-lane freeway with a median large enough to contain two extra lanes in each direction. Every one of the alternatives will modify SR-905 in order to make the needed connections with SR-11. The project mitigates the proximity of La Media Road Interchange with the eastbound and westbound connectors with SR-11 by adding auxiliary lanes. A westbound auxiliary lane in the median from the westbound SR-11/SR-905 connector to La Media Road will improve functioning of that roadway section. Two auxiliary lanes to the outside of the eastbound mainlanes would also have a positive affect.

TWO INTERCHANGE ALTERNATIVE: The Two Interchange Alternative has local road interchanges at Enrico Fermi Drive and Siempre Viva Road (see Appendix A). Enrico Fermi Drive is designed as a full diamond interchange and is located about one mile to the east of the SR-905/SR-125/SR-11 Interchange. One auxiliary lane in each direction has been included between Enrico Fermi Drive Interchange and the SR-905/SR-125/SR-11 Interchange to mitigate the proximity of the two interchanges. The addition of the auxiliary lanes increases the width of the roadway. In turn, this forces traffic closer to the buildings where the SR-11 goes between the buildings at Sanyo Avenue. The profile is raised and retained by walls on each side of the freeway. By using retaining walls, the amount of Right of Way (R/W) needed is reduced.

The second, local-road interchange is at Siempre Viva Road. It is a half interchange located close to the POE and Toll Plaza. It is located approximately one mile to the east of the Enrico Fermi Drive Interchange.

ONE INTERCHANGE ALTERNATIVE: This alternative has a single, full, local-road-to-highway interchange at Alta Road. It is located about 1.4 miles to the east of the SR-905/SR-125/SR-11 Interchanges (see Appendix A). As in the Two Interchange Alternative, the profile is raised and retained by walls on the outside shoulders of the highway in the vicinity of Sanyo Avenue. Enrico Fermi Drive is not an interchange in this alternative; so auxiliary lanes between Enrico Fermi Drive and Sanyo Avenue are not needed. The bridge at Siempre Viva Road would be reduced in size since there would be no local-road access to the highway.

NO INTERCHANGE ALTERNATIVE: The No Interchange Alternative connects SR-905 and SR-125 with SR-11, but there are no local road interchanges along SR-11 (see Appendix A). The SR-11 simply provides access to the Mexico and United States Ports of Entry.

DESIGN VARIATIONS: In addition to the three proposed build alternatives, several possible variations are proposed. These are: the No Toll Variation (in which SR-11 would be operated as a freeway instead of a toll highway); the 46-foot Median Variation (in which the median in the Sanyo Avenue area would be 46 feet wide instead of the 22-foot median proposed under the build alternatives); the SR-125 Connector Variation (in which an extra connector would be constructed at the SR-90/SR-125/SR-11 Interchange to connect southbound SR-125 to eastbound SR-11 and SR-905, in addition to the SR-125 connector just mentioned); and the Siempre Viva Road Full Interchange Variation (which would apply only to the Two Interchange Alternative, and would involve construction of a full interchange at Siempre Viva Road, instead of the half interchange proposed at this location under the Two Interchange Alternative).

1.4. Affected Land Uses

The majority of the land within and immediately adjacent to the SR11 alignment project is undeveloped. Along the SR-905 segment, however, the majority of the land is developed. The developed properties include developed industrial land, partially graded areas, and Southwestern College Higher Education Facility.

2. Results of the Noise Study Report

The purpose of the Noise Study Report is to analyze traffic noise impacts predicted to occur due to the project and then to identify preliminary, noise abatement measures. The NSR addresses the requirements of the FHWA and of Caltrans.

Surrounding land uses in the vicinity of the project include primarily industrial, commercial and undeveloped, and one educational institution (Southwestern College Higher Education Facility). The nearest residence is located approximately 1,200 feet to the north of the project, beyond a reasonably expected project noise impact distance. The project R/W is primarily vacant; but does currently contain a portion of several developed properties just east of Sanyo Avenue that would be altered under the SR-11 project. In addition, the project would traverse a portion of an auto auction yard west of Alta Road, a portion of a graded industrial property currently being used for truck parking to the east of Enrico Fermi Drive, and a portion of a developed property just west of Michael Faraday Drive. The site and immediate vicinity are located on a mesa, and, as such, are relatively flat, with a slight downward slope to the south. According to the Federal Regulation 23 CFR 772, the adjacent land uses fall within Activity Categories B, C, D and E. Activity category D does not have a corresponding Noise Abatement Criteria (NAC), but Activity Category B has a NAC of 67 A-weighted decibels (dBA) 1-hour A-weighted equivalent sound level ($L_{EQ(h)}$) at the exterior of the buildings; Activity Category C has a NAC of 72 dBA $L_{EQ(h)}$; and Activity Category E has a NAC of 52 dBA $L_{EQ(h)}$ at the interior of the buildings.

Ambient noise in the area is primarily generated by vehicular traffic, airport traffic (Brown Field), and commercial/industrial uses. Ambient noise levels in the project vicinity range from 46 to 65 dBA L_{EQ}. The East Otay Mesa area is undergoing a substantial amount of development and is expected to experience an increase in noise levels in the future.

With the implementation of any of the proposed build alternative, future noise is expected to increase as a result of SR-11 and associated facilities. To determine traffic noise impacts, nineteen surrounding receiver locations were identified in three areas of the project, and the noise levels at these receivers were modeled (see Appendix A). The traffic noise modeling completed for each alternative with the baseline 22-foot median and the 46-foot median variation did not identify any traffic noise impacts from the implementation of any of the alternatives with any of the proposed variations in Area 2 or Area 3. Therefore, no abatement measures were considered in these areas. In Area 1, modeling results for all of the build alternatives and design variation indicated that predicted traffic noise levels with maximum traffic for LOS C traffic conditions would exceed the NAC at the Southwestern College Higher Education Facility receiver locations (R-10 and R-11). A noise control barrier of 10 feet in height approximately 591 feet in length along the edge of the roadway (within transportation R/W) would achieve the required minimum 5-dBA of noise reduction. The total reasonable allowance for this barrier is $105,000.

Under the No Build Alternative, it is anticipated that future traffic noise levels associated with LOS C traffic conditions at analyzed receivers would be similar to noise levels predicted for the proposed project in Areas 1 and 2, where approved SR-905 is planned or under construction, and lower than noise levels predicted for the proposed project in Area 3.

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction noise is regulated by Caltrans Standard Specifications Section 7-1.01(l), "Sound Control Requirements" (Caltrans 2006b).

Table 1. Summary of Barrier Evaluation from Noise Study Report

Barrier	Location	Station	Height Feet	Acoustically Feasible?	Number of Benefited Residences	Reasonable Allowance per Residence	Total Reasonable Allowance
NB1	EP	Sta. 570+22.7 to 570+28	6	N/A	3*	$35,000	$105,000
NB1	EP	Sta. 570+22.7 to 570+28	8	No	3*	$35,000	$105,000
NB1	EP	Sta. 570+22.7 to 570+28	10	Yes	3*	$35,000	$105,000
NB1	EP	Sta. 570+22.7 to 570+28	12	Yes	3*	$35,000	$105,000
NB1	EP	Sta. 570+22.7 to 570+28	14	Yes	3*	$35,000	$105,000
NB1	EP	Sta. 570+22.7 to 570+28	16	Yes	3*	$35,000	$105,000

EP = edge of pavement
* This is one location considered equivalent to 3 benefited residences,

3. Preliminary Noise Abatement Decision

3.1. Summary of Key Information

3.1.1. Feasibility Criteria

The NSR summarizes data gathered on existing and predicted noise impacts, provides the recommendation for the type of sound abatement to be used and recommends the number, size and locations of sites to be mitigated. The NSR recommends abatement for noise impacts only after an impacted site is determined to be an area of frequent human use and when a lowered noise level would be of benefit. The Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects (Protocol) (Caltrans 2006a) provides Caltrans policy for implementing 23 CFR 772 in California. The Protocol states that recommended abatement is feasible if the noise barrier results in an insertion loss of at least 5-dBA reduction in noise level when comparing future noise levels with and without abatement. Factors that could affect feasibility include the need to provide openings in the noise barrier due to the presence of cross streets or driveway openings, topography, safety considerations or the existence of other noise sources in the area.

After evaluating the data for this project, Southwestern College Higher Education Facility (located 0.5 miles west of La Media Road along SR-905) is the one location that the NSR recommends for noise abatement. The building at the Southwestern College building is constructed with permanently closed, double glazed windows. The building construction is heavier than Light Frame construction, but does not provide as much noise control as Masonry construction. This type of construction typically provides a minimum of 25 dBA applied to the predicted exterior noise level of 75 dBA L_{eq}, the expected interior noise level would be 50 dBA L_{eq}. The predicted exterior noise level would not approach or exceed the Activity Category E NAC of 52 dBA L_{eq}; therefore, noise abatement is not considered. The parking lot exceeds noise abatement criteria but the parking lot is not a benefited area for educational uses, so it does not require mitigation. The preliminary findings show the track meets the feasibility criteria of 5-dBA as set out in the PDPM. This criterion is satisfied with a wall height of 10 feet.

3.1.2. Reasonableness Criteria

The preliminary decision for considering abatement occurs when there are noise sensitive receptors that would benefit from a reduced noise level. For most of the SR-11 Project,

the surrounding land use s are industrial and commercial developed lands or undeveloped lands, Noise Abatement Categories C and E, both of which do not have frequent outdoor human use areas that would benefit from a reduced noise level. A noise impact was identified at Southwestern Community College recreational use area, therefore, noise abatement was considered. Although the recommended abatement met the feasibility requirement, the NADR has preliminarily resulted in the decision not to build the soundwall, as the construction cost exceeds the reasonable allowance, as discussed in further detail in section 3.1.2.

The cost reasonable determination is a collar amount allocated for noise abatement consideration based on some of the following factors:

- The cost of the abatement per benefited resident
- The life cycle of the selected abatement measure
- The amount of the noise impact
- The amount of the achievable noise reduction verses cost
- The points of view of the impacted residents
- The timeframe for future development along the highway
- The legal, social, environment, economic conditions
- The input of public and local agencies

Some of the considerations have been addressed while others remain to be considered after public input and a thorough evaluation of environmental impacts. For this reason, the decision presented here is a preliminary one.

Cost Analysis Methodology

Cost Allowance

While some of the above factors call for common sense and good judgment, others of the conditions are more easily quantifiable. A noise barrier project has a cost allowance associated with it that is based on the number of benefited frontage units; the greater the number of impacted frontage units, the longer the wall and the greater the costs. Since the sound wall under consideration is contiguous to a college, an equivalency is made based on the length of footage along the highway. For the purposes of this report, the frontage along Southwestern College Higher Education Facility is equivalent to three frontage units. A cost related to current, general, construction costs is established as the base allowance. Other very specific cost factors, when applicable to the project, are added to the base allowance. The reasonable allowance for this project, as calculated in the NSR, is $35, 000 per frontage unit (see Appendix A). This brings the total reasonable allowance for the wall to $105, 000.

Construction Cost

Caltrans construction estimates of cost are based on the actual, most current construction costs to build a Caltrans project. The completed, estimated construction cost is compared to the cost allowance and the sound wall is preliminarily established as reasonable or not reasonable to build.

Unit Price Derivation: The height, length, type and location of a sound wall all affect the Estimated Cost to build the wall. Caltrans assigns a unit price to each component of construction based upon historical data for that item of work. In generating this cost estimate, the most recent Contract Cost Data (2009 CCD) was used. This database is located at the Caltrans web site, http://www.dot.ca.gov/hq/esc/oe/awards/2009CCDB/2009ccdb.pdf. The 2009 CCD lists the costs by district and also gives the average cost for every pay item. At times, a district may not have done any work in a particular category in the past year. At other times, a district may only have one project within a particular category. To use a cost, in that case, risks skewing the results. The costs used here are the average costs of all the districts as listed in Caltrans' 2009 CCD. It may not be immediately apparent by the name of a pay item what is included in its payment. The Caltrans Standard Special Provisions specifies exactly what labor, material and incidentals are included for each pay item. See Caltrans Office Engineer's web site at http://www.dot.ca.gov/hq/esc/oe/specifications/SSPs/2006-SSPs/ Measurements and Payments section for each item of work to see what the cost item covers.

Certain actual costs of construction are not added to the sound wall budget, but will be included in the overall cost of constructing the SR-11 project. For example, the construction cost is based on a standard, masonry block wall with standard aesthetic treatments. Additional costs to mitigate the visual effects of the wall or to mitigate for hazardous materials, cultural resources or biological resources are not considered as a part of the cost for comparison purposes.

It should be noted that there are no easement costs associated with this sound wall because the wall in entirely within the State Right of Way. The costs that apply to the construction of the sound wall at the Southwestern College Higher Education Facility are as follows:

- Structure Excavation (Sound Wall): $34.71 per cubic yard
- Structure Backfill (Sound Wall): $27.00 per cubic yard
- Relocate Roadside Sign (Wood Post): $207.73 each
- Remove Road Base and Surfacing: $21.61 per cubic yard
- Remove Concrete Barrier (Type 736S): $94.56 per linear foot
- Remove Asphalt Concrete Dike: $4.12 per linear foot
- 16" Cast-In-Drilled-Hole Concrete Piling (Sound Wall): $35.93 per linear foot
- Concrete Barrier Type 736S: $94.56 per linear foot
- Sound Wall (Barrier) (Masonry Block): $20.00 per square foot
- Asphalt Concrete: $63.36 per ton
- Class 2 Aggregate Base: $30.83 per cubic yard
- Tack Coat: $26.81 per cubic yard
- Asphaltic Emulsion (Fog Seal Coat): $477.10 per ton
- Remove Concrete Barrier: $14.12 per linear foot
- Place Hot Mix Asphalt (Type E): $1.85 per linear foot
- Fiber Roll: $2.69 per linear foot
- Remove Gate: $381.67 each
- 8' Chain Link Gate (Type CL-6): $1,410.00 each

- Clearing and Grubbing: 8% of the project cost
- Landscape Costs: 10% of the project cost
- Storm Water Pollution Prevention Costs: 5% of the project cost
- Traffic Control Costs: 5% of the project cost

The total cost for the noise barrier has been calculated to be $289,463. Since the total reasonable allowance has been calculated at $105,000 , even the shortest feasible sound wall is double the reasonable allowance The table below summarizes the results.

Table 2. Summary of Abatement Key Information

Barrier	Height Feet	Acoustically Feasible? If, so, dBA reduction.	Number of Benefited Residences	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
NB1	6	No	3*	$105,000	N/A	N/A
NB1	8	No	3*	$105,000	N/A	N/A
NB1	10	5 dBA	3*	$105,000	$289,463	No
NB1	12	6 dBA	3*	$105,000	> $289,463	No
NB1	14	6 dBA	3*	$105,000	> $289,463	No
NB1	16	6 dBA	3*	$105,000	> $289,463	No

*This is one location equivalent to 3 benefited frontage units

3.2. Nonacoustical Factors Relating to Feasibility

Preliminary findings show the proposed noise barrier for this project is feasible when evaluating nonacoustical considerations for this project. The recommended noise barrier for this project is able to be positioned so it meets the geometric standards set out in the Highway Design Manual (HDM). There are no utility conflicts with the barrier. There is, however, a double reinforced concrete box culvert that would conflict with the placement of the noise barrier. A solution to work around this obstacle would add to the cost of the project.

The recommendation made in the NSR is for the noise barrier to be placed on the edge of shoulder. This placement would negatively impact the clear recovery zone. It would also be at the minimum acceptable horizontal clearance. To ameliorate the two conditions, the HDM recommends the wall and the barrier rail be shielded. These are all issues that can be addressed in the design of the sound wall.

3.3. Preliminary Recommendation and Decision

A sound wall has been recommended in the NSR as the best option for noise abatement for the Southwestern College track area. The acoustically feasible wall is identified in the NSR as being 591 feet long and 10 feet high.

The other criterion used for considering the recommendation to construct a noise barrier is the cost comparison between the construction cost and the reasonableness allowance. The sound wall would benefit three frontage units. The allotted cost per benefited unit has been identified as $35, 000 each or a combined reasonable allowance of $105, 000.The reasonable allowance cost is compared to the construction cost of a masonry block wall built to Caltrans standards. The estimated construction costs for this wall is $289,463. This exceeds the allowable cost; therefore, the preliminary decision is to not build a noise barrier. This finding will be included in the draft environmental document. The document will be circulated for public review.

The preliminary noise abatement decision presented in this report is based on preliminary project alignments and profiles, which may be subject to change. As such, the physical characteristics of noise abatement described herein also may be subject to change. If pertinent parameters change substantially during the final project design, the preliminary noise abatement decision may be changed or eliminated from the final project design. A final decision to construct noise abatement will be made upon completion of the project design.

4. References

California Department of Transportation, 2006. *Traffic Noise Analysis Protocol*, Sacramento, California

Internet Resources:

http://www.dot.ca.gov/hq/LandArch/scenic_highways/
Copy of the map showing District 11 Scenic Routes

http://www.conservation.ca.gov/cgs/cgs_history/Pages/2010_geologicmap.aspx
Copy of the quadrangle map showing the geological formations

http://www.dot.ca.gov/hq/esc/oe/specifications/SSPs/2006-SSPs/

http://www.dot.ca.gov/hq/esc/oe/awards/2009CCDB/2009ccdb.pdf

http://www.sandiego.gov/planning/community/profiles/otaymesa/pdf/1luotaymesa.pdf
Copy of the City of San Diego's Otay Mesa Community Plan – Land Use

http://www.sandiego.gov/planning/genplan/pdf/generalplan/adoptedluelemfv.pdf
Copy of the City of San Diego adopted General Plan Land Use

http://www.sdcounty.ca.gov/dplu/docs/existgp/gpcpaotay.pdf
Copy of the Couny of San Diego Existing General Plan

Appendix A – Appendix

PRELIMINARY PLANS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

LOCATION MAP

BEGIN WORK
"E4" 529+85 SR-905
PM R8.4

BEGIN CONSTRUCTION
"E4" 539+85 SR-905
PM R8.6

To Chula Vista

CITY OF SAN DIEGO
COUNTY OF SAN DIEGO

BEGIN WORK
SR 125 PM 0.7

BEGIN CONSTRUCTION
SR 125 PM 0.5

END OF CONSTRUCTION
"SD-11" LINE PM 2.8

BROWN FIELD MUNICIPAL AIRPORT

CONTINENTAL STREET
BRITANNIA Blvd
GAILES BOULEVARD
AILSA COURT
OTAY MESA CENTER Rd
LA MEDIA ROAD
OTAY MESA ROAD
ALTA Rd

To San Diego

SAINT ANDREWS AVENUE
ROUTE 905
COLCHESTER COURT
AIRWAY ROAD
PIPER RANCH Rd
HARVEST ROAD
DORNOCH COURT
SANYO Ave
ROUTE 11
FERMI Dr
ALTA Rd
HEINRICH HERTZ DRIVE
MICHAEL FARADAY Dr
SIEMPRE VIVA ROAD
HARVEST ROAD
OTAY CENTER DRIVE
ROLL Dr
PASEO DE LAS AMERICAS
CITY OF SAN DIEGO
COUNTY OF SAN DIEGO
VIA DE LA AMISTAD
CUSTOMHOUSE PLAZA
OTAY FEDERAL PORT OF ENTRY
To Tijuana

INTERSECTION PM 0.0

ROUTE 11/125/905 INTERSECTION

FEDERAL COMMERCIAL VEHICLE INSPECTION AREA
CVEF
POE
FEDERAL PASSENGER VEHICLE INSPECTION AREA
FEDERAL PORT OF ENTRY

END OF WORK

UNITED STATE OF AMERICA
MEXICO
TIJUANA

NADR EXHIBIT 1
TWO INTERCHANGE ALTERNATIVE

SCALE 1":900'

PROJECT ENGINEER _____ DATE
REGISTERED CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER
No. _____
Exp. _____
CIVIL
STATE OF CALIFORNIA

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

PROJECT MANAGER

DESIGN ENGINEER

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

CONTRACT No.

LAST REVISION 00-00-00
DATE PLOTTED => 11-OCT-2010
TIME PLOTTED => 11:21

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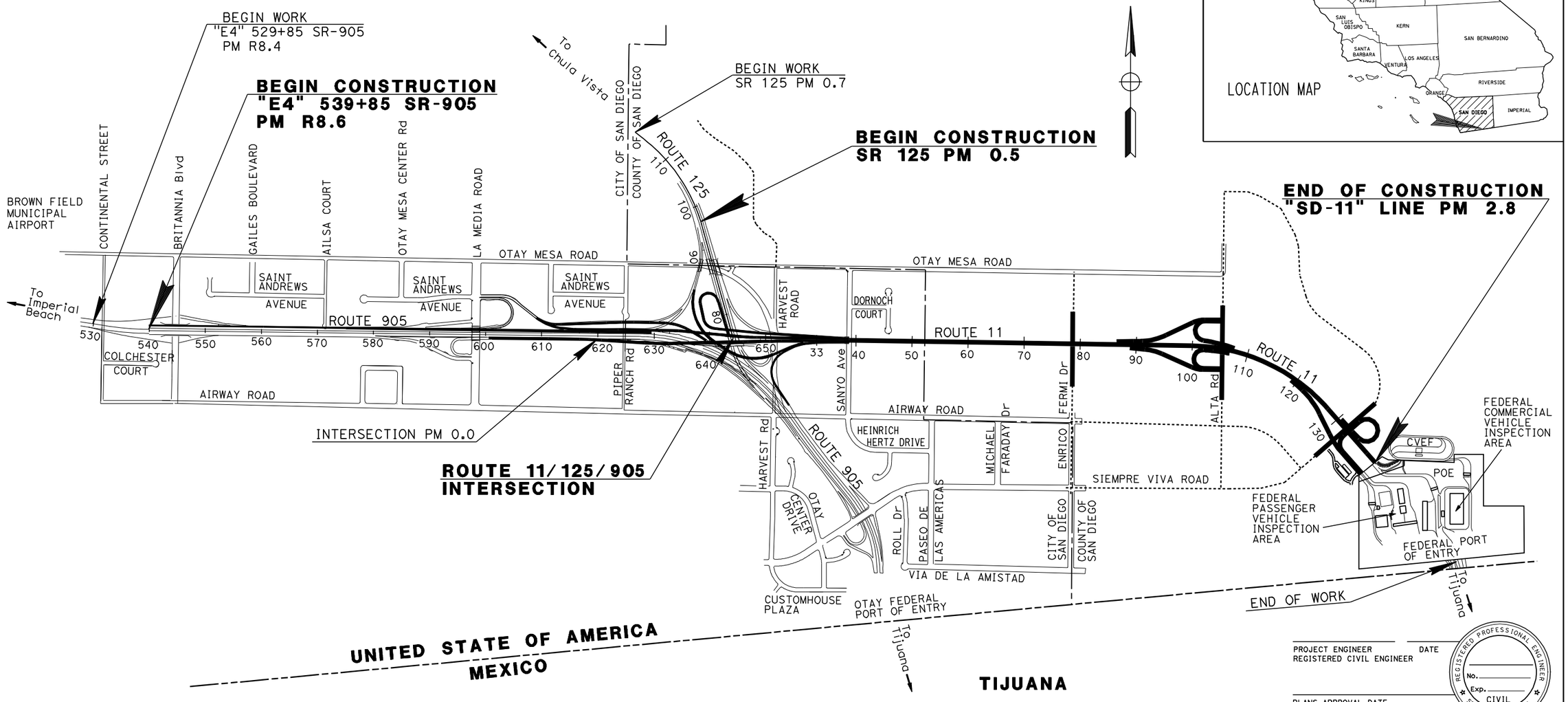
PRELIMINARY PLANS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

LOCATION MAP



NADR EXHIBIT 2
ONE INTERCHANGE ALTERNATIVE

SCALE 1":900'

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

PROJECT ENGINEER DATE
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

PROJECT MANAGER

DESIGN ENGINEER

LAST REVISION 00-00-00
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TIME PLOTTED => 11:21

CONTRACT No.

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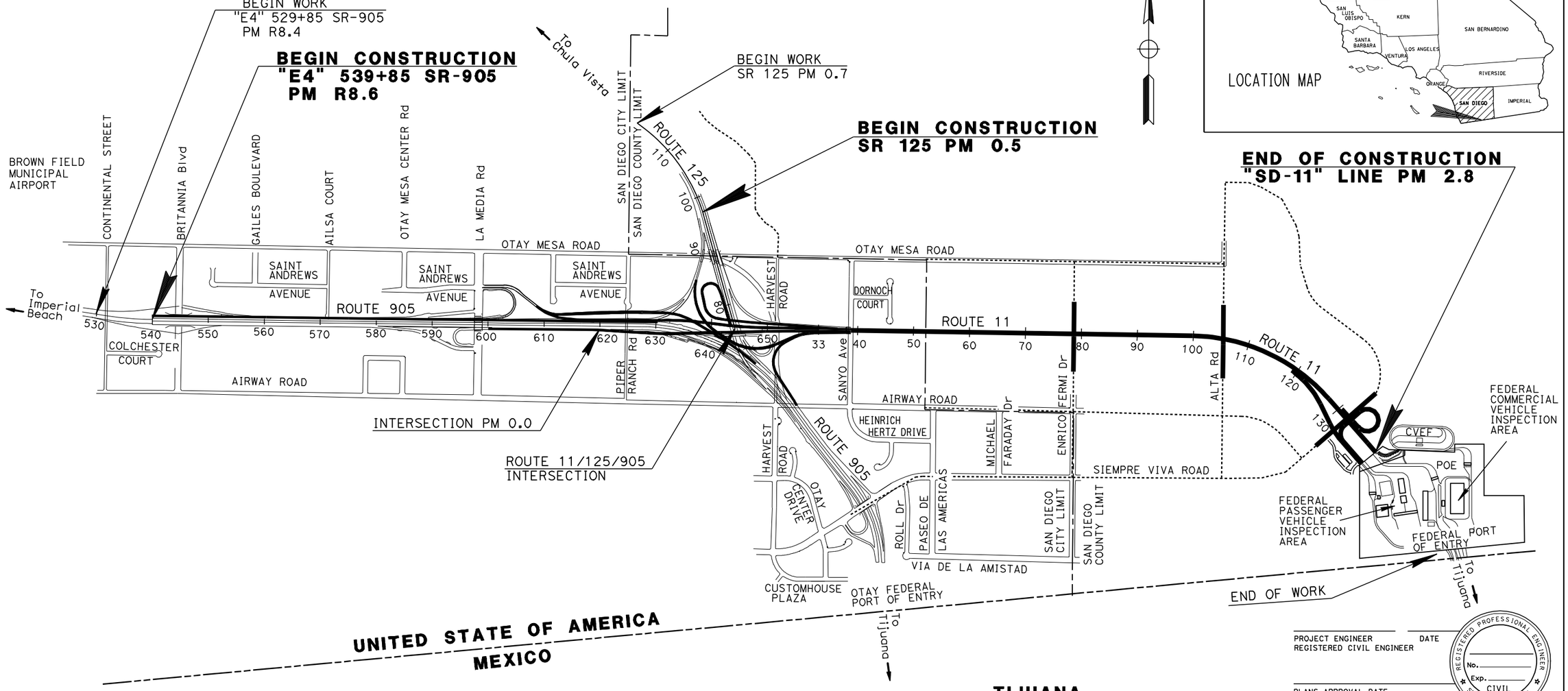
PRELIMINARY PLANS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

LOCATION MAP



NADR EXHIBIT 3
NO INTERCHANGE ALTERNATIVE

SCALE 1":900'

PROJECT ENGINEER DATE
REGISTERED CIVIL ENGINEER

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REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

PROJECT MANAGER

DESIGN ENGINEER

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CONTRACT No.

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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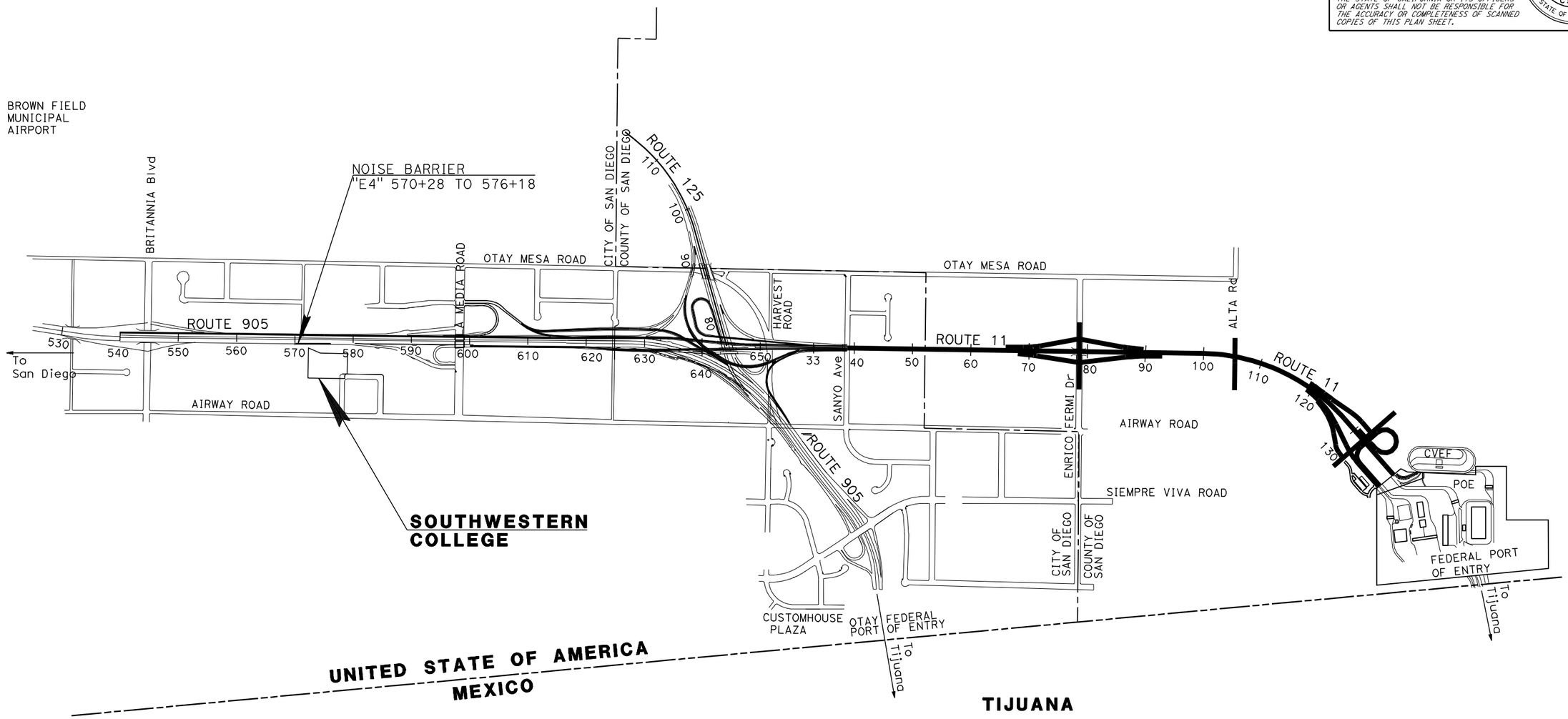
PRELIMINARY DESIGN



NOISE BARRIER AND SOUTHWESTERN COLLEGE HIGHER EDUCATION FACILITY

NADR EXHIBIT 4

REVISED BY | DATE REVISED | CALCULATED-DESIGNED BY | CHECKED BY | FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 00-00-00 | DATE PLOTTED => 11-OCT-2010 | TIME PLOTTED => 11:22

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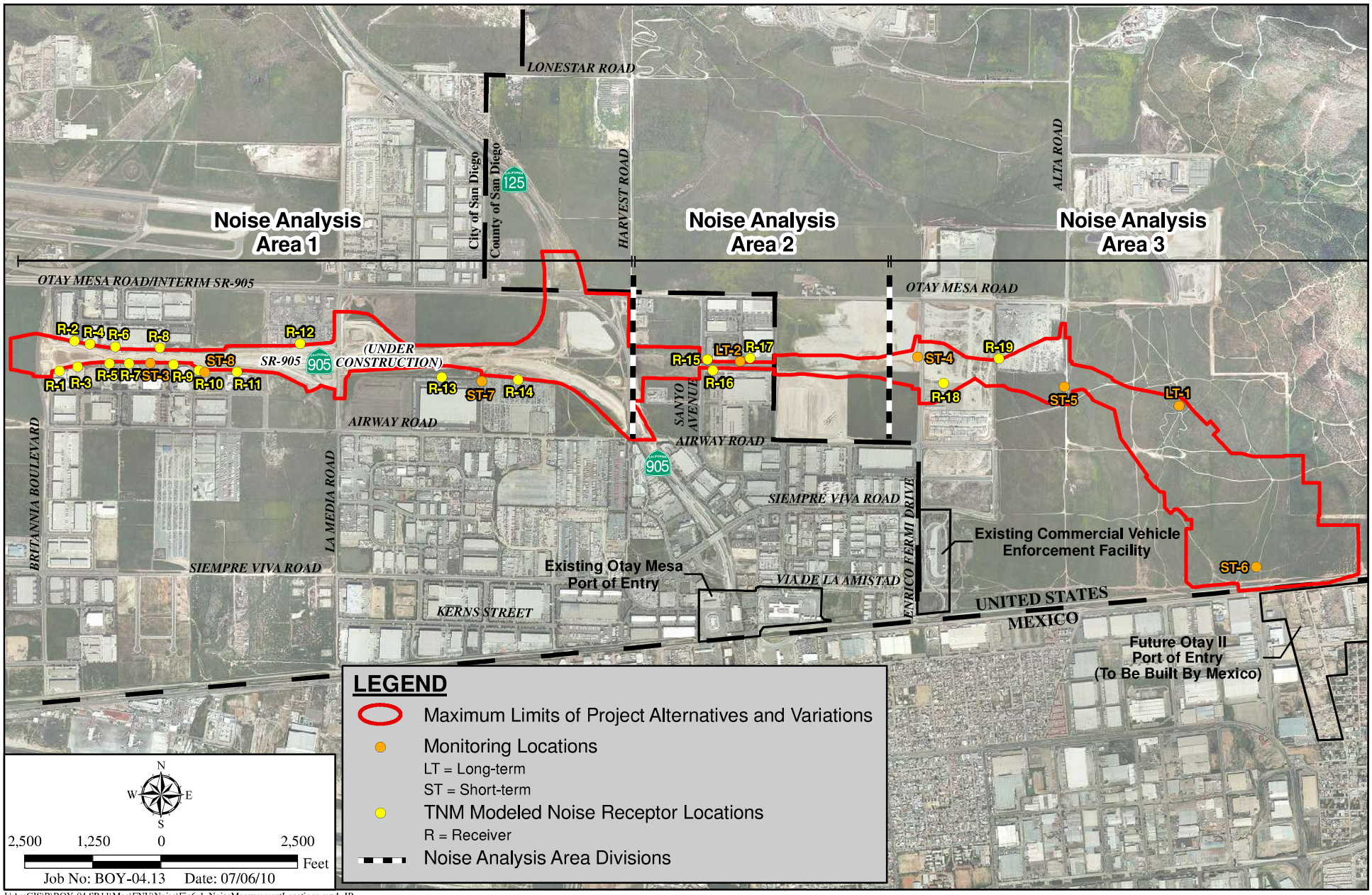


F:\ArcGIS\B\BOY-04 SR11\Map\ENV\Noise\Fig6-1_NoiseMeasurementLocations.mxd -JP

Noise Analysis Areas and Receiver and Monitoring Locations

Worksheet A
Reasonable Allowance Calculation for Noise Abatement based on Critical Design Receiver

Base Allowance				
Base Year	2008			$31,000
1) Absolute Noise Levels			Check One	
69 dBA or less:	Add:	$2,000		$0
70-74 dBA:	Add:	$4,000	√	$4,000
75-78 dBA:	Add:	$6,000		$0
More than 78 dBA:	Add:	$8,000		$0
2) Build vs. Existing Noise Levels[1]			Check One	
Less than 3 dBA:	Add:	$0	√	$0
3-7 dBA:	Add:	$2,000		$0
8-11 dBA:	Add:	$4,000		$0
12 dBA or more:	Add:	$6,000		$0
3) Achievable Noise Reduction			Check One	
Less than 6 dBA:	Add:	$0	√	$0
6-8 dBA:	Add:	$2,000		$0
9-11 dBA:	Add:	$4,000		$0
12 dBA or more:	Add:	$6,000		$0
4) New Construction Or Pre 1978 residences? (Choose Yes or No)				
YES on either one:	Add:	$10,000		$0
NO on both:	Add:	$0	√	$0
Reasonable Allowance Per Residence				$35,000
Unmodified Barrier Allowance				$105,000
Adjusted reasonable allowance for Benefitted Residence				$35,000
Adjusted Unmodified Barrier Allowance				$105,000

Adjusted reasonable allowance for Residence and Barrier must be rounded up to the nearest $1,000

[1] Build vs. Build-out SR-905 (under construction)
[2] Build-out SR-905 Noise Levels

County: San Diego
Route: SR-905
Post Mile: 570+28/576+18
Project Exp Auth: EA 085780
Program Code:

Barrier Name or ID	NB-1
Barrier Height (Feet)	10
Critical Design Receiver	R-10
Number of benefitted Residences (equivalent)	3
New Hwy Construction	No
Pre 1978 residences	No
Existing Noise Levels[2]	74 dBA
Future Noise Levels	74 dBA
Changes in Noise Level	0 dBA
Noise Level with Abatement	69 dBA
Barrier Insertion Loss	5 dBA

Continue to Worksheet B

Worksheet B
Noise Barrier Reasonable Allowance Calculation

County: San Diego Route: SR-905 Post Mile: 570+28/576+18 Program Code:
Construction Cost without abatement: $139,134,000.00[1]

From Worksheet A				Adjusted Barrier Allowance vs Construction Cost	Percentage of Total Barrier Allowance	Modified Barrier Allowance	Modified Allowance Benefitted Residence
Barrier ID	Adjusted Allowance for Critical Design Receiver	Number of Benefitted Residences	Adjusted Unmodified Barrier Allowance		(col 4: A/ΣA)	(A/ΣA x .5 x Const Cost)	(col 7/col 3)
R-10	$35,000	3	$105,000	The total unmodified barrier allowance (column 4) is less than 50% of the construction cost without abatement, therefore no allowance modification is required.			
	Totals	3	$105,000				
1	2	3	4	5	6	7	8

[1] Lowest cost scenario, i.e. No Interchange Alternative, SR-11 Only ($358,020,000 if POE and CVEF included)

NOISE BARRIER

Construction Cost Estimate

Number of Equivalent Benefited Residences	Height	Length	Structure Excavation Sound Wall	Structure Backfill	Relocate Sign (Wood Post)	Remove Road Base and Surfacing	Remove Concrete Barrier	Remove AC Dike	16" CIDH Concrete Piling (Sound Wall)	Concrete Barrier Type 736S	Sound Wall (Barrier) (Masonry Block)
	Ft	Ft	CY	CY	Ea	CY	LF	LF	LF	LF	SF
	10	591	73.9	22.0		72.5		130.0	627.9	591.0	4137.0
COSTS			$2,542	$594	$0	$1,567	$0	$536	$22,560	$55,885	$82,740

Number of Equivalent Benefited Residences	Ht.	Len.	Asphalt Concrete	Class 2 Aggregate Base	Tack Coat	Asphaltic Emulsion (Fog Seal Coat)	Place Hot Mix Asphalt Type E	Fiber Roll	Remove Gate	Gate
	Ft	Ft	CY	CY	Ton		LF	LF	Ea	Ea
	10	591	24.5	75.7	1.4	0.6	130.0	100.4	2.0	2.0
COSTS			$1,554	$2,334	$551	$286	$51,141	$270	$763	$2,820

Construction Cost: $226,143

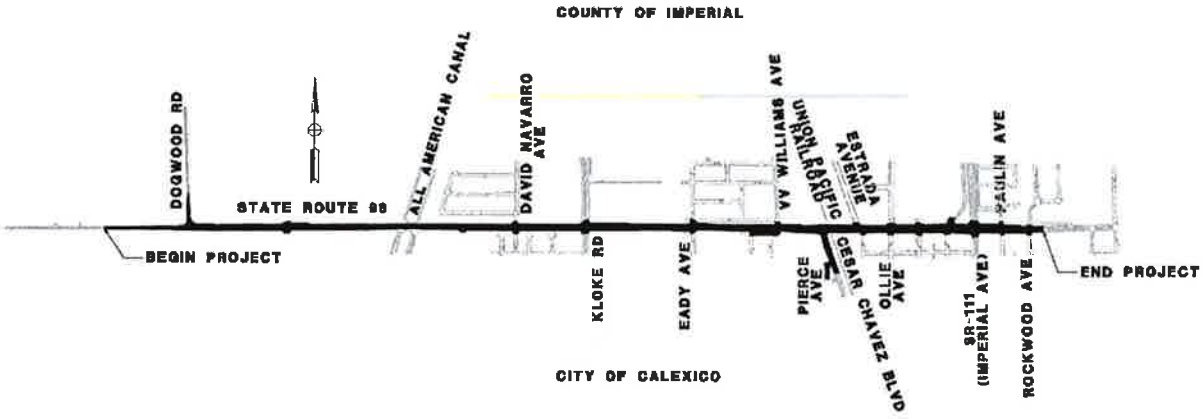
Clearing & Grubbing	Landscaping Cost	Traffic Control Cost	SWPPP Cost
(8% Wall Cost)	(10% Wall Cost)	(5% Wall Cost)	(5% Wall Cost)
$18,091	$22,614	$11,307	$11,307

Additional Costs: $63,320

TOTAL COSTS: $289,463

11-IMP-98
KP 48.2/52.5
(PM 30.0/32.6)
EA 080200
December 2008

PROJECT REPORT



IN IMPERIAL COUNTY IN THE CITY OF CALEXICO
ON ROUTE 98 FROM 0.5 KILOMETERS (0.3 MILES) WEST OF DOGWOOD ROAD TO 0.3 KILOMETERS (0.2 MILES) EAST OF ROCKWOOD AVENUE
KP 48.2 to KP 52.5 (PM 30.0 to PM 32.6)

Submitted by: _____
Jason Lemons, PE
Dokken Engineering

Approval Recommended by: _____
Mario Orso
Project Manager

I have reviewed the right of way information contained in this Draft Project Report and the R/W Data Sheet attached hereto and find the data to be complete, current, and accurate:

Right of Way Certification: _____ 1-27-09
Janet Schaffer — Date
DEPUTY DISTRICT DIRECTOR
RIGHT OF WAY DIVISION

Environmental Certification: _____ 9 Feb 2009
Susanne Glasgow — Date
DEPUTY DISTRICT DIRECTOR
ENVIRONMENTAL

Approved by: _____ 2/10/09
Marcelo Peinado — Date
DEPUTY DISTRICT DIRECTOR
DESIGN

_____ 2/18/09
Ross Cather — Date
DEPUTY DISTRICT DIRECTOR
PROGRAM/PROJECT MANAGEMENT

This Project Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Jason Lemons, P.E.
Registered Civil Engineer

12/19/08
Date

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1. Introduction

The California Department of Transportation (Caltrans) in cooperation with the City of Calexico (City) proposes to improve traffic operations, enhance bicycle and pedestrian safety, and improve drainage performance on State Route 98 (SR-98). The project is located on SR-98 from 0.5 kilometers (0.3 miles) west of Dogwood Road to 0.3 kilometers (0.2 miles) east of Rockwood Avenue, KP 48.2 to KP 52.5 (PM 30.0 to PM 32.6), in the city of Calexico in Imperial County (see **Attachment A).**

The following describes the proposed alternatives:

No Build Alternative
The No Build Alternative proposes no improvements to the project area.

Build Alternative
The Build Alternative proposes to widen State Route 98 (SR-98) from two to four lanes from Dogwood Road through just west of Ollie Avenue, and from four to six lanes from Ollie Avenue through State Route 111 (SR-111), tying back to the existing road at Rockwood Avenue (see **Attachments B and C**). The lane widths are a standard 3.6 meters (12 feet) and a raised median that averages 4.3 meters (14 feet) in width will be incorporated throughout the length of the project. In addition, the alternative will update the number of turning lanes according to traffic needs at each intersection within the project limits. There will also be new intersections constructed or right-turn lanes lengthened to create access for future commercial and residential developments.

Some intersections will have access reduced or restricted from the existing conditions. These intersections are:

- SR-98/Harold Avenue
  - Existing Condition – Full access
  - Future Condition – Right in/right out
- SR-98/Paulin Avenue
  - Existing Condition – Full access
  - Future Condition – Right in/right out
- SR-98/Lee Avenue
  - Existing Condition – Full access
  - Future Condition – No direct access
- SR-98/Lacy Avenue
  - Existing Condition – Full access
  - Future Condition – Traffic that would normally exit Lacy Avenue to go east on SR-98 will be diverted to Birch Street which will then lead to the realigned V.V. Williams Avenue.

All full intersections will be signalized. The intersections that are currently unsignalized that will be signalized as a result of this project are as follows:

- SR-98/David Navarro Avenue
- SR-98/V.V.Williams Avenue/Lee Avenue
- SR-98/Cesar Chavez Boulevard.

Intersections that are currently signalized will remain signalized. New detection loops will need to be added to all through eastbound lanes east of SR-111 on SR-98.

Sidewalks are proposed along either side of SR-98 for the entire length of the project to encourage pedestrian use as well as enhance the safety of pedestrians. The sidewalks will be 1.5 meters (5 feet) in width.

This alternative will also incorporate a new Class II bike lane in order to promote bicycle use as well as enhance bicyclist access. The bike lane will be adjacent to the sidewalk for the entire length of the project for both the eastbound and westbound directions. The bicycle lane will be 2.4 meters (8 feet) in width.

The project proposes to include a standard drainage system. Curb and gutter will be placed along the entire length of the project on both sides of the road. Water will drain through inlets to pipes that connect to proposed drainage basins. These six detention basins will be constructed along the project at various locations. The capacity of the basins will be sized to hold the volume generated by a 100-year, 24-hour storm. The collected water of the two basins west of the All American Canal and the two basins immediately east of the All American Canal will flow via pipes to the All American Canal drains numbers 9 and 10. The water collected by the two eastern most basins will be pumped to the existing 24 inch storm drain system at Kloke Road, which then drains south to the New River.

All staging areas will be located within the project footprint.

Construction would occur in two phases:

- Phase 1 – Location: From East of the All American Canal to Rockwood Avenue.
- Phase 2 – Location: From just west of Dogwood Road to east of the All American Canal.

Phase 2 construction is expected to be largely funded by private developers through fair share agreements.

Cost estimations for the Build Alternative were escalated for the year 2014 to reflect a 5 percent increase for inflation compounded annually. Total estimated project costs for Phase 1, in 2014 dollars, are $46,900,000 (which includes $36,263,000 in capital costs and $10,621,400 in support costs) for the road widening improvements. Total estimated project costs for Phase 2, in 2014 dollars, are $19,100,000 (which includes $15,237,000 in capital costs and $3,845,500 in support costs) for the road widening improvements. Total estimated project costs for the combined Phase 1 and Phase 2, in 2014 dollars, are $63,900,000 (which includes $49,398,000 in capital costs and $14,468,000 in support costs) for the road widening improvements (see **Attachment D**). The project is listed in the 2007 Regional Transportation Plan (RTP), and the 2006 State Transportation Improvement Program (STIP).

2. Recommendation

It is recommended that the Draft Environmental Document (DED) for this project be approved and distributed to the public along with A NOTICE OF AVAILABILITY AND OPPORTUNITY FOR PUBLIC HEARING. During the 30-day review period, members of the public may comment and/or request a public hearing.

3. Background

- **Project History**

  Various improvements on the portion of SR-98 extending from David Navarro Avenue to SR-111 have been considered by Caltrans and the City of Calexico since 1993. These include widening to four or six lanes, adding a left-turn median, constructing traffic signals or restricting turns at several intersections, upgrading the Union Pacific Railroad (UPRR) at-grade crossing, adding bike lanes, and constructing sidewalks.

  A cooperatively funded Minor A project addressing safety concerns from Ollie Avenue to V.V. Williams Avenue was initiated in 1993, but suspended in 1994 due to costs exceeding the funding limit. A downscaled Minor B safety project was completed in 1995, with approval conditioned on future upgrading of resulting nonstandard features.

  In 1996, Caltrans approved a Project Study Report (PSR) for the portion of SR-98 from Kloke Road to SR-111 which proposed the following alternatives:

  Alternative 1 (Full Four Lane Widening):
  -Full four lane widening from Kloke Road to Ollie Avenue
  -Signalizing the V.V. Williams Avenue intersection
  -Channelization at Emerson Avenue
  -Upgrading the UPRR at-grade crossing

  Alternative 2 (Partial Four Lane Widening):
  -Widening to a four lane facility from V.V. Williams Avenue to Ollie Avenue
  -Signalizing the Ollie Avenue, V.V. Williams, and Eady Avenue intersections
  -Channelization at Emerson Avenue
  -Upgrading the UPRR at-grade crossing

  Alternative 3 (Miscellaneous Improvements):
  -Signalizing the Ollie Avenue and Eady Avenue intersections
  -Upgrading nonstandard shoulders and UPRR at-grade crossing
  -Channelization at Emerson Avenue

  The City agreed to Alternative 2 with the condition that sidewalks would be added on the south side of SR-98 from Kloke Road to Ollie Avenue.

This new condition changed the project footprint requiring all environmental studies to be updated and the project estimate increased by 100% due to added work related to the new conditions and project limits.

Due to the time frame to perform and approve a Project Report for the revised Alternative 2 and pressing safety concerns, Caltrans proposed the construction of traffic signals and curb ramps on SR-98 at the Eady Avenue and Ollie Avenue intersections. A Project Report for the signals was approved in November 1999 and construction was completed in January 2001.

In 2005, the western logical terminus of the highway widening project was extended to just west of Dogwood Road, due to an increase in residential development in the area. Sidewalks and Class II bike lanes were also added to the east and west-bound sides of SR-98 for the entire stretch of the project. The current General Plan (GP) for the City of Calexico calls for Class I bike lanes from David Navarro to SR-111, but meetings with city representatives have confirmed the intent to adjust the City's GP to recommend Class II bike lanes for the full widening project. Signalizations of the following intersections were also proposed: SR-98/David Navarro, SR-98/V.V.Williams Avenue/Lee Avenue, and SR-98/Cesar Chavez Boulevard. In 2006, the eastern terminus was extended to Rockwood Avenue based on increased traffic needs east of SR-111.

- **Community Interaction**
  Project Development Team (PDT) meetings were held every month from 2005 until 2008 to discuss issues related to the project. The City of Calexico staff was invited to all meetings and often had representatives at the meetings to discuss matters of concern to the City. Other representatives including that of the new developments and the Imperial Irrigation District (IID) were also present at certain meetings. Caltrans and the various representatives would work to resolve problems that were brought up at these meetings.

  A public notice was placed in the local news publications in both English and Spanish inviting the public to attend the Public Hearing scheduled on September 30, 2008. Project personnel were on hand to discuss the project. Exhibits of the project were displayed and the Draft Environmental Document was available for review and comment.

- **Existing Facility**
  SR-98 is a two-lane highway from Dogwood Road to just west of Ollie Avenue and a four-lane facility from Ollie Avenue to Rockwood Avenue. The setting of SR-98 ranges from rural on the western portion of the project site with new proposed developments, to largely residential in the middle of the project site, to highly urbanized on the eastern portion of the project site. There are traffic signals at the intersections of SR-98/Dogwood Rd, SR-98/Kloke Road, SR-98/Eady Avenue, SR-98/Ollie Avenue, SR-98/SR-111, and SR-98/Rockwood Avenue, and left-turn pockets at each full intersection. The spacing between intersections is very close along SR-98 between David Navarro

Avenue and Rockwood Avenue. There are no bike lanes or bus stops and parking along the curb is prohibited. Sidewalks exist sporadically along SR-98, many of them not going from one intersection to the next, but stopping somewhere in-between. Sidewalks, partial or full, exist at David Navarro on the northern and southern sides of SR-98 going west; at Kloke on the southern side of SR-98 going east; at Ollie on the southern side going west; and at SR-111 on the northern side of SR-98 going west. SR-98 is flanked on either side by residential and commercial development for most of the project. The terrain is very flat and no real existing drainage features are present. In large storms, the area floods and water sheet flows into adjacent parcels.

4. Need and Purpose

A. Problem, Deficiencies, Justification

The purpose of the SR-98 widening project is to improve traffic operations, provide congestion relief in order to improve traffic flow, enhance bicycle safety and pedestrian access, and improve drainage along this section of SR-98.

Population growth, increased development, and improvements to the border crossings have contributed to highway congestion, traffic queues and delays. Currently two of the intersections along this corridor operate at a Level of Service (LOS) F with a peak hour total delay of 22 minutes. Development is expected to continue in the area and increase traffic flow problems. In the 2035 No Build condition, every intersection along this corridor, with the exception of SR-98/Ollie Avenue, would operate at a LOS F with a peak hour total delay of 49 minutes.

There is a lack of sidewalks and/or bike access for those pedestrian/bicyclists traveling through the corridor. Due to the number of schools nearby, this also contributes to an increased number of pedestrians walking or biking adjacent to the highway.

There is currently no structured drainage system along this corridor and the highway experiences localized flooding during heavy storms.

B. Regional and System Planning

- **Identify Systems**
  State Route 98 is designated as a terminal access route for Surface Transportation Assistance Act (STAA) trucks as well as part of the De Anza Historic Trail. From SR-111 to SR-7, SR-98 is included in the Interregional Road System (IRRS) and the International Border Trade Corridor (IBTC). From I-8 to Bonds Corner Road (PM R0.3 to PM 42.1), SR-98 is designated as Maintenance Service Level (MSL) 2 and the rest of SR-98 is designated as MSL3 in the State Highway

System. SR-98 is also part of the Intermodal Corridor of Economic Significance (ICES) system.

- **State Planning**
  Upgrading SR-98 from two lanes to four lanes from David Navarro Road to Ollie Avenue is part of Caltrans 2020 Transportation Concept Facility Improvements and is included in the *State Route 98 Transportation Concept Report*. An attempt is being made to update the project limits and increase the designated budget. Widening SR-98 west of SR-111 is also part of the State Transportation Improvement Program (STIP).

- **Regional Planning**
  Widening and signalizing SR-98 west of SR-111 is part of the *2002 Imperial County Transportation Plan* as a Near Term Project Commitment.

- **Local Planning**
  The current General Plan (GP) Update for the City of Calexico classifies SR-98 as a primary east/west arterial and recommends that the facility be upgraded to a 4-lane divided highway. The Bicycle Master Plan for the City of Calexico is based on input from workshops, staff input, and a review of existing roadway conditions. According to the Bicycle Master Plan, SR-98 should be a Class I Bicycle Path and Class II Bicycle Lane. Due to right of way of way constraints, a Class I Bicycle Path will not be provided.

- **Transit Operator Planning**
  There is currently no rail or bus transit along SR-98. The City of Calexico is considering adding a transit service, either rail or bus, on Dogwood Road, but no official plans have been made.

C. Traffic

- **Current and Forecasted Traffic**
  A combined Traffic Volumes/Traffic Operational Report (**Attachment E**) was performed by Linscott, Law and Greenspan Engineers (LLG) for the project study area. This report examined volumes, conditions, lane configurations, and projections for the following years:
  - Year 2005/2006 (Existing Conditions)
  - Year 2018 (Open to Traffic Date)
  - Year 2035 (Design Year)

  The report studied two scenarios for the aforementioned dates:
  - With Anza Road Extension
  - Without Anza Road Extension

The Anza Road Extension signifies the City of Calexico's intention to connect Anza Road (2nd Street) from west of Cesar Chavez Boulevard to Dogwood Road. Though the City does not yet have a final alignment, discussions with city representatives

confirms the intentions to build. As such, the forecasted traffic numbers that include the Anza Road extension is the preferred alternative for the project.

Traffic Modeling and Forecasting

A modification of Southern California Association of Governments (SCAG) 2025 Regional Model was used to forecast Year 2025 traffic volumes. Modifications were made to both the land use and network impacts so that the data is consistent with the City of Calexico General Plan. The Model was reviewed in coordination with the City of Calexico and Caltrans. The forecast Model plots are contained in Appendix D of the Traffic Report dated September 5, 2006 along with figures that show the Average Daily Traffic (ADT) volumes for both scenarios (without and with the Anza Street extension).

The following key roadway network and land use parameters were verified and/or assumed:

§ The Socio-Economic and Land Use data was reviewed for the 2025 Imperial County Transportation Model (ICTM). The 2025 ICTM contained two different socio-economic and land use data, one is the Calexico General Plan (CalexGP) version and the other is the Imperial Mall (ImpMall4a) version. After a review of the demographic information for both versions and consultation with City staff, it was determined that the Calexico General Plan version was to be used for this project.

§ The Calexico General Plan version of the ICTM was updated based on comments from the City of Calexico and is called the CalexGP+ version. The CalexGP+ version is considered a land use alternative to the CalexGP and ImpMall4a versions of the model and was created exclusively for the SR 98 Widening Project.

§ The transportation network in the 2025 Imperial County Transportation Model was modified to include a link for Kloke Road from SR 98 to Cole Road and minor adjustments to some centroid connections.

§ The transportation network in the 2025 Imperial County Transportation Model does not include the potential modification to the Calexico West Border Station. The modification will likely increase traffic volumes on Cesar Chavez Boulevard.

§ Three specific projects were applied to the CalexGP+ model based on recent traffic studies of reasonably expected development.

- § Los Lagos – 442.54 acres of mixed-use development in Traffic Analysis Zone (TAZ) 574
- § River View Condominium - 352 unit of multi-family homes in TAZ 606
- § Remington Condominium – 272 unit of multi-family homes in TAZ 605

Table A: Average Daily Traffic (ADT)Volumes (with Anza Road Extension)

Study Segment	Existing	Year 2015	Year 2035
	ADT	ADT	ADT
SR-98			
West of Dogwood Rd	5600	6800	9300
East of Dogwood Rd	8800	19,600	27,100
All American Canal and David Navarro Ave	9200	21,000	29,000
David Navarro and Kloke Rd	11,200	23,700	32,800
Kloke Rd and Eady Ave	17,100	26,300	36,300
Eady Ave and V.V. Williams Ave	17,000	26,300	36,300
V.V. Williams and Cesar Chavez Blvd	22,100	27,400	37,900
Estrada Blvd and Ollie Ave	22,400	28,900	39,800
Ollie Ave ad SR-111	25,400	28,900	39,800
East of SR-111	26,400	34,100	47,100
SR-111			
North of SR-98	33,100	57,000	78,700
South of SR-98	36,200	47,800	65,900

Operational Analysis for Intersections

Level of Service Objectives - The objective of the project is to accommodate future traffic demands by achieving a target Level of Service (LOS) D.

The traffic evaluation used a LOS analysis to describe operational conditions throughout the project limits. The levels are depicted with letter designations A through F, with LOS A representing the best operating conditions and LOS F the worst. **Table B** defines the characteristics associated with each service category.

Table B: Level of Service Descriptions

LOS	Description
LOS A	Free-flow traffic operations; vehicles easily maneuver within the traffic stream; impacts of traffic incidents are easily absorbed
LOS B	Reasonably free-flow traffic operations; vehicle maneuvers are slightly restricted; impacts of minor traffic incidents are easily absorbed
LOS C	At or near free-flow traffic operations; vehicle maneuvers are noticeably restricted; minor traffic incidents create localized impacts to traffic flows
LOS D	Traffic flow operations decline slightly and vehicle density increases more quickly; vehicles maneuvers are noticeably limited; minor traffic incidents create queuing
LOS E	Traffic operations are at or near capacity; vehicle movements are volatile since there are few gaps in the traffic stream; minor traffic incidents create extensive queuing
LOS F	Considerable delays; heavy congestion; extensive queues

Intersection capacity analyses were conducted for the following intersections in the project area:

- SR-98/Dogwood Rd
- SR-98/David Navarro Ave
- SR-98/Kloke Rd
- SR-98/Eady Ave
- SR-98/V.V.Williams/Lee Ave
- SR-98/Cesar Chavez Blvd
- SR-98/Estrada Blvd
- SR-98/Ollie Ave
- SR-98/SR-111/Imperial Ave

Two intersections currently operate at LOS F for both AM and PM peak hours:

- SR-98/V.V.Williams/Lee Ave
- SR-98/Cesar Chavez Blvd

One intersection currently operates at LOS E for AM peak hours:

- SR-98/Kloke Rd

All intersections operate at LOS E or worse in 2015 except for two:

- SR-98/Ollie Ave
- SR-98/SR-111/Imperial Ave

All intersections operate at LOS F in 2035 except for one:

- SR-98/Ollie Ave

Table C compares the results of the intersection analyses for the existing year and years 2015 and 2035 with the two alternatives, build and no-build.

Table C: Intersection Traffic Operations

Intersection	Existing Control Type	Future Control Type	Peak Hour	Existing LOS	Year 2015		Year 2035	
					No Build LOS	Build LOS	No Build LOS	Build LOS
SR-98/ Dogwood Rd	Signal	Signal	AM PM	B B	- -	C C	- -	C D
SR-98/David Navarro Ave	All-Way Stop	Signal	AM PM	B C	**F** **F**	D C	**F** **F**	C C
SR-98/Kloke Rd	Signal	Signal	AM PM	**E** D	**E** **E**	D D	**F** **F**	D D
SR-98/Eady Ave	Signal	Signal	AM PM	C C	**F** **E**	C C	**F** **F**	C C
SR-98/ V.V.Williams Ave/Lee Ave	Two-Way Stop	Signal	AM PM	**F** **F**	**F** **F**	B B	**F** **F**	B B
SR-98/Cesar Chavez Blvd	Two-Way Stop	Signal	AM PM	**F** **F**	**F** **F**	C C	**F** **F**	B B
SR-98/Estrada Blvd	Two-Way Stop	Two-Way Stop	AM PM	C C	**F** **E**	B B	**F** **F**	B B
SR-98/Ollie Ave	Signal	Signal	AM PM	D D	B C	B C	D D	B C
SR-98/SR-111/Imperial Ave	Signal	Signal	AM PM	D D	D D	C D	**F** **F**	D D

LOS	Delay/Vehicle (Sec.)	LOS	Delay/Vehicle (Sec.)
A	</= 10.0	D	35.1 to 55.0
B	10.1 to 20.0	E	55.1 to 80.0
C	20.1 to 35.0	F	> 80.0

State Route 98 Operations

Traffic analyses were performed on segments along SR-98. Without improvements, SR-98 will continue to decrease in operability with increases in congestion and delays.

Table D: SR-98 Traffic Operations

Intersection	Peak Hour	Existing		2015 with Anza		2035 with Anza	
		Delay	LOS	Delay	LOS	Delay	LOS
SR-98/Dogwood Rd	AM	15.1	B	--	--	--	--
	PM	19.1	B	--	--	--	--
SR-98/David Navarro Ave	AM	14.2	B	>100.0	F	>100.0	F
	PM	20.4	C	>100.0	F	>100.0	F
SR-98/Kloke Rd	AM	59.6	E	56.7	E	>100.0	F
	PM	44.0	D	64.1	E	>100.0	F
SR-98/Eady Ave	AM	34.5	C	>100.0	F	>100.0	F
	PM	28.3	C	78.7	E	>100.0	F
SR-98/V.V. Williams Ave/Lee Ave	AM	>100	F	>100.0	F	>100.0	F
	PM	>100	F	>100.0	F	>100.0	F
SR-98/Cesar Chavez Blvd	AM	>100	F	>100.0	F	>100.0	F
	PM	>100	F	>100.0	F	>100.0	F
SR-98/Estrada Blvd	AM	22.0	C	86.6	F	>100.0	F
	PM	16.8	C	37.8	E	>100.0	F
SR-98/Ollie Ave	AM	41.0	D	17.0	B	39.2	D
	PM	37.8	D	32.9	C	53.6	D
SR-98/SR-111/Imperial Ave	AM	43.8	D	34.4	D	>100.0	F
	PM	52.8	D	49.0	D	>100.0	F

LOS	Delay/Vehicle (Sec.)	LOS	Delay/Vehicle (Sec.)
A	</= 10.0	D	35.1 to 55.0
B	10.1 to 20.0	E	55.1 to 80.0
C	20.1 to 35.0	F	> 80.0

- **Accident Rates**

  Attachment F includes the Traffic Accident Surveillance and Analysis System (TASAS) Traffic Selective Accident Retrieval (TSAR). As shown from **Table E**, accident rates exceed the statewide average accident rates for most segments of SR-98 within the project area

Table E: Accident Rates[1]

Segment along SR-98	KP Limits	TOTAL No. of Accidents	ACTUAL RATES (per million vehicle miles)			STATEWIDE AVERAGE RATES (per million vehicle miles)		
			F*	F+I**	Total***	F*	F+I**	Total***
Eastbound and Westbound	48.2/52.3	89	0.00	0.42	2.05	0.025	0.73	1.59

[1] Data taken between December 1st, 2004 and November 30th, 2007
* Fatalities
** Fatalities plus Injuries
*** All reported accidents (includes PDO)

As shown in **Table F** below, most accidents occurred under normal conditions – clear weather during the daytime on dry pavement with no unusual roadway conditions.

Table F: Contribution of Climate/Roadway Conditions to Accidents[1]

Direction along SR-98	KP Limits	Total No. of Accidents	Weather					Lighting					Road Surface				Road Conditions			
			Clear	Cloudy	Rain	Not Stated	Other	Day	Dusk/Dawn	Dark – Street Light	Dark - No street Light	Other	Dry	Slippery	Not Stated	Other	No Unusual Conditions	Holes, Ruts	Not Stated	Other
Eastbound	48.2/52.3	56	54	2	0	0	0	45	2	8	1	0	56	0	0	0	52	1	2	1
Westbound	48.2/52.3	33	32	0	0	1	0	28	0	5	0	0	32	0	1	0	28	0	3	2

[1] Data taken between December 1st, 2004 and November 30th, 2007

As summarized in **Table G** below, most collisions were caused by speeding, followed by other violations. Most collisions were rear ends, followed by sideswipes and broadsides.

Table G: Collision Factors and Types of Collisions[1]

Direction along SR-98	KP Limits	Total No. of Accidents	Primary Collision Factor									Type of Collision							
			Influence of Alcohol	Follow too Close	Failure to Yield	Improper Turn	Speeding	Other Violations	Other Than Driver	Unknown	Not Stated	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Auto-Pedestrian	Not Stated
Eastbound	48.2/52.3	56	0	0	7	2	30	14	2	1	0	2	7	31	10	3	1	2	0
Westbound	48.2/52.3	33	1	0	7	2	18	3	0	2	0	2	4	17	5	4	0	0	1

[1] Data taken between December 1st, 2004 and November 30th, 2007

5. Alternatives

A. Viable Alternatives

The only viable alternative is the Build Alternative.

- **Proposed Engineering Features**

  SR-98 is proposed to be widened to four lanes from Dogwood Road to George Avenue, five lanes from George Avenue to Ollie Avenue, and six lanes from Ollie Avenue to Rockwood Avenue. Double left turn pockets will exist at SR-98/Cesar Chavez Boulevard and SR-98/SR-111. Single left turn pockets will exist at all remaining full

intersections. Right turn pockets have been designed for places where traffic needs warrant right turn pockets. **Table H** below summarizes the existing and proposed turning lanes. Median widths generally range from 0.7 meters (2.5 feet) to 4.3 meters (14 feet) with certain areas obtaining median widths near 10 meters (33 feet) in order to keep a generally straight and easily navigable alignment within intersections. 2.4 meter (8 feet) shoulders and 1.5 meter (5 feet) sidewalks are proposed for the entire length of the project (except west of Dogwood where there is no sidewalk proposed). The vertical profile of the centerline of the proposed widening project is very flat. As such a revised profile that inserts slopes of at least 0.5% (for drainage purposes) has been designed for the stretch of the project (see **Attachment G**). On the westbound side of the highway, the proposed project lies mostly in cut as landscaped slopes exist for mostly aesthetic reasons.

Table H: Existing and Proposed Turning Lanes

Intersecting Street	Existing Number of Turning Lanes on SR-98		Proposed Number of Turning Lanes on SR-98		Existing Number of Turning Lanes on Intersecting Street		Proposed Number of Turning Lanes on Intersecting Street	
	Eastbound	Westbound	Eastbound	Westbound	Northbound	Southbound	Northbound	Southbound
	R/L	R/L	R/L	R/L	R/L	R/L	R/L	R/L
Dogwood Road	0/1	1/0	0/1	2/0	0/0	1/1	0/0	1/1
New Intersection (Los Lagos)	--	--	0/1	1/1	--	--	0/0	0/0
New Intersection (Riverview)	--	--	0/0	0/1	--	--	1/0	0/0
David Navarro	0/1	0/1	0/1	0/1	1/0	1/0	0/1	0/1
Kloke Road	0/1	1/1	0/1	1/1	0/1	1/1	0/1	0/2
New at Linda Plaza	--	--	0/0	1/0	--	--	0/0	0/0
Eady Avenue	0/1	1/1	1/1	1/1	0/0	0/0	0/1	0/1
Lacy Avenue	0/0	0/0	0/0	0/0	1/0	0/0	0/0	0/0
Lee Avenue	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
V.V. Williams Avenue	0/0	1/0	0/1	1/1	0/0	0/0	0/0	0/0
Cesar Chavez Boulevard	0/0	0/1	1/0	0/2	1/1	0/0	1/2	0/0
Estrada Avenue	0/0	0/0	0/0	0/0	0/0	1/0	0/0	1/0
George Avenue	0/0	0/0	0/0	0/0	1/0	0/0	1/0	0/0
Ollie Avenue	0/1	1/1	0/1	1/1	0/1	0/1	0/1	0/1
Harold / Imperial Avenue West	0/0	1/1	0/0	0/0	1/0	1/0	1/0	1/0
Emerson Avenue	0/1	0/1	0/0	0/0	1/0	1/0	1/0	1/0
SR-111	1/1	1/2	1/2	1/2	0/2	1/2	0/2	1/2
Paulin Avenue	0/1	0/1	0/0	0/0	0/0	0/0	1/0	1/0
Rockwood Avenue	0/1	0/1	1/1	0/1	0/0	0/0	0/0	0/0

Curb returns for intersections have been designed to accommodate California Legal trucks where warranted. Truck turns were run on the following major intersections: SR-98/Dogwood Road, SR-98/David Navarro Avenue, SR-98/Kloke Road, SR-98/Cesar Chavez Boulevard, SR-98/Estrada Avenue, and SR-98/SR-111. Design standards required by the City of Calexico state a minimum curb return of 4.6 meters (15 feet). Curbs have generally met this requirement with the exceptions of where "frontage streets" exist and a smaller curb return is necessary to allow these streets to function as is. All curb returns are designed with American Disabilities Act (ADA) compliance taken into account during design; PS&E will verify ADA compliance. Curb returns tie into the existing cross-street as soon as possible so that minimum alterations to the cross-streets are required.

Altered Intersections:

V.V. Williams Intersection: The original concept for the SR-98/V.V. Williams/Lee Avenue intersection consisted of closing access to Lacy Avenue and shifting the opening of Lee Avenue east to align with V.V. Williams Avenue to make the V.V Williams intersection a full intersection. Upon careful examination, it was determined that this would create unnatural turn movements from eastbound SR-98 onto southbound Lee Avenue. Two other alternatives were proposed. One alternative was to close access to both Lee Avenue and V.V. Williams Avenue and create a full intersection at Lacy Avenue. The preferred alternative however proposes shifting the opening to Lee Avenue to align with V.V. Williams Avenue while allowing right-in only access to Lacy Avenue. Traffic from Lacy Avenue entering SR-98 will have to utilize the small frontage road that runs parallel to the highway to enter SR-98 from the new V.V. Williams intersection.

Cesar Chavez Boulevard Intersection: Four alternatives were discussed regarding the Cesar Chavez intersection. These alternatives were chosen in order to eliminate the skewed angle between Pierce Avenue and Cesar Chavez Boulevard, without completely closing off the accesses to and from the existing parcels.

- *Alternative 1:* The first alternative proposed to modify Pierce Avenue by turning the northern portion of Pierce Avenue into a one-way southbound street. This is accomplished by narrowing Pierce Avenue to one lane and adjusting access to Pierce Avenue from Cesar Chavez Boulevard to accommodate a right-turn onto Pierce Avenue from southbound Cesar Chavez Boulevard and a left-turn onto Pierce Avenue from northbound Cesar Chavez Boulevard only.
- *Alternative 2:* The second alternative proposed to close off the northern portion of Pierce Avenue and allow driveway access only from the existing parcels to Cesar Chavez Boulevard.
- *Alternative 3:* The third alternative proposed to close the skewed angle between Cesar Chavez Boulevard and Pierce Avenue and create a 90 degree access between the two streets.
- *Alternative 4:* The fourth alternative proposed to close direct access between Pierce Avenue and Cesar Chavez Boulevard by the addition of a cul-de-sac to the most northern portion of Pierce Avenue.

Imperial Avenue West Intersection: The Imperial Avenue West intersection was adjusted from its current configuration in order to make the intersection closer to a standard 90 degree connection with SR-98. The current skew causes difficulty for trucks trying to get on Imperial Avenue West from westbound SR-98.

Harold Avenue Intersection: A raised median will be inserted along SR-98 that would disallow left-turn movement onto southbound Harold Avenue form westbound SR-98. Traffic wishing to make this movement would have to make a u-turn at Ollie Avenue. With the widening project proposing three eastbound lanes in this area, closure of this unsignalized left-turn movement is necessary to promote safety and reduce potential broadsiding accidents.

Paulin Avenue Intersection: A raised median will be inserted along SR-98 that would disallow through movement along Paulin Avenue to cross SR-98. Traffic wishing to make this movement would have to make u-turns at either SR-111 or Rockwood Avenue. This closure is necessary to reduce traffic congestion and confusion in the area between SR-111 and Rockwood Avenue and to install standard left turn pockets and storage capacity lengths for the area.

New Access to Developments:
New intersections will be constructed or right-turn lanes lengthened to create access to new developments, as listed below.

Los Lagos Development: A new full signalized intersection will be constructed at the Los Lagos development. Vehicles will be allowed to make all turning and through movements.

Riverview Development: A partial intersection will be constructed at the Riverview development. Vehicles will be allowed to make right-in turn movements from eastbound SR-98 and right-out turn movements onto eastbound SR-98. Vehicles will also be allowed to make left-in turn movements from westbound SR-98 into the development. The intersection will be unsignalized.

Linda Plaza Development: The right-turn pocket at Kloke Road will be extended to allow for a new right-in only driveway into the Linda Plaza development from westbound SR-98.

Gas Station: The right-turn lane at Cesar Chavez Boulevard will be extended to allow for a new right-in only driveway access for the proposed gas station from eastbound SR-98.

Drainage Features:
There is no existing comprehensive storm drain system within the studied segment of SR-98. The majority of the existing roadway runoff sheet flows off of SR-98 and travels to

local low points where it ponds until infiltration and evaporation remove the water. Many of these low points are located in areas outside of state right of way. The entire project area is extremely flat, making it difficult to install storm drain inlets and culverts with appropriate downward slope for the lengths required.

The major components of the proposed drainage system include: curb outlets, curb inlets, cross culverts, detention basins, and a pump station to manage the storm water runoff along this section of SR-98. The curb inlets and cross culverts collect the storm water runoff and transport it to a series of six interconnected detention basins. The basins will have paved sides with a permeable concrete bottoms. The basins will ultimately drain into the All American Canal via All American Canal Drains 9 and 10. In the event that the All American Canal has inadequate capacity to accept the storm water discharge, the basins will temporarily store the runoff. The proposed drainage improvements are estimated to cost approximately $2,586,000. For further discussion of the proposed drainage system see **Attachment H**.

The proposed drainage systems for this project are relatively complex; thus, a discussion on the risks associated with this design is necessary. For this discussion see **Attachment I**.

Structural Sections:
The existing roadway needs to be removed and reconstructed with a new structural section. A Geotechnical Design Report (**Attachment J**) prepared by Southern California Soil and Testing, Inc. (SCS&T) determined two alternatives for the new structural sections of the project, one that keeps the existing subgrade and the other that replaces the subgrade. The first alternative keeps the existing subgrade and is summarized in **Table I.**

Table I: Proposed Structural Section with R<5

SR-98 (R-Value<5)		
Location	Traffic Index	Flexible Pavement Section
SR-111 to Lee Avenue/V.V. Williams Avenue	12.5	195mm (7.5”) HMA (Type A)/ 840mm (33”) Cl 2 AB
Lee Avenue/V.V. Williams Avenue to Kloke Road	13.5	210mm (8.25”) HMA (Type A)/ 915mm (36”) Cl 2 AB
Kloke Road to Dogwood Road	12.5	195mm (7.5”) HMA (Type A)/ 840mm (33”) Cl 2 AB

HMA (Type A)- Hot Mix Asphalt
AC (Type A) – Asphalt Concrete Pavement
Cl 2 AB – Class 2 Aggregate Base

The second alternative proposes to improve the subgrade (typically to a depth of 1 meter) with the replacement of the current soil with a material having an R-value of 35 or greater. **Table J** shows the required structural sections with the improved subgrade.

Table J: Proposed Structural Section with R=35

SR-98 (R-Value-35)		
Location	Traffic Index	Flexible Pavement Section
SR-111 to Lee Avenue/V.V. Williams Avenue	12.5	195mm (7.5") HMA (Type A)/ 480mm (19") Cl 2 AB
Lee Avenue/V.V. Williams Avenue to Kloke Road	13.5	210mm (8.25") HMA (Type A)/ 525mm (20.5") Cl 2 AB
Kloke Road to Dogwood Road	12.5	195mm (7.5") HMA (Type A)/ 480mm (19") Cl 2 AB

HMA (Type A) – Hot Mix Asphalt
AC (Type A) – Asphalt Concrete Pavement
Cl 2 AB – Class 2 Aggregate Base

- **Nonstandard Mandatory and Advisory Design Standards**
  A preliminary investigation of the project alternatives was completed to identify potential design exceptions. **Table K** below shows a list of the potential Mandatory Design Exceptions. A Draft Mandatory Design Exception Fact Sheet is included as **Attachment K**.

Table K: List of Mandatory Design Exceptions

Index	Standard	Exception Locations
HDM: Table 302.1	**Median Shoulders for Conventional Highways in Urban Areas with Speeds Less than 75km/hr and Curbed Medians: 0.6 m**	From the All American Canal to Dogwood Road

- **Interim Features**
  No interim features are proposed for the project.

- **High Occupancy Vehicle (HOV) (Bus and Carpool) Lanes**
  There are no proposed High Occupancy Vehicle (HOV) lanes proposed for bus and carpools in the Build Alternative.

- **Ramp Metering**
  There are no proposed ramp meters in the Build Alternative.

- **CHP Enforcement Areas**
  There are no proposed California Highway Patrol (CHP) Enforcement Areas in the Build Alternative.

- **Park and Ride Facilities**
  There are no proposed Park and Ride facilities in the Build Alternative.

- **Utility and Other Owner Involvement**
  Owners of utilities in the project area are the Imperial Irrigation District (IID), AT&T, SBC/PacBell, Southern California Gas Company (SC Gas), City of Calexico Water and Sewer District, and Time Warner Cable which was previously Adelphia. All utilities will be affected by the widening project (see **Attachment L**). Most of IID's power poles will have to be relocated due to the widening of the road. In order to remain within the proposed right-of-way, the guy-guide cables that support the power poles will need to be shifted in certain areas, creating the need for steel utility poles or guy-guide cable support poles. The following have the potential to be either protected in place or lowered in place: gas lines owned by SC Gas; water pipelines owned by IID; water pipelines owned by the City of Calexico; and cables owned by SBC Pacific Bell.
  Most utility companies affected by the project will design and construct their own relocation of utilities. The estimated utility relocation cost is nearly four million dollars (see **Attachment M**).

- **Railroad Involvement**
  Meetings with the Union Pacific Rail Road (UPRR) representatives were held throughout the project approval process. UPRR maintained that the minimum standards to be met for the widening project shall follow the California Public Utilities Commission (CPUC) General Order (GO) #75. Engineering design for the area of the railroad site has complied with this order. As such, the railroad crossing will have upgraded gates and signalization under UPRR's own construction team. A cost estimate of the upgrade was made in 2000 by UPRR and given to Caltrans (see **Attachment N**). The cost has since been adjusted to $400,000.

- **Highway Planting**
  A Landscape Concept Plan has been prepared for this project by Estrada Land Planning and is included as **Attachment O**. Four landscape alternatives were created which ranged from no landscaping (hardscaping only) to full landscaping. The City chose Alternative 2 which proposes trees with full landscaping only at key areas/intersections as their preferred choice. Mitigation measures took into consideration the high heat and dry climate of the city. Trees and shrubs were chosen that are able to survive limited water after the establishment period and consideration was given to hardscaping alternatives whose colors would not be bleached out by the sun (natural rock). Alternative 2 proposes the following:
    - Medians: Stamped and/or colored concrete or natural materials (river rock, boulders, cobblestone) for median pavement. Drought-resistant trees and accent shrubbery for median planting.
    - Sidewalk areas: Plain or decorative concrete for sidewalk pavement. Decomposed granite for areas outside of the sidewalk that are within the right-of-way, along with draught-resistant trees.
    - Detention basins: River rock will be put on detention basin slopes (to reduce erosion and deter graffiti). No planting will be placed in the basins as leaves have

the potential to block drains, leading to a possible flooding of the basins in severe storms. Chain link fence will be erected around the basins in order to avoid the potentially severe visual impact the large length of fencing around the basins would cause.

Alternative 2 was agreed upon between the City and Caltrans with the stipulation that the City would be responsible for maintenance in perpetuity after the initial plant establishment period. If the City neglects to maintain the landscaping at any point, the City will, at its own cost, remove the landscaping.

- **Storm Water Pollution Prevention**
  On July 15, 1999 State Water Resources Control Board, SWRCB, adopted Order 99-06 DWQ, National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from Caltrans properties, facilities, and activities. This project will be designed in conformance with the NPDES Permit requirements. The Project Planning and Design Guide Manual was used to determine the appropriate Best Management Practices (BMPs). A Storm Water Data Report (SWDR) was prepared which details the BMPs and is included as **Attachment P**.

- **Treatment BMPs**
  The project is not exempt from treatment BMPs according to the Evaluation Documentation Form from Appendix E of the Project Planning and Design Guide Manual.

  The project will mitigate for the long-term impacts to water quality by incorporation detention basins with permeable concrete bottoms as part of this project. The preliminary locations of the treatment BMPs are included in the SWDR.

- **Construction BMPs**
  The project will mitigate for the short-term impacts to water quality during construction by the use of construction BMPs. The BMPs that are anticipated for use on this project are temporary fiber rolls, temporary drainage inlet protection, temporary construction entrance, temporary street sweeping, temporary check dams, temporary gravel bag berms, and temporary concrete washout facilities. In addition, temporary erosion control will be applied on all disturbed slopes before the beginning of the rainy season (October 1st) in Imperial County.

- **Design Pollution Prevention BMPs**
  - Any vegetation outside the work limits will be preserved, which will provide erosion and sediment control benefits.
  - This project proposed landscaping which will act as permanent erosion control.

- **Noise Barriers**
  A Noise Study Report, dated May 2007 was performed for the project to determine the feasibility of noise abatement to impacted receptors. Noise abatement is considered

feasible if its insertion decreases projected noise levels by 5 decibels, A-weighted (dBA). All noise barriers were analyzed as sound walls. Eight sound walls were proposed and were further analyzed in the Noise Abatement Decision Report (NADR) found in **Attachment Q**. The purpose of the NADR is to determine the reasonableness of each sound wall. Reasonableness is established by creating a cost allowance per benefited unit and then comparing it to the estimated construction cost per benefited unit of each sound wall. The wall is considered reasonable if the estimated construction cost is lower than the cost allowance per benefited unit. If the estimated construction cost is higher than the cost allowance, the wall is considered not reasonable. **Table L** shows the method of determining the cost allowance:

Table L: Cost Allowance Determination for Noise Barriers

Absolute Noise Levels	Less than 69 dBA	Add $2,000
	70-74 dBA	Add $4,000
	75-78 dBA	Add $6,000
	More than 78 dBA	Add $8,000
Noise Level Increase	Less than 3 dBA	Add $0
	3-7 dBA	Add $2,000
	8-11 dBA	Add $4,000
	12 dBA or more	Add $6,000
Achievable Noise Reduction	Less than 6 dBA	Add $0
	6-8 dBA	Add $2,000
	9-11 dBA	Add $4,000
	12 dBA or more	Add $6,000
New Construction or pre-dates 1978	No on both	Add $0
	Yes on either one	Add $10,000

Of the eight sound walls analyzed, none were found to be reasonable and therefore further analysis of the barriers is not needed. **Table M** summarizes the findings of the NADR.

Table M: Summary of Sound Wall Reasonableness

Sound Wall	# of Benefited Residences	Reasonable w/o Easements	Reasonable w/ Construction Easements Only	Reasonable w/ all easements	Existence of Severely Impacted Receptors	Preliminarily Recommended
S502	1	NO	NO	NO	NO	NO
S511	4	NO	NO	NO	NO	NO
S516A/B/C	8	NO	NO	NO	NO	NO
S518	5	NO	NO	NO	NO	NO
S520A	1	NO	NO	NO	NO	NO
S520B	2	NO	NO	NO	NO	NO
S526	2	NO	NO	NO	NO	NO

- **NonMotorized and Pedestrian features, etc.**
  The City of Calexico General Plan states a desire to add sidewalks and bike facilities to promote walking and biking as alternatives to driving. Sidewalks (1.5 meters (5 feet) in width) are proposed on both sides of the highway for the entire length of the project except for west of Dogwood Road where the highway tapers back into the existing facility. Class II bike lanes (2.4 meters (8 feet) in width) are also proposed for both sides of the entire project length.

  All work required for compliance with the Americans with Disabilities Act will be provided. This included but is not limited to typical pedestrian facilities such as sidewalks, driveways, curb ramps, curb cuts, crosswalks and associated signage.

- **Needed Roadway Rehabilitation and Upgrading**
  Geotechnical studies indicate that the original SR-98 was constructed with Portland Cement Concrete (PCC). Since then the road has been widened with asphalt concrete (AC). In-place strength testing shows a need for significant structural rehabilitation. The existing AC roadway should be removed and be replaced with hot mix asphalt (HMA) that resists the stresses from trucks and heat associated with the region. For the complete Deflection Analysis Report, see Appendix IV of **Attachment I**.

- **Needed Structure Rehabilitation and Upgrading**
  No structure rehabilitation or upgrading is needed. Within the project limits exists the All American Canal Siphon, but a Design Feasibility Study (**Attachment R**) was performed and determined the siphon could retain up to an additional 1.2 meters (4 feet) of soil with full live loading. The proposed median through the siphon area has been narrowed so as to avoid the sloped sides of the structure.

- **Cost Estimates**
  An 11-page Estimate was performed for this project and is included as **Attachment D**. Cost estimations for the Build Alternative were escalated for the year 2014 to reflect a 5 percent increase for inflation compounded annually. Total estimated project costs for Phase 1, in 2014 dollars, are $46,900,000 (which includes $36,263,000 in capital costs and $10,621,400 in support costs) for the road widening improvements. Total estimated project costs for Phase 2, in 2014 dollars, are $19,100,000 (which includes $15,237,000 in capital costs and $3,845,500 in support costs) for the road widening improvements. Total estimated project costs for the combined Phase 1 and Phase 2, in 2014 dollars, are $63,900,000 (which includes $49,398,000 in capital costs and $14,468,000 in support costs) for the road widening improvements. The project is listed in the 2007 Regional Transportation Plan (RTP), and the 2006 State Transportation Improvement Program (STIP). **Table N** summarizes the cost estimate for the project.

Table N: Summary of 11-Page Cost Estimate

	Complete Project		Phase 1		Phase 2	
	Current Cost	Escalated Cost	Current Cost	Escalated Cost	Current Cost	Escalated Cost
Roadway Items	$30,837,400	$41,325,100	$22,293,400	$30,730,300	$9,474,400	$12,696,700
Structure Items	$0	$0	$0	$0	$0	$0
Subtotal Construction Cost	$30,837,400	$41,325,100	$22,931,400	$30,730,300	$9,474,400	$12,696,700
Right of Way	$5,860,000	$8,072,000	$4,037,000	$5,532,000	$1,823,000	$2,540,000
Total Capital Cost	**$36,698,000**	**$49,398,000**	**$26,969,000**	**$36,263,000**	**$11,298,000**	**$15,237,000**
PR/ED Support	$3,400,000		$2,380,000		$1,020,000	
PS&E Support	$2,540,000	$3,345,000	$1,778,000	$2,341,200	$762,000	$1,003,400
Right of Way Support	$1,217,000	$1,649,000	$1,217,000	$1,648,700		
Construction Support	$6,822,000	$9,474,000	$4,775,400	$6,631,500	$2,046,600	$2,842,100
Total Support Cost	**$13,979,000**	**$14,468,000**	**$10,150,400**	**$10,621,400**	**$3,828,600**	**$3,845,500**
Total Project Cost	**$50,700,000**	**$63,900,000**	**$37,150,000**	**$46,900,000**	**$15,150,000**	**$19,100,000**

- **Right of Way Data**
  The estimated cost to purchase right-of-way for the project is $8,072,000 for 2015. Fifty-two parcels will require partial takes, but no full takes or relocations are required (see **Attachment S**). In addition, many utilities will be affected by the project. Estimated utility costs are $5,628,000 for 2015 and are included as part of the Right-of-Way cost estimate (see **Attachment D**).

- **Effect of Special Funded Proposal on State Highway**
  The project is to be partially funded by new developments in the area. Agreements between Caltrans and the developers are under development.

B. Rejected Alternatives

The lane configurations for the existing roadway segment do not presently provide acceptable levels of service. The levels of service for the study area are projected to continue to decrease in the future. In addition, nonstandard turn pocket lengths and intersection spacing cause increased congestion and confusion for motorists. The No-Build Alternative is not a viable alternative.

6. Considerations Requiring Discussion

A. Hazardous Waste

A Report of Environmental Site Assessment for Aerially Deposited Lead by Southern California Soil & Testing (SCS&T) (see **Attachment T**) concluded that the soil that would

be excavated for the project would not be considered a hazardous waste with respect to lead according to Title 22 of the California Code 4 of Regulations (CCR). Therefore, no restrictions are required on the use of excavated soils for new fills with respect to lead.

There is a known case of groundwater contamination coming from a former Fed Mart gasoline station, located on the north side of SR-98 between Ollie Avenue and Imperial Avenue West. This groundwater contamination extends beneath the existing SR-98 and several other properties adjacent to the former Fed Mart, and is currently being remediated by the property owners. A site investigation (summarized in **Attachment U**) performed at the northeast corner of SR-98 and Ollie Avenue indicated that no groundwater or contaminated soil was present down to 4.5 meters (15 feet) below the ground surface at this location. Since the maximum depth of excavations for the roadway widening of the project is less than that, it is not anticipated that contaminated soil or groundwater will be encountered during the course of construction activities for the widening of SR-98. However, the relocation of the large steel transmission pole at the northeast corner of Imperial Avenue West may cause a potential risk for an encounter with hazardous waste. Foundation depth of this power pole must be determined before Plans, Specifications and Estimates (PS&E) to see if hazardous waste will be an issue. It should be recognized that the current owners of the former Fed Mart property (The Birch Corporation) will continue to be the Primary Responsible Party (PRP) for all corrective actions related to the aforementioned case.

B. Value Analysis

A Value Analysis (VA) was conducted in April of 2000 (see **Attachment AA**). This study analyzed five alternatives for improving the traffic conditions on SR-98 from Dogwood Road to State Route 7 (SR-7). This study concluded that the preferred alternative would be to widen SR-98 from SR-7 to Bowker Road and realigning SR-98 along Jasper Road to Dogwood Road. Further analysis of the preferred alternative concluded that the proposed widening of SR-98 from Dogwood Road to Rockwood Avenue would be needed in addition to the realignment of SR-98 to help relieve traffic congestion within the City of Calexico.

C. Resource Conservation

During construction, an irretrievable commitment of fossil fuel resources will be required for equipment operation; however, the amount of fuel to be used for construction is not considered substantial when compared with the benefits of the improved transportation system. The proposed modifications will actually decrease vehicle fuel consumption as a result of reduced traffic congestion and more efficient traffic operations within the project limits. In addition, the project will require removal of asphalt concrete pavement, concrete, and aggregate base. The removed materials will be recycled for new construction uses where feasible.

D. Right of Way Issues

- **Right of Way Required** – A Right-of-Way Data Sheet is included as **Attachment V**. The total construction easements required for the project is 5,376 m^2 (1.328 acres). The total amount of permanent takes required is 20,822 m^2 (5.15 acres). There are several developments that are planned along the project site that will be conditioned to dedicate right of way for the proposed widening project. The total amount of dedicated right of way will be 3049 m^2 (0.75 acres). For a breakdown of the area of required easements by parcel, see **Attachment S**.

- **Relocation Impact Studies –** No persons or businesses will be displaced due to the widening project.

- **Airspace Lease Areas** – The project is not in an area of high land values having potential for future airspace leases. No new airspace leases are required.

E. Environmental Issues

A Mitigated Negative Declaration (MND) has been prepared in accordance with Caltrans' environmental procedures, as well as State and federal environmental regulations. The attached MND is the appropriate document for the proposal.

Parks and Recreational Facilities
Within the proposed project is 7080 m^2 (1.75 acre) park identified as the Williams Greenbelt Park. The park is listed in the Calexico General Plan in Section 6 Parks and Recreation Element. Williams Greenbelt Park is located along the westbound side of SR-98, west of V.V. Williams Avenue. The park is a long and narrow strip of land with some trees, overhead electrical lines, and no recreational amenities (.i.e. no picnic tables, benches or playground equipment). The park appears to be more of a land use buffer separating SR-98 from a frontage road and residential housing. There are no organized actives recognized in the General Plan or identified by the City of Calexico.

Impacting the Williams Greenbelt Park created a potential 4(f) issue. The City has however concurred that the greenbelt does not function as a park as people are rarely seen utilizing the space. A memo from the City dated August 22, 2008 states the use of the greenbelt area would not result in any temporary or permanent adverse change to the activities, features, or attributes which are important to the purposes or functions that qualify the resource protection under section 4(f).

The widening project will be taking approximately half of the greenbelt currently described as Williams Park in the City's General Plan. Originally a drainage basin was proposed for the other half of the park that is unaffected by the widening project. Since this would completely remove the greenbelt, the drainage basin was moved to the southeastern side SR-98, east of Lee Avenue. Other mitigation measures, such as

picnic tables and benches, are being considered for the half of the greenbelt that will remain after the widening project (see **Attachment O**).

Wetlands and Other Waters
Impacts to wetlands and other waters were evaluated in the July 2007 Natural Environment Study (Minimal Impacts). The proposed project is not expected to impact wetlands or other waters. No areas falling under the jurisdiction of the Army Corps of Engineers (ACOE) or the California Department of Fish and Game (CDFG) were observed within the project limits, therefore, no permits are required.

Floodplain
In order to maintain existing drainage patterns while preventing roadway runoff from discharging into private yards and houses, a series of detention basins are proposed as part of the drainage improvements. The basins will provide discharge locations and storm water treatment for several storm drain networks designed within the project. Due to the flat terrain and lack of existing storm drain facilities, the basins are needed in order to control roadway runoff. Without the basins, it would be difficult to drain and treat the roadway runoff without the use of pump stations and larger diameter pipe to convey larger quantities of storm water over longer distances.

Animal Species
Burrowing owl, a state species of special concern, was observed within the study area and suitable habitat for this species is present along the levees associated with the canals and drainages within the study area. To avoid potential impacts, preconstruction surveys will be required within 30 days prior to initial ground-disturbing activity to avoid impacts to nesting burrowing owls from construction of the project.

Visual
A Visual Impact Assessment was conducted to assess the visual effects of the proposed project and to propose measures to mitigate any adverse visual impacts while improving overall visual quality and promoting positive viewer response.

To reduce the visual impact, the project would introduce a planted median which will visually separate the two directions of traffic, and reduce the perceived road width to the width of a single side. The introduction of trees and the resulting shadows will emphasize the median as a place of visual refuge, and reduce glare and the perceived street width. Small street trees introduced along the edges of the roadway will provide a visual buffer between the roads and adjacent land uses; create new visual continuity to increase visual unity; create shade and help to reduce the visual dominance of the power poles and power lines. The trees will also make a more comfortable pedestrian environment by providing shade, creating a more pedestrian scale, and reducing the sense of pedestrian isolation on the vast length of the project. The project also introduces planting and special materials and fencing at the detention basins to add

interest and reduce visual monotony and the visual impact of the fence and basin (see **Attachment O**).

Landscaping concepts shown in this project are subject to an agreement from City of Calexico to maintain landscaping within the project limits. In case City of Calexico is unable to maintain the landscaping then the project during design phase will be modified to hardscape only.

F. Air Quality Conformity

An Air Quality Impact Analysis, dated December 2007 (see **Attachment W**) was performed for the project. The main purpose of the analysis was to describe the existing air quality and discuss the potential impacts of toxic emissions and identify measures to mitigate or minimize pollutant emissions associated with the proposed project.

The project is located in the Salton Sea Air Basin (SSAB) which is a nonattainment area for federal and state 8-hour ozone (O_3), and state and federal Particulate Matter 10 (PM_{10}). The project is partially located in a non-attainment area for Carbon Monoxide (CO). **Table O** shows the attainment status of the Imperial County portion of the SSAB:

Table O: Attainment Status for the Imperial County Portion of the SSAB

Pollutant	Attainment Status	
	Federal	State
O_3-1-Hour	--[a]	Nonattainment
O_3 - 8-hour	Nonattainment/Moderate	
PM_{10}	Nonattainment Serious	Nonattainment
$PM_{2.5}$	Attainment	Unclassified/Attainment
CO[b]	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Pb	Attainment	Attainment

[a] - Repealed by law in June 2005.
Sources: EPA 2007b; ARB 2007b
[b] – Includes Calexico

A Hot Spot Analysis was conducted for the project for PM_{10} and was not found to be a Project of Air Quality Concern (POAQC). The analysis determined that the project does not have negative impacts on other regional or local air quality. However, standard mitigation measures are recommended for the construction period of the project, which can be found in Section 6.0 of **Attachment W**.

The project is in the MPO's 2008-2035 Regional Transportation Plan (RTP) (Project Listing Report, page 2, RTP ID 8020) which was fully-funded and found to be conforming by FHWA and FTA on June 5, 2008. The project is also in the MPO's 2006/11 Regional Transportation Improvement Program (RTIP) (page 1, Project ID

8020) which was found to be conforming by FHWA/FTA on October 2, 2006. Conformity to the 2006 RTIP was redetermined on June 5, 2008. Project design concept and scope are also consistent with the project description in the above RTP and FTIP. The project is carried forward in the draft 2008 RTIP.

G. Title VI Considerations

Title VI of the Civil Rights Act entails that no person be excluded from, denied the benefits of, or discriminated by any federal aid activity because of race, color, religion, national origin, gender, age, or handicap. Caltrans and the Federal Highway Administration (FHWA) policies demonstrate commitment to this requirement. The proposed project complies with Execute Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," which is an extension of the Title VI. It further requires prevention of "disproportionately high and adverse" health or environmental impacts to minority and/or low-income populations to the fullest extent possible.

All intersections contain ramps that comply with the American Disabilities Act (ADA) and sidewalks and bike lanes are proposed to aid low mobility groups. Current access to schools and businesses will remain open.

7. Other Considerations As Appropriate

- **Public Hearing Process**
  A Public Hearing was held on September 30, 2008.

- **Route Matters**
  The City and Caltrans are currently in discussion about relinquishing the project portion of SR-98 to the City. The portion of SR-98 represented in this project operates as a local road instead of a state highway, due to the close intersection spacing, low vehicle speeds, and extensive development surrounding the highway.

- **Permits**
  A National Pollutant Discharge Elimination System (NPDES) permit is required for the project. A 401 Regional Water Control Board permit is not likely needed.

- **Cooperative Agreements**
  A Cooperative agreement has not been negotiated between Caltrans and the City of Calexico as of summer 2008.

- **Other Agreements**
  Landscaping concepts shown in this project are subject to an agreement from City of Calexico to maintain landscaping within the project limits. In case City of Calexico is unable to maintain the landscaping then the project during design phase will be modified to hardscape only (see **Attachment X**).

- **Involvement with a Navigable Waterway**
  There are no navigable waterways within the project site.

- **Transportation Management Plan for Use During Construction**
  Preceding roadway design approval, a final Traffic Management Plan (TMP), included as **Attachment Y**, will be prepared to reduce potential construction-related traffic conflicts, detours, and delays. The elements to be considered for the highway widening project include, but are not limited to, the following:

  - Development of a Public Awareness Campaign to sufficiently inform residents and motorists prior to construction. These may include establishment of a public information center, brochures and mailers, media releases and/or paid advertising.

  - Proper identification of detour routes and lane closures within the construction area to direct motorists during construction activities. These may include changeable message signs, signing and striping, and highway advisory radio announcements.

  - Placement of appropriate signs, cones, and barricades near construction to increase safety and driver certainty.

  - Scheduling of construction activities during off-peak hours to minimize traffic congestion and delays. All lane closure charts shall be prepared by the Department and obtained from the District Traffic Manager.

  - Development of plans that ensure emergency access and access to existing residences and businesses within the construction area.

  - Development of traffic and contractor contingency plans. The traffic contingency plan, prepared by the Department, evaluates measures to be implemented when traffic demands exceed anticipated limits during construction activities. The contractor contingency plan, prepared by the contractor, addresses all factors affecting construction activities within the contractor's control in a work zone. Overall, a TMP contingency plan defines factors that necessitate removal of lane closures (such as inclement weather, excessive traffic volumes, etc.), identifies lines of communication and authority, and describes the responsibilities of specific parties when lane closures are implemented.

  - Implementation of a Construction Zone Enhanced Enforcement Plan (COZEEP) to provide police assistance and surveillance within construction areas. The officers can enforce speed reductions within work zones and provide emergency response support.

- Ø Inclusion of construction activities on the Caltrans Highway Information Network (CHIN), a public information line. (1-800-427-ROAD)

- Ø Implementation of a Transportation Management Team (TMT) to refine TMP strategies prior to construction and to monitor and evaluate TMP activities during construction.

- **Stage Construction**
  The preliminary stage construction exhibits are given in **Attachment Z**. Three stages are necessary to minimize traffic disturbances and maintain current traffic flow during construction. The three stages are as follows:
  Stage 1:
  - § Remove medians for entire project length
  - § Widen portions of the westbound lanes from west of Dogwood Road to Ollie Avenue.
  - § Replace the existing railroad at grade crossing

  Stage 2:
  - § Construct remaining portions of SR 98 from west of Dogwood Road to Ollie Avenue.
  - § Widen SR 98 from Ollie Avenue to Rockwood Avenue

  Stage 3:
  - § Construct remaining medians.

  Construction of the entire project is anticipated to take approximately twenty-four months.

- **Accommodation of Oversize Loads**
  The accommodation of oversize loads is not an issue for this project as there are no obstructions within the site that would limit the height of vehicles.

- **Graffiti Control**
  The County of Imperial is not considered a graffiti-prone zone; however cobble will be put on the side slopes of the drainage basins, which are considered the most likely project feature to be vandalized, in order to deter graffiti.

- **Other Appropriate Topics**
  There are no other relevant topics to be discussed that have not been covered already within this report.

8. Programming

- **Programming**
  Proposal Funding Data: The project has funding from both the State Transportation Improvement Program (STIP) – Interregional Improvement Program (IIP) and Safe-Tea-

Lu High Priority Project (HPP) Demo Earmark. The environmental phase of the project is fully funded through STIP-IIP. The Safe-Tea-Lu High Priority Project (HPP) Demo Earmark supplied an additional $2.4 million in funds for the acquisition of right-of-way and right-of-way support. As of December 2008, the design phase has not been programmed for funding.

Combining Projects: This project is a stand-alone project and will not be combined with any other projects.

Multiple Counties: The project occurs only in Imperial County.

- **Funding**

  This project receives funding from state, proposed federal, and special sources. **Table P** shows the current funding and expenditures for the State Route 98 West Widening Project.

  Special Funding: A large portion of the funding for the project is expected to come from developers in the area (see *Effect of Special Funded Proposal on State Highway*). The exact amount has not yet been determined.

  State-Only Funding: It is the intent for all of the Right of Way expenditures in Programming to go for Phase 1. It is also the intent that the Right of Way for Phase 2 will be funded by Developer contributions. The $2.54M for the PS&E phase is expected to be funded with future STIP dollars.

Table P: Current Funding and Expenditures 11-08020 SR-98

Expenditures As Of March 2009		STIP/IIP			DEMO			FUTURE PROGRAMMED FUNDS			**TOTAL**		
	EA phase	Prog	Expend	Bal	Prog	Expend	Bal	Prog	Expend	Bal	Total Program	Expended	Remaining Balance
PA/ED	0	3,400.00	2,973.50	426.50			0.00			0.00	3,400.00	2,973.50	426.50
PS&E	1			0.00			0.00			0.00	0.00	0.00	0.00
RW Supp	2	737.00	0.84	736.16	480.00		480.00			0.00	1,217.00	0.84	1,216.16
ConSupp	3			0.00			0.00	6,822.00		6,822.00	6,822.00	0.00	6,822.00
ConCap	4			0.00			0.00	40,100.00		40,100.00	40,100.00	0.00	40,100.00
RW Cap	9	720.00	6.42	713.58	1,920.00		1,920.00			0.00	2,640.00	6.42	2,633.58
TOTAL		4,857.00	2,980.76	1,876.24	2,400.00	0.00	2,400.00	46,922.00	0.00	46,922.00	54,179.00	2,980.76	51,198.24

**AMOUNTS ARE SHOWN IN THOUSANDS & DOLLARS

9. Reviews

The following Reviews were conducted for the 2000 PSR:

Reviewer	Title	Representing	Date Reviewed
James Douglas	Project Dev. Coordinator	D&LP	9/14/00
Jeffrey Lewis	Senior Engineer	FHWA	8/30/00
Alex Kennedy	Traffic Reviewer	HQ Traffic Ops	6/21/00

Per Caltrans/FHWA Stewardship Agreements, as discussed in the OPPD Manual Section 1-20.70 (Federal Government) this project is considered EXEMPT.

10. Project Personnel

Mario Orso
619.688.2561
Department District 11
4050 Taylor Street
San Diego, CA 92110

Kazim Mamdani
619.718.7840
Department District 11
4050 Taylor Street
San Diego, CA 92110

Maurice Eaton
619.688.3137
Department District 11
4050 Taylor Street
San Diego, CA 92110

Jayne Dowda
619.688.0182
Department District 11
4050 Taylor Street
San Diego, CA 92110

Jacob Armstrong
619.688.6963
Department District 11
4050 Taylor Street
San Diego, CA 92110

Sai Win
619.767.2361
Department District 11
4050 Taylor Street
San Diego, CA 92110

Sandy Johnson
619.688.6460
Department District 11
4050 Taylor Street
San Diego, CA 92110

Sandy Johnson
619.688.6460
Department District 11
4050 Taylor Street
San Diego, CA 92110

Sandra Durbin
619.688.0182
Department District 11
4050 Taylor Street
San Diego, CA 92110

Olga Estrada
619.688.0172
Department District 11
4050 Taylor Street
San Diego, CA 92110

Jeff Bentz
619.220.5434
Department District 11
4050 Taylor Street
San Diego, CA 92110

Michael Powers
619.688.3210
Department District 11
4050 Taylor Street
San Diego, CA 92110

Melisa Wiedemeier
619.688.3188
Department District 11
4050 Taylor Street
San Diego, CA 92110

Anh Hoang
619.688.3383
Department District 11
4050 Taylor Street
San Diego, CA 92110

Bill Graham
619.233.1454
EDAW
1420 Kettner Blvd, Suite 620
San Diego, CA 92101-2434

Garrett Fountain
619.280.4321
Southern California Soil and Testing
6280 Riverdale Street
San Diego, CA 92120

Tony Wong
760.768.2110
City of Calexico
608 Heber Avenue
Calexico, CA 92231

Chris Johnson
858.514.8377
Dokken Engineering
5675 Ruffin Road, Suite 250
San Diego, CA 92123

Jason Lemons
858.514.8377
Dokken Engineering
5675 Ruffin Road, Suite 250
San Diego, CA 92123

John Keating
858.300.8800
Linscott, Law, and Greenspan
4542 Ruffner Street, Suite 100
San Diego, CA 9211

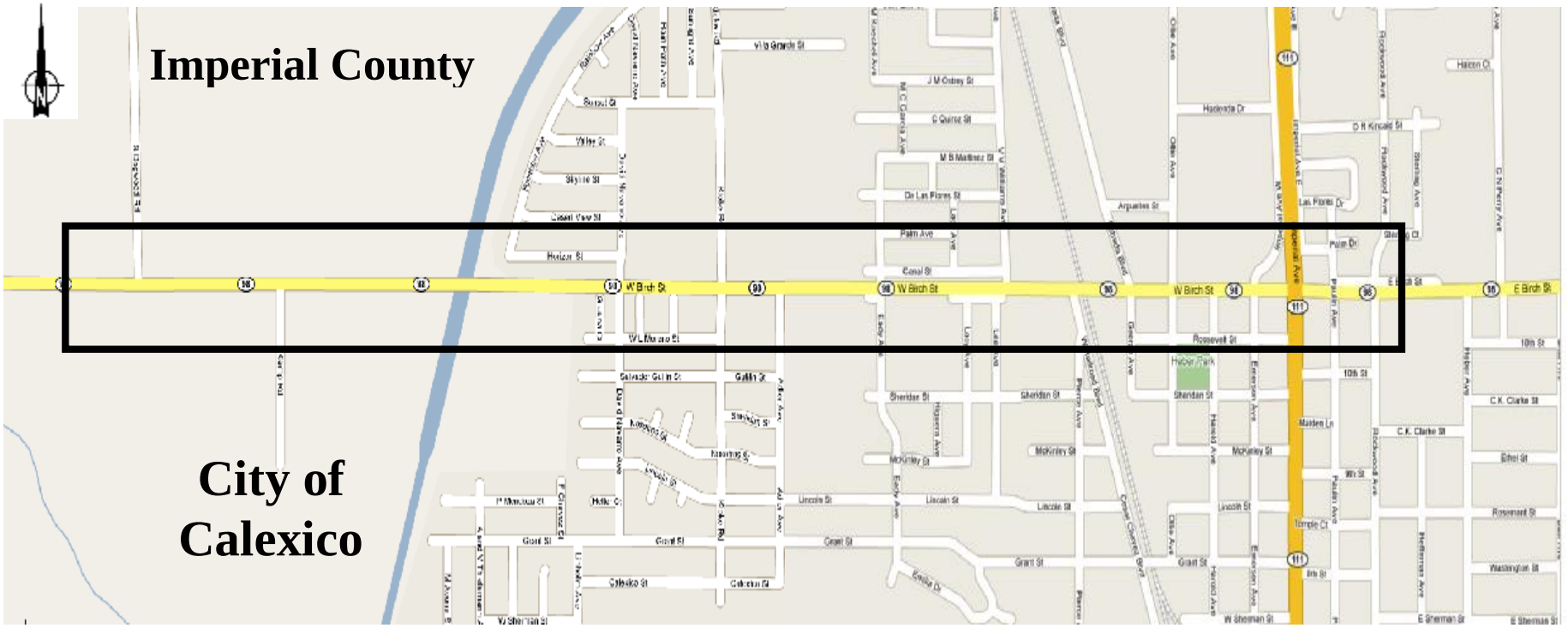

Figure 1
Project Location/Vicinity Map

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	1	9

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

Dokken Engineering
5675 Ruffin Road
Suite 250
San Diego, CA 92123

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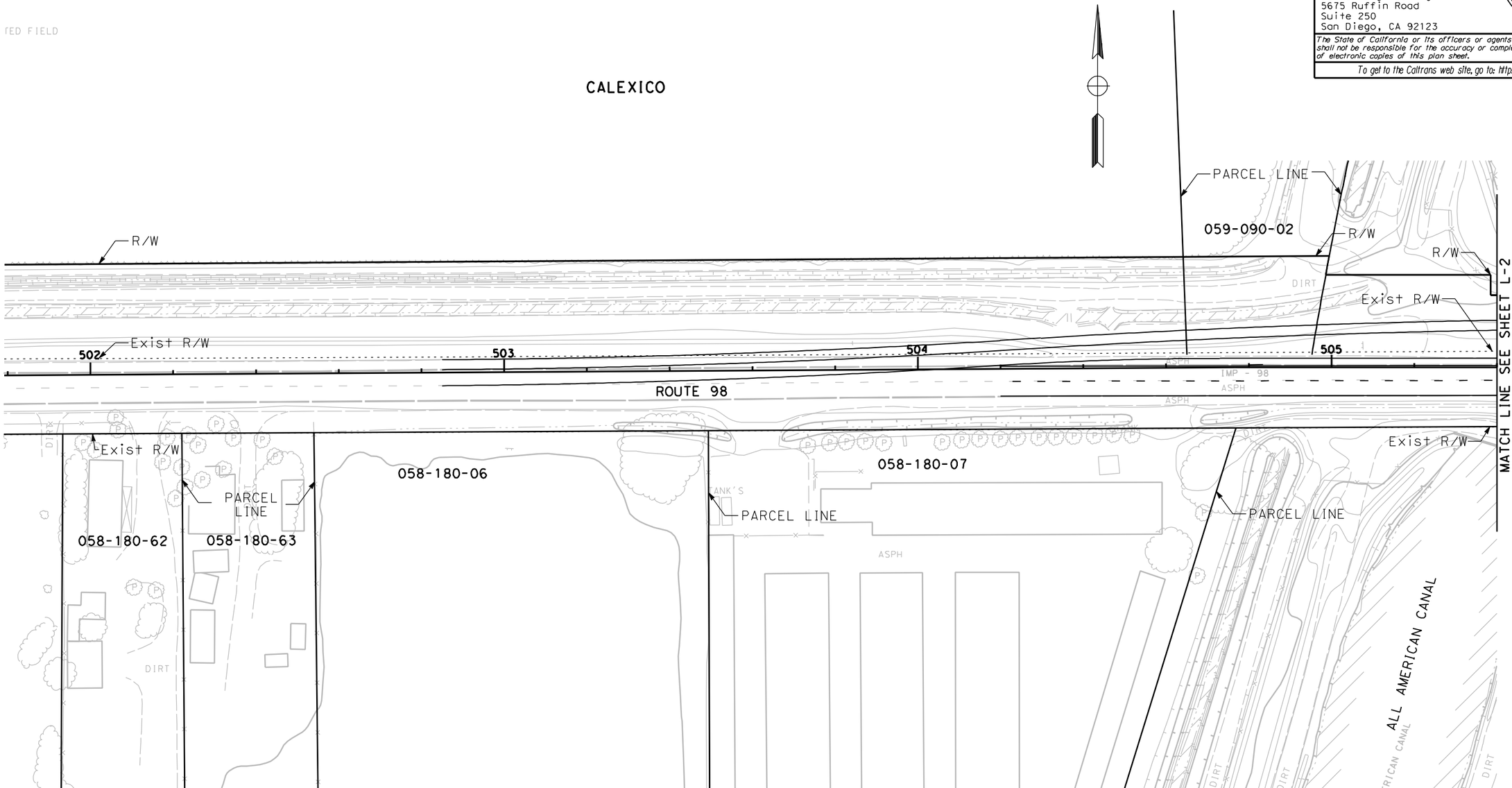
FED FIELD

CALEXICO



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 1

L-1

LAST REVISION 02-11-08 DATE PLOTTED => 12/29/2008 TIME PLOTTED => 10:04:44 AM

DATE	REVISED BY	DATE REVISED

CALCULATED/DESIGNED BY

CHECKED BY

OVERSIGHT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

$FREQUEST

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
DGN FILE => ...\1524eq001.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	2	9

Caltrans Metric

REGISTERED CIVIL ENGINEER DATE

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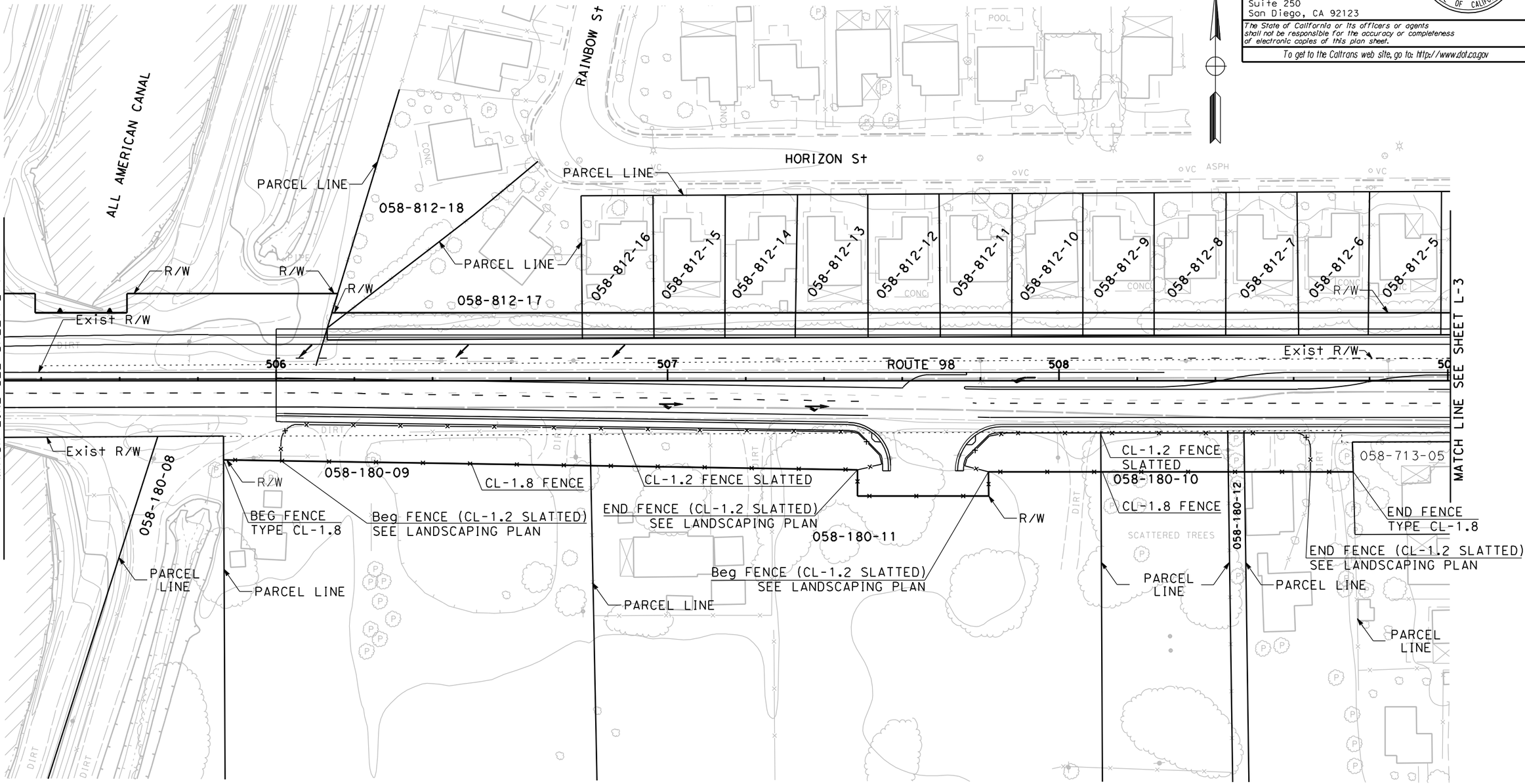

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 1

L-2

OVERSIGHT ENGINEER

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DGN FILE => ...\1524ea002.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	3	9

REGISTERED CIVIL ENGINEER DATE

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$REQUEST

DAVID NAVARRO Ave

PARCEL LINE

Beg FENCE (TYPE CL-1.8)
Beg FENCE (TYPE CL-1.2 SLATTED-SEE LANDSCAPING PLANS)

CL-1.8 FENCE
CL-1.2 FENCE SLATTED

058-812-5 | 058-812-4 | 058-812-3 | 058-812-2 | 058-812-1

R/W

058-811-10

058-811-02

058-811-01

Exist R/W

509 | 510 | 511 | 512

ROUTE 98

IMP - 98

ASPH

CONC

Y 557 000

MATCH LINE SEE SHEET L-2

MATCH LINE SEE SHEET L-4

058-713-05 | 058-714-01 | 058-715-05 | 058-716-01 | 058-716-10 | 058-717-01 | 058-717-09 | 058-717-10

LUNA Ct

H FRITSCH St

MERCADO St

GNV

VC'S

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 1

L-3

LAST REVISION 02-11-08 | DATE PLOTTED => 12/29/2008 | TIME PLOTTED => 10:05:20 AM

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DGN FILE => ...\1524ea003.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	4	9

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

Dokken Engineering
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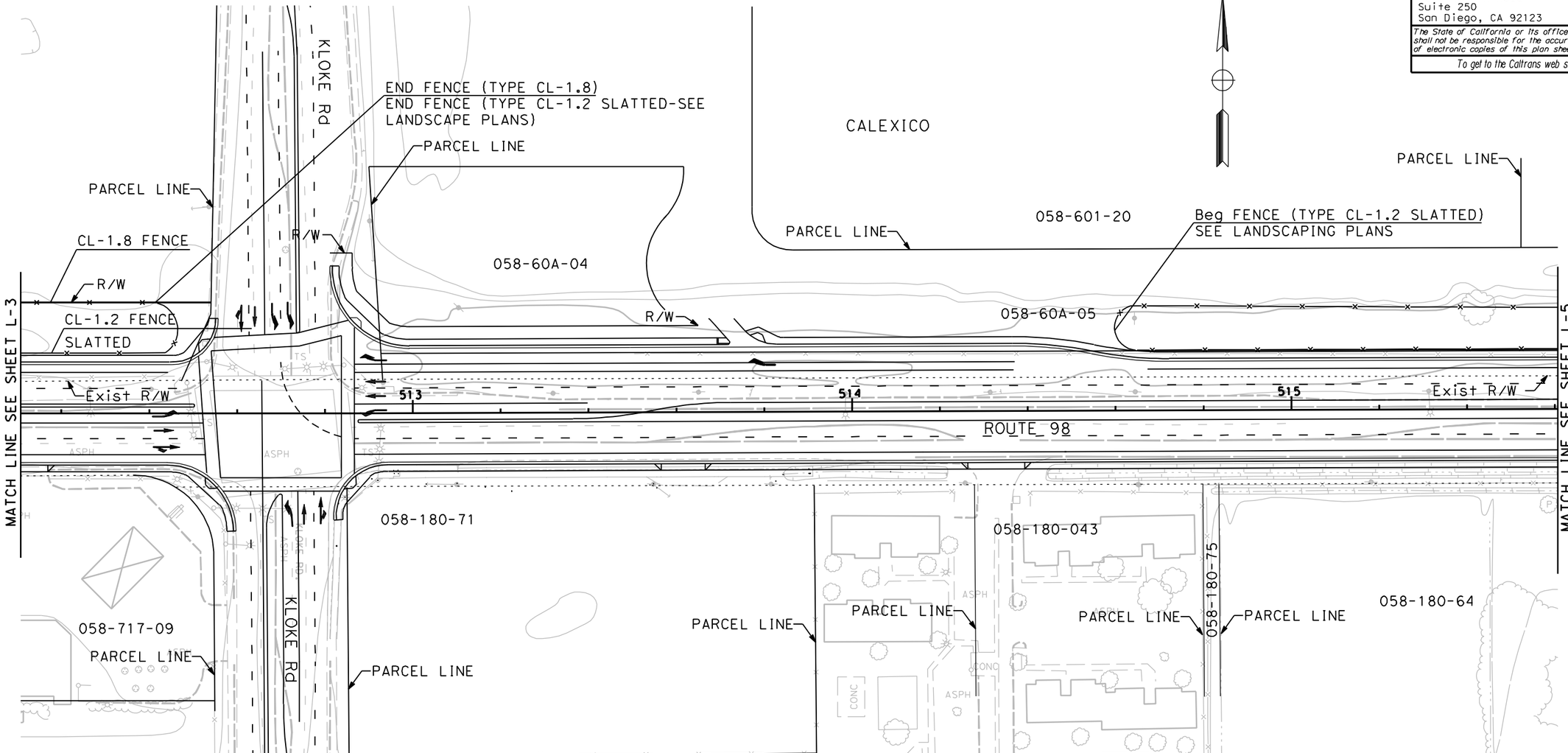

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 1

L-4

DATE REVISED | REVISED BY | DATE

CALCULATED/ DESIGNED BY | CHECKED BY

OVERSIGHT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	5	9

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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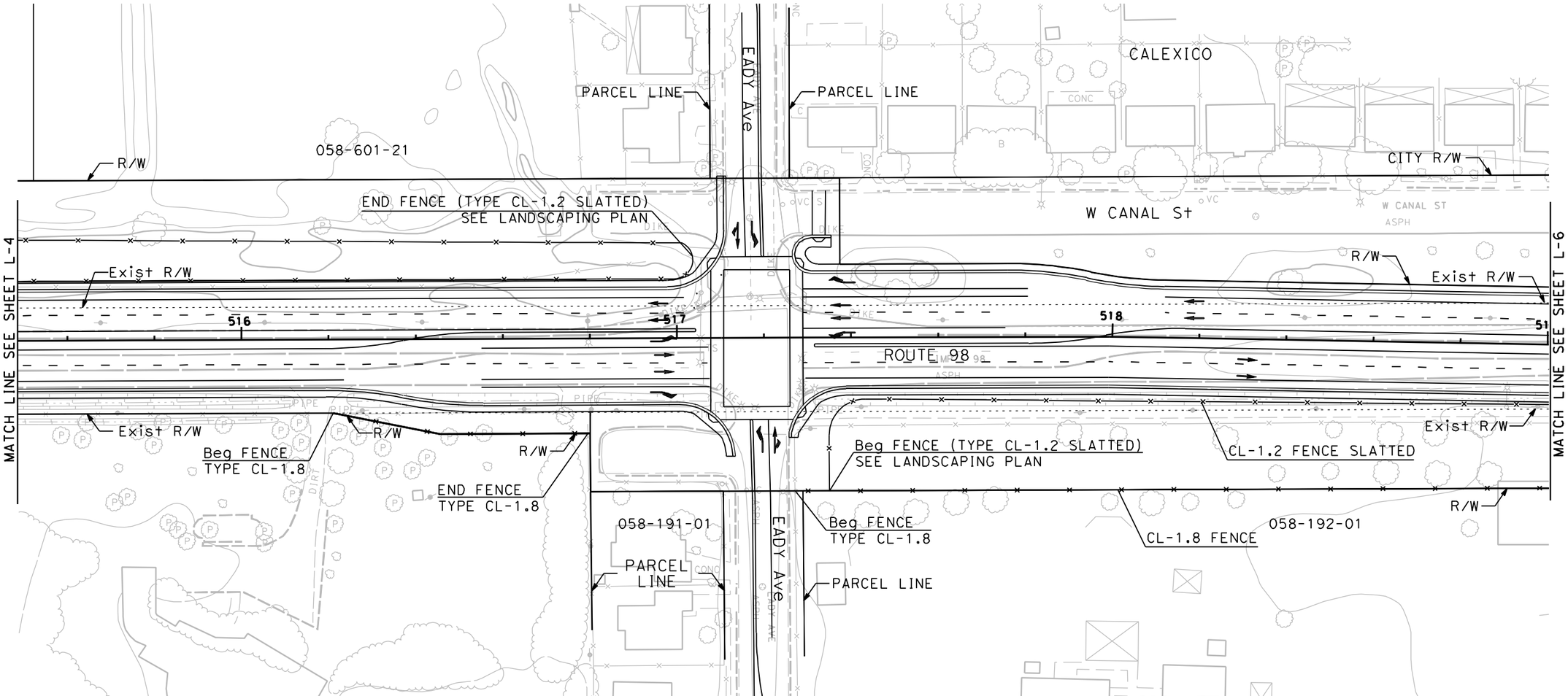

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 1

L-5

LAST REVISION 02-11-08
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TIME PLOTTED => 10:05:46 AM

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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DGN FILE => ...\1524ea005.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	6	9

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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San Diego, CA 92123

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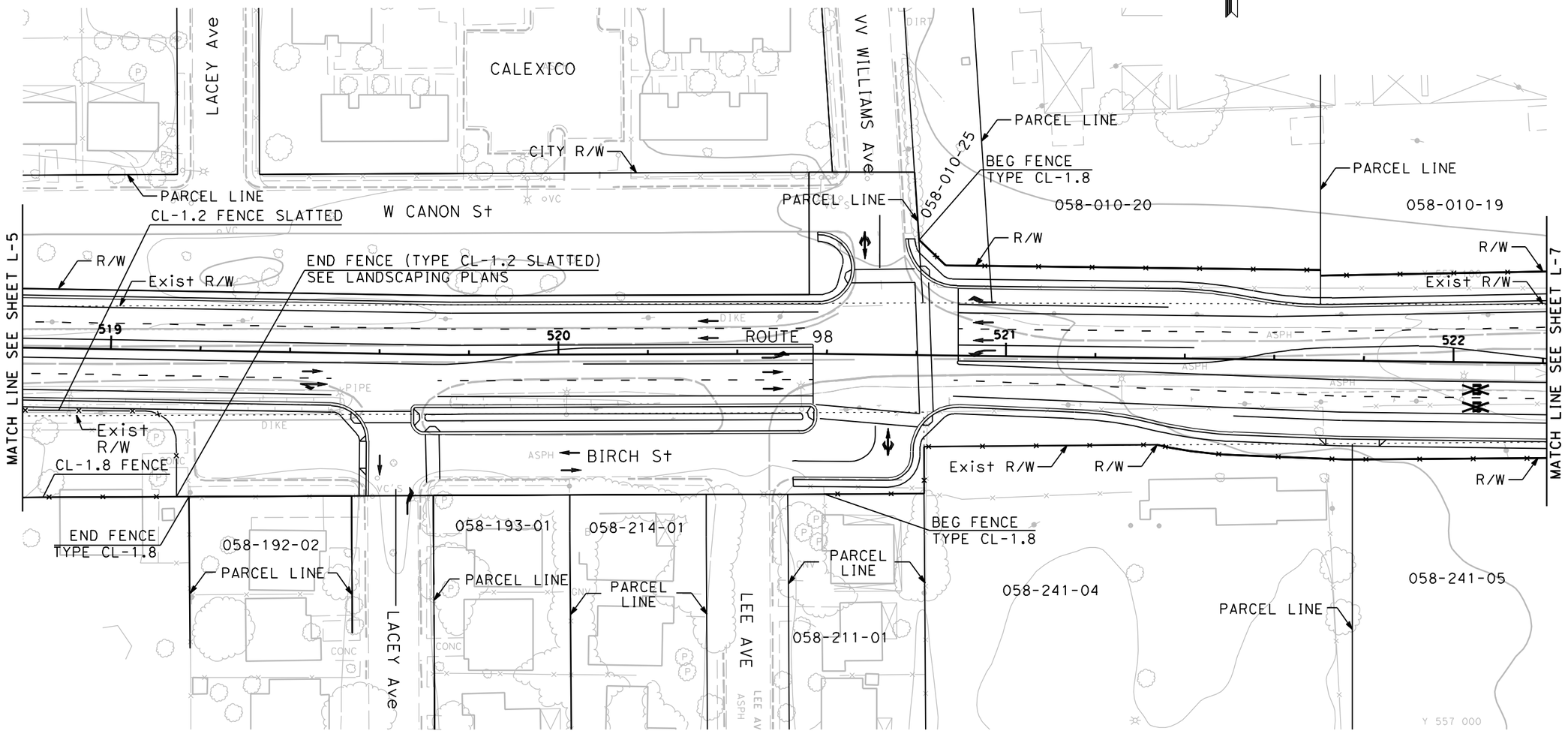

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 1

L-6

DATE REVISED | REVISED BY | DATE | CALCULATED/ DESIGNED BY | CHECKED BY | OVERSIGHT ENGINEER

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LAST REVISION 02-11-08 | DATE PLOTTED => 12/29/2008 | TIME PLOTTED => 10:06:19 AM

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
DGN FILE => ...\1524ea006.dgn

CU

EA 080200

$REQUEST

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	7	9

REGISTERED CIVIL ENGINEER DATE

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Caltrans

$REQUEST

CALEXICO

ESTRADA Blvd

PARCEL LINE

REPLACE EXISTING RAILROAD CROSSING IN COMPLIANCE WITH CPUC GENERAL ORDER 75C

PARCEL LINE END FENCE TYPE CL-1.8

R/W

Exist R/W

058-010-67

058-010-46

058-010-32

ROUTE 98

523

524

525

OLLIE Ave

058-120-40

MATCH LINE SEE SHEET L-6

MATCH LINE SEE SHEET L-8

CESAR CHAVEZ BLVD

UNION PACIFIC RAILROAD

058-245-01

058-251-01

GEORGE AVE

058-252-01

058-252-02

Beg FENCE TYPE CL-1.8

END FENCE TYPE CL-1.8

058-254-01

058-254-02

058-254-03

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 1

L-7

LAST REVISION 02-11-08

DATE PLOTTED => 12/29/2008
TIME PLOTTED => 10:06:38 AM

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
DGN FILE => ...\1524ea007.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	8	9

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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Caltrans

$F REQUEST

CALEXICO

ROUTE 98

ROUTE 111

W CANAL St

HAROLD Ave

EMERSON Ave

PARCEL LINE

R/W

058-120-39

058-120-38

058-120-37

058-120-36

058-261-005

058-254-03

058-256-10

058-256-09

058-256-02

058-261-05

058-261-02

058-263-16

U-10a

U-10b

526

527

528

529

MATCH LINE SEE SHEET L-7

MATCH LINE SEE SHEET L-9

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 1

L-8

LAST REVISION 02-11-08

DATE PLOTTED => 12/29/2008
TIME PLOTTED => 10:06:54 AM

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
DGN FILE => ...\1524ea008.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	9	9

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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Suite 250
San Diego, CA 92123

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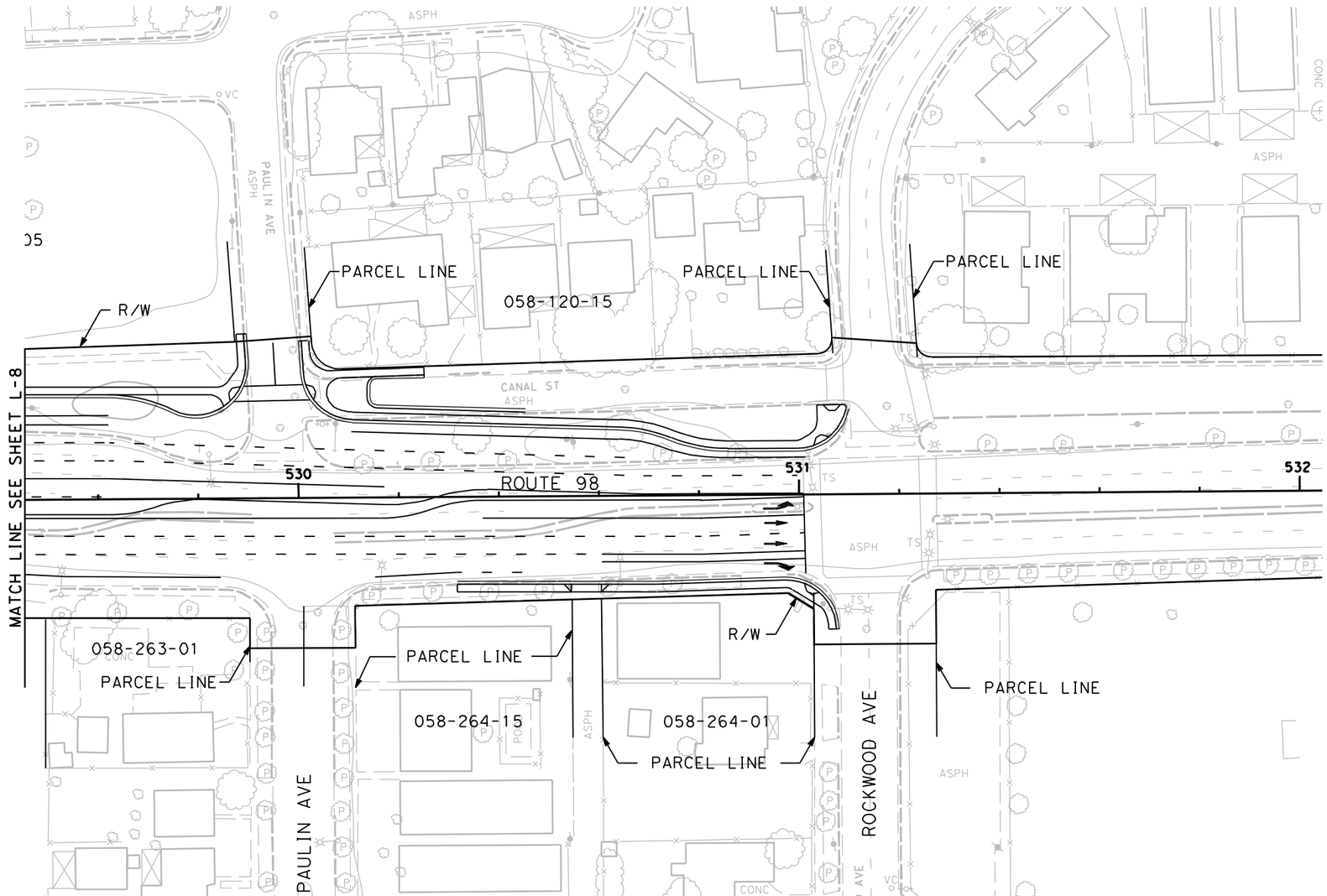

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 1

L-9

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*PREQUEST

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DATE PLOTTED => 12/29/2008
TIME PLOTTED => 10:07:09 AM

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
DGN FILE => ...\1524ea009.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	1	4

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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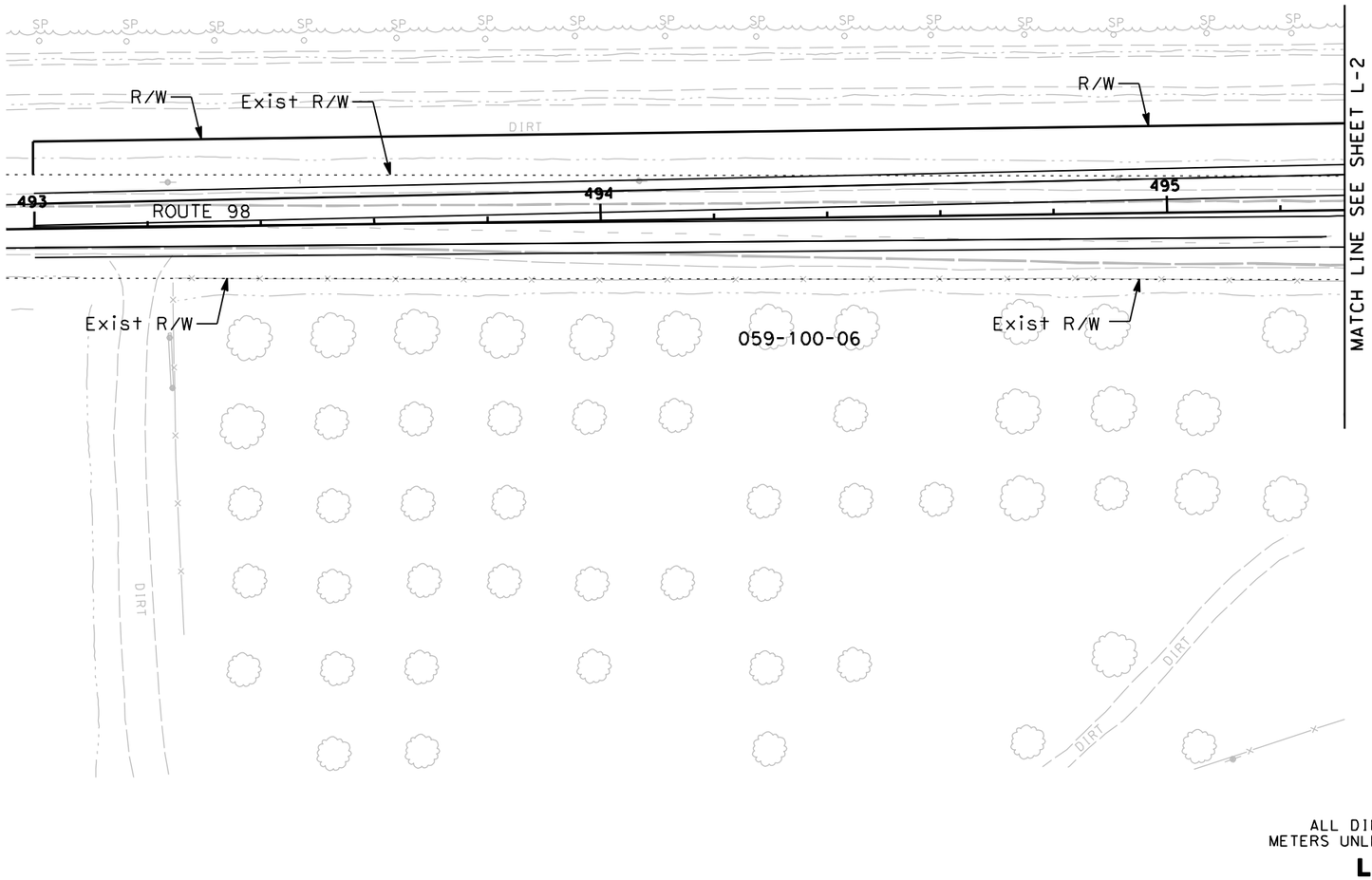
Caltrans Metric

CALEXICO

058-070-008



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 2

L-1

LAST REVISION 02-11-08
DATE PLOTTED => 12/29/2008
TIME PLOTTED => 10:07:29 AM

DATE	REVISED BY	DATE REVISED

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OVERSIGHT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

$FREQUEST

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
DGN FILE => ...\1524eaPH2-001.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	2	4

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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CALEXICO

S. DOGWOOD Rd

CR-S31

ASPH

R/W

Exist R/W

GNV
CULTIVATED FIELD

Beg FENCE (TYPE CL-1.2 SLATTED)
SEE LANDSCAPING PLANS

MATCH LINE SEE SHEET L-1

MATCH LINE SEE SHEET L-3

495 ROUTE 98 496 497 498

ROUTE 98

ASPH
IMP - 98

DIRT

058-180-01

PARCEL LINE

ALL DIMENSIONS ARE IN
METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 2

L-2

DATE	REVISED BY	DATE REVISED
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OVERSIGHT ENGINEER

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
DGN FILE => ...\1524eaPH2-002.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	3	4

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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Suite 250
San Diego, CA 92123

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OVERSIGHT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

$FREQUEST

CALEXICO

GNV

END FENCE (TYPE CL-1.2 SLATTED)
SEE LANDSCAPING PLANS

Beg FENCE (TYPE CL-1.2 SLATTED)
SEE LANDSCAPING PLANS

059-090-04

MATCH LINE SEE SHEET L-2

MATCH LINE SEE SHEET L-4

R/W

Exist R/W

DIRT

SP

ASPH

IMP - 98

499

500

501

502

ROUTE 98

058-180-01

058-180-04
END FENCE
TYPE CL-1.8

Beg FENCE
TYPE CL-1.8

058-180-74

TANK'S

PARCEL LINE

SCATTERED TREES

CULTIVATED FIELD

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 2

L-3

LAST REVISION 02-11-08

DATE PLOTTED => 12/29/2008
TIME PLOTTED => 10:08:07 AM

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
DGN FILE => ...\1524eaPH2-003.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	4	4

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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Suite 250
San Diego, CA 92123

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CALEXICO

FED FIELD

MATCH LINE SEE SHEET L-3

MATCH LINE SEE SHEET L-5

R/W

Exist R/W

PARCEL LINE

059-090-02

502 503 504 505

ROUTE 98

ASPH

PIPE

DIRT

058-180-06

058-180-07

058-180-62

058-180-63

Beg FENCE TYPE CL-1.8

END FENCE TYPE CL-1.8

PARCEL LINE

END FENCE (TYPE CL-1.2 SLATTED) SEE LANDSCAPING PLANS

ALL AMERICAN CANAL

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 2

L-4

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
DGN FILE => ...\1524eaPH2-004.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	48.5/52.5	2	9

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

Dokken Engineering
5675 Ruffin Road
Suite 250
San Diego, CA 92123

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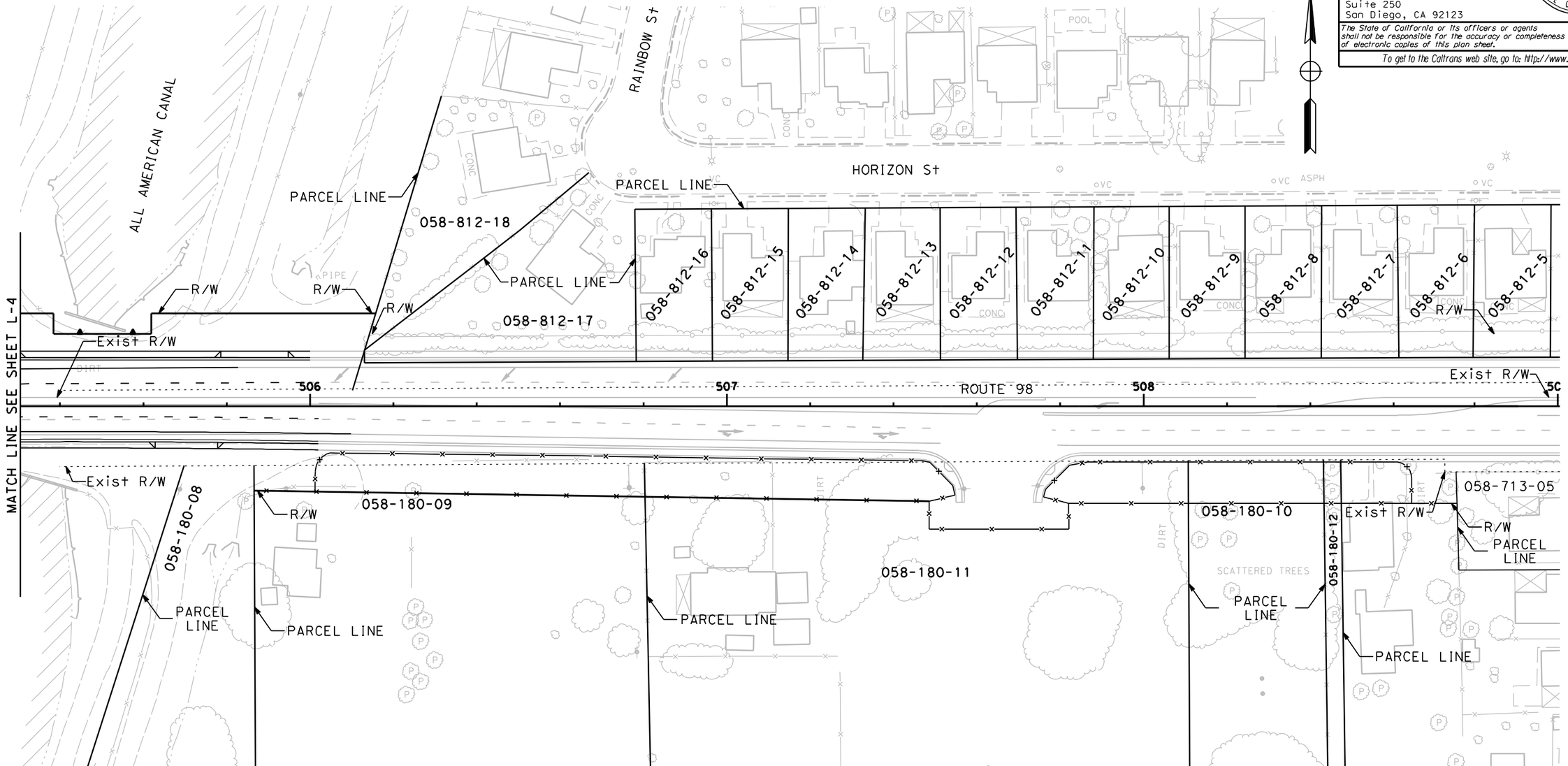
Caltrans Metric



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

LAYOUT

SCALE 1:500

PHASE 2

L-5

DATE	REVISED BY	DATE REVISED
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	CHECKED BY	

OVERSIGHT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

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CU

EA 080200

LAST REVISION 02-11-08

DATE PLOTTED => 12/29/2008
TIME PLOTTED => 10:08:53 AM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.2/52.5	1	10

REGISTERED CIVIL ENGINEER — DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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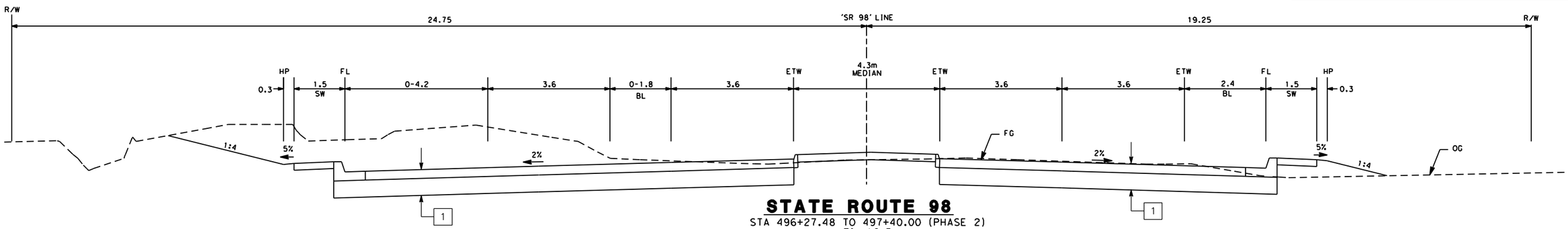
Caltrans Metric

STRUCTURAL SECTION TYPES

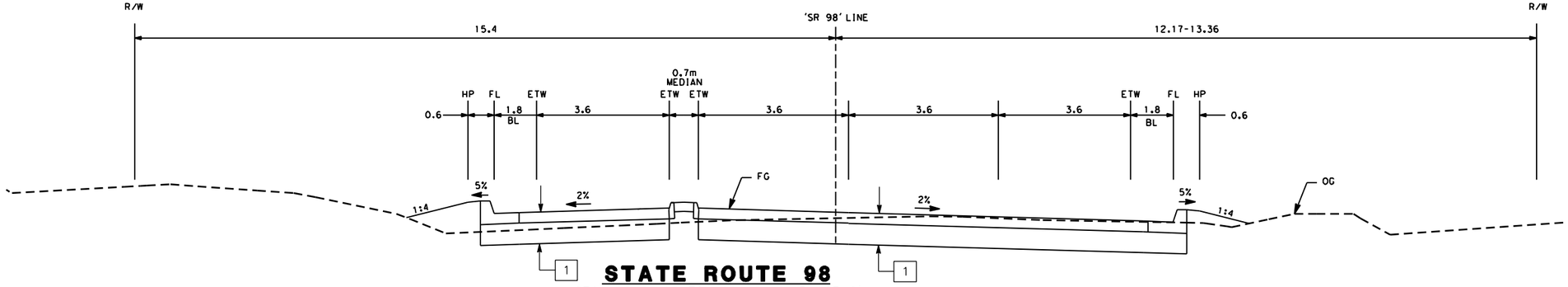
SS NO.	OPTION 1	OPTION 2
1	195 mm HMA(Type A) 840 mm Cl 2 AB	195 mm HMA(Type A) 480 mm Cl 2 AB 1 m Cl 4 AS
2	210 mm HMA(Type A) 915 mm Cl 2 AB	210 mm HMA(Type A) 525 mm Cl 2 AB 1 m Cl 4 AS

* BL = Bike Lane
SW = Sidewalk

NOTE: FOR MEDIAN STRUCTURAL SECTION, SEE ATTACHMENT O.



STATE ROUTE 98
STA 496+27.48 TO 497+40.00 (PHASE 2)
TI =12.5



STATE ROUTE 98
STA 495+27.97 TO 496+27.48 (PHASE 2)
TI =12.5

STATE ROUTE 98
STA 493+00 TO 495+27.97 (PHASE 2)
TI =12.5

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-1

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

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CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.2/52.5	2	10

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

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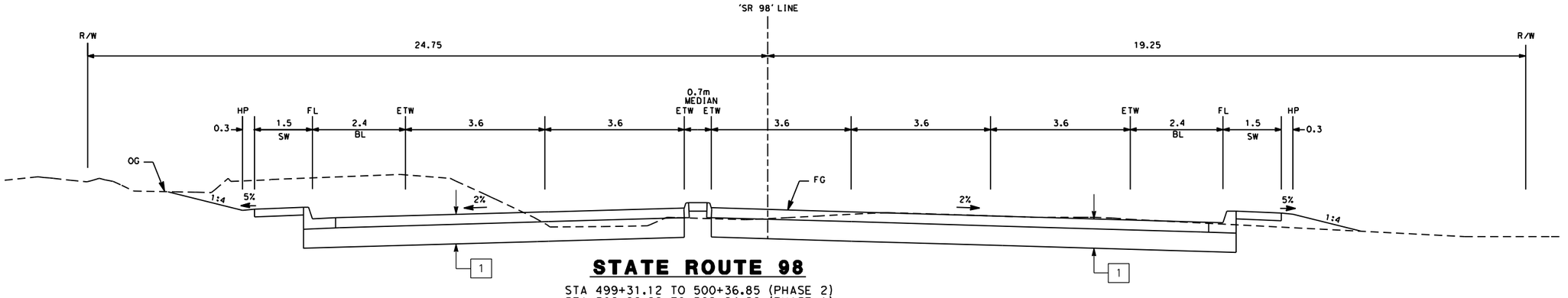
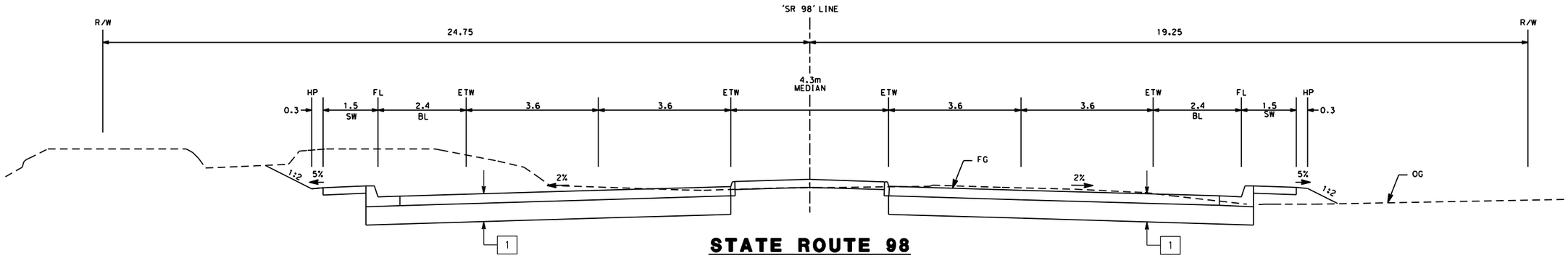


STATE ROUTE 98

STA 499+31.12 TO 500+36.85 (PHASE 2)
STA 508+96.88 TO 509+84.28 (PHASE 1)
STA 512+01.82 TO 512+68.93 (PHASE 1)
TI = 12.5



STATE ROUTE 98

STA 497+40.00 TO 499+31.12 (PHASE 2)
STA 501+30.66 TO 502+39.02 (PHASE 2)
STA 510+47.33 TO 512+01.82 (PHASE 1)
TI = 12.5

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-2

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CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.2/52.5	3	10

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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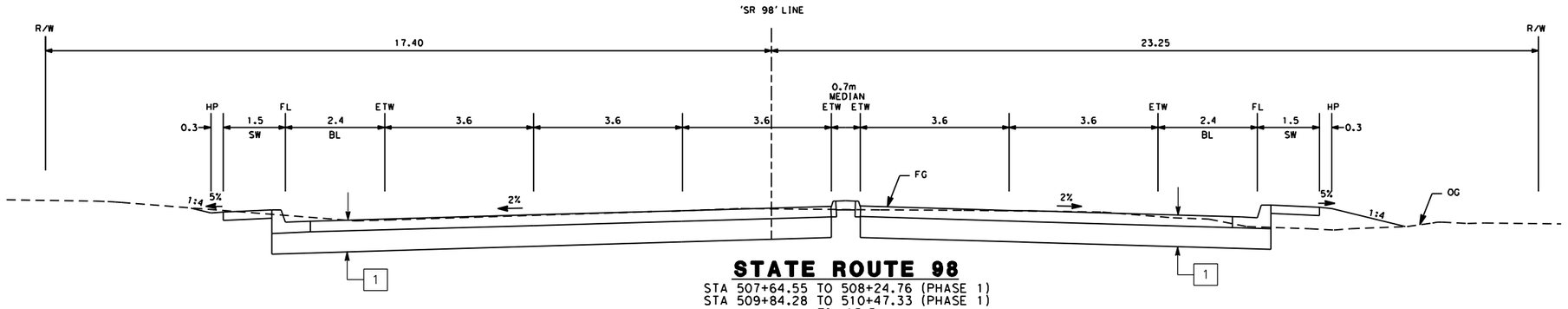
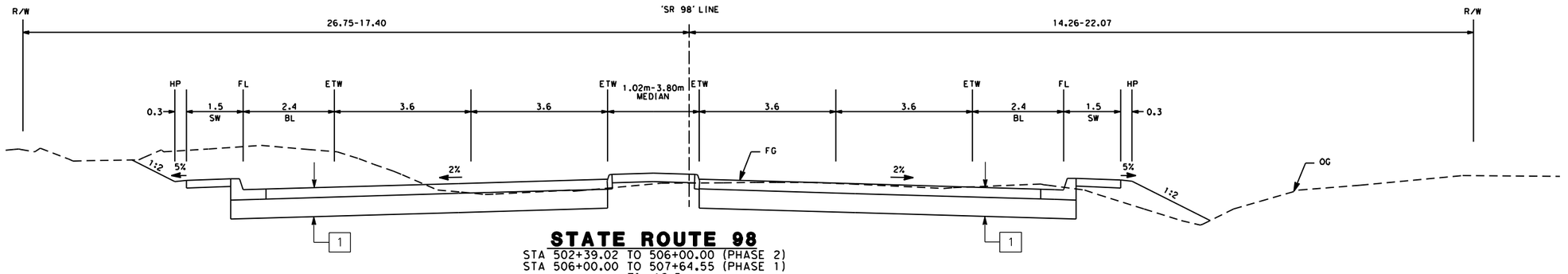


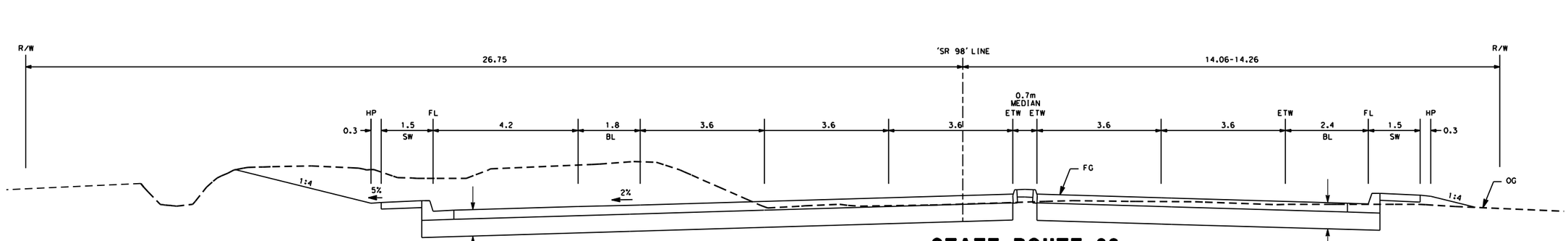
STATE ROUTE 98

STA 507+64.55 TO 508+24.76 (PHASE 1)
STA 509+84.28 TO 510+47.33 (PHASE 1)
TI =12.5



STATE ROUTE 98

STA 502+39.02 TO 506+00.00 (PHASE 2)
STA 506+00.00 TO 507+64.55 (PHASE 1)
TI =12.5



STATE ROUTE 98

STA 500+36.85 TO 501+30.66 (PHASE 2)
TI =12.5

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-3

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OVERSIGHT ENGINEER

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LAST REVISION 02-11-08
DATE PLOTTED => 2/3/2009
TIME PLOTTED => 1:46:46 PM

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

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CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.2/52.5	4	10

REGISTERED CIVIL ENGINEER — DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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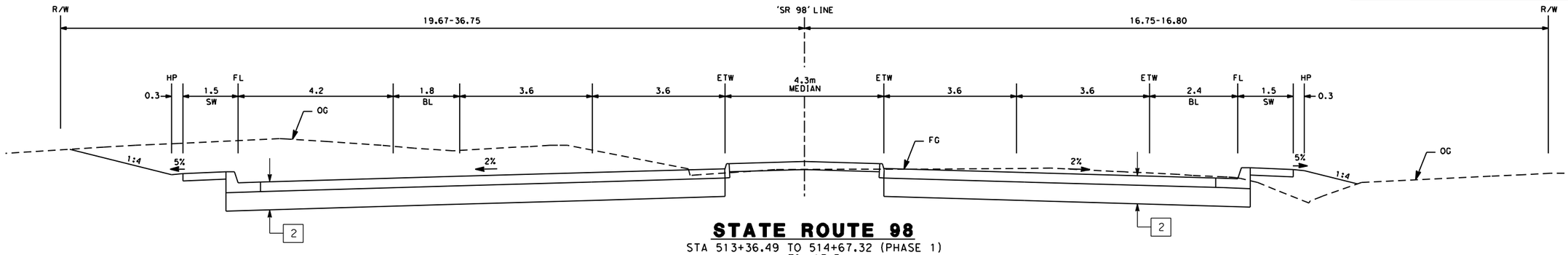
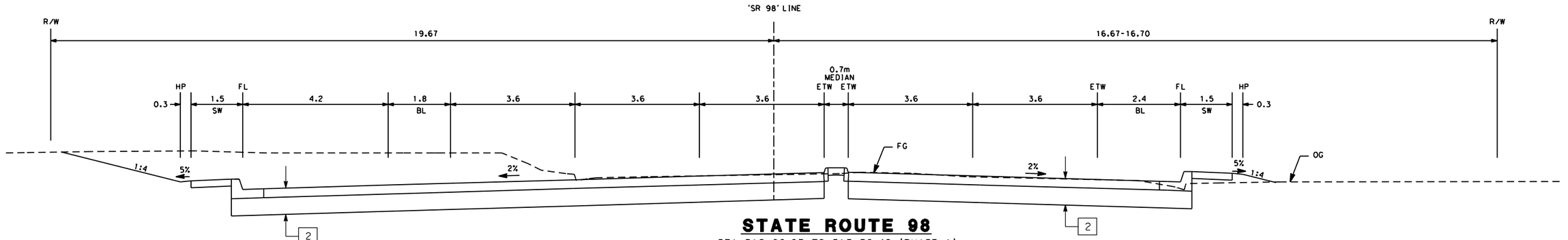


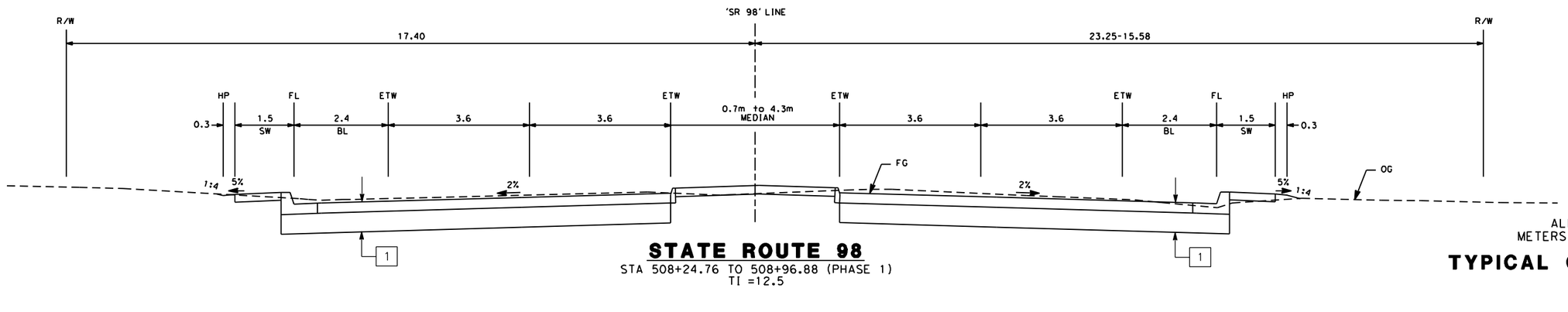
STATE ROUTE 98

STA 513+36.49 TO 514+67.32 (PHASE 1)
TI =13.5



STATE ROUTE 98

STA 512+68.93 TO 513+36.49 (PHASE 1)
STA 517+18.99 TO 517+80.75 (PHASE 1)
TI =13.5



STATE ROUTE 98

STA 508+24.76 TO 508+96.88 (PHASE 1)
TI =12.5

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-4

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OVERSIGHT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

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DGN FILE => ...\1524_typ_xsec_sh04.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.2/52.5	5	10

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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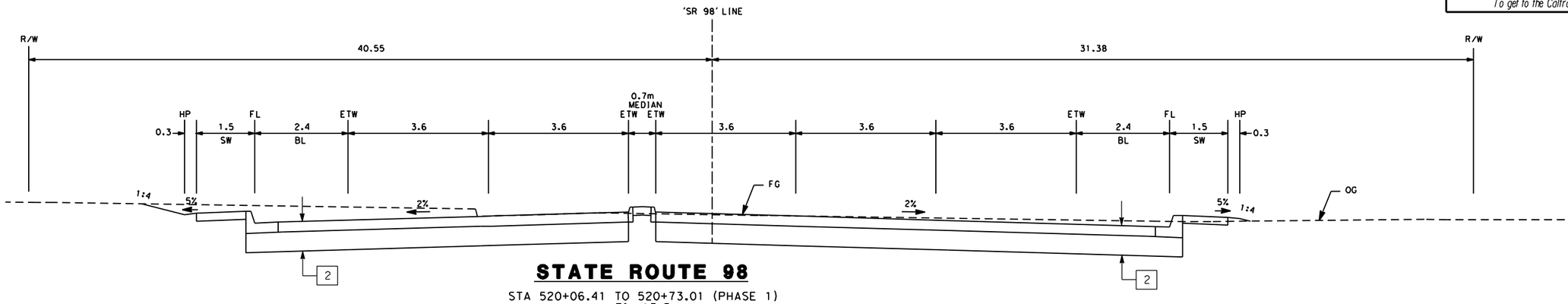
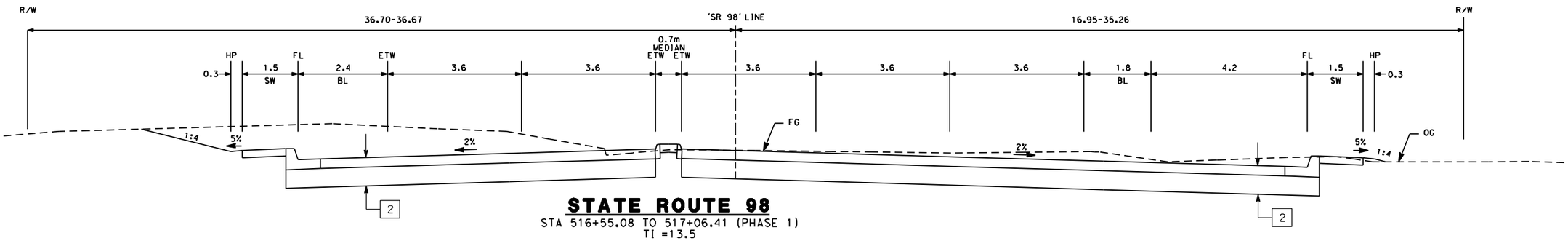


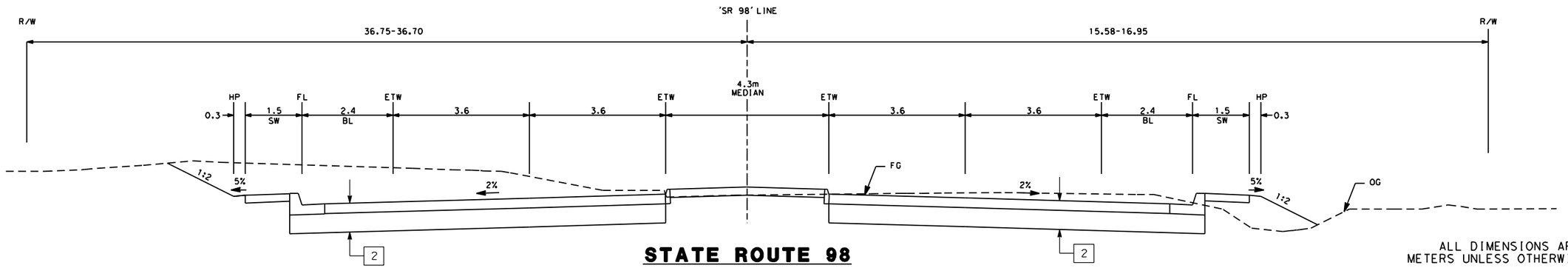
STATE ROUTE 98

STA 520+06.41 TO 520+73.01 (PHASE 1)
TI =13.5



STATE ROUTE 98

STA 516+55.08 TO 517+06.41 (PHASE 1)
TI =13.5



STATE ROUTE 98

STA 514+67.32 TO 516+55.08 (PHASE 1)
STA 517+80.75 TO 520+06.41 (PHASE 1)
TI =13.5

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-5

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
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EA 080200

LAST REVISION 02-11-08

DATE PLOTTED => 2/3/2009
TIME PLOTTED => 1:46:47 PM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.2/52.5	6	10

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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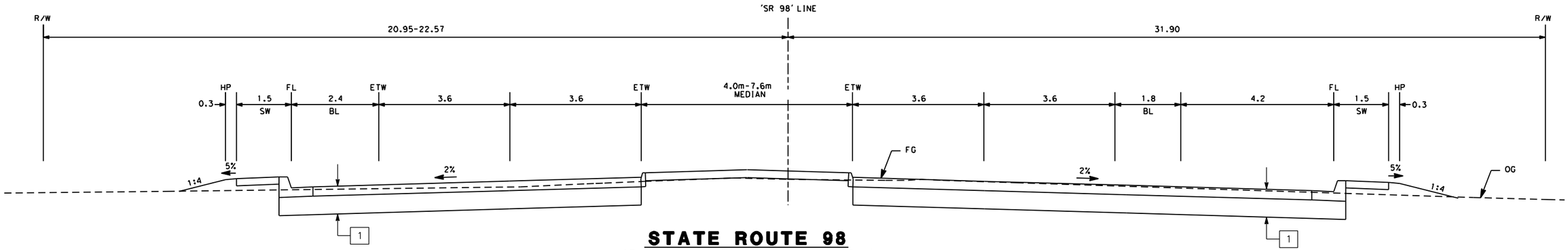
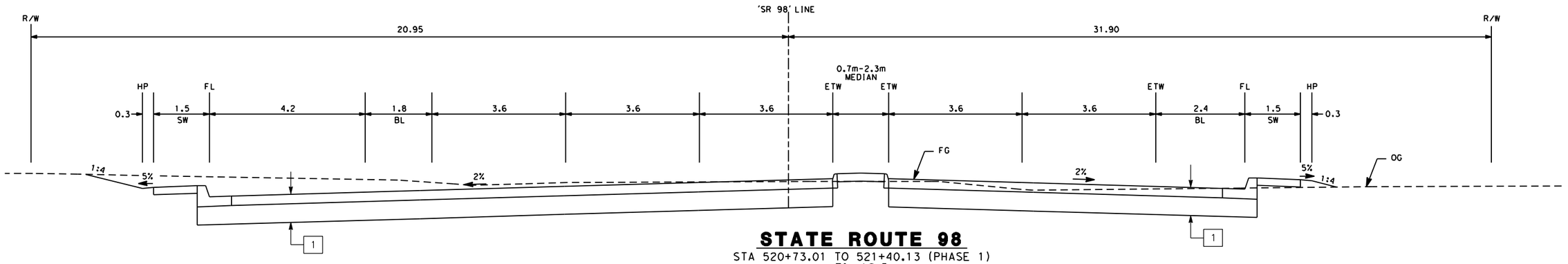


STATE ROUTE 98

STA 521+40.13 TO 522+64.40 (PHASE 1)
TI =12.5



STATE ROUTE 98

STA 520+73.01 TO 521+40.13 (PHASE 1)
TI =12.5

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
OVERSIGHT ENGINEER
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DATE

LAST REVISION 02-11-08
DATE PLOTTED => 2/3/2009
TIME PLOTTED => 1:46:47 PM

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

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CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.2/52.5	7	10

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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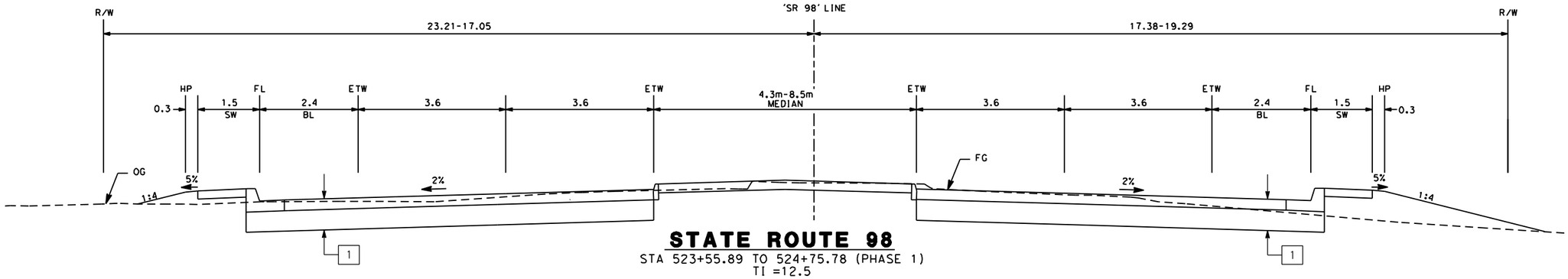
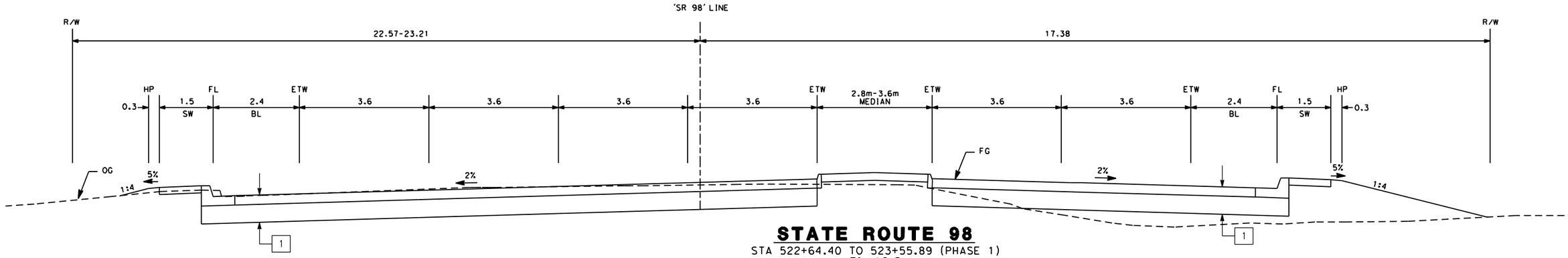


STATE ROUTE 98

STA 523+55.89 TO 524+75.78 (PHASE 1)
TI =12.5



STATE ROUTE 98

STA 522+64.40 TO 523+55.89 (PHASE 1)
TI =12.5

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-7

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CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.2/52.5	8	10

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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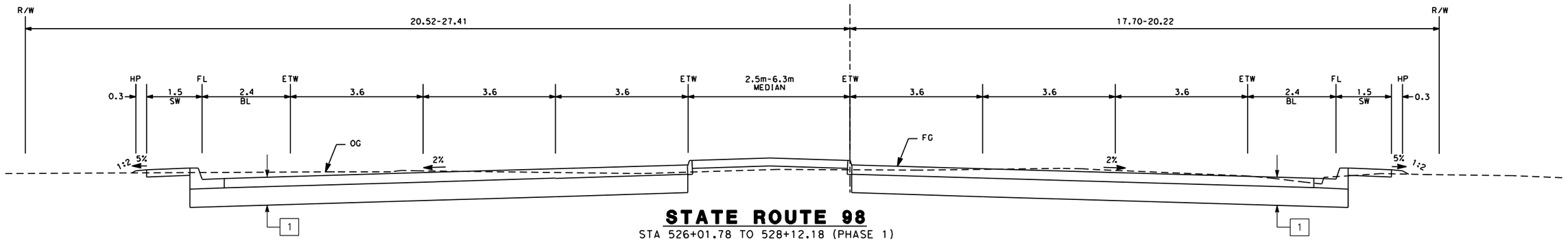
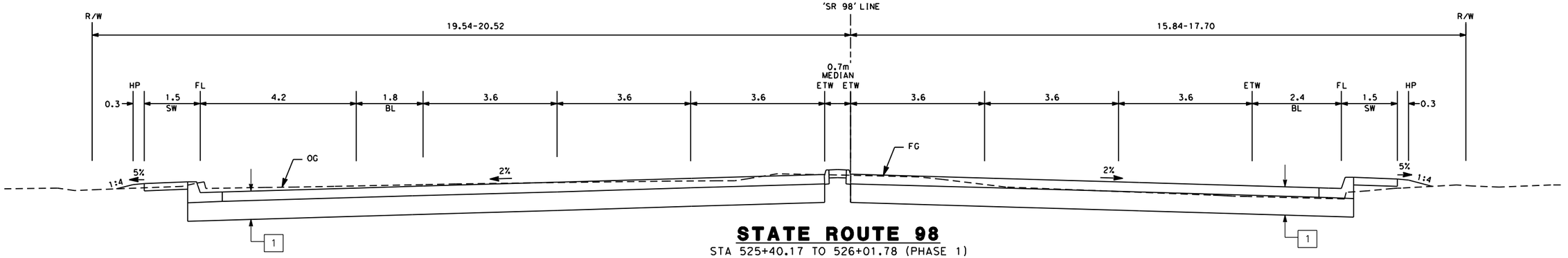


STATE ROUTE 98

STA 526+01.78 TO 528+12.18 (PHASE 1)
TI =12.5



STATE ROUTE 98

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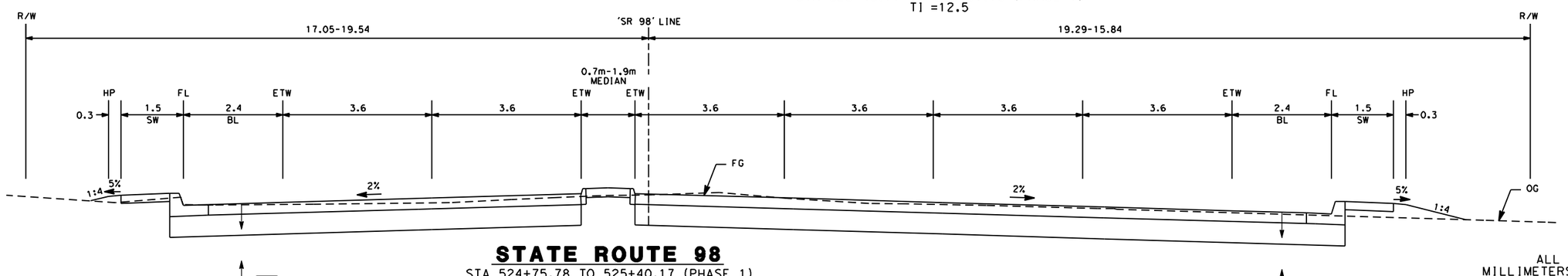
TI =12.5



STATE ROUTE 98

STA 524+75.78 TO 525+40.17 (PHASE 1)
TI =12.5

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-8

DATE | REVISED BY | DATE REVISED

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LAST REVISION 02-11-08 | DATE PLOTTED => 2/3/2009 | TIME PLOTTED => 1:46:48 PM

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => jeffb
DGN FILE => ...\1524_typ_xsec_sh08.dgn

CU | EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.2/52.5	9	10

REGISTERED CIVIL ENGINEER — 02/21/06 DATE

PLANS APPROVAL DATE

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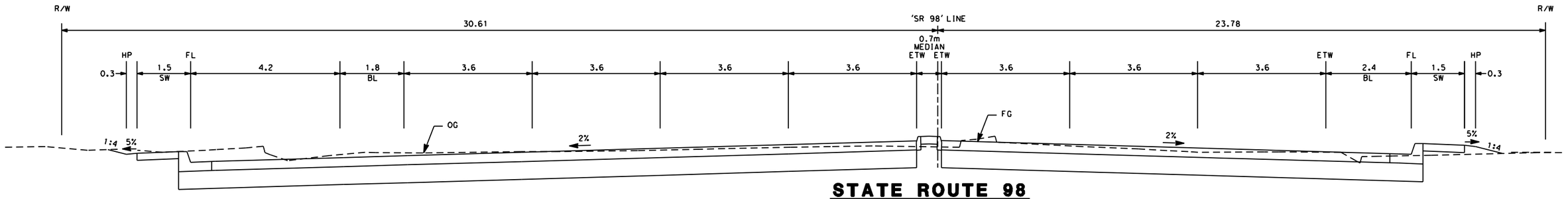
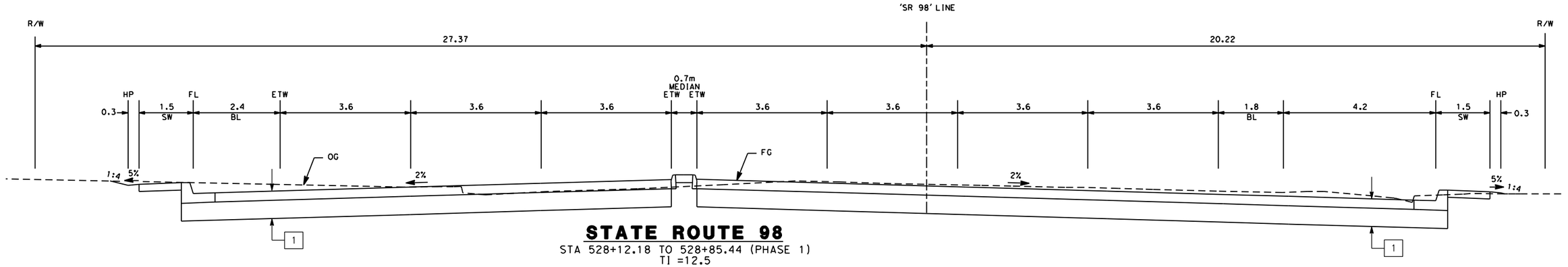


STATE ROUTE 98

STA 528+85.44 TO 529+62.02 (PHASE 1)



STATE ROUTE 98

STA 528+12.18 TO 528+85.44 (PHASE 1)
TI =12.5

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-9

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

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DGN FILE => ...\1524_typ_xsec_sh09.dgn

CU

EA 080200

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.2/52.5	10	10

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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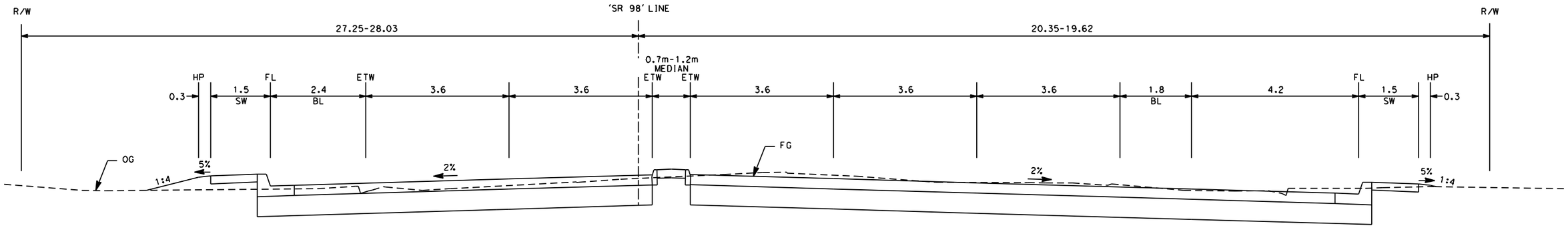
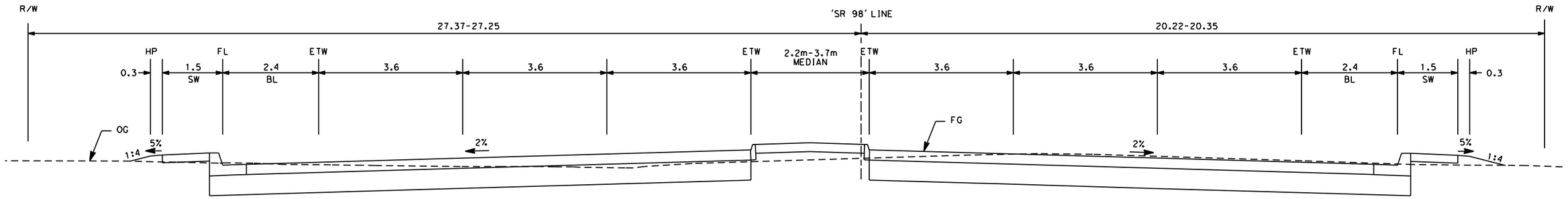


STATE ROUTE 98

530+69.71 TO 531+00.93 (PHASE 1)



STATE ROUTE 98

STA 529+62.02 TO 530+69.71 (PHASE 1)

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-10

REVISED BY | DATE REVISED

CALCULATED/DESIGNED BY | CHECKED BY

OVERSIGHT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

$FREQUEST

LAST REVISION 02-11-08 | DATE PLOTTED => 2/3/2009 | TIME PLOTTED => 1:46:49 PM

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

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EA 080200

DISTRICT 11
PRELIMINARY
PROJECT COST ESTIMATE

11- PAGE ESTIMATE

11-080200

Type of Estimate : Project Report
Program Code :
Project Limits : SR-98 KP48.2/52.5
Description: **SR-98 West Highway Widening Improvements**
Scope : Highway widening, intersection signalization, curb and gutter, sidewalk, and drainage features
Alternative : Build Alternative

	Current Cost	Escalated Cost
ROADWAY ITEMS	$ 30,837,400.00	$ 41,325,100.00
STRUCTURE ITEMS	$ -	$ -
SUBTOTAL CONSTRUCTION COST	$ 30,837,400.00	$ 41,325,100.00
RIGHT OF WAY	$ 5,860,000.00	$ 8,072,000.00
TOTAL CAPITAL COST	**$ 36,698,000.00**	**$ 49,398,000.00**
PR/ED SUPPORT	$ 3,400,000.00	$ -
PS&E SUPPORT	$ 2,540,000.00	$ 3,345,000.00
RIGHT OF WAY SUPPORT	$ 1,217,000.00	$ 1,649,000.00
CONSTRUCTION SUPPORT	$ 6,822,000.00	$ 9,474,000.00
TOTAL SUPPORT COST	**$ 13,979,000.00**	**$ 14,468,000.00**
TOTAL PROJECT COST	**$ 50,700,000.00**	**$ 63,900,000.00**

	month	year
Date (Month/Year) of Estimate	1	2008
Estimated Date (Month/Year) of Construction	1	2014
Number of Months of Escalation	72	
Number of Years of Escalation	6.00	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days		480
Number of Plant Establishment Days		525

Estimated Project Schedule

PID Approval	
PA/ED Approval	2008
PS&E	2012
RTL	2014
Begin Construction	2014

Reviewed by District 0.E. — for Leon G. Edmonds, District 11 Office Engineer — Claire F. Dodge — 2/3/09 (Date) — (619) 688-6735 (Phone)

Approved by Project Manager — Mario Orso — 2/4/09 (Date) — (619) 688-2561 (Phone)

[2] Escalation rates used on this estimate for Support Cost are 12% for FY 07/08, 6% for FY 08/09, and 3% for FY 09/10 and each year beyond. Escalation rates used in this estimate for Highway Construction Capital Costs are 5.0% compounded annually to Construction year. These rates are different than the suggested 2006 STIP of 8.3% for fiscal year 05/06 and 3.0% thereafter. The decision to use 5.0% for this estimate was as per the Office of Office Engineer. (REV091108)

I. ROADWAY ITEMS

Section			Cost
1	Earthwork		$ 440,000
2	Structural Section		$ 9,084,000
3	Drainage		$ 2,586,000
4	Specialty Items		$ 240,000
5	Environmental		$ 3,106,000
	5A Environmental Mitigati	$ -	
	5B Landscape and Irrigatic	$ 2,440,000	
	5C NPDES	$ 666,000	
6	Traffic Items		$ 2,431,700
	6A Electrical	$ 1,270,000	
	6B Signing and Striping	$ 118,500	
	6C Traffic Management Plan	$ 197,700	
	6D Traffic Control	$ 845,500	
7	Detours		$ -
8	Minor Items		$ 894,400
9	Roadway Mobilization		$ 1,878,300
10	Supplemental Work		$ 1,773,700
11	State Furnished		$ 2,481,000
12	Contingencies		$ 4,983,100
13	Overhead		$ 939,200

TOTAL ROADWAY ITEMS	$ 30,837,400

Estimate Prepared By: Jeff Burdick, EIT - Assistant Engineer 12/19/2008 (858) 514-8377

Estimate Reviewed By: Jason Lemons, PE - Project Engineer 12/19/2008 (858) 514-8377

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1 EARTHWORK

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	M3	20,000	x	20.00	=	$	400,000
190103	Roadway Excavation (Type Y) ADL	M3		x		=	$	-
190105	Roadway Excavation (Type Z-2) ADL	M3		x		=	$	-
194001	Ditch Excavation	M3		x		=	$	-
198001	Imported Borrow	M3		x		=	$	-
198007	Imported Material (Shoulder Backing)	Tonne		x		=	$	-
192037	Structure Excavation (Retaining Wall)	M3		x		=	$	-
193013	Structure Backfill (Retaining Wall)	M3		x		=	$	-
193031	Pervious Backfill Material (Retaining Wall)	M3		x		=	$	-
160101	Clearing & Grubbing	LS	1	x	30,000.00	=	$	30,000
170101	Develop Water Supply	LS	1	x	10,000.00	=	$	10,000

TOTAL EARTHWORK SECTION ITEMS	$	440,000

Section 2 STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
401000	Concrete Pavement	M3		x		=	$	-
404092	Seal Pavement Joint	M		x		=	$	-
404094	Seal Longitudinal Isolation Joint	M		x		=	$	-
113115	Seal Existing Concrete Pavement Joint	M		x		=	$	-
401108	Replace Concrete Pavement (Rapid Strength Cor	M3		x		=	$	-
390132	Hot Mix Asphalt Concrete (Type A)	Tonne	47,500	x	90.00	=	$	4,275,000
390108	Asphalt Concrete Base (Type A)	Tonne		x		=	$	-
390126	Rubberized AC (Type G)	Tonne		x		=	$	-
393001	Pavement Reinforcing Fabric	M2		x		=	$	-
260201	Class 2 Aggregate Base	M3	86,000	x	40.00	=	$	3,440,000
290201	Asphalt Treated Permeable Base	M3		x		=	$	-
250401	Class 4 Aggregate Subbase	M3		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	Tonne		x		=	$	-
397001	Asphaltic Emulsion (Paint Binder)	Tonne		x		=	$	-
377501	Slurry Seal	Tonne		x		=	$	-
3750XX	Screenings (Type XX)	Tonne		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	Tonne		x		=	$	-
365001	Sand Cover	Tonne		x		=	$	-
731519	Minor Concrete (Stamped Concrete)	M2	1,000	x	100.00	=	$	100,000
731510	Minor Concrete (Curb, gutter, sidewalk, and	M3	2,700	x	470.00	=	$	1,269,000
731623	Minor Concrete (Curb Ramp)	M3	See Note	x	See note	=	$	-
394001	Place Asphalt Concrete Dike	M		x		=	$	-
150771	Remove Asphalt Concrete Dike	M		x		=	$	-
420201	Grind Existing Concrete Pavement	M2		x		=	$	-
150860	Remove Base and Surfacing	M3		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	M3		x		=	$	-
1532XX	Remove Concrete (type)	M3		x		=	$	-
394002	Place Asphalt Concrete (Misc. Area)	M2		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	M2		x		=	$	-
394050	Rumble Strip	STA		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	M2		x		=	$	-
420102	Groove Existing Concrete Pavement	M2		x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	$	9,084,000

Note: Quantity for item 731623 - Minor Concrete (Curb Ramp) is included with item 731510 - Minor Concrete (Curb, gutterm sidewalk, and dri

SECTION 3 DRAINAGE

Item code		Unit	Quantity		Price		Amount
150820	Modify Inlet	EA	8	x	2,500.00	=	$ 20,000
193114	Sand Backfill	M3		x		=	$ -
150206	Abandon Culvert	M		x		=	$ -
152430	Adjust Inlet	EA		x		=	$ -
155003	Cap Inlet	EA		x		=	$ -
707050	Drainage Inlet	EA	45	x	6,000.00	=	$ 270,000
707051	Drainage Manhole	EA	10	x	10,000.00	=	$ 100,000
XXXXXX	Miscellaneous Drainage Outlet	EA	40	x	10,000.00	=	$ 400,000
510502	Minor Concrete (Minor Structure)	M3		x		=	$ -
510512	Minor Concrete (Box Culvert)	M3		x		=	$ -
62XXXX	XXX mm APC Pipe	M		x		=	$ -
64XXXX	XXX mm Plastic Pipe	M		x		=	$ -
650075	600 mm RCP Pipe	M	3,000	x	500.00	=	$ 1,500,000
66XXXX	XXX mm CSP Pipe	M		x		=	$ -
68XXXX	Edge Drain	M		x		=	$ -
69XXXX	XXX mm Pipe Downdrain	M		x		=	$ -
70XXXX	XXX mm Pipe Inlet	M		x		=	$ -
70XXXX	XXX mm Pipe Riser	M		x		=	$ -
70XXXX	XXX mm Flared End Section	EA		x		=	$ -
703233	Grated Line Drain	M		x		=	$ -
72XXXX	Rock Slope Protection (Type and Method)	M3		x		=	$ -
729010	Rock Slope Protection Fabric	M2		x		=	$ -
721420	Concrete (Ditch Lining)	M3		x		=	$ -
721430	Concrete (Permeable Channel Lining)	M3	550	x	470.00	=	$ 258,500
750001	Miscellaneous Iron and Steel	KG	6,500	x	5.00	=	$ 32,500
XXXXXX	Additional Drainage	LS	1	x	5,000.00	=	$ 5,000

TOTAL DRAINAGE ITEMS $ 2,586,000

SECTION 4 SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)		Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	10,000.00	=	$ 10,000
518002	Sound Wall (Masonry Block)	M2		x		=	$ -
510524	Minor Concrete (Sound Wall)	M3		x		=	$ -
153250	Remove Sound Wall	M2		x		=	$ -
190110	Lead Compliance Plan	LS		x		=	$ -
1532XX	Remove Barrier (*Insert Type*)	M		x		=	$ -
150662	Remove Metal Beam Guard Railing	M		x		=	$ -
150668	Remove Terminal Systems	EA		x		=	$ -
800XXX	Fence (*CL-1.2 Slatted*)	M	2,600	x	50.00	=	$ 130,000
800391	Fence (*CL-1.8*)	M	2,000	x	50.00	=	$ 100,000
80XXXX	Gate (Insert *Type*)	EA		x		=	$ -
832001	Metal Beam Guard Railing	M		x		=	$ -
839301	Single Thrie Beam Barrier	M		x		=	$ -
839310	Double Thrie Beam Barrier	M		x		=	$ -
839521	Cable Railing	M		x		=	$ -
8395XX	Terminal System (Type *CAT*)	EA		x		=	$ -
8395XX	Alternative Flared Terminal System	EA		x		=	$ -
8395XX	Alternative In-line Terminal System	EA		x		=	$ -
49XXXX	CIDH Concrete Piling (Insert Diameter)	M		x		=	$ -
839XXX	Crash Cushion (Type X)	EA		x		=	$ -
83XXXX	Concrete Barrier (Type X)	M		x		=	$ -
83XXXX	Concrete Barrier (Type X)	M		x		=	$ -
520103	Bar Reinf. Steel (Ret. Wall)	KG		x		=	$ -
510408	Class 1 Concrete (Retaining Wall)	M3		x		=	$ -
510133	Class 2 Concrete (Retaining Wall)	M3		x		=	$ -
510060	Structural Concrete (Retaining Wall)	M3		x		=	$ -
513553	Retaining Wall (Masonry Wall)	M3		x		=	$ -
5110XX	Architectural Treatment (Type)	M2		x		=	$ -
511048	Apply Anti-Graffiti Coating	M2		x		=	$ -
5136XX	Reinforced Concrete Crib Wall (Type X)	M2		x		=	$ -
83954X	Transition Railing (Insert Type)	EA		x		=	$ -
597601	Prepare and Stain Concrete	M2		x		=	$ -
839561	Rail Tensioning Assembly	EA		x		=	$ -
8395XX	End Anchor Assembly (*Insert Type X*)	EA		x		=	$ -

TOTAL SPECIALTY ITEMS $ 240,000

Section 5 ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Price		Amount
	Biological Mitigation	LS		x		=	$ -
071325	Temporary Fence (Type ESA)	M		x		=	$ -

Subtotal Environmental $ -

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Price		Amount
200001	Highway Planting	LS	1	x	1,020,000.00	=	$ 1,020,000
208000	Irrigation System	LS	1	x	500,000.00	=	$ 500,000
204099	Plant Establishment Work	LS	1	x	50,000.00	=	$ 50,000
204101	Extend Plant Establishment (X Years)	LS		x		=	$ -
201700	Imported Topsoil	M3		x		=	$ -
20XXXX	___ mm (*Insert Type*) Conduit *(Use for Irrigation x-overs)*	M		x		=	$ -
20XXXX	Extend ___ mm *(Insert Type)* Conduit *(Use for Extension of Irrigation x-overs)*	M		x		=	$ -
2030XX	Erosion Control (Type __)	HA		x		=	$ -
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$ -
209801	Maintenance Vehicle Pullout	EA		x		=	$ -
208304	Water Meter	EA	1	x	20,000.00	=	$ 20,000
731XXX	Slope Paving (Rock Coble)	M2	8,500	x	100.00	=	$ 850,000

Subtotal Landscape and Irrigation $ 2,440,000

5C - NPDES

Item code		Unit	Quantity		Price		Amount
074019	Prepare SWPPP	LS	1	x	10,000.00	=	$ 10,000
074017	Prepare WPCP	LS		x		=	$ -
074016	Construction Site Management	LS	1	x	66,500.00	=	$ 66,500
074020	Water Pollution Control	LS		x		=	$ -
074023	Temporary Erosion Control	M2	30,000	x	1.00	=	$ 30,000
074027	Temporary Erosion Control Blanket	M2		x		=	$ -
074037	Move In/ Move Out (Temporary Erosion Contı	EA	10	x	500.00	=	$ 5,000
074028	Temporary Fiber Roll	M	16,600	x	15.00	=	$ 249,000
074029	Temporary Silt Fence	m	7,800	x	15.00	=	$ 117,000
074042	Temporary Concrete Washout (Portable)	LS		x		=	$ -
074031	Temporary Gravel Bag Berm	EA	5,000	x	1.50	=	$ 7,500
074032	Temporary Concrete Washout Facility	EA	11	x	5,000.00	=	$ 55,000
074033	Temporary Construction Entrance	EA	10	x	4,000.00	=	$ 40,000
074035	Temporary Check Dam	M	60	x	100.00	=	$ 6,000
074038	Temp. Drainage Inlet Protection	EA	60	x	500.00	=	$ 30,000
074041	Street Sweeping	LS	1	x	50,000.00	=	$ 50,000
Supplemental Work for NPDES							
066595	Water Pollution Control Maint. Sharing*	LS	1	x	30,000.00	=	$ 30,000
066596	Additional Water Pollution Control	LS	1	x	50,000.00	=	$ 50,000
066597	Storm Water Sampling and Analysis*	LS	1	x	45,000.00	=	$ 45,000

ıbtotal NPDES (Without Supplemental Work) $ 666,000

* Applies only to project with SWPPP's

TOTAL ENVIRONMENTAL $ 3,106,000

Section 6 TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
86055X	Lighting & Sign Illumination	LS		x		=	$	-
860XXX	Signals & Lighting	LS	9	x	140,000.00	=	$	1,260,000
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
8611XX	Ramp Metering System (Location X)	LS		x		=	$	-
8611XX	Ramp Metering System (Location X)	LS		x		=	$	-
8607XX	Interconnection Facilities	LS		x		=	$	-
5602XX	Furnish Sign Structure	KG		x		=	$	-
5602XX	Install Sign Structure	KG		x		=	$	-
56XXXX	XXX mm CIDHC Pile (Sign Foundation)	M		x		=	$	-
860810	Inductive Loop Detectors	EA		x		=	$	-
8609XX	Traffic Monitoring Stations	LS		x		=	$	-
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
860090	Maintain Existing Traffic Management System Elements During Construction	LS	1	x	10,000.00	=	$	10,000

Subtotal Traffic Electrical *$ 1,270,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
566011	Roadside Sign (One Post)	EA	90	x	450.00	=	$	40,500
566012	Roadside Sign (Two Post)	EA		x		=	$	-
560XXX	Furnish Sign Panels	M2		x		=	$	-
560XXX	Install Sign Panels	M2		x		=	$	-
150742	Remove Roadside Sign	EA		x		=	$	-
2320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
840656	Paint Traffic Stripe (2 Coat)	m	20,000	x	0.80	=	$	16,000
840666	Paint Pavement Marking (2 Coat)	m	300	x	40.00	=	$	12,000
120090	Construction Area Signs	LS	1	x	50,000.00	=	$	50,000

Subtotal Traffic Signing and Striping *$ 118,500*

6C - Traffic Management Plan

Item code		Unit	Quantity		Unit Price ($)			Cost
128650	Traffic Management System	EA	1	x	197,700.00	=	$	197,700

Subtotal Traffic Management Plan *$ 197,700*

6D - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
129099A	Traffic Plastic Drum	EA	1,000	x	40.00	=	$	40,000
12016X	Channelizer	EA		x		=	$	-
120120	Type III Barricade	EA	50	x	80.00	=	$	4,000
129100	Temp. Crash Cushion Module	EA	110	x	250.00	=	$	27,500
120100	Traffic Control System	WD	480	x	1,000.00	=	$	480,000
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
129000	Temporary Railing (Type K)	M	5,000	x	50.00	=	$	250,000
120143	Temporary Pavement Delineation	M	30,000	x	0.80	=	$	24,000
128650	Portable Changeable Message Sign	EA	4	x	5,000.00	=	$	20,000

tal Stage Construction and Traffic Handling *$ 845,500*

TOTAL TRAFFIC ITEMS $ 2,431,700

Section 7 DETOURS*

Item code		Unit	Quantity		Unit Price ($)		Cost
190101	Roadway Excavation	M3		x		=	$ -
198050	Embankment	M3		x		=	$ -
198001	Imported Borrow	M3		x		=	$ -
390102	Asphalt Concrete (Type A)	Tonne		x		=	$ -
260201	Class 2 Aggregate Base	M3		x		=	$ -
250401	Class 4 Aggregate Subbase	M3		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
129000	Temporary Railing (Type K)	M		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
120143	Temporary Pavement Delineation	M		x		=	$ -
0713XX	Temporary Fence (Type X)	M		x		=	$ -

* Includes constructing, maintaining, and removal

TOTAL DETOURS $ -

Section 8 MINOR ITEMS (Use Appropriate percentage between 5%-10%)

Total of Section 1-7 17,887,700 x 5% = $ 894,385

TOTAL MINOR ITEMS $ 894,400

Section 9 ROADWAY MOBILIZATION*

Item							
999990	Total Section 1-8	$	18,782,100	x	10%	=	$ 1,878,210

TOTAL MOBILIZATION $ 1,878,300

* For Project less than 50 Working Days "Mobilization" is not required as a separate contract item, however contract item prices should take into consideration mobilization as part of the price.

Note: If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

Section 10 SUPPLEMENTAL WORK

Total Section 1-8 = $ 18,782,100 5% = $ 939,105

Item code		Unit	Quantity		Unit Price ($)		Cost
066666	Compensation Adjustment for Price Index Fluctuations of Paving Asphalt	LS	1	x	250,000.00	=	$ 250,000
066094	Value Analysis	LS	1	x	10,000.00	=	$ 10,000
066090	Maintain Traffic	LS	1	x	336,000.00	=	$ 336,000
066920	Dispute Review Board	LS	1	x	22,500.00	=	$ 22,500
066015	Federal Trainee Program	LS	1	x	20,000.00	=	$ 20,000
066700	Partnering	LS	1	x	60,000.00	=	$ 60,000
066411	Clean & Seal Random Pavement Cracks	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066204	Remove Rock & Debris	LS	1	x	10,000.00	=	$ 10,000
066866	Operation of Existing Traffic Management System Elements During Construction	LS	1	x	1,000.00	=	$ 1,000
	NPDES Supplemental Work specified in Section 5C					=	$ 125,000

TOTAL SUPPLEMENTAL WORK $ 1,773,700

Section 11 STATE FURNISHED MATERIALS

Item code		Unit	Quantity		Unit Price ($)		Cost
066105	RE Office	LS	1	x	136,000.00	=	$136,000
066063	Public Information	LS	1	x	45,000.00	=	$45,000
066901	Water Expenses	LS	1	x	2,200,000.00	=	$2,200,000
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
06684X	TMS Controller Assembly	LS		x		=	$0
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
066062A	COZEEP Expenses	LS	40	x	1,000.00	=	$40,000
066066	Public Transport Support	LS	1		50,000.00		$50,000
066069	Rideshare Promotion	LS	1		10,000.00		$10,000
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066803	Padlocks	LS		x		=	$0

TOTAL STATE FURNISHED $2,481,000

Section 12 CONTINGENCY

Use appropriate percentage based on the detail of estimate. Anything other than the suggested contingency in the PDPM needs to be *justified. (Pre-PSR 30%-50%, PSR 25%, PR 20%, PAR 15%, After PAR 10%)

Total Section 1-11	$	24,915,100	x	20%	=	$4,983,020

TOTAL CONTINGENCY $4,983,100

*Justification:

Section 13 OVERHEAD

Item code		Unit	Quantity		Unit Price ($)		Cost
070018	Time Related Overhead (TRO)	WD	480	x	1956.666667	=	$939,200

Note: If the building portion of the project is greater than 50% of the total project cost, then TRO is not included

TOTAL OVERHEAD $939,200

II. STRUCTURES ITEMS

DATE OF ESTIMATE	00/00/00	00/00/00	00/00/00
Bridge Name	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Meters) [out to ou	0.00 m	0.00 m	0.00 m
Total Bridge Length (Mete	0.00 m	0.00 m	0.00 m
Total Area (Square Meters	0.00 m^2	0.00 m^2	0.00 m^2
Structure Depth (Meters)	0.00 m	0.00 m	0.00 m
Footing Type (pile or spre	spread	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Meters	$0.00	$0.00	$0.00
COST OF EACH STRUCTURE	**$0.00**	**$0.00**	**$0.00**

DATE OF ESTIMATE	00/00/00	00/00/00	00/00/00
Bridge Name	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Meters) [out to ou	0.00 m	0.00 m	0.00 m
Total Bridge Length (Mete	0.00 m	0.00 m	0.00 m
Total Area (Square Meters	0.00 m^2	0.00 m^2	0.00 m^2
Structure Depth (Meters)	0.00 m	0.00 m	0.00 m
Footing Type (pile or spre	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Meters	$0.00	$0.00	$0.00
COST OF EACH STRUCTURE	**$0.00**	**$0.00**	**$0.00**

TOTAL COST OF BRIDGES	**$0.00**
TOTAL COST OF BUILDINGS	**$0.00**
TOTAL COST OF STRUCTURES[1]	**$0.00**

Estimate Prepared By: _____ _____
XXXXXXXXXXXXXXXX ------ Division of Structures Date

III. RIGHT OF WAY

A)	A1)	Acquisition, including Excess Lands, Damages & Goodwill, Fees	$	730,000
	A2)	SB-1210	$	355,000
B)		Acquisition of Offsite Mitigation	$	0
C)	C1)	Utility Relocation (State Share)	$	4,000,000
	C2)	Potholing (Design Phase)	$	0
D)		Railroad Acquisition	$	400,000
E)		Clearance / Demolition	$	0
F)		Relocation Assistance	$	0
G)		Title and Escrow	$	78,000

R/W ESTIMATE **$5,563,000.00**

H)	Condemnation Settlements	10%	$	148,500
I)	Design Appreciation Factor (Items H & I applied to items A + B)	10%	$	148,500

TOTAL R/W ESTIMATE **$5,860,000.00**

(Excluding Item #8 - Hazardous Waste)

J) **TOTAL R/W ESTIMATE: Escalated** **$8,072,000.00**

K)	Utility Relocation (Construction Cost)	$	0
	RIGHT OF WAY SUPPORT	$	**1,100,000**

Support Cost Estimate Prepared By	Pat Kipley Project Coordinator	688-6932 Phone
Utility Estimate Prepared By	Utility Coordinator[2]	688 6946 Phone
R/W Acquistion Estimate Prepared By	Right of Way Estimator[3]	6 9 668 2572 Phone

[1] When estimate has Support Costs only [2] When estimate has Utility Relocation [3] When R/W Acquisition is required

IV. SUPPORT COST ESTIMATE SUMMARY

SB-45 CATEGORY SUPPORT COST	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	P3 Subtotal
PR/ED (PD,PE,PM)							1,360,000	1,836,000	204,000		3,400,000
PS&E (PS)											0
R/W (RW)											0
CONSTRUCTION (CM)											0
Total Support Cost:	0	0	0	0	0	0	1,360,000	1,836,000	204,000	0	3,400,000

SB-45 CATEGORY SUPPORT COST	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	P3 Total	Support Ratio
PR/ED (PD,PE,PM)										3,400,000	9%
PS&E (PS)			1,270,000	1,270,000						2,540,000	7%
R/W (RW)			110,500	553,000	443,000	110,500				1,217,000	3%
CONSTRUCTION (CM)					4,775,000	2,047,000				6,822,000	19%
Total Support Cost:	0	0	1,380,500	1,823,000	5,218,000	2,157,500	0	0	0	**13,979,000**	

NOTE: ESCALTED COSTS ARE FILLED IN AUTOMATICALLY ON PAGE 1. DO NOT ENTER ESCALATED COSTS ON THIS PAGE.

Total Capital Cost:	**$36,698,000**
Overall Percent Support Cost:	**38%**

Approved by: Linda J. White — Project Control Engineer — 3/24/09 — Date

DISTRICT 11
PRELIMINARY
PROJECT COST ESTIMATE

11- PAGE ESTIMATE

11-080200

Type of Estimate : Project Report
Program Code :
Project Limits : SR-98 KP48.2/52.5
Description: **(PHASE 1) SR-98 West Highway Widening Improvements**
Scope : Highway widening, intersection signalization, curb and gutter, sidewalk, and drainage features
Alternative : Build Alternative - Phase 1

	Current Cost	Escalated Cost
ROADWAY ITEMS	$ 22,931,400.00	$ 30,730,300.00
STRUCTURE ITEMS	$ -	$ -
SUBTOTAL CONSTRUCTION COST	$ 22,931,400.00	$ 30,730,300.00
RIGHT OF WAY	$ 4,037,000.00	$ 5,532,000.00
TOTAL CAPITAL COST	**$ 26,969,000.00**	**$ 36,263,000.00**
PR/ED SUPPORT	$ 2,380,000.00	$ -
PS&E SUPPORT	$ 1,778,000.00	$ 2,341,200.00
RIGHT OF WAY SUPPORT	$ 1,217,000.00	$ 1,648,700.00
CONSTRUCTION SUPPORT	$ 4,775,400.00	$ 6,631,500.00
TOTAL SUPPORT COST	**$ 10,150,400.00**	**$ 10,621,400.00**
TOTAL PROJECT COST	**$ 37,150,000.00**	**$ 46,900,000.00**

	month	year
Date (Month/Year) of Estimate	1	/ 2008
Estimated Date (Month/Year) of Construction	1	/ 2014
Number of Months of Escalation	72	
Number of Years of Escalation	6.00	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days		360
Number of Plant Establishment Days		525

Estimated Project Schedule

PID Approval		
PA/ED Approval	2008	
PS&E	2012	
RTL	2014	
Begin Construction		2014

Reviewed by District O.E. Claire F Dodge for Leon G. Edmonds, District 11 Office Engineer — 2/3/09 (Date) — (619) 688-6735 (Phone)

Approved by Project Manager — Mario Orso — 2/4/09 (Date) — (619) 688-2561 (Phone)

[2] Escalation rates used on this estimate for Support Cost are 12% for FY 07/08, 6% for FY 08/09, and 3% for FY 09/10 and each year beyond. Escalation rates used in this estimate for Highway Construction Capital Costs are 5.0% compounded annually to Construction year. These rates are different than the suggested 2006 STIP of 8.3% for fiscal year 05/06 and 3.0% thereafter. The decision to use 5.0% for this estimate was as per the Office of Office Engineer. (REV091108)

I. ROADWAY ITEMS

Section				Cost
1	Earthwork		$	280,000
2	Structural Section		$	6,965,000
3	Drainage		$	1,924,100
4	Specialty Items		$	157,500
5	Environmental		$	2,173,500
	5A Environmental Mitigati	$ -		
	5B Landscape and Irrigatic	$ 1,742,500		
	5C NPDES	$ 431,000		
6	Traffic Items		$	1,964,300
	6A Electrical	$ 1,130,000		
	6B Signing and Striping	$ 99,800		
	6C Traffic Management Plan	$ 127,000		
	6D Traffic Control	$ 607,500		
7	Detours		$	-
8	Minor Items		$	673,300
9	Roadway Mobilization		$	1,413,800
10	Supplemental Work		$	1,252,900
11	State Furnished		$	1,716,000
12	Contingencies		$	3,704,100
13	Overhead		$	706,900
	TOTAL ROADWAY ITEMS		$	22,931,400

Estimate Prepared By: Jeff Burdick, EIT - Assistant Engineer 12/19/2008 (858) 514-8377

Estimate Reviewed By: Jason Lemons, PE - Project Engineer 12/19/2008 (858) 514-8377

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

ECTION 1 EARTHWORK

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	M3	12,000	x	20.00	=	$	240,000
190103	Roadway Excavation (Type Y) ADL	M3		x		=	$	-
190105	Roadway Excavation (Type Z-2) ADL	M3		x		=	$	-
194001	Ditch Excavation	M3		x		=	$	-
198001	Imported Borrow	M3		x		=	$	-
198007	Imported Material (Shoulder Backing)	Tonne		x		=	$	-
192037	Structure Excavation (Retaining Wall)	M3		x		=	$	-
193013	Structure Backfill (Retaining Wall)	M3		x		=	$	-
193031	Pervious Backfill Material (Retaining Wall)	M3		x		=	$	-
160101	Clearing & Grubbing	LS	1	x	30,000.00	=	$	30,000
170101	Develop Water Supply	LS	1	x	10,000.00	=	$	10,000

TOTAL EARTHWORK SECTION ITEMS	$	280,000

Section 2 STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
401000	Concrete Pavement	M3		x		=	$	-
404092	Seal Pavement Joint	M		x		=	$	-
404094	Seal Longitudinal Isolation Joint	M		x		=	$	-
113115	Seal Existing Concrete Pavement Joint	M		x		=	$	-
401108	Replace Concrete Pavement (Rapid Strength Cor	M3		x		=	$	-
390132	Hot Mix Asphalt Concrete (Type A)	Tonne	36,500	x	90.00	=	$	3,285,000
390108	Asphalt Concrete Base (Type A)	Tonne		x		=	$	-
390126	Rubberized AC (Type G)	Tonne		x		=	$	-
393001	Pavement Reinforcing Fabric	M2		x		=	$	-
260201	Class 2 Aggregate Base	M3	66,000	x	40.00	=	$	2,640,000
290201	Asphalt Treated Permeable Base	M3		x		=	$	-
250401	Class 4 Aggregate Subbase	M3		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	Tonne		x		=	$	-
397001	Asphaltic Emulsion (Paint Binder)	Tonne		x		=	$	-
377501	Slurry Seal	Tonne		x		=	$	-
3750XX	Screenings (Type XX)	Tonne		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	Tonne		x		=	$	-
365001	Sand Cover	Tonne		x		=	$	-
731519	Minor Concrete (Stamped Concrete)	M2	1,000	x	100.00	=	$	100,000
731510	Minor Concrete (Curb, gutter, sidewalk, and	M3	2,000	x	470.00	=	$	940,000
731623	Minor Concrete (Curb Ramp)	M3	See Note	x	See note	=	$	-
394001	Place Asphalt Concrete Dike	M		x		=	$	-
150771	Remove Asphalt Concrete Dike	M		x		=	$	-
420201	Grind Existing Concrete Pavement	M2		x		=	$	-
150860	Remove Base and Surfacing	M3		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	M3		x		=	$	-
1532XX	Remove Concrete (type)	M3		x		=	$	-
394002	Place Asphalt Concrete (Misc. Area)	M2		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	M2		x		=	$	-
394050	Rumble Strip	STA		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	M2		x		=	$	-
420102	Groove Existing Concrete Pavement	M2		x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	$	6,965,000

Note: Quantity for item 731623 - Minor Concrete (Curb Ramp) is included with item 731510 - Minor Concrete (Curb, gutterm sidewalk, and dri

SECTION 3 DRAINAGE

Item code		Unit	Quantity		Price		Amount
150820	Modify Inlet	EA	8	x	2,500.00	=	$ 20,000
193114	Sand Backfill	M3		x		=	$ -
150206	Abandon Culvert	M		x		=	$ -
152430	Adjust Inlet	EA		x		=	$ -
155003	Cap Inlet	EA		x		=	$ -
707050	Drainage Inlet	EA	33	x	6,000.00	=	$ 198,000
707051	Drainage Manhole	EA	10	x	10,000.00	=	$ 100,000
XXXXXX	Miscellaneous Drainage Outlet	EA	25	x	10,000.00	=	$ 250,000
510502	Minor Concrete (Minor Structure)	M3		x		=	$ -
510512	Minor Concrete (Box Culvert)	M3		x		=	$ -
62XXXX	XXX mm APC Pipe	M		x		=	$ -
64XXXX	XXX mm Plastic Pipe	M		x		=	$ -
650075	600 mm RCP Pipe	M	2,300	x	500.00	=	$ 1,150,000
66XXXX	XXX mm CSP Pipe	M		x		=	$ -
68XXXX	Edge Drain	M		x		=	$ -
69XXXX	XXX mm Pipe Downdrain	M		x		=	$ -
70XXXX	XXX mm Pipe Inlet	M		x		=	$ -
70XXXX	XXX mm Pipe Riser	M		x		=	$ -
70XXXX	XXX mm Flared End Section	EA		x		=	$ -
703233	Grated Line Drain	M		x		=	$ -
72XXXX	Rock Slope Protection (Type and Method)	M3		x		=	$ -
729010	Rock Slope Protection Fabric	M2		x		=	$ -
721420	Concrete (Ditch Lining)	M3		x		=	$ -
721430	Concrete (Permeable Channel Lining)	M3	380	x	470.00	=	$ 178,600
750001	Miscellaneous Iron and Steel	KG	5,000	x	5.00	=	$ 25,000
XXXXXX	Additional Drainage	LS	1	x	2,500.00	=	$ 2,500

TOTAL DRAINAGE ITEMS $ 1,924,100

SECTION 4 SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)		Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	10,000.00	=	$ 10,000
518002	Sound Wall (Masonry Block)	M2		x		=	$ -
510524	Minor Concrete (Sound Wall)	M3		x		=	$ -
153250	Remove Sound Wall	M2		x		=	$ -
190110	Lead Compliance Plan	LS		x		=	$ -
1532XX	Remove Barrier (*Insert Type*)	M		x		=	$ -
150662	Remove Metal Beam Guard Railing	M		x		=	$ -
150668	Remove Terminal Systems	EA		x		=	$ -
800XXX	Fence (*CL-1.2 Slatted*)	M	1,250	x	50.00	=	$ 62,500
800391	Fence (*CL-1.8*)	M	1,700	x	50.00	=	$ 85,000
80XXXX	Gate (Insert *Type*)	EA		x		=	$ -
832001	Metal Beam Guard Railing	M		x		=	$ -
839301	Single Thrie Beam Barrier	M		x		=	$ -
839310	Double Thrie Beam Barrier	M		x		=	$ -
839521	Cable Railing	M		x		=	$ -
8395XX	Terminal System (Type *CAT*)	EA		x		=	$ -
8395XX	Alternative Flared Terminal System	EA		x		=	$ -
8395XX	Alternative In-line Terminal System	EA		x		=	$ -
49XXXX	CIDH Concrete Piling (Insert Diameter)	M		x		=	$ -
839XXX	Crash Cushion (Type X)	EA		x		=	$ -
83XXXX	Concrete Barrier (Type X)	M		x		=	$ -
83XXXX	Concrete Barrier (Type X)	M		x		=	$ -
520103	Bar Reinf. Steel (Ret. Wall)	KG		x		=	$ -
510408	Class 1 Concrete (Retaining Wall)	M3		x		=	$ -
510133	Class 2 Concrete (Retaining Wall)	M3		x		=	$ -
510060	Structural Concrete (Retaining Wall)	M3		x		=	$ -
513553	Retaining Wall (Masonry Wall)	M3		x		=	$ -
5110XX	Architectural Treatment (Type)	M2		x		=	$ -
511048	Apply Anti-Graffiti Coating	M2		x		=	$ -
5136XX	Reinforced Concrete Crib Wall (Type X)	M2		x		=	$ -
83954X	Transition Railing (Insert Type)	EA		x		=	$ -
597601	Prepare and Stain Concrete	M2		x		=	$ -
339561	Rail Tensioning Assembly	EA		x		=	$ -
8395XX	End Anchor Assembly (*Insert Type X*)	EA		x		=	$ -

TOTAL SPECIALTY ITEMS $ 157,500

Section 5 ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Price		Amount
	Biological Mitigation	LS		x		=	$ -
071325	Temporary Fence (Type ESA)	M		x		=	$ -

Subtotal Environmental $ -

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Price		Amount
200001	Highway Planting	LS	1	x	837,500.00	=	$ 837,500
208000	Irrigation System	LS	1	x	350,000.00	=	$ 350,000
204099	Plant Establishment Work	LS	1	x	35,000.00	=	$ 35,000
204101	Extend Plant Establishment (X Years)	LS		x		=	$ -
201700	Imported Topsoil	M3		x		=	$ -
20XXXX	___ mm (*Insert Type*) Conduit *(Use for Irrigation x-overs)*	M		x		=	$ -
20XXXX	Extend ___ mm *(Insert Type)* Conduit *(Use for Extension of Irrigation x-overs)*	M		x		=	$ -
2030XX	Erosion Control (Type __)	HA		x		=	$ -
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$ -
209801	Maintenance Vehicle Pullout	EA		x		=	$ -
208304	Water Meter	EA	1	x	20,000.00	=	$ 20,000
731XXX	Slope Paving (Rock Coble)	M2	5,000	x	100.00	=	$ 500,000

Subtotal Landscape and Irrigation $ 1,742,500

5C - NPDES

Item code		Unit	Quantity		Price		Amount
074019	Prepare SWPPP	LS	1	x	6,500.00	=	$ 6,500
074017	Prepare WPCP	LS		x		=	$ -
074016	Construction Site Management	LS	1	x	43,500.00	=	$ 43,500
074020	Water Pollution Control	LS		x		=	$ -
074023	Temporary Erosion Control	M2	19,500	x	1.00	=	$ 19,500
074027	Temporary Erosion Control Blanket	M2		x		=	$ -
074037	Move In/ Move Out (Temporary Erosion Contı	EA	6	x	500.00	=	$ 3,000
074028	Temporary Fiber Roll	M	10,800	x	15.00	=	$ 162,000
074029	Temporary Silt Fence	m	5,100	x	15.00	=	$ 76,500
074042	Temporary Concrete Washout (Portable)	LS		x		=	$ -
074031	Temporary Gravel Bag Berm	EA	3,000	x	1.50	=	$ 4,500
074032	Temporary Concrete Washout Facility	EA	7	x	5,000.00	=	$ 35,000
074033	Temporary Construction Entrance	EA	6	x	4,000.00	=	$ 24,000
074035	Temporary Check Dam	EA	40	x	100.00	=	$ 4,000
074038	Temp. Drainage Inlet Protection	EA	40	x	500.00	=	$ 20,000
074041	Street Sweeping	LS	1	x	32,500.00	=	$ 32,500
Supplemental Work for NPDES							
066595	Water Pollution Control Maint. Sharing*	LS	1	x	20,000.00	=	$ 20,000
066596	Additional Water Pollution Control	LS	1	x	30,000.00	=	$ 30,000
066597	Storm Water Sampling and Analysis*	LS	1	x	29,000.00	=	$ 29,000

ıbtotal NPDES (Without Supplemental Work) $ 431,000

* Applies only to project with SWPPP's

TOTAL ENVIRONMENTAL $ 2,173,500

Section 6 TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)		Cost
86055X	Lighting & Sign Illumination	LS		x		=	$ -
860XXX	Signals & Lighting	LS	8	x	140,000.00	=	$ 1,120,000
86XXXX	Fiber Optic Conduit System	LS		x		=	$ -
8611XX	Ramp Metering System (Location X)	LS		x		=	$ -
8611XX	Ramp Metering System (Location X)	LS		x		=	$ -
8607XX	Interconnection Facilities	LS		x		=	$ -
5602XX	Furnish Sign Structure	KG		x		=	$ -
5602XX	Install Sign Structure	KG		x		=	$ -
56XXXX	XXX mm CIDHC Pile (Sign Foundation)	M		x		=	$ -
860810	Inductive Loop Detectors	EA		x		=	$ -
8609XX	Traffic Monitoring Stations	LS		x		=	$ -
150760	Remove Sign Structure	EA		x		=	$ -
151581	Reconstruct Sign Structure	EA		x		=	$ -
152641	Modify Sign Structure	EA		x		=	$ -
860090	Maintain Existing Traffic Management System Elements During Construction	LS	1	x	10,000.00	=	$ 10,000

Subtotal Traffic Electrical *$ 1,130,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)		Cost
566011	Roadside Sign (One Post)	EA	60	x	450.00	=	$ 27,000
566012	Roadside Sign (Two Post)	EA		x		=	$ -
560XXX	Furnish Sign Panels	M2		x		=	$ -
560XXX	Install Sign Panels	M2		x		=	$ -
150742	Remove Roadside Sign	EA		x		=	$ -
152320	Reset Roadside Sign	EA		x		=	$ -
152390	Relocate Roadside Sign	EA		x		=	$ -
82010X	Delineator (Class X)	EA		x		=	$ -
840656	Paint Traffic Stripe (2 Coat)	m	18,500	x	0.80	=	$ 14,800
840666	Paint Pavement Marking (2 Coat)	m	200	x	40.00	=	$ 8,000
120090	Construction Area Signs	LS	1	x	50,000.00	=	$ 50,000

Subtotal Traffic Signing and Striping *$ 99,800*

6C - Traffic Management Plan

Item code		Unit	Quantity		Unit Price ($)		Cost
	Transportation Management System	LS	1	x	127,000.00	=	$ 127,000

Subtotal Traffic Management Plan *$ 127,000*

6D - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)		Cost
129099A	Traffic Plastic Drum	EA	1,000	x	40.00	=	$ 40,000
12016X	Channelizer	EA		x		=	$ -
120120	Type III Barricade	EA	50	x	80.00	=	$ 4,000
129100	Temp. Crash Cushion Module	EA	110	x	250.00	=	$ 27,500
120100	Traffic Control System	WD	360	x	1,000.00	=	$ 360,000
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$ -
129000	Temporary Railing (Type K)	M	3,000	x	50.00	=	$ 150,000
120143	Temporary Pavement Delineation	M	20,000	x	0.80	=	$ 16,000
128650	Portable Changeable Message Sign	EA	2	x	5,000.00	=	$ 10,000

tal Stage Construction and Traffic Handling *$ 607,500*

TOTAL TRAFFIC ITEMS $ 1,964,300

Section 7 DETOURS*

Item code		Unit	Quantity		Unit Price ($)		Cost
190101	Roadway Excavation	M3		x		=	$ -
198050	Embankment	M3		x		=	$ -
198001	Imported Borrow	M3		x		=	$ -
390102	Asphalt Concrete (Type A)	Tonne		x		=	$ -
260201	Class 2 Aggregate Base	M3		x		=	$ -
250401	Class 4 Aggregate Subbase	M3		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
129000	Temporary Railing (Type K)	M		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
120143	Temporary Pavement Delineation	M		x		=	$ -
0713XX	Temporary Fence (Type X)	M		x		=	$ -

* Includes constructing, maintaining, and removal

TOTAL DETOURS $ -

Section 8 MINOR ITEMS (Use Appropriate percentage between 5%-10%)

Total of Section 1-7 13,464,400 x 5% = $ 673,220

TOTAL MINOR ITEMS $ 673,300

Section 9 ROADWAY MOBILIZATION*

Item							
999990	Total Section 1-8	$	14,137,700	x	10%	=	$ 1,413,770

TOTAL MOBILIZATION $ 1,413,800

* For Project less than 50 Working Days "Mobilization" is not required as a separate contract item, however contract item prices should take into consideration mobilization as part of the price.

Note: If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

Section 10 SUPPLEMENTAL WORK

Total Section 1-8 = $ 14,137,700 5% = $ 706,885

Item code		Unit	Quantity		Unit Price ($)		Cost
066666	Compensation Adjustment for Price Index Fluctuations of Paving Asphalt	LS	1	x	99,000.00	=	$ 99,000
066094	Value Analysis	LS	1	x	10,000.00	=	$ 10,000
066090	Maintain Traffic	LS	1	x	252,000.00	=	$ 252,000
066920	Dispute Review Board	LS	1	x	15,000.00	=	$ 15,000
066015	Federal Trainee Program	LS	1	x	20,000.00	=	$ 20,000
066700	Partnering	LS	1	x	60,000.00	=	$ 60,000
066411	Clean & Seal Random Pavement Cracks	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066204	Remove Rock & Debris	LS	1	x	10,000.00	=	$ 10,000
066866	Operation of Existing Traffic Management System Elements During Construction	LS	1	x	1,000.00	=	$ 1,000
	NPDES Supplemental Work specified in Section 5C					=	$ 79,000

TOTAL SUPPLEMENTAL WORK $ 1,252,900

Section 11 STATE FURNISHED MATERIALS

Item code		Unit	Quantity		Unit Price ($)		Cost
066105	RE Office	LS	1	x	95,000.00	=	$95,000
066063	Public Information	LS	1	x	31,000.00	=	$31,000
066901	Water Expenses	LS	1	x	1,500,000.00	=	$1,500,000
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
06684X	TMS Controller Assembly	LS		x		=	$0
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
066062A	COZEEP Expenses	LS	30	x	1,000.00	=	$30,000
066066	Public Transport Support	LS	1		50,000.00		$50,000
066069	Rideshare Promotion	LS	1		10,000.00		$10,000
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066803	Padlocks	LS		x		=	$0

TOTAL STATE FURNISHED $1,716,000

Section 12 CONTINGENCY

Use appropriate percentage based on the detail of estimate. Anything other than the suggested contingency in the PDPM needs to be *justified. (Pre-PSR 30%-50%, PSR 25%, PR 20%, PAR 15%, After PAR 10%)

Total Section 1-11	$	18,520,400	x	20%	=	$3,704,080

TOTAL CONTINGENCY $3,704,100

*Justification:

Section 13 OVERHEAD

Item code		Unit	Quantity		Unit Price ($)		Cost
070018	Time Related Overhead (TRO)	WD	360	x	1963.611111	=	$706,900

Note: If the building portion of the project is greater than 50% of the total project cost, then TRO is not included

TOTAL OVERHEAD $706,900

II. STRUCTURES ITEMS

DATE OF ESTIMATE	00/00/00	00/00/00	00/00/00
Bridge Name	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Meters) [out to ou	0.00 m	0.00 m	0.00 m
Total Bridge Length (Mete	0.00 m	0.00 m	0.00 m
Total Area (Square Meters	0.00 m^2	0.00 m^2	0.00 m^2
Structure Depth (Meters)	0.00 m	0.00 m	0.00 m
Footing Type (pile or spre	spread	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Meters	$0.00	$0.00	$0.00
COST OF EACH STRUCTURE	**$0.00**	**$0.00**	**$0.00**

DATE OF ESTIMATE	00/00/00	00/00/00	00/00/00
Bridge Name	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Meters) [out to ou	0.00 m	0.00 m	0.00 m
Total Bridge Length (Mete	0.00 m	0.00 m	0.00 m
Total Area (Square Meters	0.00 m^2	0.00 m^2	0.00 m^2
Structure Depth (Meters)	0.00 m	0.00 m	0.00 m
Footing Type (pile or spre	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Meters	$0.00	$0.00	$0.00
COST OF EACH STRUCTURE	**$0.00**	**$0.00**	**$0.00**

TOTAL COST OF BRIDGES	**$0.00**
TOTAL COST OF BUILDINGS	**$0.00**
TOTAL COST OF STRUCTURES[1]	**$0.00**

Estimate Prepared By: _____ _____
XXXXXXXXXXXXXXXX ------ Division of Structures Date

III. RIGHT OF WAY

A)	A1)	Acquisition, including Excess Lands, Damages & Goodwill, Fees	$	605,000
	A2)	SB-1210	$	305,000
B)	Acquisition of Offsite Mitigation		$	0
C)	C1)	Utility Relocation (State Share)	$	2,400,000
	C2)	Potholing (Design Phase)	$	0
D)	Railroad Acquisition		$	400,000
E)	Clearance / Demolition		$	0
F)	Relocation Assistance		$	0
G)	Title and Escrow		$	65,000

R/W ESTIMATE **$3,775,000.00**

H)	Condemnation Settlements	10%	$	131,000
I)	Design Appreciation Factor (Items H & I applied to items A + B)	10%	$	131,000

TOTAL R/W ESTIMATE **$4,037,000.00**

(Excluding Item #8 - Hazardous Waste)

J) **TOTAL R/W ESTIMATE: Escalated** **$5,532,000.00**

K)	Utility Relocation (Construction Cost)	$	0
	RIGHT OF WAY SUPPORT	$	**770,000**

Support Cost Estimate Prepared By	Pat Kipley — Project Coordinator[1]	688-6932 — Phone
Utility Estimate Prepared By	Carol Uu — Utility Coordinator[2]	688-6946 — Phone
R/W Acquistion Estimate Prepared By	— Right of Way Estimator[3]	619 688 7572 — Phone

[1] When estimate has Support Costs only [2] When estimate has Utility Relocation [3] When R/W Acquisition is required

IV. SUPPORT COST ESTIMATE SUMMARY

SB-45 CATEGORY SUPPORT COST	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	P3 Subtotal
PR/ED (PD,PE,PM)							952,000	1,285,200	142,800		2,380,000
PS&E (PS)											0
R/W (RW)											0
CONSTRUCTION (CM)											0
Total Support Cost:	0	0	0	0	0	0	952,000	1,285,200	142,800	0	

SB-45 CATEGORY SUPPORT COST	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	P3 Total	Support Ratio
PR/ED (PD,PE,PM)										2,380,000	9%
PS&E (PS)			889,000	889,000						1,778,000	7%
R/W (RW)			110,500	553,000	443,000	110,500				1,217,000	5%
CONSTRUCTION (CM)					3,342,500	1,432,900				4,775,400	18%
Total Support Cost:	0	0	999,500	1,442,000	3,785,500	1,543,400	0	0	0	**10,150,400**	

NOTE: ESCALTED COSTS ARE FILLED IN AUTOMATICALLY ON PAGE 1. DO NOT ENTER ESCALATED COSTS ON THIS PAGE.

Total Capital Cost:	**$26,969,000**
Overall Percent Support Cost:	**38%**

Approved by: Bruce J. White — Project Control Engineer — 3/24/09 — Date

DISTRICT 11
PRELIMINARY
PROJECT COST ESTIMATE

11- PAGE ESTIMATE

11-080200

Type of Estimate : Project Report
Program Code :
Project Limits : SR-98 KP48.2/52.5
Description: **(PHASE 2) SR-98 West Highway Widening Improvements**
Scope : Highway widening, intersection signalization, curb and gutter, sidewalk, and drainage features
Alternative : Build Alternative - Phase 2

	Current Cost	Escalated Cost
ROADWAY ITEMS	$ 9,474,400.00	$ 12,696,700.00
STRUCTURE ITEMS	$ -	$ -
SUBTOTAL CONSTRUCTION COST	$ 9,474,400.00	$ 12,696,700.00
RIGHT OF WAY	$ 1,823,000.00	$ 2,540,000.00
TOTAL CAPITAL COST	**$ 11,298,000.00**	**$ 15,237,000.00**
PR/ED SUPPORT	$ 1,020,000.00	$ -
PS&E SUPPORT	$ 762,000.00	$ 1,003,400.00
RIGHT OF WAY SUPPORT	$ -	$ -
CONSTRUCTION SUPPORT	$ 2,046,600.00	$ 2,842,100.00
TOTAL SUPPORT COST	**$ 3,828,600.00**	**$ 3,845,500.00**
TOTAL PROJECT COST	**$ 15,150,000.00**	**$ 19,100,000.00**

	month	year
Date (Month/Year) of Estimate	1	/ 2008
Estimated Date (Month/Year) of Construction	1	/ 2014
Number of Months of Escalation	72	
Number of Years of Escalation	6.00	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days	180	
Number of Plant Establishment Days	525	

Estimated Project Schedule

PID Approval		
PA/ED Approval	2008	
PS&E	2012	
RTL	2014	
Begin Construction		2014

Reviewed by District 0.E. Claire F. Dodge for Leon G. Edmonds — District 11 Office Engineer — 2/3/09 (Date) — (619) 688-6735 (Phone)

Approved by Project Manager — Mario Orso — 2/4/09 (Date) — (619) 688-2561 (Phone)

[2] Escalation rates used on this estimate for Support Cost are 12% for FY 07/08, 6% for FY 08/09, and 3% for FY 09/10 and each year beyond. Escalation rates used in this estimate for Highway Construction Capital Costs are 5.0% compounded annually to Construction year. These rates are different than the suggested 2006 STIP of 8.3% for fiscal year 05/06 and 3.0% thereafter. The decision to use 5.0% for this estimate was as per the Office of Office Engineer. (REV091108)

I. ROADWAY ITEMS

Section				Cost
1	Earthwork		$	195,000
2	Structural Section		$	2,149,000
3	Drainage		$	661,900
4	Specialty Items		$	90,000
5	Environmental		$	955,000
	5A Environmental Mitigati	$ -		
	5B Landscape and Irrigatic	$ 720,000		
	5C NPDES	$ 235,000		
6	Traffic Items		$	653,300
	6A Electrical	$ 150,000		
	6B Signing and Striping	$ 69,500		
	6C Traffic Management Plan	$ 64,300		
	6D Traffic Control	$ 369,500		
7	Detours		$	-
8	Minor Items		$	235,300
9	Roadway Mobilization		$	494,000
10	Supplemental Work		$	540,000
11	State Furnished		$	1,716,000
12	Contingencies		$	1,537,900
13	Overhead		$	247,000
	TOTAL ROADWAY ITEMS		**$**	**9,474,400**

Estimate Prepared By: JJB 12/19/2008
Jeff Burdick, EIT - Assistant Engineer 12/19/2008 (858) 514-8377

Estimate Reviewed By: 12/19/08
Jason Lemons, PE - Project Engineer 12/19/2008 (858) 514-8377

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

`ECTION 1 EARTHWORK

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	M3	9,000	x	20.00	=	$	180,000
190103	Roadway Excavation (Type Y) ADL	M3		x		=	$	-
190105	Roadway Excavation (Type Z-2) ADL	M3		x		=	$	-
194001	Ditch Excavation	M3		x		=	$	-
198001	Imported Borrow	M3		x		=	$	-
198007	Imported Material (Shoulder Backing)	Tonne		x		=	$	-
192037	Structure Excavation (Retaining Wall)	M3		x		=	$	-
193013	Structure Backfill (Retaining Wall)	M3		x		=	$	-
193031	Pervious Backfill Material (Retaining Wall)	M3		x		=	$	-
160101	Clearing & Grubbing	LS	1	x	10,000.00	=	$	10,000
170101	Develop Water Supply	LS	1	x	5,000.00	=	$	5,000

TOTAL EARTHWORK SECTION ITEMS	$	195,000

Section 2 STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
401000	Concrete Pavement	M3		x		=	$	-
404092	Seal Pavement Joint	M		x		=	$	-
404094	Seal Longitudinal Isolation Joint	M		x		=	$	-
413115	Seal Existing Concrete Pavement Joint	M		x		=	$	-
401108	Replace Concrete Pavement (Rapid Strength Cor	M3		x		=	$	-
390132	Hot Mix Asphalt Concrete (Type A)	Tonne	11,000	x	90.00	=	$	990,000
390108	Asphalt Concrete Base (Type A)	Tonne		x		=	$	-
390126	Rubberized AC (Type G)	Tonne		x		=	$	-
393001	Pavement Reinforcing Fabric	M2		x		=	$	-
260201	Class 2 Aggregate Base	M3	20,000	x	40.00	=	$	800,000
290201	Asphalt Treated Permeable Base	M3		x		=	$	-
250401	Class 4 Aggregate Subbase	M3		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	Tonne		x		=	$	-
397001	Asphaltic Emulsion (Paint Binder)	Tonne		x		=	$	-
377501	Slurry Seal	Tonne		x		=	$	-
3750XX	Screenings (Type XX)	Tonne		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	Tonne		x		=	$	-
365001	Sand Cover	Tonne		x		=	$	-
731519	Minor Concrete (Stamped Concrete)	M2	300	x	100.00	=	$	30,000
731510	Minor Concrete (Curb, gutter, sidewalk, and	M3	700	x	470.00	=	$	329,000
731623	Minor Concrete (Curb Ramp)	M3	See Note	x	See note	=	$	-
394001	Place Asphalt Concrete Dike	M		x		=	$	-
150771	Remove Asphalt Concrete Dike	M		x		=	$	-
420201	Grind Existing Concrete Pavement	M2		x		=	$	-
150860	Remove Base and Surfacing	M3		x		=	$	-
390095	Replace Asphalt Concrete Surfacing	M3		x		=	$	-
1532XX	Remove Concrete (type)	M3		x		=	$	-
394002	Place Asphalt Concrete (Misc. Area)	M2		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	M2		x		=	$	-
394050	Rumble Strip	STA		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	M2		x		=	$	-
420102	Groove Existing Concrete Pavement	M2		x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS	$	2,149,000

Note: Quantity for item 731623 - Minor Concrete (Curb Ramp) is included with item 731510 - Minor Concrete (Curb, gutterm sidewalk, and dri

SECTION 3 DRAINAGE

Item code		Unit	Quantity		Price		Amount
150820	Modify Inlet	EA		x		=	$ -
193114	Sand Backfill	M3		x		=	$ -
150206	Abandon Culvert	M		x		=	$ -
152430	Adjust Inlet	EA		x		=	$ -
155003	Cap Inlet	EA		x		=	$ -
707050	Drainage Inlet	EA	12	x	6,000.00	=	$ 72,000
707051	Drainage Manhole	EA		x		=	$ -
XXXXXX	Miscellaneous Drainage Outlet	EA	15	x	10,000.00	=	$ 150,000
510502	Minor Concrete (Minor Structure)	M3		x		=	$ -
510512	Minor Concrete (Box Culvert)	M3		x		=	$ -
62XXXX	XXX mm APC Pipe	M		x		=	$ -
64XXXX	XXX mm Plastic Pipe	M		x		=	$ -
650075	600 mm RCP Pipe	M	700	x	500.00	=	$ 350,000
66XXXX	XXX mm CSP Pipe	M		x		=	$ -
68XXXX	Edge Drain	M		x		=	$ -
69XXXX	XXX mm Pipe Downdrain	M		x		=	$ -
70XXXX	XXX mm Pipe Inlet	M		x		=	$ -
70XXXX	XXX mm Pipe Riser	M		x		=	$ -
70XXXX	XXX mm Flared End Section	EA		x		=	$ -
703233	Grated Line Drain	M		x		=	$ -
72XXXX	Rock Slope Protection (Type and Method)	M3		x		=	$ -
729010	Rock Slope Protection Fabric	M2		x		=	$ -
721420	Concrete (Ditch Lining)	M3		x		=	$ -
721430	Concrete (Permeable Channel Lining)	M3	170	x	470.00	=	$ 79,900
750001	Miscellaneous Iron and Steel	KG	1,500	x	5.00	=	$ 7,500
XXXXXX	Additional Drainage	LS	1	x	2,500.00	=	$ 2,500

TOTAL DRAINAGE ITEMS $ 661,900

SECTION 4 SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)		Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	10,000.00	=	$ 10,000
518002	Sound Wall (Masonry Block)	M2		x		=	$ -
510524	Minor Concrete (Sound Wall)	M3		x		=	$ -
153250	Remove Sound Wall	M2		x		=	$ -
190110	Lead Compliance Plan	LS		x		=	$ -
1532XX	Remove Barrier (*Insert Type*)	M		x		=	$ -
150662	Remove Metal Beam Guard Railing	M		x		=	$ -
150668	Remove Terminal Systems	EA		x		=	$ -
800XXX	Fence (*CL-1.2 Slatted*)	M	1,300	x	50.00	=	$ 65,000
800391	Fence (*CL-1.8*)	M	300	x	50.00	=	$ 15,000
80XXXX	Gate (Insert *Type*)	EA		x		=	$ -
832001	Metal Beam Guard Railing	M		x		=	$ -
839301	Single Thrie Beam Barrier	M		x		=	$ -
839310	Double Thrie Beam Barrier	M		x		=	$ -
839521	Cable Railing	M		x		=	$ -
8395XX	Terminal System (Type *CAT*)	EA		x		=	$ -
8395XX	Alternative Flared Terminal System	EA		x		=	$ -
8395XX	Alternative In-line Terminal System	EA		x		=	$ -
49XXXX	CIDH Concrete Piling (Insert Diameter)	M		x		=	$ -
839XXX	Crash Cushion (Type X)	EA		x		=	$ -
83XXXX	Concrete Barrier (Type X)	M		x		=	$ -
83XXXX	Concrete Barrier (Type X)	M		x		=	$ -
520103	Bar Reinf. Steel (Ret. Wall)	KG		x		=	$ -
510408	Class 1 Concrete (Retaining Wall)	M3		x		=	$ -
510133	Class 2 Concrete (Retaining Wall)	M3		x		=	$ -
510060	Structural Concrete (Retaining Wall)	M3		x		=	$ -
513553	Retaining Wall (Masonry Wall)	M3		x		=	$ -
5110XX	Architectural Treatment (Type)	M2		x		=	$ -
511048	Apply Anti-Graffiti Coating	M2		x		=	$ -
5136XX	Reinforced Concrete Crib Wall (Type X)	M2		x		=	$ -
83954X	Transition Railing (Insert Type)	EA		x		=	$ -
597601	Prepare and Stain Concrete	M2		x		=	$ -
839561	Rail Tensioning Assembly	EA		x		=	$ -
395XX	End Anchor Assembly (*Insert Type X*)	EA		x		=	$ -

TOTAL SPECIALTY ITEMS $ 90,000

Section 5 ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Price		Amount
	Biological Mitigation	LS		x		=	$ -
071325	Temporary Fence (Type ESA)	M		x		=	$ -

Subtotal Environmental $ -

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Price		Amount
200001	Highway Planting	LS	1	x	185,000.00	=	$ 185,000
208000	Irrigation System	LS	1	x	150,000.00	=	$ 150,000
204099	Plant Establishment Work	LS	1	x	15,000.00	=	$ 15,000
204101	Extend Plant Establishment (X Years)	LS		x		=	$ -
201700	Imported Topsoil	M3		x		=	$ -
20XXXX	___ mm (*Insert Type*) Conduit *(Use for Irrigation x-overs)*	M		x		=	$ -
20XXXX	Extend ___ mm *(Insert Type)* Conduit *(Use for Extension of Irrigation x-overs)*	M		x		=	$ -
2030XX	Erosion Control (Type __)	HA		x		=	$ -
203026	Move In/ Move Out (Erosion Control)	EA		x		=	$ -
209801	Maintenance Vehicle Pullout	EA		x		=	$ -
208304	Water Meter	EA	1	x	20,000.00	=	$ 20,000
731XXX	Slope Paving (Rock Coble)	M2	3,500	x	100.00	=	$ 350,000

Subtotal Landscape and Irrigation $ 720,000

5C - NPDES

Item code		Unit	Quantity		Price		Amount
074019	Prepare SWPPP	LS	1	x	3,500.00	=	$ 3,500
074017	Prepare WPCP	LS		x		=	$ -
074016	Construction Site Management	LS	1	x	23,000.00	=	$ 23,000
074020	Water Pollution Control	LS		x		=	$ -
074023	Temporary Erosion Control	M2	10,500	x	1.00	=	$ 10,500
074027	Temporary Erosion Control Blanket	M2		x		=	$ -
074037	Move In/ Move Out (Temporary Erosion Contı	EA	4	x	500.00	=	$ 2,000
074028	Temporary Fiber Roll	M	5,800	x	15.00	=	$ 87,000
074029	Temporary Silt Fence	m	2,700	x	15.00	=	$ 40,500
074042	Temporary Concrete Washout (Portable)	LS		x		=	$ -
074031	Temporary Gravel Bag Berm	EA	2,000	x	1.50	=	$ 3,000
074032	Temporary Concrete Washout Facility	EA	4	x	5,000.00	=	$ 20,000
074033	Temporary Construction Entrance	EA	4	x	4,000.00	=	$ 16,000
074035	Temporary Check Dam	M	20	x	100.00	=	$ 2,000
074038	Temp. Drainage Inlet Protection	EA	20	x	500.00	=	$ 10,000
074041	Street Sweeping	LS	1	x	17,500.00	=	$ 17,500
Supplemental Work for NPDES							
066595	Water Pollution Control Maint. Sharing*	LS	1	x	10,000.00	=	$ 10,000
066596	Additional Water Pollution Control	LS	1	x	20,000.00	=	$ 20,000
066597	Storm Water Sampling and Analysis*	LS	1	x	16,000.00	=	$ 16,000

ıbtotal NPDES (Without Supplemental Work) $ 235,000

* Applies only to project with SWPPP's

TOTAL ENVIRONMENTAL $ 955,000

Section 6 TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
86055X	Lighting & Sign Illumination	LS		x		=	$	-
860XXX	Signals & Lighting	LS	1	x	140,000.00	=	$	140,000
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
8611XX	Ramp Metering System (Location X)	LS		x		=	$	-
8611XX	Ramp Metering System (Location X)	LS		x		=	$	-
8607XX	Interconnection Facilities	LS		x		=	$	-
5602XX	Furnish Sign Structure	KG		x		=	$	-
5602XX	Install Sign Structure	KG		x		=	$	-
56XXXX	XXX mm CIDHC Pile (Sign Foundation)	M		x		=	$	-
860810	Inductive Loop Detectors	EA		x		=	$	-
8609XX	Traffic Monitoring Stations	LS		x		=	$	-
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
860090	Maintain Existing Traffic Management System Elements During Construction	LS	1	x	10,000.00	=	$	10,000

Subtotal Traffic Electrical $ 150,000

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
566011	Roadside Sign (One Post)	EA	30	x	450.00	=	$	13,500
566012	Roadside Sign (Two Post)	EA		x		=	$	-
560XXX	Furnish Sign Panels	M2		x		=	$	-
560XXX	Install Sign Panels	M2		x		=	$	-
150742	Remove Roadside Sign	EA		x		=	$	-
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
840656	Paint Traffic Stripe (2 Coat)	m	5,000	x	0.80	=	$	4,000
840666	Paint Pavement Marking (2 Coat)	m	50	x	40.00	=	$	2,000
120090	Construction Area Signs	LS	1	x	50,000.00	=	$	50,000

Subtotal Traffic Signing and Striping $ 69,500

6C - Traffic Management Plan

Item code		Unit	Quantity		Unit Price ($)			Cost
	Transportation Management System	LS	1	x	64,300.00	=	$	64,300

Subtotal Traffic Management Plan $ 64,300

6D - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
129099A	Traffic Plastic Drum	EA	1,000	x	40.00	=	$	40,000
12016X	Channelizer	EA		x		=	$	-
120120	Type III Barricade	EA	50	x	80.00	=	$	4,000
129100	Temp. Crash Cushion Module	EA	110	x	250.00	=	$	27,500
120100	Traffic Control System	WD	180	x	1,000.00	=	$	180,000
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
129000	Temporary Railing (Type K)	M	2,000	x	50.00	=	$	100,000
120143	Temporary Pavement Delineation	M	10,000	x	0.80	=	$	8,000
128650	Portable Changeable Message Sign	EA	2	x	5,000.00	=	$	10,000

Subtotal Stage Construction and Traffic Handling $ 369,500

TOTAL TRAFFIC ITEMS $ 653,300

Section 7 DETOURS*

Item code		Unit	Quantity		Unit Price ($)		Cost
190101	Roadway Excavation	M3		x		=	$ -
198050	Embankment	M3		x		=	$ -
198001	Imported Borrow	M3		x		=	$ -
390102	Asphalt Concrete (Type A)	Tonne		x		=	$ -
260201	Class 2 Aggregate Base	M3		x		=	$ -
250401	Class 4 Aggregate Subbase	M3		x		=	$ -
07XXXX	Temporary Drainage	LS		x		=	$ -
129000	Temporary Railing (Type K)	M		x		=	$ -
1286XX	Temporary Signals	EA		x		=	$ -
120143	Temporary Pavement Delineation	M		x		=	$ -
0713XX	Temporary Fence (Type X)	M		x		=	$ -

* Includes constructing, maintaining, and removal

TOTAL DETOURS $ -

Section 8 MINOR ITEMS (Use Appropriate percentage between 5%-10%)

Total of Section 1-7 4,704,200 x 5% = $ 235,210

TOTAL MINOR ITEMS $ 235,300

Section 9 ROADWAY MOBILIZATION*

Item							
999990	Total Section 1-8	$	4,939,500	x	10%	=	$ 493,950

TOTAL MOBILIZATION $ 494,000

* For Project less than 50 Working Days "Mobilization" is not required as a separate contract item, however contract item prices should take into consideration mobilization as part of the price.

Note: If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

Section 10 SUPPLEMENTAL WORK

Total Section 1-8 = $ 4,939,500 5% = $ 246,975

Item code		Unit	Quantity		Unit Price ($)		Cost
066666	Compensation Adjustment for Price Index Fluctuations of Paving Asphalt	LS	1	x	10,000.00	=	$ 10,000
066094	Value Analysis	LS	1	x	10,000.00	=	$ 10,000
066090	Maintain Traffic	LS	1	x	126,000.00	=	$ 126,000
066920	Dispute Review Board	LS	1	x	10,000.00	=	$ 10,000
066015	Federal Trainee Program	LS	1	x	20,000.00	=	$ 20,000
066700	Partnering	LS	1	x	60,000.00	=	$ 60,000
066411	Clean & Seal Random Pavement Cracks	LS		x		=	$ -
066222	Locate Existing Cross-Over	LS		x		=	$ -
066204	Remove Rock & Debris	LS	1	x	10,000.00	=	$ 10,000
066866	Operation of Existing Traffic Management System Elements During Construction	LS	1	x	1,000.00	=	$ 1,000
	***NPDES** Supplemental Work specified in Section 5C*					=	$ 46,000

TOTAL SUPPLEMENTAL WORK $ 540,000

Section 11 STATE FURNISHED MATERIALS

Item code		Unit	Quantity		Unit Price ($)		Cost
066105	RE Office	LS	1	x	95,000.00	=	$95,000
066063	Public Information	LS	1	x	31,000.00	=	$31,000
066901	Water Expenses	LS	1	x	1,500,000.00	=	$1,500,000
06684X	Ramp Meter Controller Assembly	LS		x		=	$0
06684X	TMS Controller Assembly	LS		x		=	$0
06684X	Traffic Signal Controller Assembly	LS		x		=	$0
066062A	COZEEP Expenses	LS	30	x	1,000.00	=	$30,000
066066	Public Transport Support	LS	1		50,000.00		$50,000
066069	Rideshare Promotion	LS	1		10,000.00		$10,000
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066803	Padlocks	LS		x		=	$0

TOTAL STATE FURNISHED $1,716,000

Section 12 CONTINGENCY

Use appropriate percentage based on the detail of estimate. Anything other than the suggested contingency in the PDPM needs to be *justified. (Pre-PSR 30%-50%, PSR 25%, PR 20%, PAR 15%, After PAR 10%)

Total Section 1-11	$	7,689,500	x	20%	=	$1,537,900

TOTAL CONTINGENCY $1,537,900

*Justification:

Section 13 OVERHEAD

Item code		Unit	Quantity		Unit Price ($)		Cost
070018	Time Related Overhead (TRO)	WD	180	x	1372.222222	=	$247,000

Note: If the building portion of the project is greater than 50% of the total project cost, then TRO is not included

TOTAL OVERHEAD $247,000

II. STRUCTURES ITEMS

DATE OF ESTIMATE	00/00/00	00/00/00	00/00/00
Bridge Name	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Meters) [out to ou	0.00 m	0.00 m	0.00 m
Total Bridge Length (Mete	0.00 m	0.00 m	0.00 m
Total Area (Square Meters	0.00 m^2	0.00 m^2	0.00 m^2
Structure Depth (Meters)	0.00 m	0.00 m	0.00 m
Footing Type (pile or spre	spread	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Meters	$0.00	$0.00	$0.00
COST OF EACH STRUCTURE	**$0.00**	**$0.00**	**$0.00**

DATE OF ESTIMATE	00/00/00	00/00/00	00/00/00
Bridge Name	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX	57-XXX	57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Meters) [out to ou	0.00 m	0.00 m	0.00 m
Total Bridge Length (Mete	0.00 m	0.00 m	0.00 m
Total Area (Square Meters	0.00 m^2	0.00 m^2	0.00 m^2
Structure Depth (Meters)	0.00 m	0.00 m	0.00 m
Footing Type (pile or spre	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Meters	$0.00	$0.00	$0.00
COST OF EACH STRUCTURE	**$0.00**	**$0.00**	**$0.00**

TOTAL COST OF BRIDGES	**$0.00**
TOTAL COST OF BUILDINGS	**$0.00**
TOTAL COST OF STRUCTURES[1]	**$0.00**

Estimate Prepared By: _____ _____
xxxxxxxxxxxxxxxx ----- Division of Structures Date

III. RIGHT OF WAY

A)	A1)	Acquisition, including Excess Lands, Damages & Goodwill, Fees	$	125,000
	A2)	SB-1210	$	50,000
B)		Acquisition of Offsite Mitigation	$	0
C)	C1)	Utility Relocation (State Share)	$	1,600,000
	C2)	Potholing (Design Phase)	$	0
D)		Railroad Acquisition	$	0
E)		Clearance / Demolition	$	0
F)		Relocation Assistance	$	0
G)		Title and Escrow	$	13,000
		R/W ESTIMATE		**$1,788,000.00**
H)		Condemnation Settlements 10%	$	17,500
I)		Design Appreciation Factor 10% (Items H & I applied to items A + B)	$	17,500
		TOTAL R/W ESTIMATE		**$1,823,000.00**

(Excluding Item #8 - Hazardous Waste)

J)		**TOTAL R/W ESTIMATE: Escalated**		**$2,540,000.00**
K)		Utility Relocation (Construction Cost)	$	0
		RIGHT OF WAY SUPPORT	$	**330,000**

Support Cost Estimate Prepared By: Pat Kipley — Project Coordinator[1] — Phone: 688-6952

Utility Estimate Prepared By: [signature] — Utility Coordinator[2] — Phone: 688-6946

R/W Acquistion Estimate Prepared By: [signature] — Right of Way Estimator[3] — Phone: 619 688 7572

[1] When estimate has Support Costs only [2] When estimate has Utility Relocation [3] When R/W Acquisition is required

IV. SUPPORT COST ESTIMATE SUMMARY

SB-45 CATEGORY SUPPORT COST	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	FY 09/10	P3 Subtotal
PR/ED (PD,PE,PM)							408,000	550,800	61,200		1,020,000
PS&E (PS)											0
R/W (RW)											0
CONSTRUCTION (CM)											0
Total Support Cost:	0	0	0	0	0	0	408,000	550,800	61,200	0	

SB-45 CATEGORY SUPPORT COST	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	P3 Total	Support Ratio
PR/ED (PD,PE,PM)										1,020,000	9%
PS&E (PS)			381,000	381,000						762,000	7%
R/W (RW)										0	0%
CONSTRUCTION (CM)					1,432,500	614,100				2,046,600	18%
Total Support Cost:	0	0	381,000	381,000	1,432,500	614,100	0	0	0	**3,828,600**	

NOTE: ESCALTED COSTS ARE FILLED IN AUTOMATICALLY ON PAGE 1. DO NOT ENTER ESCALATED COSTS ON THIS PAGE.

Total Capital Cost:	**$11,298,000**
Overall Percent Support Cost:	**34%**

Approved by: Lynda J. White — Project Control Engineer — 3/24/09 — Date

LINSCOTT LAW & GREENSPAN engineers

FINAL TRAFFIC VOLUMES/TRAFFIC OPERATIONAL REPORT

SR 98 WIDENING UPDATE

City of Calexico, California

April 23, 2007

Prepared for:

DOKKEN ENGINEERING
5675 Ruffin Road, Suite 250
San Diego, California 92123

LLG Ref. 3-04-1500 Task 6

Prepared by:
Norene N. Pen, P.E.
Transportation Engineer III

Under the Supervision of:
John P. Keating, P.E.
Principal

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

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FINAL TRAFFIC VOLUMES/TRAFFIC OPERATIONAL REPORT

SR 98 WIDENING UPDATE

City of Calexico, California
April 23, 2007

1.0 INTRODUCTION

Linscott, Law & Greenspan, Engineers (LLG) has been retained by the California Department of Transportation (Caltrans) through Dokken Engineering to evaluate the proposed widening of State Route 98 (SR 98) in the City of Calexico.

This traffic study encompasses the SR 98 corridor from west of Dogwood Road to east of SR 111, Cesar Chavez Boulevard from SR 98 to 2nd Street, and 2nd Street from Cesar Chavez Boulevard to SR 111. The roadway facilities within the study area fall under both City of Calexico and Caltrans jurisdiction. The project vicinity is shown in ***Figure 1–1***.

The first phase of the report is the preparation of a traffic volumes report. The report includes existing intersection volumes, 24-hour traffic volumes, intersection geometric conditions, and forecast future Year 2015 and Year 2035 traffic volumes.

The second phase of the report is the preparation of a traffic operational analysis report. The report includes existing intersection capacity analysis, Year 2015 and Year 2035 intersection capacity analysis, roadway segment recommendations, and intersection geometric recommendations. The analysis will identify the number of lanes midblock on SR 98 and at the key intersections to achieve acceptable Levels of Service (LOS D).

1.1 Study Area

The study area for this project includes nine intersections along State Route 98 (SR 98), plus three intersections to the south of SR 98. SR 98 is mainly a two-lane east-west roadway in Imperial County and the alignment is parallel to I-8 (to the north) and the USA/Mexico International Border (to the south). SR 98 begins at I-8 near Ocotillo and ends at I-8 near Midway Well. SR 98 serves as an alternate route for I-8 and provides the closest route from the Calexico/Mexicali International Border Crossing and to the Calexico/Mexicali East International Border Crossing and the City of Calexico.

The scope of the study area was developed under the direction of the City staff, Caltrans and LLG's working knowledge of the local transportation system.

The study intersections include:

- SR 98 and Dogwood Road
- SR 98 and David Navaro Avenue
- SR 98 and Kloke Road
- SR 98 and Eady Avenue
- SR 98 and Lee Avenue/V.V. Williams Avenue
- SR 98 and Cesar Chavez Boulevard (formerly Railroad Boulevard)
- SR 98 and Estrada Boulevard
- SR 98 and Ollie Avenue
- SR 98 and State Route 111 (SR 111)
- Cesar Chavez Boulevard and Grant Avenue
- Cesar Chavez Boulevard and 2nd Street
- SR 111 and 2nd Street

The key street segments are listed below:

SR 98:

- West of Dogwood Road
- Between Dogwood Road and David Navaro Avenue
- Between David Navaro Avenue and Kloke Road
- Between Kloke Road and Eady Avenue
- Between Eady Avenue and Lee Avenue
- Between Lee Avenue and Cesar Chavez Boulevard
- Between Cesar Chavez Boulevard and Ollie Avenue
- Between Ollie Avenue and SR 111 (Imperial Avenue)
- East of SR 111 (Imperial Avenue)

SR 111 (Imperial Avenue):

- North of SR 98
- South of SR 98
- North of 2nd Street
- South of 2nd Street

Cesar Chavez Boulevard:

- Between SR 98 and Grant Avenue
- Between Grant Avenue and 2nd Street

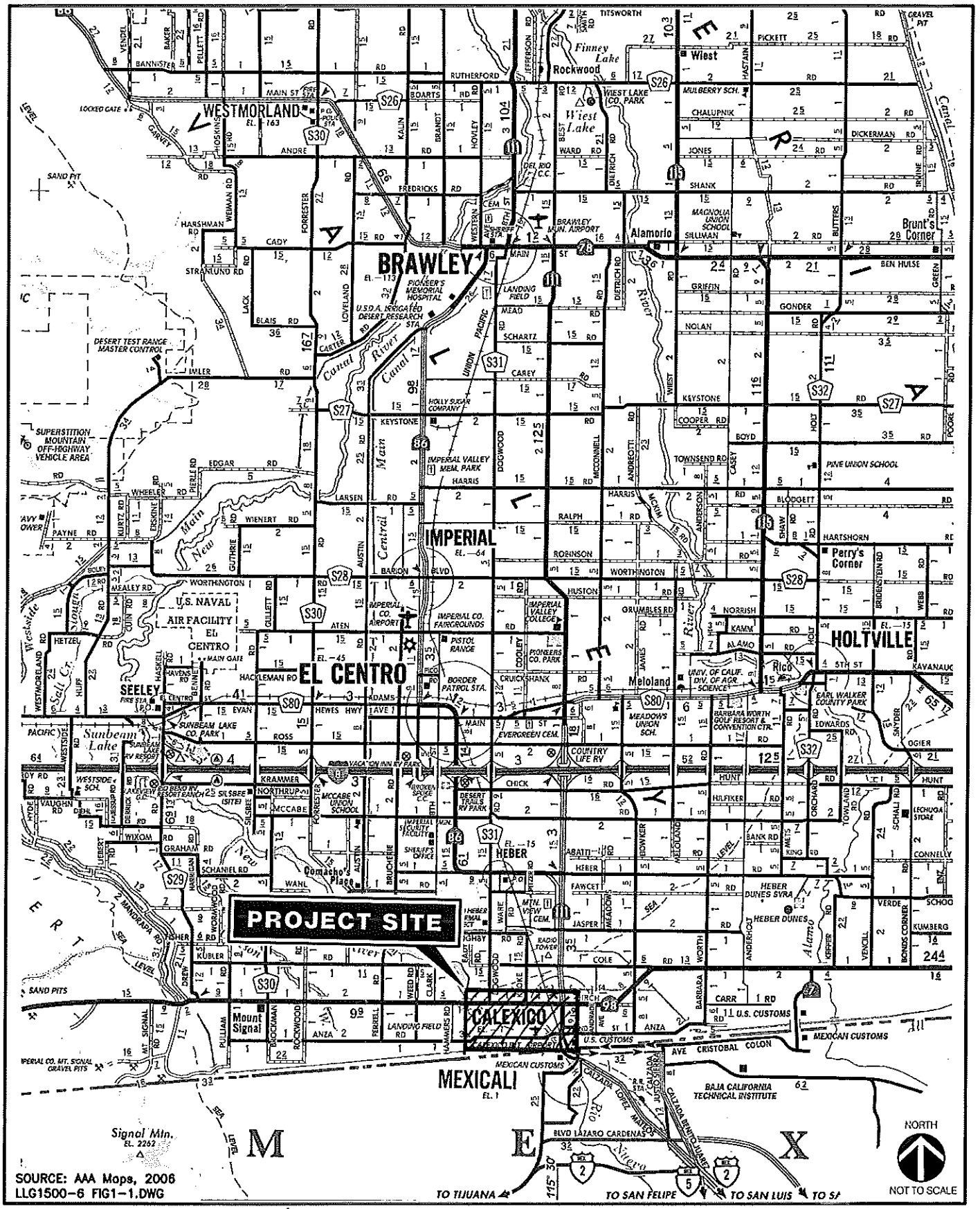
Dogwood Road:

- North of SR 98

2nd Street (Anza Road)

- West of Cesar Chavez Boulevard
- Between Cesar Chavez Boulevard and SR 111

- East of SR 111



LINSCOTT LAW & GREENSPAN engineers

Figure 1-1

Vicinity Map

SR 98 Widening Update

2.0 EXISTING CONDITIONS

2.1 Roadway Descriptions

The principal roadways in the project study area are described briefly below. The City of Calexico Street Classification with Traffic Signals Map (March 2005) and the City of Calexico General Plan (2004) were consulted to determine street classification for roadways in the study area. The roads not listed below are not on the Circulation Element. ***Figure 2–1*** illustrates existing transportation conditions.

State Route 98 is classified as a Principle Arterial Interstate roadway and currently consists of two-lane roadway from the City of Calexico city limits to west of Ollie Avenue. From Ollie Avenue to Meadows Road, SR 98 widens to a four-lane roadway. The speed limit along SR 98 from David Navaro Avenue to SR 111 is 40 MPH.

State Route 111 is classified as a Principle Arterial Interstate roadway. SR 111 is a four-lane divided north/south facility providing two lanes of travel in each direction within the study area. State Route 111 has a posted speed limit of 55 mph. No bike lanes or bus stops are provided and curbside parking is prohibited.

Cesar Chavez Boulevard is classified as an Other Principle Arterial roadway from SR 98 to 2nd Street. It is currently a two-lane roadway immediately south of SR 98. Cesar Chavez Boulevard varies between two and four lanes south of SR 98 to 2nd Street. The speed limit along Cesar Chavez Boulevard from SR 98 to 2nd Street is 25 MPH.

Kloke Road is classified as an Other Principle Arterial roadway from Calexico Street to Jasper Street. Kloke Road is a four-lane roadway in the vicinity of SR 98.

David Navaro Avenue is classified as a Collector roadway from Calexico Street to Sunset Street. It is a two-lane roadway north and south of SR 98.

V.V. Williams Avenue is classified as a Collector roadway from SR 98 to Ellis Street. It is a two-lane roadway near SR 98.

Dogwood Road is classified as an Other Principle Arterial roadway north of SR 98. It is currently a two-lane roadway north of SR 98 and provides connection to Interstate 8. The speed limit along Dogwood Road north of SR 98 is 50 MPH. Dogwood Road is proposed to expand to four lanes with 80 to 100 feet of right-of-way in the future.

2nd Street is classified as an Other Principle Arterial roadway from SR 111 to west of Cesar Chavez Boulevard. It is currently an undivided two-lane roadway in the study area and has a posted speed limit of 25 mph.

2.2 Existing Traffic Volumes

Existing weekday AM/PM peak hour traffic volumes were collected at the key intersections to capture peak commuter activity. The initial peak hour turning movement counts were conducted from 6:30 AM to 9:30 AM and 2:30 PM to 6:30 PM on Wednesday, May 4, 2005 and Thursday, May 5, 2005. Additional peak hour manual turning movement counts were conducted on Thursday, April 23, 2006. The peak hour manual turning movement counts includes all pedestrian and bicycle activities at the intersection. The initial street segment Average Daily Traffic (ADT) volume counts were conducted on Wednesday, May 4, 2005. Additional street segment counts were conducted on Wednesday, April 22, 2006. The street segment counts for Kloke Road between SR 98 and Cole Road were conducted on November 15, 2005.

Existing street segment Average Daily Traffic (ADT) volumes on the minor cross streets along SR 98 were calculated based on the relationship between the peak hour traffic and ADT along SR 98. Vehicle classifications based on the Federal Highway Administration 13-bin classification were also conducted on the street segments along SR 98 in conjunction with the ADT counts. ***Table 2-1*** summarizes the results of the vehicle classification counts.

Appendices A and ***B*** contain copies of the intersection and segment count sheets, respectively.

Figure 2–2 illustrates the existing traffic volumes for the key intersections and roadway segments. The roadway segment volumes were rounded to the nearest hundred vehicles.

In addition to the vehicular intersection turning movement counts, intersection pedestrian and bicycle activity were counted for the main sections along SR 98 that were estimated to have a significant or large amount of pedestrian and bicycle activity. This section of SR 98 is from David Navaro Avenue to SR 111. ***Figure 2–3*** and ***Figure 2–4*** show the pedestrian volumes and bicycle traffic volumes for the high pedestrian/bicycle activity sections along SR 98.

A review of *Figure 2–3* shows a high volume of pedestrian activity at the SR 98 and Kloke Road intersection. The high number of SR 98 crossing is due to the elementary and high schools located on Kloke Road north of SR 98. The only other intersection that has a high volume of pedestrian activity is at the SR 98 and Eady Avenue intersection.

A review of *Figure 2–4* indicates low bicycle activity along the SR 98 corridor during the morning and evening peak periods.

TABLE 2–1
SR 98 WIDENING PROJECT ADT - VEHICLE CLASSIFICATION

Street Segment	Class 1[a] ADT[b]	Class 2 ADT	Class 3 ADT	Class 4 ADT	Class 5 ADT	Class 6 ADT	Class 7 ADT	Class 8 ADT	Class 9 ADT	Class 10 ADT	Class 11 ADT	Class 12 ADT	Class 13 ADT	Total
SR 98														
West of Dogwood Road	7	3086	1723	14	521	46	0	40	105	0	21	5	2	5570
East of Dogwood Road	19	5553	2326	13	661	55	0	23	106	4	15	3	6	8784
All American Canal and David Navaro	20	5901	2430	15	562	50	0	28	102	6	13	2	9	9138
David Navaro and Kloke Rd	37	7224	3,009	13	738	36	0	7	56	2	0	0	4	11,126
Kloke Rd and Eady Ave	59	8344	6,682	22	1,827	47	0	15	68	12	4	0	1	17,081
Eady Ave and V.V. Williams Ave	50	5988	8,555	22	2,241	34	0	9	71	2	5	0	16	16,993
Estrada Blvd and Ollie Ave	120	11,446	8,206	45	2,202	107	0	34	166	33	5	0	25	22,389
Ollie Ave and SR 111	114	17,166	6,387	27	1,085	174	0	34	212	71	2	0	59	25,331
East of SR 111	419	10,917	11,013	80	2,723	420	0	67	380	145	6	0	146	26,316
SR 111														
North of SR 98	777	21,282	8,119	83	1,471	281	0	97	629	156	21	0	145	33,061
South of SR 98	170	23,451	10,037	75	1,813	240	0	49	143	114	6	0	67	36,165

Footnotes:

a. Vehicle Classification refers to the FHWA 13-bin classification and are as follows:
- Class 1 – Motorcycles
- Class 2 – Passenger Cars
- Class 3 – Other 2-axle, 4-tire single-unit vehicles
- Class 4 – Buses
- Class 5 – 2-axle, 6-tire single-unit trucks
- Class 6 – 3-axle single-unit trucks
- Class 7 – 4- or more axle single-unit trucks
- Class 8 – 4- or less axle single-trailer trucks
- Class 9 – 5-axle single-trailer trucks
- Class 10 – 6- or more axle single-trailer trucks
- Class 11 – 5- or less axle multi-trailer trucks
- Class 12 – 6-axle multi-trailer trucks
- Class 13 – 7- or more axle multi-trailer trucks

b. Average Daily Traffic Volumes

2.3 Existing Signal Timings

Existing traffic signal timing plans were obtained for the existing four signalized intersections. Copies of the signal timing plans are contained in ***Appendix C***. The four traffic signals on SR 98 are currently not coordinated and have cycle lengths that range from 114 seconds to 150 seconds. Below is a brief discussion of the signal timing plans for each intersection:

- SR 98 / Dogwood Road – the cycle length is 140 seconds. A pedestrian phase is provided for all three approaches.
- SR 98 / Kloke Road – the cycle length is 144 seconds and there is a protected left-turn phase for all four approaches. A pedestrian phase is provided for all approaches.
- SR 98 / Eady Avenue – the cycle length is 114 seconds and there is a protected left-turn phase for the east and west approaches on SR 98. A pedestrian phase is provided for the east, north, and south approaches.
- SR 98 / Ollie Avenue – the cycle length is 145 seconds. There is a protected left-turn phase for the east and west approaches on SR 98 and the phasing along Ollie Avenue is split phasing. A pedestrian phase is provided for the west, north, and south approaches.
- SR 98 / SR 111 – the cycle length is 150 seconds. There is a protected left-turn phase for all four approaches. A pedestrian phase is provided for all approaches.

2.4 Existing Railroad Gate Data

The Southern Pacific Railroad intersects SR 98 between Cesar Chavez Boulevard and Estrada Boulevard. The railroad gate operation was observed from 6:30 AM to 9:30 AM and 2:30 PM to 6:30 PM on Wednesday, May 4, 2005. ***Table 2-2*** summarizes the result of the field observations. A review of Table 2-2 indicates that the gate was "down" for approximately 13 minutes during the evening period from 2:30 PM to 6:30 PM.

TABLE 2–2
SAMPLE DOWNGATE TIME
Southern Pacific Railroad

Gate Down			Train Direction
Start	End	Down Time	
7:13:59	7:14:45	00:46	No Train
15:31:59	15:32:45	00:56	No Train
15:32:59	15:33:30	00:31	NB
15:35:24	15:39:30	04:06	NB
15:50:53	15:52:40	01:47	No Train
16:00:58	16:07:00	06:02	NB
Total		14 minutes	

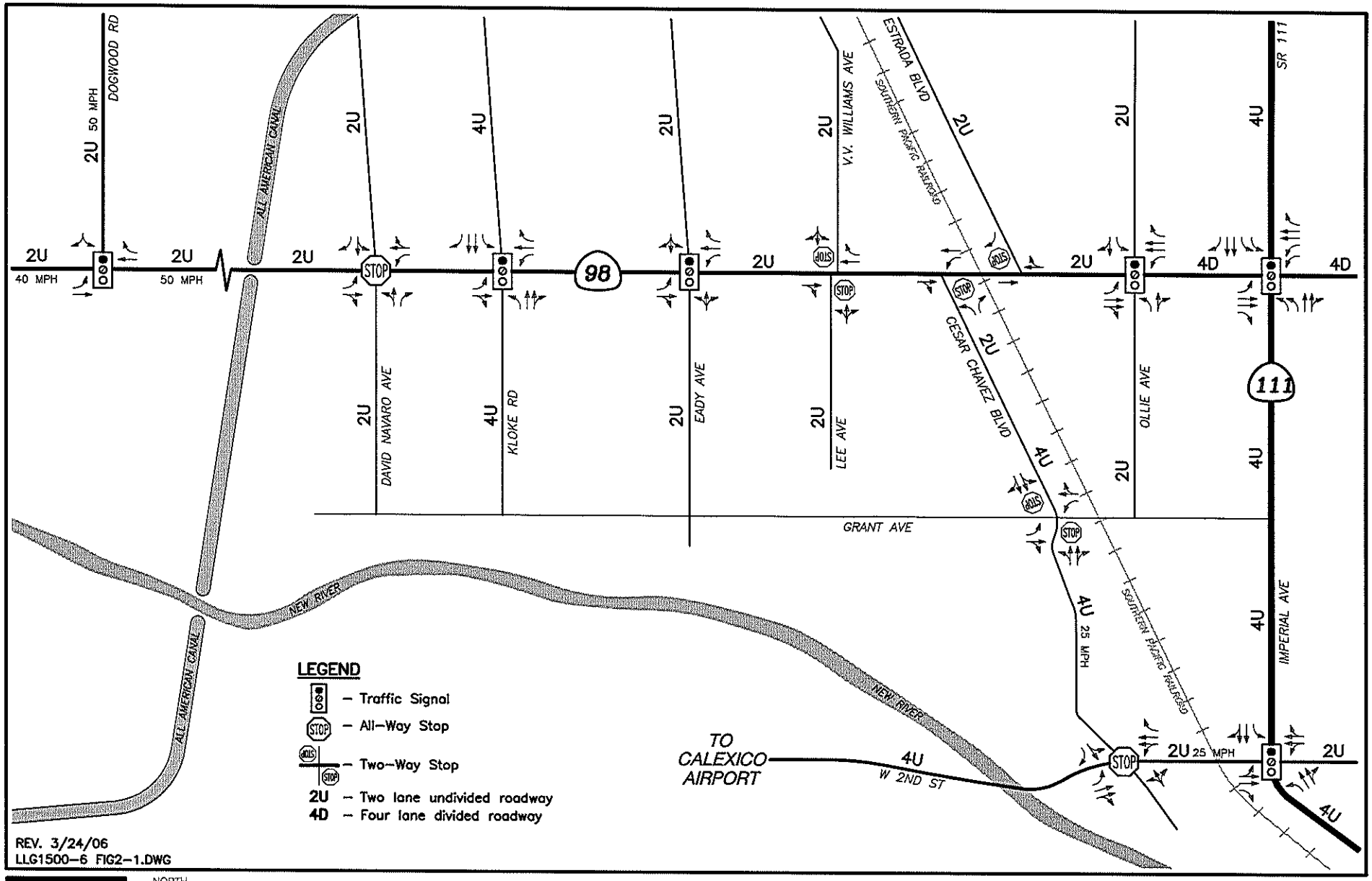


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Figure 2-1

Existing Conditions Diagram

SR 98 Widening Update

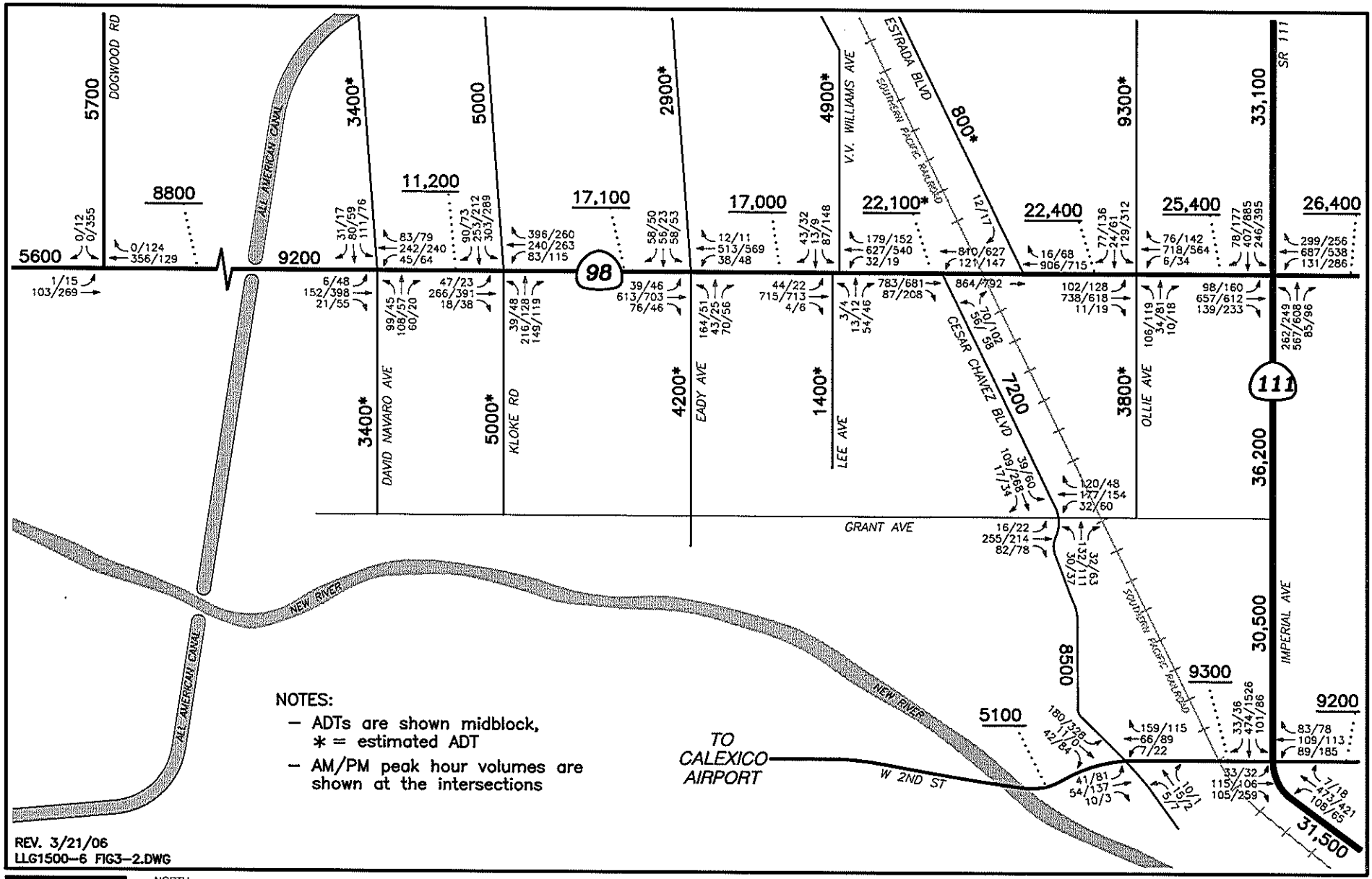

Figure 2-2

Existing Traffic Volumes AM/PM Peak Hours & ADT

SR 98 Widening Update

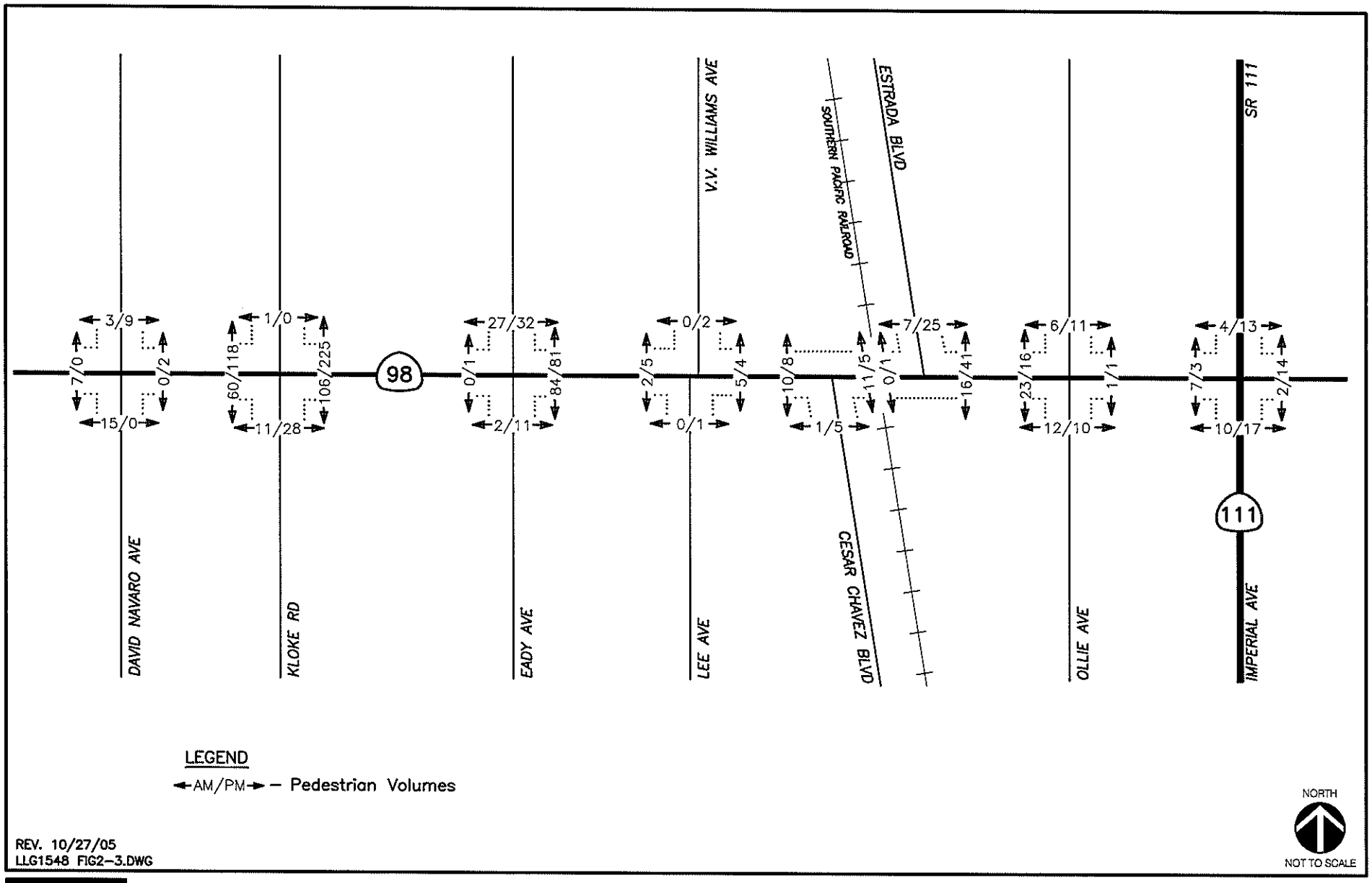

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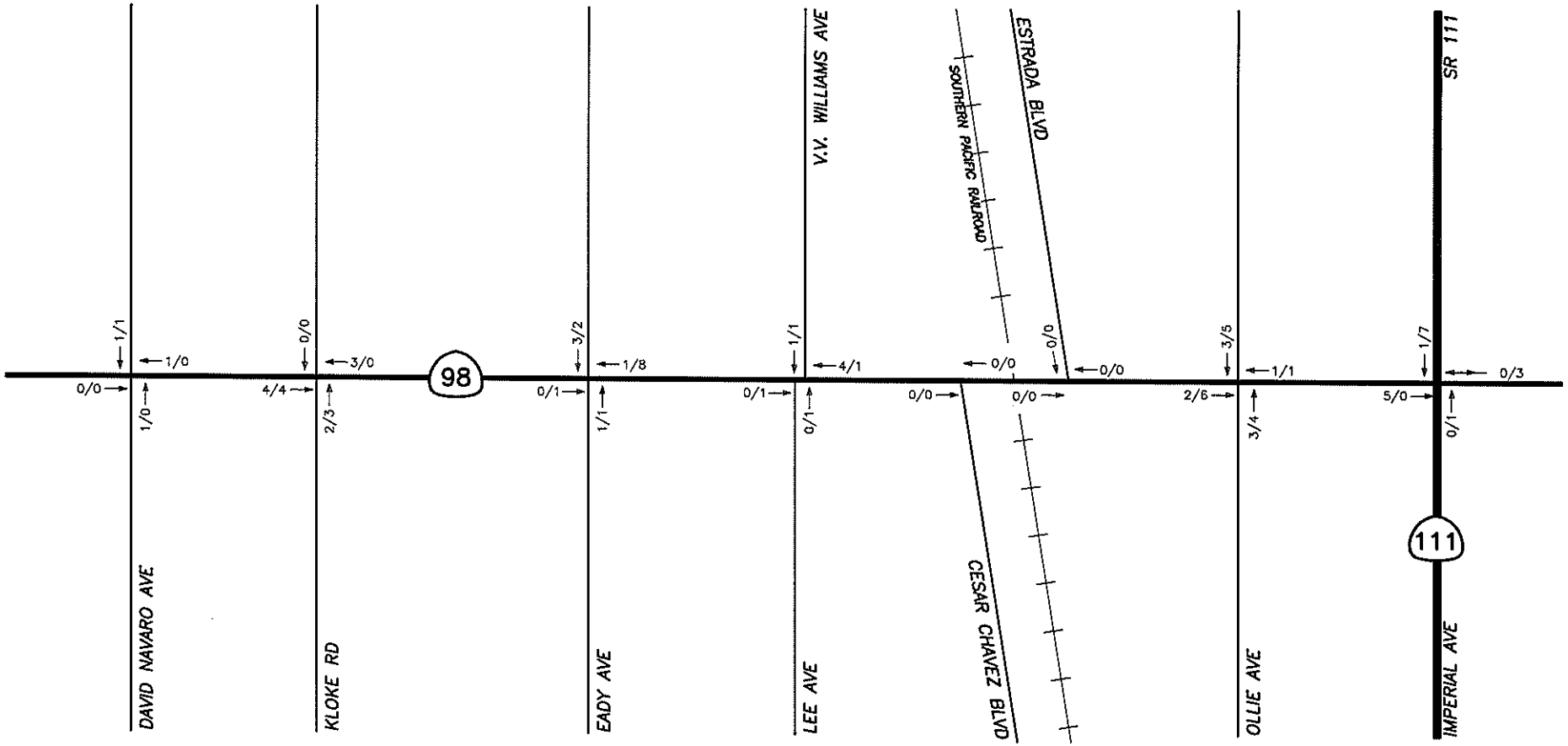
Figure 2-3

Existing Pedestrian Volumes AM/PM Peak Hours



NOTES:
- AM/PM peak hour volumes are shown at the intersections

REV. 10/27/05
LLG1548 FIG2-4.DWG

NORTH

NOT TO SCALE

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E-W STREET / N-S STREET
AM/PM

Figure 2-4

Existing Bicycle Volumes AM/PM Peak Hours

SR 98 Widening Update

3.0 TRAFFIC VOLUME FORECAST

3.1 Forecast Model

A modification of SCAG's 2025 Regional Model was used to forecast Year 2025 traffic volumes. Modifications were made to both the land use and network impacts so that the data is consistent with the City of Calexico General Plan. The Model was reviewed in coordination with the City of Calexico and Caltrans. The forecast Model plots are contained in ***Appendix D*** along with figures that show the ADT volumes for both scenarios (without and with the Anza Street extension).

The following key roadway network and land use parameters were verified and/or assumed:

- The Socio-Economic and Land Use data was reviewed for the 2025 Imperial County Transportation Model (ICTM). The 2025 ICTM contained two different socio-economic and land use data, one is the Calexico General Plan (CalexGP) version and the other is the Imperial Mall (ImpMall4a) version. After a review of the demographic information for both versions and consultation with City staff, it was determined that the Calexico General Plan version was to be used for this project.
- The Calexico General Plan version of the ICTM was updated based on comments from the City of Calexico and is called the CalexGP+ version. The CalexGP+ demographic distribution map is contained in Appendix D. The CalexGP+ version is considered a land use alternative to the CalexGP and ImpMall4a versions of the model and was created exclusively for the SR 98 Widening Project.
- The transportation network in the 2025 Imperial County Transportation Model was modified to include a link for Kloke Road from SR 98 to Cole Road and minor adjustments to some centroid connections.
- The transportation network in the 2025 Imperial County Transportation Model does not include the potential modification to the Calexico West Border Station. The modification will likely increase traffic volumes on Cesar Chavez Boulevard.
- Three specific projects were applied to the CalexGP+ model based on recent traffic studies of reasonably expected development.
    - Los Lagos – 442.54 acres of mixed-use development in TAZ 574
    - River View Condominium - 352 unit of multi-family homes in TAZ 606
    - Remington Condominium – 272 unit of multi-family homes in TAZ 605
- The City of Calexico has plans to connect Anza Road west of Cesar Chavez Boulevard to Dogwood Road at SR 98. The actual alignment of the proposed extension has not been finalized. According to the Street Classification Plan for the City of Calexico, the Anza Road extension is proposed to be a four-lane arterial route with right-of-way between 80 to 100 feet. Two network scenarios were run for the CalexGP+ model:
    - Without the Anza Road connection to Dogwood Road
    - With the Anza Road connection to Dogwood Road

3.2 Year 2015 Traffic Volumes

Once the land use and network data were modified in the 2025 CalexGP+ Model, Year 2025 ADT volumes were forecasted. The Year 2025 forecasted ADT volumes for both scenarios (with and without the Anza Road extension) were reviewed for validity and consistency to existing ADT volumes and the surrounding land use and network data. A review of the Year 2025 forecasted ADT volumes for the Anza Road extension scenario showed a reduction of approximately 10,000 ADT vehicles along SR 98 between Dogwood Road and Cesar Chavez Boulevard due to the Anza Road extension. The model showed that the majority of the new trips on the Anza Road extension are from Cesar Chavez Boulevard as oppose to SR 111. LLG consulted with Caltrans and determined that a higher amount of traffic assigned to the Anza Road extension should be from SR 111 and not Cesar Chavez Boulevard. To better reflect future traffic patterns, two thousand ADT volumes were added to Cesar Chavez Boulevard and reduced on SR 111 between SR 98 and 2nd Street/Anza Road for the Anza Road extension scenario.

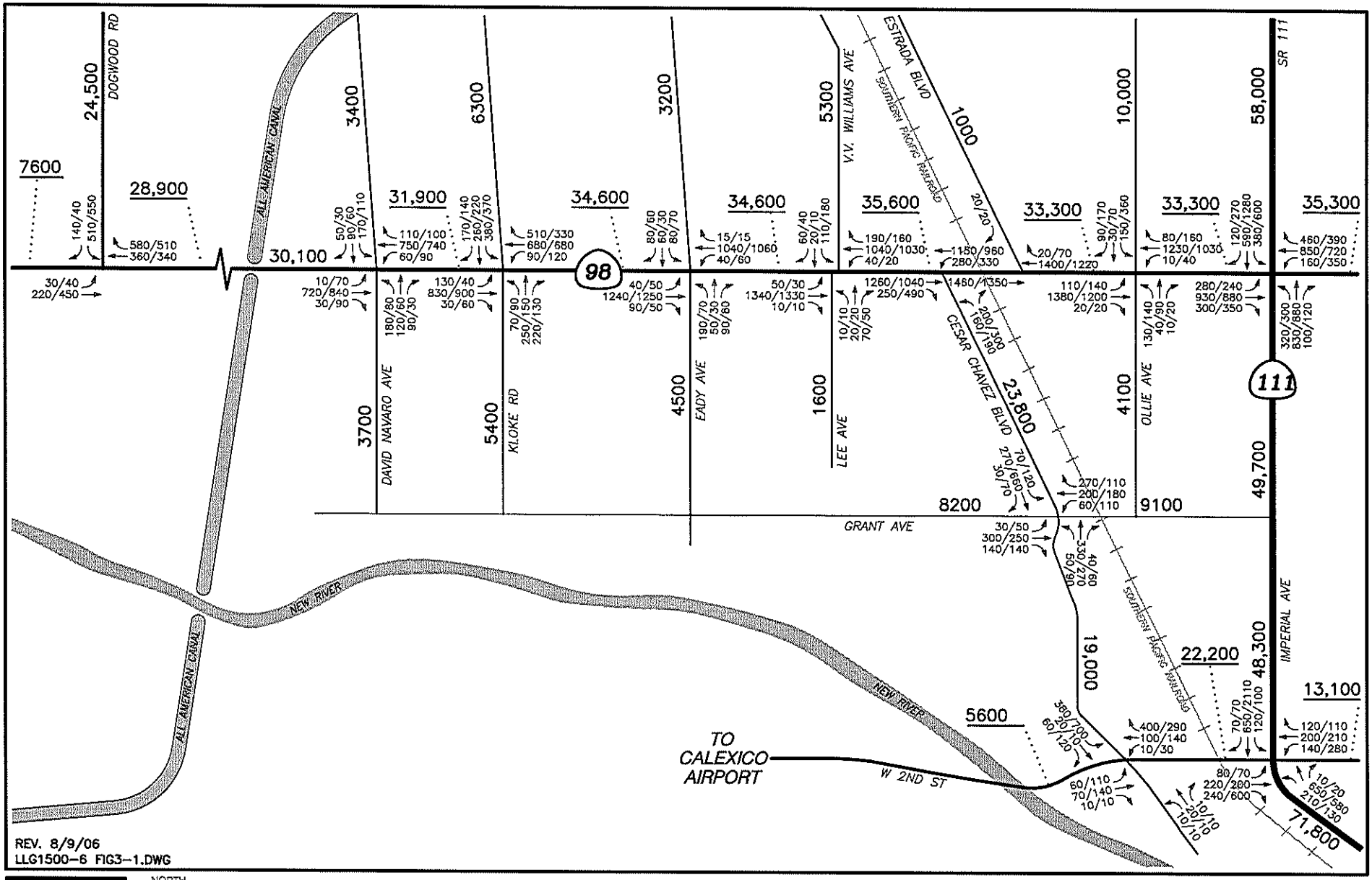
The annual growth rates were calculated along SR 98 from the existing ADT volumes and Year 2025 ADT volumes for both scenarios. The average annual growth rates were calculated for all the segments in the study area. After a review of the annual growth rates, an annual growth rate of one and one-half percent (1.5%) was applied for traffic on SR 98, SR 111, Cesar Chavez Boulevard, and 2nd Street and a three quarter percent (0.75%) annual growth rate was applied to the other roads in the study area to the Year 2025 ADT volumes to determine Year 2015 ADT volumes for both scenarios.

Year 2015 ADT volumes were used to calculate Year 2015 intersection peak hour turning volumes for both scenarios based on the existing relationship between ADT and peak hour turning volumes. The forecast volumes were reviewed for consistency between intersections and were compared to existing turning volumes. Minor adjustments were made to smooth the ADT volumes.

The resultant Year 2015 forecast traffic volumes for the key intersections and roadway segments are illustrated on ***Figure 3–1*** and ***Figure 3-2***.

3.3 Year 2035 Traffic Volumes

Year 2035 ADT volumes for both scenarios (without and with the Anza Road extension) were calculated using the same adjusted Year 2025 CalexGP+ Model and same methodology used to calculate Year 2015 ADT volumes. The Year 2025 ADT volumes were increased to determine Year 2035 ADT volumes using the same annual growth rates that were applied to determine the Year 2015 ADT volumes as described in the previous section. The resultant Year 2035 forecast traffic volumes for the key intersections and roadway segments are illustrated on ***Figure 3–3*** and ***Figure 3-4***.



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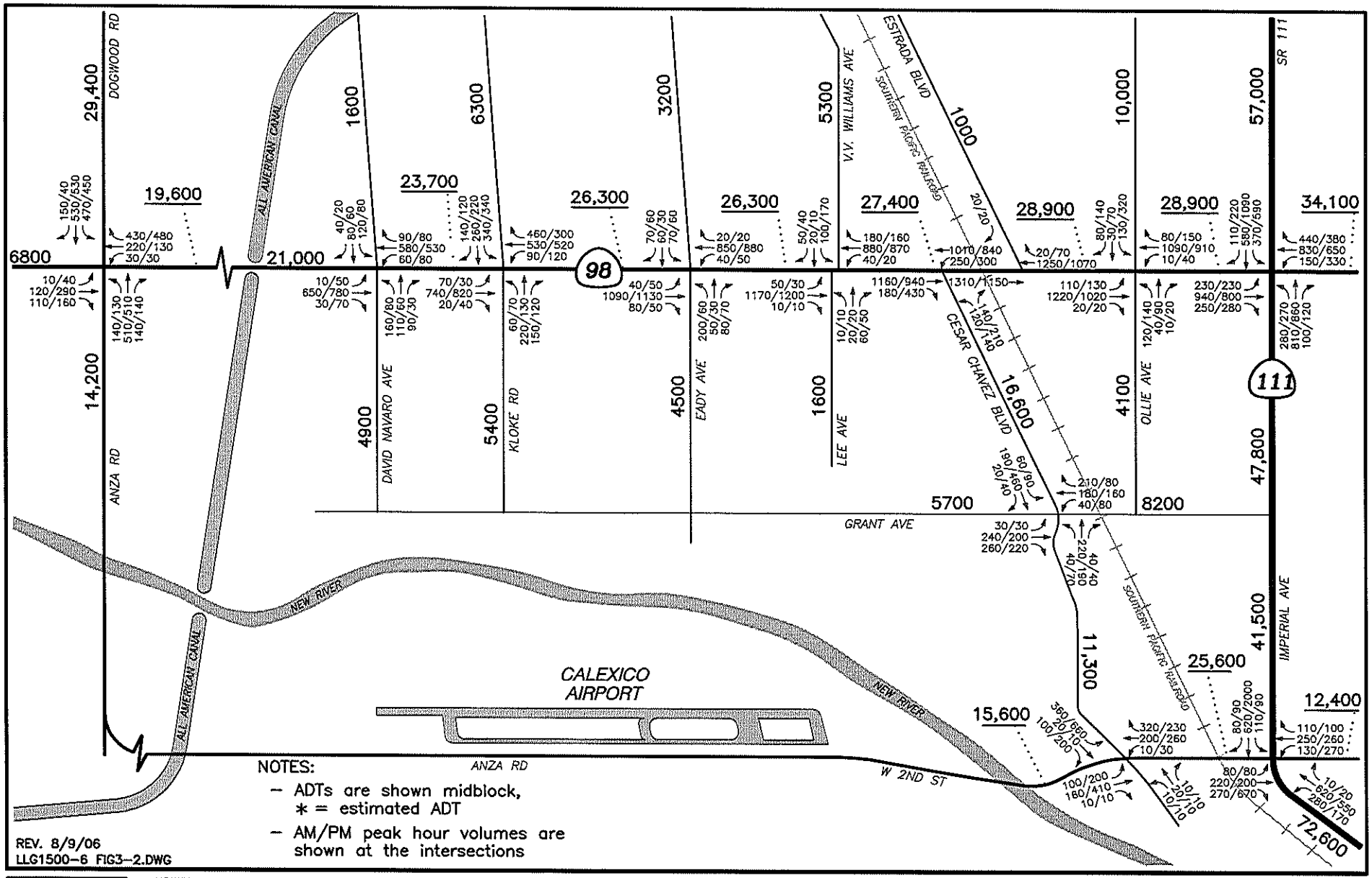
NOTES:

- ADTs are shown midblock, * = estimated ADT
- AM/PM peak hour volumes are shown at the intersections

Figure 3-1

2015 Traffic Volumes (without Anza Road Extension) AM/PM Peak Hours & ADT

SR 98 Widening Update



NOTES:

- ADTs are shown midblock, * = estimated ADT
- AM/PM peak hour volumes are shown at the intersections

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Figure 3-2

2015 Traffic Volumes (with Anza Road Extension) AM/PM Peak Hours & ADT

SR 98 Widening Update

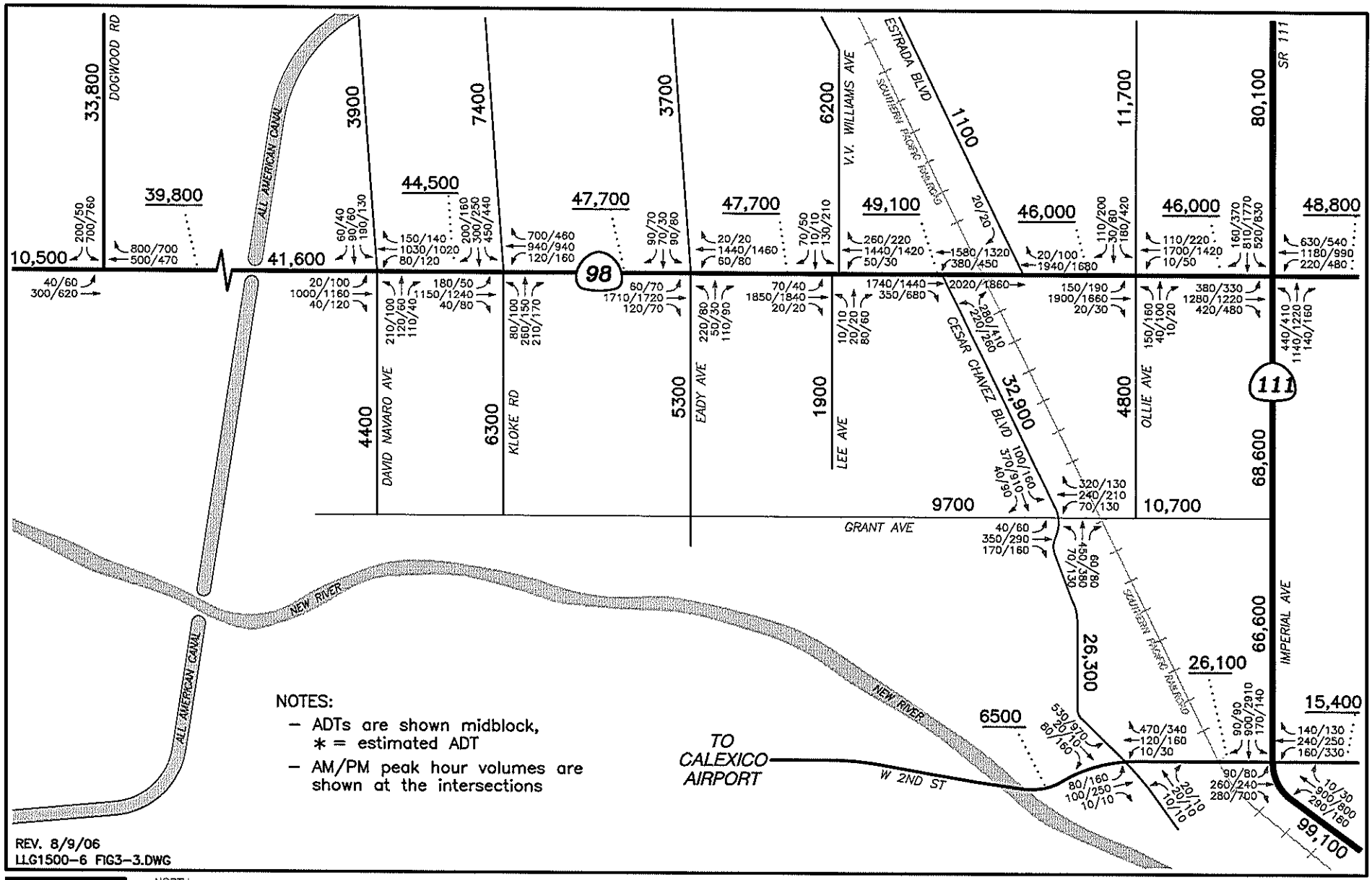
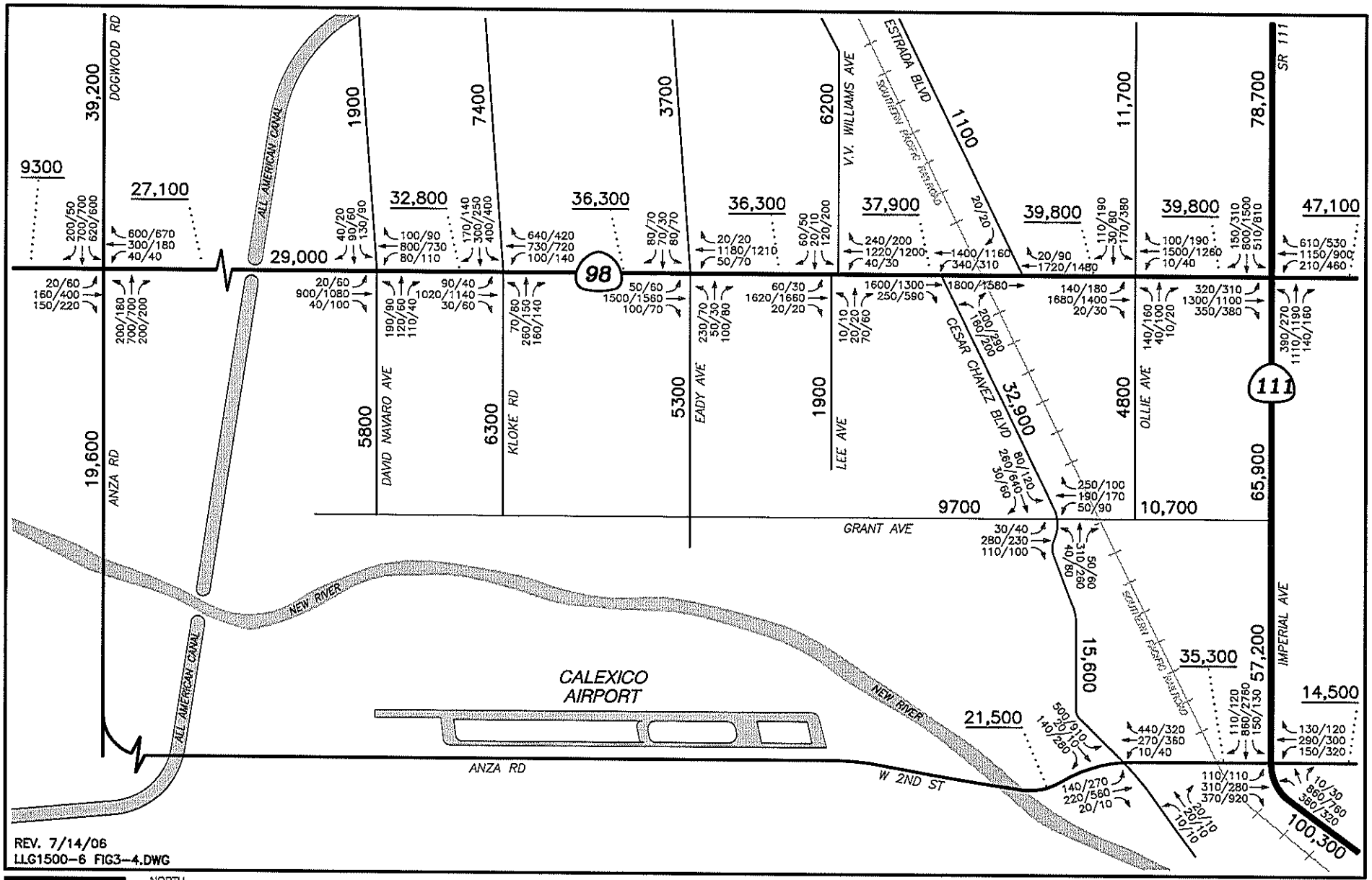


Figure 3-3

2035 Traffic Volumes (without Anza Road Extension) AM/PM Peak Hours & ADT

SR 98 Widening Update



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LLG1500-6 FIG3-4.DWG

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NORTH

NOT TO SCALE

NOTES:
- ADTs are shown midblock, * = estimated ADT
- AM/PM peak hour volumes are shown at the intersections

Figure 3-4

2035 Traffic Volumes (with Anza Road Extension) AM/PM Peak Hours & ADT

SR 98 Widening Update

4.0 TRAFFIC ANALYSIS METHODOLOGY

Intersection capacity analyses were conducted for the intersections in the study area based on the Caltrans Guide for the Preparation of Traffic Impact Studies (December 2002).

4.1 Analysis Approach and Methodology

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometrics, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

4.1.1 *Signalized Intersections*

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 16 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Synchro* (version 6.0) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS). Signalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in ***Appendix E.***

4.1.2 *Unsignalized Intersections*

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) were determined based upon the procedures found in Chapter 17 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Synchro* (version 6) computer software. Unsignalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in *Appendix E.*

4.1.3 *Street Segments*

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the Imperial County Standard Street Classification table. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. Imperial County Standard Street Classification table is attached in *Appendix E.*

5.0 TRAFFIC OPERATIONAL ANALYSIS

Intersection capacity analyses were conducted for the following conditions with the existing lane configurations on SR 98:

- Existing Condition
- Year 2015 without Anza Road extension
- Year 2015 with Anza Road extension
- Year 2035 without Anza Road extension
- Year 2035 with Anza Road extension

5.1 Existing Conditions

Intersection capacity analyses were conducted at the intersections in the study area with existing traffic volumes and existing intersection lane configurations. The existing cycle lengths were utilized for the analysis of the signalized intersections. ***Table 5-1*** shows the results of the existing intersection analysis. ***Appendix F*** contains the existing intersection analysis worksheets.

A review of *Table 5-1* shows that all the signalized intersections are operating at LOS D or better except at the following location:

- SR 98 / Kloke Road – LOS E (AM peak hour)

A review of *Table 5-1* also indicates that the following unsignalized intersections are operating at LOS E or F.

- SR 98 / Lee Ave / V.V. Williams Ave – LOS F (AM and PM peak hours)
- SR 98 / Cesar Chavez Blvd – LOS F (AM and PM peak hours)
- Grant Avenue / Cesar Chavez Blvd – LOS F (PM peak hour)

The street segments level of service results are shown in ***Table 5-2***. A review of Table 5-2 shows that the following street segments in the study area are currently operating at LOS E or F:

- SR 98 between David Navaro Avenue and Kloke Road
- SR 98 between Kloke Road and Eady Avenue
- SR 98 between Eady Avenue and Lee Avenue
- SR 98 between Lee Avenue and Cesar Chavez Boulevard
- SR 98 between Cesar Chavez Boulevard and Ollie Avenue
- SR 98 between Ollie Avenue and SR 111
- SR 98 east of SR 111
- SR 111 south of SR 98

5.2 Year 2015 without Anza Road Extension

Intersection capacity analyses were conducted for Year 2015 (without Anza Road extension) traffic volumes and existing intersection lane configurations and intersection control. The existing cycle lengths were utilized for the analysis of the signalized intersections. ***Appendix G*** contains the Year 2015 (without Anza Road extension) intersection analysis worksheets.

A review of ***Table 5-3*** shows that most of the signalized intersections are calculated to operate at failing LOS E or LOS F during the AM or PM peak hours except at the following intersections:

- SR 98 / Dogwood Road
- SR 98 / Ollie Avenue

The results from *Table 5-3* also show that all of the unsignalized intersections are calculated to operating at failing conditions (LOS E or F) during the AM or PM peak hours.

5.3 Year 2015 with Anza Road Extension

Intersection capacity analyses were conducted for Year 2015 (with Anza Road extension) traffic volumes and existing intersection lane configurations and intersection control. The existing cycle lengths were utilized for the analysis of the signalized intersections. ***Appendix H*** contains the Year 2015 (with Anza Road extension) intersection analysis worksheets.

A review of *Table 5-3* shows that most of the signalized intersections are calculated to operate at failing LOS E or LOS F except at the following intersections:

- SR 98 / Ollie Avenue
- SR 98 / SR 111

The intersection of SR 98 / Dogwood Road was not analyzed under existing conditions because the construction of the Anza Road extension requires intersection improvements at this intersection.

The results from ***Table 5-4*** also show that all of the unsignalized intersections are calculated to operating at failing conditions (LOS E or F) during the AM or PM peak hours.

5.4 Year 2035 without Anza Road

Intersection capacity analyses were conducted for Year 2035 (without Anza Road extension) traffic volumes and existing intersection lane configurations and intersection control. The existing cycle lengths were utilized for the analysis of the signalized intersections. ***Appendix I*** contains the Year 2035 (without Anza Road extension) intersection analysis worksheets.

The results from *Table 5-3* show that all the signalized and unsignalized intersections are calculated to operating at failing conditions (LOS E or F) during the AM or PM peak hours, except for the intersection of SR 98/Dogwood Road.

5.5 Year 2035 with Anza Road

Intersection capacity analyses were conducted for Year 2035 (with Anza Road extension) traffic volumes and existing intersection lane configurations and intersection control. The existing cycle lengths were utilized for the analysis of the signalized intersections. ***Appendix J*** contains the Year 2035 (with Anza Road extension) intersection analysis worksheets.

The results from *Table 5-4* show that all the signalized and unsignalized intersections are calculated to operating at failing conditions (LOS E or F) during the AM or PM peak hours, except for the intersection of SR 98/Ollie Avenue.

The intersection of SR 98 / Dogwood Road was not analyzed under existing conditions because the construction of the Anza Road extension requires intersection improvements at this intersection.

5.6 Year 2035 with Anza Road Street Segment Analysis

Street segment analyses were conducted for all the street segments for the Year 2035 with Anza Road extension scenario and is summarized in ***Table 5-5***. Future street classifications are based on the City of Calexico Street Classification with Traffic Signal Map.

A review of *Table 5-5* shows that the following street segments in the study area are projected to operate at LOS E or F:

- SR 98 between Kloke Road and Eady Avenue
- SR 98 between Eady Avenue and Lee Avenue
- SR 98 between Lee Avenue and Cesar Chavez Boulevard
- SR 98 between Cesar Chavez Boulevard and Ollie Avenue
- 2nd Street between Cesar Chavez Boulevard and SR 111
- Dogwood Road north of SR 98
- SR 111 north of SR 98
- SR 111 south of SR 98
- SR 111 north of 2nd Street
- SR 111 south of 2nd Street

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the Imperial County Standard Street Classification table. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics.

Peak hour intersection operations are commonly considered to be a better indicator of the roadway operating conditions since intersections generally control the traffic flow along roadway segments. Furthermore, peak hour intersection analysis considers more operating factors like signal coordination, peak hour factor, lane widths, etc. than roadway segment analysis. Therefore, despite that a large number of segments in the study area are projected to operate at LOS E or F, all the intersections are calculated to operate at LOS D or better with the recommended intersection improvements.

TABLE 5–1
EXISTING INTERSECTION OPERATIONS

Intersection	Existing Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
SR 98/ Dogwood Road	Signal	AM	15.1	B
		PM	19.1	B
SR 98/ David Navaro Avenue	AWSC	AM	14.2	B
		PM	20.4	C
SR 98 / Kloke Road	Signal	AM	**59.6**	**E**
		PM	44.0	D
SR 98/ Eady Avenue	Signal	AM	34.5	C
		PM	28.3	C
SR 98/ V.V. Williams Avenue / Lee Avenue	TWSC[c]	AM	**>100.0**	**F**
		PM	**>100.0**	**F**
SR 98/ Cesar Chavez Blvd	TWSC[c]	AM	**>100.0**	**F**
		PM	**>100.0**	**F**
SR 98/ Estrada Blvd	TWSC[c]	AM	22.0	C
		PM	16.8	C
SR 98/ Ollie Avenue	Signal	AM	41.0	D
		PM	37.8	D
SR 98/ SR 111/ Imperial Avenue	Signal	AM	43.8	D
		PM	52.8	D
Grant Avenue/ Cesar Chavez Blvd	TWSC[c]	AM	22.6	C
		PM	**98.0**	**F**
2nd Street/ Cesar Chavez Blvd	AWSC[d]	AM	-[e]	-
		PM	-[e]	-
2nd Street/ SR 111	Signal	AM	27.6	C
		PM	29.4	C

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
d. AWSC – All-Way Stop Controlled Intersection. Delay not calculated because of too many lanes for unsignalized analysis.
e. The intersection cannot be calculated because the Trafficware Synchro software does not accept the existing lane geometrics for unsignalized intersections.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

TABLE 5–2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Existing Classification	Existing Capacity (LOS E)[a]	Existing		
			ADT[b]	V/C[c]	LOS[d]
SR 98					
West of Dogwood Road	Collector St	16,200	5600	0.35	C
Dogwood Road to All American Canal	Collector St	16,200	8800	0.54	D
All American Canal to David Navaro Ave	Collector St	16,200	9200	0.57	D
David Navaro Ave to Kloke Rd	Collector St	16,200	11,200	0.69	E
Kloke Road to Eady Ave	Collector St	16,200	17,100	1.06	F
Eady Ave to Lee Ave	Collector St	16,200	17,000	1.05	F
Lee Ave to Cesar Chavez Blvd	Collector St	16,200	22,100	1.36	F
Cesar Chavez Blvd to Ollie Ave	Collector St	16,200	22,400	1.38	F
Ollie Ave to SR 111	Collector St	16,200	25,300	1.56	F
East of SR 111	Collector St	16,200	26,300	1.62	F
2nd Street					
West of 2nd Street	Sec. Arterial	34,200	5100	0.15	A
Cesar Chavez Blvd to SR 111	Collector St	16,200	9300	0.57	D
East of SR 111	Collector St	16,200	9200	0.57	D
Dogwood Road					
North of SR 98	Collector St	16,200	5700	0.35	C
Cesar Chavez Blvd					
SR 98 to Grant Avenue	Sec. Arterial	34,200	7200	0.21	A
Grant Avenue to 2nd Street	Sec. Arterial	34,200	8500	0.25	A
SR 111					
North of SR 98	Major Arterial	37,000	33,000	0.89	D
South of SR 98	Major Arterial	37,000	36,200	0.98	E
North of 2nd Street	Major Arterial	37,000	30,500	0.82	D
South of 2nd Street	Major Arterial	37,000	31,500	0.85	D

Footnotes:

a. LOS E according to Imperial County Standard Street Classification

b. Average Daily Traffic Volumes.

c. V/C – Volume to Capacity ratio

d. LOS – Level of Service

TABLE 5–3
YEAR 2015 INTERSECTION OPERATIONS WITH NO IMPROVEMENTS

Intersection	Existing Control Type	Peak Hour	2015 without Anza Road		2015 with Anza Road	
			Delay[a]	LOS[b]	Delay	LOS
SR 98/ Dogwood Road	Signal	AM	23.0	C	-[f]	-
		PM	26.7	C	-[f]	-
SR 98/ David Navaro Avenue	AWSC[d]	AM	**>100.0**	**F**	**>100.0**	**F**
		PM	**>100.0**	**F**	**>100.0**	**F**
SR 98 / Kloke Road	Signal	AM	**68.5**	**E**	**56.7**	**E**
		PM	**76.3**	**E**	**64.1**	**E**
SR 98/ Eady Avenue	Signal	AM	**>100.0**	**F**	**>100.0**	**F**
		PM	**>100.0**	**F**	**78.7**	**E**
SR 98/ V.V. Williams Avenue / Lee Avenue	TWSC[c]	AM	**>100.0**	**F**	**>100.0**	**F**
		PM	**>100.0**	**F**	**>100.0**	**F**
SR 98/ Cesar Chavez Blvd	TWSC[c]	AM	**>100.0**	**F**	**>100.0**	**F**
		PM	**>100.0**	**F**	**>100.0**	**F**
SR 98/ Estrada Blvd	TWSC[c]	AM	**>100.0**	**F**	**86.6**	**F**
		PM	**61.9**	**F**	**37.8**	**E**
SR 98/ Ollie Avenue	Signal	AM	21.4	C	17.0	B
		PM	40.2	D	32.9	C
SR 98/ SR 111/ Imperial Avenue	Signal	AM	47.0	D	43.4	D
		PM	**62.3**	**E**	49.0	D
Grant Avenue/ Cesar Chavez Blvd	TWSC[c]	AM	**>100.0**	**F**	**>100.0**	**F**
		PM	**>100.0**	**F**	**>100.0**	**F**
2nd Street/ Cesar Chavez Blvd	AWSC[d]	AM	-[e]	-	-[e]	-
		PM	-[e]	-	-[e]	-
2nd Street/ SR 111	Signal	AM	33.6	C	34.8	C
		PM	**>100.0**	**F**	**>100.0**	**F**

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
d. AWSC – All-Way Stop Controlled Intersection. Delay not calculated because of too many lanes for unsignalized analysis.
e. The intersection cannot be calculated because the Trafficware Synchro software does not accept the existing lane geometrics for unsignalized intersections.
f. The intersection of SR 98 / Dogwood Road was not analyzed under existing conditions because the construction of the Anza Road extension requires intersection improvements at this intersection.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

TABLE 5–4
YEAR 2035 INTERSECTION OPERATIONS WITH NO IMPROVEMENTS

Intersection	Existing Control Type	Peak Hour	2035 without Anza Road		2035 with Anza Road	
			Delay[a]	LOS[b]	Delay	LOS
SR 98/ Dogwood Road	Signal	AM	37.6	D	-[f]	-
		PM	40.9	D	-[f]	-
SR 98/ David Navaro Avenue	AWSC[d]	AM	>100.0	F	>100.0	F
		PM	>100.0	F	>100.0	F
SR 98 / Kloke Road	Signal	AM	>100.0	F	>100.0	F
		PM	>100.0	F	>100.0	F
SR 98/ Eady Avenue	Signal	AM	>100.0	F	>100.0	F
		PM	>100.0	F	>100.0	F
SR 98/ V.V. Williams Avenue / Lee Avenue	TWSC[c]	AM	>100.0	F	>100.0	F
		PM	>100.0	F	>100.0	F
SR 98/ Cesar Chavez Blvd	TWSC[c]	AM	>100.0	F	>100.0	F
		PM	>100.0	F	>100.0	F
SR 98/ Estrada Blvd	TWSC[c]	AM	>100.0	F	>100.0	F
		PM	>100.0	F	>100.0	F
SR 98/ Ollie Avenue	Signal	AM	95.7	F	39.2	D
		PM	>100.0	F	53.6	D
SR 98/ SR 111/ Imperial Avenue	Signal	AM	>100.0	F	>100.0	F
		PM	>100.0	F	>100.0	F
Grant Avenue/ Cesar Chavez Blvd	TWSC[c]	AM	>100.0	F	>100.0	F
		PM	>100.0	F	>100.0	F
2nd Street/ Cesar Chavez Blvd	AWSC[d]	AM	-[e]	-	-[e]	-
		PM	-[e]	-	-[e]	-
2nd Street/ SR 111	Signal	AM	41.0	D	78.5	E
		PM	>100.0	F	>100.0	F

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
d. AWSC – All-Way Stop Controlled Intersection. Delay not calculated because of too many lanes for unsignalized analysis.
e. The intersection cannot be calculated because the Trafficware Synchro software does not accept the existing lane geometrics for unsignalized intersections.
f. The intersection of SR 98 / Dogwood Road was not analyzed under existing conditions because the construction of the Anza Road extension requires intersection improvements at this intersection.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

TABLE 5–5
YEAR 2035 STREET SEGMENT OPERATIONS (PER CIRCULATION ELEMENT)

Street Segment	Future Classification	Future Capacity (LOS E)[a]	Year 2035 with Anza Road		
			ADT	V/C	LOS
SR 98					
West of Dogwood Road	Major Arterial	37,000	9,300	0.25	A
Dogwood Road to All American Canal	Major Arterial	37,000	27,100	0.73	C
All American Canal to David Navaro Ave	Major Arterial	37,000	29,000	0.78	C
David Navaro Ave to Kloke Rd	Major Arterial	37,000	32,800	0.89	D
Kloke Road to Eady Ave	Major Arterial	37,000	36,300	0.98	**E**
Eady Ave to Lee Ave	Major Arterial	37,000	36,300	0.98	**E**
Lee Ave to Cesar Chavez Blvd	Major Arterial	37,000	37,900	1.02	**F**
Cesar Chavez Blvd to Ollie Ave	Major Arterial	37,000	39,800	1.08	**F**
Ollie Ave to SR 111	Prime Arterial	57,000	39,800	0.70	C
East of SR 111	Prime Arterial	57,000	47,100	0.83	D
2nd Street					
West of 2nd Street	Sec. Arterial	34,200	21,500	0.63	B
Cesar Chaved Blvd to SR 111	Major Arterial	37,000	35,300	0.95	**E**
East of SR 111	Sec. Arterial	34,200	14,500	0.42	B
Dogwood Road					
North of SR 98	Major Arterial	37,000	39,200	1.06	**F**
Cesar Chavez Blvd					
SR 98 to Grant Avenue	Major Arterial	37,000	32,900	0.89	D
Grant Avenue to 2nd Street	Major Arterial	37,000	15,600	0.42	B
SR 111					
North of SR 98	Prime Arterial	57,000	78,700	1.38	**F**
South of SR 98	Prime Arterial	57,000	65,900	1.16	**F**
North of 2nd Street	Prime Arterial	57,000	57,200	1.00	**F**
South of 2nd Street	Prime Arterial	57,000	100,300	1.76	**F**

Footnotes:

a. LOS E according to Imperial County Standard Street Classification

b. Average Daily Traffic Volumes.

c. V/C – Volume to Capacity ratio

d. LOS – Level of Service

6.0 RECOMMENDED IMPROVEMENTS – YEAR 2035 WITH ANZA ROAD EXTENSION

A review of the future traffic volumes and a review of *Table 5-3* and *Table 5-4* indicate that roadway and intersection improvements are required along SR 98 in addition to the basic four lanes between Dogwood Road and SR 111. Although several scenarios were analyzed, the Year 2035 with the Anza Road extension scenario was used to determine recommended improvements because it is the most likely long-term/build-out scenario.

6.1 Roadway Improvements

A review of the future traffic volumes indicates that roadway improvements are required along SR 98 in addition to the basic four lanes between Dogwood Road and SR 111.

6.1.1 *SR 98 West of Dogwood Road*

The ADT volumes on SR 98 west of Dogwood Road are 9,300 vehicles. Therefore, four thru lanes are recommended on SR 98 to Dogwood Road. For the westbound direction, the number two thru lane should trap into a right-turn lane at Dogwood Road. The second eastbound thru lane on SR 98 should start approximately 300 feet west of Dogwood Road.

6.1.2 *SR 98 East of Ollie Avenue*

The ADT volumes for Year 2035 on SR 98 east of Ollie Avenue are projected to be about 39,800 vehicles. Due to the high traffic volumes and the reduced green time available at SR 111, three thru lanes in each direction are recommended east of Ollie Avenue. For the westbound direction, the number three thru lane should trap into a right-turn lane at Ollie Avenue. The third eastbound thru lane on SR 98 should start at the east curb return of George Avenue.

6.2 Intersection Improvements

Year 2035 (with Anza Road Extension) recommended intersection improvements are illustrated on ***Figure 6–1***. The existing and proposed signals along SR 98 were assumed coordinated as part of the analysis.

The following is a summary of the recommended intersection geometric and operational improvements along SR 98.

6.2.1 *SR 98 / Dogwood Road*

Geometric improvements are recommended due to the addition of Anza Road on the south leg of the intersection. From the forecasted volumes and expected traffic patterns, the recommended intersection improvements are:

- Install a second left-turn lane for the southbound approach.
- Install two thru lanes and a right-turn lane for the southbound approach.
- Install a left-turn lane for the westbound approach.
- Install a right-turn lane for the westbound approach.
- Install a left-turn lane, two thru lanes, and a right-turn lane for the new northbound approach.

In addition to the intersection geometric improvements, the following traffic signal improvements are recommended:

- Cycle length of 120 seconds.
- Protected left-turn phase on all four approaches.
- Pedestrian phase for all four legs.

6.2.2 *SR 98 / David Navaro Avenue*

The unsignalized intersection is calculated to operate at LOS F for Year 2035 (with Anza Road Extension). Based on the traffic volumes, a traffic signal is recommended. A traffic signal warrant (Warrant 3 – Peak Hour) was conducted based on the guidelines in the Manual of Uniform Transportation Devices (MUTCD), 2003 Edition, and the result of the warrant shows that a signal is warranted.

The new traffic signal should have the following timing/phasing characteristics:

- Cycle length of 120 seconds.
- Protected left-turn phase on the eastbound and westbound approaches.
- Pedestrian phase for all four legs.

Prior to installation of a traffic signal, the following intersection geometric improvements are recommended:

- Re-stripe the northbound and southbound approaches from a shared left/thru lane and a right-turn lane to a left-turn lane and a shared thru/right lane.

6.2.3 *SR 98 / Kloke Road*

The intersection is calculated to operate at LOS F for the Year 2035 (with Anza Road Extension) AM and PM peak hours. The traffic volumes show a high southbound left-turn movement with only one southbound left-turn lane. The westbound right-turn traffic is also high due to the location of the elementary school and high school north of SR 98, as well as a crossing of the All American Canal. From the traffic pattern, the recommended intersection improvements are:

- Change the protected left-turn phasing for the northbound and southbound approaches to split phasing.
- Modify the southbound number one thru lane to a shared left/thru lane, so that there are two lanes able to make the left-turn movement.

6.2.4 *SR 98 / Eady Road*

The intersection is projected to operate at LOS F for Year 2035 (with Anza Road Extension). From the traffic pattern, the recommended intersection improvements are:

- Re-stripe the northbound and southbound approaches from a shared left/thru/right lane to a left-turn lane and a shared thru/right lane.
- Construct a right-turn lane for the eastbound approach.
- Provide a protected left-turn phase on the eastbound and westbound approaches.

6.2.5 *SR 98 / Lee Avenue / V.V. Williams Avenue*

The unsignalized intersection is calculated to operate at LOS F for Year 2035 (with Anza Road Extension). Based on the traffic volumes, a traffic signal is recommended. A traffic signal warrant (Warrant 3 – Peak Hour) was conducted based on the guidelines in the Manual of Uniform Transportation Devices (MUTCD), 2003 Edition, and the result of the warrant shows that a signal is warranted.

The new traffic signal should have the following timing/phasing characteristics:

- Cycle length of 120 seconds.
- Protected left-turn phase for the eastbound and westbound approaches.
- Permissive left-turn phasing for the northbound and southbound approaches.
- Pedestrian phase for all four legs.

6.2.6 *SR 98 / Cesar Chavez Boulevard*

The unsignalized intersection is calculated to operate at LOS F for Year 2035 (with Anza Road Extension). Based on the traffic volumes, a traffic signal is recommended. A traffic signal warrant (Warrant 3 – Peak Hour) was conducted based on the guidelines in the Manual of Uniform Transportation Devices (MUTCD), 2003 Edition, and the result of the warrant shows that a signal is warranted.

The new traffic signal should have the following timing/phasing characteristics:

- Cycle length of 120 seconds.
- Protected left-turn phase for the westbound approach along SR 98 only.
- Pedestrian phase for all three legs.

Prior to installation of a traffic signal, the following intersection geometric improvements are recommended:

- Install dual left-turn lanes and a right-turn lane for the northbound approach.
- Install dual left-turn lanes for the westbound approach.

The SR 98 / Cesar Chavez Boulevard intersection was analyzed with the new traffic signal for both a single and dual left-turn lanes for the westbound approach on SR 98. The intersection is calculated to operate at LOS D or better with a single left-turn lane on the westbound approach. The 95th percent queue for the single left-turn lane is 443 feet for the AM peak hour and 495 feet for the PM peak hour. The intersection is also calculated to operate at LOS D or better with dual left-turn lanes on the westbound approach. The 95th percent queue for the dual left-turn lanes is 145 feet for the AM peak hour and 174 feet for the PM peak hour. Dual left-turn lanes are recommended due to the limited storage availability to Estrada Boulevard.

6.2.7 *SR 98 / Estrada Boulevard*

The intersection is calculated to operate at LOS B or better for the Year 2035 (with Anza Road Extension) AM and PM peak hours with the recommended street segment and intersection improvements at all the other locations along SR 98. No intersection improvements are required.

6.2.8 *SR 98 / Ollie Avenue*

The intersection is calculated to operate at LOS D for the Year 2035 (with Anza Road Extension) during the AM and PM peak hours. Although the intersection is calculated to operate at an acceptable LOS, the following signal phasing modification is recommended:

- Restripe the existing southbound shared through/right lane to shared right/through/left lane and maintain split phasing on north and southbound approaches with pedestrian prohibited on the east leg of the intersections

6.2.9 *SR 98 / SR 111*

The intersection is calculated to operate at LOS F for the Year 2035 (with Anza Road Extension) AM and PM peak hours. From the traffic pattern, the recommended intersection improvements are:

- Install a second left-turn lane for the eastbound approach.
- Install a third left-turn lane for the southbound approach.
- Install a right-turn lane for the northbound approach.
- Install a third thru lane for the northbound and southbound approaches.
- Prohibit the southbound u-turn movement and add a westbound right-turn overlap phase.

6.3 Intersection Improvements for Remaining Intersections

In addition to the intersections along SR 98, the following is a summary of the recommended intersection geometric and operational improvements for the other intersections in the study area.

6.3.1 *Cesar Chavez Boulevard / Grant Avenue*

The unsignalized intersection is projected to operate at LOS F for Year 2035 (with Anza Road Extension). Based on the traffic volumes, a traffic signal is recommended. A traffic signal warrant (Warrant 3 – Peak Hour) was conducted based on the guidelines in the Manual of Uniform Transportation Devices (MUTCD), 2003 Edition, and the result of the warrant shows that a signal is warranted.

The new traffic signal should have the following timing/phasing characteristics:

- Cycle length of 120 seconds.
- Protected left-turn phase on all four approaches.
- Pedestrian phase for all four legs.

Prior to installation of a traffic signal, the following intersection geometric improvements are recommended:

- Re-stripe the northbound and southbound approaches from a shared left/thru lane and a shared thru/right lane to a left-turn lane, a thru lane, and a shared thru/right lane.
- Install a right-turn lane for the eastbound and westbound approaches.

6.3.2 *Cesar Chavez Boulevard / Anza Road*

The unsignalized intersection is projected to operate at LOS F for Year 2035 (with Anza Road Extension). Based on the traffic volumes, a traffic signal is recommended. A traffic signal warrant (Warrant 3 – Peak Hour) was conducted based on the guidelines in the Manual of Uniform Transportation Devices (MUTCD), 2003 Edition, and the result of the warrant shows that a signal is warranted.

The new traffic signal should have the following timing/phasing characteristics:

- Cycle length of 120 seconds.
- Protected left-turn phase on the eastbound and westbound approaches.
- Split phasing for the northbound and southbound approaches.
- Pedestrian phase for all three legs and prohibit pedestrians on the east leg.

Prior to installation of a traffic signal, the following intersection geometric improvements are recommended:

- Re-stripe the westbound approach from a shared left/thru lane, thru lane, and right-turn lane to a left-turn lane, two thru lanes, and a right-turn lane.
- Construct a second left-turn lane for the southbound approach.

6.3.3 *SR 111 / 2nd Street*

The intersection is projected to operate at LOS F for the Year 2035 (with Anza Road Extension) AM and PM peak hours. From the traffic pattern, the recommended intersection improvements are:

- Re-stripe the eastbound approach from a shared left /thru lane to a left-turn lane.
- Construct a second right-turn lane for the eastbound approach.
- Re-stripe the westbound approach from a shared left/thru lane to a left-turn lane.
- Install a second left-turn lane for the westbound approach.
- Construct a right-turn lane for the westbound approach.
- Install two additional thru lanes in the southbound direction and a third thru lane in the northbound direction
- Install a right-turn lane for the southbound approach.

6.4 Results of Intersection Improvements

Intersection capacity analyses were conducted at all the intersections in the study area with the recommended intersection lane configurations for the following scenarios and are summarized on ***Table 6-1***:

- Year 2015 without Anza Road
- Year 2015 with Anza Road
- Year 2035 with Anza Road

The existing and proposed signals along SR 98 were assumed coordinated as part of the analysis. ***Appendices K, L, and M*** contains the intersection analysis worksheets for the three scenarios. ***Appendix N*** contains the time space diagram for the SR 98 corridor for the Year 2035 with improvements (with Anza Road extension) scenario.

A review of *Table 6-1* shows that all the intersections are projected to operate at LOS D or better with the recommended intersection and segment recommendations.

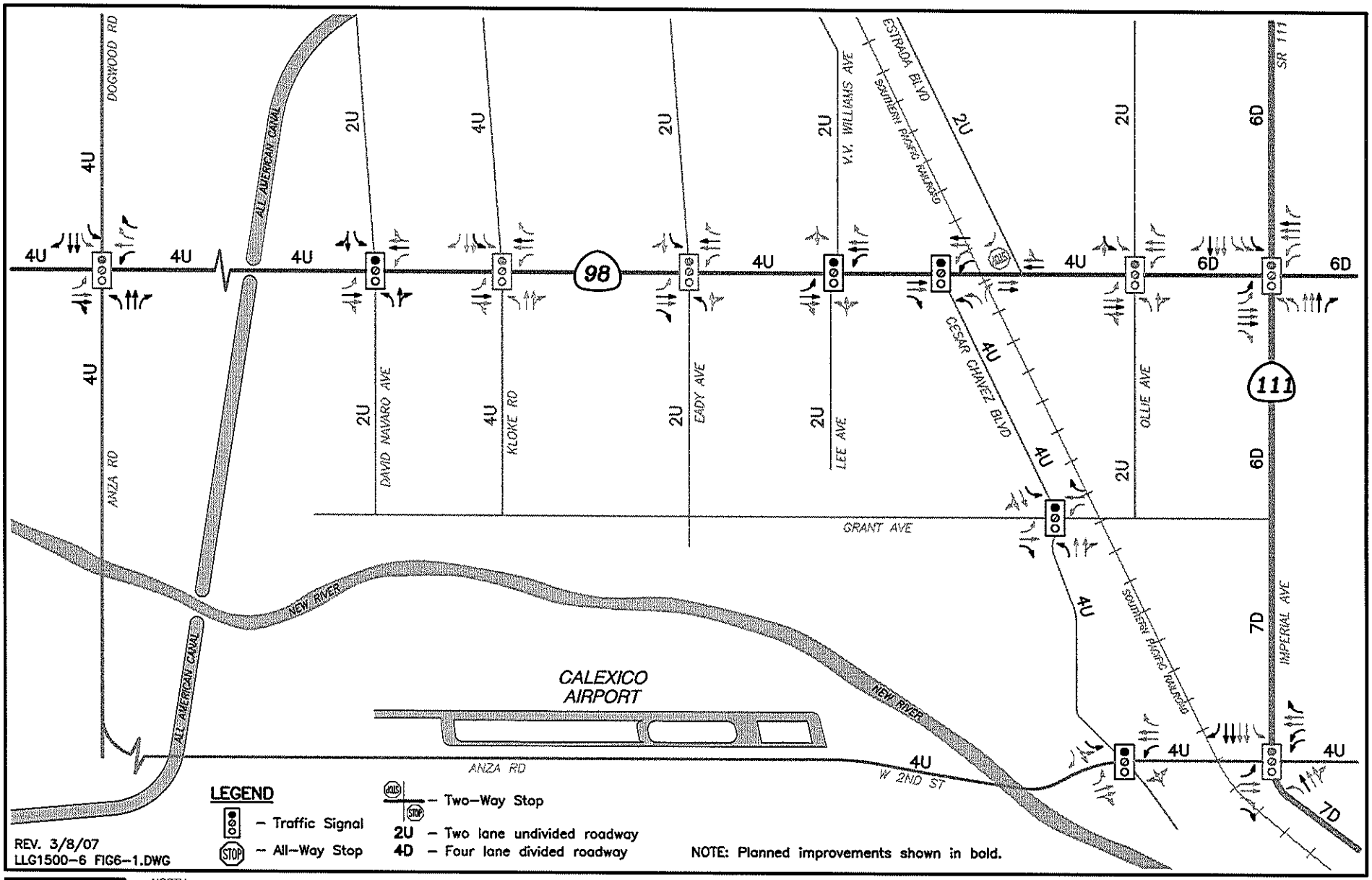
TABLE 6–1
INTERSECTION OPERATIONS WITH IMPROVEMENTS

Intersection	Existing Control Type	Peak Hour	2015 without Anza Road		2015 with Anza Road		2035 with Anza Road	
			Delay[a]	LOS[b]	Delay	LOS	Delay	LOS
SR 98/ Dogwood Road	Signal	AM	23.9	C	32.9	C	37.5	D
		PM	23.4	C	32.0	C	41.1	D
SR 98/ David Navaro Avenue	Signal	AM	45.2	D	40.4	D	28.4	C
		PM	28.5	C	27.0	C	20.4	C
SR 98 / Kloke Road	Signal	AM	53.2	D	45.1	D	46.8	D
		PM	40.3	D	36.3	D	46.8	D
SR 98/ Eady Avenue	Signal	AM	24.2	C	24.4	C	20.5	C
		PM	21.2	C	20.9	C	14.8	B
SR 98/V.V. Williams Avenue/ Lee Av	Signal	AM	17.2	B	15.2	B	17.7	B
		PM	18.6	B	18.1	B	26.9	C
SR 98/ Cesar Chavez Blvd	Signal	AM	21.6	C	20.1	C	15.2	B
		PM	30.0	C	25.9	C	14.5	B
SR 98/ Estrada Blvd	TWSC[c]	AM	13.3	B	12.6	B	13.9	B
		PM	12.6	B	11.9	B	13.5	B
SR 98/ Ollie Avenue	Signal	AM	16.4	B	13.2	B	21.1	C
		PM	34.9	C	28.1	C	34.7	C
SR 98/ SR 111/ Imperial Avenue	Signal	AM	45.7	D	32.9	C	39.2	D
		PM	50.3	D	35.5	D	48.2	D
Grant Avenue/ Cesar Chavez Blvd	Signal	AM	20.9	C	18.2	B	20.4	C
		PM	29.4	C	21.4	C	27.2	C
2nd Street/ Cesar Chavez Blvd	Signal	AM	14.6	B	16.6	B	18.7	B
		PM	19.4	B	24.4	C	30.5	C
2nd Street/ SR 111	Signal	AM	24.3	C	25.3	C	32.5	C
		PM	27.9	C	32.4	C	54.6	D

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F



LINSCOTT LAW & GREENSPAN engineers

Figure 6-1

Recommended Year 2035 Improvements (With Anza Road Extension)

7.0 OTHER ISSUES

In addition to segment improvements and intersection improvements, there are several other items that require future review or modification in order to improve traffic conditions on SR 98.

7.1.1 *Modification to Calexico West Border Crossing*

As stated in Section 3.1, the transportation network in the 2025 Imperial County Transportation Model does not include the potential modification to the Calexico West Border Station, which is also called the Downtown Calexico Port of Entry. The current facility is served by SR 111 and according to the 2002 Imperial County Transportation Plan, generates 14 million auto crossings annually (northbound and southbound). Due to the high volumes of crossing that generate high volumes of traffic to SR 111, studies have recently been conducted by several agencies to address this congestion issue. One of the recommendations is to create a coupling roadway system in which the northbound Calexico/Mexicali International Border Crossing would be directed to SR 111 and the southbound Calexico/Mexicali International Border Crossing will use Cesar Chavez Boulevard.

The modification will potentially increase traffic volumes on Cesar Chavez Boulevard. This increase in traffic volumes will need to be reviewed to determine future impacts on the SR 98 and Cesar Chavez Boulevard intersection.

7.1.2 *Spacing Between Cesar Chavez Boulevard and Southern Pacific Railroad*

The distance on SR 98 between the Cesar Chavez Boulevard and the Southern Pacific Railroad is approximately 75 feet. The short distance is critical for the westbound left-turn movement from SR 98 to Cesar Chavez Boulevard. A distance of 75 feet can store about three to four vehicles. Currently if there is a queue of more than three vehicles making a westbound left-turn movement, the following vehicle could be on the Southern Pacific railroad tracks, which is illegal and an extremely dangerous situation.

A traffic signal is proposed for the SR 98 and Cesar Chavez intersection due to the increase of traffic on Cesar Chavez Boulevard and the widening of SR 98. The addition of a traffic signal, along with the short distance on SR 98 between Cesar Chavez Boulevard and the Southern Pacific Railroad, should improve this operational issue for the left-turn vehicles on the westbound approach. A traffic signal with preemption allows vehicles stopped on the tracks the opportunity to move out of the railroad track area before arrival of a train.

7.1.3 *Truck Traffic*

Vehicle classification counts were conducted along SR 98 from west of David Navaro Avenue to east of SR 111. ***Table 7-1*** summarizes the percentile of truck traffic on SR 98. The table indicates that the percentage of trucks on SR 98 in the project area range from 6.57 percent to 15.07 percent. According to the Traffic Engineering Handbook published by ITE (5th Edition), trucks constitute approximately 11 percent of traffic on rural highways and approximately 5 percent of traffic on urban highways. A review of *Table 6-1* indicates that the truck composition on SR 98 falls within the 11 percent range except for the segment between Eady Avenue and Lee Avenue and the section east of SR 111. In general, the truck volumes are relatively high for this urbanizing area.

The widening of SR 98 to a four-lane roadway should also improve general operation since the additional thru lane will be used as a lane for passing truck traffic.

7.1.4 *Bicycle Lanes*

There currently are no bicycle lanes on SR 98 from David Navaro Avenue to SR 111. The City of Calexico Bicycle Master Plan (September 30, 2003) proposed a Class I bicycle facility on SR 98 from Ollie Avenue to the Canal. A Class I bicycle path is defined as an eight-foot wide multi-use two-way pathway, separate from the vehicle roadway.

The City of Calexico is in the process of updating their General Plan. They are recommending in the Updated General Plan that a Class II bicycle facility be installed on SR 98 instead of a Class I bicycle facility. A Class II bicycle lane is defined as a five-foot striped bicycle lane within the roadway segment. However, the General Plan has not yet been amended so until the amendment is completed, a Class I bicycle facility is still the most current recommendation for SR 98 from David Navaro Avenue to SR 111.

TABLE 7–1
SR 98 – PERCENTILE TRUCK TRAFFIC

Segment	ADT	Truck Traffic	Percent Trucks
SR 98			
- West of David Navaro	10,878	920	8.46%
- David Navaro and Kloke Rd	11,126	856	7.69%
- Kloke Rd and Easy Ave	17,081	1,996	11.69%
- Eady Ave and V.V. Williams Ave	16,993	2,400	14.12%
- Estrada Blvd and Ollie Ave	22,389	2,617	11.69%
- Ollie Ave and SR 111	25,331	1,664	6.57%
- East of SR 111	26,316	3,967	15.07%
SR 111			
- North of SR 98	33,061	2,883	8.72%
- South of SR 98	36,165	2,507	6.93%

8.0 CONCLUSIONS

Linscott, Law & Greenspan, Engineers (LLG) was retained by Caltrans through Dokken Engineering to evaluate the proposed widening of State Route 98 (SR 98) in the City of Calexico. The project encompasses the SR 98 corridor from Dogwood Road to SR 111, Cesar Chavez Boulevard from SR 98 to 2nd Street, and 2nd Street from Cesar Chavez Boulevard to SR 111. The roadway facilities within the study area fall under both City of Calexico and CALTRANS jurisdiction.

The first phase of the study is the preparation of a traffic volumes report for the study area and the second phase is the preparation of a traffic operational analysis report. The main purpose of the operational analysis report is to identify the number of lanes midblock on SR 98 and at the key intersections to achieve acceptable Levels of Service (LOS D) for Year 2015 and Year 2035.

A modification of SCAG's 2025 Regional Model was used to forecast Year 2025 traffic volumes along SR 98. Modifications were made to both the land use and network impacts so that the data is consistent with the City of Calexico General Plan. Once the land use and network data were modified, Year 2025 ADT volumes were forecasted for two scenarios (with and without the Anza Road extension to Dogwood Road). An annual growth rate of one and one-half percent (1.5%) was applied for traffic on SR 98, SR 111, Cesar Chavez Boulevard, and 2nd Street and a three quarter percent (0.75%) annual growth rate was applied to the other roads in the study area to the Year 2025 ADT volumes to determine Year 2015 and Year 2035 ADT volumes for both scenarios. ADT volumes for Year 2015 and Year 2035 were than used to calculate Year 2015 and Year 2035 intersection peak hour turning volumes for both scenarios based on the existing relationship between ADT and peak hour turning volumes.

Intersection capacity analyses were conducted for the following conditions with the existing lane configurations on SR 98:

- Existing Condition
- Year 2015 without Anza Road
- Year 2015 with Anza Road
- Year 2035 without Anza Road
- Year 2035 with Anza Road

Street segment analyses were conducted for all the street segments for the existing conditions and for Year 2035 with Anza Road extension scenario. Future street classifications are based on the City of Calexico Street Classification with Traffic Signal Map.

The intersection capacity analysis and street segment analysis indicated that roadway and intersection improvements were required along SR 98 in addition to widening the corridor to four lanes between Dogwood Road and SR 111. Although several scenarios were analyzed, the Year 2035 with the Anza Road extension scenario volumes were used to determine recommended improvements because it is the most likely long-term/build-out scenario.

After segment and intersection recommendations were made for the Year 2035 (with Anza Road Extension) scenario, intersection capacity analyses were conducted at all the intersections with the recommended intersection lane configurations for the following scenarios:

- Year 2015 without Anza Road
- Year 2015 with Anza Road
- Year 2035 with Anza Road

The intersection analysis showed that all the intersections are projected to operate at LOS D or better with the recommended intersection and segment recommendations as described in the report.

LINSCOTT
LAW &
GREENSPAN
engineers

TECHNICAL APPENDICES

SR 98 WIDENING UPDATE

City of Calexico, California
April 23, 2007

Prepared for:
DOKKEN ENGINEERING
5675 Ruffin Road, Suite 250
San Diego, California 92123

LLG Ref. 3-04-1500 Task 6

Prepared by:
Norene N. Pen, P.E.
Transportation Engineer III

Under the Supervision of:
John P. Keating, P.E.
Principal

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

APPENDIX A

INTERSECTION COUNT SHEETS

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Ave & SR-98

File Name : 05145010
Site Code : 00145010
Start Date : 5/4/2005
Page No : 1

Groups Printed- Cars & Light Trucks

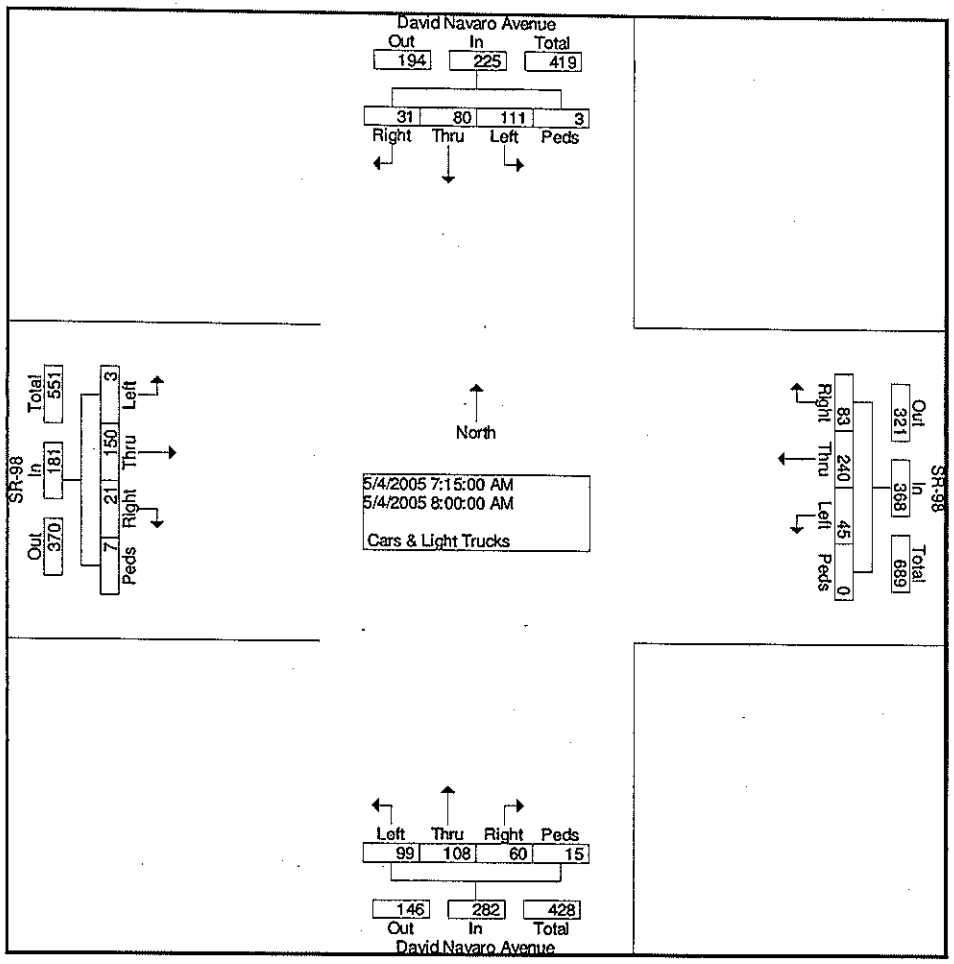
	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	4	2	6	0	12	4	74	1	0	79	11	3	9	2	25	1	24	0	1	26	142
06:45	12	6	9	1	28	6	48	3	1	58	11	11	6	1	29	3	27	4	0	34	149
Total	16	8	15	1	40	10	122	4	1	137	22	14	15	3	54	4	51	4	1	60	291
07:00	11	0	6	2	19	5	49	5	0	59	18	9	12	0	39	1	22	0	1	24	141
07:15	10	5	8	2	25	8	53	9	0	70	17	10	11	3	41	1	28	2	2	33	169
07:30	23	17	10	0	50	7	64	23	0	94	35	33	13	9	90	1	38	6	5	50	284
07:45	48	25	10	0	83	15	52	18	0	85	29	41	20	3	93	1	38	6	0	45	306
Total	92	47	34	4	177	35	218	55	0	308	99	93	56	15	263	4	126	14	8	152	900
08:00	30	33	3	1	67	15	71	33	0	119	18	24	16	0	58	0	46	7	0	53	297
08:15	13	9	4	0	26	12	67	16	0	95	6	9	8	0	23	1	23	0	0	24	168
08:30	4	5	3	2	14	9	57	8	0	74	11	2	10	0	23	3	32	1	0	36	147
08:45	9	4	3	0	16	10	45	6	0	61	8	7	9	1	25	4	16	3	0	23	125
Total	56	51	13	3	123	46	240	63	0	349	43	42	43	1	129	8	117	11	0	136	737
09:00	11	2	3	1	17	6	47	8	0	61	10	5	15	0	30	3	17	0	0	20	128
09:15	12	0	3	0	15	4	44	5	1	54	6	2	8	0	16	1	37	3	0	41	126
Grand Total	187	108	68	9	372	101	671	135	2	909	180	156	137	19	492	20	348	32	9	409	2182
Apprch %	50.3	29.0	18.3	2.4		11.1	73.8	14.9	0.2		36.6	31.7	27.8	3.9		4.9	85.1	7.8	2.2		
Total %	8.6	4.9	3.1	0.4	17.0	4.6	30.8	6.2	0.1	41.7	8.2	7.1	6.3	0.9	22.5	0.9	15.9	1.5	0.4	18.7	

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	07:15																				
Volume	111	80	31	3	225	45	240	83	0	368	99	108	60	15	282	3	150	21	7	181	1056
Percent	49.3	35.6	13.8	1.3		12.2	65.2	22.6	0.0		35.1	38.3	21.3	5.3		1.7	82.9	11.6	3.9		
07:45 Volume	48	25	10	0	83	15	52	18	0	85	29	41	20	3	93	1	38	6	0	45	306
Peak Factor																					0.863
High Int.	07:45					08:00					07:45					08:00					
Volume	48	25	10	0	83	15	71	33	0	119	29	41	20	3	93	0	46	7	0	53	
Peak Factor					0.678					0.773					0.758					0.854	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Ave & SR-98

File Name : 05145010
Site Code : 00145010
Start Date : 5/4/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Av. & SR-98

File Name : 05145011
Site Code : 00145011
Start Date : 5/4/2005
Page No : 1

Groups Printed- Cars & Light Trucks

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	12	8	6	0	26	13	51	24	1	89	13	27	5	0	45	3	63	8	0	74	234
14:45	27	15	9	3	54	15	48	27	0	90	10	22	5	0	37	7	94	7	0	108	289
Total	39	23	15	3	80	28	99	51	1	179	23	49	10	0	82	10	157	15	0	182	523
15:00	23	22	4	2	51	20	65	15	0	100	10	11	5	0	26	5	73	17	0	95	272
15:15	17	11	1	2	31	23	51	21	1	96	15	12	5	0	32	5	116	12	0	133	292
15:30	9	11	3	2	25	6	72	16	0	94	10	12	5	0	27	7	107	19	0	133	279
15:45	11	5	4	0	20	22	60	12	1	95	4	8	7	3	22	6	96	18	0	120	257
Total	60	49	12	6	127	71	248	64	2	385	39	43	22	3	107	23	392	66	0	481	1100
16:00	11	12	5	2	30	15	50	15	0	80	5	9	8	0	22	9	91	22	0	122	254
16:15	9	3	3	0	15	32	42	14	0	88	10	5	3	0	18	6	115	20	0	141	262
16:30	11	6	1	1	19	16	45	7	0	68	12	3	10	0	25	9	99	20	0	128	240
16:45	13	7	4	1	25	22	49	20	1	92	10	6	9	0	25	10	90	17	0	117	259
Total	44	28	13	4	89	85	186	56	1	328	37	23	30	0	90	34	395	79	0	508	1015
17:00	16	9	2	0	27	23	54	17	0	94	6	3	11	0	20	15	114	25	0	154	295
17:15	11	7	5	0	23	21	55	13	0	89	6	9	7	1	23	10	114	20	0	144	279
17:30	14	7	9	0	30	21	44	25	0	90	10	8	8	0	26	5	98	28	0	131	277
17:45	19	4	5	0	28	21	41	8	0	70	17	12	14	2	45	7	96	20	0	123	266
Total	60	27	21	0	108	86	194	63	0	343	39	32	40	3	114	37	422	93	0	552	1117
18:00	15	8	1	1	25	16	47	18	1	82	3	9	10	1	23	3	79	16	0	98	228
18:15	14	14	1	1	30	23	45	11	1	80	11	15	18	0	44	6	78	17	0	101	255
Grand Total	232	149	63	15	459	309	819	263	6	1397	152	171	130	7	460	113	1523	286	0	1922	4238
Apprch %	50.5	32.5	13.7	3.3		22.1	58.6	18.8	0.4		33.0	37.2	28.3	1.5		5.9	79.2	14.9	0.0		
Total %	5.5	3.5	1.5	0.4	10.8	7.3	19.3	6.2	0.1	33.0	3.6	4.0	3.1	0.2	10.9	2.7	35.9	6.7	0.0	45.4	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Av. & SR-98

File Name : 05145011
Site Code : 00145011
Start Date : 5/4/2005
Page No : 2

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection	14:45																				
Volume	76	59	17	9	161	64	236	79	1	380	45	57	20	0	122	24	390	55	0	469	1132
Percent	47.2	36.6	10.6	5.6		16.8	62.1	20.8	0.3		36.9	46.7	16.4	0.0		5.1	83.2	11.7	0.0		
15:15 Volume	17	11	1	2	31	23	51	21	1	96	15	12	5	0	32	5	116	12	0	133	292
Peak Factor																					0.969
High Int.	14:45					15:00					14:45					15:15					
Volume	27	15	9	3	54	20	65	15	0	100	10	22	5	0	37	5	116	12	0	133	
Peak Factor					0.745					0.950					0.824					0.882	

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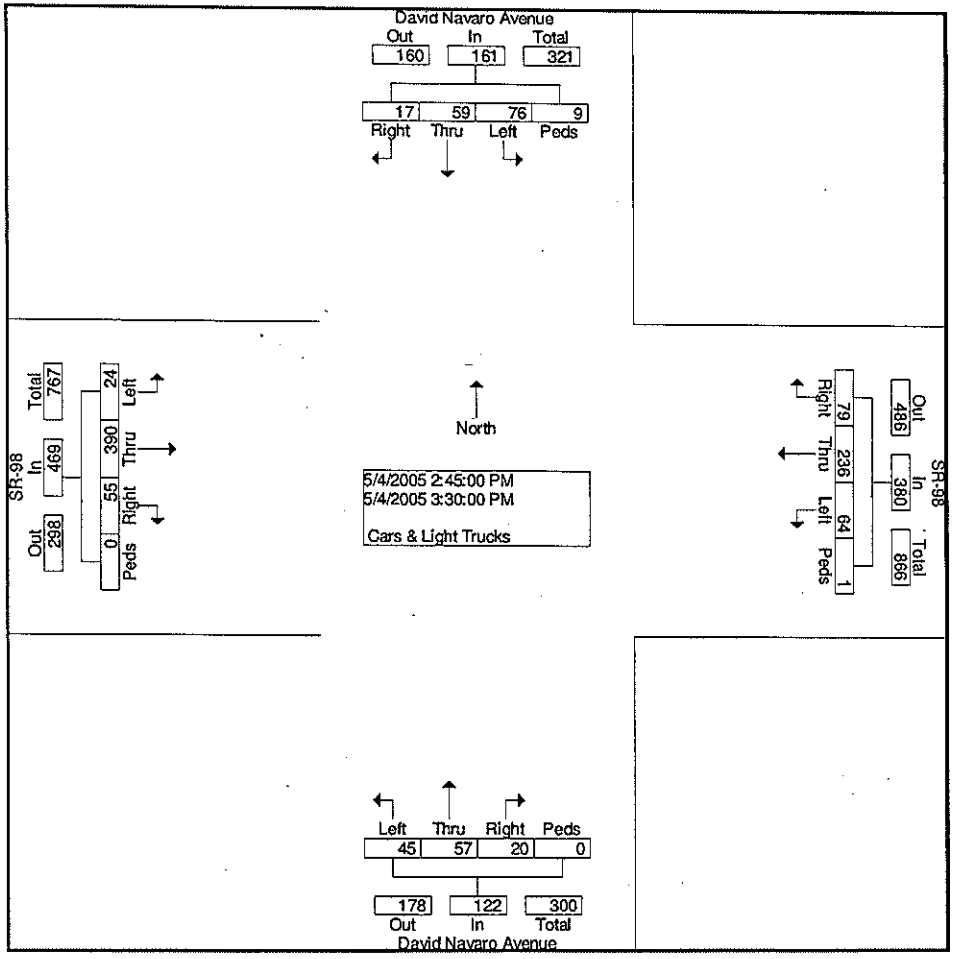
Location : David Navaro Av. & SR-98

File Name : 05145011
Site Code : 00145011
Start Date : 5/4/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

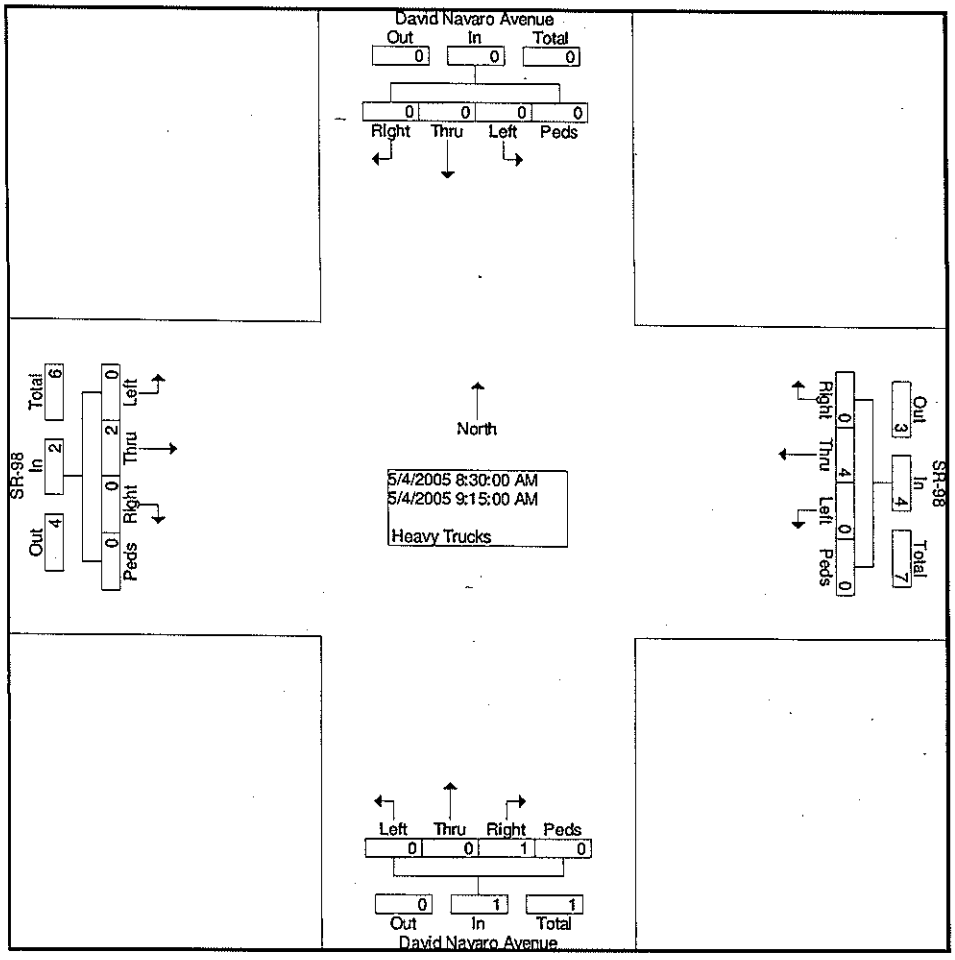
Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Ave & SR-98

File Name : 05145010
Site Code : 00145010
Start Date : 5/4/2005

Groups Printed- Heavy Trucks

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
07:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
07:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
09:00	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
09:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	0	4	0	0	4	11
Apprch %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	54.5	0.0	0.0	54.5	0.0	0.0	9.1	0.0	9.1	0.0	36.4	0.0	0.0	36.4	

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	08:30																				
Volume	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	0	2	0	0	2	7
Percent	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0		
09:00 Volume	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Peak Factor																					0.583
High Int.	6:15:00 AM					09:00					09:15					08:30					
Volume	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	0	1	0	0	1	
Peak Factor										0.333					0.250					0.500	


David Navaro Avenue
Out
In
Total
0
0
0
0
0
0
0
Right
Thru
Left
Peds
North
5/4/2005 8:30:00 AM
5/4/2005 9:15:00 AM
Heavy Trucks
SR-98
Total
6
In
2
Out
4
0
2
0
0
Left
Thru
Right
Peds
SR-98
Out
3
In
4
Total
7
0
4
0
0
Right
Thru
Left
Peds
Left
Thru
Right
Peds
0
0
1
0
0
1
1
Out
In
Total
David Navaro Avenue

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Av. & SR-98

File Name : 05145011
Site Code : 00145011
Start Date : 5/4/2005

Groups Printed- Heavy Trucks

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
15:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
15:30	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	7	0	0	7	10
16:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
16:15	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
16:30	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	2	0	0	2	5
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	5	0	0	5	11
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
17:30	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
17:45	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
Total	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	11
18:00	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Grand Total	0	0	0	0	0	0	17	0	0	17	1	0	0	0	1	0	22	0	0	22	40
Apprch %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	42.5	0.0	0.0	42.5	2.5	0.0	0.0	0.0	2.5	0.0	55.0	0.0	0.0	55.0	

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Av. & SR-98

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

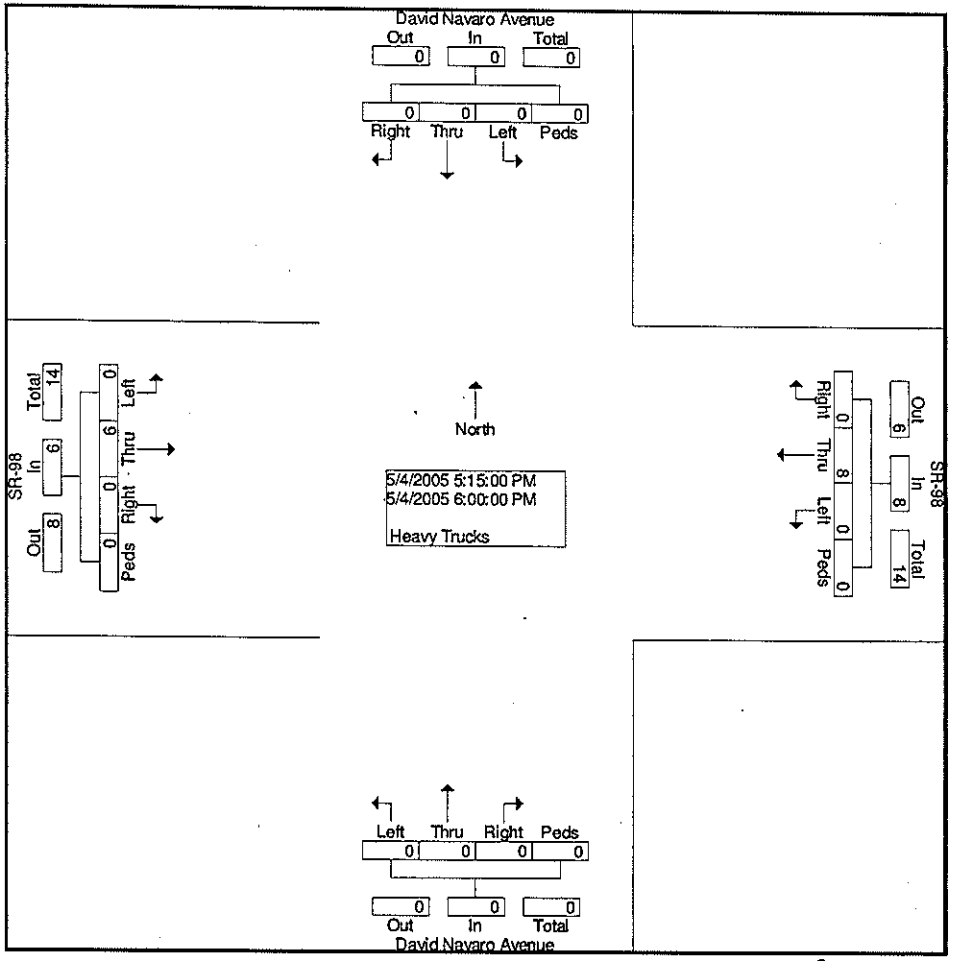
File Name : 05145011
Site Code : 00145011
Start Date : 5/4/2005
Page No : 2

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection	17:15																				
Volume	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	6	0	0	6	14
Percent	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
17:30 Volume	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
Peak Factor																					0.583
High Int.	2:15:00 PM					17:45					2:15:00 PM					17:30					
Volume	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	
Peak Factor										0.667										0.375	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Av. & SR-98

File Name : 05145011
Site Code : 00145011
Start Date : 5/4/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

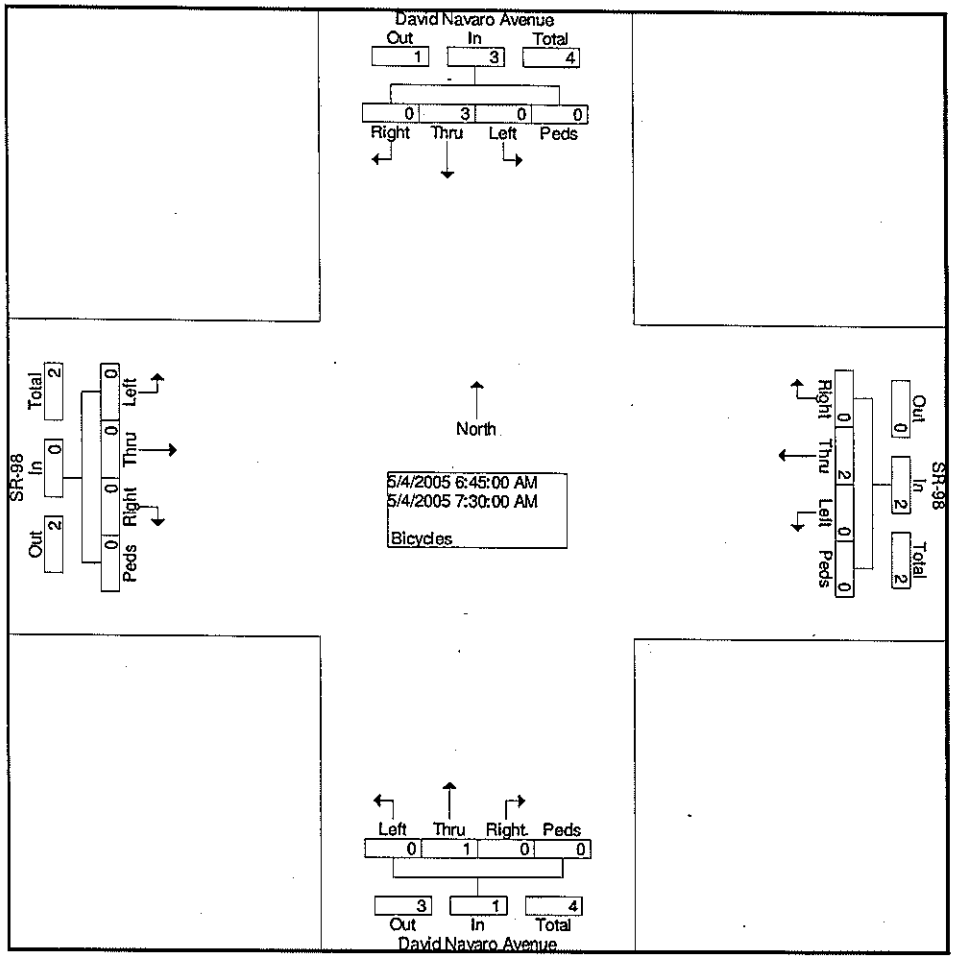
Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Ave & SR-98

File Name : 05145010
Site Code : 00145010
Start Date : 5/4/2005
Page No : 1

Groups Printed- Bicycles

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
Total	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:30	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	3
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	3	0	0	3	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	6
Apprch %	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	50.0	0.0	0.0	50.0	0.0	33.3	0.0	0.0	33.3	0.0	16.7	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	06:45																				
Volume	0	3	0	0	3	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	6
Percent	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		
06:45 Volume	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
Peak Factor																					0.500
High Int.	06:45					06:45					07:30					6:15:00 AM					
Volume	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1						
Peak Factor					0.375					0.500					0.250						


David Navaro Avenue
Out
In
Total
1
3
4
0
3
0
0
Right
Thru
Left
Peds
North
5/4/2005 6:45:00 AM
5/4/2005 7:30:00 AM
Bicycles
SR-98
Total
2
In
0
Out
2
Left
Thru
Right
Peds
0
0
0
0
SR-98
Out
0
In
2
Total
2
Right
Thru
Left
Peds
0
2
0
0
Left
Thru
Right
Peds
0
1
0
0
3
Out
1
In
4
Total
David Navaro Avenue

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Av. & SR-98

File Name : 05145011
Site Code : 00145011
Start Date : 5/4/2005
Page No : 1

Groups Printed- Bicycles

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Grand Total	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2	7
Apprch %	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	42.9	0.0	0.0	42.9	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	28.6	0.0	28.6	0.0	0.0	28.6	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Av. & SR-98

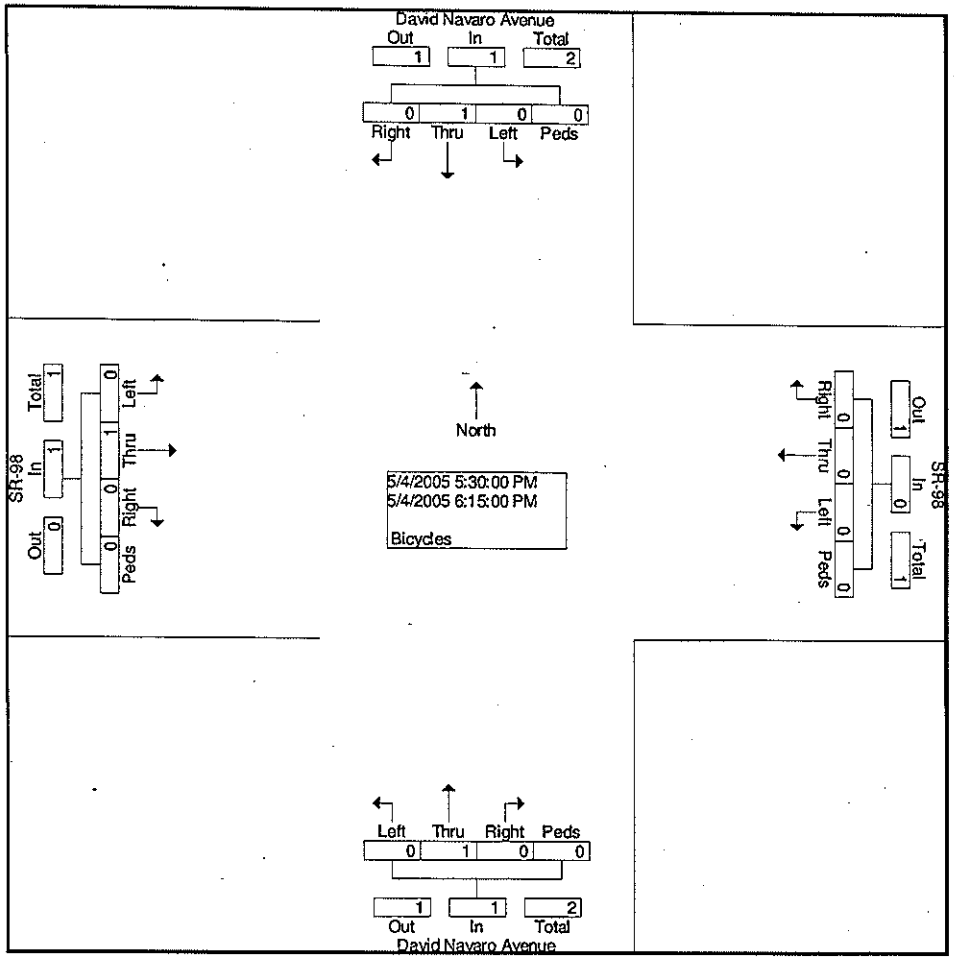
File Name : 05145011
Site Code : 00145011
Start Date : 5/4/2005
Page No : 2

	David Navaro Avenue Southbound					SR-98 Westbound					David Navaro Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection	17:30																				
Volume	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	3
Percent	0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
18:15 Volume	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Peak Factor																					0.750
High Int.	17:30					2:15:00 PM					18:15					17:45					
Volume	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	
Peak Factor					0.250										0.250					0.250	

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : David Navaro Av. & SR-98

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

File Name : 05145011
Site Code : 00145011
Start Date : 5/4/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

File Name : 05145020
Site Code : 00145020
Start Date : 5/4/2005
Page No : 1

Groups Printed- Cars & Light Trucks

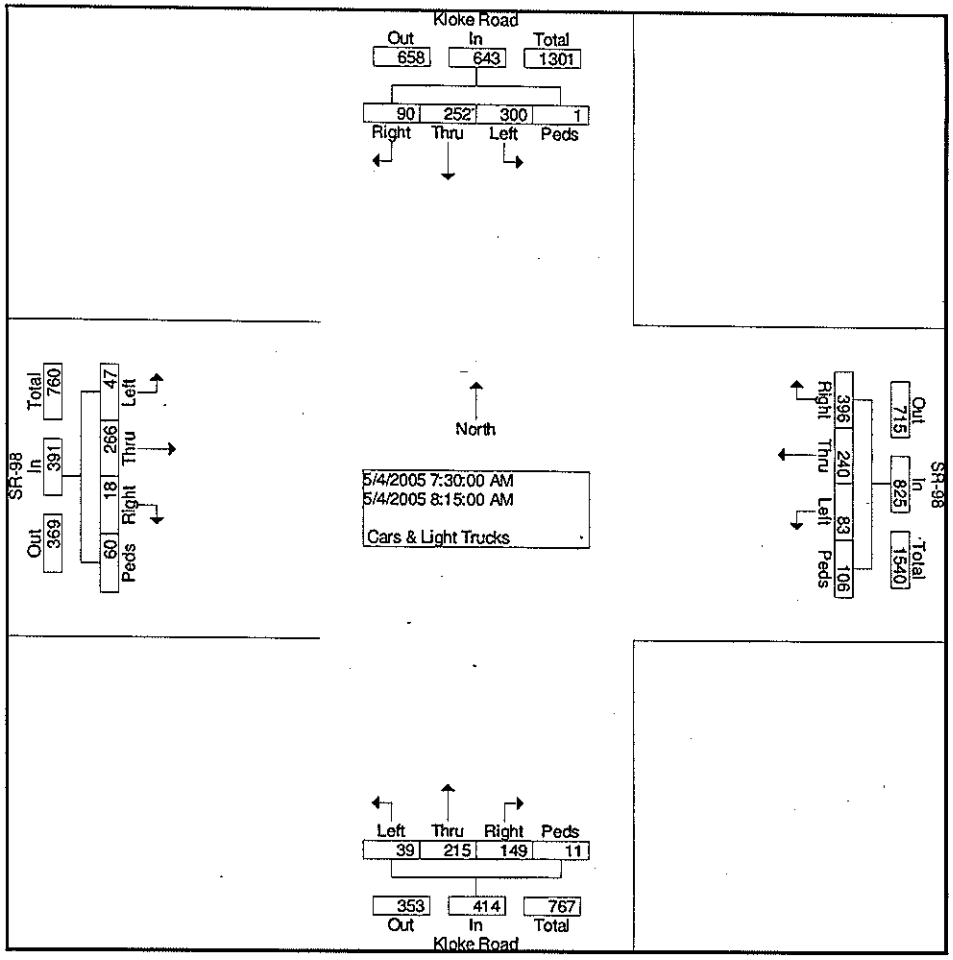
	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	11	9	1	1	22	14	56	8	0	78	6	11	18	1	36	1	30	1	2	34	170
06:45	14	2	2	1	19	15	39	12	1	67	9	6	21	1	37	2	36	4	1	43	166
Total	25	11	3	2	41	29	95	20	1	145	15	17	39	2	73	3	66	5	3	77	336
07:00	9	7	4	1	21	14	45	19	0	78	5	8	17	0	30	2	32	6	3	43	172
07:15	32	16	13	2	63	12	51	31	6	100	7	17	26	2	52	3	36	6	11	56	271
07:30	60	41	19	1	121	17	65	77	27	186	8	52	49	3	112	11	59	1	24	95	514
07:45	111	90	19	0	220	16	51	135	36	238	10	71	44	0	125	15	83	5	21	124	707
Total	212	154	55	4	425	59	212	262	69	602	30	148	136	5	319	31	210	18	59	318	1664
08:00	79	90	40	0	209	20	56	138	43	257	9	72	36	8	125	15	83	6	15	119	710
08:15	50	31	12	0	93	30	68	46	0	144	12	20	20	0	52	6	41	6	0	53	342
08:30	34	22	5	0	61	14	58	16	0	88	5	13	28	0	46	7	34	4	0	45	240
08:45	36	8	4	0	48	20	47	16	0	83	3	12	20	0	35	3	31	3	0	37	203
Total	199	151	61	0	411	84	229	216	43	572	29	117	104	8	258	31	189	19	15	254	1495
09:00	26	17	4	0	47	23	50	16	0	89	6	19	21	0	46	3	38	4	0	45	227
09:15	28	10	2	1	41	19	33	12	0	64	11	11	10	0	32	9	45	2	1	57	194
Grand Total	490	343	125	7	965	214	619	526	113	1472	91	312	310	15	728	77	548	48	78	751	3916
Apprch %	50.8	35.5	13.0	0.7		14.5	42.1	35.7	7.7		12.5	42.9	42.6	2.1		10.3	73.0	6.4	10.4		
Total %	12.5	8.8	3.2	0.2	24.6	5.5	15.8	13.4	2.9	37.6	2.3	8.0	7.9	0.4	18.6	2.0	14.0	1.2	2.0	19.2	

	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	07:30																				
Volume	300	252	90	1	643	83	240	396	106	825	39	215	149	11	414	47	266	18	60	391	2273
Percent	46.7	39.2	14.0	0.2		10.1	29.1	48.0	12.8		9.4	51.9	36.0	2.7		12.0	68.0	4.6	15.3		
08:00 Volume	79	90	40	0	209	20	56	138	43	257	9	72	36	8	125	15	83	6	15	119	710
Peak Factor																					0.800
High Int.	07:45					08:00					07:45					07:45					
Volume	111	90	19	0	220	20	56	138	43	257	10	71	44	0	125	15	83	5	21	124	
Peak Factor					0.731					0.803					0.828					0.788	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

File Name : 05145020
Site Code : 00145020
Start Date : 5/4/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

File Name : 05145021
Site Code : 00145021
Start Date : 5/4/2005
Page No : 1

Groups Printed- Cars & Light Trucks

	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	53	40	21	2	116	19	38	59	0	116	13	37	13	8	71	4	51	6	25	86	389
14:45	90	66	22	0	178	26	67	83	42	218	9	49	26	10	94	8	88	11	39	146	636
Total	143	106	43	2	294	45	105	142	42	334	22	86	39	18	165	12	139	17	64	232	1025
15:00	107	64	26	0	197	29	53	93	96	271	15	29	28	12	84	12	84	7	52	155	707
15:15	54	42	11	0	107	25	72	32	42	171	11	29	30	3	73	2	113	12	19	146	497
15:30	38	40	12	0	90	35	68	49	45	197	13	21	35	3	72	1	98	8	8	115	474
15:45	47	30	5	2	84	38	73	38	12	161	26	15	34	0	75	7	101	10	6	124	444
Total	246	176	54	2	478	127	266	212	195	800	65	94	127	18	304	22	396	37	85	540	2122
16:00	38	32	3	3	76	17	55	28	2	102	9	22	27	1	59	5	89	7	10	111	348
16:15	41	18	10	0	69	30	71	28	0	129	6	10	24	0	40	2	109	13	3	127	365
16:30	21	20	3	1	45	42	58	31	0	131	12	13	23	0	48	2	103	14	0	119	343
16:45	27	21	11	0	59	30	67	28	1	126	7	17	34	1	59	7	82	13	6	108	352
Total	127	91	27	4	249	119	251	115	3	488	34	62	108	2	206	16	383	47	19	465	1408
17:00	26	21	13	0	60	29	60	35	0	124	14	20	32	2	68	6	114	12	0	132	384
17:15	39	26	8	0	73	22	72	35	2	131	15	18	34	0	67	5	114	19	5	143	414
17:30	45	24	6	0	75	28	67	39	0	134	12	28	38	1	79	11	87	9	1	108	396
17:45	27	26	7	0	60	16	54	47	1	118	8	22	35	0	65	12	103	6	2	123	366
Total	137	97	34	0	268	95	253	156	3	507	49	88	139	3	279	34	418	46	8	506	1560
18:00	32	25	10	0	67	32	57	38	0	127	11	31	39	0	81	9	82	7	0	98	373
18:15	21	18	6	1	46	25	62	28	1	116	13	17	45	0	75	5	84	10	3	102	339
Grand Total	706	513	174	9	1402	443	994	691	244	2372	194	378	497	41	1110	98	1502	164	179	1943	6827
Apprch %	50.4	36.6	12.4	0.6		18.7	41.9	29.1	10.3		17.5	34.1	44.8	3.7		5.0	77.3	8.4	9.2		
Total %	10.3	7.5	2.5	0.1	20.5	6.5	14.6	10.1	3.6	34.7	2.8	5.5	7.3	0.6	16.3	1.4	22.0	2.4	2.6	28.5	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

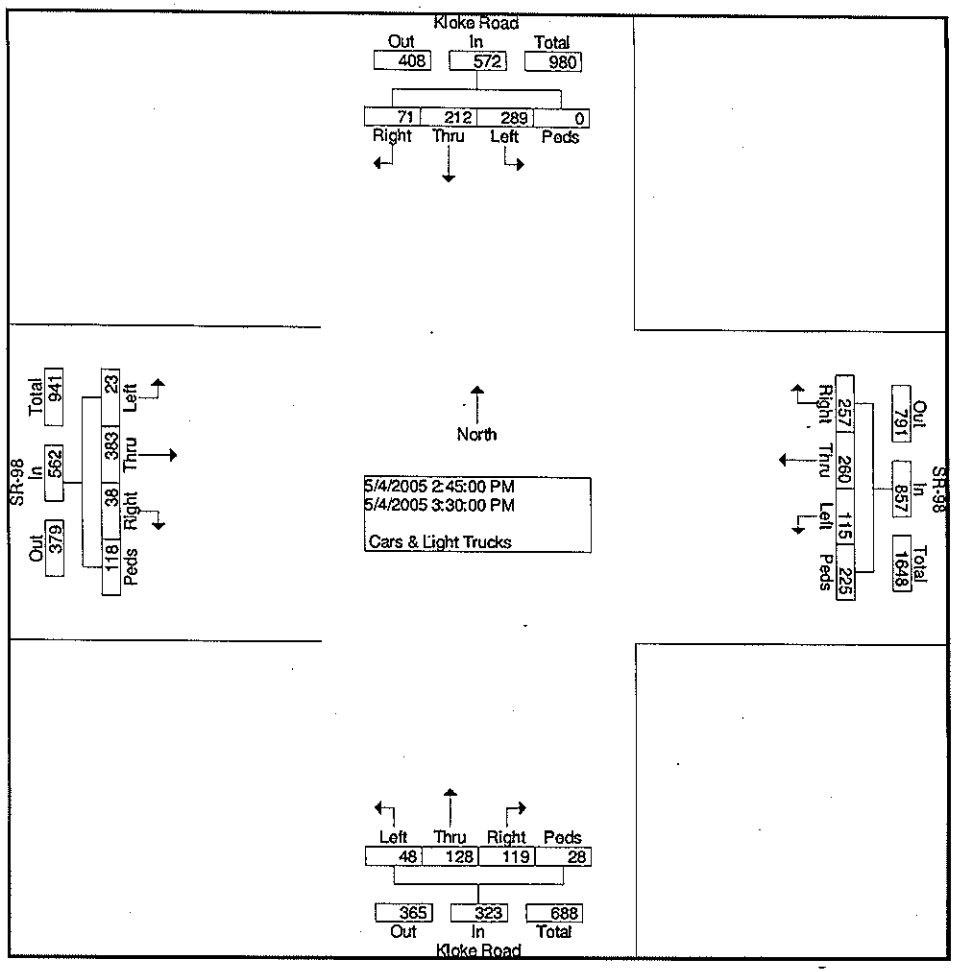
File Name : 05145021
Site Code : 00145021
Start Date : 5/4/2005
Page No : 2

	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection	14:45																				
Volume	289	212	71	0	572	115	260	257	225	857	48	128	119	28	323	23	383	38	118	562	2314
Percent	50.5	37.1	12.4	0.0		13.4	30.3	30.0	26.3		14.9	39.6	36.8	8.7		4.1	68.1	6.8	21.0		
15:00 Volume	107	64	26	0	197	29	53	93	96	271	15	29	28	12	84	12	84	7	52	155	707
Peak Factor																					
High Int.	15:00					15:00					14:45					15:00					0.818
Volume	107	64	26	0	197	29	53	93	96	271	9	49	26	10	94	12	84	7	52	155	
Peak Factor					0.726					0.791					0.859					0.906	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

File Name : 05145021
Site Code : 00145021
Start Date : 5/4/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

File Name : 05145020
Site Code : 00145020
Start Date : 5/4/2005
Page No : 1

Groups Printed- Heavy Trucks

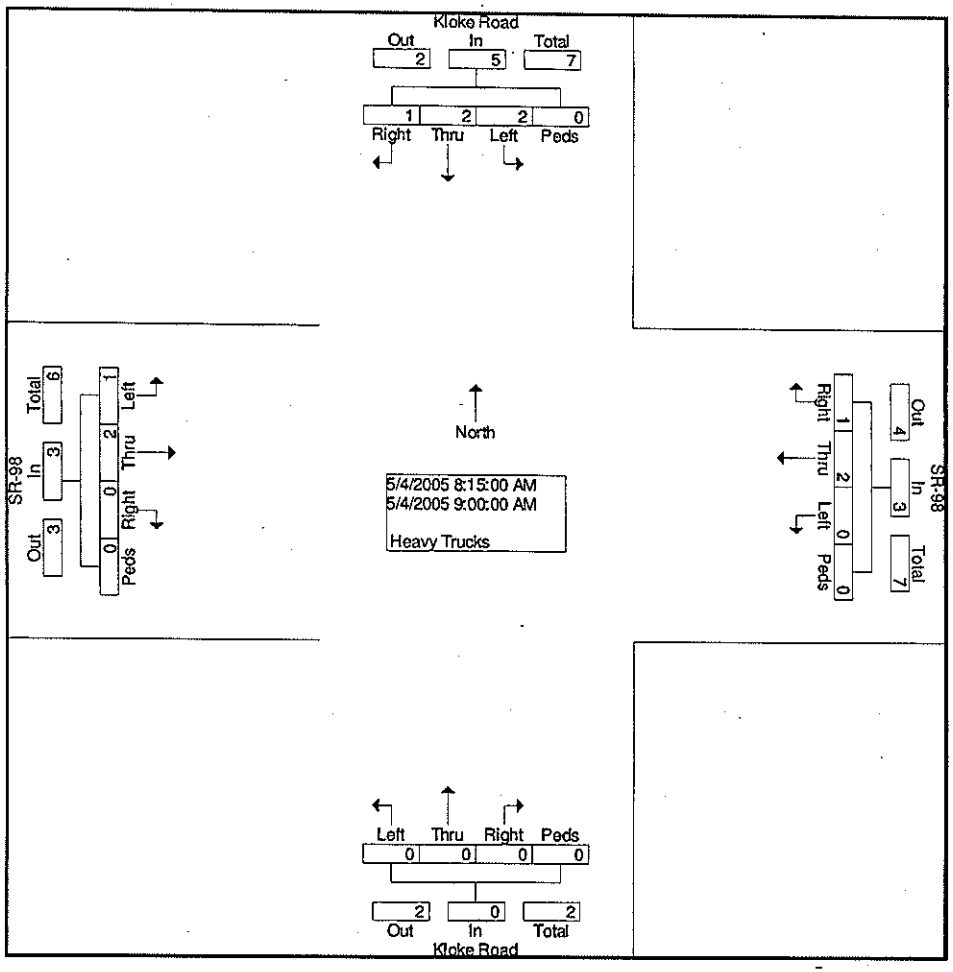
	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
07:00	0	0	1	0	1	0	2	2	0	4	0	0	0	0	0	0	0	0	0	0	5
07:15	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	1	1	0	3	0	2	2	0	4	0	0	0	0	0	0	0	0	0	0	7
08:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
08:15	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
08:45	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	1	1	0	0	2	4
Total	2	2	0	0	4	0	0	1	0	1	0	1	0	0	1	1	2	0	0	3	9
09:00	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3
09:15	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	0	0	1	3
Grand Total	3	3	2	0	8	0	6	5	0	11	0	1	0	0	1	2	2	0	0	4	24
Apprch %	37.5	37.5	25.0	0.0		0.0	54.5	45.5	0.0		0.0	100.0	0.0	0.0		50.0	50.0	0.0	0.0		
Total %	12.5	12.5	8.3	0.0	33.3	0.0	25.0	20.8	0.0	45.8	0.0	4.2	0.0	0.0	4.2	8.3	8.3	0.0	0.0	16.7	

	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	08:15																				
Volume	2	2	1	0	5	0	2	1	0	3	0	0	0	0	0	1	2	0	0	3	11
Percent	40.0	40.0	20.0	0.0		0.0	66.7	33.3	0.0		0.0	0.0	0.0	0.0		33.3	66.7	0.0	0.0		
08:45																					
Volume	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	1	1	0	0	2	4
Peak Factor																					0.688
High Int.	08:15					09:00					6:15:00 AM					08:45					
Volume	2	1	0	0	3	0	2	0	0	2	0	0	0	0	0	1	1	0	0	2	
Peak Factor					0.417					0.375										0.375	

Weather : Clear & Dry
Counted by: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

File Name : 05145020
Site Code : 00145020
Start Date : 5/4/2005
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

File Name : 05145021
Site Code : 00145021
Start Date : 5/4/2005
Page No : 1

Groups Printed- Heavy Trucks

	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	2	0	0	2	0	0	1	0	1	0	2	3	0	5	0	0	0	0	0	8
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	2	0	0	2	0	0	1	0	1	0	2	3	0	5	0	2	0	0	2	10
15:00	0	0	1	0	1	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	4
15:15	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	0	0	2	3
15:30	0	0	1	0	1	0	2	1	0	3	0	0	0	0	0	0	3	0	0	3	7
15:45	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	4
Total	1	0	2	0	3	0	4	3	0	7	0	0	0	0	0	0	8	0	0	8	18
16:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	4
16:15	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	2
16:30	1	0	0	0	1	1	2	0	0	3	0	0	0	0	0	0	2	0	0	2	6
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	2	1	3	1	0	5	0	0	0	0	0	1	4	0	0	5	12
17:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
17:15	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	4
17:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	4
17:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
Total	3	0	0	0	3	0	2	2	0	4	0	0	0	0	0	0	5	1	0	6	13
18:00	2	0	0	0	2	0	3	2	0	5	0	0	0	0	0	0	0	0	0	0	7
18:15	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3
Grand Total	10	2	2	0	14	1	12	10	0	23	0	2	3	0	5	1	19	1	0	21	63
Apprch %	71.4	14.3	14.3	0.0		4.3	52.2	43.5	0.0		0.0	40.0	60.0	0.0		4.8	90.5	4.8	0.0		
Total %	15.9	3.2	3.2	0.0	22.2	1.6	19.0	15.9	0.0	36.5	0.0	3.2	4.8	0.0	7.9	1.6	30.2	1.6	0.0	33.3	

Weather : Clear & Dry
Counted By: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

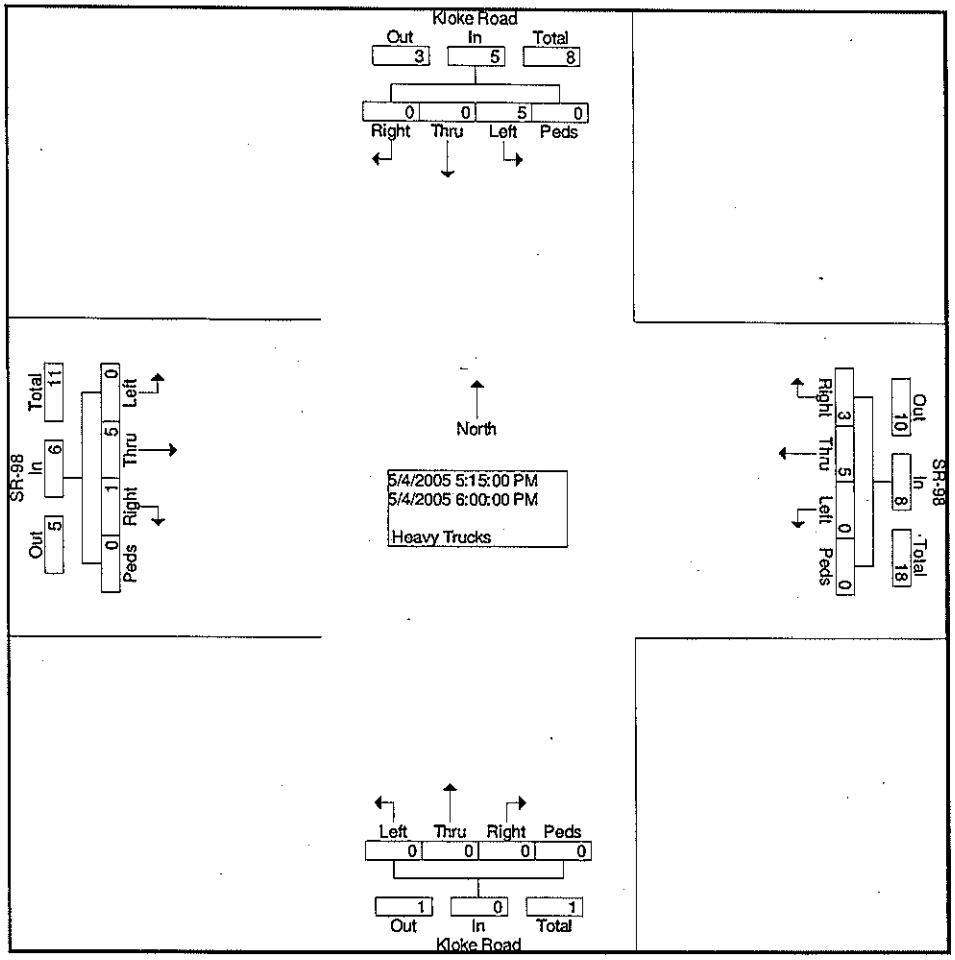
File Name : 05145021
Site Code : 00145021
Start Date : 5/4/2005

	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 17:15																					
Volume	5	0	0	0	5	0	5	3	0	8	0	0	0	0	0	0	5	1	0	6	19
Percent	100.0	0.0	0.0	0.0		0.0	62.5	37.5	0.0		0.0	0.0	0.0	0.0		0.0	83.3	16.7	0.0		
18:00 Volume	2	0	0	0	2	0	3	2	0	5	0	0	0	0	0	0	0	0	0	0	7
Peak Factor																					0.679
High Int. 17:15						18:00					2:15:00 PM					17:30					
Volume	2	0	0	0	2	0	3	2	0	5	0	0	0	0	0	0	3	0	0	3	
Peak Factor					0.625					0.400										0.500	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

File Name : 051 45021
Site Code : 001 45021
Start Date : 5/4/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

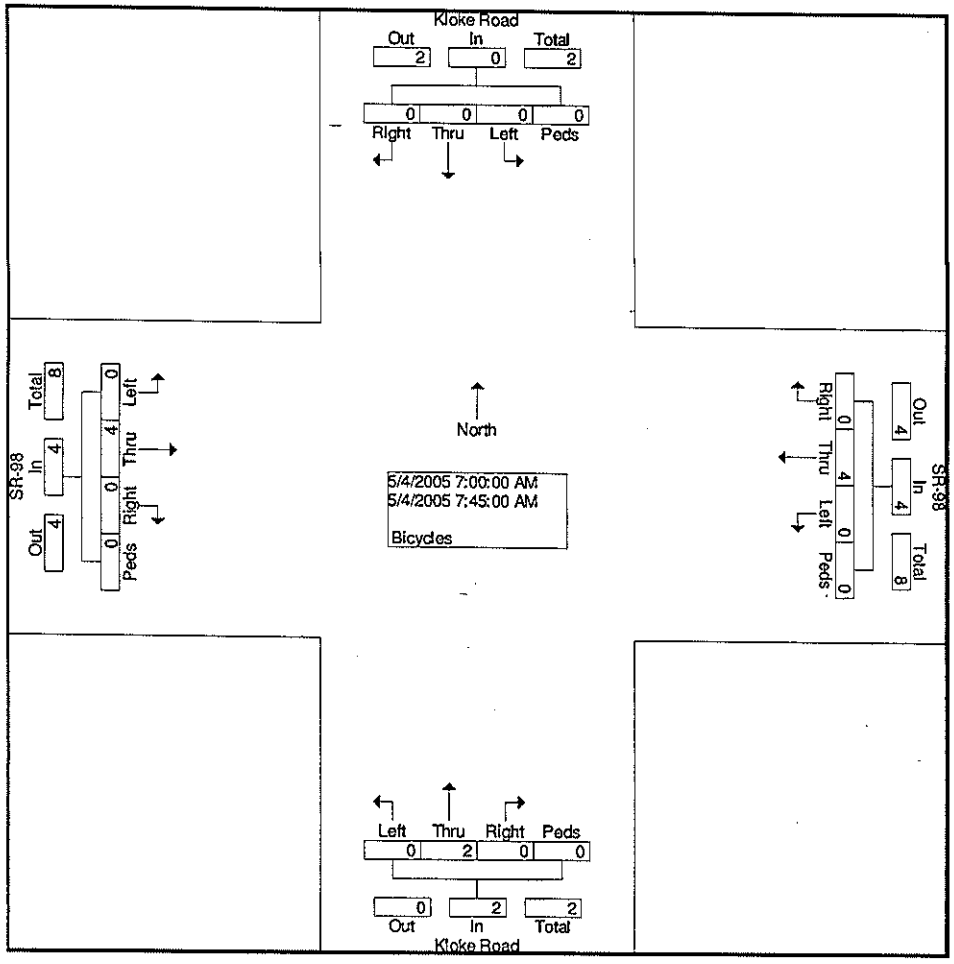
Weather : Clear & Dry
Counted by: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

File Name : 05145020
Site Code : 00145020
Start Date : 5/4/2005
Page No : 1

Groups Printed- Bicycles

	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:30	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	0	3	0	0	3	6
07:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
Total	0	0	0	0	0	0	4	0	0	4	0	2	0	0	2	0	4	0	0	4	10
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	5	0	0	5	0	3	0	0	3	0	4	0	0	4	12
Apprch %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	41.7	0.0	0.0	41.7	0.0	25.0	0.0	0.0	25.0	0.0	33.3	0.0	0.0	33.3	

	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	07:00																				
Volume	0	0	0	0	0	0	4	0	0	4	0	2	0	0	2	0	4	0	0	4	10
Percent	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
07:30 Volume	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	0	3	0	0	3	6
Peak Factor																					0.417
High Int.	6:15:00 AM					07:45					07:30					07:30					
Volume	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2	0	3	0	0	3	
Peak Factor										0.500					0.250					0.333	


Kloke Road
Out 2
In 0
Total 2
0 0 0 0
Right Thru Left Peds
SR-98
Total 8
In 4
Out 4
0 4 0 0
Left Thru Right Peds
North
5/4/2005 7:00:00 AM
5/4/2005 7:45:00 AM
Bicycles
SR-98
Out 4
In 4
Total 8
0 4 0 0
Right Thru Left Peds
Left Thru Right Peds
0 2 0 0
Out 0
In 2
Total 2
Kloke Road

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

File Name : 05145021
Site Code : 00145021
Start Date : 5/4/2005
Page No : 1

Groups Printed- Bicycles

	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
14:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2	4
15:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	3	0	0	3	6
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
16:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	3	0	0	3	0	1	0	0	1	0	2	0	0	2	6
17:00	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	2
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	3	0	0	3	0	1	0	0	1	0	1	0	0	1	5
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	8	0	0	8	0	5	0	0	5	0	11	0	0	11	24
Apprch %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	33.3	0.0	20.8	0.0	0.0	20.8	0.0	45.8	0.0	0.0	45.8	

Weather : Clear & Dry
Counted By: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

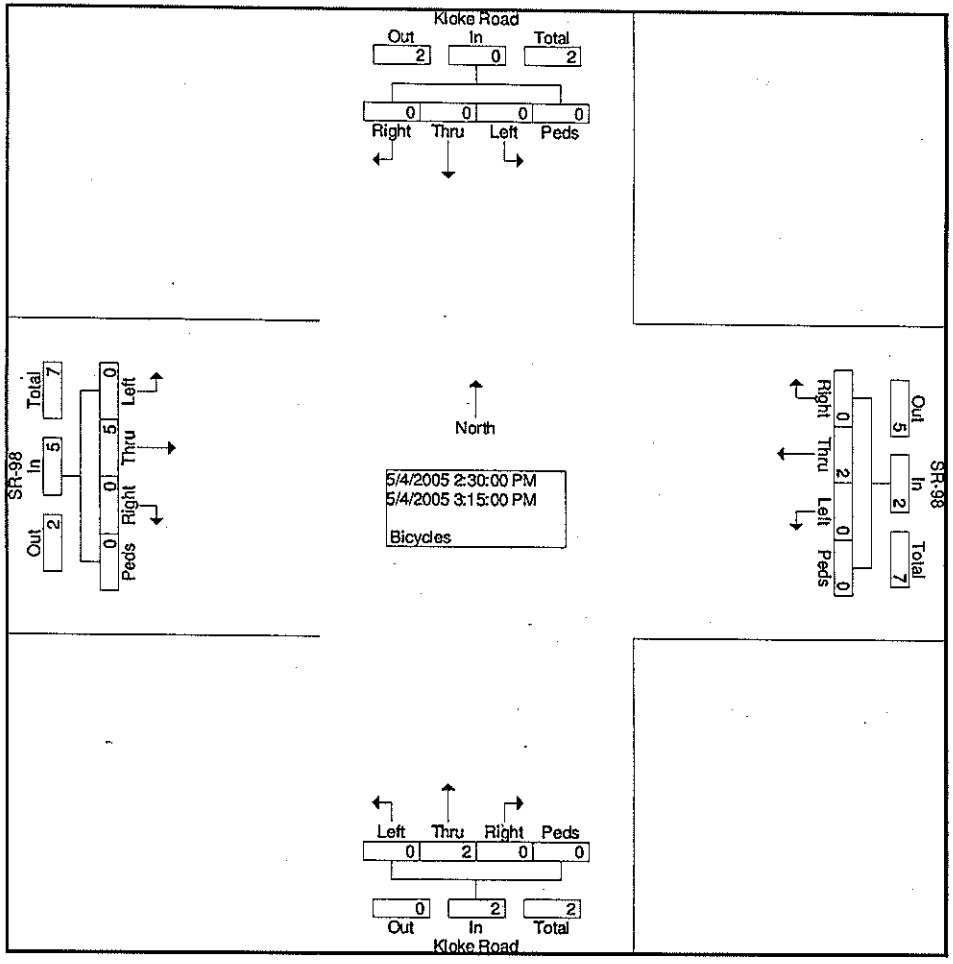
File Name : 05145021
Site Code : 00145021
Start Date : 5/4/2005

	Kloke Road Southbound					SR-98 Westbound					Kloke Road Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 14:30																					
Volume	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2	0	5	0	0	5	9
Percent	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
15:15 Volume	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2	4
Peak Factor																					0.563
High Int. 2:15:00 PM						14:30					15:15					14:30					
Volume	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	0	2	0	0	2	
Peak Factor										0.500					0.250					0.625	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman
Board # : D1-1306
Location : Kloke Road & SR-98

File Name : 05145021
Site Code : 00145021
Start Date : 5/4/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D0239
Location : Eady Avenue & SR-98

File Name : 05145030
Site Code : 00145030
Start Date : 5/4/2005
Page No : 1

Groups Printed- Cars & Light Trucks

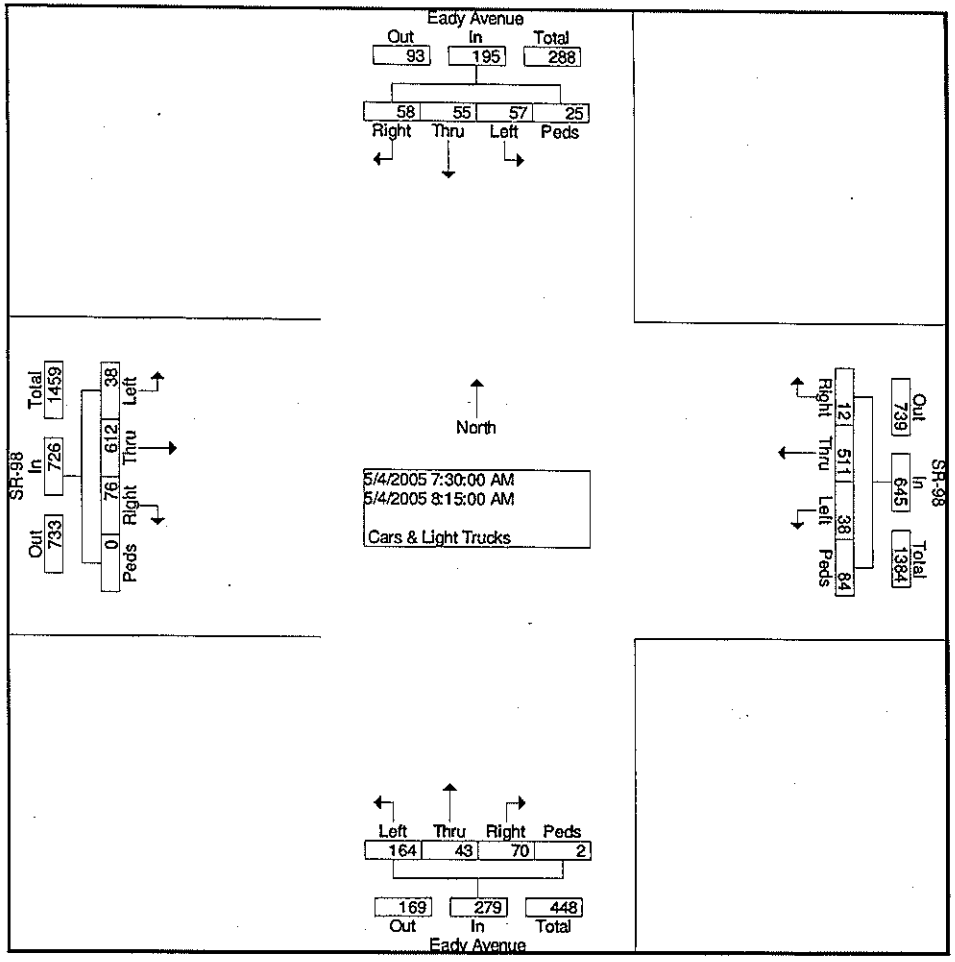
	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	1	0	9	0	10	3	66	3	0	72	7	1	3	0	11	5	58	0	0	63	156
06:45	4	1	7	2	14	0	63	0	0	63	8	1	3	0	12	2	62	1	0	65	154
Total	5	1	16	2	24	3	129	3	0	135	15	2	6	0	23	7	120	1	0	128	310
07:00	3	1	7	1	12	3	62	3	0	68	7	3	3	0	13	0	76	1	0	77	170
07:15	11	2	9	0	22	5	76	0	5	86	17	3	8	1	29	3	92	3	0	98	235
07:30	7	7	17	9	40	5	126	5	27	163	33	2	8	0	43	5	140	16	0	161	407
07:45	20	22	19	14	75	7	142	1	35	185	40	11	20	0	71	10	194	22	0	226	557
Total	41	32	52	24	149	20	406	9	67	502	97	19	39	1	156	18	502	42	0	562	1369
08:00	20	21	14	2	57	18	139	5	19	181	61	20	22	1	104	13	166	28	0	207	549
08:15	10	5	8	0	23	8	104	1	3	116	30	10	20	1	61	10	112	10	0	132	332
08:30	9	3	5	2	19	3	72	2	0	77	8	3	9	1	21	0	92	4	1	97	214
08:45	10	0	9	0	19	6	68	4	0	78	10	2	2	1	15	2	84	5	0	91	203
Total	49	29	36	4	118	35	383	12	22	452	109	35	53	4	201	25	454	47	1	527	1298
09:00	3	3	3	0	9	1	66	4	0	71	5	3	4	1	13	2	86	4	0	92	185
09:15	7	2	6	2	17	3	68	0	1	72	4	3	7	0	14	1	66	0	0	67	170
Grand Total	105	67	113	32	317	62	1052	28	90	1232	230	62	109	6	407	53	1228	94	1	1376	3332
Apprch %	33.1	21.1	35.6	10.1		5.0	85.4	2.3	7.3		56.5	15.2	26.8	1.5		3.9	89.2	6.8	0.1		
Total %	3.2	2.0	3.4	1.0	9.5	1.9	31.6	0.8	2.7	37.0	6.9	1.9	3.3	0.2	12.2	1.6	36.9	2.8	0.0	41.3	

	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	07:30																				
Volume	57	55	58	25	195	38	511	12	84	645	164	43	70	2	279	38	612	76	0	726	1845
Percent	29.2	28.2	29.7	12.8		5.9	79.2	1.9	13.0		58.8	15.4	25.1	0.7		5.2	84.3	10.5	0.0		
07:45 Volume	20	22	19	14	75	7	142	1	35	185	40	11	20	0	71	10	194	22	0	226	557
Peak Factor																					0.828
High Int.	07:45					07:45					08:00					07:45					
Volume	20	22	19	14	75	7	142	1	35	185	61	20	22	1	104	10	194	22	0	226	
Peak Factor					0.650					0.872					0.671					0.803	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D0239
Location : Eady Avenue & SR-98

File Name : 05145030
Site Code : 00145030
Start Date : 5/4/2005
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D1-0240
Location : Eady Avenue & SR-98

File Name : 05145031
Site Code : 00145031
Start Date : 5/4/2005
Page No : 1

Groups Printed- Cars & Light Trucks

	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	10	6	10	1	27	10	120	4	11	145	18	5	10	0	33	5	130	10	0	145	350
14:45	21	5	14	16	56	13	151	4	38	206	19	13	18	0	50	13	172	12	0	197	509
Total	31	11	24	17	83	23	271	8	49	351	37	18	28	0	83	18	302	22	0	342	859
15:00	14	7	16	13	50	9	167	2	19	197	16	5	19	3	43	13	201	10	0	224	514
15:15	7	5	9	2	23	11	110	2	19	142	11	5	11	4	31	13	170	14	1	198	394
15:30	11	6	11	1	29	15	135	3	5	158	5	2	8	4	19	7	152	10	0	169	375
15:45	10	4	9	1	24	7	110	3	6	126	8	9	25	0	42	7	176	7	0	190	382
Total	42	22	45	17	126	42	522	10	49	623	40	21	63	11	135	40	699	41	1	781	1665
16:00	10	6	7	1	24	13	108	2	2	125	11	8	10	0	29	9	153	7	0	169	347
16:15	18	4	12	0	34	5	119	5	1	130	9	7	9	2	27	9	162	15	0	186	377
16:30	14	3	6	0	23	15	117	3	4	139	7	2	9	1	19	8	139	5	0	152	333
16:45	5	16	7	0	28	9	112	3	0	124	11	6	8	5	30	8	133	5	2	148	330
Total	47	29	32	1	109	42	456	13	7	518	38	23	36	8	105	34	587	32	2	655	1387
17:00	11	5	8	1	25	7	112	2	4	125	6	14	15	0	35	13	160	6	0	179	364
17:15	12	3	9	1	25	7	121	1	2	131	6	3	9	0	18	11	170	5	1	187	361
17:30	9	2	14	0	25	11	115	3	1	130	10	1	13	1	25	9	147	7	0	163	343
17:45	10	3	13	0	26	11	112	0	1	124	5	5	5	0	15	6	155	4	0	165	330
Total	42	13	44	2	101	36	460	6	8	510	27	23	42	1	93	39	632	22	1	694	1398
18:00	6	2	3	0	11	6	116	3	2	127	8	2	9	0	19	11	140	4	0	155	312
18:15	10	4	8	2	24	9	111	4	1	125	3	3	7	1	14	13	152	3	1	169	332
Grand Total	178	81	156	39	454	158	1936	44	116	2254	153	90	185	21	449	155	2512	124	5	2796	5953
Apprch %	39.2	17.8	34.4	8.6		7.0	85.9	2.0	5.1		34.1	20.0	41.2	4.7		5.5	89.8	4.4	0.2		
Total %	3.0	1.4	2.6	0.7	7.6	2.7	32.5	0.7	1.9	37.9	2.6	1.5	3.1	0.4	7.5	2.6	42.2	2.1	0.1	47.0	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D1-0240
Location : Eady Avenue & SR-98

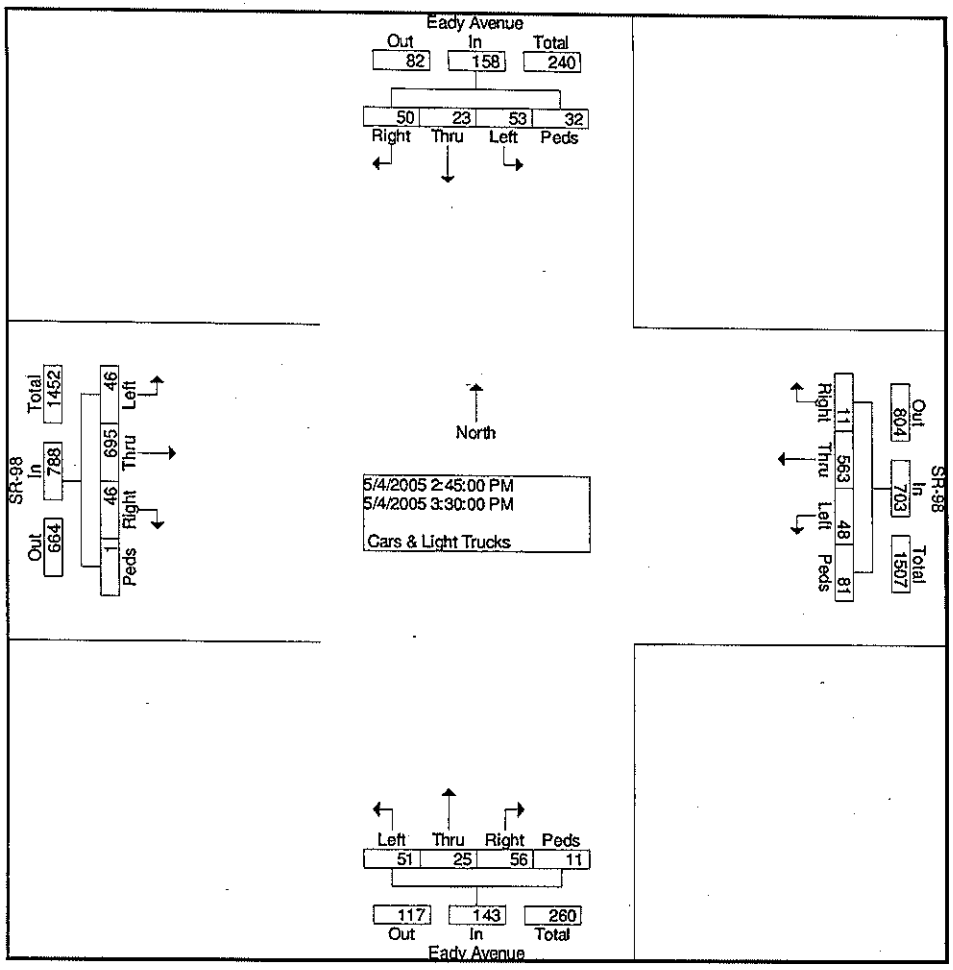
File Name : 05145031
Site Code : 00145031
Start Date : 5/4/2005

	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 14:45																					
Volume	53	23	50	32	158	48	563	11	81	703	51	25	56	11	143	46	695	46	1	788	1792
Percent	33.5	14.6	31.6	20.3		6.8	80.1	1.6	11.5		35.7	17.5	39.2	7.7		5.8	88.2	5.8	0.1		
15:00 Volume	14	7	16	13	50	9	167	2	19	197	16	5	19	3	43	13	201	10	0	224	514
Peak Factor																					0.872
High Int.	14:45					14:45					14:45					15:00					
Volume	21	5	14	16	56	13	151	4	38	206	19	13	18	0	50	13	201	10	0	224	
Peak Factor					0.705					0.853					0.715					0.879	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D1-0240
Location : Eady Avenue & SR-98

File Name : 051 45031
Site Code : 001 45031
Start Date : 5/4/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

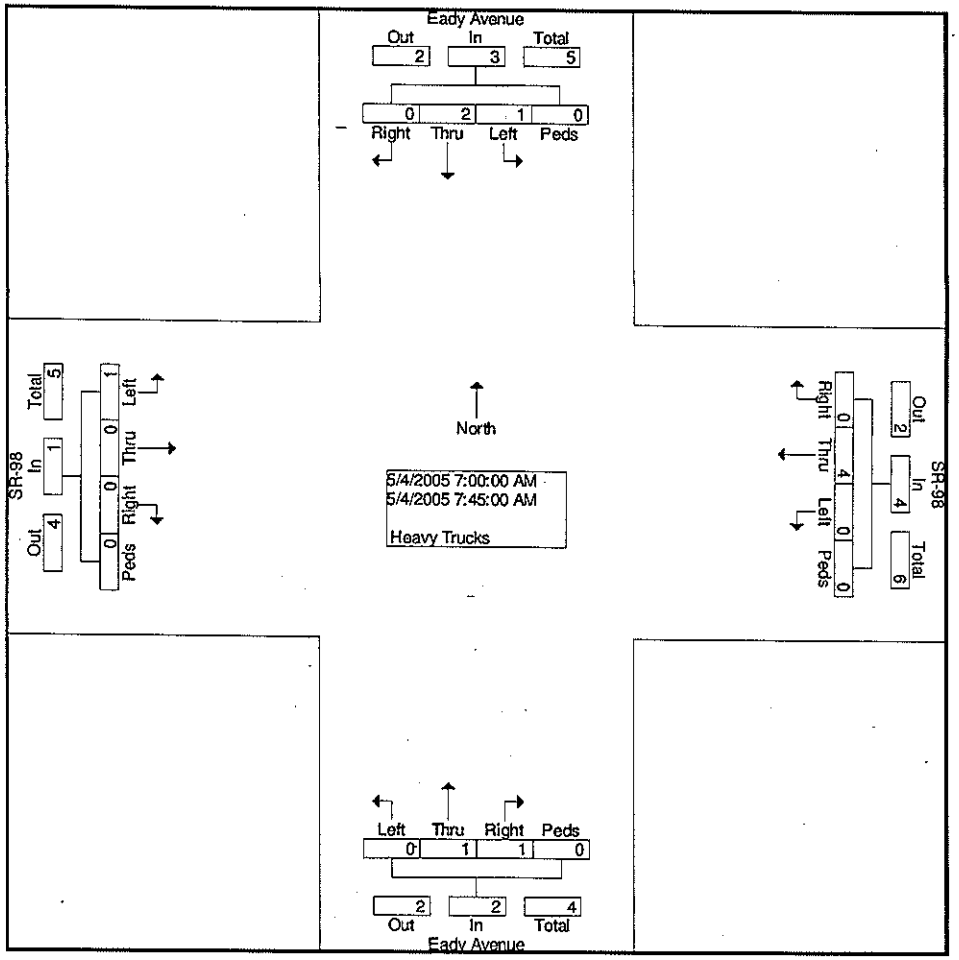
Weather : Clear & Dry
Counted by: E. Furrer
Board # : D0239
Location : Eady Avenue & SR-98

File Name : 05145030
Site Code : 00145030
Start Date : 5/4/2005
Page No : 1

Groups Printed- Heavy Trucks

	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
07:00	0	1	0	0	1	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	4
07:15	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	2
07:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	2
07:45	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	1	2	0	0	3	0	4	0	0	4	0	1	1	0	2	1	0	0	0	1	10
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Grand Total	1	2	0	0	3	0	6	0	0	6	1	1	1	0	3	1	3	0	0	4	16
Apprch %	33.3	66.7	0.0	0.0		0.0	100.0	0.0	0.0		33.3	33.3	33.3	0.0		25.0	75.0	0.0	0.0		
Total %	6.3	12.5	0.0	0.0	18.8	0.0	37.5	0.0	0.0	37.5	6.3	6.3	6.3	0.0	18.8	6.3	18.8	0.0	0.0	25.0	

	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	07:00																				
Volume	1	2	0	0	3	0	4	0	0	4	0	1	1	0	2	1	0	0	0	1	10
Percent	33.3	66.7	0.0	0.0		0.0	100.0	0.0	0.0		0.0	50.0	50.0	0.0		100.0	0.0	0.0	0.0		
07:00 Volume	0	1	0	0	1	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	4
Peak Factor																					0.625
High Int.	07:45					07:00		-	-		07:15					07:30					
Volume	1	1	0	0	2	0	3	0	0	3	0	1	1	0	2	1	0	0	0	1	
Peak Factor					0.375					0.333					0.250					0.250	


Eady Avenue
Out 2
In 3
Total 5
0 2 1 0
Right Thru Left Peds
SR-98
Total 5
In 1
Out 4
1 0 0 0
Left Thru Right Peds
North
5/4/2005 7:00:00 AM
5/4/2005 7:45:00 AM
Heavy Trucks
SR-98
Out 2
In 4
Total 6
0 4 0 0
Right Thru Left Peds
Left Thru Right Peds
0 1 1 0
2 2 4
Out In Total
Eady Avenue

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D1-0240
Location : Eady Avenue & SR-98

File Name : 05145031
Site Code : 00145031
Start Date : 5/4/2005

Groups Printed- Heavy Trucks

	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
14:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
15:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
15:30	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
Total	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	9	0	0	9	14
16:00	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	0	3	0	0	3	6
16:15	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
16:30	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	0	6	0	0	6	13
17:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
17:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
17:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	5	0	0	5	6
17:45	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
Total	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	6	0	0	6	12
18:00	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
18:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Grand Total	0	0	0	0	0	0	22	0	0	22	1	0	1	0	2	0	27	0	0	27	51
Apprch %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		50.0	0.0	50.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	43.1	0.0	0.0	43.1	2.0	0.0	2.0	0.0	3.9	0.0	52.9	0.0	0.0	52.9	

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D1-0240
Location : Eady Avenue & SR-98

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

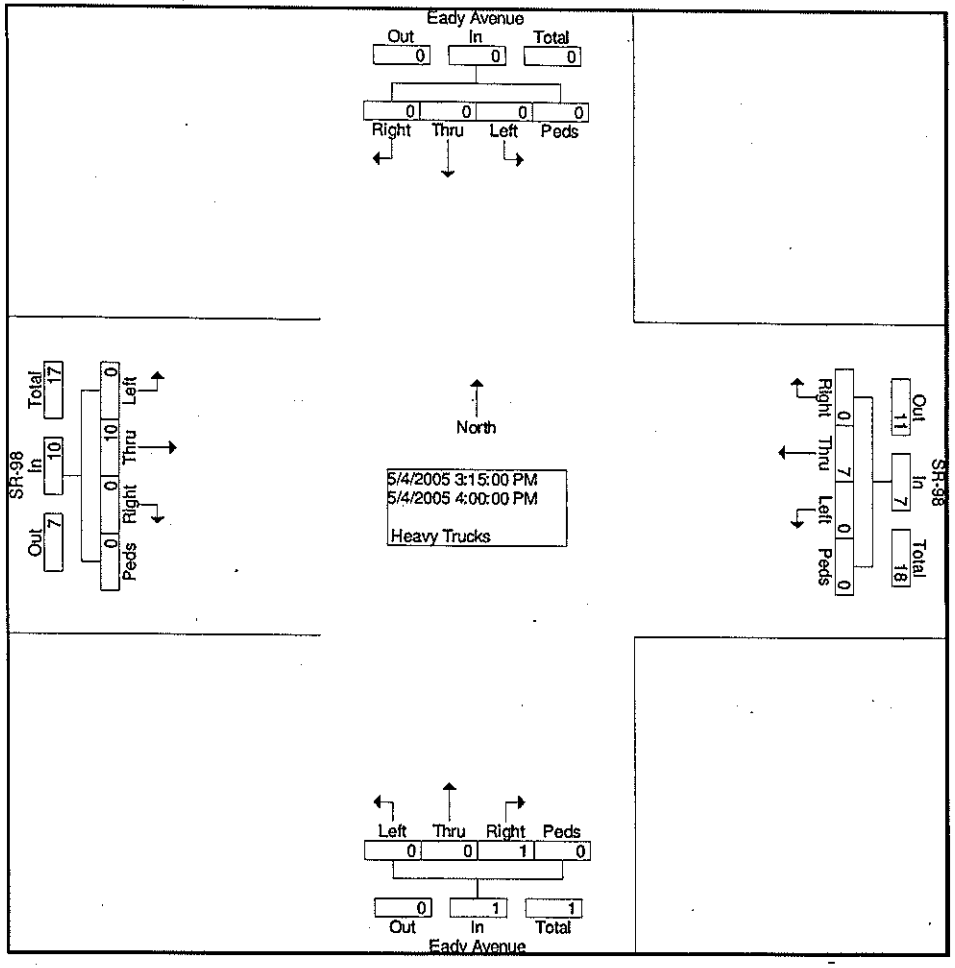
File Name : 05145031
Site Code : 00145031
Start Date : 5/4/2005

	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 15:15																					
Volume	0	0	0	0	0	0	7	0	0	7	0	0	1	0	1	0	10	0	0	10	18
Percent	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0		
15:30 Volume	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
Peak Factor																					0.643
High Int. 2:15:00 PM						15:30					16:00					15:30					
Volume	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	0	3	0	0	3	
Peak Factor										0.438					0.250					0.833	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D1-0240
Location : Eady Avenue & SR-98

File Name : 05145031
Site Code : 00145031
Start Date : 5/4/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D0239
Location : Eady Avenue & SR-98

File Name : 05145030
Site Code : 00145030
Start Date : 5/4/2005
Page No : 1

Groups Printed- Bicycles

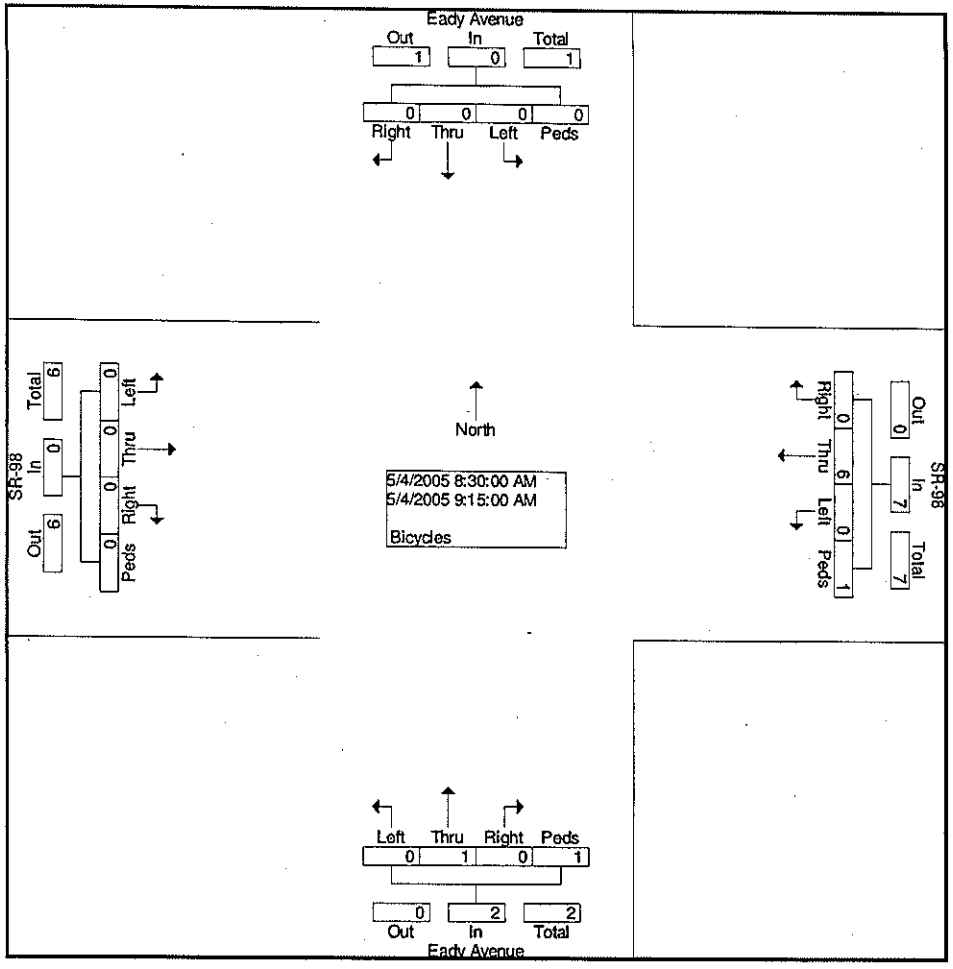
	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:45	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	3
Total	0	0	0	0	0	0	3	0	0	3	0	1	0	0	1	0	0	0	0	0	4
09:00	0	0	0	0	0	0	2	0	1	3	0	0	0	1	1	0	0	0	0	0	4
09:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	4	0	0	4	0	6	0	1	7	0	3	0	1	4	0	0	0	0	0	15
Apprch %	0.0	100.0	0.0	0.0		0.0	85.7	0.0	14.3		0.0	75.0	0.0	25.0		0.0	0.0	0.0	0.0		
Total %	0.0	26.7	0.0	0.0	26.7	0.0	40.0	0.0	6.7	46.7	0.0	20.0	0.0	6.7	26.7	0.0	0.0	0.0	0.0	0.0	

	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	08:30																				
Volume	0	0	0	0	0	0	6	0	1	7	0	1	0	1	2	0	0	0	0	0	9
Percent	0.0	0.0	0.0	0.0		0.0	85.7	0.0	14.3		0.0	50.0	0.0	50.0		0.0	0.0	0.0	0.0		
09:00 Volume	0	0	0	0	0	0	2	0	1	3	0	0	0	1	1	0	0	0	0	0	4
Peak Factor																					0.563
High Int.	6:15:00 AM					09:00					08:45					6:15:00 AM					
Volume	0	0	0	0	0	0	2	0	1	3	0	1	0	0	1						
Peak Factor										0.583					0.500						

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D0239
Location : Eady Avenue & SR-98

File Name : 051 45030
Site Code : 001 45030
Start Date : 5/4/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D1-0240
Location : Eady Avenue & SR-98

File Name : 051 45031
Site Code : 001 45031
Start Date : 5/4/2005
Page No : 1

Groups Printed- Bicycles

	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Total	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
15:00	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4
15:15	0	1	0	0	1	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1	5
15:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	7	0	0	7	0	1	0	0	1	0	1	0	0	1	10
16:00	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
16:15	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
16:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
16:45	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total	0	1	0	0	1	0	5	0	0	5	0	1	0	0	1	0	0	0	0	0	7
17:00	0	1	0	0	1	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	4
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	3	0	0	3	0	1	0	0	1	0	0	0	0	0	5
18:00	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	3
18:15	0	0	0	0	0	0	4	0	0	4	0	1	0	0	1	0	0	0	0	0	5
Grand Total	0	4	0	0	4	0	22	0	0	22	0	5	0	0	5	0	1	0	0	1	32
Apprch %	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	12.5	0.0	0.0	12.5	0.0	68.8	0.0	0.0	68.8	0.0	15.6	0.0	0.0	15.6	0.0	3.1	0.0	0.0	3.1	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D1-0240
Location : Eady Avenue & SR-98

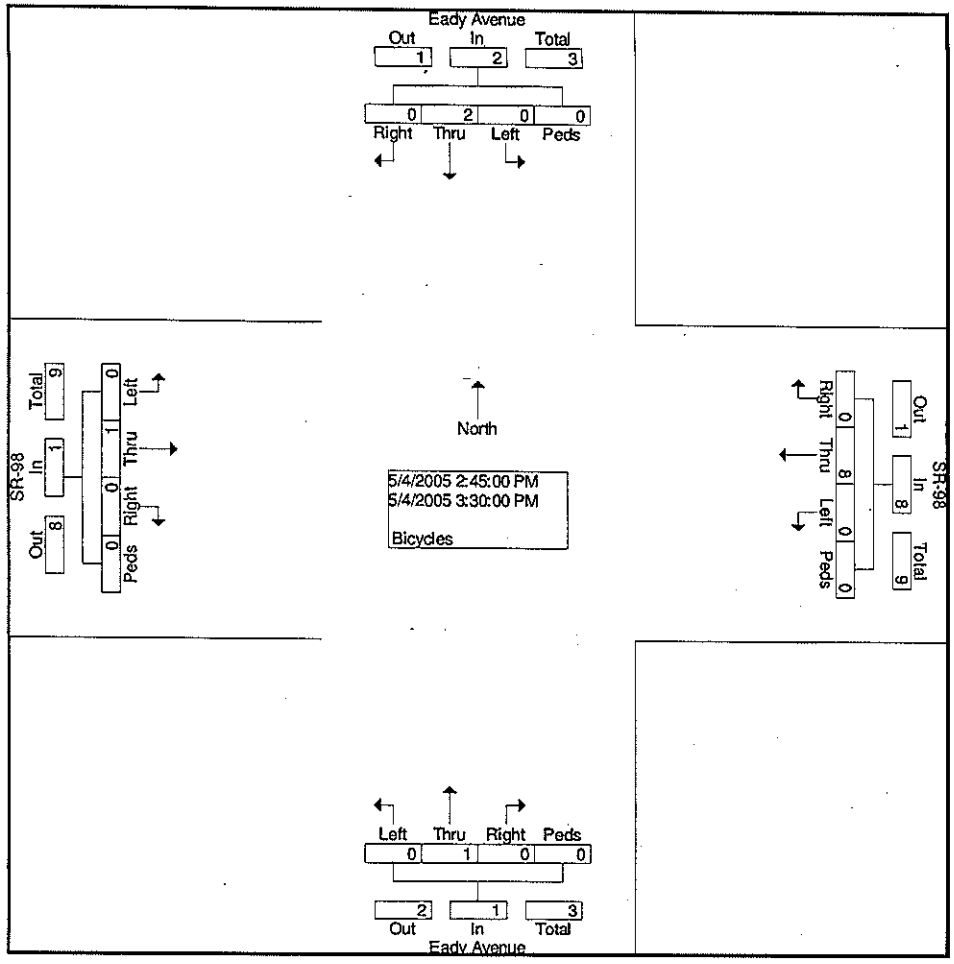
File Name : 05145031
Site Code : 00145031
Start Date : 5/4/2005

	Eady Avenue Southbound					SR-98 Westbound					Eady Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 14:45																					
Volume	0	2	0	0	2	0	8	0	0	8	0	1	0	0	1	0	1	0	0	1	12
Percent	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
15:15 Volume	0	1	0	0	1	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1	5
Peak Factor																					0.600
High Int. 14:45						15:00					15:15					15:15					
Volume	0	1	0	0	1	0	4	0	0	4	0	1	0	0	1	0	1	0	0	1	
Peak Factor					0.500					0.500					0.250					0.250	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : D1-0240
Location : Eady Avenue & SR-98

File Name : 05145031
Site Code : 00145031
Start Date : 5/4/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av/Lee Av & SR-98

File Name : 05145040
Site Code : 00146040
Start Date : 5/3/2005
Page No : 1

Groups Printed- Cars & Light Trucks

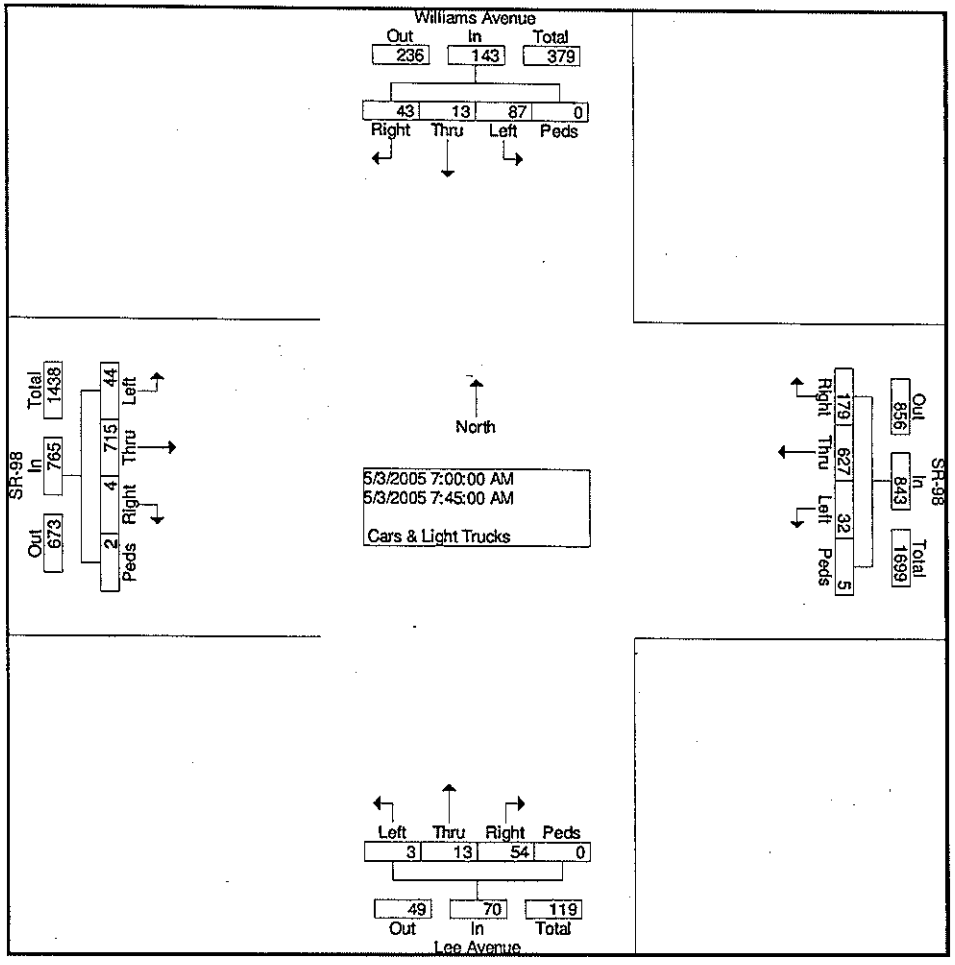
	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:00	9	2	3	0	14	0	60	35	0	95	1	1	1	0	3	3	69	0	0	72	184
06:15	16	1	3	2	22	0	76	35	1	112	2	1	2	0	5	4	49	1	1	55	194
06:30	23	2	4	0	29	1	85	51	0	137	0	1	1	0	2	4	71	0	0	75	243
06:45	17	1	3	1	22	5	96	49	1	151	1	1	3	0	5	7	100	1	0	108	286
Total	65	6	13	3	87	6	317	170	2	495	4	4	7	0	15	18	289	2	1	310	907
07:00	23	2	10	0	35	5	148	39	0	192	1	0	12	0	13	6	164	0	2	172	412
07:15	10	5	14	0	29	11	223	34	3	271	0	8	17	0	25	12	228	0	0	240	565
07:30	23	5	13	0	41	12	175	47	1	235	1	3	14	0	18	15	198	3	0	216	510
07:45	31	1	6	0	38	4	81	59	1	145	1	2	11	0	14	11	125	1	0	137	334
Total	87	13	43	0	143	32	627	179	5	843	3	13	54	0	70	44	715	4	2	765	1821
08:00	42	0	5	0	47	2	82	42	0	126	2	3	4	2	11	11	88	1	2	102	286
08:15	40	4	7	1	52	3	78	61	2	144	0	2	2	0	4	9	81	1	0	91	291
08:30	42	3	3	0	48	3	90	51	0	144	3	0	3	0	6	6	119	0	0	125	323
08:45	40	1	6	0	47	2	78	45	0	125	3	1	3	0	7	8	99	0	0	107	286
Total	164	8	21	1	194	10	328	199	2	539	8	6	12	2	28	34	387	2	2	425	1186
Grand Total	316	27	77	4	424	48	1272	548	9	1877	15	23	73	2	113	96	1391	8	5	1500	3914
Apprch %	74.5	6.4	18.2	0.9		2.6	67.8	29.2	0.5		13.3	20.4	64.6	1.8		6.4	92.7	0.5	0.3		
Total %	8.1	0.7	2.0	0.1	10.8	1.2	32.5	14.0	0.2	48.0	0.4	0.6	1.9	0.1	2.9	2.5	35.5	0.2	0.1	38.3	

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:00 to 08:45 - Peak 1 of 1																					
Intersection	07:00																				
Volume	87	13	43	0	143	32	627	179	5	843	3	13	54	0	70	44	715	4	2	765	1821
Percent	60.8	9.1	30.1	0.0		3.8	74.4	21.2	0.6		4.3	18.6	77.1	0.0		5.8	93.5	0.5	0.3		
07:15 Volume	10	5	14	0	29	11	223	34	3	271	0	8	17	0	25	12	228	0	0	240	565
Peak Factor																					0.806
High Int.	07:30					07:15					07:15					07:15					
Volume	23	5	13	0	41	11	223	34	3	271	0	8	17	0	25	12	228	0	0	240	
Peak Factor					0.872					0.778					0.700					0.797	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av/Lee Av & SR-98

File Name : 05145040
Site Code : 00146040
Start Date : 5/3/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av / Lee Av & SR-98

File Name : 05145041
Site Code : 00145041
Start Date : 5/3/2005
Page No : 1

Groups Printed- Cars & Light Trucks

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	53	1	11	0	65	2	120	33	0	155	0	0	2	0	2	7	132	0	0	139	361
14:45	51	3	5	0	59	7	115	38	0	160	1	2	21	0	24	4	198	0	0	202	445
Total	104	4	16	0	124	9	235	71	0	315	1	2	23	0	26	11	330	0	0	341	806
15:00	46	1	7	0	54	2	142	33	0	177	1	2	15	0	18	5	171	2	0	178	427
15:15	25	1	7	2	35	5	168	45	1	219	0	4	7	1	12	9	180	1	4	194	460
15:30	26	4	13	0	43	5	115	36	3	159	2	4	3	0	9	4	164	3	1	172	383
15:45	36	2	9	0	47	3	109	37	4	153	1	3	8	0	12	6	187	1	1	195	407
Total	133	8	36	2	179	15	534	151	8	708	4	13	33	1	51	24	702	7	6	739	1677
16:00	26	0	23	0	49	10	111	29	0	150	0	1	3	0	4	6	143	0	0	149	352
16:15	38	4	3	0	45	3	109	36	2	150	0	2	4	0	6	4	166	3	0	173	374
16:30	24	1	2	0	27	4	108	25	1	138	1	2	4	2	9	3	173	0	0	176	350
16:45	25	3	3	0	31	6	106	30	2	144	1	1	2	0	4	8	164	0	1	173	352
Total	113	8	31	0	152	23	434	120	5	582	2	6	13	2	23	21	646	3	1	671	1428
17:00	36	3	2	0	41	2	124	37	0	163	3	1	4	0	8	3	159	2	0	164	376
17:15	26	0	2	0	28	4	111	26	1	142	0	1	2	0	3	4	172	3	1	180	353
17:30	22	1	6	0	29	2	135	34	0	171	0	2	2	0	4	4	170	2	0	176	380
17:45	29	1	3	0	33	4	110	24	0	138	1	1	4	0	6	3	156	3	1	163	340
Total	113	5	13	0	131	12	480	121	1	614	4	5	12	0	21	14	657	10	2	683	1449
18:00	22	4	4	0	30	3	118	20	1	142	0	0	6	1	7	5	123	2	1	131	310
18:15	29	1	3	1	34	3	92	22	0	117	0	1	3	0	4	4	134	3	0	141	296
Grand Total	514	30	103	3	650	65	1893	505	15	2478	11	27	90	4	132	79	2592	25	10	2706	5966
Apprch %	79.1	4.6	15.8	0.5		2.6	76.4	20.4	0.6		8.3	20.5	68.2	3.0		2.9	95.8	0.9	0.4		
Total %	8.6	0.5	1.7	0.1	10.9	1.1	31.7	8.5	0.3	41.5	0.2	0.5	1.5	0.1	2.2	1.3	43.4	0.4	0.2	45.4	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av / Lee Av & SR-98

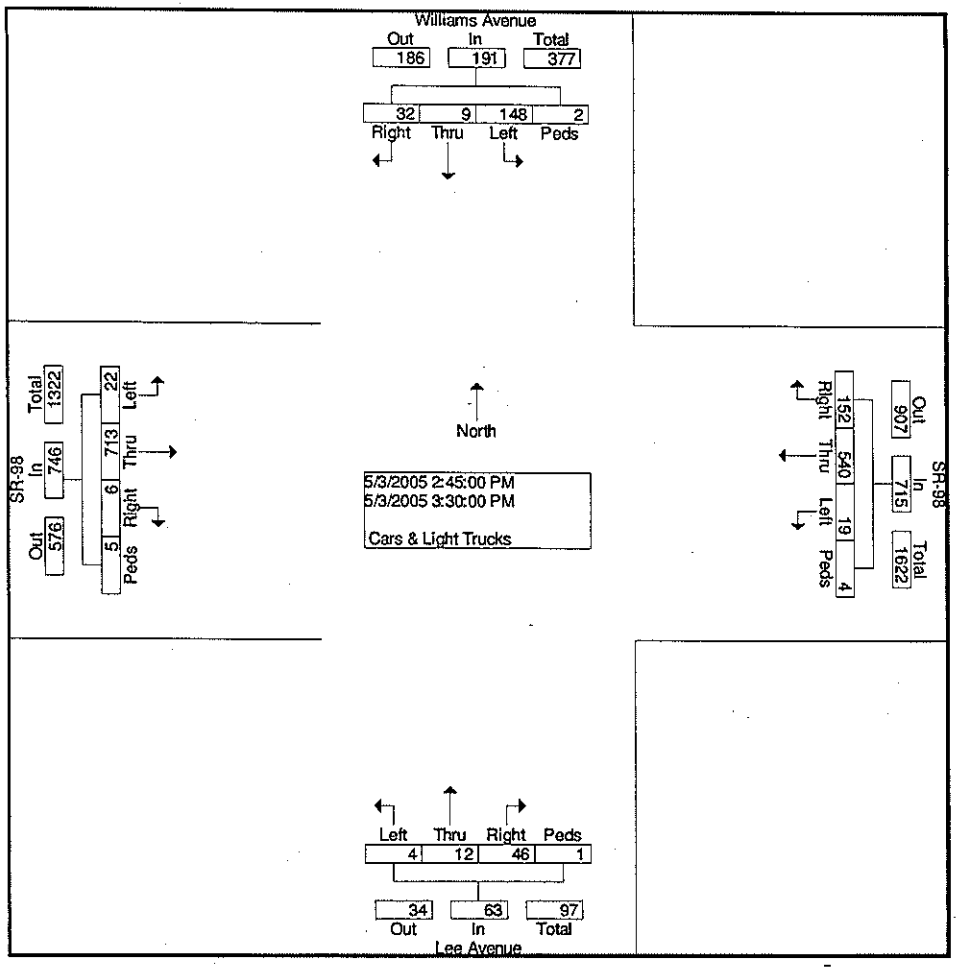
File Name : 05145041
Site Code : 00145041
Start Date : 5/3/2005

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 14:45																					
Volume	148	9	32	2	191	19	540	152	4	715	4	12	46	1	63	22	713	6	5	746	1715
Percent	77.5	4.7	16.8	1.0		2.7	75.5	21.3	0.6		6.3	19.0	73.0	1.6		2.9	95.6	0.8	0.7		
15:15																					
Volume	25	1	7	2	35	5	168	45	1	219	0	4	7	1	12	9	180	1	4	194	460
Peak Factor																					0.932
High Int.	14:45					15:15					14:45					14:45					
Volume	51	3	5	0	59	5	168	45	1	219	1	2	21	0	24	4	198	0	0	202	
Peak Factor					0.809					0.816					0.656					0.923	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av / Lee Av & SR-98

File Name : 05145041
Site Code : 00145041
Start Date : 5/3/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av/Lee Av & SR-98

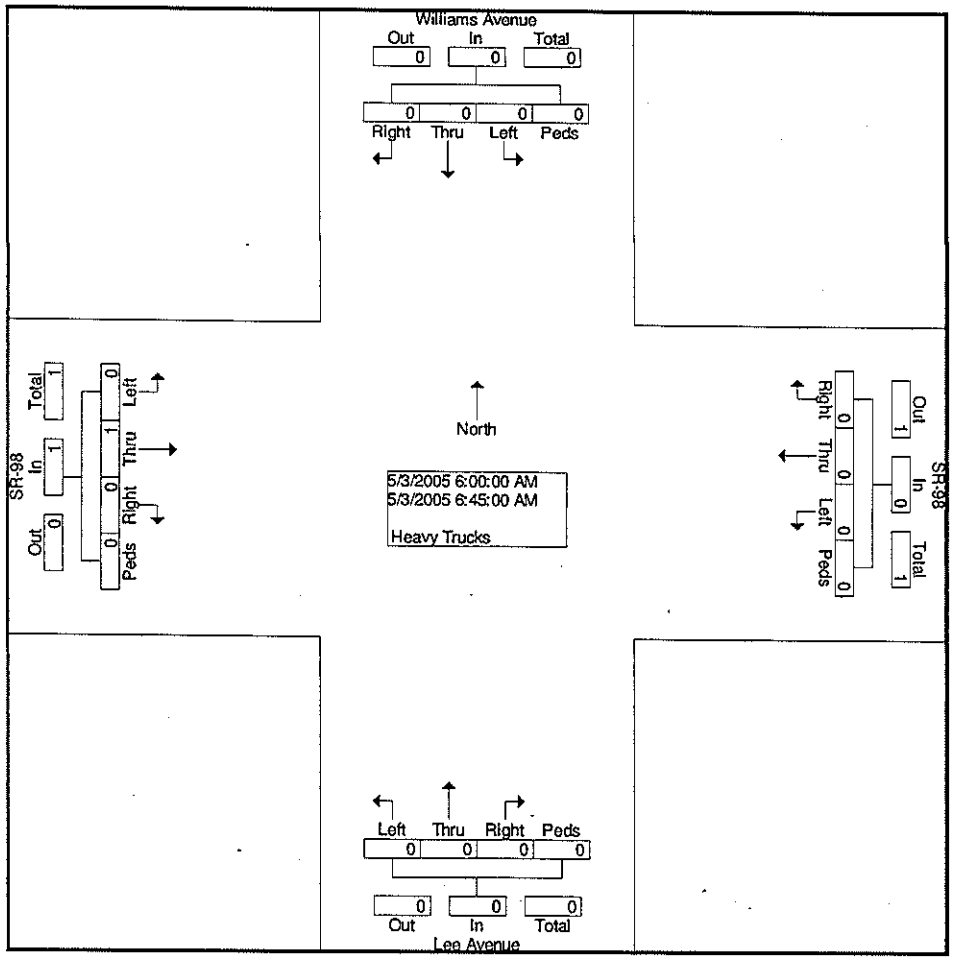
File Name : 05145040
Site Code : 00146040
Start Date : 5/3/2005
Page No : 1

Groups Printed- Heavy Trucks

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
06:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Apprch %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0	

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:00 to 08:45 - Peak 1 of 1																					
Intersection 06:00																					
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Percent	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
06:00 Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Peak Factor																					0.250
High Int.	5:45:00 AM					5:45:00 AM					5:45:00 AM					06:00					
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	

Peak Factor | 0.250 |



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av / Lee Av & SR-98

File Name : 05145041
Site Code : 00145041
Start Date : 5/3/2005
Page No : 1

Groups Printed- Heavy Trucks

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
Apprch %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av / Lee Av & SR-98

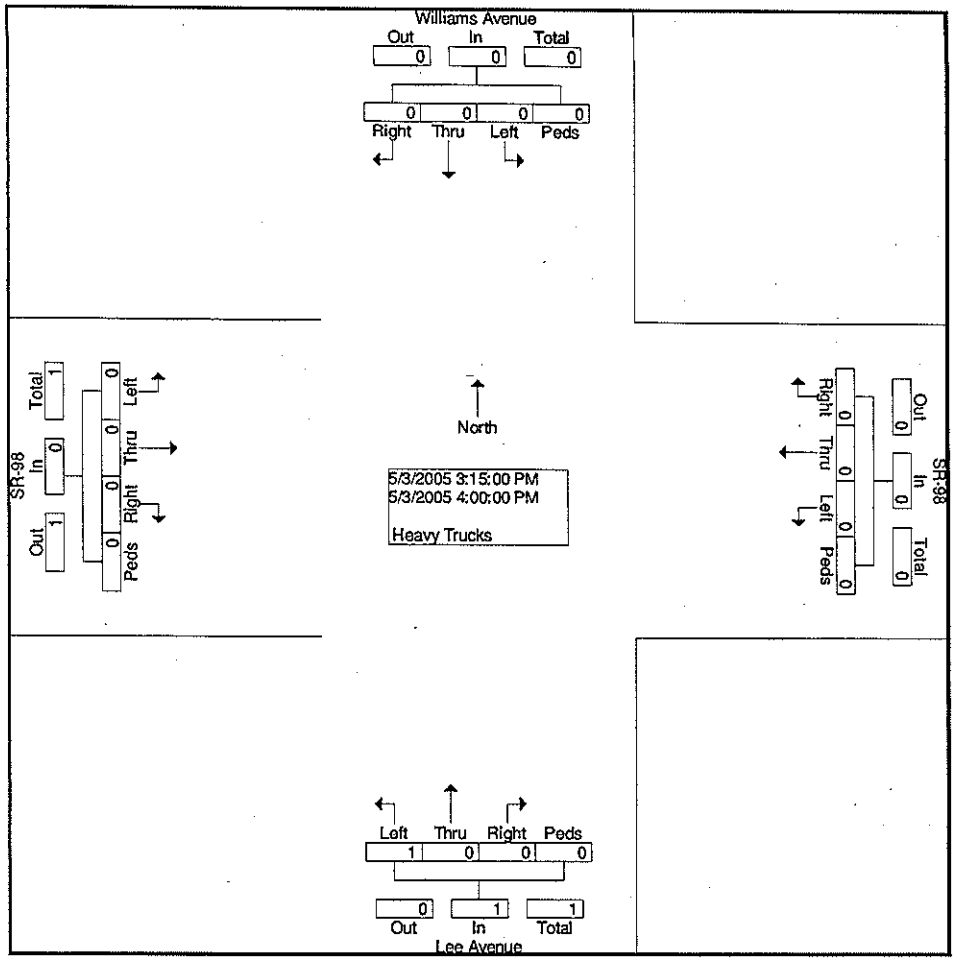
File Name : 05145041
Site Code : 00145041
Start Date : 5/3/2005

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 15:15																					
Volume	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
Percent	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
16:00 Volume	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
Peak Factor																					0.250
High Int.	2:15:00 PM					2:15:00 PM					16:00					2:15:00 PM					
Volume	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1						
Peak Factor															0.250						

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av / Lee Av & SR-98

File Name : 05145041
Site Code : 00145041
Start Date : 5/3/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

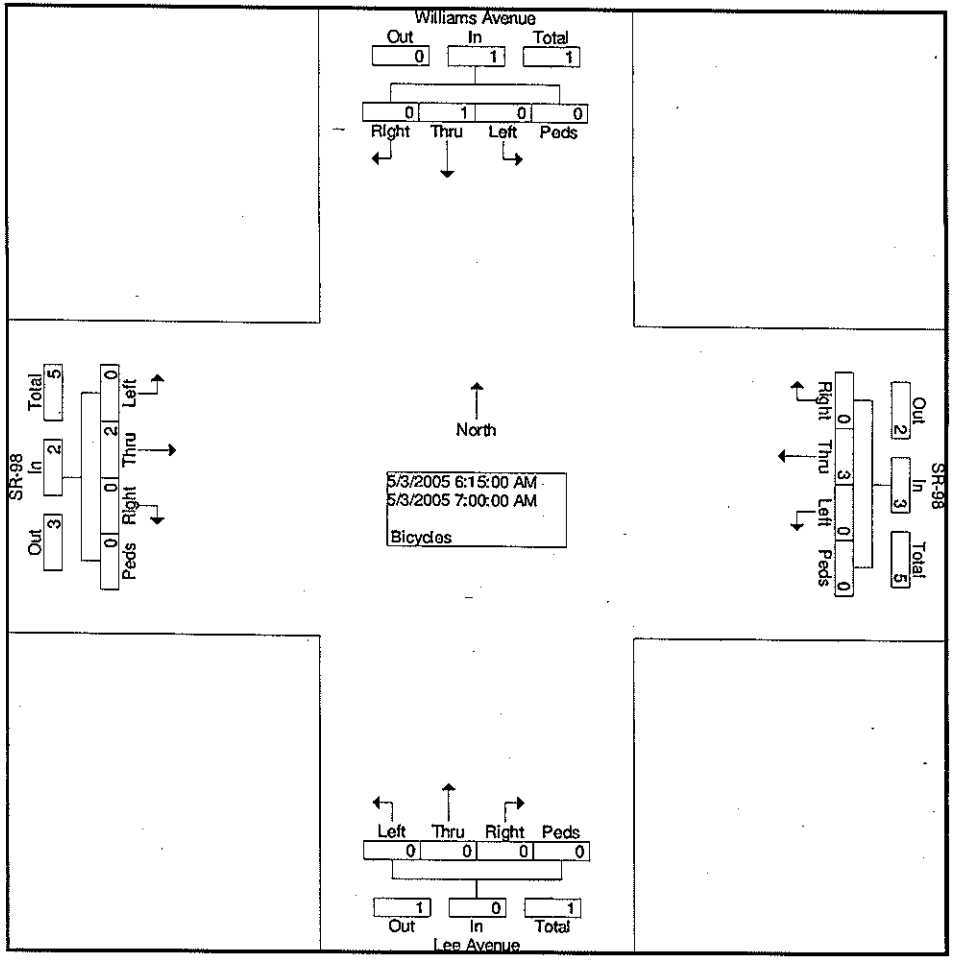
Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av/Lee Av & SR-98

File Name : 051 45040
Site Code : 001 46040
Start Date : 5/3/2005

Groups Printed- Bicycles

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
06:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
07:00	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3
07:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:30	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	5
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
08:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	6
Grand Total	0	1	0	0	1	0	8	0	0	8	0	0	0	0	0	0	6	0	0	6	15
Apprch %	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	6.7	0.0	0.0	6.7	0.0	53.3	0.0	0.0	53.3	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	40.0	

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:00 to 08:45 - Peak 1 of 1																					
Intersection	06:15																				
Volume	0	1	0	0	1	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	6
Percent	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
07:00 Volume	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3
Peak Factor																					0.500
High Int.	07:00					07:00					5:45:00 AM					06:30					
Volume	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	
Peak Factor					0.250					0.375										0.500	


Williams Avenue
Out
In
Total
0
1
1
0
1
0
0
Right
Thru
Left
Peds
SR-98
Total
5
In
2
Out
3
0
2
0
0
Left
Thru
Right
Peds
North
5/3/2005 6:15:00 AM
5/3/2005 7:00:00 AM
Bicycles
SR-98
Out
2
In
3
Total
5
0
3
0
0
Right
Thru
Left
Peds
Left
Thru
Right
Peds
0
0
0
0
1
0
1
Out
In
Total
Lee Avenue

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av / Lee Av & SR-98

File Name : 051 45041
Site Code : 001 45041
Start Date : 5/3/2005
Page No : 1

Groups Printed- Bicycles

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	2
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	4
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1	4
16:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
Total	0	1	0	0	1	0	2	0	0	2	0	1	0	0	1	0	2	0	0	2	6
17:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17:15	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
17:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	3
17:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Total	0	3	0	0	3	0	1	0	0	1	0	1	0	0	1	0	3	0	0	3	8
18:00	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
18:15	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	7	0	0	7	0	5	0	0	5	0	3	0	0	3	0	6	0	0	6	21
Apprch %	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	33.3	0.0	0.0	33.3	0.0	23.8	0.0	0.0	23.8	0.0	14.3	0.0	0.0	14.3	0.0	28.6	0.0	0.0	28.6	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av / Lee Av & SR-98

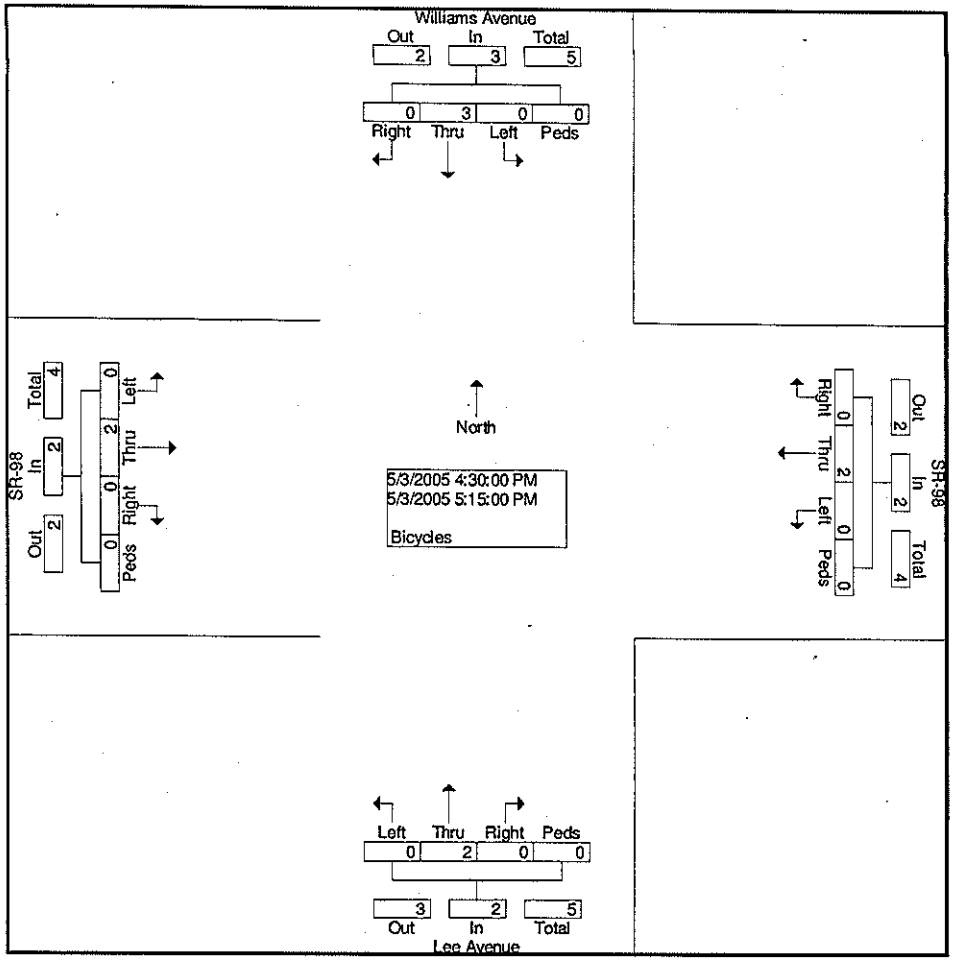
File Name : 05145041
Site Code : 00145041
Start Date : 5/3/2005
Page No : 2

	Williams Avenue Southbound					SR-98 Westbound					Lee Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 16:30																					
Volume	0	3	0	0	3	0	2	0	0	2	0	2	0	0	2	0	2	0	0	2	9
Percent	0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	100.0	0.0	0.0		
16:30 Volume	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1	4
Peak Factor																					0.563
High Int. 16:45						16:30					16:30					16:30					
Volume	0	1	0	0	1	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1	
Peak Factor					0.750					0.250					0.500					0.500	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Brown
Board # : D1-0239
Location : Williams Av / Lee Av & SR-98

File Name : 05145041
Site Code : 00145041
Start Date : 5/3/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd & SR-98

File Name : 05145050
Site Code : 00145050
Start Date : 5/3/2005
Page No : 1

Groups Printed- Cars & Light Trucks

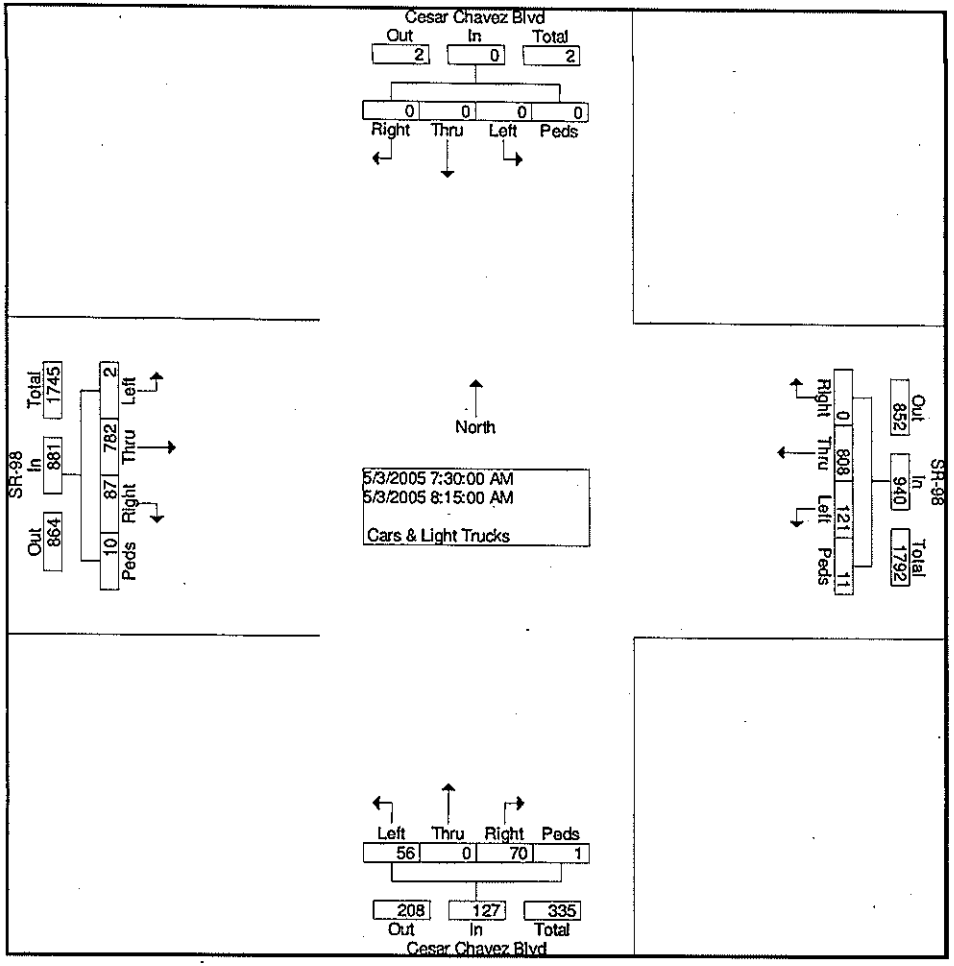
	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	7	74	0	1	82	18	0	7	0	25	1	49	20	0	70	177
06:45	0	0	0	0	0	11	89	0	0	100	11	0	3	0	14	0	54	14	0	68	182
Total	0	0	0	0	0	18	163	0	1	182	29	0	10	0	39	1	103	34	0	138	359
07:00	0	0	0	0	0	10	127	1	0	138	15	0	14	0	29	0	73	16	0	89	256
07:15	0	0	0	0	0	12	124	2	4	142	16	0	12	1	29	0	90	15	0	105	276
07:30	0	0	0	0	0	25	178	0	3	206	7	0	11	0	18	2	148	28	5	183	407
07:45	0	0	0	0	0	32	254	0	6	292	13	0	17	0	30	0	235	10	3	248	570
Total	0	0	0	0	0	79	683	3	13	778	51	0	54	1	106	2	546	69	8	625	1509
08:00	0	0	0	0	0	33	235	0	0	268	19	0	24	0	43	0	253	23	0	276	587
08:15	0	0	0	0	0	31	141	0	2	174	17	0	18	1	36	0	146	26	2	174	384
08:30	0	0	0	0	0	19	106	2	0	127	14	0	21	0	35	0	103	32	1	136	298
08:45	0	0	0	0	0	10	45	0	0	55	9	0	10	0	19	1	35	13	0	49	123
Total	0	0	0	0	0	93	527	2	2	624	59	0	73	1	133	1	537	94	3	635	1392
09:00	0	0	0	0	0	12	132	0	0	144	16	0	14	0	30	0	120	24	0	144	318
Grand Total	0	0	0	0	0	202	1505	5	16	1728	155	0	151	2	308	4	1306	221	11	1542	3578
Apprch %	0.0	0.0	0.0	0.0		11.7	87.1	0.3	0.9		50.3	0.0	49.0	0.6		0.3	84.7	14.3	0.7		
Total %	0.0	0.0	0.0	0.0	0.0	5.6	42.1	0.1	0.4	48.3	4.3	0.0	4.2	0.1	8.6	0.1	36.5	6.2	0.3	43.1	

	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:00 - Peak 1 of 1																					
Intersection	07:30																				
Volume	0	0	0	0	0	121	808	0	11	940	56	0	70	1	127	2	782	87	10	881	1948
Percent	0.0	0.0	0.0	0.0		12.9	86.0	0.0	1.2		44.1	0.0	55.1	0.8		0.2	88.8	9.9	1.1		
08:00 Volume	0	0	0	0	0	33	235	0	0	268	19	0	24	0	43	0	253	23	0	276	587
Peak Factor																					0.830
High Int.	6:15:00 AM					07:45					08:00					08:00					
Volume	0	0	0	0	0	32	254	0	6	292	19	0	24	0	43	0	253	23	0	276	
Peak Factor										0.805					0.738					0.798	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd & SR-98

File Name : 05145050
Site Code : 00145050
Start Date : 5/3/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd. & SR-98

File Name : 05145051
Site Code : 00145051
Start Date : 5/3/2005
Page No : 1

Groups Printed- Cars & Light Trucks

	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	29	136	0	0	165	23	0	32	2	57	1	136	48	0	185	407
14:45	0	0	0	0	0	33	143	0	1	177	21	0	37	0	58	0	213	54	2	269	504
Total	0	0	0	0	0	62	279	0	1	342	44	0	69	2	115	1	349	102	2	454	911
15:00	0	0	0	0	0	45	165	0	0	210	12	0	22	4	38	2	171	42	2	217	465
15:15	0	0	0	0	0	37	167	0	3	207	13	0	23	1	37	1	165	53	2	221	465
15:30	0	0	0	0	0	32	150	0	1	183	12	0	20	0	32	0	132	59	2	193	408
15:45	0	0	0	0	0	32	114	0	0	146	10	0	36	0	46	0	152	66	0	218	410
Total	0	0	0	0	0	146	596	0	4	746	47	0	101	5	153	3	620	220	6	849	1748
16:00	0	0	0	0	0	26	146	1	1	174	15	0	15	0	30	0	128	61	0	189	393
16:15	0	0	0	0	0	33	114	0	1	148	13	0	29	1	43	0	156	39	0	195	386
16:30	0	0	0	0	0	33	129	0	0	162	14	0	30	0	44	0	155	36	0	191	397
16:45	0	0	0	0	0	44	116	0	3	163	14	0	15	0	29	0	159	34	1	194	386
Total	0	0	0	0	0	136	505	1	5	647	56	0	89	1	146	0	598	170	1	769	1562
17:00	0	0	0	0	0	33	151	0	0	184	14	0	25	1	40	0	149	53	0	202	426
17:15	0	0	0	0	0	32	147	1	0	180	10	0	31	0	41	0	167	41	0	208	429
17:30	0	0	0	0	0	48	157	0	0	205	8	0	24	0	32	1	169	31	1	202	439
17:45	0	0	0	0	0	35	118	0	0	153	14	0	33	0	47	0	146	27	0	173	373
Total	0	0	0	0	0	148	573	1	0	722	46	0	113	1	160	1	631	152	1	785	1667
18:00	0	0	0	0	0	38	117	0	1	156	14	0	22	0	36	0	125	28	2	155	347
Grand Total	0	0	0	0	0	530	2070	2	11	2613	207	0	394	9	610	5	2323	672	12	3012	6235
Apprch %	0.0	0.0	0.0	0.0		20.3	79.2	0.1	0.4		33.9	0.0	64.6	1.5		0.2	77.1	22.3	0.4		
Total %	0.0	0.0	0.0	0.0	0.0	8.5	33.2	0.0	0.2	41.9	3.3	0.0	6.3	0.1	9.8	0.1	37.3	10.8	0.2	48.3	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd. & SR-98

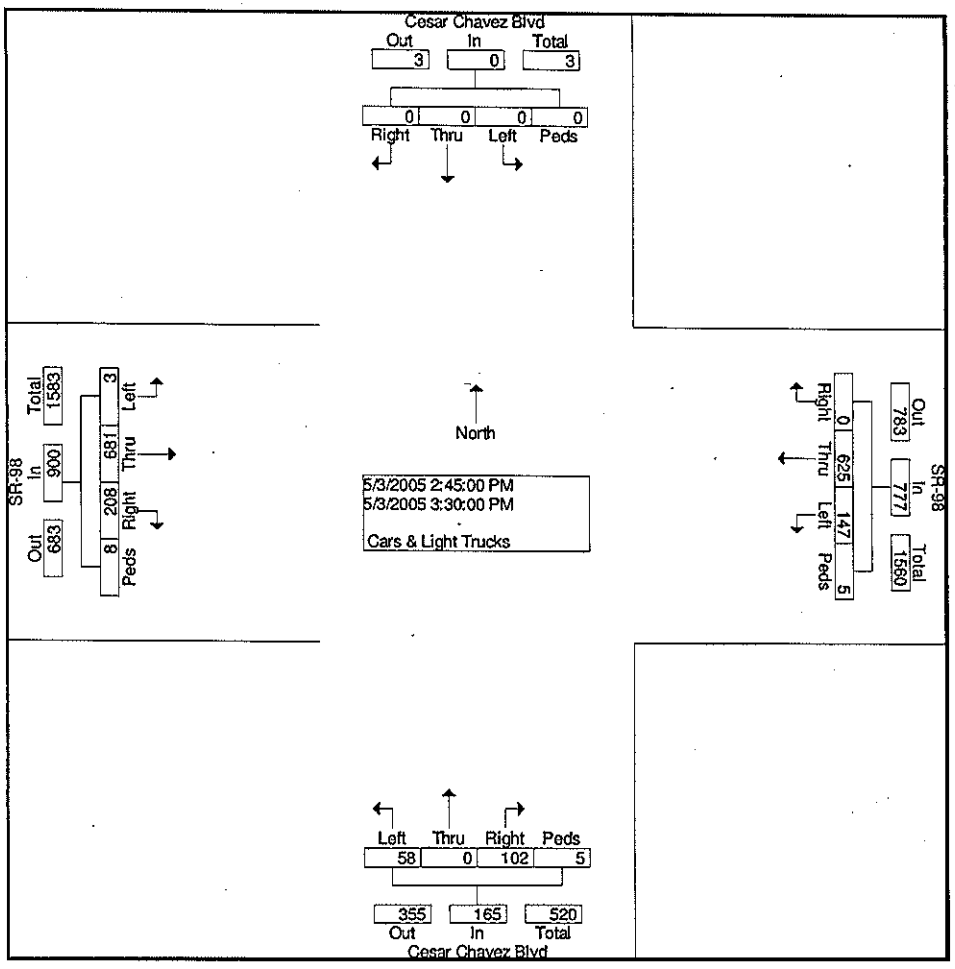
File Name : 051 45051
Site Code : 001 45051
Start Date : 5/3/2005

	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:00 - Peak 1 of 1																					
Intersection 14:45																					
Volume	0	0	0	0	0	147	625	0	5	777	58	0	102	5	165	3	681	208	8	900	1842
Percent	0.0	0.0	0.0	0.0		18.9	80.4	0.0	0.6		35.2	0.0	61.8	3.0		0.3	75.7	23.1	0.9		
14:45 Volume	0	0	0	0	0	33	143	0	1	177	21	0	37	0	58	0	213	54	2	269	504
Peak Factor																					0.914
High Int.	2:15:00 PM					15:00					14:45					14:45					
Volume	0	0	0	0	0	45	165	0	0	210	21	0	37	0	58	0	213	54	2	269	
Peak Factor										0.925					0.711					0.836	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd. & SR-98

File Name : 05145051
Site Code : 00145051
Start Date : 5/3/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd & SR-98

File Name : 05145050
Site Code : 00145050
Start Date : 5/3/2005
Page No : 1

Groups Printed- Heavy Trucks

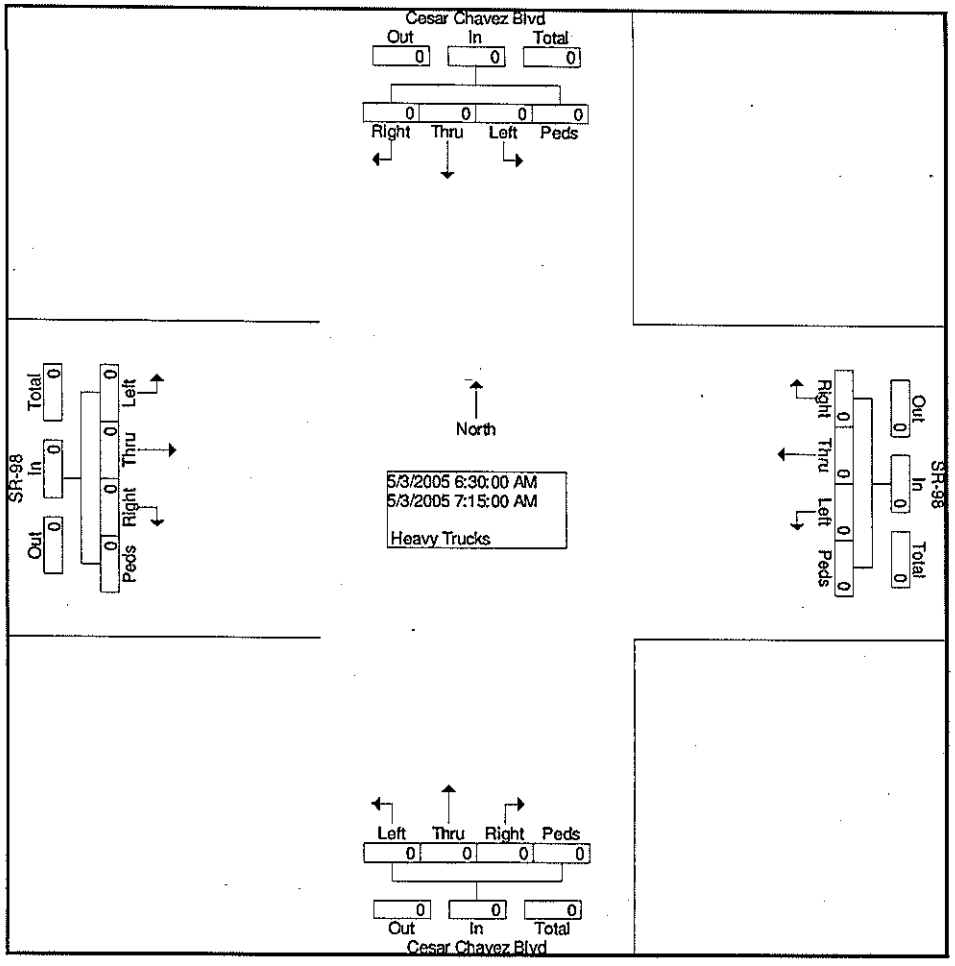
	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %																					

	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:00 - Peak 1 of 1																					
Intersection	06:30																				
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0:0	0.0		
07:15 Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Factor																					0.000
High Int.	6:15:00 AM					6:15:00 AM					6:15:00 AM					6:15:00 AM					
Volume																					
Peak Factor																					

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd & SR-98

File Name : 05145050
Site Code : 00145050
Start Date : 5/3/2005
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd. & SR-98

File Name : 05145051
Site Code : 00145051
Start Date : 5/3/2005
Page No : 1

Groups Printed- Heavy Trucks

	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %																					

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd. & SR-98

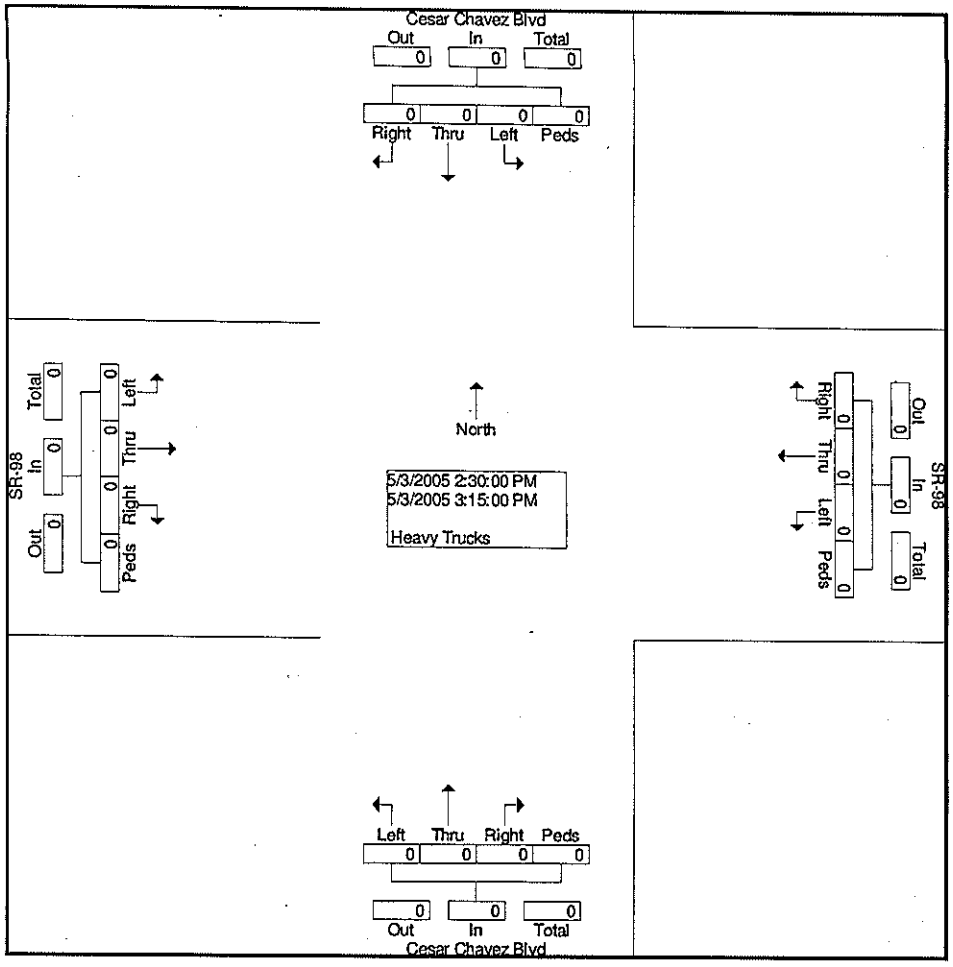
File Name : 05145051
Site Code : 00145051
Start Date : 5/3/2005
Page No : 2

	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:00 - Peak 1 of 1																					
Intersection 14:30																					
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
15:15																					
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Factor																					0.000
High Int.	2:15:00 PM					2:15:00 PM					2:15:00 PM					2:15:00 PM					
Volume																					
Peak Factor																					

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd. & SR-98

File Name : 05145051
Site Code : 00145051
Start Date : 5/3/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd & SR-98

File Name : 051 45050
Site Code : 001 45050
Start Date : 5/3/2005
Page No : 1

Groups Printed- Bicycles

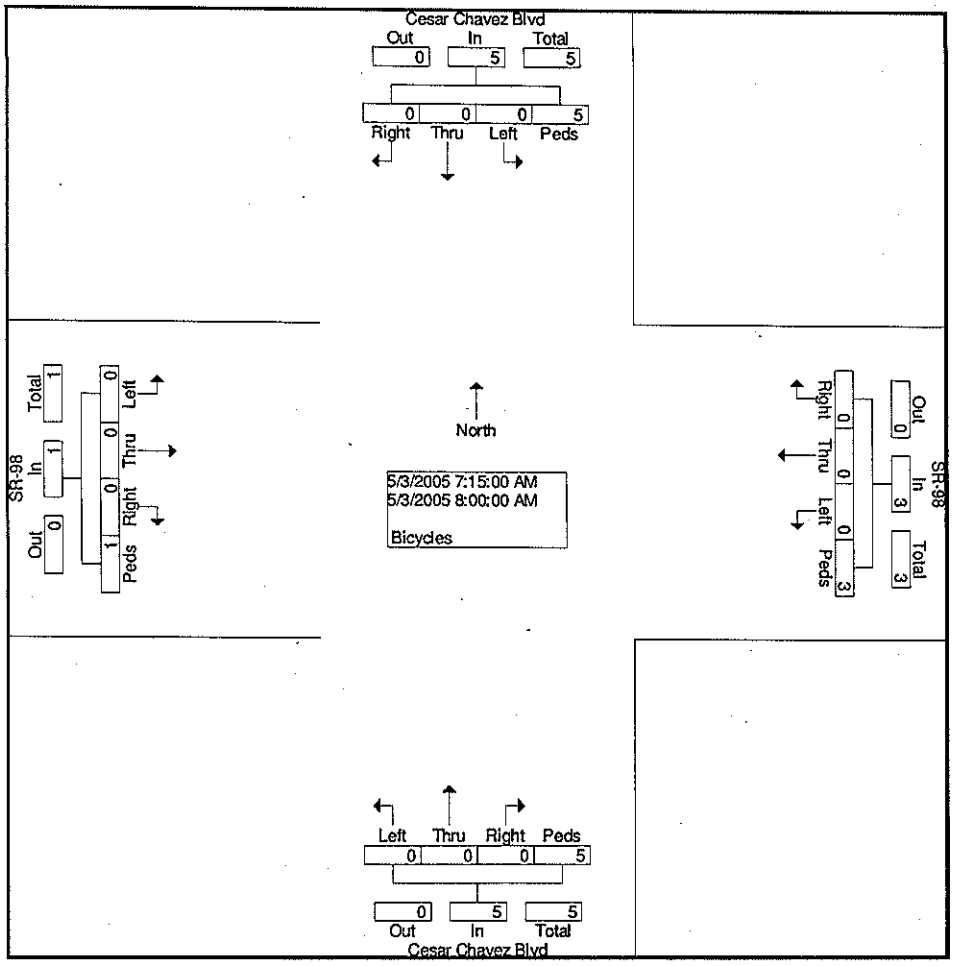
	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	4
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	4	4	0	0	0	1	1	6
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
07:15	0	0	0	3	3	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	6
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
07:45	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	1	1	3
Total	0	0	0	3	3	0	0	0	2	2	0	0	0	5	5	0	0	0	2	2	12
08:00	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3
08:15	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
08:30	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
08:45	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	2	2	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	6
09:00	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	0	0	0	1	1	4
Grand Total	0	0	0	6	6	0	0	0	8	8	0	0	0	10	10	0	0	0	4	4	28
Apprch %	0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		
Total %	0.0	0.0	0.0	21.4	21.4	0.0	0.0	0.0	28.6	28.6	0.0	0.0	0.0	35.7	35.7	0.0	0.0	0.0	14.3	14.3	

	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:00 - Peak 1 of 1																					
Intersection	07:15																				
Volume	0	0	0	5	5	0	0	0	3	3	0	0	0	5	5	0	0	0	1	1	14
Percent	0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		
07:15 Volume	0	0	0	3	3	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	6
Peak Factor																					0.583
High Int.	07:15					07:45					07:15					07:45					
Volume	0	0	0	3	3	0	0	0	2	2	0	0	0	3	3	0	0	0	1	1	
Peak Factor					0.417					0.375					0.417					0.250	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd & SR-98

File Name : 05145050
Site Code : 00145050
Start Date : 5/3/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd. & SR-98

File Name : 05145051
Site Code : 00145051
Start Date : 5/3/2005
Page No : 1

Groups Printed- Bicycles

	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
15:00	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	3	3	5
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	5	5	6
15:30	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2	0	0	0	8	8	12
16:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:15	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:30	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0	3
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	2	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0	5
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
17:30	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	3
17:45	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	5
18:00	0	0	0	3	3	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	4
Grand Total	0	0	0	9	9	0	0	0	4	4	0	0	0	3	3	0	0	0	11	11	27
Apprch %	0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		
Total %	0.0	0.0	0.0	33.3	33.3	0.0	0.0	0.0	14.8	14.8	0.0	0.0	0.0	11.1	11.1	0.0	0.0	0.0	40.7	40.7	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd. & SR-98

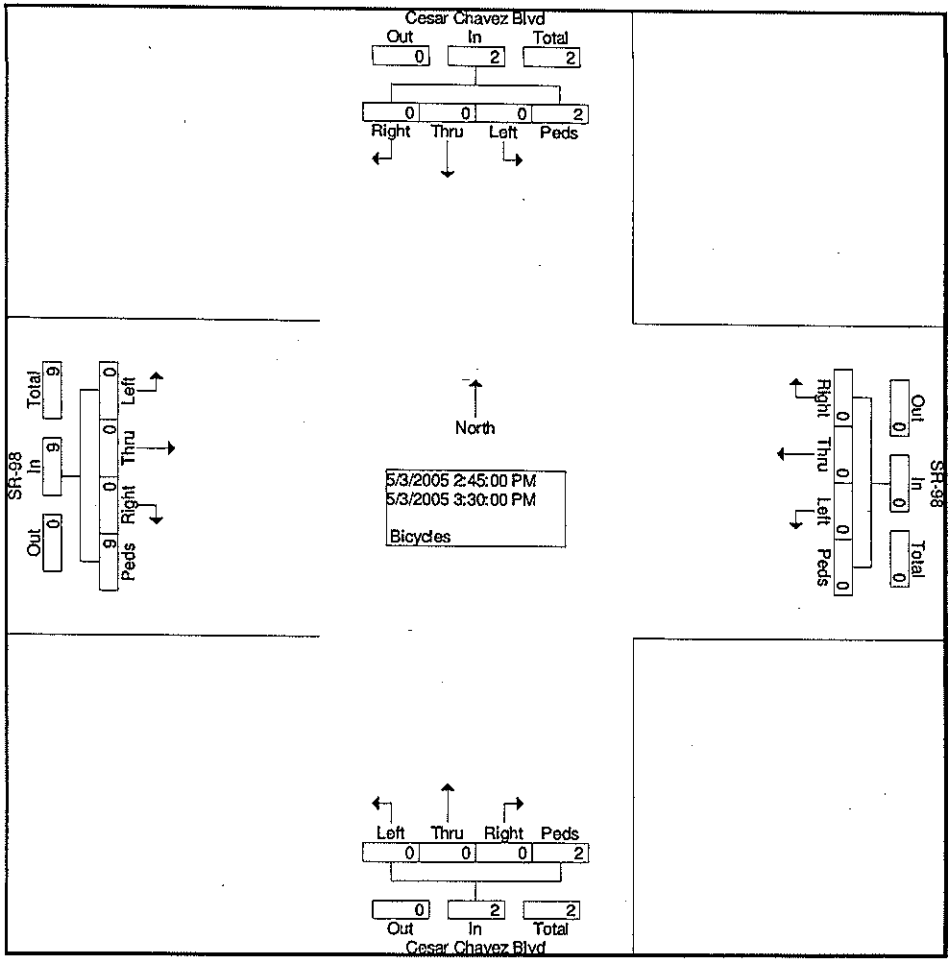
File Name : 05145051
Site Code : 00145051
Start Date : 5/3/2005

	Cesar Chavez Blvd Southbound					SR-98 Westbound					Cesar Chavez Blvd Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:00 - Peak 1 of 1																					
Intersection 14:45																					
Volume	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2	0	0	0	9	9	13
Percent	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		
15:15 Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	5	5	6
Peak Factor																					0.542
High Int. 15:00						2:15:00 PM					15:00					15:15					
Volume	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	5	5	
Peak Factor					0.500										0.500					0.450	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: R. Feist
Board # : D1-1424
Location : Ceaser Chavez Blvd. & SR-98

File Name : 05145051
Site Code : 00145051
Start Date : 5/3/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

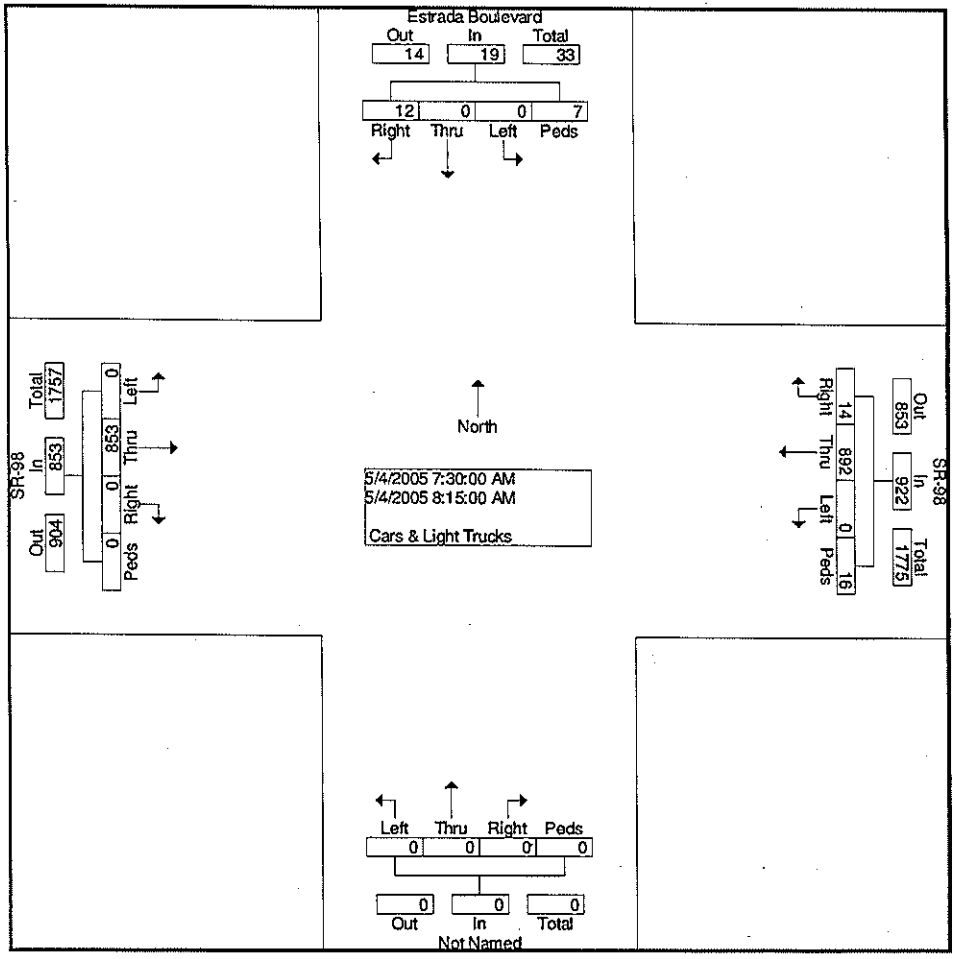
Weather : Clear & Dry
Counted by: C. Parish
Board # : D1-0239 Video
Location : Estrada Blvd & SR-98

File Name : 05145060
Site Code : 00145060
Start Date : 5/4/2005
Page No : 1

Groups Printed- Cars & Light Trucks

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	107	0	0	107	0	0	0	0	0	0	61	0	0	61	168
06:45	0	0	1	0	1	0	103	2	0	105	0	0	0	0	0	0	62	0	0	62	168
Total	0	0	1	0	1	0	210	2	0	212	0	0	0	0	0	0	123	0	0	123	336
07:00	0	0	0	1	1	0	111	0	0	111	0	0	0	0	0	0	79	0	0	79	191
07:15	0	0	0	0	0	0	145	1	3	149	0	0	0	1	1	0	107	0	0	107	257
07:30	0	0	1	1	2	0	190	1	5	196	0	0	0	0	0	0	151	0	0	151	349
07:45	0	0	3	1	4	0	269	4	6	279	0	0	0	0	0	0	245	0	0	245	528
Total	0	0	4	3	7	0	715	6	14	735	0	0	0	1	1	0	582	0	0	582	1325
08:00	0	0	3	0	3	0	254	5	5	264	0	0	0	0	0	0	293	0	0	293	560
08:15	0	0	5	5	10	0	179	4	0	183	0	0	0	0	0	0	164	0	0	164	357
08:30	0	0	4	1	5	0	108	6	1	115	0	0	0	0	0	0	117	0	0	117	237
08:45	0	0	3	0	3	0	158	7	2	167	0	0	0	0	0	0	129	0	0	129	299
Total	0	0	15	6	21	0	699	22	8	729	0	0	0	0	0	0	703	0	0	703	1453
09:00	0	0	6	0	6	0	137	8	0	145	0	0	0	0	0	0	147	0	0	147	298
09:15	0	0	3	0	3	0	115	10	0	125	0	0	0	0	0	0	133	0	0	133	261
Grand Total	0	0	29	9	38	0	1876	48	22	1946	0	0	0	1	1	0	1688	0	0	1688	3673
Apprch %	0.0	0.0	76.3	23.7		0.0	96.4	2.5	1.1		0.0	0.0	0.0	100.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.8	0.2	1.0	0.0	51.1	1.3	0.6	53.0	0.0	0.0	0.0	0.0	0.0	0.0	46.0	0.0	0.0	46.0	

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	07:30																				
Volume	0	0	12	7	19	0	892	14	16	922	0	0	0	0	0	0	853	0	0	853	1794
Percent	0.0	0.0	63.2	36.8		0.0	96.7	1.5	1.7		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
08:00 Volume	0	0	3	0	3	0	254	5	5	264	0	0	0	0	0	0	293	0	0	293	560
Peak Factor																					0.801
High Int.	08:15					07:45		-	-		6:15:00 AM					08:00					
Volume	0	0	5	5	10	0	269	4	6	279	0	0	0	0	0	0	293	0	0	293	
Peak Factor					0.475					0.826										0.728	


Estrada Boulevard
Out
In
Total
14
19
33
12
0
0
7
Right
Thru
Left
Peds
SR-98
Total
1757
In
853
Out
904
0
853
0
0
Left
Thru
Right
Peds
North
5/4/2005 7:30:00 AM
5/4/2005 8:15:00 AM
Cars & Light Trucks
14
892
0
16
Right
Thru
Left
Peds
Out
853
In
922
Total
1775
SR-98
Left
Thru
Right
Peds
0
0
0
0
0
0
0
Out
In
Total
Not Named

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Parish
Board #: D1-239 Video
Location : Estrada Blvd. & SR-98

File Name : 05145061
Site Code : 00145061
Start Date : 5/4/2005
Page No : 1

Groups Printed- Cars & Light Trucks

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	2	5	7	0	142	36	1	179	0	0	0	0	0	0	179	0	0	179	365
14:45	0	0	2	5	7	0	136	38	1	175	0	0	0	0	0	0	177	0	0	177	359
Total	0	0	4	10	14	0	278	74	2	354	0	0	0	0	0	0	356	0	0	356	724
15:00	0	0	1	5	6	0	191	3	0	194	0	0	0	0	0	0	253	0	1	254	454
15:15	0	0	6	6	12	0	188	11	0	199	0	0	0	0	0	0	172	0	0	172	383
15:30	0	0	4	9	13	0	193	12	0	205	0	0	0	0	0	0	176	0	0	176	394
15:45	0	0	3	5	8	0	166	8	0	174	0	0	0	0	0	0	156	0	0	156	338
Total	0	0	14	25	39	0	738	34	0	772	0	0	0	0	0	0	757	0	1	758	1569
16:00	0	0	3	5	8	0	103	26	0	129	0	0	0	0	0	0	135	0	0	135	272
16:15	0	0	7	0	7	0	200	14	0	214	0	0	0	0	0	0	157	0	0	157	378
16:30	0	0	5	2	7	0	147	3	0	150	0	0	0	0	0	1	202	0	0	203	360
16:45	0	0	7	2	9	0	149	6	0	155	0	0	0	0	0	0	175	0	0	175	339
Total	0	0	22	9	31	0	599	49	0	648	0	0	0	0	0	1	669	0	0	670	1349
17:00	0	0	7	0	7	0	160	3	0	163	0	0	0	0	0	0	167	0	0	167	337
17:15	0	0	6	1	7	0	156	3	0	159	0	0	0	0	0	0	170	0	0	170	336
17:30	0	0	8	1	9	0	191	4	0	195	0	0	0	0	0	0	185	0	0	185	389
17:45	0	0	5	1	6	0	188	3	0	191	0	0	0	0	0	0	189	0	2	191	388
Total	0	0	26	3	29	0	695	13	0	708	0	0	0	0	0	0	711	0	2	713	1450
18:00	0	0	4	0	4	0	178	2	0	180	0	0	0	0	0	0	187	0	0	187	371
18:15	0	0	4	1	5	0	165	2	0	167	0	0	0	0	0	0	179	0	2	181	353
Grand Total	0	0	74	48	122	0	2653	174	2	2829	0	0	0	0	0	1	2859	0	5	2865	5816
Apprch %	0.0	0.0	60.7	39.3		0.0	93.8	6.2	0.1		0.0	0.0	0.0	0.0		0.0	99.8	0.0	0.2		
Total %	0.0	0.0	1.3	0.8	2.1	0.0	45.6	3.0	0.0	48.6	0.0	0.0	0.0	0.0	0.0	0.0	49.2	0.0	0.1	49.3	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Parish
Board #: D1-239 Video
Location : Estrada Blvd. & SR-98

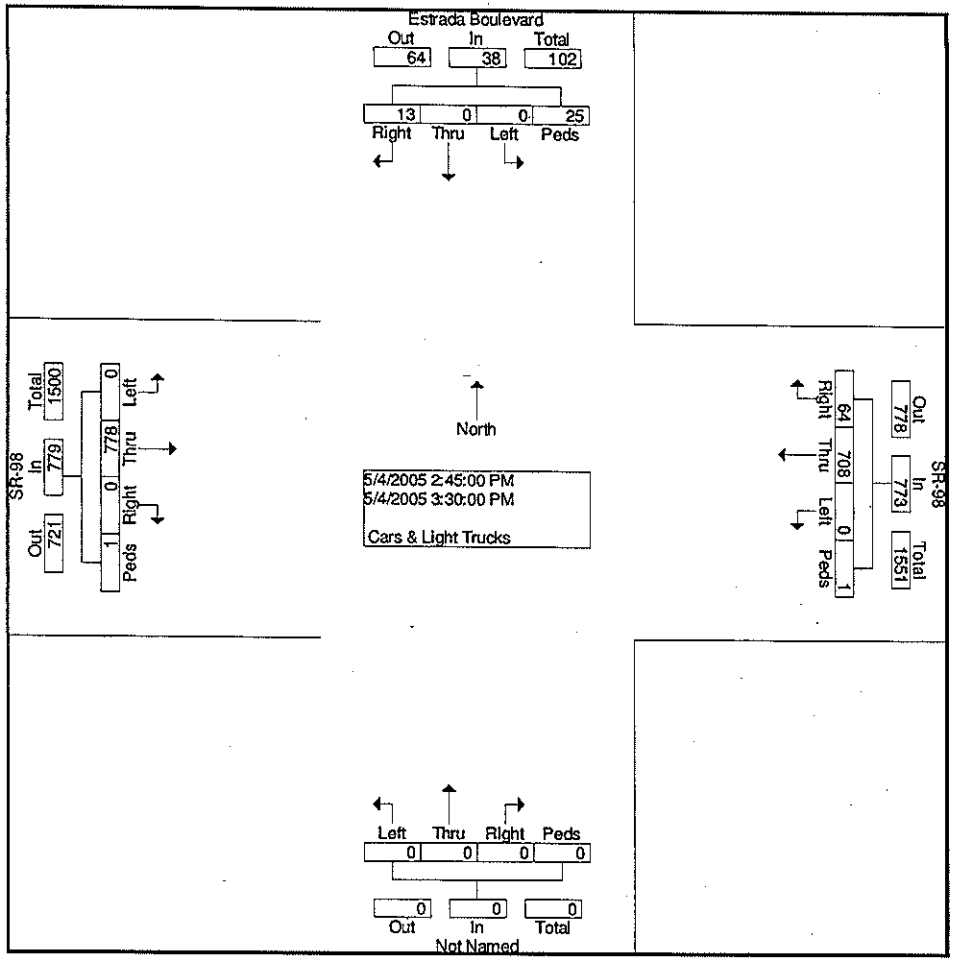
File Name : 05145061
Site Code : 00145061
Start Date : 5/4/2005

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection	14:45																				
Volume	0	0	13	25	38	0	708	64	1	773	0	0	0	0	0	0	778	0	1	779	1590
Percent	0.0	0.0	34.2	65.8		0.0	91.6	8.3	0.1		0.0	0.0	0.0	0.0		0.0	99.9	0.0	0.1		
15:00 Volume	0	0	1	5	6	0	191	3	0	194	0	0	0	0	0	0	253	0	1	254	454
Peak Factor																					0.876
High Int.	15:30					15:30					2:15:00 PM					15:00					
Volume	0	0	4	9	13	0	193	12	0	205	0	0	0	0	0	0	253	0	1	254	
Peak Factor					0.731					0.943										0.767	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Parish
Board # : D1-239 Video
Location : Estrada Blvd. & SR-98

File Name : 051 45061
Site Code : 001 45061
Start Date : 5/4/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

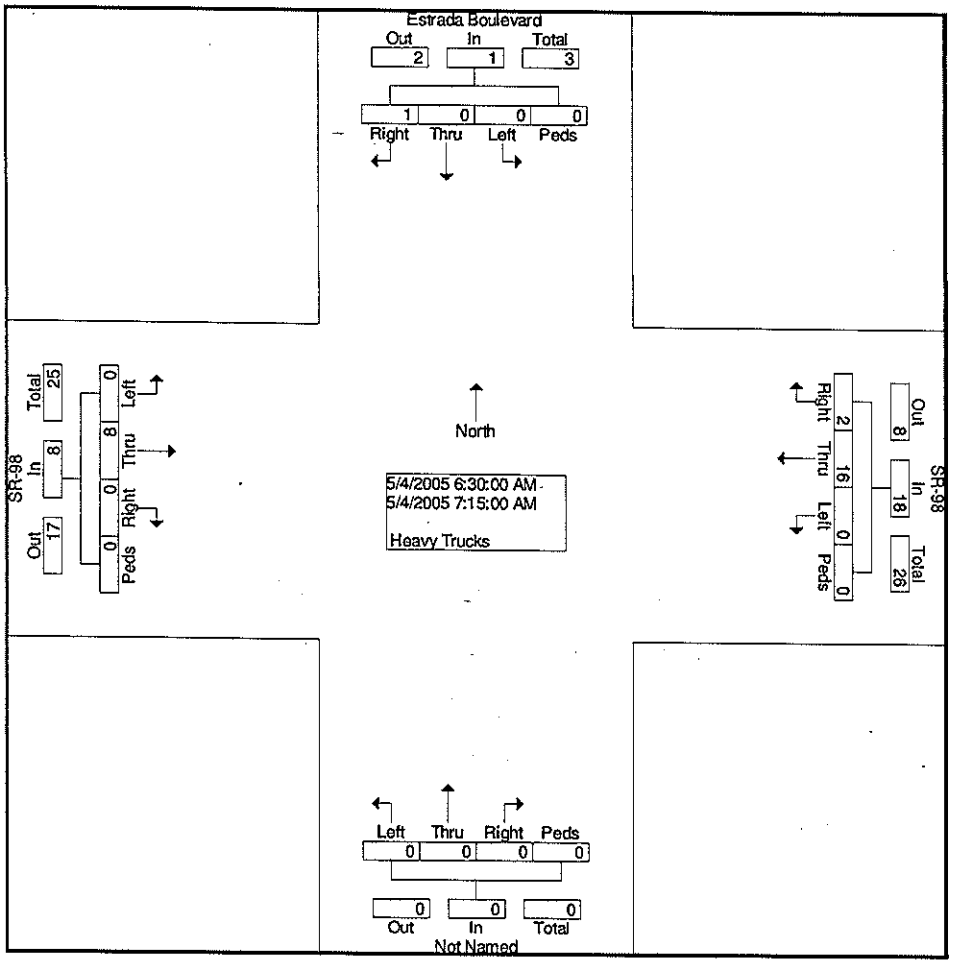
Weather : Clear & Dry
Counted by: C. Parish
Board # : D1-0239 Video
Location : Estrada Blvd & SR-98

File Name : 05145060
Site Code : 00145060
Start Date : 5/4/2005
Page No : 1

Groups Printed- Heavy Trucks

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	5	1	0	6	0	0	0	0	0	0	2	0	0	2	8
06:45	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	1	0	0	1	8
Total	0	0	0	0	0	0	12	1	0	13	0	0	0	0	0	0	3	0	0	3	16
07:00	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
07:15	0	0	1	0	1	0	2	1	0	3	0	0	0	0	0	0	3	0	0	3	7
07:30	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	1	0	0	1	5
07:45	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	0	2	0	0	2	7
Total	0	0	1	0	1	0	11	3	0	14	0	0	0	0	0	0	8	0	0	8	23
08:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
08:15	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	5	0	0	5	11
08:30	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3	0	0	3	4
08:45	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	0	0	9	2	0	11	0	0	0	0	0	0	11	0	0	11	22
09:00	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
09:15	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	8
Grand Total	0	0	1	0	1	0	38	6	0	44	0	0	0	0	0	0	27	0	0	27	72
Apprch %	0.0	0.0	100.0	0.0		0.0	86.4	13.6	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	1.4	0.0	1.4	0.0	52.8	8.3	0.0	61.1	0.0	0.0	0.0	0.0	0.0	0.0	37.5	0.0	0.0	37.5	

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection 06:30																					
Volume	0	0	1	0	1	0	16	2	0	18	0	0	0	0	0	0	8	0	0	8	27
Percent	0.0	0.0	100.0	0.0		0.0	88.9	11.1	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
06:45 Volume	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	1	0	0	1	8
Peak Factor																					0.844
High Int.	07:15					06:45					6:15:00 AM					07:15					
Volume	0	0	1	0	1	0	7	0	0	7	0	0	0	0	0	0	3	0	0	3	
Peak Factor					0.250					0.643										0.667	


Estrada Boulevard
Out
In
Total
2
1
3
1
0
0
0
Right
Thru
Left
Peds
North
5/4/2005 6:30:00 AM
5/4/2005 7:15:00 AM
Heavy Trucks
SR-98
Total
25
In
8
Out
17
0
8
0
0
Left
Thru
Right
Peds
SR-98
Out
8
In
18
Total
26
2
16
0
0
Right
Thru
Left
Peds
Left
Thru
Right
Peds
0
0
0
0
0
0
0
Out
In
Total
Not Named

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Parish
Board # : D1-239 Video
Location : Estrada Blvd. & SR-98

File Name : 05145061
Site Code : 00145061
Start Date : 5/4/2005
Page No : 1

Groups Printed- Heavy Trucks

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	1	0	1	0	3	1	0	4	0	0	0	0	0	0	9	0	0	9	14
14:45	0	0	1	0	1	0	2	1	0	3	0	0	0	0	0	0	8	0	0	8	12
Total	0	0	2	0	2	0	5	2	0	7	0	0	0	0	0	0	17	0	0	17	26
15:00	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	4
15:15	0	0	0	0	0	0	2	2	0	4	0	0	0	0	0	0	4	0	0	4	8
15:30	0	0	1	0	1	0	2	1	0	3	0	0	0	0	0	0	1	0	0	1	5
15:45	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	3	0	3	0	6	3	0	9	0	0	0	0	0	0	8	0	0	8	20
16:00	0	0	1	0	1	0	4	1	0	5	0	0	0	0	0	0	0	0	0	0	6
16:15	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	7
16:30	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	7
16:45	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
Total	0	0	2	0	2	0	12	1	0	13	0	0	0	0	0	0	10	0	0	10	25
17:00	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	5
17:15	0	0	2	0	2	0	5	1	0	6	0	0	0	0	0	0	3	0	0	3	11
17:30	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	7
17:45	0	0	1	0	1	0	5	0	0	5	0	0	0	0	0	0	1	0	0	1	7
Total	0	0	5	0	5	0	18	1	0	19	0	0	0	0	0	0	6	0	0	6	30
18:00	0	0	2	0	2	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	7
18:15	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	0	16	0	16	0	43	7	0	50	0	0	0	0	0	0	44	0	0	44	110
Apprch %	0.0	0.0	100.0	0.0		0.0	86.0	14.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	14.5	0.0	14.5	0.0	39.1	6.4	0.0	45.5	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	40.0	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Parish
Board #: D1-239 Video
Location : Estrada Blvd. & SR-98

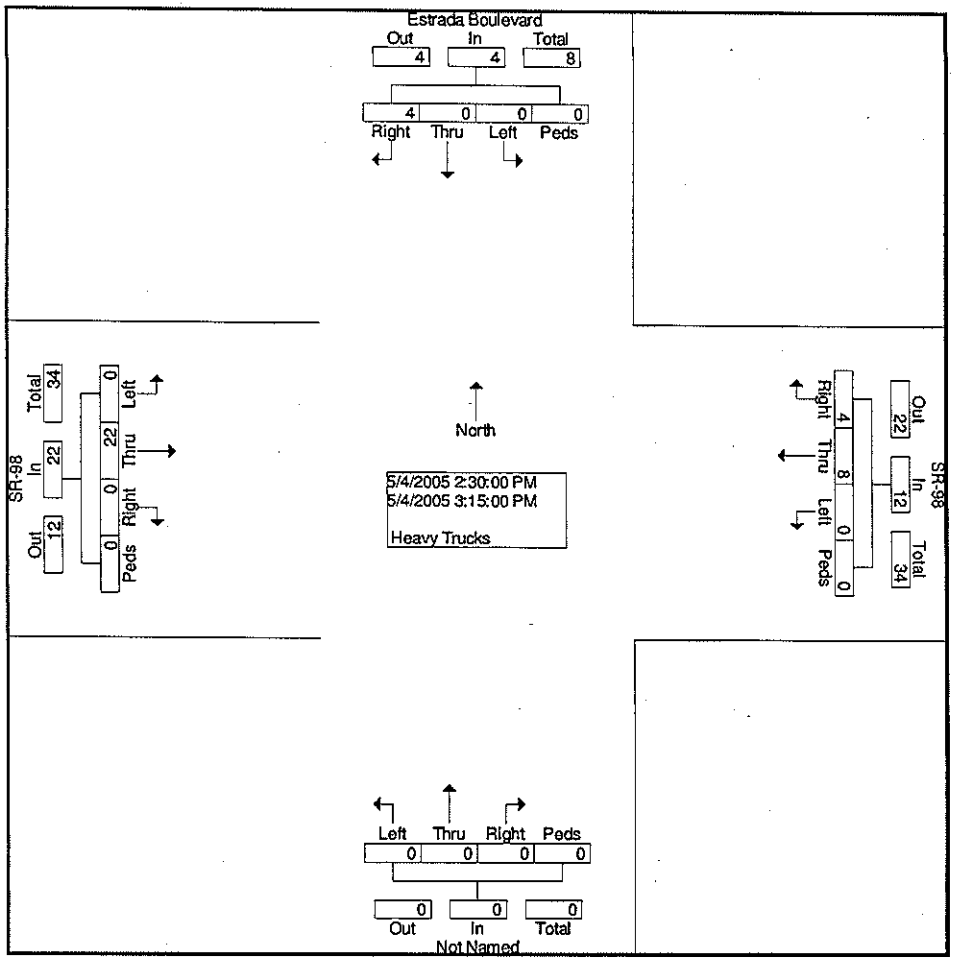
File Name : 05145061
Site Code : 00145061
Start Date : 5/4/2005
Page No : 2

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 14:30																					
Volume	0	0	4	0	4	0	8	4	0	12	0	0	0	0	0	0	22	0	0	22	38
Percent	0.0	0.0	100.0	0.0		0.0	66.7	33.3	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
14:30 Volume	0	0	1	0	1	0	3	1	0	4	0	0	0	0	0	0	9	0	0	9	14
Peak Factor																					0.679
High Int. 15:00						14:30					2:15:00 PM					14:30					
Volume	0	0	2	0	2	0	3	1	0	4	0	0	0	0	0	0	9	0	0	9	
Peak Factor					0.500					0.750										0.611	

Weather : Clear & Dry
Counted by: C. Parish
Board #: D1-239 Video
Location : Estrada Blvd. & SR-98

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

File Name : 05145061
Site Code : 00145061
Start Date : 5/4/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Parish
Board # : D1-0239 Video
Location : Estrada Blvd & SR-98

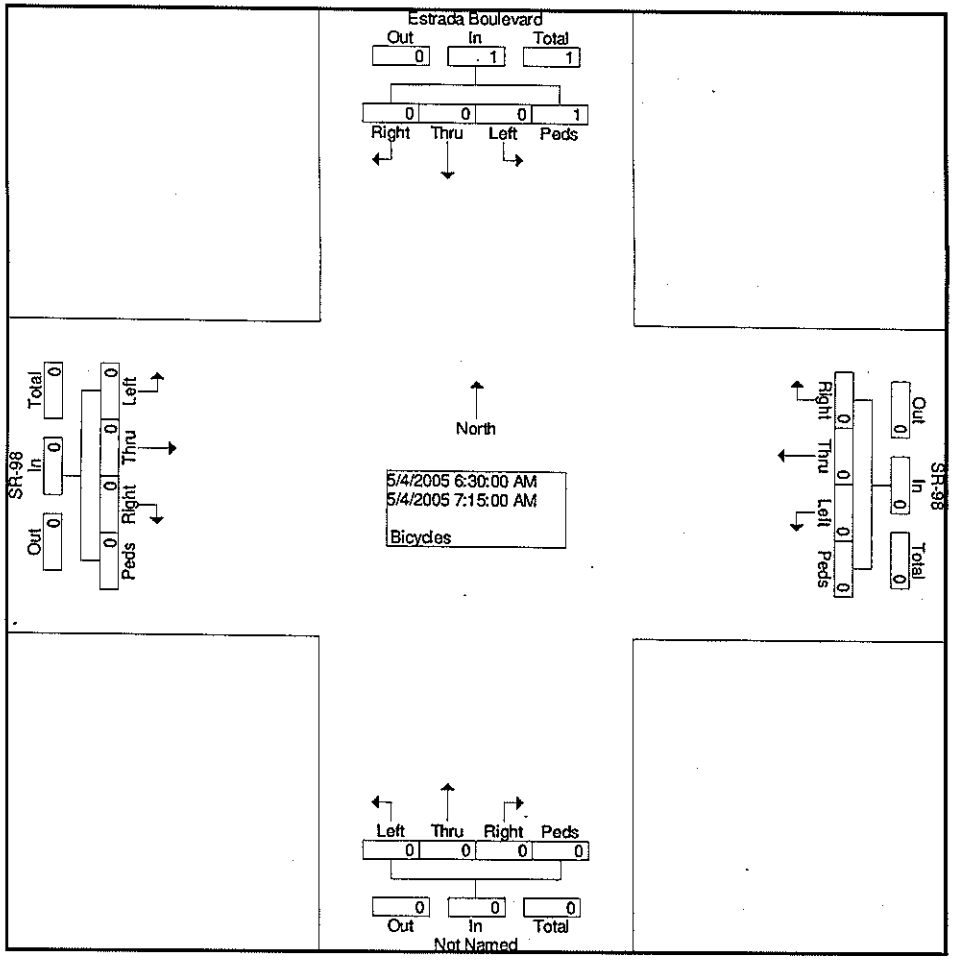
File Name : 05145060
Site Code : 00145060
Start Date : 5/4/2005
Page No : 1

Groups Printed- Bicycles

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Apprch %	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection 06:30																					
Volume	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Percent	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
06:45 Volume	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Peak Factor																					0.250
High Int. 06:45						6:15:00 AM					6:15:00 AM					6:15:00 AM					
Volume	0	0	0	1	1																

Peak Factor 0.250



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Parish
Board # : D1-239 Video
Location : Estrada Blvd. & SR-98

File Name : 05145061
Site Code : 00145061
Start Date : 5/4/2005
Page No : 1

Groups Printed- Bicycles

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14:45	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
15:00	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
15:15	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
15:30	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
15:45	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
16:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17:15	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17:30	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
17:45	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
18:00	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
18:15	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	22	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Apprch %	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Parish
Board # : D1-239 Video
Location : Estrada Blvd. & SR-98

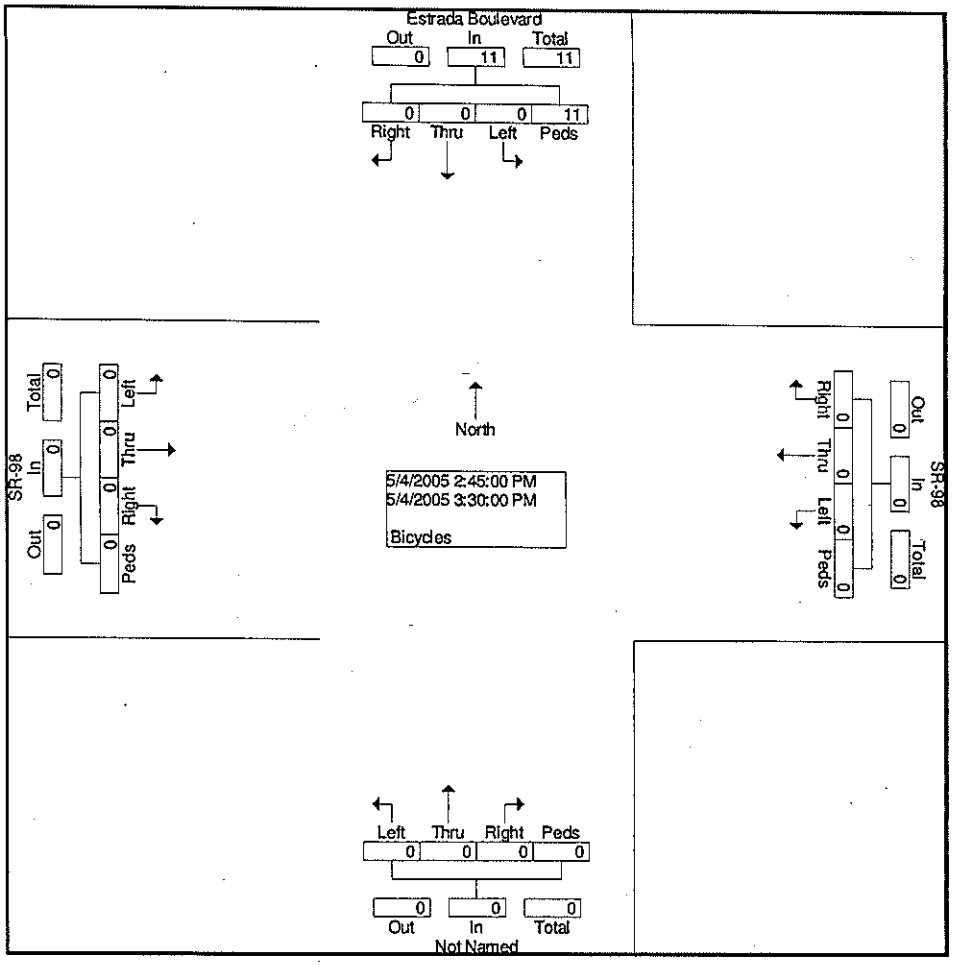
File Name : 05145061
Site Code : 00145061
Start Date : 5/4/2005

	Estrada Boulevard Southbound					SR-98 Westbound					Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 14:45																					
Volume	0	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Percent	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
15:15 Volume	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Peak Factor																					0.458
High Int. 15:15						2:15:00 PM					2:15:00 PM					2:15:00 PM					
Volume	0	0	0	6	6																
Peak Factor					0.458																

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: C. Parish
Board # : D1-239 Video
Location : Estrada Blvd. & SR-98

File Name : 051 45061
Site Code : 001 45061
Start Date : 5/4/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : Dd1-0240
Location : Ollie Avenue & SR-98

File Name : 05145070
Site Code : 00145070
Start Date : 5/3/2005
Page No : 1

Groups Printed- Cars & Light Trucks

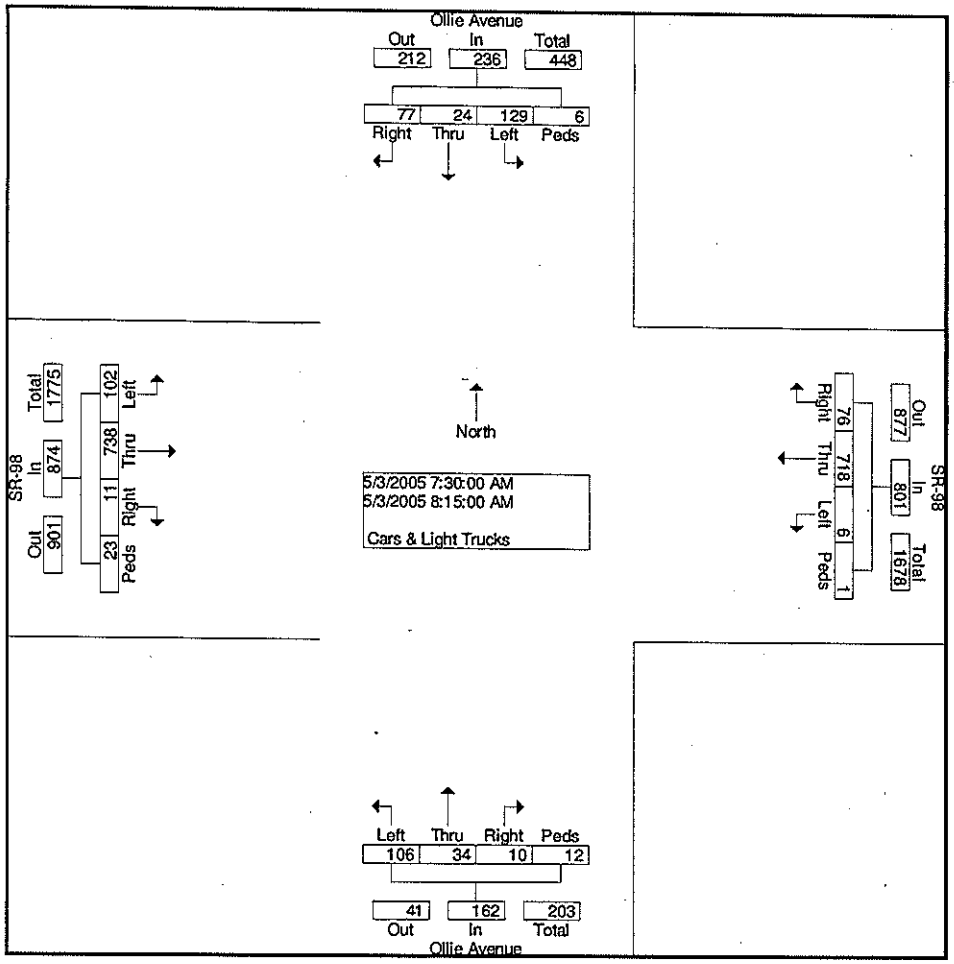
	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	17	3	11	1	32	0	63	18	0	81	14	3	0	0	17	17	43	0	1	61	191
06:45	16	1	10	0	27	1	93	12	0	106	6	2	0	1	9	10	51	0	1	62	204
Total	33	4	21	1	59	1	156	30	0	187	20	5	0	1	26	27	94	0	2	123	395
07:00	13	3	10	0	26	0	102	11	0	113	12	3	1	3	19	11	64	0	3	78	236
07:15	14	4	14	0	32	2	116	14	0	132	11	3	0	1	15	11	95	1	1	108	287
07:30	29	3	18	2	52	1	148	12	0	161	25	9	1	1	36	12	134	1	4	151	400
07:45	36	4	14	3	57	1	234	20	0	255	32	7	2	6	47	13	214	2	7	236	595
Total	92	14	56	5	167	4	600	57	0	661	80	22	4	11	117	47	507	4	15	573	1518
08:00	32	6	20	0	58	1	218	24	1	244	24	10	3	5	42	45	256	5	10	316	660
08:15	32	11	25	1	69	3	118	20	0	141	25	8	4	0	37	32	134	3	2	171	418
08:30	37	6	21	0	64	3	81	25	1	110	22	12	5	1	40	15	98	2	3	118	332
08:45	40	3	22	0	65	4	117	30	0	151	24	14	1	7	46	21	99	3	5	128	390
Total	141	26	88	1	256	11	534	99	2	646	95	44	13	13	165	113	587	13	20	733	1800
09:00	51	4	27	0	82	4	90	27	1	122	21	14	1	4	40	25	122	7	1	155	399
09:15	56	11	24	0	91	3	85	28	0	116	20	11	2	1	34	27	98	4	2	131	372
Grand Total	373	59	216	7	655	23	1465	241	3	1732	236	96	20	30	382	239	1408	28	40	1715	4484
Apprch %	56.9	9.0	33.0	1.1		1.3	84.6	13.9	0.2		61.8	25.1	5.2	7.9		13.9	82.1	1.6	2.3		
Total %	8.3	1.3	4.8	0.2	14.6	0.5	32.7	5.4	0.1	38.6	5.3	2.1	0.4	0.7	8.5	5.3	31.4	0.6	0.9	38.2	

	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	07:30																				
Volume	129	24	77	6	236	6	718	76	1	801	106	34	10	12	162	102	738	11	23	874	2073
Percent	54.7	10.2	32.6	2.5		0.7	89.6	9.5	0.1		65.4	21.0	6.2	7.4		11.7	84.4	1.3	2.6		
08:00 Volume	32	6	20	0	58	1	218	24	1	244	24	10	3	5	42	45	256	5	10	316	660
Peak Factor																					0.785
High Int.	08:15					07:45					07:45					08:00					
Volume	32	11	25	1	69	1	234	20	0	255	32	7	2	6	47	45	256	5	10	316	
Peak Factor					0.855					0.785					0.862					0.691	

Weather : Clear & Dry
Counted by: E. Furrer
Board # : Dd1-0240
Location : Ollie Avenue & SR-98

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

File Name : 05145070
Site Code : 00145070
Start Date : 5/3/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # :D1-240
Location : Ollie Avenue & SR-98

File Name : 05145071
Site Code : 00145071
Start Date : 5/3/2005

Groups Printed- Cars & Light Trucks

	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	82	18	33	0	133	1	105	25	0	131	28	16	5	0	49	33	133	6	1	173	486
14:45	70	14	40	1	125	3	110	28	2	143	27	29	3	5	64	36	200	4	1	241	573
Total	152	32	73	1	258	4	215	53	2	274	55	45	8	5	113	69	333	10	2	414	1059
15:00	75	14	38	4	131	8	145	26	0	179	32	21	10	3	66	36	160	6	6	208	584
15:15	71	13	29	3	116	6	163	35	0	204	28	15	2	5	50	28	167	5	6	206	576
15:30	78	16	28	1	123	13	125	42	1	181	22	26	2	1	51	31	122	2	3	158	513
15:45	88	18	41	3	150	7	131	39	0	177	37	19	4	1	61	33	169	6	1	209	597
Total	312	61	136	11	520	34	564	142	1	741	119	81	18	10	228	128	618	19	16	781	2270
16:00	92	19	34	1	146	13	144	55	0	212	31	22	8	2	63	28	99	3	4	134	555
16:15	75	14	39	2	130	13	104	23	0	140	18	20	3	3	44	39	145	7	1	192	506
16:30	79	18	23	1	121	6	116	30	0	152	24	10	3	0	37	28	155	5	2	190	500
16:45	91	9	29	2	131	4	108	26	0	138	16	20	2	1	39	34	148	7	0	189	497
Total	337	60	125	6	528	36	472	134	0	642	89	72	16	6	183	129	547	22	7	705	2058
17:00	72	14	29	0	115	9	136	34	0	179	19	20	5	1	45	31	146	3	0	180	519
17:15	67	19	32	0	118	4	126	17	0	147	15	23	4	0	42	23	154	6	0	183	490
17:30	78	12	29	0	119	4	142	25	2	173	24	16	1	0	41	30	157	6	0	193	526
17:45	82	9	31	2	124	6	116	20	0	142	12	16	9	1	38	35	147	2	0	184	488
Total	299	54	121	2	476	23	520	96	2	641	70	75	19	2	166	119	604	17	0	740	2023
18:00	47	11	23	0	81	4	106	28	0	138	24	18	6	0	48	27	111	3	0	141	408
Grand Total	1147	218	478	20	1863	101	1877	453	5	2436	357	291	67	23	738	472	2213	71	25	2781	7818
Apprch %	61.6	11.7	25.7	1.1		4.1	77.1	18.6	0.2		48.4	39.4	9.1	3.1		17.0	79.6	2.6	0.9		
Total %	14.7	2.8	6.1	0.3	23.8	1.3	24.0	5.8	0.1	31.2	4.6	3.7	0.9	0.3	9.4	6.0	28.3	0.9	0.3	35.6	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # :D1-240
Location : Ollie Avenue & SR-98

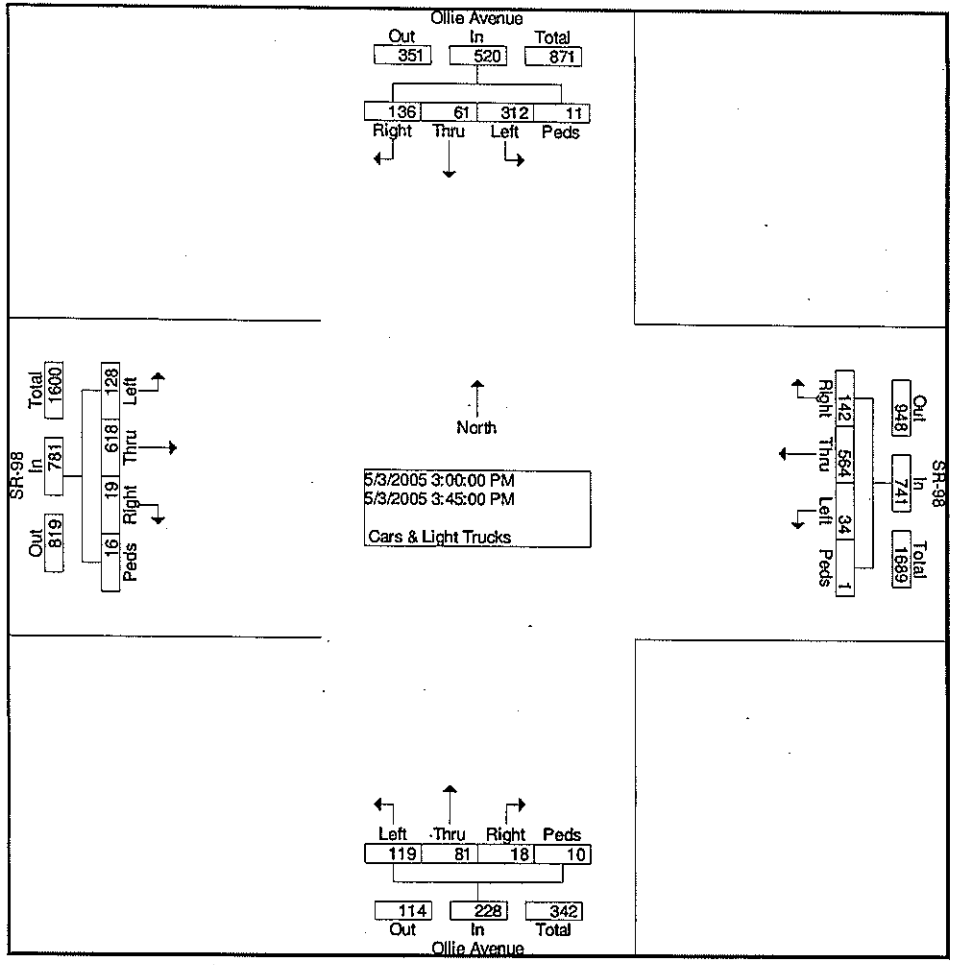
File Name : 051 45071
Site Code : 001 45071
Start Date : 5/3/2005
Page No : 2

	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:00 - Peak 1 of 1																					
Intersection 15:00																					
Volume	312	61	136	11	520	34	564	142	1	741	119	81	18	10	228	128	618	19	16	781	2270
Percent	60.0	11.7	26.2	2.1		4.6	76.1	19.2	0.1		52.2	35.5	7.9	4.4		16.4	79.1	2.4	2.0		
15:45 Volume	88	18	41	3	150	7	131	39	0	177	37	19	4	1	61	33	169	6	1	209	597
Peak Factor																					0.951
High Int. 15:45						15:15					15:00					15:45					
Volume	88	18	41	3	150	6	163	35	0	204	32	21	10	3	66	33	169	6	1	209	
Peak Factor					0.867					0.908					0.864					0.934	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # :D1-240
Location : Ollie Avenue & SR-98

File Name : 05145071
Site Code : 00145071
Start Date : 5/3/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : Dd1-0240
Location : Ollie Avenue & SR-98

File Name : 05145070
Site Code : 00145070
Start Date : 5/3/2005
Page No : 1

Groups Printed- Heavy Trucks

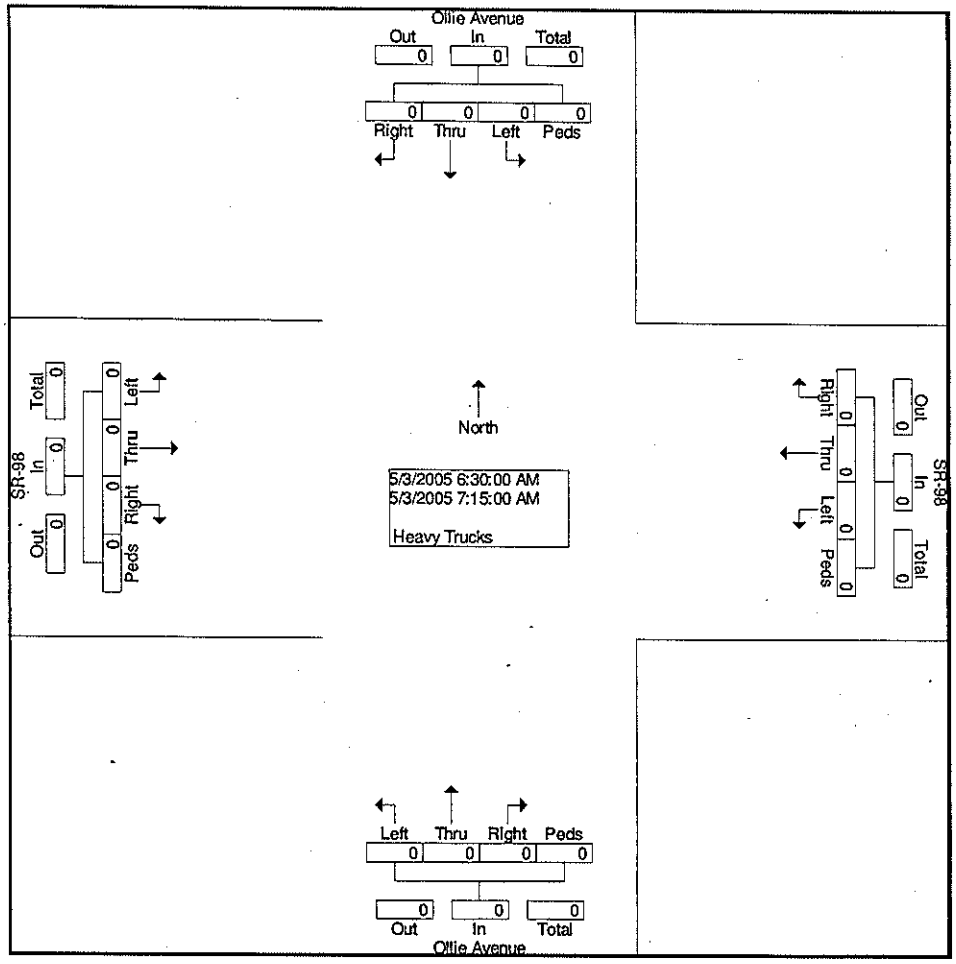
	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %																					

	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection 06:30																					
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
07:15 Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Factor																					0.000
High Int.	6:15:00 AM					6:15:00 AM					6:15:00 AM					6:15:00 AM					
Volume																					
Peak Factor																					

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # : Dd1-0240
Location : Ollie Avenue & SR-98

File Name : 05145070
Site Code : 00145070
Start Date : 5/3/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # :D1-240
Location : Ollie Avenue & SR-98

File Name : 05145071
Site Code : 00145071
Start Date : 5/3/2005
Page No : 1

Groups Printed- Heavy Trucks

	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %																					

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # :D1-240
Location : Ollie Avenue & SR-98

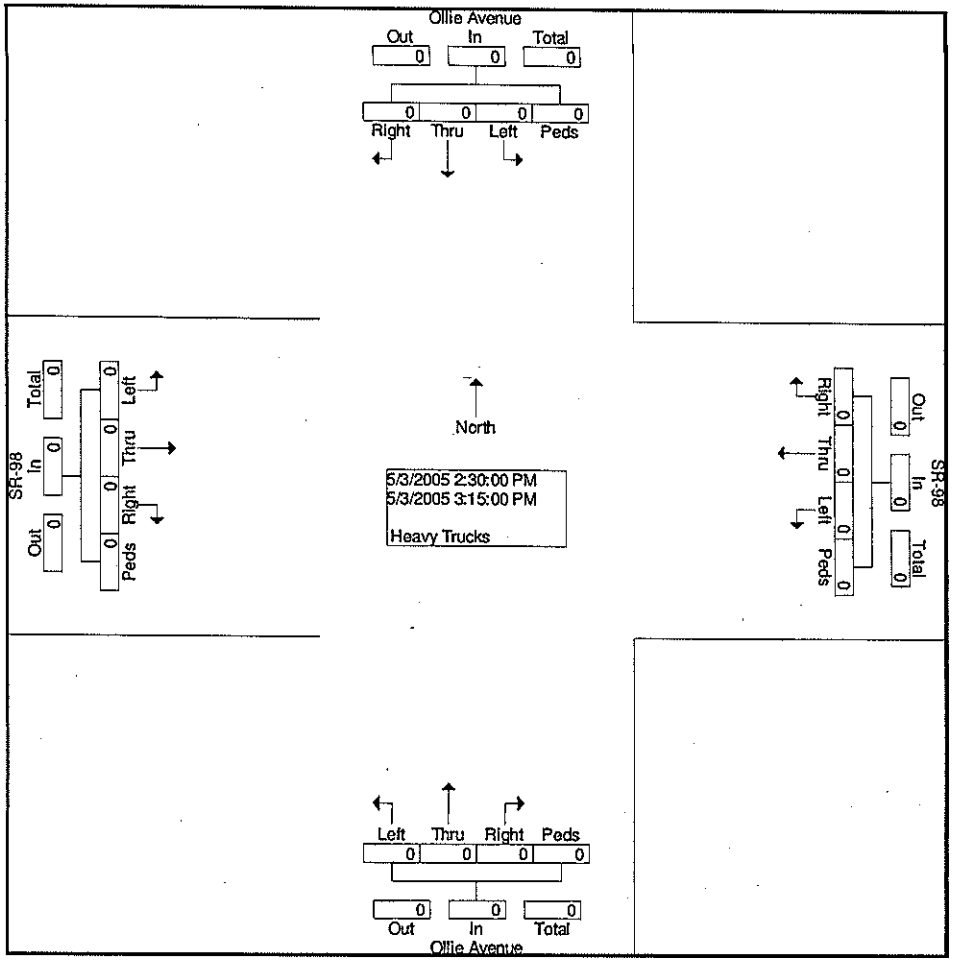
File Name : 05145071
Site Code : 00145071
Start Date : 5/3/2005

	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:00 - Peak 1 of 1																					
Intersection 14:30																					
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
15:15 Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Factor																					0.000
High Int. Volume	2:15:00 PM					2:15:00 PM					2:15:00 PM					2:15:00 PM					
Peak Factor																					

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # :D1-240
Location : Ollie Avenue & SR-98

File Name : 05145071
Site Code : 00145071
Start Date : 5/3/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

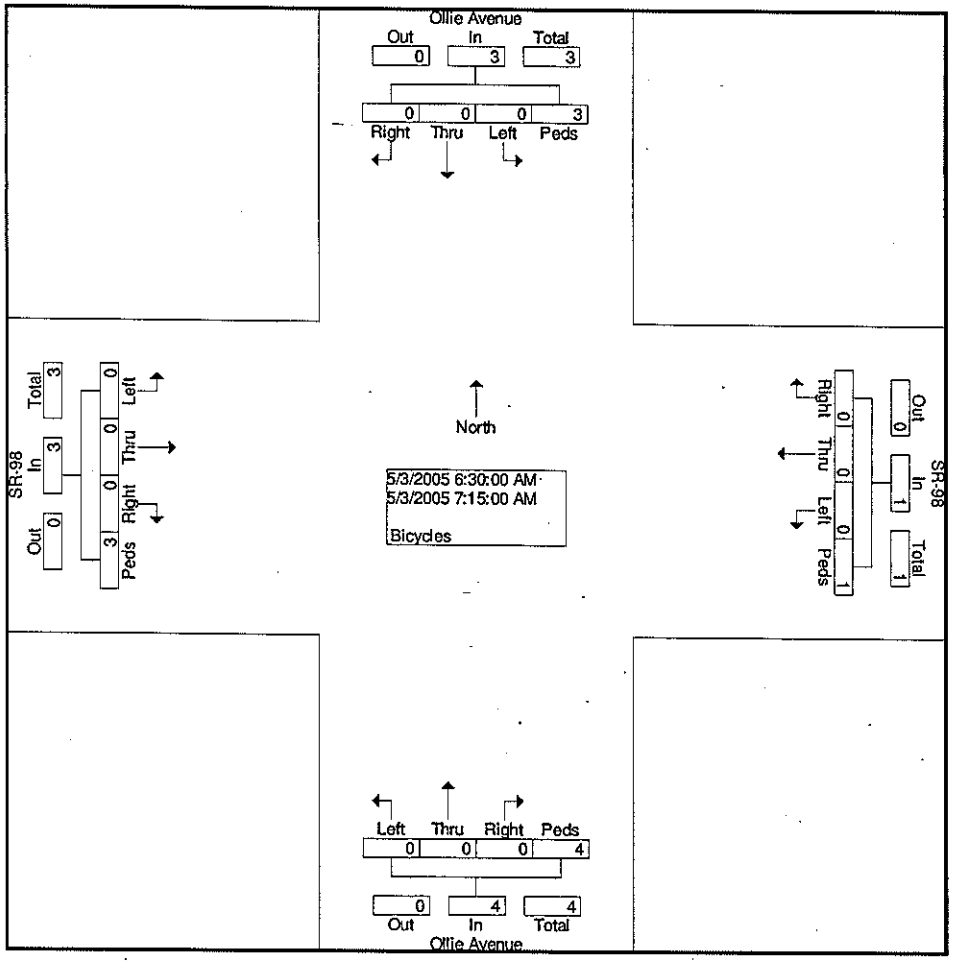
Weather : Clear & Dry
Counted by: E. Furrer
Board # : Dd1-0240
Location : Ollie Avenue & SR-98

File Name : 05145070
Site Code : 00145070
Start Date : 5/3/2005
Page No : 1

Groups Printed- Bicycles

	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	1	1	0	0	0	0	0	0	0	0	3	3	0	0	0	1	1	5
06:45	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
Total	0	0	0	2	2	0	0	0	0	0	0	0	0	4	4	0	0	0	1	1	7
07:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
07:15	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	2
07:30	0	0	0	2	2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3
07:45	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	4
Total	0	0	0	4	4	0	0	0	1	1	0	0	0	3	3	0	0	0	3	3	11
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	2
08:45	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	3
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	0	0	0	3	3	6
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	3	3	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	6
Grand Total	0	0	0	10	10	0	0	0	1	1	0	0	0	11	11	0	0	0	8	8	30
Apprch %	0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		
Total %	0.0	0.0	0.0	33.3	33.3	0.0	0.0	0.0	3.3	3.3	0.0	0.0	0.0	36.7	36.7	0.0	0.0	0.0	26.7	26.7	

	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	06:30																				
Volume	0	0	0	3	3	0	0	0	1	1	0	0	0	4	4	0	0	0	3	3	11
Percent	0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		
06:30 Volume	0	0	0	1	1	0	0	0	0	0	0	0	0	3	3	0	0	0	1	1	5
Peak Factor																					0.550
High Int.	06:30					07:15					06:30					06:30					
Volume	0	0	0	1	1	0	0	0	1	1	0	0	0	3	3	0	0	0	1	1	
Peak Factor					0.750					0.250					0.333					0.750	


Ollie Avenue
Out
In
Total
0
3
3
0
0
0
3
Right
Thru
Left
Peds
North
5/3/2005 6:30:00 AM
5/3/2005 7:15:00 AM
Bicycles
SR-98
Total
3
In
3
Out
0
0
0
3
Left
Thru
Right
Peds
SR-98
Out
0
In
1
Total
1
Right
Thru
Left
Peds
0
0
0
1
Left
Thru
Right
Peds
0
0
0
4
0
4
4
Out
In
Total
Ollie Avenue

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # :D1-240
Location : Ollie Avenue & SR-98

File Name : 05145071
Site Code : 00145071
Start Date : 5/3/2005
Page No : 1

Groups Printed- Bicycles

	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	2
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	3
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	3
15:15	0	0	0	5	5	0	0	0	1	1	0	0	0	2	2	0	0	0	2	2	10
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	3	3	5
Total	0	0	0	5	5	0	0	0	1	1	0	0	0	6	6	0	0	0	6	6	18
16:00	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
16:15	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
16:45	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	3
Total	0	0	0	2	2	0	0	0	1	1	0	0	0	3	3	0	0	0	2	2	8
17:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	2
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	4
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	1	1	5
Grand Total	0	0	0	8	8	0	0	0	2	2	0	0	0	17	17	0	0	0	11	11	38
Apprch %	0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		
Total %	0.0	0.0	0.0	21.1	21.1	0.0	0.0	0.0	5.3	5.3	0.0	0.0	0.0	44.7	44.7	0.0	0.0	0.0	28.9	28.9	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: E. Furrer
Board # :D1-240
Location : Ollie Avenue & SR-98

File Name : 05145071
Site Code : 00145071
Start Date : 5/3/2005
Page No : 2

	Ollie Avenue Southbound					SR-98 Westbound					Ollie Avenue Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:00 - Peak 1 of 1																					
Intersection 15:00																					
Volume	0	0	0	5	5	0	0	0	1	1	0	0	0	6	6	0	0	0	6	6	18
Percent	0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		
15:15 Volume	0	0	0	5	5	0	0	0	1	1	0	0	0	2	2	0	0	0	2	2	10
Peak Factor																					0.450
High Int. 15:15						15:15					15:00					15:45					
Volume	0	0	0	5	5	0	0	0	1	1	0	0	0	2	2	0	0	0	3	3	
Peak Factor					0.250					0.250					0.750					0.500	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
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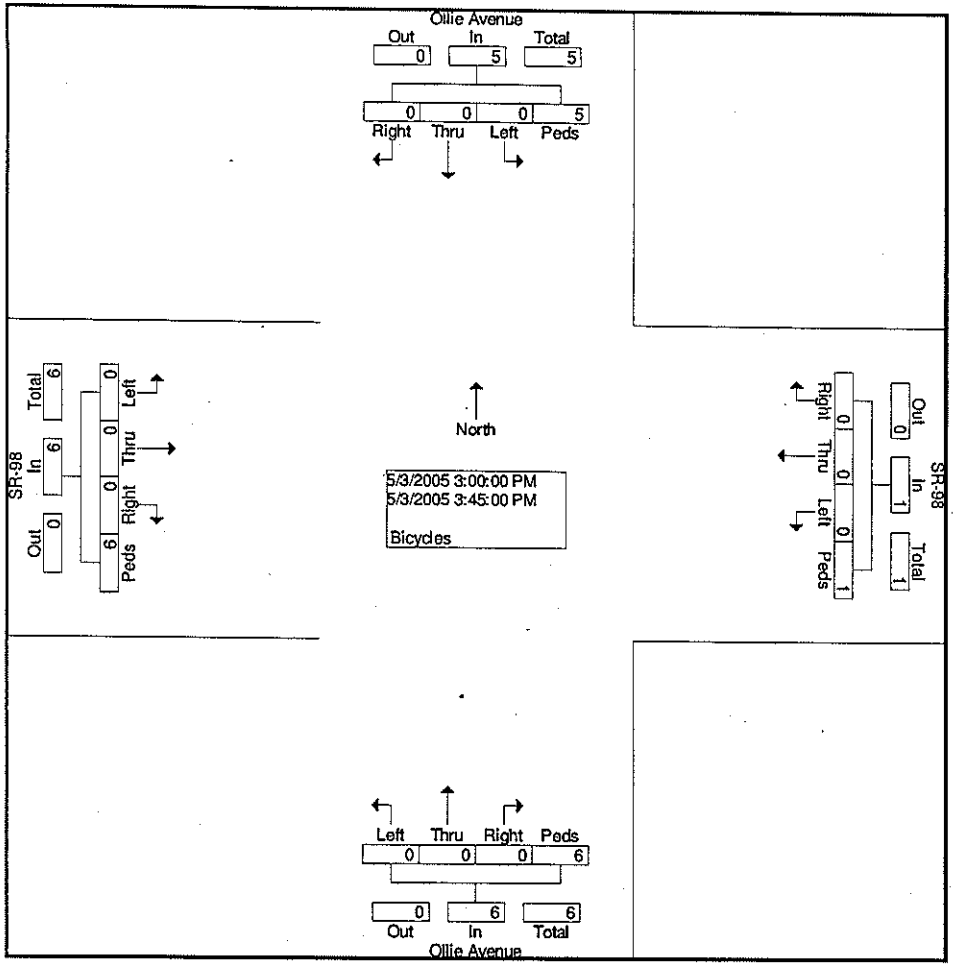
Location : Ollie Avenue & SR-98

File Name : 05145071
Site Code : 00145071
Start Date : 5/3/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman & J. Alloway
Board #: D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145080
Site Code : 00145080
Start Date : 5/3/2005
Page No : 1

Groups Printed- Cars & Light Trucks

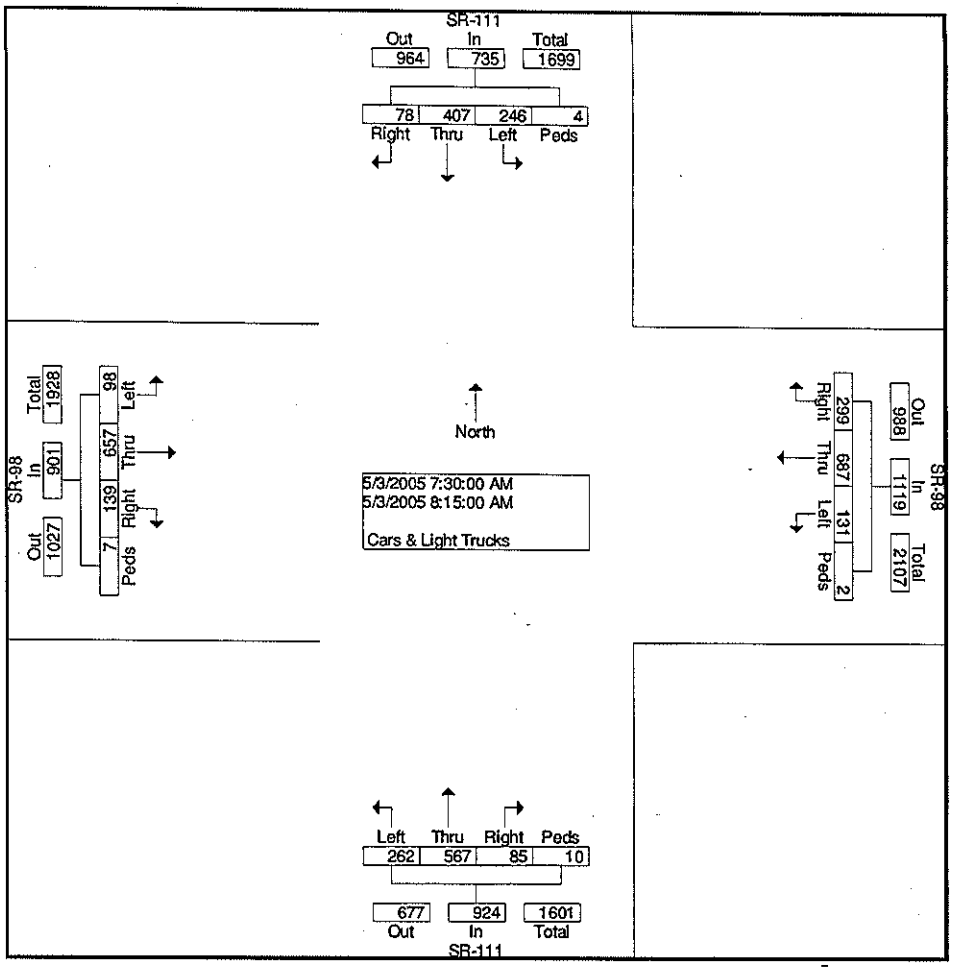
	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	22	48	8	1	79	26	36	47	0	109	54	153	16	2	225	16	39	4	3	62	475
06:45	31	73	5	1	110	17	91	25	0	133	42	126	15	2	185	11	51	13	0	75	503
Total	53	121	13	2	189	43	127	72	0	242	96	279	31	4	410	27	90	17	3	137	978
07:00	37	46	7	1	91	20	71	52	1	144	66	153	19	0	238	13	58	13	1	85	558
07:15	27	78	14	0	119	27	97	68	2	194	48	151	14	4	217	13	87	17	0	117	647
07:30	59	59	14	3	135	29	156	122	2	309	62	167	22	0	251	25	110	39	2	176	871
07:45	70	126	18	1	215	35	215	72	0	322	60	146	7	5	218	23	216	34	3	276	1031
Total	193	309	53	5	560	111	539	314	5	969	236	617	62	9	924	74	471	103	6	654	3107
08:00	63	128	22	0	213	32	195	55	0	282	88	151	27	2	268	26	207	37	0	270	1033
08:15	54	94	24	0	172	35	121	50	0	206	52	103	29	3	187	24	124	29	2	179	744
08:30	51	136	17	0	204	33	89	52	0	174	55	112	15	2	184	27	94	36	1	158	720
08:45	47	94	13	0	154	43	111	33	1	188	62	110	14	2	188	36	90	36	1	163	693
Total	215	452	76	0	743	143	516	190	1	850	257	476	85	9	827	113	515	138	4	770	3190
09:00	60	126	17	0	203	43	98	52	1	194	61	111	22	1	195	23	95	41	0	159	751
09:15	47	129	16	0	192	39	85	52	3	179	74	115	12	3	204	37	114	30	1	182	757
Grand Total	568	1137	175	7	1887	379	1365	680	10	2434	724	1598	212	26	2560	274	1285	329	14	1902	8783
Apprch %	30.1	60.3	9.3	0.4		15.6	56.1	27.9	0.4		28.3	62.4	8.3	1.0		14.4	67.6	17.3	0.7		
Total %	6.5	12.9	2.0	0.1	21.5	4.3	15.5	7.7	0.1	27.7	8.2	18.2	2.4	0.3	29.1	3.1	14.6	3.7	0.2	21.7	

	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	07:30																				
Volume	246	407	78	4	735	131	687	299	2	1119	262	567	85	10	924	98	657	139	7	901	3679
Percent	33.5	55.4	10.6	0.5		11.7	61.4	26.7	0.2		28.4	61.4	9.2	1.1		10.9	72.9	15.4	0.8		
08:00 Volume	63	128	22	0	213	32	195	55	0	282	88	151	27	2	268	26	207	37	0	270	1033
Peak Factor																					0.890
High Int.	07:45					07:45					08:00					07:45					
Volume	70	126	18	1	215	35	215	72	0	322	88	151	27	2	268	23	216	34	3	276	
Peak Factor					0.855					0.869					0.862					0.816	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman & J. Alloway
Board #: D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145080
Site Code : 00145080
Start Date : 5/3/2005
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman & J. Alloway
Board # : D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145081
Site Code : 00145081
Start Date : 5/3/2005
Page No : 1

Groups Printed- Cars & Light Trucks

	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	78	201	26	1	306	77	150	58	0	285	36	106	17	1	160	48	192	66	1	307	1058
14:45	73	198	31	0	302	54	126	43	0	223	55	153	19	0	227	45	184	61	0	290	1042
Total	151	399	57	1	608	131	276	101	0	508	91	259	36	1	387	93	376	127	1	597	2100
15:00	78	193	32	1	304	53	134	70	0	257	68	167	39	2	276	27	191	50	0	268	1105
15:15	76	217	49	9	351	58	159	71	10	298	48	175	22	12	257	49	164	56	0	269	1175
15:30	111	220	52	1	384	79	135	74	0	288	70	132	22	2	226	23	136	54	2	215	1113
15:45	101	214	34	3	352	75	110	56	1	242	72	174	27	0	273	55	151	74	1	281	1148
Total	366	844	167	14	1391	265	538	271	11	1085	258	648	110	16	1032	154	642	234	3	1033	4541
16:00	107	234	42	0	383	74	134	55	3	266	59	127	25	3	214	33	161	49	0	243	1106
16:15	81	255	44	1	381	59	102	57	2	220	56	175	22	2	255	41	142	63	0	246	1102
16:30	91	235	41	7	374	68	141	67	2	278	60	119	33	0	212	32	133	60	0	225	1089
16:45	117	244	38	0	399	74	115	41	0	230	49	127	14	0	190	34	148	78	0	260	1079
Total	396	968	165	8	1537	275	492	220	7	994	224	548	94	5	871	140	584	250	0	974	4376
17:00	66	204	33	1	304	52	138	82	0	272	64	132	29	1	226	36	150	76	2	264	1066
17:15	85	243	32	1	361	71	97	47	0	215	52	144	32	2	230	49	144	57	0	250	1056
17:30	92	208	42	0	342	59	124	45	0	228	68	135	26	2	231	31	146	71	0	248	1049
17:45	59	227	30	0	316	76	141	48	2	267	57	112	22	1	192	20	153	71	0	244	1019
Total	302	882	137	2	1323	258	500	222	2	982	241	523	109	6	879	136	593	275	2	1006	4190
18:00	75	154	49	1	279	53	125	62	0	240	46	105	13	4	168	38	142	52	0	232	919
18:15	52	211	33	2	298	72	103	40	4	219	65	175	23	2	265	33	133	54	1	221	1003
Grand Total	1342	3458	608	28	5436	1054	2034	916	24	4028	925	2258	385	34	3602	594	2470	992	7	4063	17129
Apprch %	24.7	63.6	11.2	0.5		26.2	50.5	22.7	0.6		25.7	62.7	10.7	0.9		14.6	60.8	24.4	0.2		
Total %	7.8	20.2	3.5	0.2	31.7	6.2	11.9	5.3	0.1	23.5	5.4	13.2	2.2	0.2	21.0	3.5	14.4	5.8	0.0	23.7	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman & J. Alloway
Board # : D1-1306 & D1-1307
Location : SR-111 & SR-98

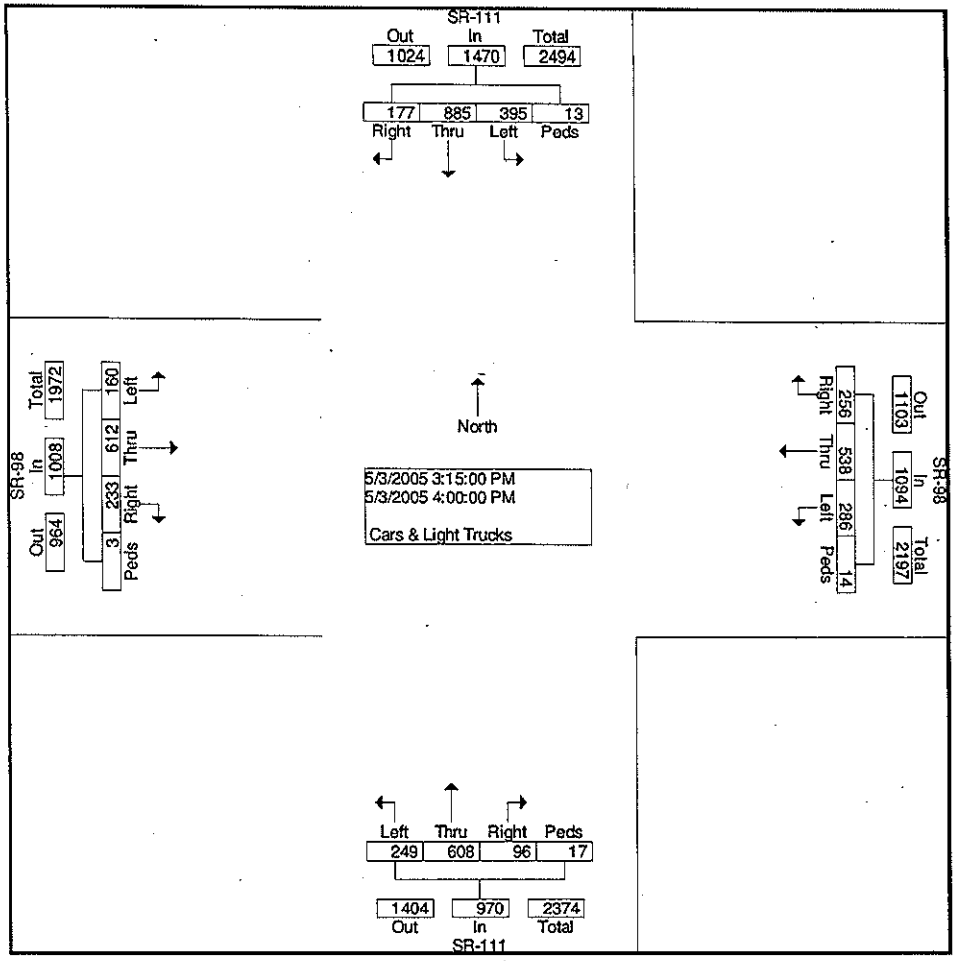
File Name : 05145081
Site Code : 00145081
Start Date : 5/3/2005

	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 15:15																					
Volume	395	885	177	13	1470	286	538	256	14	1094	249	608	96	17	970	160	612	233	3	1008	4542
Percent	26.9	60.2	12.0	0.9		26.1	49.2	23.4	1.3		25.7	62.7	9.9	1.8		15.9	60.7	23.1	0.3		
15:15 Volume	76	217	49	9	351	58	159	71	10	298	48	175	22	12	257	49	164	56	0	269	1175
Peak Factor																					0.966
High Int. 15:30						15:15					15:45					15:45					
Volume	111	220	52	1	384	58	159	71	10	298	72	174	27	0	273	55	151	74	1	281	
Peak Factor					0.957					0.918					0.888					0.897	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman & J. Alloway
Board # : D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145081
Site Code : 00145081
Start Date : 5/3/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman & J. Alloway
Board #: D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145080
Site Code : 00145080
Start Date : 5/3/2005

Groups Printed- Heavy Trucks

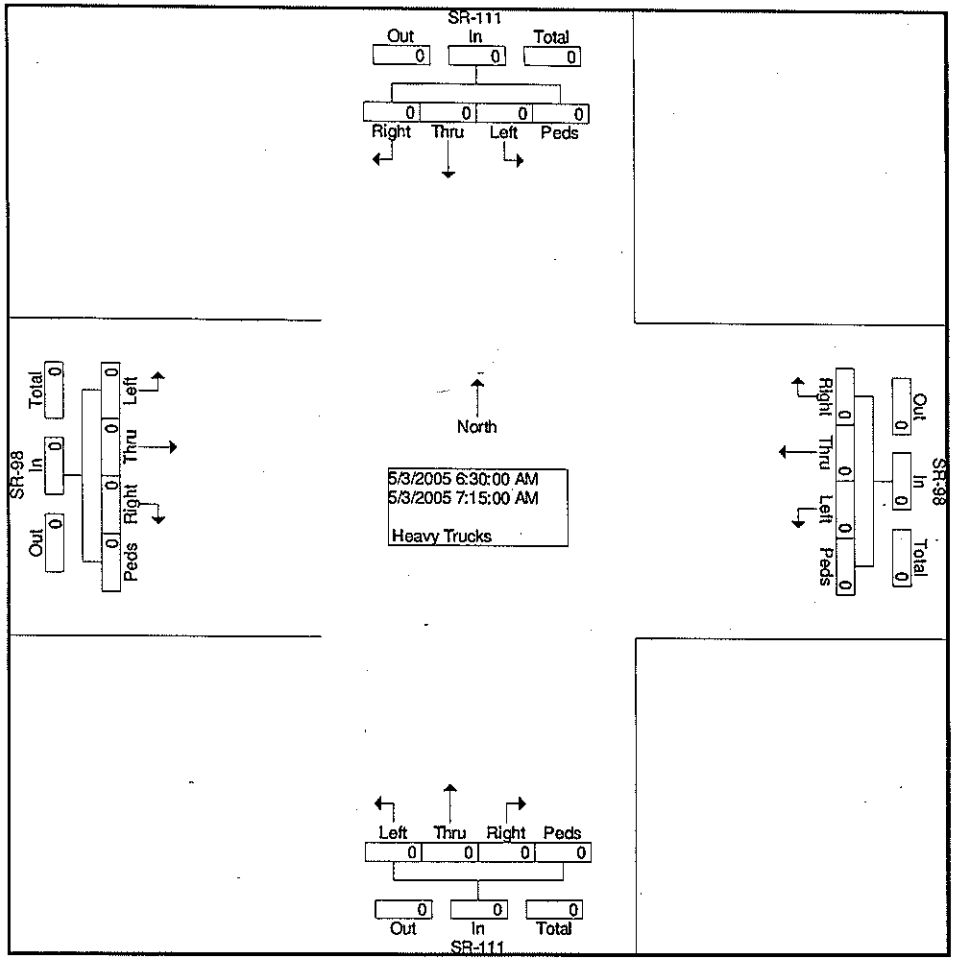
	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %																					

	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	06:30																				
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
07:15 Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Factor																					0.000
High Int. Volume	6:15:00 AM					6:15:00 AM					6:15:00 AM					6:15:00 AM					
Peak Factor																					

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted By: S. Tillman & J. Alloway
Board #: D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145080
Site Code : 00145080
Start Date : 5/3/2005
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman & J. Alloway
Board # : D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145081
Site Code : 00145081
Start Date : 5/3/2005
Page No : 1

Groups Printed- Heavy Trucks

	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %																					

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman & J. Alloway
Board # : D1-1306 & D1-1307
Location : SR-111 & SR-98

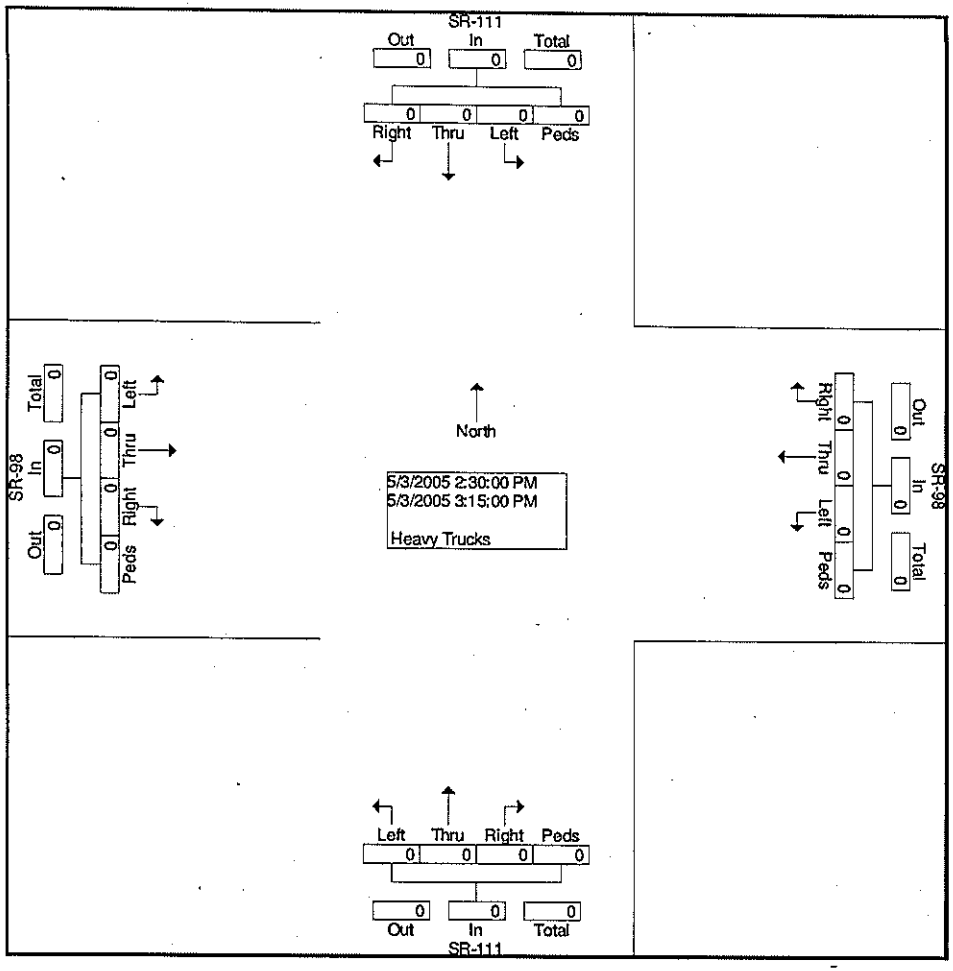
File Name : 05145081
Site Code : 00145081
Start Date : 5/3/2005
Page No : 2

	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 14:30																					
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
15:15 Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Factor																					0.000
High Int. Volume	2:15:00 PM					2:15:00 PM					2:15:00 PM					2:15:00 PM					
Peak Factor																					

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman & J. Alloway
Board # : D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145081
Site Code : 00145081
Start Date : 5/3/2005
Page No : 3



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

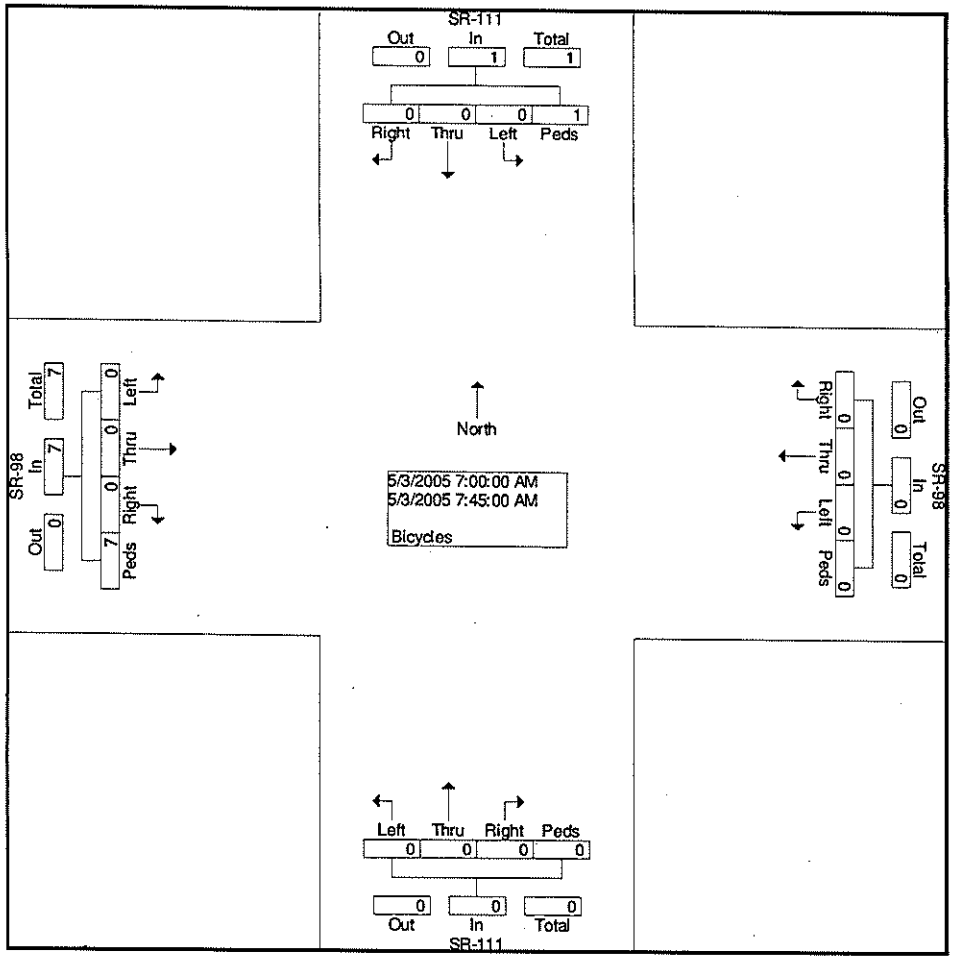
Weather : Clear & Dry
Counted By: S. Tillman & J. Alloway
Board #: D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145080
Site Code : 00145080
Start Date : 5/3/2005
Page No : 1

Groups Printed- Bicycles

	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:30	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	3
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
07:45	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Total	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	8
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
09:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2	3
Grand Total	0	0	0	2	2	0	0	0	0	0	0	0	0	3	3	0	0	0	11	11	16
Apprch %	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		
Total %	0.0	0.0	0.0	12.5	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.8	18.8	0.0	0.0	0.0	68.8	68.8	

	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 to 09:15 - Peak 1 of 1																					
Intersection	07:00																				
Volume	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	8
Percent	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	100.0		
07:30 Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4
Peak Factor																					0.500
High Int.	07:45					6:15:00 AM					6:15:00 AM					07:30					
Volume	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	
Peak Factor					0.250															0.438	


SR-111
Out
In
Total
0
1
1
0
0
0
1
Right
Thru
Left
Peds
North
5/3/2005 7:00:00 AM
5/3/2005 7:45:00 AM
Bicycles
SR-98
Total
7
In
7
Out
0
0
0
7
Left
Thru
Right
Peds
SR-98
Out
In
Total
0
0
0
Right
Thru
Left
Peds
0
0
0
0
Left
Thru
Right
Peds
0
0
0
0
0
0
0
Out
In
Total
SR-111

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman & J. Alloway
Board # : D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145081
Site Code : 00145081
Start Date : 5/3/2005
Page No : 1

Groups Printed- Bicycles

	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	4	4	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	5
15:30	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
15:45	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	5	5	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	8
16:00	0	0	0	2	2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3
16:15	0	0	0	1	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	3
16:30	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
16:45	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
Total	0	0	0	6	6	0	0	0	2	2	0	0	0	2	2	0	0	0	0	0	10
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	0	0	12	12	0	0	0	6	6	0	0	0	2	2	0	0	0	0	0	20
Apprch %	0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	60.0	60.0	0.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman & J. Alloway
Board # : D1-1306 & D1-1307
Location : SR-111 & SR-98

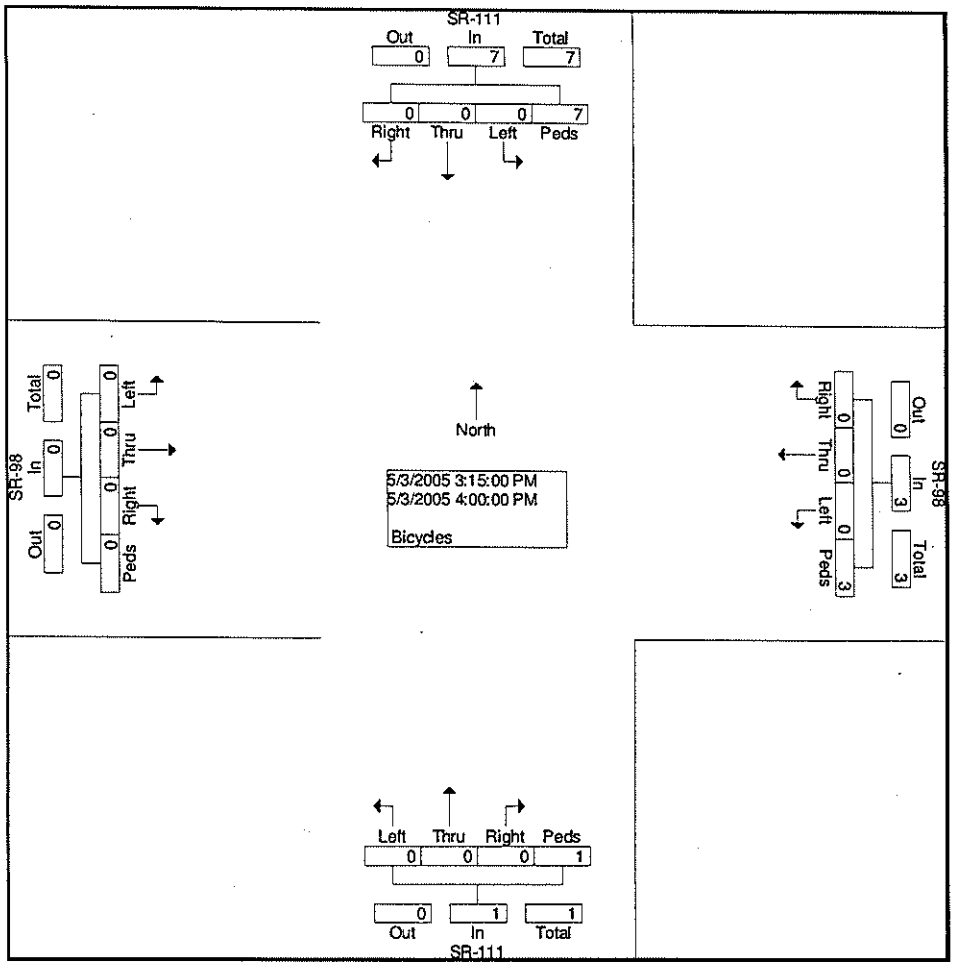
File Name : 05145081
Site Code : 00145081
Start Date : 5/3/2005
Page No : 2

	SR-111 Southbound					SR-98 Westbound					SR-111 Northbound					SR-98 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 14:30 to 18:15 - Peak 1 of 1																					
Intersection 15:15																					
Volume	0	0	0	7	7	0	0	0	3	3	0	0	0	1	1	0	0	0	0	0	11
Percent	0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0		
15:15 Volume	0	0	0	4	4	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	5
Peak Factor																					0.550
High Int. 15:15						15:15					16:00					2:15:00 PM					
Volume	0	0	0	4	4	0	0	0	1	1	0	0	0	1	1						
Peak Factor					0.438					0.750					0.250						

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather : Clear & Dry
Counted by: S. Tillman & J. Alloway
Board # : D1-1306 & D1-1307
Location : SR-111 & SR-98

File Name : 05145081
Site Code : 00145081
Start Date : 5/3/2005



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather: Clear & Dry
Counted By: D. Gallagher
Board No.: D1-2172
Loc: Dogwood & SR-98

File Name : 06048010
Site Code : 00048010
Start Date : 2/23/2006
Page No : 1

Groups Printed- Group 1

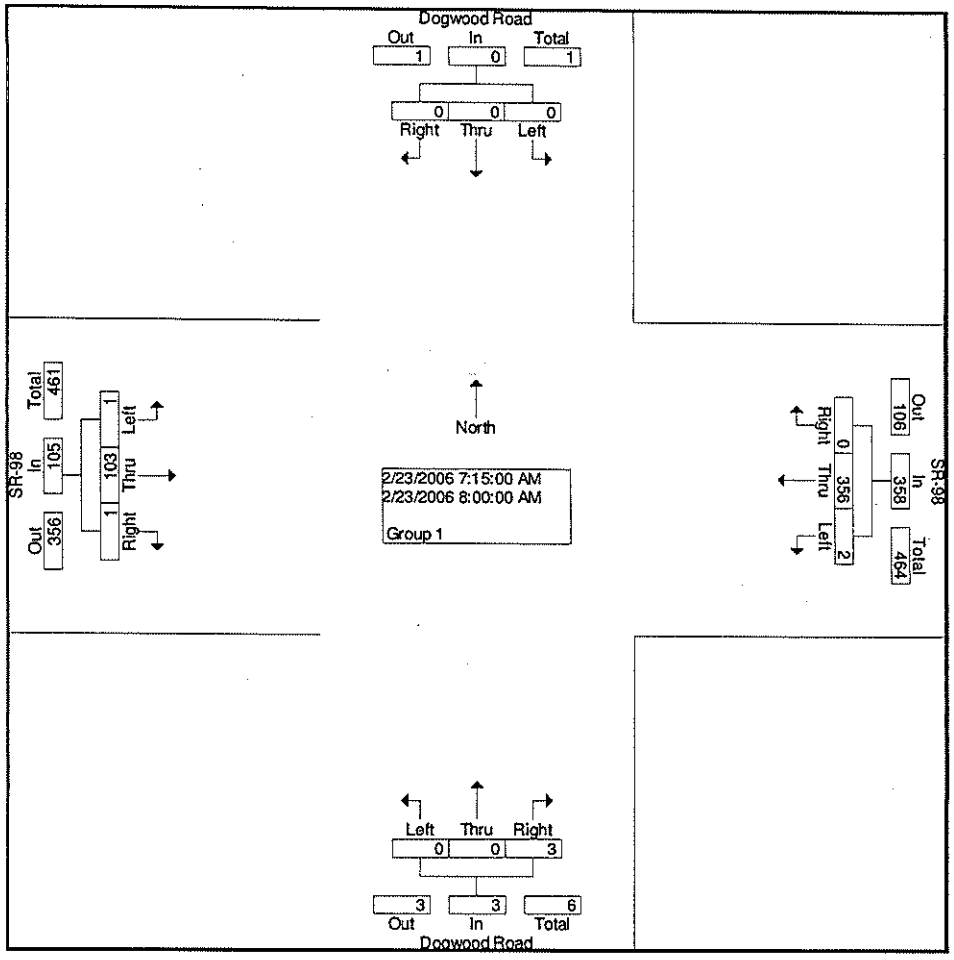
	Dogwood Road Southbound					SR-98 Westbound					Dogwood Road Northbound					SR-98 Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	0	0	0	0	73	1	0	74	0	0	1	0	1	0	18	0	0	18	0	93	93
07:15	0	0	0	0	0	2	83	0	0	85	0	0	0	0	0	0	24	0	0	24	0	109	109
07:30	0	0	0	0	0	0	114	0	0	114	0	0	0	0	0	1	19	0	0	20	0	134	134
07:45	0	0	0	0	0	0	80	0	0	80	0	0	0	1	0	0	22	0	1	22	2	102	104
Total	0	0	0	0	0	2	350	1	0	353	0	0	1	1	1	1	83	0	1	84	2	438	440
08:00	0	0	0	0	0	0	79	0	0	79	0	0	3	0	3	0	38	1	0	39	0	121	121
08:15	0	0	0	0	0	0	59	1	0	60	0	0	0	0	0	0	17	0	0	17	0	77	77
08:30	0	0	1	0	1	1	57	0	0	58	0	0	1	0	1	0	22	0	0	22	0	82	82
08:45	1	0	0	0	1	0	51	0	0	51	0	0	0	0	0	0	38	0	0	38	0	90	90
Total	1	0	1	0	2	1	246	1	0	248	0	0	4	0	4	0	115	1	0	116	0	370	370
Grand Total	1	0	1	0	2	3	596	2	0	601	0	0	5	1	5	1	198	1	1	200	2	808	810
Apprch %	50.0	0.0	50.0			0.5	99.2	0.3			0.0	0.0	100.0			0.5	99.0	0.5					
Total %	0.1	0.0	0.1		0.2	0.4	73.8	0.2		74.4	0.0	0.0	0.6		0.6	0.1	24.5	0.1		24.8	0.2	99.8	

	Dogwood Road Southbound				SR-98 Westbound				Dogwood Road Northbound				SR-98 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 07:00 to 08:45 - Peak 1 of 1																	
Intersection	07:15																
Volume	0	0	0	0	2	356	0	358	0	0	3	3	1	103	1	105	466
Percent	0.0	0.0	0.0		0.6	99.4	0.0		0.0	0.0	100.0		1.0	98.1	1.0		
07:30 Volume	0	0	0	0	0	114	0	114	0	0	0	0	1	19	0	20	134
Peak Factor																	0.869
High Int.	6:45:00 AM				07:30				08:00				08:00				
Volume	0	0	0	0	0	114	0	114	0	0	3	3	0	38	1	39	
Peak Factor								0.785				0.250				0.673	

Weather: Clear & Dry
Counted By: D. Gallagher
Board No.: D1-2172
Loc: Dogwood & SR-98

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

File Name : 06048010
Site Code : 00048010
Start Date : 2/23/2006
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather: Clear & Dry
Counted By: D. Gallagher
Board No.: D1-2172
Loc: Dogwood & SR-98

File Name : 06048011
Site Code : 00048011
Start Date : 2/23/2006
Page No : 1

Groups Printed- Group 1

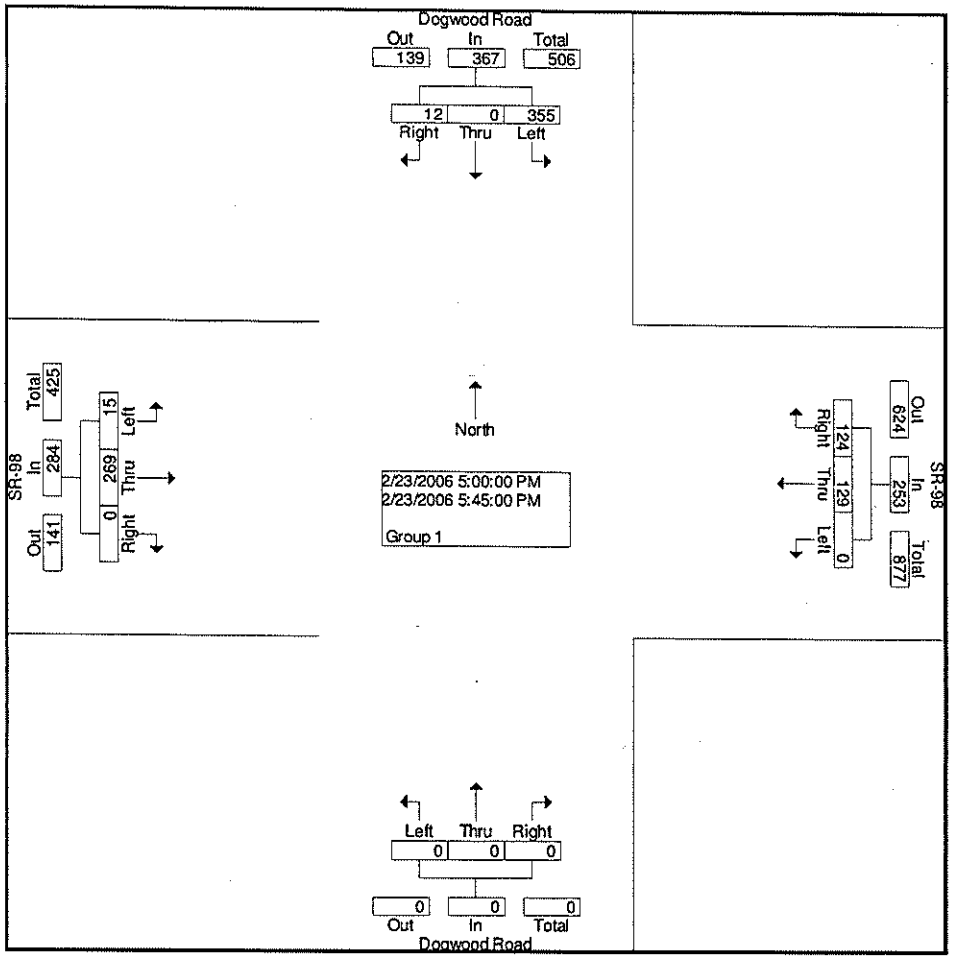
	Dogwood Road Southbound					SR-98 Westbound					Dogwood Road Northbound					SR-98 Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:00	83	0	2	0	85	0	37	41	1	78	0	0	0	0	0	6	65	0	0	71	1	234	235
16:15	75	0	0	0	75	0	36	27	0	63	0	0	0	0	0	4	63	0	0	67	0	205	205
16:30	52	0	4	0	56	0	34	34	0	68	0	0	0	0	0	4	75	0	0	79	0	203	203
16:45	54	0	3	0	57	0	26	21	0	47	0	0	0	0	0	4	74	0	0	78	0	182	182
Total	264	0	9	0	273	0	133	123	1	256	0	0	0	0	0	18	277	0	0	295	1	824	825
17:00	101	0	6	0	107	0	39	25	0	64	0	0	0	0	0	6	76	0	0	82	0	253	253
17:15	99	0	2	0	101	0	29	33	0	62	0	0	0	0	0	4	72	0	0	76	0	239	239
17:30	80	0	1	0	81	0	19	39	0	58	0	0	0	0	0	2	79	0	0	81	0	220	220
17:45	75	0	3	0	78	0	42	27	1	69	0	0	0	0	0	3	42	0	0	45	1	192	193
Total	355	0	12	0	367	0	129	124	1	253	0	0	0	0	0	15	269	0	0	284	1	904	905
Grand Total	619	0	21	0	640	0	262	247	2	509	0	0	0	0	0	33	546	0	0	579	2	1728	1730
Apprch %	96.7	0.0	3.3			0.0	51.5	48.5			0.0	0.0	0.0			5.7	94.3	0.0					
Total %	35.8	0.0	1.2		37.0	0.0	15.2	14.3		29.5	0.0	0.0	0.0		0.0	1.9	31.6	0.0		33.5	0.1	99.9	

	Dogwood Road Southbound				SR-98 Westbound				Dogwood Road Northbound				SR-98 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 16:00 to 17:45 - Peak 1 of 1																	
Intersection	17:00																
Volume	355	0	12	367	0	129	124	253	0	0	0	0	15	269	0	284	904
Percent	96.7	0.0	3.3		0.0	51.0	49.0		0.0	0.0	0.0		5.3	94.7	0.0		
17:00 Volume	101	0	6	107	0	39	25	64	0	0	0	0	6	76	0	82	253
Peak Factor																	0.893
High Int.	17:00				17:45				3:45:00 PM				17:00				
Volume	101	0	6	107	0	42	27	69	0	0	0	0	6	76	0	82	
Peak Factor				0.857				0.917								0.866	

Weather: Clear & Dry
Counted By: D. Gallagher
Board No.: D1-2172
Loc: Dogwood & SR-98

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

File Name : 06048011
Site Code : 00048011
Start Date : 2/23/2006
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather: Clear & Dry
Counted By: E. Furrer
Board No.: D1-1432
Loc: SR-111 & 2nd St.

File Name : 06048020
Site Code : 00048020
Start Date : 2/23/2006
Page No : 1

Groups Printed- Group 1

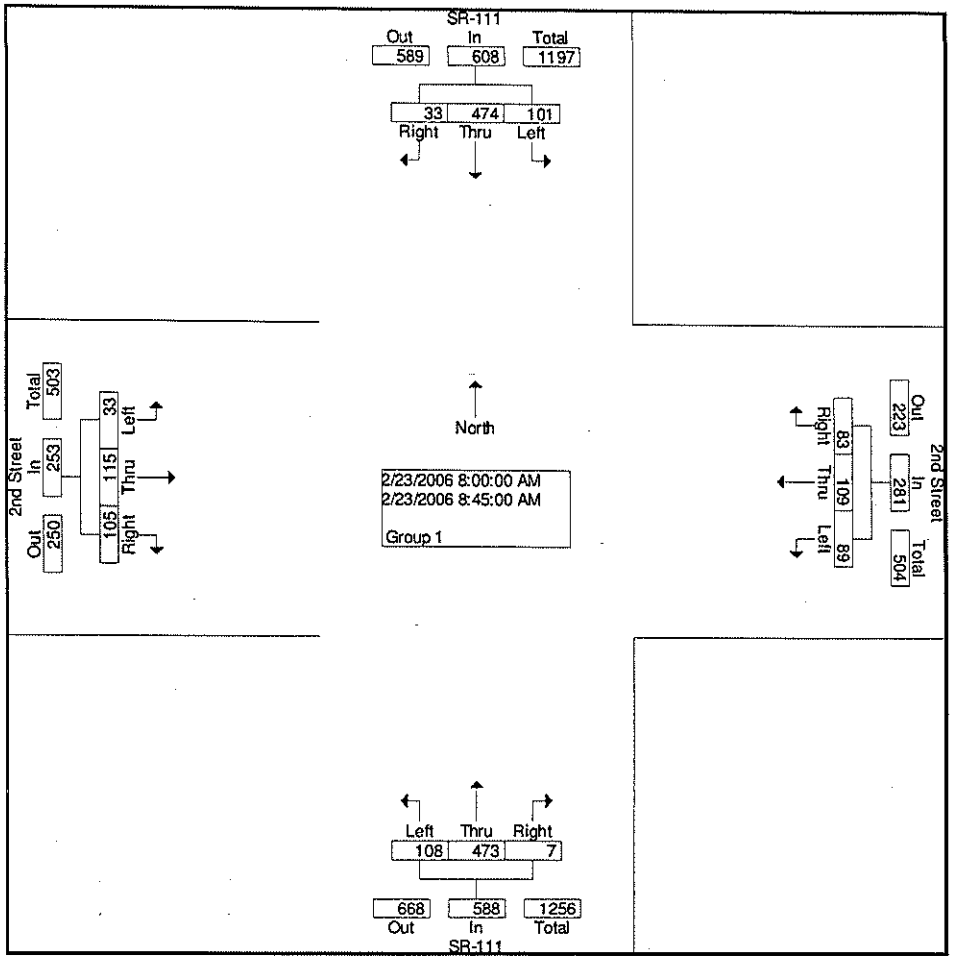
	SR-111 Southbound					2nd Street Westbound					SR-111 Northbound					2nd Street Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	11	41	4	15	56	4	22	26	0	52	27	146	1	8	174	4	9	5	1	18	24	300	324
07:15	11	52	5	13	68	7	14	16	4	37	25	128	3	1	156	4	15	17	5	36	23	297	320
07:30	12	99	4	8	115	7	25	13	3	45	22	121	3	4	146	5	11	19	4	35	19	341	360
07:45	13	106	9	3	128	11	20	23	3	54	30	106	5	0	141	3	20	25	1	48	7	371	378
Total	47	298	22	39	367	29	81	78	10	188	104	501	12	13	617	16	55	66	11	137	73	1309	1382
08:00	19	117	8	13	144	21	26	30	6	77	38	126	3	5	167	8	24	28	0	60	24	448	472
08:15	23	129	14	25	166	22	35	18	5	75	28	112	2	8	142	8	29	31	1	68	39	451	490
08:30	23	121	4	32	148	27	23	19	10	69	18	104	1	17	123	12	30	24	5	66	64	406	470
08:45	36	107	7	10	150	19	25	16	5	60	24	131	1	1	156	5	32	22	0	59	16	425	441
Total	101	474	33	80	608	89	109	83	26	281	108	473	7	31	588	33	115	105	6	253	143	1730	1873
Grand Total	148	772	55	119	975	118	190	161	36	469	212	974	19	44	1205	49	170	171	17	390	216	3039	3255
Apprch %	15.2	79.2	5.6			25.2	40.5	34.3			17.6	80.8	1.6			12.6	43.6	43.8					
Total %	4.9	25.4	1.8		32.1	3.9	6.3	5.3		15.4	7.0	32.1	0.6		39.7	1.6	5.6	5.6		12.8	6.6	93.4	

	SR-111 Southbound				2nd Street Westbound				SR-111 Northbound				2nd Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 07:00 to 08:45 - Peak 1 of 1																	
Intersection 08:00																	
Volume	101	474	33	608	89	109	83	281	108	473	7	588	33	115	105	253	1730
Percent	16.6	78.0	5.4		31.7	38.8	29.5		18.4	80.4	1.2		13.0	45.5	41.5		
08:15 Volume	23	129	14	166	22	35	18	75	28	112	2	142	8	29	31	68	451
Peak Factor																	0.959
High Int. 08:15					08:00				08:00				08:15				
Volume	23	129	14	166	21	26	30	77	38	126	3	167	8	29	31	68	
Peak Factor				0.916				0.912				0.880				0.930	

Weather: Clear & Dry
Counted By: E. Furrer
Board No.: D1-1432
Loc: SR-111 & 2nd St.

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

File Name : 06048020
Site Code : 00048020
Start Date : 2/23/2006
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather: Clear & Dry
Counted By: E. Furrer
Board No.: D1-1432
Loc: SR-111 & 2nd St.

File Name : 06048021
Site Code : 00048021
Start Date : 2/23/2006
Page No : 1

Groups Printed- Group 1

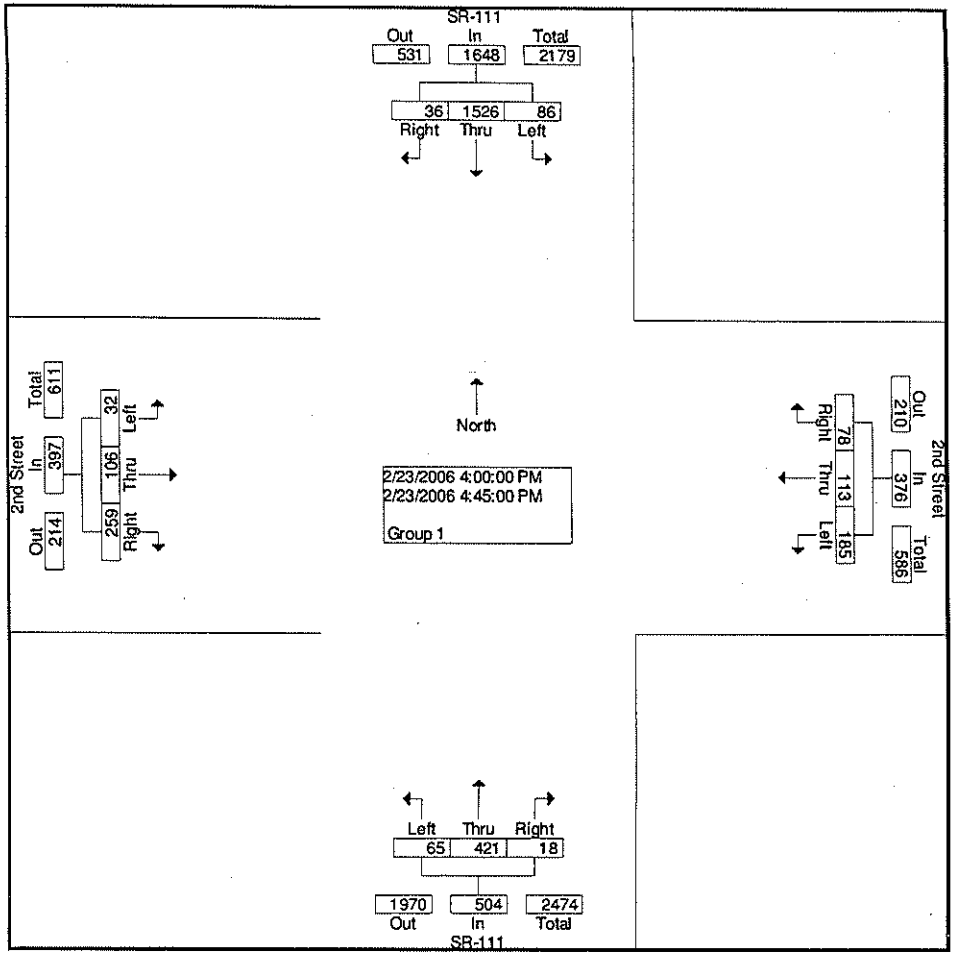
	SR-111 Southbound					2nd Street Westbound					SR-111 Northbound					2nd Street Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:00	18	399	6	27	423	47	35	22	3	104	19	114	5	4	138	8	24	59	8	91	42	756	798
16:15	23	375	9	19	407	48	23	20	3	91	15	73	6	14	94	7	33	67	8	107	44	699	743
16:30	26	391	15	22	432	46	31	13	4	90	12	128	6	4	146	7	24	69	8	100	38	768	806
16:45	19	361	6	30	386	44	24	23	5	91	19	106	1	3	126	10	25	64	1	99	39	702	741
Total	86	1526	36	98	1648	185	113	78	15	376	65	421	18	25	504	32	106	259	25	397	163	2925	3088
17:00	20	360	11	28	391	40	16	21	0	77	24	127	2	7	153	16	29	51	23	96	58	717	775
17:15	14	359	7	30	380	45	35	20	6	100	17	111	2	1	130	6	26	62	14	94	51	704	755
17:30	3	378	8	20	389	0	67	28	1	95	21	125	1	10	147	3	30	78	25	111	56	742	798
17:45	5	401	2	14	408	0	49	19	1	68	7	102	1	3	110	4	37	62	17	103	35	689	724
Total	42	1498	28	92	1568	85	167	88	8	340	69	465	6	21	540	29	122	253	79	404	200	2852	3052
Grand Total	128	3024	64	190	3216	270	280	166	23	716	134	886	24	46	1044	61	228	512	104	801	363	5777	6140
Apprch %	4.0	94.0	2.0			37.7	39.1	23.2			12.8	84.9	2.3			7.6	28.5	63.9					
Total %	2.2	52.3	1.1		55.7	4.7	4.8	2.9		12.4	2.3	15.3	0.4		18.1	1.1	3.9	8.9		13.9	5.9	94.1	

	SR-111 Southbound				2nd Street Westbound				SR-111 Northbound				2nd Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 16:00 to 17:45 - Peak 1 of 1																	
Intersection 16:00																	
Volume	86	1526	36	1648	185	113	78	376	65	421	18	504	32	106	259	397	2925
Percent	5.2	92.6	2.2		49.2	30.1	20.7		12.9	83.5	3.6		8.1	26.7	65.2		
16:30 Volume	26	391	15	432	46	31	13	90	12	128	6	146	7	24	69	100	768
Peak Factor																	0.952
High Int.	16:30				16:00				16:30				16:15				
Volume	26	391	15	432	47	35	22	104	12	128	6	146	7	33	67	107	
Peak Factor				0.954				0.904				0.863				0.928	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather: Clear & Dry
Counted By: E. Furrer
Board No.: D1-1432
Loc: SR-111 & 2nd St.

File Name : 06048021
Site Code : 00048021
Start Date : 2/23/2006
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather: Clear & Dry
Counted By: C. Brown
Board No.: D1-1428
Loc: Cesar Chavez & 2nd Street

File Name : 06048030
Site Code : 00048030
Start Date : 2/23/2006
Page No : 1

Groups Printed- Group 1

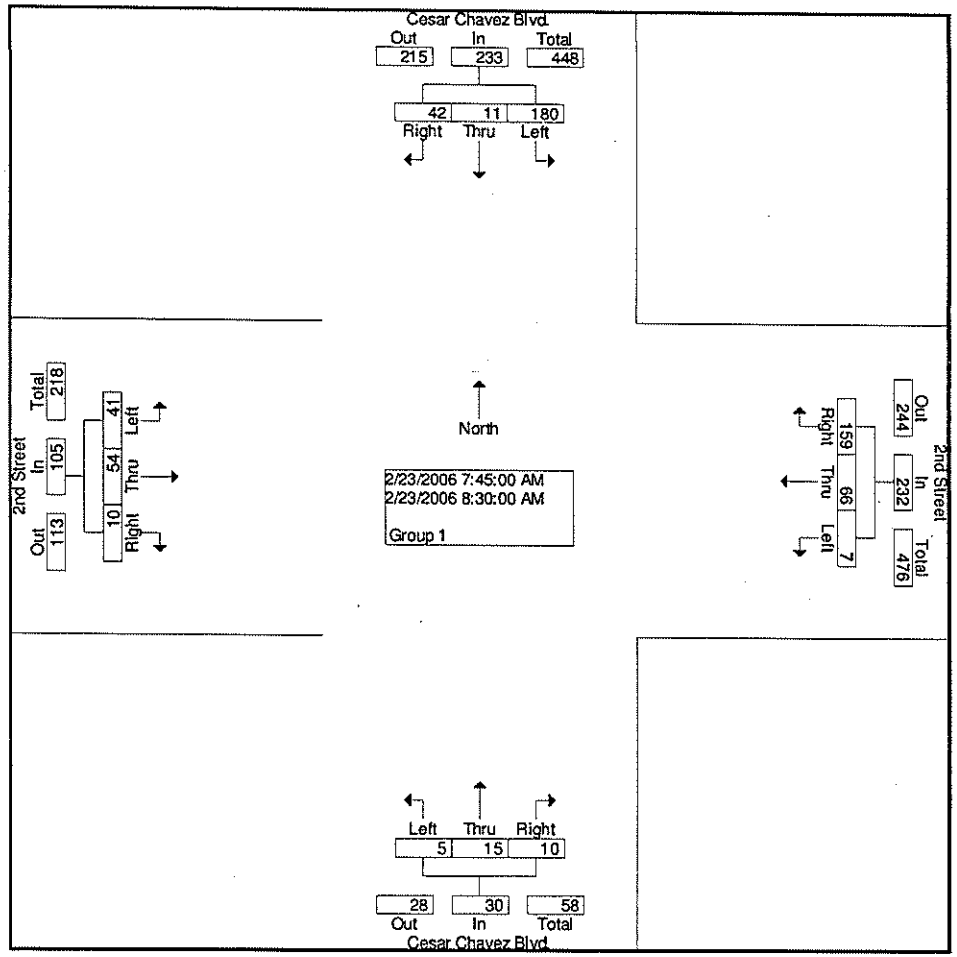
	Cesar Chavez Blvd. Southbound					2nd Street Westbound					Cesar Chavez Blvd. Northbound					2nd Street Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	10	2	2	0	14	0	16	36	6	52	0	0	1	0	1	7	4	1	0	12	6	79	85
07:15	24	1	5	0	30	0	10	37	8	47	0	0	0	0	0	9	10	0	0	19	8	96	104
07:30	27	5	5	0	37	2	8	39	5	49	0	0	1	0	1	9	5	3	0	17	5	104	109
07:45	41	8	9	0	58	2	14	40	1	56	1	2	2	1	5	12	11	10	3	33	5	152	157
Total	102	16	21	0	139	4	48	152	20	204	1	2	4	1	7	37	30	14	3	81	24	431	455
08:00	42	0	11	0	53	1	21	41	2	63	1	7	5	0	13	6	14	0	0	20	2	149	151
08:15	49	1	16	0	66	4	21	42	14	67	1	2	2	0	5	7	13	0	0	20	14	158	172
08:30	48	2	6	1	56	0	10	36	6	46	2	4	1	1	7	16	16	0	1	32	9	141	150
08:45	33	0	14	0	47	3	19	33	3	55	0	0	1	0	1	19	18	0	3	37	6	140	146
Total	172	3	47	1	222	8	71	152	25	231	4	13	9	1	26	48	61	0	4	109	31	588	619
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	274	19	68	1	361	12	119	304	45	435	5	15	13	2	33	85	91	14	7	190	55	1019	1074
Apprch %	75.9	5.3	18.8			2.8	27.4	69.9			15.2	45.5	39.4			44.7	47.9	7.4					
Total %	26.9	1.9	6.7		35.4	1.2	11.7	29.8		42.7	0.5	1.5	1.3		3.2	8.3	8.9	1.4		18.6	5.1	94.9	

	Cesar Chavez Blvd. Southbound				2nd Street Westbound				Cesar Chavez Blvd. Northbound				2nd Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 07:00 to 09:00 - Peak 1 of 1																	
Intersection	07:45																
Volume	180	11	42	233	7	66	159	232	5	15	10	30	41	54	10	105	600
Percent	77.3	4.7	18.0		3.0	28.4	68.5		16.7	50.0	33.3		39.0	51.4	9.5		
08:15 Volume	49	1	16	66	4	21	42	67	1	2	2	5	7	13	0	20	158
Peak Factor																	0.949
High Int.	08:15				08:15				08:00				07:45				
Volume	49	1	16	66	4	21	42	67	1	7	5	13	12	11	10	33	
Peak Factor				0.883				0.866				0.577				0.795	

Weather: Clear & Dry
Counted By: C. Brown
Board No.: D1-1428
Loc: Cesar Chavez & 2nd Street

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

File Name : 06048030
Site Code : 00048030
Start Date : 2/23/2006
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather: Clear & Dry
Counted By: C. Brown
Board No.: D1-1428
Loc: Cesar Chavez & 2nd Street

File Name : 06048031
Site Code : 00048031
Start Date : 2/23/2006
Page No : 1

Groups Printed- Group 1

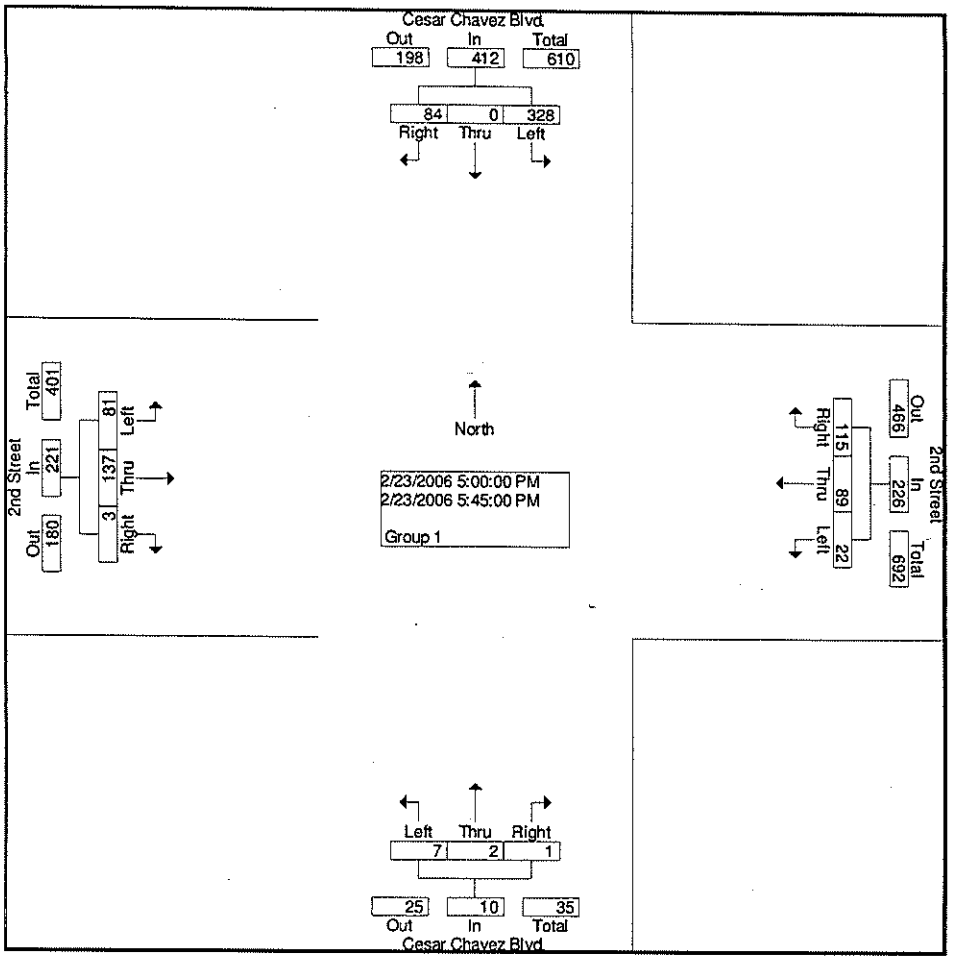
	Cesar Chavez Blvd. Southbound					2nd Street Westbound					Cesar Chavez Blvd. Northbound					2nd Street Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:00	71	1	16	0	88	2	28	26	2	56	4	11	2	2	17	37	26	2	14	65	18	226	244
16:15	79	1	21	0	101	0	14	21	3	35	0	5	3	2	8	17	33	1	15	51	20	195	215
16:30	68	0	23	0	91	0	26	29	3	55	0	1	2	0	3	26	49	0	2	75	5	224	229
16:45	69	2	18	0	89	0	15	33	1	48	1	2	0	2	3	20	36	0	13	56	16	196	212
Total	287	4	78	0	369	2	83	109	9	194	5	19	7	6	31	100	144	3	44	247	59	841	900
17:00	88	0	18	0	106	0	20	26	5	46	2	0	0	0	2	19	30	0	26	49	31	203	234
17:15	84	0	22	0	106	3	19	31	1	53	1	0	0	0	1	26	44	0	5	70	6	230	236
17:30	73	0	23	0	96	8	24	35	5	67	1	1	0	0	2	22	30	1	14	53	19	218	237
17:45	83	0	21	1	104	11	26	23	1	60	3	1	1	1	5	14	33	2	0	49	3	218	221
Total	328	0	84	1	412	22	89	115	12	226	7	2	1	1	10	81	137	3	45	221	59	869	928
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	615	4	162	1	781	24	172	224	21	420	12	21	8	7	41	181	281	6	89	468	118	1710	1828
Apprch %	78.7	0.5	20.7			5.7	41.0	53.3			29.3	51.2	19.5			38.7	60.0	1.3					
Total %	36.0	0.2	9.5		45.7	1.4	10.1	13.1		24.6	0.7	1.2	0.5		2.4	10.6	16.4	0.4		27.4	6.5	93.5	

	Cesar Chavez Blvd. Southbound				2nd Street Westbound				Cesar Chavez Blvd. Northbound				2nd Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 16:00 to 18:00 - Peak 1 of 1																	
Intersection	17:00																
Volume	328	0	84	412	22	89	115	226	7	2	1	10	81	137	3	221	869
Percent	79.6	0.0	20.4		9.7	39.4	50.9		70.0	20.0	10.0		36.7	62.0	1.4		
17:15 Volume	84	0	22	106	3	19	31	53	1	0	0	1	26	44	0	70	230
Peak Factor																	0.945
High Int.	17:00				17:30				17:45				17:15				
Volume	88	0	18	106	8	24	35	67	3	1	1	5	26	44	0	70	
Peak Factor				0.972				0.843				0.500				0.789	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather: Clear & Dry
Counted By: C. Brown
Board No.: D1-1428
Loc: Cesar Chavez & 2nd Street

File Name : 06048031
Site Code : 00048031
Start Date : 2/23/2006
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather: Clear & Dry
Counted By: K. Dell
Board No.: D1-1425
Loc: Cesar Chavez & Grant Street

File Name : 06048040
Site Code : 00048040
Start Date : 2/23/2006
Page No : 1

Groups Printed- Group 1

	Cesar Chavez Blvd. Southbound					Grant Street Westbound					Cesar Chavez Blvd. Northbound					Grant Street Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
06:55	2	11	4	0	17	2	18	9	0	29	8	21	8	2	37	2	21	5	0	28	2	111	113
07:10	2	19	3	0	24	4	15	9	0	28	9	27	8	1	44	1	18	11	0	30	1	126	127
07:25	8	29	3	0	40	4	36	23	0	63	9	28	3	1	40	5	45	13	0	63	1	206	207
07:40	10	18	4	1	32	10	51	37	0	98	10	34	10	3	54	3	96	18	2	117	6	301	307
07:55	10	27	7	0	44	11	59	42	2	112	8	33	8	1	49	4	68	25	0	97	3	302	305
08:10	11	35	3	1	49	7	31	18	0	56	5	37	9	1	51	4	46	26	0	76	2	232	234
08:25	5	33	6	0	44	9	22	5	0	36	11	39	12	1	62	2	39	10	0	51	1	193	194
08:40	11	36	7	1	54	9	26	16	0	51	7	41	19	3	67	5	37	9	0	51	4	223	227
Grand Total	59	208	37	3	304	56	258	159	2	473	67	260	77	13	404	26	370	117	2	513	20	1694	1714
Apprch %	19.4	68.4	12.2			11.8	54.5	33.6			16.6	64.4	19.1			5.1	72.1	22.8					
Total %	3.5	12.3	2.2		17.9	3.3	15.2	9.4		27.9	4.0	15.3	4.5		23.8	1.5	21.8	6.9		30.3	1.2	98.8	

	Cesar Chavez Blvd. Southbound				Grant Street Westbound				Cesar Chavez Blvd. Northbound				Grant Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 06:55 to 08:40 - Peak 1 of 1																	
Intersection	07:25																
Volume	39	109	17	165	32	177	120	329	32	132	30	194	16	255	82	353	1041
Percent	23.6	66.1	10.3		9.7	53.8	36.5		16.5	68.0	15.5		4.5	72.2	23.2		
07:55 Volume	10	27	7	44	11	59	42	112	8	33	8	49	4	68	25	97	302
Peak Factor																	0.862
High Int.	08:10				07:55				07:40				07:40				
Volume	11	35	3	49	11	59	42	112	10	34	10	54	3	96	18	117	
Peak Factor				0.842				0.734				0.898				0.754	

Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
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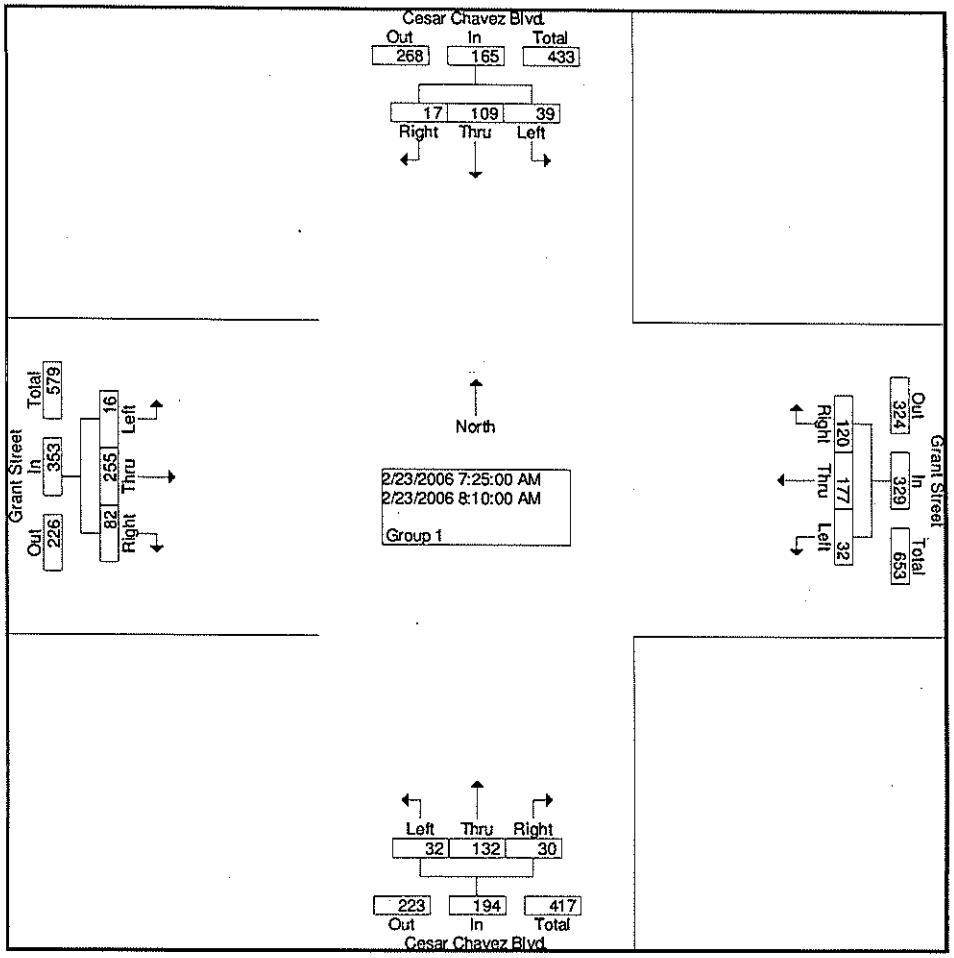
Loc: Cesar Chavez & Grant Street

File Name : 06048040
Site Code : 00048040
Start Date : 2/23/2006
Page No : 2



Traffic Data Service Southwest
9773 Maine Avenue
Lakeside, CA 92040
(619) 390-8495 Fax (619) 390-8427

Weather: Clear & Dry
Counted By: K. Dell
Board No.: D1-1425
Loc: Cesar Chavez & Grant Street

File Name : 06048041
Site Code : 00048041
Start Date : 2/23/2006
Page No : 1

Groups Printed- Group 1

	Cesar Chavez Blvd. Southbound					Grant Street Westbound					Cesar Chavez Blvd. Northbound					Grant Street Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:00	11	42	1	0	54	10	33	5	0	48	10	37	14	0	61	7	46	15	0	68	0	231	231
16:15	12	55	6	0	73	20	40	13	0	73	10	29	13	1	52	8	42	17	0	67	1	265	266
16:30	12	64	6	2	82	9	36	16	0	61	10	29	18	0	57	5	51	19	0	75	2	275	277
16:45	14	80	6	0	100	19	34	11	0	64	14	27	9	0	50	5	55	12	0	72	0	286	286
Total	49	241	19	2	309	58	143	45	0	246	44	122	54	1	220	25	194	63	0	282	3	1057	1060
17:00	17	63	11	0	91	16	46	12	0	74	17	22	11	2	50	5	43	19	0	67	2	282	284
17:15	12	61	10	0	83	14	37	11	0	62	15	26	7	2	48	8	55	26	0	89	2	282	284
17:30	17	64	7	0	88	11	37	14	0	62	17	36	10	0	63	4	61	21	0	86	0	299	299
17:45	14	65	4	0	83	11	37	9	0	57	9	25	10	0	44	2	49	24	0	75	0	259	259
Total	60	253	32	0	345	52	157	46	0	255	58	109	38	4	205	19	208	90	0	317	4	1122	1126
Grand Total	109	494	51	2	654	110	300	91	0	501	102	231	92	5	425	44	402	153	0	599	7	2179	2186
Apprch %	16.7	75.5	7.8			22.0	59.9	18.2			24.0	54.4	21.6			7.3	67.1	25.5					
Total %	5.0	22.7	2.3		30.0	5.0	13.8	4.2		23.0	4.7	10.6	4.2		19.5	2.0	18.4	7.0		27.5	0.3	99.7	

	Cesar Chavez Blvd. Southbound				Grant Street Westbound				Cesar Chavez Blvd. Northbound				Grant Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 16:00 to 17:45 - Peak 1 of 1																	
Intersection 16:45																	
Volume	60	268	34	362	60	154	48	262	63	111	37	211	22	214	78	314	1149
Percent	16.6	74.0	9.4		22.9	58.8	18.3		29.9	52.6	17.5		7.0	68.2	24.8		
17:30 Volume	17	64	7	88	11	37	14	62	17	36	10	63	4	61	21	86	299
Peak Factor																	0.961
High Int.	16:45				17:00				17:30				17:15				
Volume	14	80	6	100	16	46	12	74	17	36	10	63	8	55	26	89	
Peak Factor				0.905				0.885				0.837				0.882	

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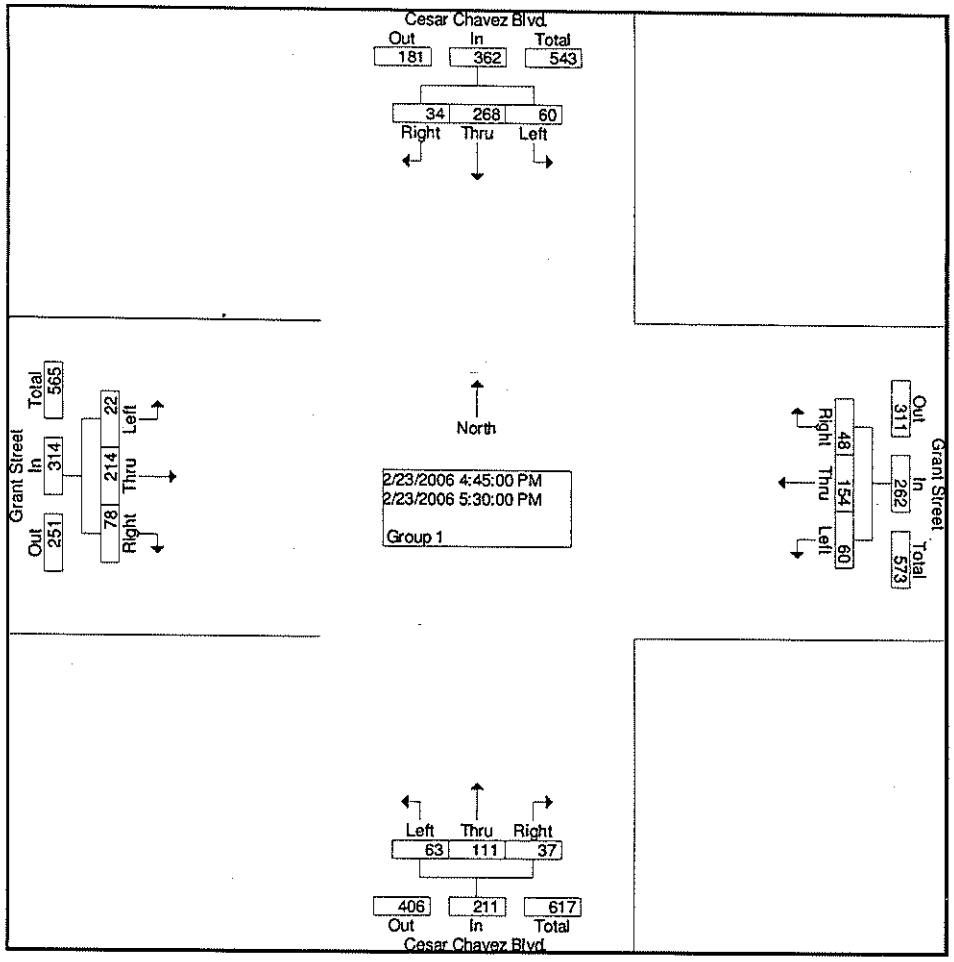
File Name : 06048041
Site Code : 00048041
Start Date : 2/23/2006



APPENDIX B

SEGMENT MANUAL COUNT SHEETS

Site: [14501] SR-98 West of David Navarro Ave.
Direction: 8 - East bound A>B, West bound B>A., Lane: 0
Survey Durati 9:40 Wednesday, May 04, 2005 => 11:01 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\1450108MAY2005.EC0 (Plus)
Identifier: M264XC37 MC56-6 [MC56] (c)Microcom 02/03/01
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included clas 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: East (bound)
Separation: All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	56	0	19	27	0	10	0	0	0	0	0	0	0	0
1045	53	0	18	25	0	10	0	0	0	0	0	0	0	0
	109	**0**	**37**	**52**	**0**	**20**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1100	49	0	18	20	0	10	1	0	0	0	0	0	0	0
1115	47	0	21	18	0	7	0	0	0	1	0	0	0	0
1130	61	0	27	26	0	8	0	0	0	0	0	0	0	0
1145	63	0	25	30	0	8	0	0	0	0	0	0	0	0
	220	**0**	**91**	**94**	**0**	**33**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
1200	78	0	34	34	0	10	0	0	0	0	0	0	0	0
1215	67	0	20	33	0	13	1	0	0	0	0	0	0	0
1230	77	0	35	30	0	11	0	0	0	1	0	0	0	0
1245	81	0	37	37	0	6	0	0	0	1	0	0	0	0
	303	**0**	**126**	**134**	**0**	**40**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
1300	78	0	29	32	0	17	0	0	0	0	0	0	0	0
1315	76	0	31	27	0	17	0	0	0	1	0	0	0	0
1330	67	0	32	27	0	8	0	0	0	0	0	0	0	0
1345	85	0	33	43	0	8	0	0	0	1	0	0	0	0
	306	**0**	**125**	**129**	**0**	**50**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
1400	80	0	35	31	0	12	0	0	0	2	0	0	0	0
1415	77	0	32	25	0	20	0	0	0	0	0	0	0	0
1430	106	0	51	39	0	16	0	0	0	0	0	0	0	0
1445	111	0	64	35	0	12	0	0	0	0	0	0	0	0
	374	**0**	**182**	**130**	**0**	**60**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
1500	125	1	65	47	1	10	0	0	0	1	0	0	0	0
1515	144	0	84	42	0	16	0	0	0	2	0	0	0	0
1530	149	2	82	45	0	19	0	0	0	1	0	0	0	0
1545	159	2	100	37	0	19	0	0	0	1	0	0	0	0
	577	**5**	**331**	**171**	**1**	**64**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**
1600	151	0	80	53	0	17	0	0	0	1	0	0	0	0
1615	157	0	88	52	0	17	0	0	0	0	0	0	0	0
1630	165	0	97	55	0	12	0	0	0	1	0	0	0	0
1645	146	1	72	54	0	17	1	0	0	0	0	1	0	0
	619	**1**	**337**	**214**	**0**	**63**	**1**	**0**	**0**	**2**	**0**	**1**	**0**	**0**
1700	121	0	56	52	0	13	0	0	0	0	0	0	0	0
1715	172	0	82	67	0	23	0	0	0	0	0	0	0	0
1730	139	1	64	56	0	16	0	0	0	2	0	0	0	0
1745	128	0	52	55	0	20	0	0	0	0	0	1	0	0
	560	**1**	**254**	**230**	**0**	**72**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**0**
1800	105	2	53	36	0	13	0	0	0	0	1	0	0	0
1815	100	0	47	39	0	14	0	0	0	0	0	0	0	0
1830	101	0	54	39	0	7	0	0	0	1	0	0	0	0
1845	83	3	34	39	1	6	0	0	0	0	0	0	0	0
	389	**5**	**188**	**153**	**1**	**40**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**
1900	108	0	53	35	0	16	0	0	0	4	0	0	0	0
1915	109	0	55	43	0	10	0	0	0	1	0	0	0	0
1930	90	0	52	26	0	11	0	0	0	1	0	0	0	0
1945	63	0	30	30	0	3	0	0	0	0	0	0	0	0
	370	**0**	**190**	**134**	**0**	**40**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**
2000	57	1	35	17	0	4	0	0	0	0	0	0	0	0
2015	55	0	27	22	0	6	0	0	0	0	0	0	0	0
2030	56	0	31	21	0	4	0	0	0	0	0	0	0	0
2045	47	1	27	16	0	2	1	0	0	0	0	0	0	0
	215	**2**	**120**	**76**	**0**	**16**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2100	58	0	31	22	0	3	0	0	0	0	0	0	0	0

2115	54	0	32	18	0	4	0	0	0	0	0	0	0	0	0
2130	64	0	38	24	0	2	0	0	0	0	0	0	0	0	0
2145	42	0	24	14	1	1	1	0	0	0	1	0	0	0	0
	216	**0**	**125**	**78**	**1**	**10**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
2200	36	0	17	15	0	4	0	0	0	0	0	0	0	0	0
2215	41	0	18	15	1	6	0	0	0	1	0	0	0	0	0
2230	23	0	9	8	0	6	0	0	0	0	0	0	0	0	0
2245	34	0	21	7	0	5	0	0	0	1	0	0	0	0	0
	134	**0**	**65**	**45**	**1**	**21**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
2300	28	0	14	10	0	3	0	0	0	1	0	0	0	0	0
2315	29	0	8	14	0	6	0	0	0	1	0	0	0	0	0
2330	21	0	12	7	0	2	0	0	0	0	0	0	0	0	0
2345	26	0	16	6	0	4	0	0	0	0	0	0	0	0	0
	104	**0**	**50**	**37**	**0**	**15**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
0	22	0	13	5	1	2	0	0	0	1	0	0	0	0	0
15	12	0	9	1	1	1	0	0	0	0	0	0	0	0	0
30	13	0	5	5	0	2	0	0	0	1	0	0	0	0	0
45	13	0	6	6	0	1	0	0	0	0	0	0	0	0	0
	60	**0**	**33**	**17**	**2**	**6**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
100	21	0	8	9	0	4	0	0	0	0	0	0	0	0	0
115	12	0	5	6	0	1	0	0	0	0	0	0	0	0	0
130	11	0	6	2	0	3	0	0	0	0	0	0	0	0	0
145	11	0	5	4	0	2	0	0	0	0	0	0	0	0	0
	55	**0**	**24**	**21**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
200	10	0	9	0	0	0	0	0	1	0	0	0	0	0	0
215	11	0	4	2	0	5	0	0	0	0	0	0	0	0	0
230	11	0	6	1	0	1	0	0	0	3	0	0	0	0	0
245	7	0	3	2	0	2	0	0	0	0	0	0	0	0	0
	39	**0**	**22**	**5**	**0**	**8**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**0**
300	7	0	3	1	0	1	0	0	2	0	0	0	0	0	0
315	15	0	10	4	0	1	0	0	0	0	0	0	0	0	0
330	12	0	7	2	0	3	0	0	0	0	0	0	0	0	0
345	12	0	9	1	0	2	0	0	0	0	0	0	0	0	0
	46	**0**	**29**	**8**	**0**	**7**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
400	10	0	7	3	0	0	0	0	0	0	0	0	0	0	0
415	18	0	14	4	0	0	0	0	0	0	0	0	0	0	0
430	13	0	8	3	0	2	0	0	0	0	0	0	0	0	0
445	14	0	12	2	0	0	0	0	0	0	0	0	0	0	0
	55	**0**	**41**	**12**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
500	20	0	13	6	0	1	0	0	0	0	0	0	0	0	0
515	17	0	13	2	0	2	0	0	0	0	0	0	0	0	0
530	38	0	29	5	0	3	0	0	0	1	0	0	0	0	0
545	36	0	22	9	0	5	0	0	0	0	0	0	0	0	0
	111	**0**	**77**	**22**	**0**	**11**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
600	35	0	18	12	0	5	0	0	0	0	0	0	0	0	0
615	48	0	33	10	0	5	0	0	0	0	0	0	0	0	0
630	24	0	19	3	0	2	0	0	0	0	0	0	0	0	0
645	52	0	30	15	0	5	0	0	0	2	0	0	0	0	0
	159	**0**	**100**	**40**	**0**	**17**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
700	39	0	23	11	0	5	0	0	0	0	0	0	0	0	0
715	45	0	33	7	0	4	0	0	0	1	0	0	0	0	0
730	45	0	24	17	0	4	0	0	0	0	0	0	0	0	0
745	69	0	38	24	0	6	0	0	0	1	0	0	0	0	0
	198	**0**	**118**	**59**	**0**	**19**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
800	71	0	37	25	0	9	0	0	0	0	0	0	0	0	0
815	67	0	42	22	0	3	0	0	0	0	0	0	0	0	0
830	60	0	31	22	0	7	0	0	0	0	0	0	0	0	0
845	64	0	36	18	0	7	0	0	0	1	0	0	0	0	0
	262	**0**	**146**	**87**	**0**	**26**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
900	79	0	42	26	0	11	0	0	0	0	0	0	0	0	0
915	79	0	43	30	0	5	1	0	0	0	0	0	0	0	0
930	89	0	49	33	0	7	0	0	0	0	0	0	0	0	0
945	81	0	52	22	0	7	0	0	0	0	0	0	0	0	0
	328	**0**	**186**	**111**	**0**	**30**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1000	88	0	56	19	0	13	0	0	0	0	0	0	0	0	0
1015	82	0	44	27	0	10	0	0	0	1	0	0	0	0	0
	170	**0**	**100**	**46**	**0**	**23**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
[24]	5979	14	3099	2105	6	703	6	0	3	38	3	2	0	0	

Time	Grand Total	Total Cls	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
[--]	5979	14	3099	2105	6	703	6	0	3	38	3	2	0	0	

Site: [14501] SR-98 West of David Navarro Ave.
Direction: 8 - East bound A>B, West bound B>A., Lane: 0
Survey Du 9:40 Wednesday, May 04, 2005 => 11:01 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\14501 08MAY2005.EC0 (Plus)
Identifier: M264XG37 MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: West (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	60	0	44	12	0	3	0	0	0	1	0	0	0	0
1045	45	0	34	9	0	1	1	0	0	0	0	0	0	0
	105	0	78	21	0	4	1	0	0	1	0	0	0	0
1100	52	0	41	8	0	3	0	0	0	0	0	0	0	0
1115	64	0	48	9	0	4	1	0	0	1	0	0	0	1
1130	72	1	59	10	0	1	1	0	0	0	0	0	0	0
1145	72	0	81	8	0	2	0	0	0	1	0	0	0	0
	260	1	209	35	0	10	2	0	0	2	0	0	0	1
1200	75	1	55	17	0	2	0	0	0	0	0	0	0	0
1215	78	0	58	20	0	0	0	0	0	0	0	0	0	0
1230	77	0	56	15	0	5	0	0	0	1	0	0	0	0
1245	77	0	56	16	0	3	1	0	0	1	0	0	0	0
	307	1	225	68	0	10	1	0	0	2	0	0	0	0
1300	79	0	60	19	0	0	0	0	0	0	0	0	0	0
1315	71	0	51	16	0	3	0	0	0	1	0	0	0	0
1330	77	0	54	18	1	3	1	0	0	0	0	0	0	0
1345	75	0	58	14	0	3	0	0	0	0	0	0	0	0
	302	0	223	67	1	9	1	0	0	1	0	0	0	0
1400	76	0	52	17	0	7	0	0	0	0	0	0	0	0
1415	65	0	47	15	0	3	0	0	0	0	0	0	0	0
1430	62	0	50	9	0	3	0	0	0	0	0	0	0	0
1445	69	0	61	7	0	1	0	0	0	0	0	0	0	0
	272	0	210	48	0	14	0	0	0	0	0	0	0	0
1500	67	0	61	5	0	1	0	0	0	0	0	0	0	0
1515	85	0	81	10	0	2	2	0	0	0	0	0	0	0
1530	53	1	48	4	0	0	0	0	0	0	0	0	0	0
1545	93	1	80	7	0	4	0	0	0	1	0	0	0	0
	308	2	270	26	0	7	2	0	0	1	0	0	0	0
1600	62	0	57	5	0	0	0	0	0	0	0	0	0	0
1615	55	0	48	5	0	1	0	0	0	1	0	0	0	0
1630	60	0	54	5	0	1	0	0	0	0	0	0	0	0
1645	60	0	50	9	0	1	0	0	0	0	0	0	0	0
	237	0	209	24	0	3	0	0	0	1	0	0	0	0
1700	63	0	51	10	0	2	0	0	0	0	0	0	0	0
1715	66	0	51	10	0	5	0	0	0	0	0	0	0	0
1730	63	1	53	9	0	0	0	0	0	0	0	0	0	0
1745	65	0	49	14	0	2	0	0	0	0	0	0	0	0
	257	1	204	43	0	9	0	0	0	0	0	0	0	0
1800	76	0	65	9	0	1	0	0	0	1	0	0	0	0
1815	43	0	33	9	0	1	0	0	0	0	0	0	0	0
1830	57	0	46	10	0	1	0	0	0	0	0	0	0	0
1845	53	0	48	3	0	0	1	0	0	1	0	0	0	0
	229	0	192	31	0	3	1	0	0	2	0	0	0	0
1900	62	0	55	5	0	2	0	0	0	0	0	0	0	0
1915	49	0	42	6	0	1	0	0	0	0	0	0	0	0
1930	48	0	43	4	0	0	1	0	0	0	0	0	0	0
1945	33	0	28	4	0	1	0	0	0	0	0	0	0	0
	192	0	168	19	0	4	1	0	0	0	0	0	0	0
2000	23	0	18	3	0	0	0	0	0	1	0	0	0	0
2015	29	0	24	5	0	0	0	0	0	0	0	0	0	0
2030	28	0	26	2	0	0	0	0	0	0	0	0	0	0
2045	28	1	21	5	0	1	0	0	0	0	0	0	0	0
	108	1	90	15	0	1	0	0	0	1	0	0	0	0
2100	39	0	32	6	0	0	1	0	0	0	0	0	0	0

2115	26	0	22	3	0	1	0	0	0	0	0	0	0	0	0
2130	27	0	25	1	0	0	0	0	0	1	0	0	0	0	0
2145	28	0	22	6	0	0	0	0	0	0	0	0	0	0	0
	120	**0**	**101**	**16**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
2200	21	0	18	2	0	1	0	0	0	0	0	0	0	0	0
2215	17	0	17	0	0	0	0	0	0	0	0	0	0	0	0
2230	15	0	11	3	0	1	0	0	0	0	0	0	0	0	0
2245	27	0	20	7	0	0	0	0	0	0	0	0	0	0	0
	80	**0**	**66**	**12**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2300	13	0	10	2	0	1	0	0	0	0	0	0	0	0	0
2315	15	0	13	2	0	0	0	0	0	0	0	0	0	0	0
2330	12	0	12	0	0	0	0	0	0	0	0	0	0	0	0
2345	8	0	6	2	0	0	0	0	0	0	0	0	0	0	0
	48	**0**	**41**	**6**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0	16	0	13	2	0	0	1	0	0	0	0	0	0	0	0
15	7	0	6	1	0	0	0	0	0	0	0	0	0	0	0
30	10	0	7	3	0	0	0	0	0	0	0	0	0	0	0
45	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0
	35	**0**	**27**	**7**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
100	6	0	4	2	0	0	0	0	0	0	0	0	0	0	0
115	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
130	8	0	6	2	0	0	0	0	0	0	0	0	0	0	0
145	10	0	9	1	0	0	0	0	0	0	0	0	0	0	0
	25	**0**	**20**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
200	8	0	5	2	0	0	0	0	0	1	0	0	0	0	0
215	9	0	7	1	0	1	0	0	0	0	0	0	0	0	0
230	13	0	9	4	0	0	0	0	0	0	0	0	0	0	0
245	13	0	8	4	0	0	0	0	0	1	0	0	0	0	0
	43	**0**	**29**	**11**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
300	10	0	6	3	0	0	0	0	0	1	0	0	0	0	0
315	17	0	13	4	0	0	0	0	0	0	0	0	0	0	0
330	18	0	15	3	0	0	0	0	0	0	0	0	0	0	0
345	23	0	15	5	0	3	0	0	0	0	0	0	0	0	0
	68	**0**	**49**	**15**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
400	18	0	12	5	0	1	0	0	0	0	0	0	0	0	0
415	34	0	27	7	0	0	0	0	0	0	0	0	0	0	0
430	34	0	24	9	0	1	0	0	0	0	0	0	0	0	0
445	42	0	35	6	0	1	0	0	0	0	0	0	0	0	0
	128	**0**	**98**	**27**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
500	66	0	47	16	2	1	0	0	0	0	0	0	0	0	0
515	65	0	56	9	0	0	0	0	0	0	0	0	0	0	0
530	106	0	88	16	0	1	0	0	0	0	0	1	0	0	0
545	76	1	62	9	0	3	0	0	1	0	0	0	0	0	0
	313	**1**	**253**	**50**	**2**	**5**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**
600	55	0	47	8	0	0	0	0	0	0	0	0	0	0	0
615	78	0	64	12	0	1	1	0	0	0	0	0	0	0	0
630	89	0	61	23	0	2	1	0	0	2	0	0	0	0	0
645	73	0	53	20	0	0	0	0	0	0	0	0	0	0	0
	295	**0**	**225**	**63**	**0**	**3**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
700	77	1	61	13	0	2	0	0	0	0	0	0	0	0	0
715	69	0	55	13	0	1	0	0	0	0	0	0	0	0	0
730	108	1	92	14	0	0	1	0	0	0	0	0	0	0	0
745	104	0	92	6	1	4	0	0	0	1	0	0	0	0	0
	358	**2**	**300**	**46**	**1**	**7**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
800	79	1	67	10	0	1	0	0	0	0	0	0	0	0	0
815	80	1	67	8	0	3	0	0	0	1	0	0	0	0	0
830	83	0	69	13	0	1	0	0	0	0	0	0	0	0	0
845	97	0	87	9	0	1	0	0	0	0	0	0	0	0	0
	339	**2**	**290**	**40**	**0**	**6**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
900	77	0	69	7	0	1	0	0	0	0	0	0	0	0	0
915	86	0	68	15	0	3	0	0	0	0	0	0	0	0	0
930	73	0	67	5	0	1	0	0	0	0	0	0	0	0	0
945	85	0	72	11	0	2	0	0	0	0	0	0	0	0	0
	321	**0**	**276**	**38**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1000	78	1	67	7	0	0	1	0	0	2	0	0	0	0	0
1015	71	0	62	6	0	2	1	0	0	0	0	0	0	0	0
	149	**1**	**129**	**13**	**0**	**2**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
[24]	4899	12	3982	746	4	115	16	0	1	21	0	1	0	1	

* Time	Grand Total	Total Cls	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
[--]	4899		12	3982	746	4	115	16	0	1	21	0	1	0	1

Site: [14502] SR-98 Btwn Kloke Rd and David Navaro
Direction: 8 - East bound A>B, West bound B>A., Lane: 0
Survey Du 9:30 Wednesday, May 04, 2005 => 11:23 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\fixed files\1450208MAY2005.EC0 (Plus)
Identifier: A554FJK9 MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: East (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	59	0	43	13	0	3	0	0	0	0	0	0	0	0
1045	51	0	36	13	0	2	0	0	0	0	0	0	0	0
	110	**0**	**79**	**26**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1100	57	0	46	9	0	2	0	0	0	0	0	0	0	0
1115	52	0	35	14	0	2	1	0	0	0	0	0	0	0
1130	68	0	49	17	0	2	0	0	0	0	0	0	0	0
1145	69	0	48	17	0	4	0	0	0	0	0	0	0	0
	246	**0**	**178**	**57**	**0**	**10**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1200	75	0	49	20	0	5	1	0	0	0	0	0	0	0
1215	72	0	51	16	0	5	0	0	0	0	0	0	0	0
1230	79	0	53	22	0	4	0	0	0	0	0	0	0	0
1245	85	0	61	22	0	1	1	0	0	0	0	0	0	0
	311	**0**	**214**	**80**	**0**	**15**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1300	82	0	52	23	0	7	0	0	0	0	0	0	0	0
1315	85	1	58	22	0	3	1	0	0	0	0	0	0	0
1330	85	0	62	18	0	5	0	0	0	0	0	0	0	0
1345	76	0	46	23	0	6	0	0	0	1	0	0	0	0
	328	**1**	**218**	**86**	**0**	**21**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
1400	81	0	57	18	0	4	0	0	0	2	0	0	0	0
1415	77	0	59	13	0	5	0	0	0	0	0	0	0	0
1430	98	0	68	26	0	4	0	0	0	0	0	0	0	0
1445	97	0	67	25	0	5	0	0	0	0	0	0	0	0
	353	**0**	**251**	**82**	**0**	**18**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
1500	116	1	78	28	0	5	1	0	0	3	0	0	0	0
1515	114	2	80	26	0	4	0	0	1	1	0	0	0	0
1530	134	2	97	26	0	7	1	0	0	1	0	0	0	0
1545	122	3	85	27	0	5	1	0	0	1	0	0	0	0
	486	**8**	**340**	**107**	**0**	**21**	**3**	**0**	**1**	**6**	**0**	**0**	**0**	**0**
1600	116	0	91	19	0	4	1	0	0	1	0	0	0	0
1615	120	0	82	30	0	8	0	0	0	0	0	0	0	0
1630	135	1	93	36	1	4	0	0	0	0	0	0	0	0
1645	114	1	82	26	0	4	0	0	0	0	1	0	0	0
	485	**2**	**348**	**111**	**1**	**20**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**
1700	120	0	85	30	0	5	0	0	0	0	0	0	0	0
1715	150	0	106	39	0	5	0	0	0	0	0	0	0	0
1730	130	1	91	29	0	5	1	0	0	3	0	0	0	0
1745	120	0	80	34	0	6	0	0	0	0	0	0	0	0
	520	**1**	**362**	**132**	**0**	**21**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
1800	109	0	77	27	0	4	0	0	0	1	0	0	0	0
1815	96	0	66	27	0	3	0	0	0	0	0	0	0	0
1830	113	0	82	28	0	2	0	0	0	1	0	0	0	0
1845	76	2	50	21	0	2	0	0	0	1	0	0	0	0
	394	**2**	**275**	**103**	**0**	**11**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
1900	100	4	63	25	0	4	2	0	0	2	0	0	0	0
1915	88	0	68	15	0	3	1	0	0	1	0	0	0	0
1930	81	0	57	22	0	1	0	0	0	1	0	0	0	0
1945	70	0	55	13	0	2	0	0	0	0	0	0	0	0
	339	**4**	**243**	**75**	**0**	**10**	**3**	**0**	**0**	**4**	**0**	**0**	**0**	**0**
2000	59	1	42	15	0	1	0	0	0	0	0	0	0	0
2015	51	1	33	12	0	5	0	0	0	0	0	0	0	0
2030	60	0	37	19	0	4	0	0	0	0	0	0	0	0
2045	41	1	30	9	0	0	1	0	0	0	0	0	0	0
	211	**3**	**142**	**55**	**0**	**10**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2100	72	0	49	21	0	2	0	0	0	0	0	0	0	0

2115	39	0	32	6	0	1	0	0	0	0	0	0	0	0	0
2130	68	0	49	15	0	4	0	0	0	0	0	0	0	0	0
2145	44	0	34	6	1	1	1	0	0	0	1	0	0	0	0
	223	0	164	48	1	8	1	0	0	0	1	0	0	0	0
2200	36	0	27	7	0	2	0	0	0	0	0	0	0	0	0
2215	37	0	25	9	0	1	0	0	0	2	0	0	0	0	0
2230	28	0	18	8	0	2	0	0	0	0	0	0	0	0	0
2245	24	0	16	7	0	0	0	0	0	1	0	0	0	0	0
	125	0	86	31	0	5	0	0	0	3	0	0	0	0	0
2300	23	0	12	9	0	2	0	0	0	0	0	0	0	0	0
2315	24	0	9	12	0	2	0	0	0	1	0	0	0	0	0
2330	19	0	14	5	0	0	0	0	0	0	0	0	0	0	0
2345	22	0	16	4	0	2	0	0	0	0	0	0	0	0	0
	88	0	51	30	0	6	0	0	0	1	0	0	0	0	0
0	21	0	13	5	2	1	0	0	0	0	0	0	0	0	0
15	11	0	8	1	0	2	0	0	0	0	0	0	0	0	0
30	11	0	8	2	0	0	0	0	1	0	0	0	0	0	0
45	13	0	10	3	0	0	0	0	0	0	0	0	0	0	0
	56	0	39	11	2	3	0	0	1	0	0	0	0	0	0
100	14	0	9	2	0	3	0	0	0	0	0	0	0	0	0
115	9	0	7	1	0	1	0	0	0	0	0	0	0	0	0
130	6	0	4	1	0	1	0	0	0	0	0	0	0	0	0
145	8	0	4	4	0	0	0	0	0	0	0	0	0	0	0
	37	0	24	8	0	5	0	0	0	0	0	0	0	0	0
200	10	0	8	1	0	0	1	0	0	0	0	0	0	0	0
215	8	0	2	4	0	2	0	0	0	0	0	0	0	0	0
230	9	0	6	0	0	1	0	0	0	2	0	0	0	0	0
245	4	0	0	3	0	1	0	0	0	0	0	0	0	0	0
	31	0	16	8	0	4	1	0	0	2	0	0	0	0	0
300	6	0	3	0	0	3	0	0	0	0	0	0	0	0	0
315	11	0	6	4	0	1	0	0	0	0	0	0	0	0	0
330	7	0	2	4	0	1	0	0	0	0	0	0	0	0	0
345	11	0	6	5	0	0	0	0	0	0	0	0	0	0	0
	35	0	17	13	0	5	0	0	0	0	0	0	0	0	0
400	8	0	4	3	0	1	0	0	0	0	0	0	0	0	0
415	8	0	7	1	0	0	0	0	0	0	0	0	0	0	0
430	6	0	3	1	0	2	0	0	0	0	0	0	0	0	0
445	12	0	8	3	0	1	0	0	0	0	0	0	0	0	0
	34	0	22	8	0	4	0	0	0	0	0	0	0	0	0
500	14	0	11	3	0	0	0	0	0	0	0	0	0	0	0
515	10	0	6	3	0	1	0	0	0	0	0	0	0	0	0
530	24	2	13	4	0	4	1	0	0	0	0	0	0	0	0
545	26	0	15	9	0	2	0	0	0	0	0	0	0	0	0
	74	2	45	19	0	7	1	0	0	0	0	0	0		
600	21	0	7	9	0	5	0	0	0	0	0	0	0	0	
615	27	0	17	5	0	5	0	0	0	0	0	0	0	0	0
630	22	0	17	5	0	0	0	0	0	0	0	0	0	0	0
645	41	1	22	15	0	1	1	0	0	1	0	0	0	0	0
	111	1	63	34	0	11	1	0	0	1	0	0	0	0	0
700	34	0	23	11	0	0	0	0	0	0	0	0	0	0	0
715	43	0	31	8	0	5	1	0	0	0	0	0	0	0	0
730	61	0	44	13	0	4	0	0	0	0	0	0	0	0	0
745	101	0	64	29	0	6	1	0	0	1	0	0	0	0	0
	239	0	162	59	0	15	2	0	0	1	0	0	0	0	0
800	88	0	59	21	0	5	1	0	0	0	0	0	0	0	0
815	73	0	52	17	0	4	0	0	0	0	0	0	0	0	0
830	51	0	33	12	0	6	0	0	0	0	0	0	0	0	0
845	65	0	46	15	0	3	1	0	0	0	0	0	0	0	0
	275	0	190	65	0	18	2	0	0	0	0	0	0	0	0
900	80	0	35	21	0	4	0	0	0	0	0	0	0	0	0
915	70	1	44	20	0	4	1	0	0	0	0	0	0	0	0
930	77	0	50	18	0	8	1	0	0	0	0	0	0	0	0
945	80	0	45	11	0	4	0	0	0	0	0	0	0	0	0
	267	1	174	70	0	20	2	0	0	0	0	0	0	0	0
1000	69	1	43	19	0	6	0	0	0	0	0	0	0	0	0
1015	67	0	45	17	0	4	0	0	0	0	0	0	0	0	1
	136	1	88	36	0	10	0	0	0	0	0	0	0	0	1
[24]	5514	26	3791	1354	4	283	23	0	2	28	2	0	0	0	1

* Time	Grand Total	Total Cls	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
[–]	5514	26	3791	1354	4	283	23	0	2	28	2	0	0	0	1

Site: [14502] SR-98 Btwn Kloke Rd and David Navaro
Direction: 8 - East bound A>B, West bound B>A., Lane: 0
Survey Du 9:30 Wednesday, May 04, 2005 => 11:23 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\fixed files\1450208MAY2005.EC0 (Plus)
Identifier: A554FJK9 MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran(0 - 100 mph.
Direction: West (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	52	0	34	14	0	4	0	0	0	0	0	0	0	0
1045	54	0	36	15	0	3	0	0	0	0	0	0	0	0
	106	**0**	**70**	**29**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1100	60	0	43	13	0	4	0	0	0	0	0	0	0	0
1115	86	0	49	27	0	7	1	0	0	2	0	0	0	0
1130	70	0	42	23	0	3	1	0	0	1	0	0	0	0
1145	83	0	54	23	0	6	0	0	0	0	0	0	0	0
	299	**0**	**188**	**86**	**0**	**20**	**2**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
1200	92	0	56	29	0	6	0	0	0	1	0	0	0	0
1215	88	0	51	35	0	2	0	0	0	0	0	0	0	0
1230	84	0	51	24	0	8	0	0	0	1	0	0	0	0
1245	73	0	43	20	1	8	0	0	0	1	0	0	0	0
	337	**0**	**201**	**108**	**1**	**24**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
1300	100	0	59	30	0	11	0	0	0	0	0	0	0	0
1315	76	0	41	25	0	9	0	0	0	1	0	0	0	0
1330	85	0	51	20	1	12	1	0	0	0	0	0	0	0
1345	81	0	51	20	0	10	0	0	0	0	0	0	0	0
	342	**0**	**202**	**95**	**1**	**42**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
1400	80	0	49	22	0	9	0	0	0	0	0	0	0	0
1415	85	2	47	26	0	10	0	0	0	0	0	0	0	0
1430	82	0	47	27	0	8	0	0	0	0	0	0	0	0
1445	83	0	48	29	0	6	0	0	0	0	0	0	0	0
	330	**2**	**191**	**104**	**0**	**33**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1500	76	0	45	23	0	7	0	0	0	1	0	0	0	0
1515	80	0	57	18	0	4	0	0	0	1	0	0	0	0
1530	80	1	50	24	0	5	0	0	0	0	0	0	0	0
1545	96	0	61	18	0	14	2	0	0	1	0	0	0	0
	332	**1**	**213**	**83**	**0**	**30**	**2**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
1600	78	0	47	26	0	5	0	0	0	0	0	0	0	0
1615	77	0	52	20	0	4	0	0	0	1	0	0	0	0
1630	76	0	45	25	0	5	1	0	0	0	0	0	0	0
1645	83	0	47	27	2	7	0	0	0	0	0	0	0	0
	314	**0**	**191**	**98**	**2**	**21**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
1700	83	0	62	16	0	5	0	0	0	0	0	0	0	0
1715	105	0	67	29	0	9	0	0	0	0	0	0	0	0
1730	85	0	58	22	0	5	0	0	0	0	0	0	0	0
1745	76	0	47	22	0	6	1	0	0	0	0	0	0	0
	349	**0**	**234**	**89**	**0**	**25**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1800	84	0	52	21	0	8	0	0	0	2	0	0	0	1
1815	70	0	41	20	0	9	0	0	0	0	0	0	0	0
1830	76	0	49	21	0	4	1	0	0	1	0	0	0	0
1845	78	0	58	17	0	3	0	0	0	2	0	0	0	0
	308	**0**	**198**	**79**	**0**	**24**	**1**	**0**	**0**	**5**	**0**	**0**	**0**	**1**
1900	85	0	47	32	0	4	1	0	0	1	0	0	0	0
1915	72	0	42	22	0	7	0	0	0	1	0	0	0	0
1930	62	0	36	23	0	3	0	0	0	0	0	0	0	0
1945	49	0	27	16	0	6	0	0	0	0	0	0	0	0
	268	**0**	**152**	**93**	**0**	**20**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
2000	43	0	21	16	0	5	0	0	0	1	0	0	0	0
2015	48	0	35	12	0	0	0	0	1	0	0	0	0	0
2030	41	0	28	12	0	0	0	0	0	1	0	0	0	0
2045	56	1	33	15	0	7	0	0	0	0	0	0	0	0
	188	**1**	**117**	**55**	**0**	**12**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**
2100	69	0	46	19	0	4	0	0	0	0	0	0	0	0

2115	55	0	37	15	0	3	0	0	0	0	0	0	0	0	
2130	44	1	30	13	0	0	0	0	0	0	0	0	0	0	
2145	54	0	32	16	0	6	0	0	0	0	0	0	0	0	
	222	1	145	63	0	13	0	0	0	0	0	0	0	0	
2200	33	0	20	12	0	1	0	0	0	0	0	0	0	0	
2215	25	0	18	5	0	2	0	0	0	0	0	0	0	0	
2230	33	0	21	8	0	4	0	0	0	0	0	0	0	0	
2245	27	0	16	8	0	3	0	0	0	0	0	0	0	0	
	118	0	75	33	0	10	0	0	0	0	0	0	0	0	
2300	18	0	14	2	0	2	0	0	0	0	0	0	0	0	
2315	24	0	17	7	0	0	0	0	0	0	0	0	0	0	
2330	16	0	10	5	0	1	0	0	0	0	0	0	0	0	
2345	17	0	11	5	0	1	0	0	0	0	0	0	0	0	
	75	0	52	19	0	4	0	0	0	0	0	0	0	0	
0	18	0	9	9	0	1	0	0	0	0	0	0	0	0	
15	9	0	5	4	0	0	0	0	0	0	0	0	0	0	
30	13	0	8	5	0	1	0	0	0	1	0	0	0	0	
45	8	0	4	3	0	1	0	0	0	0	0	0	0	0	
	49	0	24	21	0	3	0	0	0	1	0	0	0	0	
100	6	0	3	1	0	2	0	0	0	0	0	0	0	0	
115	3	0	2	0	0	1	0	0	0	0	0	0	0	0	
130	12	0	7	5	0	0	0	0	0	0	0	0	0	0	
145	9	0	7	2	0	0	0	0	0	0	0	0	0	0	
	30	0	19	8	0	3	0	0	0	0	0	0	0	0	
200	9	0	7	1	0	0	0	0	0	1	0	0	0	0	
215	10	0	8	1	0	2	0	0	1	0	0	0	0	0	
230	14	0	7	6	0	1	0	0	0	0	0	0	0	0	
245	15	1	5	6	1	2	0	0	0	0	0	0	0	0	
	48	1	25	14	1	5	0	0	1	1	0	0	0	0	
300	11	1	5	4	0	0	1	0	0	0	0	0	0	0	
315	15	0	7	5	0	2	0	0	1	0	0	0	0	0	
330	20	0	16	3	0	1	0	0	0	0	0	0	0	0	
345	22	0	12	7	0	3	0	0	0	0	0	0	0	0	
	68	1	40	19	0	6	1	0	1	0	0	0	0	0	
400	22	0	11	6	0	4	0	0	0	1	0	0	0	0	
415	27	0	18	7	0	1	0	0	1	0	0	0	0	0	
430	33	0	20	10	0	3	0	0	0	0	0	0	0	0	
445	32	0	16	12	0	4	0	0	0	0	0	0	0	0	
	114	0	65	35	0	12	0	0	1	1	0	0	0	0	
500	55	0	28	20	4	3	0	0	0	0	0	0	0	0	
515	52	0	36	14	0	2	0	0	0	0	0	0	0	0	
530	97	0	57	34	0	6	0	0	0	0	0	0	0	0	
545	59	1	35	14	0	9	0	0	0	0	0	0	0	0	
	263	1	156	82	4	20	0	0	0	0	0	0	0	0	
600	50	0	33	13	0	4	0	0	0	0	0	0	0	0	
615	74	0	47	19	0	8	0	0	0	0	0	0	0	0	
630	71	0	42	19	0	8	0	0	0	2	0	0	0	0	
645	61	0	32	26	0	3	0	0	0	0	0	0	0	0	
	256	0	154	77	0	23	0	0	0	2	0	0	0	0	
700	61	0	39	21	0	1	0	0	0	0	0	0	0	0	
715	62	0	40	20	0	2	0	0	0	0	0	0	0	0	
730	105	1	74	26	0	4	0	0	0	0	0	0	0	0	
745	99	0	68	21	0	9	1	0	0	0	0	0	0	0	
	327	1	221	88	0	16	1	0	0	0	0	0	0	0	
800	119	1	76	35	0	6	0	0	0	0	0	0	0	1	
815	110	0	63	37	0	8	1	0	0	0	0	0	0	1	
830	85	0	45	32	0	8	0	0	0	0	0	0	0	0	
845	77	0	47	25	0	5	0	0	0	0	0	0	0	0	
	391	1	231	129	0	27	1	0	0	0	0	0	0	2	
900	70	0	42	21	0	6	1	0	0	0	0	0	0	0	
915	90	0	53	25	0	12	0	0	0	0	0	0	0	0	
930	83	0	48	24	0	10	0	0	0	1	0	0	0	0	
945	90	0	43	35	0	11	0	0	1	0	0	0	0	0	
	333	0	186	105	0	39	1	0	1	1	0	0	0	0	
1000	80	1	49	20	0	8	0	0	0	2	0	0	0	0	
1015	65	0	34	23	0	8	0	0	0	0	0	0	0	0	
	145	1	83	43	0	16	0	0	0	2	0	0	0	0	
[24]	5812	11	3433	1655	9	455	13	0	5	28	0	0	0	3	

*	Grand	Total												
Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls
		1	2	3	4	5	6	7	8	9	10	11	12	13
[--]	5812	11	3433	1655	9	455	13	0	5	28	0	0	0	3

Site: [14503] SR-98 Btwn Kloke Rd and Eady Ave
Direction: 6 - West bound A>B, East bound B>A., Lane: 0
Survey Du 9:23 Wednesday, May 04, 2005 => 11:04 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\fixed files\1450308MAY2005.EC0 (Plus)
Identifier: A578EM15 MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: East (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	89	0	48	30	0	12	0	0	0	1	0	0	0	0
1045	87	0	44	33	0	10	0	0	0	0	0	0	0	0
	176	0	90	63	0	22	0	0	0	1	0	0	0	0
1100	103	1	55	37	0	9	0	0	0	1	0	0	0	0
1115	102	1	68	31	0	2	0	0	0	0	0	0	0	0
1130	120	0	74	33	0	11	2	0	0	0	0	0	0	0
1145	108	0	58	34	0	15	0	0	0	1	0	0	0	0
	433	2	255	135	0	37	2	0	0	2	0	0	0	0
1200	122	0	75	33	0	13	0	0	0	1	0	0	0	0
1215	108	0	58	36	0	13	0	0	0	1	0	0	0	0
1230	108	0	58	38	1	10	1	0	0	0	0	0	0	0
1245	143	0	80	52	0	10	0	0	0	1	0	0	0	0
	481	0	271	159	1	46	1	0	0	3	0	0	0	0
1300	126	1	83	45	0	16	1	0	0	0	0	0	0	0
1315	113	0	55	35	0	20	2	0	0	1	0	0	0	0
1330	137	0	69	52	0	16	0	0	0	0	0	0	0	0
1345	103	0	53	37	0	11	1	0	0	1	0	0	0	0
	479	1	240	169	0	63	4	0	0	2	0	0	0	0
1400	123	2	59	46	0	14	0	0	0	2	0	0	0	0
1415	123	0	74	39	0	9	0	0	0	1	0	0	0	0
1430	135	0	85	37	0	11	0	0	0	2	0	0	0	0
1445	172	0	96	59	0	16	1	0	0	0	0	0	0	0
	553	2	314	181	0	50	1	0	0	5	0	0	0	0
1500	216	1	146	56	0	11	0	0	0	2	0	0	0	0
1515	201	0	140	47	0	13	1	0	0	0	0	0	0	0
1530	190	1	125	43	0	20	0	0	0	1	0	0	0	0
1545	178	3	99	56	1	18	0	0	0	1	0	0	0	0
	785	5	510	202	1	62	1	0	0	4	0	0	0	0
1600	174	1	100	61	0	9	2	0	0	1	0	0	0	0
1615	186	0	103	66	0	16	1	0	0	0	0	0	0	0
1630	170	1	106	53	1	9	0	0	0	0	0	0	0	0
1645	154	0	67	72	0	13	1	0	0	0	1	0	0	0
	684	2	376	252	1	47	4	0	0	1	1	0	0	0
1700	153	2	81	55	0	15	0	0	0	0	0	0	0	0
1715	182	1	102	62	0	17	0	0	0	0	0	0	0	0
1730	190	3	113	65	1	8	0	0	0	2	0	0	0	0
1745	164	0	86	58	0	18	0	0	0	1	0	1	0	0
	689	6	382	240	1	56	0	0	0	3	0	1	0	0
1800	146	0	83	47	0	13	1	0	0	2	0	0	0	0
1815	160	0	82	63	0	14	1	0	0	0	0	0	0	0
1830	163	1	83	65	1	13	0	0	0	0	0	0	0	0
1845	139	2	74	50	0	11	0	0	0	1	0	0	0	1
	608	3	322	225	1	51	2	0	0	3	0	0	0	1
1900	147	1	85	49	0	8	0	0	0	4	0	0	0	0
1915	143	0	88	41	0	11	2	0	0	1	0	0	0	0
1930	134	2	69	50	0	12	1	0	0	0	0	0	0	0
1945	112	0	61	45	0	5	1	0	0	0	0	0	0	0
	536	3	303	185	0	36	4	0	0	5	0	0	0	0
2000	105	1	66	29	0	9	0	0	0	0	0	0	0	0
2015	108	2	51	42	0	11	0	0	0	0	0	0	0	0
2030	113	0	61	39	0	13	0	0	0	0	0	0	0	0
2045	85	2	40	36	0	6	0	0	0	1	0	0	0	0
	409	5	218	146	0	39	0	0	0	1	0	0	0	0
2100	86	0	42	36	0	8	0	0	0	0	0	0	0	0

2115	76	0	47	24	0	5	0	0	0	0	0	0	0	0	
2130	96	1	50	36	1	8	0	0	0	0	0	0	0	0	
2145	71	0	45	21	1	2	1	0	0	0	1	0	0	0	
	329	1	184	117	2	23	1	0	0	0	1	0	0	0	
2200	71	1	37	29	0	4	0	0	0	0	0	0	0	0	
2215	52	0	22	22	1	7	0	0	0	0	0	0	0	0	
2230	55	0	32	15	0	7	0	0	0	1	0	0	0	0	
2245	49	0	29	18	0	1	0	0	0	1	0	0	0	0	
	227	1	120	84	1	19	0	0	0	2	0	0	0	0	
2300	43	0	19	19	0	5	0	0	0	0	0	0	0	0	
2315	35	0	12	17	0	4	0	0	0	2	0	0	0	0	
2330	26	0	15	8	0	3	0	0	0	0	0	0	0	0	
2345	38	0	23	12	0	3	0	0	0	0	0	0	0	0	
	142	0	69	56	0	15	0	0	0	2	0	0	0	0	
0	34	0	20	8	1	4	0	0	0	1	0	0	0	0	
15	10	0	4	3	1	2	0	0	0	0	0	0	0	0	
30	11	0	5	3	0	2	0	0	0	1	0	0	0	0	
45	22	0	11	9	0	2	0	0	0	0	0	0	0	0	
	77	0	40	23	2	10	0	0	0	2	0	0	0	0	
100	21	0	15	3	0	3	0	0	0	0	0	0	0	0	
115	15	0	6	7	0	2	0	0	0	0	0	0	0	0	
130	15	0	8	5	0	2	0	0	0	0	0	0	0	0	
145	7	0	4	3	0	0	0	0	0	0	0	0	0	0	
	58	0	33	18	0	7	0	0	0	0	0	0	0	0	
200	16	0	10	5	0	0	0	0	1	0	0	0	0	0	
215	10	0	1	3	0	6	0	0	0	0	0	0	0	0	
230	12	0	7	1	0	1	0	0	1	2	0	0	0	0	
245	9	0	4	3	0	2	0	0	0	0	0	0	0	0	
	47	0	22	12	0	9	0	0	2	2	0	0	0	0	
300	7	0	3	1	0	1	0	0	2	0	0	0	0	0	
315	18	0	9	6	0	3	0	0	0	0	0	0	0	0	
330	8	0	5	2	0	1	0	0	0	0	0	0	0	0	
345	18	0	7	8	0	3	0	0	0	0	0	0	0	0	
	51	0	24	17	0	8	0	0	2	0	0	0	0	0	
400	11	0	4	4	0	2	1	0	0	0	0	0	0	0	
415	14	0	10	4	0	0	0	0	0	0	0	0	0	0	
430	14	0	7	5	0	2	0	0	0	0	0	0	0	0	
445	15	0	7	8	0	0	0	0	0	0	0	0	0	0	
	54	0	28	21	0	4	1	0	0	0	0	0	0	0	
500	18	0	9	7	0	2	0	0	0	0	0	0	0	0	
515	18	0	7	7	0	4	0	0	0	0	0	0	0	0	
530	39	0	16	15	0	7	0	0	0	1	0	0	0	0	
545	46	0	22	13	0	10	1	0	0	0	0	0	0	0	
	121	0	54	42	0	23	1	0	0	1	0	0	0	0	
600	28	0	11	11	0	6	0	0	0	0	0	0	0	0	
615	51	0	23	17	0	11	0	0	0	0	0	0	0	0	
630	35	0	17	15	0	3	0	0	0	0	0	0	0	0	
645	50	1	27	18	0	3	0	0	0	1	0	0	0	0	
	164	1	78	61	0	23	0	0	0	1	0	0	0	0	
700	66	0	27	26	0	13	0	0	0	0	0	0	0	0	
715	84	0	35	39	0	9	0	0	0	1	0	0	0	0	
730	106	0	58	40	0	9	0	0	0	0	0	1	0	0	
745	210	2	137	55	0	15	0	0	0	1	0	0	0	0	
	466	2	255	160	0	46	0	0	0	2	0	1	0	0	
800	204	4	134	58	0	8	0	0	0	0	0	0	0	0	
815	157	0	85	67	0	5	0	0	0	0	0	0	0	0	
830	94	0	39	45	0	10	0	0	0	0	0	0	0	0	
845	102	0	45	46	0	10	1	0	0	0	0	0	0	0	
	557	4	303	216	0	33	1	0	0	0	0	0	0	0	
900	98	0	46	38	0	14	0	0	0	0	0	0	0	0	
915	111	1	58	44	0	8	0	0	0	0	0	0	0	0	
930	103	0	47	39	0	15	1	0	0	1	0	0	0	0	
945	92	0	50	32	0	10	0	0	0	0	0	0	0	0	
	404	1	201	153	0	47	1	0	0	1	0	0	0	0	
1000	110	1	56	37	1	14	1	0	0	0	0	0	0	0	
1015	115	0	49	48	0	16	1	0	0	1	0	0	0	0	
	225	1	105	85	1	30	2	0	0	1	0	0	0	0	
[24]	8755	40	4797	3022	11	806	26	0	4	44	2	2	0	1	

*	Grand	Total													
Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls
		1	2	3	4	5	6	7	8	9	10	11	12	13	
[--]	8755	40	4797	3022	11	806	26	0	4	44	2	2	0	1	

Site: [14503] SR-98 Btwn Kloke Rd and Eady Ave
Direction: 6 - West bound A>B, East bound B>A., Lane: 0
Survey Du 9:23 Wednesday, May 04, 2005 => 11:04 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\fixed files\1450308MAY2005.EC0 (Plus)
Identifier: A578EM15 MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed rang 0 - 100 mph.
Direction: West (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	88	0	28	39	0	18	1	0	0	0	0	0	0	0
1045	68	0	24	35	0	9	0	0	0	0	0	0	0	0
	154	**0**	**52**	**74**	**0**	**27**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1100	104	0	36	54	0	12	1	0	0	0	1	0	0	0
1115	117	0	42	57	0	15	1	0	0	2	0	0	0	0
1130	96	0	38	47	1	9	1	0	0	0	0	0	0	0
1145	149	0	49	80	0	20	0	0	0	0	0	0	0	0
	466	**0**	**165**	**238**	**1**	**56**	**3**	**0**	**0**	**2**	**1**	**0**	**0**	**0**
1200	125	0	49	54	0	21	0	0	0	1	0	0	0	0
1215	110	0	35	58	0	16	0	0	1	0	0	0	0	0
1230	106	0	31	54	0	19	1	0	0	0	1	0	0	0
1245	115	0	57	41	1	15	0	0	0	1	0	0	0	0
	456	**0**	**172**	**207**	**1**	**71**	**1**	**0**	**1**	**2**	**1**	**0**	**0**	**0**
1300	134	1	49	62	0	20	1	0	1	0	0	0	0	0
1315	119	0	34	59	0	25	0	0	0	1	0	0	0	0
1330	121	0	44	55	1	21	0	0	0	0	0	0	0	0
1345	115	0	41	52	0	21	0	0	0	1	0	0	0	0
	489	**1**	**168**	**228**	**1**	**87**	**1**	**0**	**1**	**2**	**0**	**0**	**0**	**0**
1400	127	0	44	61	0	22	0	0	0	0	0	0	0	0
1415	144	3	60	62	1	18	0	0	0	0	0	0	0	0
1430	114	0	42	58	0	14	0	0	0	0	0	0	0	0
1445	161	0	73	71	0	16	0	0	0	1	0	0	0	0
	546	**3**	**219**	**252**	**1**	**70**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
1500	193	0	114	66	0	11	0	0	1	0	1	0	0	0
1515	140	0	74	54	0	12	0	0	0	0	0	0	0	0
1530	150	0	72	51	0	26	0	0	0	1	0	0	0	0
1545	130	1	56	58	0	12	1	0	0	1	1	0	0	0
	613	**1**	**316**	**229**	**0**	**61**	**1**	**0**	**1**	**2**	**2**	**0**	**0**	**0**
1600	116	0	62	44	0	10	0	0	0	0	0	0	0	0
1615	130	0	50	62	0	17	0	0	0	0	1	0	0	0
1630	134	0	61	55	1	17	0	0	0	0	0	0	0	0
1645	135	1	49	69	0	15	1	0	0	0	0	0	0	0
	515	**1**	**222**	**230**	**1**	**59**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
1700	128	1	65	51	0	10	1	0	0	0	0	0	0	0
1715	132	0	62	57	0	13	0	0	0	0	0	0	0	0
1730	138	0	62	66	0	10	0	0	0	0	0	0	0	0
1745	113	0	51	48	1	12	0	0	1	0	0	0	0	0
	511	**1**	**240**	**222**	**1**	**45**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
1800	154	1	72	66	0	11	1	0	1	2	0	0	0	0
1815	118	1	52	53	0	12	0	0	0	0	0	0	0	0
1830	114	0	47	52	0	10	2	0	0	0	3	0	0	0
1845	118	0	56	51	0	11	0	0	0	0	0	0	0	0
	504	**2**	**227**	**222**	**0**	**44**	**3**	**0**	**1**	**2**	**3**	**0**	**0**	**0**
1900	113	0	58	45	0	9	0	0	0	1	0	0	0	0
1915	100	1	41	41	0	17	0	0	0	0	0	0	0	0
1930	96	0	47	35	0	14	0	0	0	0	0	0	0	0
1945	76	0	30	37	0	9	0	0	0	0	0	0	0	0
	385	**1**	**176**	**158**	**0**	**49**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
2000	77	1	29	38	0	7	0	0	1	1	0	0	0	0
2015	90	0	41	43	2	4	0	0	0	0	0	0	0	0
2030	70	1	31	34	0	4	0	0	0	0	0	0	0	0
2045	99	0	38	45	0	16	0	0	0	0	0	0	0	0
	336	**2**	**139**	**160**	**2**	**31**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**
2100	102	0	53	42	0	6	0	0	0	0	1	0	0	0

2115	82	0	41	34	0	7	0	0	0	0	0	0	0	0
2130	88	0	43	41	0	2	0	0	0	2	0	0	0	0
2145	91	0	44	39	0	8	0	0	0	0	0	0	0	0
	363	0	181	156	0	23	0	0	0	2	1	0	0	0
2200	60	1	28	26	0	5	0	0	0	0	0	0	0	0
2215	46	0	27	15	0	4	0	0	0	0	0	0	0	0
2230	49	0	18	25	0	5	1	0	0	0	0	0	0	0
2245	34	0	14	14	0	6	0	0	0	0	0	0	0	0
	189	1	87	80	0	20	1	0	0	0	0	0	0	0
2300	35	0	16	17	0	2	0	0	0	0	0	0	0	0
2315	33	0	14	17	0	2	0	0	0	0	0	0	0	0
2330	37	0	17	18	0	2	0	0	0	0	0	0	0	0
2345	25	0	12	10	0	3	0	0	0	0	0	0	0	0
	130	0	59	62	0	9	0	0	0	0	0	0	0	0
0	24	0	10	11	0	3	0	0	0	0	0	0	0	0
15	16	0	8	4	0	4	0	0	0	0	0	0	0	0
30	20	0	5	10	0	4	1	0	0	0	0	0	0	0
45	13	0	5	5	0	3	0	0	0	0	0	0	0	0
	73	0	28	30	0	14	1	0	0	0	0	0	0	0
100	11	0	6	3	0	2	0	0	0	0	0	0	0	0
115	9	0	6	2	0	1	0	0	0	0	0	0	0	0
130	13	0	4	7	0	2	0	0	0	0	0	0	0	0
145	17	0	11	3	0	3	0	0	0	0	0	0	0	0
	50	0	27	15	0	8	0	0	0	0	0	0	0	0
200	13	0	5	7	0	0	0	0	0	1	0	0	0	0
215	9	0	3	2	0	4	0	0	0	0	0	0	0	0
230	16	0	8	6	0	2	0	0	0	0	0	0	0	0
245	21	0	5	10	0	5	0	0	0	1	0	0	0	0
	59	0	21	25	0	11	0	0	0	2	0	0	0	0
300	10	0	4	5	0	1	0	0	0	0	0	0	0	0
315	15	0	6	4	0	4	0	0	1	0	0	0	0	0
330	26	0	11	9	0	6	0	0	0	0	0	0	0	0
345	22	0	8	7	0	7	0	0	0	0	0	0	0	0
	73	0	29	25	0	16	0	0	1	0	0	0	0	0
400	29	0	7	14	0	7	0	0	0	1	0	0	0	0
415	28	0	16	6	0	5	0	0	1	0	0	0	0	0
430	36	0	10	19	0	7	0	0	0	0	0	0	0	0
445	37	0	13	18	0	6	0	0	0	0	0	0	0	0
	130	0	46	57	0	25	0	0	1	1	0	0	0	0
500	55	0	20	25	3	7	0	0	0	0	0	0	0	0
515	63	0	25	29	0	8	0	0	0	0	0	1	0	0
530	81	0	35	40	0	6	0	0	0	0	0	0	0	0
545	63	1	30	20	0	12	0	0	0	0	0	0	0	0
	262	1	110	114	3	33	0	0	0	0	0	1	0	0
600	63	0	29	25	0	9	0	0	0	0	0	0	0	0
615	81	0	33	29	0	19	0	0	0	0	0	0	0	0
630	76	0	31	29	0	14	1	0	0	1	0	0	0	0
645	66	0	23	32	0	10	0	0	1	0	0	0	0	0
	286	0	116	115	0	52	1	0	1	1	0	0	0	0
700	75	0	37	32	0	6	0	0	0	0	0	0	0	0
715	108	1	45	43	0	16	0	0	1	2	0	0	0	0
730	156	0	68	72	0	16	0	0	0	0	0	0	0	0
745	205	1	111	74	0	17	1	0	0	0	0	1	0	0
	544	2	261	221	0	55	1	0	1	2	0	1	0	0
800	210	1	103	85	0	20	1	0	0	0	0	0	0	0
815	146	0	70	59	0	17	0	0	0	0	0	0	0	0
830	125	0	36	71	0	18	0	0	0	0	0	0	0	0
845	103	0	38	53	0	12	0	0	0	0	0	0	0	0
	584	1	247	268	0	67	1	0	0	0	0	0	0	0
900	107	0	47	46	0	12	1	0	0	1	0	0	0	0
915	99	0	36	46	0	16	1	0	0	0	0	0	0	0
930	81	0	35	37	0	8	0	0	0	1	0	0	0	0
945	114	0	40	53	0	20	0	0	0	1	0	0	0	0
	401	0	158	182	0	56	2	0	0	3	0	0	0	0
1000	102	2	35	49	0	14	1	0	0	0	1	0	0	0
1015	105	0	46	41	0	16	1	0	1	0	0	0	0	0
	207	2	81	90	0	30	2	0	1	0	1	0	0	0
[24]	8326	19	3547	3660	11	1021	21	0	11	24	10	2	0	0
* Time	Grand Total	Total Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls
		1	2	3	4	5	6	7	8	9	10	11	12	13
[--]	8326	19	3547	3660	11	1021	21	0	11	24	10	2	0	0

Site: [14504] SR-98 Btwn Eady Ave. and Williams Ave.
Direction: 6 - West bound A>B, East bound B>A., Lane: 0
Survey Du 10:31 Tuesday, May 03, 2005 => 11:20 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\1450408MAY2005.EC0 (Plus)
Identifier: A573BVAY MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: East (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	94	0	27	49	0	17	0	0	0	1	0	0	0	0
1045	89	0	35	41	0	12	0	0	1	0	0	0	0	0
	183	0	62	90	0	29	0	0	1	1	0	0	0	0
1100	109	0	51	45	0	13	0	0	0	0	0	0	0	0
1115	109	1	41	60	0	7	0	0	0	0	0	0	0	0
1130	147	0	66	65	0	14	1	0	1	0	0	0	0	0
1145	125	0	49	57	0	18	0	0	0	1	0	0	0	0
	490	1	207	227	0	52	1	0	1	1	0	0	0	0
1200	125	0	55	57	0	12	0	0	0	1	0	0	0	0
1215	109	1	45	45	0	18	0	0	0	0	0	0	0	0
1230	117	0	58	46	0	12	1	0	0	0	0	0	0	0
1245	141	0	45	76	0	17	1	0	0	2	0	0	0	0
	492	1	203	224	0	59	2	0	0	3	0	0	0	0
1300	126	0	39	67	0	18	2	0	0	0	0	0	0	0
1315	129	0	57	42	0	28	1	0	0	1	0	0	0	0
1330	136	0	51	67	0	18	0	0	0	0	0	0	0	0
1345	104	0	44	46	0	13	0	0	0	1	0	0	0	0
	495	0	191	222	0	77	3	0	0	2	0	0	0	0
1400	128	0	38	66	0	22	0	0	0	1	0	0	0	1
1415	129	0	59	53	0	15	0	0	0	2	0	0	0	0
1430	142	0	55	67	0	20	0	0	0	0	0	0	0	0
1445	164	0	69	77	1	17	0	0	0	0	0	0	0	0
	563	0	221	263	1	74	0	0	0	3	0	0	0	1
1500	221	1	92	114	0	13	0	0	0	1	0	0	0	0
1515	215	0	95	100	0	19	0	0	0	1	0	0	0	0
1530	198	2	98	69	0	28	0	0	0	1	0	0	0	0
1545	176	1	68	79	0	26	0	0	0	2	0	0	0	0
	810	4	353	362	0	86	0	0	0	5	0	0	0	0
1600	195	1	69	106	0	16	2	0	0	1	0	0	0	0
1615	192	0	84	84	0	23	1	0	0	0	0	0	0	0
1630	179	1	84	84	0	10	0	0	0	0	0	0	0	0
1645	157	0	51	85	0	20	1	0	0	0	0	0	0	0
	723	2	288	359	0	69	4	0	0	1	0	0	0	0
1700	147	2	68	62	0	15	0	0	0	0	0	0	0	0
1715	179	1	65	91	0	21	1	0	0	0	0	0	0	0
1730	197	1	76	99	0	17	1	0	0	2	0	0	0	1
1745	172	0	58	85	0	27	0	0	0	1	0	1	0	0
	695	4	267	337	0	80	2	0	0	3	0	1	0	1
1800	150	1	68	63	0	16	1	0	0	1	0	0	0	0
1815	157	0	56	82	1	18	0	0	0	0	0	0	0	0
1830	163	0	59	82	0	21	0	0	0	1	0	0	0	0
1845	139	2	48	73	0	14	0	0	0	0	0	0	0	2
	609	3	231	300	1	69	1	0	0	2	0	0	0	2
1900	142	0	56	65	0	16	0	0	1	3	0	0	0	1
1915	135	1	63	54	0	14	1	0	0	1	0	0	0	1
1930	124	1	47	59	1	16	0	0	0	0	0	0	0	0
1945	124	0	48	65	0	12	1	0	0	0	0	0	0	0
	525	2	212	243	1	58	2	0	1	4	0	0	0	2
2000	110	1	50	45	0	14	0	0	0	0	0	0	0	0
2015	108	1	32	59	1	13	0	0	0	0	0	0	0	0
2030	114	0	50	45	0	19	0	0	0	0	0	0	0	0
2045	95	2	36	50	0	6	0	0	0	0	0	0	0	1
	425	4	168	199	1	52	0	0	0	0	0	0	0	1
2100	94	0	43	41	0	10	0	0	0	0	0	0	0	0

2115	74	0	38	32	0	4	0	0	0	0	0	0	0	0
2130	92	0	38	42	0	11	0	0	0	1	0	0	0	0
2145	65	0	32	30	1	1	0	0	0	0	0	0	0	1
	325	0	151	145	1	26	0	0	0	1	0	0	0	1
2200	68	1	27	36	0	4	0	0	0	0	0	0	0	0
2215	55	0	20	27	1	7	0	0	0	0	0	0	0	0
2230	57	0	27	23	0	7	0	0	0	0	0	0	0	0
2245	47	0	22	21	0	4	0	0	0	0	0	0	0	0
	227	1	96	107	1	22	0	0	0	0	0	0	0	0
2300	45	0	17	22	0	5	0	0	0	0	1	0	0	0
2315	35	0	12	20	0	3	0	0	0	0	0	0	0	0
2330	27	0	13	10	0	4	0	0	0	0	0	0	0	0
2345	42	0	15	21	0	6	0	0	0	0	0	0	0	0
	149	0	57	73	0	18	0	0	0	0	1	0	0	
0	34	0	15	12	0	6	0	0	0	1	0	0	0	0
15	10	0	4	3	1	2	0	0	0	0	0	0	0	0
30	10	0	4	3	0	2	0	0	0	1	0	0	0	0
45	21	0	7	11	0	3	0	0	0	0	0	0	0	0
	75	0	30	29	1	13	0	0	0	2	0	0	0	0
100	20	0	11	5	0	4	0	0	0	0	0	0	0	0
115	15	0	6	7	0	2	0	0	0	0	0	0	0	0
130	14	0	7	6	0	1	0	0	0	0	0	0	0	0
145	6	0	2	4	0	0	0	0	0	0	0	0	0	0
	55	0	26	22	0	7	0	0	0	0	0	0	0	0
200	16	0	9	5	0	1	0	0	1	0	0	0	0	0
215	10	0	1	3	0	6	0	0	0	0	0	0	0	0
230	18	0	6	5	0	2	0	0	0	3	0	0	0	0
245	9	0	2	4	0	3	0	0	0	0	0	0	0	0
	51	0	18	17	0	12	0	0	1	3	0	0	0	0
300	7	0	2	3	0	0	0	0	2	0	0	0	0	0
315	17	0	5	7	0	5	0	0	0	0	0	0	0	0
330	10	0	3	6	0	1	0	0	0	0	0	0	0	0
345	16	0	5	8	0	3	0	0	0	0	0	0	0	0
	50	0	15	24	0	9	0	0	2	0	0	0	0	0
400	12	0	3	6	0	2	1	0	0	0	0	0	0	0
415	13	0	7	6	0	0	0	0	0	0	0	0	0	0
430	14	0	5	6	0	3	0	0	0	0	0	0	0	0
445	15	0	8	7	0	0	0	0	0	0	0	0	0	0
	54	0	23	25	0	5	1	0	0	0	0	0	0	0
500	17	0	8	6	0	3	0	0	0	0	0	0	0	0
515	17	0	5	10	0	2	0	0	0	0	0	0	0	0
530	39	0	17	15	0	6	0	0	0	1	0	0	0	0
545	46	0	19	18	0	9	0	0	0	0	0	0	0	0
	119	0	49	49	0	20	0	0	0	1	0	0	0	0
600	37	0	11	18	0	8	0	0	0	0	0	0	0	0
615	53	0	15	25	0	12	1	0	0	0	0	0	0	0
630	40	0	15	19	0	6	0	0	0	0	0	0	0	0
645	58	0	24	25	0	7	0	0	0	2	0	0	0	0
	188	0	65	87	0	33	1	0	0	2	0	0	0	0
700	69	0	29	29	0	11	0	0	0	0	0	0	0	0
715	93	0	29	50	0	13	0	0	0	1	0	0	0	0
730	108	0	49	43	0	15	0	0	0	0	0	1	0	0
745	218	2	85	116	0	15	0	0	0	0	0	0	0	0
	488	2	192	238	0	54	0	0	0	1	0	1	0	0
800	205	0	108	77	0	20	0	0	0	0	0	0	0	0
815	167	0	52	98	0	19	0	0	0	0	0	0	0	0
830	111	0	33	61	0	16	1	0	0	0	0	0	0	0
845	104	0	40	51	0	13	0	0	0	0	0	0	0	0
	587	0	233	285	0	68	1	0	0	0	0	0	0	0
900	107	0	40	52	0	15	0	0	0	0	0	0	0	0
915	112	0	37	62	0	13	0	0	0	0	0	0	0	0
930	111	0	35	59	0	14	1	0	0	2	0	0	0	0
945	97	0	38	50	0	9	0	0	0	0	0	0	0	0
	427	0	150	223	0	51	1	0	0	2	0	0	0	0
1000	112	0	41	57	1	11	0	0	0	1	0	0	0	1
1015	128	0	53	52	1	21	0	0	0	1	0	0	0	0
	240	0	94	109	2	32	0	0	0	2	0	0	0	1
[24]	9045	24	3602	4259	9	1075	19	0	6	39	1	2	0	9

* Time	Grand Total	Total Cls	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
[+]	9045	24	3602	4259	9	1075	19	0	6	39	1	2	0	9	

Site: [14504] SR-98 Btwn Eady Ave. and Williams Ave.
Direction: 6 - West bound A>B, East bound B>A., Lane: 0
Survey Du 10:31 Tuesday, May 03, 2005 => 11:20 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\1450408MAY2005.EC0 (Plus)
Identifier: A573BVAY MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: West (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	81	0	20	50	0	11	0	0	0	0	0	0	0	0
1045	73	0	24	39	0	10	0	0	0	0	0	0	0	0
	154	**0**	**44**	**89**	**0**	**21**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1100	98	0	29	54	0	13	1	0	0	1	0	0	0	0
1115	116	0	37	59	0	17	1	0	0	1	0	0	0	1
1130	88	1	31	44	0	10	1	0	0	1	0	0	0	0
1145	149	0	44	81	0	24	0	0	0	0	0	0	0	0
	451	**1**	**141**	**238**	**0**	**64**	**3**	**0**	**0**	**3**	**0**	**0**	**0**	**1**
1200	116	0	42	61	0	11	0	0	0	2	0	0	0	0
1215	114	1	37	53	0	23	0	0	0	0	0	0	0	0
1230	102	0	28	56	0	17	0	0	0	1	0	0	0	0
1245	106	0	34	53	0	18	0	0	0	2	0	1	0	0
	438	**1**	**141**	**223**	**0**	**67**	**0**	**0**	**0**	**5**	**0**	**1**	**0**	**0**
1300	120	1	36	61	0	21	0	0	0	0	0	0	0	1
1315	114	0	34	60	0	19	0	0	0	1	0	0	0	0
1330	124	0	34	64	0	28	0	0	0	0	0	0	0	0
1345	114	1	35	56	0	21	1	0	0	0	0	0	0	0
	472	**2**	**139**	**241**	**0**	**87**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**1**
1400	114	0	32	61	0	21	0	0	0	0	0	0	0	0
1415	151	3	48	73	1	26	0	0	0	0	0	0	0	0
1430	116	0	38	61	0	17	0	0	0	0	0	0	0	0
1445	155	0	53	84	0	17	0	0	0	1	0	0	0	0
	536	**3**	**171**	**279**	**1**	**81**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
1500	176	1	66	90	0	18	0	0	0	0	0	0	0	1
1515	137	0	53	72	0	12	0	0	0	0	0	0	0	0
1530	139	1	61	64	0	13	0	0	0	0	0	0	0	0
1545	136	0	37	77	0	18	2	0	0	2	0	0	0	0
	588	**2**	**217**	**303**	**0**	**61**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**1**
1600	127	0	47	64	0	15	0	0	0	0	0	1	0	0
1615	119	1	36	61	1	19	0	0	0	1	0	0	0	0
1630	136	0	48	69	1	18	0	0	0	0	0	0	0	0
1645	127	1	36	73	2	15	0	0	0	0	0	0	0	0
	509	**2**	**167**	**267**	**4**	**67**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**
1700	122	0	41	67	0	13	0	0	0	0	0	0	0	1
1715	137	0	39	84	0	13	0	0	0	1	0	0	0	0
1730	134	0	28	83	0	23	0	0	0	0	0	0	0	0
1745	96	0	33	46	1	16	0	0	0	0	0	0	0	0
	489	**0**	**141**	**280**	**1**	**65**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**
1800	155	3	57	72	1	20	1	0	0	1	0	0	0	0
1815	117	0	37	64	0	15	0	0	0	1	0	0	0	0
1830	110	1	34	53	0	18	1	0	0	2	1	0	0	0
1845	116	0	33	70	0	13	0	0	0	0	0	0	0	0
	498	**4**	**161**	**259**	**1**	**66**	**2**	**0**	**0**	**4**	**1**	**0**	**0**	**0**
1900	113	0	37	57	0	18	0	0	0	1	0	0	0	0
1915	94	1	27	44	0	21	0	0	0	1	0	0	0	0
1930	91	0	33	43	0	15	0	0	0	0	0	0	0	0
1945	75	1	20	40	0	14	0	0	0	0	0	0	0	0
	373	**2**	**117**	**184**	**0**	**68**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
2000	78	1	23	41	0	11	0	0	1	1	0	0	0	0
2015	98	0	33	56	2	7	0	0	0	0	0	0	0	0
2030	80	0	27	42	0	10	0	0	0	1	0	0	0	0
2045	107	0	31	62	0	14	0	0	0	0	0	0	0	0
	363	**1**	**114**	**201**	**2**	**42**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**
2100	98	1	30	58	0	9	0	0	0	0	0	0	0	0

2115	95	0	37	50	0	8	0	0	0	0	0	0	0	0
2130	86	1	24	56	0	5	0	0	0	0	0	0	0	0
2145	83	0	24	46	0	13	0	0	0	0	0	0	0	0
	362	**2**	**115**	**210**	**0**	**35**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2200	60	1	19	35	0	5	0	0	0	0	0	0	0	0
2215	49	0	16	28	0	5	0	0	0	0	0	0	0	0
2230	50	0	10	31	0	8	1	0	0	0	0	0	0	0
2245	34	0	8	19	0	7	0	0	0	0	0	0	0	0
	193	**1**	**53**	**113**	**0**	**25**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
2300	32	0	7	21	0	4	0	0	0	0	0	0	0	0
2315	35	0	7	25	0	3	0	0	0	0	0	0	0	0
2330	34	0	10	21	0	3	0	0	0	0	0	0	0	0
2345	24	0	7	12	0	5	0	0	0	0	0	0	0	0
	125	**0**	**31**	**79**	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0	23	0	3	16	0	4	0	0	0	0	0	0	0	0
15	16	0	6	8	0	2	0	0	0	0	0	0	0	0
30	20	0	6	9	0	5	0	0	0	0	0	0	0	0
45	14	0	4	7	0	3	0	0	0	0	0	0	0	0
	73	**0**	**19**	**40**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
100	12	0	4	6	0	2	0	0	0	0	0	0	0	0
115	6	0	3	3	0	0	0	0	0	0	0	0	0	0
130	11	0	2	7	0	2	0	0	0	0	0	0	0	0
145	17	0	6	9	0	2	0	0	0	0	0	0	0	0
	46	**0**	**15**	**25**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
200	13	0	3	8	0	1	0	0	0	1	0	0	0	0
215	10	0	3	3	0	4	0	0	0	0	0	0	0	0
230	13	0	4	6	0	3	0	0	0	0	0	0	0	0
245	21	0	3	10	0	7	0	0	0	1	0	0	0	0
	57	**0**	**13**	**27**	**0**	**15**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
300	10	0	2	7	0	1	0	0	0	0	0	0	0	0
315	15	0	2	7	0	5	1	0	0	0	0	0	0	0
330	26	0	5	13	0	8	0	0	0	0	0	0	0	0
345	19	0	6	6	0	7	0	0	0	0	0	0	0	0
	70	**0**	**15**	**33**	**0**	**21**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
400	28	0	8	13	0	6	0	0	0	1	0	0	0	0
415	25	0	7	13	0	4	0	0	1	0	0	0	0	0
430	36	0	7	21	0	8	0	0	0	0	0	0	0	0
445	34	0	8	18	0	8	0	0	0	0	0	0	0	0
	123	**0**	**30**	**65**	**0**	**26**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**
500	53	0	7	36	4	6	0	0	0	0	0	0	0	0
515	59	0	14	37	0	8	0	0	0	0	0	0	0	0
530	73	0	22	45	0	6	0	0	0	0	0	0	0	0
545	59	1	15	29	0	14	0	0	0	0	0	0	0	0
	244	**1**	**58**	**147**	**4**	**34**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
600	55	0	15	28	0	12	0	0	0	0	0	0	0	0
615	81	0	17	45	0	19	0	0	0	0	0	0	0	0
630	72	0	17	38	0	16	0	0	0	1	0	0	0	0
645	56	0	10	30	0	15	0	0	1	0	0	0	0	0
	264	**0**	**59**	**141**	**0**	**62**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**
700	70	0	19	36	0	15	0	0	0	0	0	0	0	0
715	90	1	22	53	0	12	0	0	0	2	0	0	0	0
730	129	0	36	73	0	20	0	0	0	0	0	0	0	0
745	175	1	62	93	0	18	0	0	0	0	0	0	0	1
	464	**2**	**139**	**255**	**0**	**65**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**
800	180	0	64	88	0	25	2	0	0	1	0	0	0	0
815	129	0	35	78	0	16	0	0	0	0	0	0	0	0
830	105	0	25	66	0	14	0	0	0	0	0	0	0	0
845	90	0	22	56	0	12	0	0	0	0	0	0	0	0
	504	**0**	**146**	**288**	**0**	**67**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
900	100	0	22	61	0	15	1	0	0	0	0	0	0	1
915	89	0	16	56	0	16	1	0	0	0	0	0	0	0
930	88	0	22	37	0	8	0	0	0	1	0	0	0	0
945	103	0	29	49	0	24	0	0	0	1	0	0	0	0
	360	**0**	**89**	**203**	**0**	**63**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**1**
1000	94	2	19	56	0	15	1	0	0	1	0	0	0	0
1015	98	0	32	50	0	14	0	0	0	0	0	1	0	1
	192	**2**	**51**	**106**	**0**	**29**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**1**
[24]	7948	26	2386	4296	13	1166	15	0	3	32	1	3	0	7

* Time	Grand Total	Total Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
[--]	7948	26	2386	4296	13	1166	15	0	3	32	1	3	0	7

Site: [14505E] SR-98 Btwn Ollie Ave and Estrada Blvd
Direction: 2 - East bound, A hit first., Lane: 0
Survey Du 9:05 Wednesday, May 04, 2005 => 11:04 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\fixed files\14505E08MAY2005.EC0 (Plus)
Identifier: A6462Z28 MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: East (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	204	2	110	62	1	24	3	0	0	1	0	0	0	1
1045	210	0	122	75	0	13	0	0	0	0	0	0	0	0
	414	**2**	**232**	**137**	**1**	**37**	**3**	**0**	**0**	**1**	**0**	**0**	**0**	**1**
1100	212	3	116	74	1	15	0	0	0	3	0	0	0	0
1115	204	0	114	77	1	10	1	0	0	1	0	0	0	0
1130	214	2	126	71	1	12	1	0	1	0	0	0	0	0
1145	173	1	99	48	0	24	1	0	0	0	0	0	0	0
	803	**6**	**455**	**270**	**3**	**61**	**3**	**0**	**1**	**4**	**0**	**0**	**0**	**0**
1200	173	0	102	52	0	18	0	0	0	1	0	0	0	0
1215	159	1	95	46	0	15	2	0	0	0	0	0	0	0
1230	152	1	85	53	0	11	1	0	0	1	0	0	0	0
1245	181	2	95	57	1	20	2	0	0	4	0	0	0	0
	665	**4**	**377**	**208**	**1**	**64**	**5**	**0**	**0**	**6**	**0**	**0**	**0**	**0**
1300	175	2	87	56	0	28	1	0	0	1	0	0	0	0
1315	138	0	61	50	0	23	1	0	0	3	0	0	0	0
1330	162	0	84	58	0	19	1	0	0	0	0	0	0	0
1345	147	0	70	63	0	12	0	0	0	2	0	0	0	0
	622	**2**	**302**	**227**	**0**	**82**	**3**	**0**	**0**	**6**	**0**	**0**	**0**	**0**
1400	165	1	69	69	1	21	2	0	0	2	0	0	0	0
1415	162	2	85	60	0	13	1	0	0	1	0	0	0	0
1430	186	0	108	63	0	12	1	0	1	1	0	0	0	0
1445	194	1	109	64	1	18	1	0	0	0	0	0	0	0
	707	**4**	**371**	**256**	**2**	**64**	**5**	**0**	**1**	**4**	**0**	**0**	**0**	**0**
1500	242	1	133	93	1	14	0	0	0	0	0	0	0	0
1515	186	1	104	62	0	18	0	0	0	1	0	0	0	0
1530	185	0	99	62	0	19	1	0	1	2	0	0	0	1
1545	178	2	94	62	0	19	1	0	0	0	0	0	0	0
	791	**4**	**430**	**279**	**1**	**70**	**2**	**0**	**1**	**3**	**0**	**0**	**0**	**1**
1600	171	2	88	68	0	11	1	0	0	1	0	0	0	0
1615	203	0	105	81	0	16	0	0	0	1	0	0	0	0
1630	219	2	119	82	1	13	1	0	0	1	0	0	0	0
1645	171	0	85	68	0	16	2	0	0	0	0	0	0	0
	764	**4**	**397**	**299**	**1**	**56**	**4**	**0**	**0**	**3**	**0**	**0**	**0**	**0**
1700	163	0	75	73	0	15	0	0	0	0	0	0	0	0
1715	194	1	98	74	1	20	0	0	0	2	0	0	0	0
1730	206	0	123	68	0	11	2	0	1	1	0	0	0	0
1745	188	0	93	72	0	22	0	0	0	1	0	0	0	0
	751	**1**	**387**	**287**	**1**	**68**	**2**	**0**	**1**	**4**	**0**	**0**	**0**	**0**
1800	155	1	83	56	1	13	0	0	1	0	0	0	0	0
1815	174	0	92	64	0	16	0	0	1	1	0	0	0	0
1830	166	1	97	49	1	17	0	0	0	1	0	0	0	0
1845	173	3	99	51	1	15	2	0	0	2	0	0	0	0
	668	**5**	**371**	**220**	**3**	**61**	**2**	**0**	**2**	**4**	**0**	**0**	**0**	**0**
1900	158	0	85	54	0	17	0	0	0	2	0	0	0	0
1915	151	0	90	45	0	12	2	0	0	2	0	0	0	0
1930	131	2	67	46	0	14	1	0	0	1	0	0	0	0
1945	147	1	76	58	0	12	0	0	0	0	0	0	0	0
	587	**3**	**318**	**203**	**0**	**56**	**3**	**0**	**0**	**5**	**0**	**0**	**0**	**0**
2000	129	3	63	45	1	14	1	0	0	1	1	0	0	0
2015	109	1	51	44	0	12	1	0	0	0	0	0	0	0
2030	111	0	62	36	0	12	0	0	0	1	0	0	0	0
2045	116	2	62	44	0	5	1	0	1	0	0	1	0	0
	465	**6**	**238**	**169**	**1**	**43**	**3**	**0**	**1**	**2**	**1**	**1**	**0**	**0**
2100	101	0	56	38	0	6	0	0	0	1	0	0	0	0

2115	89	0	46	35	0	8	0	0	0	0	0	0	0	0
2130	80	0	45	25	0	9	0	0	0	1	0	0	0	0
2145	68	0	50	16	1	0	0	0	1	0	0	0	0	0
	338	0	197	114	1	23	0	0	1	2	0	0	0	0
2200	66	1	33	27	0	5	0	0	0	0	0	0	0	0
2215	57	0	31	19	1	6	0	0	0	0	0	0	0	0
2230	56	0	30	21	0	5	0	0	0	0	0	0	0	0
2245	51	0	32	18	0	1	0	0	0	0	0	0	0	0
	230	1	126	85	1	17	0	0	0	0	0	0	0	0
2300	49	0	27	18	0	4	0	0	0	0	0	0	0	0
2315	33	0	18	13	0	2	0	0	0	0	0	0	0	0
2330	28	0	13	8	0	5	0	0	0	0	0	0	0	0
2345	32	0	20	7	0	5	0	0	0	0	0	0	0	0
	140	0	78	46	0	16	0	0	0	0	0	0	0	0
0	37	0	21	10	1	4	1	0	0	0	0	0	0	0
15	11	0	4	4	1	1	0	0	0	1	0	0	0	0
30	9	0	2	4	0	2	0	0	1	0	0	0	0	0
45	18	0	7	9	0	2	0	0	0	0	0	0	0	0
	75	0	34	27	2	9	1	0	1	1	0	0	0	0
100	21	0	16	4	0	1	0	0	0	0	0	0	0	0
115	10	0	4	5	0	1	0	0	0	0	0	0	0	0
130	11	0	7	2	0	2	0	0	0	0	0	0	0	0
145	5	0	2	3	0	0	0	0	0	0	0	0	0	0
	47	0	29	14	0	4	0	0	0	0	0	0	0	0
200	19	0	8	7	0	1	1	0	0	2	0	0	0	0
215	10	0	1	3	0	6	0	0	0	0	0	0	0	0
230	15	0	6	7	0	1	0	0	0	1	0	0	0	0
245	11	0	3	4	0	4	0	0	0	0	0	0	0	0
	55	0	18	21	0	12	1	0	0	3	0	0	0	0
300	9	0	3	4	0	2	0	0	0	0	0	0	0	0
315	16	0	3	8	0	5	0	0	0	0	0	0	0	0
330	6	0	4	2	0	0	0	0	0	0	0	0	0	0
345	12	0	4	6	0	2	0	0	0	0	0	0	0	0
	43	0	14	20	0	9	0	0	0	0	0	0	0	0
400	16	0	5	6	0	4	1	0	0	0	0	0	0	0
415	15	0	8	4	0	1	1	0	0	1	0	0	0	0
430	15	0	4	8	0	3	0	0	0	0	0	0	0	0
445	17	0	7	6	0	3	0	0	0	1	0	0	0	0
	63	0	24	24	0	11	2	0	0	2	0	0	0	0
500	20	0	9	7	0	4	0	0	0	0	0	0	0	0
515	16	0	8	6	0	2	0	0	0	0	0	0	0	0
530	40	0	9	21	0	9	0	0	0	1	0	0	0	0
545	40	0	16	14	0	10	0	0	0	0	0	0	0	0
	116	0	42	48	0	25	0	0	0	1	0	0	0	0
600	33	0	10	13	0	10	0	0	0	0	0	0	0	0
615	49	0	17	23	0	8	1	0	0	0	0	0	0	0
630	38	0	15	17	0	5	1	0	0	0	0	0	0	0
645	71	0	31	27	0	10	0	0	0	3	0	0	0	0
	191	0	73	80	0	33	2	0	0	3	0	0	0	0
700	71	0	35	24	0	12	0	0	0	0	0	0	0	0
715	100	0	38	47	0	13	0	0	0	2	0	0	0	0
730	148	0	74	57	0	17	0	0	0	0	0	0	0	0
745	243	2	112	110	1	16	1	0	0	1	0	0	0	0
	562	2	259	238	1	58	1	0	0	3	0	0	0	0
800	259	2	114	110	0	32	1	0	0	0	0	0	0	0
815	212	0	93	100	1	17	0	0	0	1	0	0	0	0
830	124	0	59	54	0	11	0	0	0	0	0	0	0	0
845	148	0	72	54	1	14	1	0	0	4	0	0	0	0
	741	2	338	318	2	74	2	0	0	5	0	0	0	0
900	145	0	81	48	0	15	0	0	0	0	0	0	0	1
915	130	0	72	42	0	12	3	0	0	1	0	0	0	0
930	144	0	72	45	1	20	1	0	0	5	0	0	0	0
945	152	2	80	55	1	12	1	0	0	1	0	0	0	0
	571	2	305	190	2	59	5	0	0	7	0	0	0	1
1000	145	0	67	60	1	12	1	0	2	2	0	0	0	0
1015	167	1	77	64	0	21	1	0	1	2	0	0	0	0
	312	1	144	124	1	33	2	0	3	4	0	0	0	0
[24]	10721	49	5559	3904	24	1044	51	0	12	73	1	1	0	3

*	Grand	Total												
Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls
		1	2	3	4	5	6	7	8	9	10	11	12	13
[--]	10721	49	5559	3904	24	1044	51	0	12	73	1	1	0	3

Site: [14505W] SR-98 Btwn Ollie Ave and Estrada Blvd
Direction: 4 - West bound, A hit first., Lane: 0
Survey Du 9:05 Wednesday, May 04, 2005 => 11:35 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\fixed files\14505W08MAY2005.EC0 (Plus)
Identifier: A588R525 MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: West (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	220	0	122	80	0	17	0	0	0	1	0	0	0	0
1045	230	0	125	83	0	21	0	0	0	1	0	0	0	0
	450	**0**	**247**	**163**	**0**	**38**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
1100	241	3	130	85	0	23	0	0	0	0	0	0	0	0
1115	245	3	132	93	0	15	1	0	0	1	0	0	0	0
1130	203	1	105	76	0	18	0	0	1	1	1	0	0	0
1145	185	1	83	83	0	14	0	0	1	3	0	0	0	0
	874	**8**	**450**	**337**	**0**	**70**	**1**	**0**	**2**	**6**	**1**	**0**	**0**	**0**
1200	192	1	90	72	0	23	1	0	0	3	2	0	0	0
1215	167	1	70	72	1	18	2	0	0	2	1	0	0	0
1230	199	1	85	82	0	27	1	0	1	2	0	0	0	0
1245	175	0	95	58	1	16	0	0	0	5	0	0	0	0
	733	**3**	**340**	**284**	**2**	**84**	**4**	**0**	**1**	**12**	**3**	**0**	**0**	**0**
1300	191	0	97	67	0	24	1	0	0	2	0	0	0	0
1315	162	1	71	66	0	20	3	0	0	1	0	0	0	0
1330	176	0	86	67	0	18	1	0	0	3	0	0	0	1
1345	172	0	98	48	1	26	0	0	0	0	1	0	0	0
	701	**1**	**350**	**248**	**1**	**88**	**5**	**0**	**0**	**6**	**1**	**0**	**0**	**1**
1400	172	0	83	62	1	21	1	0	2	1	1	0	0	0
1415	185	2	89	78	1	14	0	0	0	1	0	0	0	0
1430	172	0	87	68	0	15	1	0	0	1	0	0	0	0
1445	211	1	98	92	0	14	3	0	0	2	1	0	0	0
	740	**3**	**357**	**300**	**2**	**64**	**5**	**0**	**2**	**5**	**2**	**0**	**0**	**0**
1500	236	3	119	98	1	13	0	0	0	0	1	0	0	1
1515	207	0	109	69	0	24	1	0	0	0	1	0	0	3
1530	202	2	117	63	0	20	0	0	0	0	0	0	0	0
1545	195	5	101	65	1	20	1	0	0	0	2	0	0	0
	840	**10**	**446**	**295**	**2**	**77**	**2**	**0**	**0**	**0**	**4**	**0**	**0**	**4**
1600	164	3	87	54	1	16	2	0	0	1	0	0	0	0
1615	197	4	88	74	2	22	2	0	0	5	0	0	0	0
1630	185	1	96	60	1	25	1	0	0	0	0	0	0	1
1645	166	1	69	77	0	13	3	0	2	1	0	0	0	0
	712	**9**	**340**	**265**	**4**	**76**	**8**	**0**	**2**	**7**	**0**	**0**	**0**	**1**
1700	159	0	93	57	0	8	0	0	0	1	0	0	0	0
1715	204	1	107	72	0	20	0	0	0	3	0	0	0	1
1730	166	0	70	60	0	28	2	0	0	3	1	0	0	2
1745	149	0	75	57	0	16	0	0	0	1	0	0	0	0
	678	**1**	**345**	**246**	**0**	**72**	**2**	**0**	**0**	**8**	**1**	**0**	**0**	**3**
1800	179	3	95	56	0	18	1	0	0	5	1	0	0	0
1815	174	2	94	62	0	13	0	0	1	1	0	0	0	1
1830	139	2	76	39	0	17	1	0	0	2	2	0	0	0
1845	150	1	84	48	1	15	0	0	0	3	0	0	0	0
	642	**8**	**349**	**203**	**1**	**63**	**2**	**0**	**1**	**11**	**3**	**0**	**0**	**1**
1900	177	3	86	62	0	21	1	0	1	2	0	0	0	1
1915	128	1	56	50	0	15	2	0	0	3	0	1	0	0
1930	143	0	79	49	0	11	1	0	0	1	1	1	0	0
1945	106	2	53	40	0	9	1	0	0	1	0	0	0	0
	554	**6**	**274**	**201**	**0**	**56**	**5**	**0**	**1**	**7**	**1**	**2**	**0**	**1**
2000	95	2	43	38	1	7	1	0	2	1	0	0	0	0
2015	114	0	60	43	1	6	2	0	0	0	1	0	0	1
2030	107	2	64	32	0	5	2	0	0	1	0	1	0	0
2045	124	0	62	48	1	12	0	0	0	0	1	0	0	0
	440	**4**	**229**	**161**	**3**	**30**	**5**	**0**	**2**	**2**	**2**	**1**	**0**	**1**
2100	124	2	71	47	0	3	0	0	1	0	0	0	0	0

2115	107	1	63	33	0	9	1	0	0	0	0	0	0	0
2130	110	0	58	45	0	5	1	0	0	1	0	0	0	0
2145	77	0	47	21	0	8	0	0	0	0	1	0	0	0
	418	3	239	146	0	25	2	0	1	1	1	0	0	0
2200	73	1	40	24	0	6	0	0	0	1	0	0	0	1
2215	59	0	40	15	0	4	0	0	0	0	0	0	0	0
2230	60	0	35	18	0	5	1	0	0	1	0	0	0	0
2245	46	0	25	15	0	5	0	0	0	1	0	0	0	0
	238	1	140	72	0	20	1	0	0	3	0	0	0	1
2300	38	0	23	12	0	3	0	0	0	0	0	0	0	0
2315	35	0	20	11	0	3	0	0	0	1	0	0	0	0
2330	42	0	20	16	0	4	1	0	0	1	0	0	0	0
2345	32	0	19	10	0	3	0	0	0	0	0	0	0	0
	147	0	82	49	0	13	1	0	0	2	0	0	0	0
0	16	0	6	9	0	1	0	0	0	0	0	0	0	0
15	17	0	10	7	0	0	0	0	0	0	0	0	0	0
30	28	0	12	9	0	5	0	0	0	0	0	0	0	0
45	17	0	10	2	0	4	0	0	0	1	0	0	0	0
	76	0	38	27	0	10	0	0	0	1	0	0	0	0
100	15	0	10	4	0	1	0	0	0	0	0	0	0	0
115	8	0	4	3	0	1	0	0	0	0	0	0	0	0
130	11	0	6	2	0	3	0	0	0	0	0	0	0	0
145	15	0	10	3	0	1	0	0	0	1	0	0	0	0
	49	0	30	12	0	6	0	0	0	1	0	0	0	0
200	15	0	6	7	0	1	0	0	0	1	0	0	0	0
215	14	0	7	3	0	4	0	0	0	0	0	0	0	0
230	11	0	5	5	0	1	0	0	0	0	0	0	0	0
245	14	0	5	7	0	2	0	0	0	0	0	0	0	0
	54	0	23	22	0	8	0	0	0	1	0	0	0	0
300	13	0	5	5	0	3	0	0	0	0	0	0	0	0
315	12	0	5	3	0	2	0	0	1	1	0	0	0	0
330	24	0	11	10	0	3	0	0	0	0	0	0	0	0
345	17	0	7	6	0	4	0	0	0	0	0	0	0	0
	66	0	28	24	0	12	0	0	1	1	0	0	0	0
400	21	0	10	7	0	4	0	0	0	0	0	0	0	0
415	21	0	7	8	0	5	1	0	0	0	0	0	0	0
430	29	0	13	10	0	5	0	0	1	0	0	0	0	0
445	35	0	13	15	0	6	0	0	0	1	0	0	0	0
	106	0	43	40	0	20	1	0	1	1	0	0	0	0
500	42	0	22	16	2	2	0	0	0	0	0	0	0	0
515	63	1	31	23	1	5	0	0	0	2	0	0	0	0
530	80	0	37	33	0	10	0	0	0	0	0	0	0	0
545	81	1	36	30	0	12	2	0	0	0	0	0	0	0
	266	2	126	102	3	29	2	0	0	2	0	0	0	0
600	74	0	38	26	0	10	0	0	0	0	0	0	0	0
615	102	0	51	30	0	18	1	0	1	1	0	0	0	0
630	102	1	42	40	1	17	0	0	0	1	0	0	0	0
645	110	0	49	43	0	18	0	0	0	0	0	0	0	0
	388	1	180	139	1	63	1	0	1	2	0	0	0	0
700	103	0	52	43	0	7	0	0	0	1	0	0	0	0
715	152	1	71	63	0	14	0	0	0	2	1	0	0	0
730	185	0	97	68	0	19	0	0	0	0	1	0	0	0
745	249	1	112	105	0	24	0	0	2	1	2	0	0	2
	689	2	332	279	0	64	0	0	2	4	4	0	0	2
800	287	1	143	113	0	23	2	0	1	1	1	0	0	2
815	212	0	113	73	0	21	0	0	3	0	2	0	0	0
830	178	0	96	64	1	12	0	0	0	2	1	0	0	2
845	163	1	77	68	1	12	1	0	0	1	2	0	0	0
	840	2	429	318	2	68	3	0	4	4	6	0	0	4
900	160	0	87	54	0	18	1	0	0	0	0	0	0	0
915	157	1	82	57	0	13	0	0	0	2	0	0	0	2
930	142	0	61	65	0	14	1	0	0	1	0	0	0	0
945	167	0	80	65	0	18	0	0	1	1	0	1	0	1
	626	1	310	241	0	63	2	0	1	4	0	1	0	3
1000	167	4	76	81	0	22	2	0	0	1	1	0	0	0
1015	174	2	84	67	0	17	2	0	0	0	2	0	0	0
	341	6	160	128	0	39	4	0	0	1	3	0	0	0
[24]	11668	71	5887	4302	21	1158	56	0	22	93	32	4	0	22

Time	Grand Total	Total Cls	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
[–]	11668	71	5887	4302	21	1158	56	0	22	93	32	4	0	22	

Site: [14506E] SR-98 Btwn Ollie Ave. and SR-111
Direction: 2 - East bound, A hit first., Lane: 0
Survey Du 9:35 Tuesday, May 03, 2005 => 11:32 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\14506E08MAY2005.EC0 (Plus)
Identifier: A027V8X1 MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed rani 0 - 100 mph.
Direction: East (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	227	3	134	81	1	20	4	0	0	3	1	0	0	0
1045	229	0	169	49	0	11	0	0	0	0	0	0	0	0
	456	**3**	**303**	**110**	**1**	**31**	**4**	**0**	**0**	**3**	**1**	**0**	**0**	**0**
1100	245	3	166	62	0	11	0	0	0	2	1	0	0	0
1115	255	1	192	54	0	5	1	0	1	0	1	0	0	0
1130	279	2	201	59	1	13	1	0	0	1	1	0	0	0
1145	297	1	217	64	0	13	1	0	0	1	0	0	0	0
	1076	**7**	**776**	**239**	**1**	**42**	**3**	**0**	**1**	**4**	**3**	**0**	**0**	**0**
1200	298	1	207	78	0	6	2	0	1	2	0	0	0	1
1215	242	0	191	41	0	6	2	0	0	1	1	0	0	0
1230	272	0	192	65	0	13	0	0	0	1	0	0	0	1
1245	296	0	211	65	0	14	0	0	0	6	0	0	0	0
	1108	**1**	**801**	**249**	**0**	**39**	**4**	**0**	**1**	**10**	**1**	**0**	**0**	**2**
1300	261	3	174	59	0	22	1	0	1	1	0	0	0	0
1315	249	3	168	64	0	9	4	0	0	1	0	0	0	0
1330	260	0	173	68	0	16	2	0	0	1	0	0	0	0
1345	257	2	167	67	0	18	1	0	0	2	0	0	0	0
	1027	**8**	**682**	**258**	**0**	**65**	**8**	**0**	**1**	**5**	**0**	**0**	**0**	**0**
1400	256	2	171	59	0	19	1	0	0	4	0	0	0	0
1415	256	0	174	65	0	13	1	0	0	2	0	0	0	1
1430	263	0	181	67	0	13	0	0	1	0	0	0	0	1
1445	263	1	178	65	0	16	1	0	0	1	1	0	0	0
	1038	**3**	**704**	**256**	**0**	**61**	**3**	**0**	**1**	**7**	**1**	**0**	**0**	**2**
1500	337	1	238	83	0	10	1	0	0	3	0	0	0	1
1515	258	1	188	72	0	13	0	0	0	3	0	0	0	1
1530	278	5	187	71	0	9	4	0	0	1	0	0	0	1
1545	255	4	176	58	0	14	1	0	0	1	1	0	0	0
	1128	**11**	**769**	**284**	**0**	**46**	**6**	**0**	**0**	**8**	**1**	**0**	**0**	**3**
1600	260	0	185	57	0	13	1	0	0	4	0	0	0	0
1615	293	1	205	67	0	17	1	0	1	0	1	0	0	0
1630	292	3	193	84	1	9	1	0	1	0	0	0	0	0
1645	252	0	167	68	0	17	0	0	0	0	0	0	0	0
	1097	**4**	**750**	**276**	**1**	**56**	**3**	**0**	**2**	**4**	**1**	**0**	**0**	**0**
1700	260	3	162	75	0	16	2	0	1	1	0	0	0	0
1715	267	1	181	69	1	12	1	0	0	2	0	0	0	0
1730	274	0	195	65	0	10	1	0	0	1	0	0	0	2
1745	252	2	161	77	1	10	0	0	0	1	0	0	0	0
	1053	**6**	**699**	**286**	**2**	**48**	**4**	**0**	**1**	**5**	**0**	**0**	**0**	**2**
1800	209	1	141	56	0	10	0	0	0	1	0	0	0	0
1815	216	1	127	72	0	14	0	0	0	1	0	0	0	1
1830	228	0	151	61	0	12	1	0	1	2	0	0	0	0
1845	214	2	140	58	0	10	2	0	0	2	1	0	0	1
	867	**4**	**559**	**245**	**0**	**46**	**3**	**0**	**1**	**6**	**1**	**0**	**0**	**2**
1900	230	2	151	61	1	10	1	0	1	2	0	0	0	1
1915	221	1	165	44	0	5	3	0	1	2	0	0	0	0
1930	173	0	114	53	0	3	0	0	0	3	0	0	0	0
1945	159	1	95	52	0	7	3	0	0	0	1	0	0	0
	783	**4**	**525**	**210**	**1**	**25**	**7**	**0**	**2**	**7**	**1**	**0**	**0**	**1**
2000	133	2	84	30	0	10	1	0	2	4	0	0	0	0
2015	142	0	94	40	0	7	1	0	0	0	0	0	0	0
2030	181	1	108	42	0	8	1	0	0	1	0	0	0	0
2045	154	1	99	49	0	1	3	0	0	0	0	0	0	1
	590	**4**	**385**	**161**	**0**	**26**	**6**	**0**	**2**	**5**	**0**	**0**	**0**	**1**
2100	151	2	101	41	1	6	0	0	0	0	0	0	0	0

2115	144	1	105	34	0	4	0	0	0	0	0	0	0	0
2130	117	0	75	38	0	4	0	0	0	0	0	0	0	0
2145	103	0	81	18	1	2	0	0	0	1	0	0	0	0
	515	3	362	131	2	16	0	0	0	1	0	0	0	0
2200	94	1	68	22	0	3	0	0	0	0	0	0	0	0
2215	74	0	54	15	0	4	0	0	0	1	0	0	0	0
2230	74	0	53	19	0	2	0	0	0	0	0	0	0	0
2245	82	0	60	19	0	3	0	0	0	0	0	0	0	0
	324	1	235	75	0	12	0	0	0	1	0	0	0	0
2300	56	0	33	22	0	1	0	0	0	0	0	0	0	0
2315	43	0	34	8	0	1	0	0	0	0	0	0	0	0
2330	34	0	26	5	0	3	0	0	0	0	0	0	0	0
2345	42	0	30	8	0	4	0	0	0	0	0	0	0	0
	175	0	123	43	0	9	0	0	0	0	0	0	0	0
0	47	0	31	11	1	3	0	0	1	0	0	0	0	0
15	18	0	9	5	0	2	0	0	0	2	0	0	0	0
30	19	0	10	5	0	2	0	0	1	1	0	0	0	0
45	28	0	23	3	0	2	0	0	0	0	0	0	0	0
	112	0	73	24	1	9	0	0	2	3	0	0	0	0
100	22	0	18	3	0	1	0	0	0	0	0	0	0	0
115	16	0	9	5	0	1	0	0	0	1	0	0	0	0
130	13	0	9	1	0	2	0	0	0	1	0	0	0	0
145	11	0	9	2	0	0	0	0	0	0	0	0	0	0
	62	0	45	11	0	4	0	0	0	2	0	0	0	0
200	20	0	13	3	0	1	1	0	0	2	0	0	0	0
215	13	0	4	6	0	3	0	0	0	0	0	0	0	0
230	18	0	9	8	0	0	0	0	0	1	0	0	0	0
245	16	0	10	3	0	3	0	0	0	0	0	0	0	0
	67	0	36	20	0	7	1	0	0	3	0	0	0	0
300	12	0	7	3	0	2	0	0	0	0	0	0	0	0
315	18	0	6	8	0	4	0	0	0	0	0	0	0	0
330	11	0	8	3	0	0	0	0	0	0	0	0	0	0
345	19	0	15	4	0	0	0	0	0	0	0	0	0	0
	60	0	36	18	0	6	0	0	0	0	0	0	0	0
400	24	0	16	3	0	4	1	0	0	0	0	0	0	0
415	21	0	12	6	0	1	1	0	0	1	0	0	0	0
430	22	0	13	7	0	2	0	0	0	0	0	0	0	0
445	22	0	12	7	0	2	0	0	0	1	0	0	0	0
	89	0	53	23	0	9	2	0	0	2	0	0	0	0
500	23	0	18	2	0	2	0	0	1	0	0	0	0	0
515	21	0	10	8	0	3	0	0	0	0	0	0	0	0
530	43	0	20	15	0	7	0	0	0	1	0	0	0	0
545	48	0	31	12	0	4	1	0	0	0	0	0	0	0
	135	0	79	37	0	16	1	0	1	1	0	0	0	0
600	31	0	14	10	0	7	0	0	0	0	0	0	0	0
615	49	0	30	12	0	6	1	0	0	0	0	0	0	0
630	53	0	31	17	0	4	1	0	0	0	0	0	0	0
645	69	0	45	17	0	4	1	0	0	2	0	0	0	0
	202	0	120	56	0	21	3	0	0	2	0	0	0	0
700	78	0	48	23	0	9	0	0	0	0	0	0	0	0
715	109	1	69	28	0	9	1	0	0	1	0	0	0	0
730	157	0	111	41	0	5	0	0	0	0	0	0	0	0
745	240	1	152	74	1	9	0	0	0	2	0	0	0	1
	584	2	378	166	1	32	1	0	0	3	0	0	0	1
800	254	0	155	82	0	15	0	0	0	0	0	0	0	2
815	213	0	137	68	1	6	1	0	0	0	0	0	0	0
830	164	1	101	48	1	9	0	0	0	1	3	0	0	0
845	169	0	111	46	0	9	1	0	0	2	0	0	0	0
	800	1	504	244	2	39	2	0	0	3	3	0	0	2
900	163	1	111	40	0	7	1	0	0	3	0	0	0	0
915	156	0	104	43	0	6	1	0	0	1	1	0	0	0
930	159	2	99	43	1	8	3	0	0	2	0	0	0	1
945	183	2	105	51	0	21	2	0	0	1	0	0	0	1
	661	5	419	177	1	42	7	0	0	7	1	0	0	2
1000	176	2	117	42	0	11	3	0	0	1	0	0	0	0
1015	195	0	122	50	1	19	2	0	0	1	0	0	0	0
	371	2	239	92	1	30	5	0	0	2	0	0	0	0
[24]	14380	69	9655	3691	14	737	73	0	15	94	14	0	0	18

*	Grand	Total													
Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls
		1	2	3	4	5	6	7	8	9	10	11	12	13
[--]	14380	69	9655	3691	14	737	73	0	15	94	14	0	0	18

Site: [14508W] SR-98 Btwn Ollie Ave. and SR-111
Direction: 4 - West bound, A hit first., Lane: 0
Survey Du 9:40 Tuesday, May 03, 2005 => 11:39 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\14508W08MAY2005.EC0 (Plus)
Identifier: M425JZ7Q MC58-6 [MC55] (c)Microcom 02/03/01
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: West (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	1	0	1	0	0	0	0	0	0	0	0	0	0	0
1045	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	0	1	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1115	1	1	0	0	0	0	0	0	0	0	0	0	0	0
1130	60	3	36	16	0	1	2	0	0	1	1	0	0	0
1145	225	0	167	48	0	4	2	0	0	4	0	0	0	0
	286	4	203	64	0	5	4	0	0	5	1	0	0	0
1200	186	0	128	42	1	7	3	0	0	2	2	0	0	1
1215	217	0	149	55	0	6	2	0	0	2	1	0	0	2
1230	230	0	159	62	0	6	1	0	0	1	0	0	0	1
1245	180	0	123	49	1	4	0	0	0	0	2	0	0	1
	813	0	559	208	2	23	6	0	0	5	5	0	0	5
1300	181	0	129	42	0	4	3	0	0	2	1	0	0	0
1315	208	0	140	56	0	5	2	0	1	4	0	0	0	0
1330	179	0	132	40	0	4	1	0	1	1	0	0	0	0
1345	168	1	104	48	0	11	1	0	0	1	3	0	0	1
	736	1	505	184	0	24	7	0	2	8	4	0	0	1
1400	158	0	109	39	1	5	1	0	0	1	1	0	0	1
1415	199	1	134	53	0	5	2	0	0	2	0	0	0	2
1430	153	0	110	37	0	4	1	0	0	1	0	0	0	0
1445	196	0	143	43	0	6	2	0	0	1	0	0	0	1
	706	1	496	172	1	20	6	0	0	5	1	0	0	4
1500	188	0	131	36	0	12	4	0	1	3	1	0	0	0
1515	235	1	161	57	0	10	3	0	0	2	0	0	0	1
1530	205	1	147	45	0	6	2	0	0	1	2	0	0	1
1545	212	0	138	60	0	9	1	0	0	1	1	0	0	2
	840	2	577	198	0	37	10	0	1	7	4	0	0	4
1600	179	0	121	46	0	6	0	0	1	3	1	0	0	1
1615	188	2	124	44	0	6	4	0	0	4	1	0	0	3
1630	189	1	128	47	1	7	1	0	1	2	0	0	0	1
1645	191	1	140	40	0	7	0	0	0	1	1	0	0	1
	747	4	513	177	1	26	6	0	2	10	3	0	0	6
1700	176	0	130	36	0	4	2	0	0	2	2	0	0	0
1715	207	1	153	41	0	5	1	0	0	4	1	0	0	1
1730	182	0	126	41	0	8	1	0	0	2	3	0	0	1
1745	166	0	107	50	0	4	1	0	0	2	0	1	0	1
	731	1	516	168	0	21	5	0	0	10	6	1	0	3
1800	187	3	135	43	0	1	0	0	0	2	2	0	0	1
1815	164	0	116	42	1	4	0	0	1	0	0	0	0	0
1830	155	0	114	30	0	4	1	0	1	1	3	0	0	1
1845	174	0	123	37	0	8	1	0	1	3	1	0	0	0
	680	3	488	152	1	17	2	0	3	6	6	0	0	2
1900	154	1	107	33	0	2	2	0	1	6	1	0	0	1
1915	151	0	103	40	0	2	1	0	1	2	0	0	0	2
1930	133	1	101	26	0	2	1	0	0	1	1	0	0	0
1945	121	5	89	24	0	1	1	0	0	0	1	0	0	0
	559	7	400	123	0	7	5	0	2	9	3	0	0	3
2000	100	1	66	27	0	2	0	0	1	3	0	0	0	0
2015	105	0	72	25	0	3	3	0	0	1	1	0	0	0
2030	119	0	83	30	0	1	0	0	0	3	1	1	0	0
2045	131	1	88	30	0	8	2	0	0	1	1	0	0	0
	455	2	309	112	0	14	5	0	1	8	3	1	0	0
2100	119	0	93	25	0	1	0	0	0	0	0	0	0	0

2115	120	1	88	25	0	4	1	0	0	0	1	0	0	0	
2130	103	0	77	20	0	2	2	0	0	0	1	0	0	1	
2145	74	0	61	11	0	2	0	0	0	0	0	0	0	0	
	416	1	319	81	0	9	3	0	0	0	2	0	0	1	
2200	84	1	60	17	0	3	1	0	0	2	0	0	0	0	
2215	71	0	54	15	0	1	1	0	0	0	0	0	0	0	
2230	65	0	47	13	0	3	1	0	0	1	0	0	0	0	
2245	54	0	35	15	0	2	2	0	0	0	0	0	0	0	
	274	1	196	60	0	9	5	0	0	3	0	0	0	0	
2300	39	0	29	9	0	1	0	0	0	0	0	0	0	0	
2315	42	0	25	14	0	2	0	0	0	1	0	0	0	0	
2330	41	0	31	7	0	1	1	0	0	1	0	0	0	0	
2345	32	0	22	6	0	1	2	0	0	1	0	0	0	0	
	154	0	107	36	0	5	3	0	0	3	0	0	0	0	
0	19	0	13	6	0	0	0	0	0	0	0	0	0	0	
15	17	0	13	3	0	0	0	0	0	1	0	0	0	0	
30	27	0	18	7	1	1	0	0	0	0	0	0	0	0	
45	16	0	11	2	0	2	0	0	0	1	0	0	0	0	
	79	0	55	18	1	3	0	0	0	2	0	0	0	0	
100	15	0	13	2	0	0	0	0	0	0	0	0	0	0	
115	11	0	8	2	0	1	0	0	0	0	0	0	0	0	
130	11	0	7	3	0	1	0	0	0	0	0	0	0	0	
145	17	1	12	3	1	0	0	0	0	0	0	0	0	0	
	54	1	40	10	1	2	0	0	0	0	0	0	0	0	
200	17	0	12	1	0	2	0	0	0	2	0	0	0	0	
215	18	0	10	5	0	3	0	0	0	0	0	0	0	0	
230	15	0	11	3	0	1	0	0	0	0	0	0	0	0	
245	18	0	12	5	0	1	0	0	0	0	0	0	0	0	
	68	0	45	14	0	7	0	0	0	2	0	0	0	0	
300	18	0	11	6	0	1	0	0	0	0	0	0	0	0	
315	14	0	8	5	0	1	0	0	1	1	0	0	0	0	
330	30	0	19	11	0	0	0	0	0	0	0	0	0	0	
345	16	0	9	4	0	2	1	0	0	0	0	0	0	0	
	78	0	45	26	0	4	1	0	1	1	0	0	0	0	
400	26	0	17	9	0	0	0	0	0	0	0	0	0	0	
415	28	0	18	6	0	3	1	0	0	0	0	0	0	0	
430	37	0	25	9	0	3	0	0	0	0	0	0	0	0	
445	40	0	28	12	0	0	0	0	1	1	0	0	0	0	
	131	0	86	36	0	6	1	0	1	1	0	0	0	0	
500	48	0	32	13	2	0	1	0	1	0	0	0	0	0	
515	58	1	37	13	1	4	0	0	0	1	1	0	0	0	
530	77	0	52	20	0	5	0	0	0	0	0	0	0	0	
545	76	1	53	19	0	2	1	0	0	0	0	0	0	0	
	260	2	174	65	3	11	2	0	1	1	1	0	0	0	
600	76	1	51	16	0	8	0	0	0	0	0	0	0	0	
615	102	0	66	28	0	4	2	0	0	1	1	0	0	0	
630	111	3	82	38	0	4	1	0	0	2	1	0	0	0	
645	118	0	77	36	0	4	0	0	0	1	0	0	0	0	
	407	4	256	118	0	20	3	0	0	4	2	0	0	0	
700	102	0	67	28	0	4	1	0	0	2	0	0	0	0	
715	146	0	95	38	0	6	1	0	1	2	3	0	0	0	
730	169	2	109	48	0	4	2	0	0	2	2	0	0	0	
745	225	2	149	55	0	7	6	0	1	2	3	0	0	0	
	642	4	420	169	0	21	10	0	2	8	8	0	0	0	
800	300	0	194	91	0	3	3	0	0	2	3	0	0	4	
815	238	0	142	74	1	10	3	0	0	2	1	0	0	3	
830	165	1	107	46	1	2	3	0	0	4	1	0	0	0	
845	162	0	106	51	1	2	0	0	0	1	1	0	0	0	
	863	1	549	262	3	17	9	0	0	9	6	0	0	7	
900	153	3	110	32	0	3	1	0	0	2	1	0	0	1	
915	152	0	108	34	0	3	2	0	0	4	0	0	0	1	
930	157	1	101	41	0	8	3	0	0	1	1	0	0	1	
945	166	0	104	42	0	14	1	0	2	3	0	0	0	0	
	628	4	423	149	0	28	7	0	2	10	2	0	0	3	
1000	178	2	119	48	0	7	2	0	0	0	0	0	0	0	
1015	165	0	110	48	0	5	0	0	1	1	0	0	0	2	
	343	2	229	96	0	12	2	0	1	1	0	0	0	2	
[24]	10951	45	7511	2696	13	348	101	0	19	118	57	2	0	41	

*	Grand	Total													
Time	Total	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	
		1	2	3	4	5	6	7	8	9	10	11	12	13	
[-]	10951	45	7511	2696	13	348	101	0	19	118	57	2	0	41	

Site: [14507E] SR-98 East of SR-111
Direction: 2 - East bound, A hit first., Lane: 0
Survey Du 10:01 Tuesday, May 03, 2005 => 10:44 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\fixed files\14507E08MAY2005.EC0 (Plus)
Identifier: A643QTA4 MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: East (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	180	10	68	63	1	24	8	0	0	4	1	0	0	1
1045	173	7	70	69	0	12	7	0	0	8	0	0	0	0
	353	**17**	**138**	**132**	**1**	**36**	**15**	**0**	**0**	**12**	**1**	**0**	**0**	**1**
1100	158	11	65	51	3	18	4	0	1	4	0	1	0	0
1115	181	5	79	65	0	19	4	0	0	6	2	0	0	1
1130	212	5	112	73	1	12	1	0	1	6	1	0	0	0
1145	222	7	109	72	2	21	6	0	2	0	1	0	0	2
	773	**28**	**365**	**261**	**6**	**70**	**15**	**0**	**4**	**16**	**4**	**1**	**0**	**3**
1200	228	4	126	71	1	16	8	0	1	1	0	0	0	0
1215	204	7	104	66	1	13	9	0	1	2	0	0	0	1
1230	186	3	65	73	0	17	6	0	0	2	0	0	0	0
1245	220	9	78	89	0	26	12	0	2	4	0	0	0	0
	818	**23**	**373**	**299**	**2**	**72**	**35**	**0**	**4**	**9**	**0**	**0**	**0**	**1**
1300	201	7	96	69	0	17	6	0	0	6	0	0	0	0
1315	200	7	99	64	1	15	9	0	0	4	0	1	0	0
1330	189	3	92	57	1	16	5	0	0	12	0	0	0	3
1345	210	14	97	74	0	17	6	0	0	1	0	0	0	1
	800	**31**	**384**	**264**	**2**	**65**	**26**	**0**	**0**	**23**	**0**	**1**	**0**	**4**
1400	198	6	90	71	2	20	3	0	0	2	1	0	0	3
1415	224	6	102	84	0	21	7	0	0	4	0	0	0	0
1430	227	7	118	74	0	18	5	0	1	4	0	0	0	2
1445	257	8	144	74	2	23	2	0	2	1	1	0	0	0
	906	**27**	**454**	**303**	**4**	**80**	**17**	**0**	**3**	**11**	**2**	**0**	**0**	**5**
1500	250	6	140	71	1	15	9	0	0	2	1	0	0	5
1515	246	7	146	61	0	20	4	0	1	6	1	0	0	0
1530	231	8	129	63	0	18	5	0	0	3	2	0	0	3
1545	233	10	128	60	0	18	8	0	2	4	1	1	0	1
	960	**31**	**543**	**255**	**1**	**71**	**26**	**0**	**3**	**15**	**5**	**1**	**0**	**9**
1600	234	5	145	55	0	12	8	0	2	2	1	0	0	4
1615	250	5	137	70	0	24	6	0	0	3	2	0	0	3
1630	208	8	115	56	0	16	6	0	0	4	3	0	0	0
1645	218	4	105	85	1	17	3	0	0	1	0	0	0	1
	910	**22**	**502**	**267**	**1**	**69**	**23**	**0**	**2**	**10**	**6**	**0**	**0**	**8**
1700	234	9	117	77	0	16	9	0	1	4	0	0	0	1
1715	242	5	150	69	0	7	6	0	0	3	1	0	0	1
1730	240	2	133	71	0	24	3	0	2	1	2	0	0	2
1745	250	9	129	88	1	17	3	0	0	2	0	0	0	1
	966	**25**	**529**	**305**	**1**	**64**	**21**	**0**	**3**	**10**	**3**	**0**	**0**	**5**
1800	200	5	98	68	0	21	5	0	1	1	1	0	0	0
1815	183	4	91	60	2	19	3	0	0	3	1	0	0	0
1830	238	9	129	71	1	20	5	0	0	2	1	0	0	0
1845	191	2	113	53	2	12	3	0	0	5	0	0	0	1
	812	**20**	**431**	**252**	**5**	**72**	**16**	**0**	**1**	**11**	**3**	**0**	**0**	**1**
1900	197	8	116	48	1	15	7	0	0	5	1	0	0	0
1915	229	5	145	51	1	15	5	0	1	3	1	0	0	2
1930	158	3	75	58	0	18	1	0	0	3	0	0	0	0
1945	151	1	75	57	0	17	1	0	0	0	0	0	0	0
	735	**15**	**411**	**212**	**2**	**65**	**14**	**0**	**1**	**11**	**2**	**0**	**0**	**2**
2000	133	0	68	55	1	8	0	0	0	1	0	0	0	0
2015	147	0	70	61	1	13	1	0	0	1	0	0	0	0
2030	166	0	91	66	0	9	0	0	0	0	0	0	0	0
2045	154	0	87	57	0	7	2	0	0	0	0	0	0	1
	600	**0**	**316**	**239**	**2**	**37**	**3**	**0**	**0**	**2**	**0**	**0**	**0**	**1**
2100	138	0	68	60	0	9	1	0	0	0	0	0	0	0

2115	153	0	71	69	0	11	0	0	0	1	1	0	0	0
2130	144	0	81	47	0	14	1	0	0	1	0	0	0	0
2145	115	1	56	49	0	8	0	0	0	1	0	0	0	0
	550	1	276	225	0	42	2	0	0	3	1	0	0	0
2200	103	0	56	43	0	4	0	0	0	0	0	0	0	0
2215	79	0	40	33	1	4	0	0	0	1	0	0	0	0
2230	83	0	51	23	1	8	0	0	0	0	0	0	0	0
2245	89	1	51	31	0	3	2	0	0	1	0	0	0	0
	354	1	198	130	2	19	2	0	0	2	0	0	0	0
2300	66	0	31	28	0	7	0	0	0	0	0	0	0	0
2315	59	0	30	23	0	5	0	0	0	1	0	0	0	0
2330	53	1	27	21	0	4	0	0	0	0	0	0	0	0
2345	59	1	27	25	0	3	0	0	0	3	0	0	0	0
	237	2	115	97	0	19	0	0	0	4	0	0	0	0
0	33	0	15	13	0	4	1	0	0	0	0	0	0	0
15	21	0	9	9	0	2	0	0	0	1	0	0	0	0
30	14	0	5	6	0	2	0	0	0	1	0	0	0	0
45	25	0	9	11	0	5	0	0	0	0	0	0	0	0
	93	0	38	39	0	13	1	0	0	2	0	0	0	0
100	27	0	13	7	1	5	0	0	0	1	0	0	0	0
115	19	0	8	8	0	3	0	0	0	0	0	0	0	0
130	21	0	7	8	0	4	1	0	0	1	0	0	0	0
145	14	0	7	6	0	0	1	0	0	0	0	0	0	0
	81	0	35	29	1	12	2	0	0	2	0	0	0	0
200	18	0	6	4	1	3	1	0	0	1	0	0	0	0
215	23	0	11	8	0	4	0	0	0	0	0	0	0	0
230	19	0	9	5	1	3	1	0	0	0	0	0	0	0
245	16	0	5	10	0	0	0	0	0	1	0	0	0	0
	74	0	31	27	2	10	2	0	0	2	0	0	0	0
300	17	0	6	8	0	3	0	0	0	0	0	0	0	0
315	16	0	6	7	0	2	0	0	0	1	0	0	0	0
330	20	0	10	5	0	3	0	0	0	2	0	0	0	0
345	20	0	9	8	0	3	0	0	0	0	0	0	0	0
	73	0	31	28	0	11	0	0	0	3	0	0	0	0
400	35	0	7	24	0	4	0	0	0	0	0	0	0	0
415	30	0	15	11	0	4	0	0	0	0	0	0	0	0
430	33	0	12	15	0	5	1	0	0	0	0	0	0	0
445	28	0	12	10	0	3	0	0	0	1	0	0	0	0
	124	0	46	60	0	16	1	0	0	1	0	0	0	0
500	45	0	11	27	0	7	0	0	0	0	0	0	0	0
515	43	0	21	16	0	6	0	0	0	0	0	0	0	0
530	61	0	25	25	0	9	0	0	0	2	0	0	0	0
545	65	2	24	29	1	8	0	0	0	1	0	0	0	0
	214	2	81	97	1	30	0	0	0	3	0	0	0	0
600	58	0	22	25	0	10	0	0	1	0	0	0	0	0
615	66	1	22	27	0	13	1	0	0	1	1	0	0	0
630	61	0	26	23	1	11	0	0	0	0	0	0	0	0
645	95	1	42	35	0	15	0	0	1	1	0	0	0	0
	280	2	112	110	1	49	1	0	2	2	1	0	0	0
700	78	0	33	34	0	10	0	0	1	0	0	0	0	0
715	117	1	44	56	1	12	1	0	0	0	1	1	0	0
730	150	1	73	57	0	18	0	0	0	0	1	0	0	0
745	240	1	130	86	1	15	0	0	2	1	3	0	0	1
	585	3	280	233	2	55	1	0	3	1	5	1	0	1
800	234	3	115	92	0	15	6	0	1	1	1	0	0	0
815	208	0	115	70	1	22	0	0	0	0	0	0	0	0
830	158	0	70	76	0	9	0	0	0	1	2	0	0	0
845	144	5	65	48	0	16	3	0	0	6	1	0	0	0
	744	8	365	286	1	62	9	0	1	8	4	0	0	0
900	159	1	81	58	3	16	0	0	0	0	0	0	0	0
915	143	1	73	54	0	9	2	0	0	3	1	0	0	0
930	171	5	70	63	0	19	4	0	1	6	0	0	0	1
945	162	4	60	59	3	22	3	0	1	7	3	0	0	0
	635	11	284	234	6	66	9	0	2	18	4	0	0	1
1000	148	2	61	51	3	19	3	0	2	3	2	0	0	2
1015	139	2	50	57	1	18	2	0	1	7	1	0	0	0
	287	4	111	108	4	37	5	0	3	10	3	0	0	2
[24]	12964	273	6449	4492	47	1142	246	0	32	191	44	4	0	44

* Time	Grand Total	Total Cls	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
[–]	12964	273	6449	4492	47	1142	246	0	32	191	44	4	0	44	

Site: [14507W] SR-98 East of SR-111
Direction: 4 - West bound, A hit first., Lane: 0
Survey Du 9:57 Tuesday, May 03, 2005 => 11:08 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\fixed files\14507W08MAY2005.EC0 (Plus)
Identifier: M3530X9Z MC58-6 [MC55] (c)Microcom 02/03/01
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: West (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	265	10	112	103	1	27	6	0	0	4	1	0	0	1
1045	199	5	85	97	1	23	2	0	1	2	0	0	0	3
	464	**15**	**177**	**200**	**2**	**50**	**8**	**0**	**1**	**6**	**1**	**0**	**0**	**4**
1100	214	3	68	107	0	31	3	0	0	1	1	0	0	0
1115	178	1	55	90	0	22	1	0	1	3	5	0	0	0
1130	197	1	70	91	0	23	3	0	1	3	2	0	0	3
1145	181	1	45	94	1	24	4	0	0	4	3	0	0	5
	770	**6**	**238**	**382**	**1**	**100**	**11**	**0**	**2**	**11**	**11**	**0**	**0**	**8**
1200	208	6	55	94	0	32	9	0	1	5	2	0	0	4
1215	207	3	60	103	0	21	3	0	0	11	4	0	0	2
1230	222	2	63	116	1	25	3	0	2	2	4	0	0	4
1245	181	2	63	82	1	15	4	0	3	6	4	0	0	1
	818	**13**	**241**	**395**	**2**	**93**	**19**	**0**	**6**	**24**	**14**	**0**	**0**	**11**
1300	209	2	71	102	0	28	2	0	0	2	1	0	0	3
1315	165	2	52	73	0	26	1	0	1	5	2	0	0	3
1330	198	3	69	99	0	19	2	0	1	2	1	0	0	2
1345	184	2	60	91	0	20	3	0	1	4	1	0	0	2
	756	**9**	**252**	**365**	**0**	**91**	**8**	**0**	**3**	**13**	**5**	**0**	**0**	**10**
1400	199	0	60	95	0	29	2	0	1	4	4	0	0	4
1415	194	0	80	84	0	23	1	0	0	2	3	0	0	1
1430	223	3	83	110	0	19	1	0	0	3	3	0	0	1
1445	218	2	74	110	0	22	2	0	0	4	3	0	0	1
	834	**5**	**297**	**399**	**0**	**93**	**6**	**0**	**1**	**13**	**13**	**0**	**0**	**7**
1500	240	5	87	116	0	14	9	0	0	2	4	0	0	3
1515	279	6	114	120	0	23	6	0	1	3	3	0	0	3
1530	264	5	117	110	1	24	3	0	0	2	1	0	0	1
1545	249	5	83	122	0	27	5	0	1	1	1	0	0	4
	1032	**21**	**401**	**468**	**1**	**88**	**23**	**0**	**2**	**6**	**9**	**0**	**0**	**11**
1600	229	3	92	105	0	22	1	0	0	2	1	0	0	3
1615	221	3	94	92	1	19	5	0	3	1	0	0	0	3
1630	235	4	82	115	0	26	4	0	1	1	0	0	0	2
1645	256	3	95	119	0	21	3	0	1	6	2	0	0	6
	941	**13**	**363**	**431**	**1**	**88**	**13**	**0**	**5**	**10**	**3**	**0**	**0**	**14**
1700	231	4	85	113	0	18	5	0	0	2	3	0	0	1
1715	236	5	85	113	1	23	0	0	1	4	2	0	0	2
1730	237	4	75	115	1	24	5	0	2	6	3	0	0	2
1745	205	0	63	113	0	24	2	0	0	2	1	0	0	0
	909	**13**	**308**	**454**	**2**	**89**	**12**	**0**	**3**	**14**	**9**	**0**	**0**	**5**
1800	227	7	95	87	0	24	5	0	0	5	2	0	0	2
1815	237	2	86	112	0	28	6	0	1	2	0	0	0	0
1830	215	0	84	96	1	24	1	0	0	4	1	0	0	4
1845	225	3	78	109	1	21	2	0	1	5	2	1	0	2
	904	**12**	**343**	**404**	**2**	**97**	**14**	**0**	**2**	**16**	**5**	**1**	**0**	**8**
1900	205	5	62	92	2	22	6	0	1	10	2	0	0	3
1915	192	3	53	89	1	33	2	0	2	3	3	1	0	2
1930	143	1	45	65	0	15	5	0	0	8	3	0	0	1
1945	151	2	52	72	2	17	1	0	0	3	1	0	0	1
	691	**11**	**212**	**318**	**5**	**87**	**14**	**0**	**3**	**24**	**9**	**1**	**0**	**7**
2000	152	3	77	54	0	8	4	0	0	4	0	0	0	4
2015	133	2	29	76	2	13	3	0	0	6	2	0	0	0
2030	129	0	41	65	0	14	0	0	0	8	0	0	0	1
2045	148	2	58	68	1	16	1	0	0	1	1	0	0	0
	562	**7**	**205**	**263**	**3**	**49**	**8**	**0**	**0**	**19**	**3**	**0**	**0**	**5**
2100	137	0	45	76	0	13	2	0	0	1	0	0	0	0

2115	127	2	49	62	1	10	1	0	0	1	0	0	0	1
2130	95	0	29	58	0	4	0	0	0	3	1	0	0	0
2145	93	0	25	54	0	8	0	0	0	3	3	0	0	0
	452	2	148	250	1	35	3	0	0	8	4	0	0	1
2200	95	0	25	59	0	10	0	0	0	1	0	0	0	0
2215	89	0	15	44	0	8	1	0	0	0	1	0	0	0
2230	81	0	22	35	1	2	0	0	1	0	0	0	0	0
2245	58	0	21	29	0	8	0	0	0	0	0	0	0	0
	283	0	83	167	1	28	1	0	1	1	1	0	0	0
2300	50	0	12	30	0	7	1	0	0	0	0	0	0	0
2315	41	0	11	24	0	6	0	0	0	0	0	0	0	0
2330	42	0	11	24	0	7	0	0	0	0	0	0	0	0
2345	34	0	10	19	0	5	0	0	0	0	0	0	0	0
	167	0	44	97	0	25	1	0	0	0	0	0	0	0
0	18	0	3	13	0	1	0	0	0	1	0	0	0	0
15	29	0	7	14	0	7	1	0	0	0	0	0	0	0
30	36	1	8	16	1	9	1	0	0	0	0	0	0	0
45	15	0	8	5	0	2	0	0	0	0	0	0	0	0
	98	1	26	48	1	19	2	0	0	1	0	0	0	0
100	27	0	7	13	0	5	1	0	0	1	0	0	0	0
115	14	0	3	9	0	2	0	0	0	0	0	0	0	0
130	18	0	3	12	0	3	0	0	0	0	0	0	0	0
145	15	0	2	10	0	1	0	0	0	1	0	0	0	1
	74	0	15	44	0	11	1	0	0	2	0	0	0	1
200	18	0	5	11	0	1	0	0	0	1	0	0	0	0
215	14	0	3	8	0	2	0	0	0	0	1	0	0	0
230	18	0	4	11	0	2	0	0	0	1	0	0	0	0
245	17	0	2	13	0	2	0	0	0	0	0	0	0	0
	67	0	14	43	0	7	0	0	0	2	1	0	0	0
300	16	0	4	10	0	2	0	0	0	0	0	0	0	0
315	15	0	3	6	0	5	0	0	0	1	0	0	0	0
330	23	1	3	13	1	5	0	0	0	0	0	0	0	0
345	20	0	5	9	0	5	0	0	0	1	0	0	0	0
	74	1	15	38	1	17	0	0	0	2	0	0	0	0
400	32	0	6	13	0	9	2	0	0	2	0	0	0	0
415	34	0	6	18	0	10	0	0	0	0	0	0	0	0
430	30	0	4	21	0	4	1	0	0	0	0	0	0	0
445	32	0	8	19	0	4	0	0	1	0	0	0	0	0
	128	0	24	71	0	27	3	0	1	2	0	0	0	0
500	35	0	12	13	0	10	0	0	0	0	0	0	0	0
515	50	1	11	25	2	9	2	0	0	0	0	0	0	0
530	65	0	19	26	0	20	0	0	0	0	0	0	0	0
545	68	0	11	46	0	11	0	0	0	0	0	0	0	0
	218	1	53	110	2	50	2	0	0	0	0	0	0	0
600	67	0	15	31	1	20	0	0	0	0	0	0	0	0
615	102	0	26	53	0	22	1	0	0	0	0	0	0	0
630	127	1	34	60	0	30	0	0	0	2	0	0	0	0
645	139	3	49	62	0	25	0	0	0	0	0	0	0	0
	435	4	124	206	1	97	1	0	0	2	0	0	0	0
700	120	0	25	76	1	17	1	0	0	0	0	0	0	0
715	162	1	41	89	0	28	1	0	0	0	2	0	0	0
730	235	1	89	111	0	30	2	0	0	0	1	0	0	1
745	287	1	120	131	1	26	2	0	1	2	2	0	0	1
	804	3	275	407	2	101	6	0	1	2	5	0	0	2
800	299	3	132	121	0	31	5	0	1	2	3	0	0	1
815	260	0	75	151	2	23	3	0	0	2	2	0	0	2
830	187	2	61	100	1	21	2	0	0	0	0	0	0	0
845	138	1	40	81	1	14	0	0	0	0	0	0	0	1
	884	6	308	453	4	89	10	0	1	4	5	0	0	4
900	165	1	46	97	1	18	0	0	0	1	0	0	0	1
915	165	1	54	87	0	17	1	0	1	1	3	0	0	0
930	178	1	51	91	0	31	1	0	0	0	0	0	0	1
945	132	0	35	71	0	22	1	0	1	0	0	0	0	2
	638	3	186	346	1	88	3	0	2	2	3	0	0	4
1000	191	0	58	90	0	38	3	0	0	2	0	0	0	0
1015	158	0	58	72	0	24	2	0	1	1	0	0	0	0
	349	0	116	162	0	62	5	0	1	3	0	0	0	0
[24]	13352	146	4468	6521	33	1581	174	0	35	189	101	2	0	102

* Time	Grand Total	Total Cls	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
[--]	13352	146	4468	6521	33	1581	174	0	35	189	101	2	0	102

Site: [14508N] SR-111 North of SR-98
Direction: 1 - North bound, A hit first., Lane: 0
Survey Du 10:17 Tuesday, May 03, 2005 => 10:49 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\14508N08MAY2005.EC0 (Plus)
Identifier: M387WA3J MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: North (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	224	0	150	46	1	3	3	0	1	12	4	0	0	4
1045	209	1	143	43	0	12	4	0	1	3	2	0	0	0
	433	**1**	**293**	**89**	**1**	**15**	**7**	**0**	**2**	**16**	**6**	**0**	**0**	**4**
1100	202	2	134	52	0	4	1	0	3	2	3	1	0	0
1115	214	1	145	51	0	5	2	0	3	6	0	0	0	1
1130	214	3	147	47	0	4	5	0	0	4	2	0	0	2
1145	215	0	144	51	0	5	0	0	4	6	4	0	0	1
	845	**6**	**570**	**201**	**0**	**18**	**8**	**0**	**10**	**18**	**9**	**1**	**0**	**4**
1200	216	3	144	44	1	9	2	0	1	7	3	0	0	2
1215	262	0	200	46	0	5	2	0	0	6	1	1	0	1
1230	215	0	156	42	0	3	1	0	1	9	1	0	0	2
1245	246	2	180	42	0	10	3	0	1	5	2	0	0	1
	939	**5**	**680**	**174**	**1**	**27**	**8**	**0**	**3**	**27**	**7**	**1**	**0**	**6**
1300	219	0	153	50	0	9	1	0	0	5	0	0	0	1
1315	231	1	155	40	0	16	8	0	1	4	4	0	0	2
1330	218	1	140	59	0	12	1	0	0	5	0	0	0	0
1345	210	1	145	44	0	7	1	0	0	7	2	0	0	3
	878	**3**	**593**	**193**	**0**	**44**	**11**	**0**	**1**	**21**	**6**	**0**	**0**	**6**
1400	213	2	141	48	1	13	1	0	0	1	4	0	0	2
1415	222	0	164	42	1	6	1	0	0	3	3	0	0	2
1430	200	0	138	48	0	8	2	0	0	3	0	0	0	1
1445	189	1	128	45	0	7	3	0	0	4	1	0	0	0
	824	**3**	**571**	**183**	**2**	**34**	**7**	**0**	**0**	**11**	**8**	**0**	**0**	**5**
1500	214	0	156	39	0	9	1	0	0	5	2	0	0	2
1515	262	3	192	52	0	4	4	0	1	4	1	0	0	1
1530	210	1	143	49	0	7	3	0	0	4	1	0	0	2
1545	194	0	137	40	1	4	3	0	0	5	4	0	0	0
	880	**4**	**628**	**180**	**1**	**24**	**11**	**0**	**1**	**18**	**8**	**0**	**0**	**5**
1600	222	1	159	48	0	8	1	0	0	4	0	0	0	1
1615	241	0	164	58	0	9	1	0	1	4	2	1	0	1
1630	242	1	170	58	1	7	1	0	0	4	0	0	0	0
1645	255	1	178	52	0	7	2	0	1	7	4	1	0	2
	960	**3**	**671**	**216**	**1**	**31**	**5**	**0**	**2**	**19**	**6**	**2**	**0**	**4**
1700	228	0	172	47	1	6	0	0	1	1	0	0	0	0
1715	219	2	149	53	0	8	0	0	0	4	1	0	0	2
1730	252	1	189	40	1	3	4	0	0	11	2	0	0	1
1745	223	1	165	44	0	7	2	0	0	1	2	0	0	1
	922	**4**	**675**	**184**	**2**	**24**	**6**	**0**	**1**	**17**	**5**	**0**	**0**	**4**
1800	186	1	134	39	0	3	0	0	1	4	2	0	0	2
1815	233	1	174	53	0	3	1	0	1	0	0	0	0	0
1830	232	1	182	36	0	3	1	0	0	7	0	0	0	2
1845	251	2	183	48	1	9	1	0	0	4	2	0	0	1
	902	**5**	**673**	**176**	**1**	**18**	**3**	**0**	**2**	**15**	**4**	**0**	**0**	**5**
1900	213	2	148	42	0	5	1	0	2	10	2	0	0	1
1915	203	0	141	48	0	6	1	0	0	4	1	0	0	2
1930	183	2	120	38	0	6	2	0	3	5	2	1	0	4
1945	171	0	122	38	0	1	2	0	0	6	1	0	0	1
	770	**4**	**531**	**166**	**0**	**18**	**6**	**0**	**5**	**25**	**6**	**1**	**0**	**8**
2000	180	4	114	37	2	8	1	0	1	12	0	0	0	1
2015	152	1	112	27	0	4	1	0	0	7	0	0	0	0
2030	171	1	115	36	0	4	0	0	0	14	1	0	0	0
2045	176	0	126	45	0	3	0	0	0	0	0	1	0	1
	679	**6**	**467**	**145**	**2**	**19**	**2**	**0**	**1**	**33**	**1**	**1**	**0**	**2**
2100	165	0	124	33	0	4	2	0	0	1	0	0	0	1

2115	173	0	134	34	0	2	0	0	0	3	0	0	0	0
2130	127	1	100	19	0	2	2	0	0	3	0	0	0	0
2145	133	1	97	25	1	3	1	0	0	1	2	0	0	2
	598	**2**	**455**	**111**	**1**	**11**	**5**	**0**	**0**	**8**	**2**	**0**	**0**	**3**
2200	116	0	86	29	0	0	0	0	0	1	0	0	0	0
2215	109	1	84	21	0	1	2	0	0	0	0	0	0	0
2230	110	0	86	17	1	1	2	0	1	2	0	0	0	0
2245	110	0	81	24	1	2	0	0	0	1	0	0	0	1
	445	**1**	**337**	**91**	**2**	**4**	**4**	**0**	**1**	**4**	**0**	**0**	**0**	**1**
2300	84	0	65	19	0	0	0	0	0	0	0	0	0	0
2315	60	0	49	11	0	0	0	0	0	0	0	0	0	0
2330	68	0	59	8	0	1	0	0	0	0	0	0	0	0
2345	36	0	24	12	0	0	0	0	0	0	0	0	0	0
	248	**0**	**197**	**50**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0	58	1	41	12	0	2	0	0	0	1	0	1	0	0
15	46	1	27	15	0	1	0	0	0	1	0	0	0	1
30	45	0	31	9	0	3	0	0	0	2	0	0	0	0
45	32	0	24	5	0	2	0	0	0	1	0	0	0	0
	181	**2**	**123**	**41**	**0**	**8**	**0**	**0**	**0**	**5**	**0**	**1**	**0**	**1**
100	35	0	23	8	0	0	1	0	0	3	0	0	0	0
115	47	0	36	8	0	1	1	0	0	1	0	0	0	0
130	41	0	28	12	0	1	0	0	0	2	0	0	0	0
145	34	0	21	11	0	0	0	0	0	1	1	0	0	0
	157	**0**	**106**	**39**	**0**	**2**	**2**	**0**	**0**	**7**	**1**	**0**	**0**	**0**
200	49	0	33	10	0	2	0	0	1	3	0	0	0	0
215	53	0	42	9	0	0	0	0	0	2	0	0	0	0
230	75	0	55	13	1	0	1	0	0	4	0	1	0	0
245	64	0	51	8	0	3	1	0	0	1	0	0	0	0
	241	**0**	**181**	**40**	**1**	**5**	**2**	**0**	**1**	**10**	**0**	**1**	**0**	**0**
300	88	0	57	25	0	3	0	0	0	2	1	0	0	0
315	92	0	64	21	0	6	1	0	0	0	0	0	0	0
330	101	0	72	24	0	4	0	0	0	1	0	0	0	0
345	123	1	87	28	0	5	0	0	1	1	0	0	0	0
	404	**1**	**280**	**98**	**0**	**18**	**1**	**0**	**1**	**4**	**1**	**0**	**0**	**0**
400	152	0	106	38	0	5	0	0	0	3	0	0	0	0
415	187	0	122	44	1	15	1	0	1	2	1	0	0	0
430	180	0	121	49	0	5	1	0	0	1	2	1	0	0
445	137	0	86	42	0	6	0	0	0	2	1	0	0	0
	656	**0**	**435**	**173**	**1**	**31**	**2**	**0**	**1**	**8**	**4**	**1**	**0**	**0**
500	178	2	124	42	0	5	2	0	1	2	0	0	0	0
515	186	1	130	43	1	7	2	0	1	0	0	0	0	1
530	201	1	138	49	1	10	0	0	1	1	0	0	0	0
545	178	0	120	50	0	5	1	0	1	0	1	0	0	0
	743	**4**	**512**	**184**	**2**	**27**	**5**	**0**	**4**	**3**	**1**	**0**	**0**	**1**
600	181	0	117	54	1	5	1	0	0	3	0	0	0	0
615	179	0	127	39	0	6	2	0	1	0	3	0	0	1
630	182	0	131	41	0	10	0	0	0	0	0	0	0	0
645	161	1	120	36	0	2	2	0	0	0	0	0	0	0
	703	**1**	**495**	**170**	**1**	**23**	**5**	**0**	**1**	**3**	**3**	**0**	**0**	**1**
700	205	0	150	42	2	8	2	0	0	1	0	0	0	0
715	208	1	162	36	0	5	1	0	0	1	1	0	0	1
730	309	3	224	66	1	11	0	0	0	1	3	0	0	0
745	258	1	191	50	1	4	3	0	2	1	2	0	0	3
	980	**5**	**727**	**194**	**4**	**28**	**6**	**0**	**2**	**4**	**6**	**0**	**0**	**4**
800	234	0	166	53	2	6	2	0	2	0	2	0	0	1
815	237	0	173	56	2	5	0	0	0	1	0	0	0	0
830	226	0	162	49	1	8	2	0	0	1	2	0	0	1
845	206	0	149	44	1	4	0	0	0	2	4	0	0	2
	903	**0**	**650**	**202**	**6**	**23**	**4**	**0**	**2**	**4**	**8**	**0**	**0**	**4**
900	208	4	150	39	2	6	1	0	1	3	1	0	0	1
915	219	0	157	45	0	6	3	0	0	2	2	0	0	4
930	201	1	133	54	0	3	1	0	0	3	5	1	0	0
945	199	0	134	52	0	7	0	0	1	0	3	0	0	2
	827	**5**	**574**	**190**	**2**	**22**	**5**	**0**	**2**	**8**	**11**	**1**	**0**	**7**
1000	196	1	136	45	0	7	2	0	0	1	2	0	0	2
1015	218	0	159	50	0	5	1	0	0	0	0	0	0	3
	414	**1**	**295**	**95**	**0**	**12**	**3**	**0**	**0**	**1**	**2**	**0**	**0**	**5**
[24]	16532	68	11719	3585	31	487	118	0	43	288	105	10	0	80

Time	Grand Total	Total Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls
		1	2	3	4	5	6	7	8	9	10	11	12	13
[--]	16532	68	11719	3585	31	487	118	0	43	288	105	10	0	80

Site: [14508S] SR-111 North of SR-98
Direction: 3 - South bound, A hit first., Lane: 0
Survey Du 10:20 Tuesday, May 03, 2005 => 11:27 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\fixed files\14508S08MAY2005.EC0 (Plus)
Identifier: A5613NK0 MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: South (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	217	3	133	45	1	22	4	0	2	7	0	0	0	0
1045	240	4	118	79	1	22	1	0	0	11	2	0	0	2
	457	**7**	**251**	**124**	**2**	**44**	**5**	**0**	**2**	**18**	**2**	**0**	**0**	**2**
1100	254	2	150	66	2	18	4	0	0	9	1	0	0	2
1115	286	0	185	82	0	24	4	0	1	8	1	0	0	1
1130	212	1	129	57	1	11	1	0	1	9	1	0	0	1
1145	248	0	147	84	0	18	5	0	1	8	2	0	0	3
	1000	**3**	**611**	**249**	**3**	**71**	**14**	**0**	**3**	**34**	**5**	**0**	**0**	**7**
1200	229	2	131	67	2	17	0	0	1	7	0	0	0	2
1215	214	1	134	53	0	14	3	0	2	4	0	0	0	3
1230	239	1	143	70	0	14	5	0	1	4	1	0	0	0
1245	247	0	134	83	0	18	0	0	0	8	0	1	0	3
	929	**4**	**542**	**273**	**2**	**63**	**8**	**0**	**4**	**23**	**1**	**1**	**0**	**8**
1300	251	1	153	84	0	15	5	0	2	10	1	0	0	0
1315	232	1	143	57	2	14	3	0	2	7	0	0	0	3
1330	248	1	139	69	1	14	4	0	0	13	4	0	0	3
1345	257	5	148	74	0	16	5	0	0	8	1	0	0	0
	988	**8**	**583**	**264**	**3**	**59**	**17**	**0**	**4**	**38**	**6**	**0**	**0**	**6**
1400	217	1	134	60	2	9	4	0	0	4	2	0	0	1
1415	275	0	172	71	0	15	3	0	1	9	2	0	0	2
1430	265	3	163	72	0	12	3	0	5	4	1	0	0	2
1445	308	1	203	76	0	18	2	0	0	5	2	0	0	1
	1065	**5**	**672**	**279**	**2**	**54**	**12**	**0**	**6**	**22**	**7**	**0**	**0**	**6**
1500	298	4	179	82	1	15	4	0	1	7	2	0	0	3
1515	303	2	169	108	0	11	2	0	1	10	0	0	0	0
1530	350	5	217	96	0	19	4	0	1	7	1	0	0	0
1545	309	1	192	84	0	16	2	0	1	9	3	0	0	1
	1260	**12**	**757**	**370**	**1**	**61**	**12**	**0**	**4**	**33**	**6**	**0**	**0**	**4**
1600	347	1	214	98	0	15	3	0	3	8	2	0	0	3
1615	347	3	223	95	1	15	2	0	0	5	3	0	0	0
1630	341	0	218	92	0	18	6	0	0	5	0	0	0	2
1645	323	2	215	82	0	15	1	0	1	7	0	0	0	0
	1358	**6**	**870**	**367**	**1**	**63**	**12**	**0**	**4**	**25**	**5**	**0**	**0**	**5**
1700	343	3	219	95	1	10	4	0	0	6	1	0	0	4
1715	314	4	212	66	0	14	7	0	1	8	1	0	0	1
1730	328	2	214	85	0	13	4	0	1	3	2	0	0	2
1745	332	2	201	104	1	11	5	0	0	4	2	0	0	2
	1315	**11**	**846**	**350**	**2**	**48**	**20**	**0**	**2**	**21**	**6**	**0**	**0**	**9**
1800	262	0	163	76	0	13	2	0	0	6	1	0	0	1
1815	266	3	155	86	1	8	5	0	3	4	1	0	0	0
1830	286	5	165	71	0	15	3	0	0	6	0	0	0	1
1845	262	2	164	74	0	17	0	0	0	2	0	1	0	2
	1056	**10**	**647**	**307**	**1**	**53**	**10**	**0**	**3**	**18**	**2**	**1**	**0**	**4**
1900	231	3	137	62	0	14	6	0	0	9	0	0	0	0
1915	239	4	150	60	0	13	5	0	0	5	0	0	0	2
1930	195	2	110	63	1	11	1	0	1	4	1	0	0	1
1945	192	1	129	49	0	11	0	0	0	2	0	0	0	0
	857	**10**	**526**	**234**	**1**	**49**	**12**	**0**	**1**	**20**	**1**	**0**	**0**	**3**
2000	175	0	115	53	0	6	1	0	0	0	0	0	0	0
2015	166	1	110	48	0	6	1	0	0	2	0	0	0	0
2030	190	1	122	57	0	6	2	0	0	2	0	0	0	0
2045	190	0	126	53	0	8	1	0	0	2	0	0	0	0
	721	**2**	**473**	**209**	**0**	**26**	**5**	**0**	**0**	**6**	**0**	**0**	**0**	**0**
2100	185	0	125	48	0	11	1	0	0	0	0	0	0	0

2115	197	1	128	55	2	9	0	0	0	2	0	0	0	0
2130	183	0	131	42	0	9	0	0	0	1	0	0	0	0
2145	155	1	104	43	0	6	1	0	0	0	0	0	0	0
	720	2	488	188	2	35	2	0	0	3	0	0	0	0
2200	166	2	100	51	1	6	2	0	0	4	0	0	0	0
2215	160	1	110	40	1	7	0	0	0	0	0	1	0	0
2230	114	0	74	34	0	5	0	0	0	1	0	0	0	0
2245	108	1	55	40	1	5	1	0	0	2	0	1	0	0
	546	4	339	165	3	23	3	0	0	7	0	2	0	0
2300	77	0	49	21	0	7	0	0	0	0	0	0	0	0
2315	102	0	68	26	0	6	1	0	0	1	0	0	0	0
2330	82	0	53	21	1	5	0	0	1	1	0	0	0	0
2345	74	1	40	23	1	3	0	0	0	4	1	1	0	0
	335	1	210	91	2	21	1	0	1	6	1	1	0	0
0	50	0	35	12	0	1	1	0	0	1	0	0	0	0
15	49	1	33	12	1	1	0	0	0	1	0	0	0	0
30	43	0	28	9	2	3	0	0	0	0	0	1	0	0
45	36	2	18	8	0	6	2	0	0	0	0	0	0	0
	178	3	114	41	3	11	3	0	0	2	0	1	0	0
100	33	0	19	8	1	4	0	0	0	1	0	0	0	0
115	21	0	11	6	1	1	1	0	0	0	0	1	0	0
130	26	1	12	7	1	1	1	0	1	1	1	0	0	0
145	30	0	18	8	0	1	1	0	0	1	0	0	0	0
	110	1	60	30	3	7	3	0	1	3	1	1	0	0
200	20	0	9	8	1	0	0	0	0	2	0	0	0	0
215	15	0	11	2	0	2	0	0	0	0	0	0	0	0
230	24	0	10	8	0	2	1	0	0	3	0	0	0	0
245	21	0	9	8	2	1	0	0	1	0	0	0	0	0
	80	0	39	26	3	5	1	0	1	5	0	0	0	0
300	19	0	10	5	0	4	0	0	0	0	0	0	0	0
315	29	0	15	10	0	3	0	0	0	1	0	0	0	0
330	21	0	10	5	0	4	0	0	1	1	0	0	0	0
345	28	0	13	8	0	4	1	0	1	0	0	0	0	0
	97	0	48	29	0	15	1	0	2	2	0	0	0	0
400	25	0	15	9	0	0	0	0	0	1	0	0	0	0
415	11	0	6	2	1	2	0	0	0	0	0	0	0	0
430	22	0	10	7	0	4	1	0	0	0	0	0	0	0
445	25	0	10	9	1	2	0	0	1	2	0	0	0	0
	83	0	41	27	2	8	1	0	1	3	0	0	0	0
500	18	0	13	2	0	3	0	0	0	0	0	0	0	0
515	33	0	20	8	0	3	1	0	0	1	0	0	0	0
530	34	0	17	13	0	2	0	0	0	2	0	0	0	0
545	47	1	21	15	2	7	1	0	0	0	0	0	0	0
	132	1	71	38	2	15	2	0	0	3	0	0	0	0
600	55	1	31	12	0	10	0	0	1	0	0	0	0	0
615	87	0	26	29	1	8	0	0	1	2	0	0	0	0
630	84	0	51	21	0	10	1	0	0	1	0	0	0	0
645	84	0	41	31	1	8	0	0	1	2	0	0	0	0
	290	1	149	93	2	36	1	0	3	5	0	0	0	0
700	84	0	45	32	1	4	0	0	0	2	0	0	0	0
715	92	1	44	31	0	13	1	0	1	1	0	0	0	0
730	138	1	73	45	2	15	1	0	0	1	0	0	0	0
745	163	1	92	53	1	12	0	0	0	3	0	0	0	1
	477	3	254	161	4	44	2	0	1	7	0	0	0	1
800	205	1	125	64	0	9	1	0	2	1	1	1	0	0
815	145	0	77	49	1	13	2	0	0	2	0	1	0	0
830	195	3	95	69	1	17	1	0	3	1	1	1	0	3
845	200	2	115	64	1	10	1	0	2	3	2	0	0	0
	745	6	412	246	3	49	5	0	7	7	4	3	0	3
900	163	0	83	58	0	16	3	0	0	3	0	0	0	0
915	196	2	98	75	1	15	0	0	0	6	0	0	0	1
930	214	1	112	64	0	25	1	0	1	6	0	0	0	4
945	208	3	102	60	1	26	3	0	2	8	2	1	0	0
	781	6	393	257	2	82	7	0	3	23	2	1	0	5
1000	180	1	93	57	2	20	1	0	1	4	0	0	0	1
1015	169	4	74	59	1	22	3	0	0	3	2	0	0	1
	349	5	167	116	3	42	4	0	1	7	2	0	0	2
[24]	15929	111	9563	4534	52	984	183	0	54	341	51	11	0	65

* Time	Grand Total	Total Cls	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
[--]	15929	111	9563	4534	52	984	183	0	54	341	51	11	0	65	

Site: [14509N] SR-111 South of SR-98
Direction: 1 - North bound, A hit first., Lane: 0
Survey Du 9:46 Tuesday, May 03, 2005 => 10:53 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\14509N08MAY2005.EC0 (Plus)
Identifier: M432HARN MC56-6 [MC55] (c)Microcom 02/03/01
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: North (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	253	1	121	110	0	16	3	0	0	1	0	0	0	1
1045	294	1	151	115	0	20	3	0	2	2	0	0	0	0
	547	2	272	225	0	36	6	0	2	3	0	0	0	1
1100	275	0	145	98	1	26	0	0	1	2	2	0	0	0
1115	290	0	129	128	0	29	2	0	0	0	2	0	0	0
1130	260	4	123	97	1	25	6	0	1	3	0	0	0	0
1145	282	1	145	109	0	22	2	0	0	2	1	0	0	0
	1107	5	542	432	2	102	10	0	2	7	5	0	0	0
1200	273	8	161	81	3	15	1	0	1	2	0	0	0	1
1215	277	2	163	92	0	17	2	0	0	0	1	0	0	0
1230	237	0	104	112	1	14	3	0	0	3	0	0	0	0
1245	263	2	147	89	0	19	3	0	0	2	1	0	0	0
	1050	12	575	374	4	65	9	0	1	7	2	0	0	1
1300	242	2	117	103	0	13	2	0	0	2	2	1	0	0
1315	268	3	137	99	0	23	1	0	1	3	1	0	0	0
1330	225	3	103	85	2	22	4	0	0	3	1	0	0	2
1345	260	0	133	103	1	19	3	0	0	1	0	0	0	0
	995	8	490	390	3	77	10	0	1	9	4	1	0	2
1400	222	1	115	77	1	26	0	0	0	2	0	0	0	0
1415	259	3	138	89	1	24	2	0	0	1	1	0	0	0
1430	229	1	113	93	0	17	1	0	0	3	1	0	0	0
1445	221	2	105	92	0	18	2	0	0	1	0	0	0	1
	931	7	471	351	2	85	5	0	0	7	2	0	0	1
1500	229	1	130	73	2	18	3	0	0	0	1	0	0	1
1515	251	3	144	79	0	21	1	0	1	0	1	0	0	1
1530	231	5	114	81	1	26	1	0	0	2	1	0	0	0
1545	217	3	108	83	2	15	3	0	0	3	0	0	0	0
	928	12	496	316	5	80	8	0	1	5	3	0	0	2
1600	221	0	130	85	0	21	1	0	1	0	0	0	0	3
1615	282	2	159	89	2	28	2	0	0	0	0	0	0	0
1630	254	3	130	103	0	13	2	0	1	1	1	0	0	0
1645	252	3	152	73	2	19	1	0	1	0	1	0	0	0
	1009	8	571	330	4	81	6	0	3	1	2	0	0	3
1700	256	1	133	102	0	15	4	0	0	1	0	0	0	0
1715	234	0	137	75	0	15	1	0	4	1	1	0	0	0
1730	259	1	153	92	0	11	1	0	0	0	1	0	0	0
1745	218	0	110	87	1	18	1	0	0	1	0	0	0	0
	967	2	533	356	1	59	7	0	4	3	2	0	0	0
1800	240	0	116	94	0	28	0	0	1	0	2	0	0	1
1815	253	0	147	89	0	14	0	0	1	0	2	0	0	0
1830	234	1	144	70	0	12	4	0	1	1	0	0	0	1
1845	239	0	149	73	0	16	1	0	0	0	0	0	0	0
	966	1	556	326	0	68	5	0	3	1	4	0	0	2
1900	224	3	132	72	1	14	0	0	2	0	0	0	0	0
1915	219	1	101	90	0	21	4	0	1	0	1	0	0	0
1930	189	1	92	68	2	22	3	0	0	0	1	0	0	0
1945	185	1	98	67	1	15	1	0	1	0	0	1	0	0
	817	6	423	297	4	72	8	0	4	0	2	1	0	0
2000	201	5	99	74	2	17	1	0	0	2	0	0	0	1
2015	188	2	109	65	0	9	2	0	0	0	1	0	0	0
2030	203	1	108	77	0	15	0	0	0	2	0	0	0	0
2045	203	0	113	76	0	13	1	0	0	0	0	0	0	0
	795	8	429	292	2	54	4	0	0	4	1	0	0	1
2100	212	0	115	85	0	10	1	0	0	0	1	0	0	0

2115	213	0	127	84	0	21	0	0	1	0	0	0	0	0
2130	168	1	99	56	1	9	1	0	0	1	0	0	0	0
2145	165	1	91	56	0	17	0	0	0	0	0	0	0	0
	758	**2**	**432**	**261**	**1**	**57**	**2**	**0**	**1**	**1**	**1**	**0**	**0**	**0**
2200	159	0	86	57	0	14	2	0	0	0	0	0	0	0
2215	156	0	80	69	0	5	2	0	0	0	0	0	0	0
2230	156	1	83	62	1	8	0	0	0	1	0	0	0	0
2245	141	0	80	47	0	11	2	0	0	0	1	0	0	0
	612	**1**	**329**	**235**	**1**	**38**	**6**	**0**	**0**	**1**	**1**	**0**	**0**	**0**
2300	95	0	52	34	0	9	0	0	0	0	0	0	0	0
2315	88	0	48	33	0	7	0	0	0	0	0	0	0	0
2330	86	1	46	36	1	2	0	0	0	0	0	0	0	0
2345	82	1	32	19	0	10	0	0	0	0	0	0	0	0
	331	**2**	**178**	**122**	**1**	**28**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0	72	1	33	29	1	8	0	0	0	0	0	0	0	0
15	51	0	23	22	0	5	0	0	0	1	0	0	0	0
30	65	0	27	24	0	12	1	0	0	1	0	0	0	0
45	38	0	22	13	0	2	1	0	0	0	0	0	0	0
	226	**1**	**105**	**88**	**1**	**27**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
100	39	0	18	15	0	4	2	0	0	0	0	0	0	0
115	53	0	31	18	0	3	1	0	0	0	0	0	0	0
130	49	0	24	17	0	7	0	0	0	1	0	0	0	0
145	41	0	19	19	0	3	0	0	0	0	0	0	0	0
	182	**0**	**92**	**69**	**0**	**17**	**3**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
200	57	2	27	19	1	6	1	0	1	0	0	0	0	0
215	80	0	37	36	0	5	0	0	0	2	0	0	0	0
230	86	0	46	32	1	5	0	0	0	2	0	0	0	0
245	93	0	53	35	0	4	1	0	0	0	0	0	0	0
	316	**2**	**163**	**122**	**2**	**20**	**2**	**0**	**1**	**4**	**0**	**0**	**0**	**0**
300	126	0	63	45	0	14	1	0	0	2	0	0	0	1
315	104	1	56	36	0	10	0	0	1	0	0	0	0	0
330	130	0	62	55	0	12	1	0	0	0	0	0	0	0
345	139	0	69	48	0	21	0	0	1	0	0	0	0	0
	499	**1**	**250**	**184**	**0**	**57**	**2**	**0**	**2**	**2**	**0**	**0**	**0**	**1**
400	176	1	87	71	0	16	0	0	0	0	0	0	0	1
415	230	1	111	95	0	21	1	0	0	1	0	0	0	0
430	206	1	98	82	0	25	0	0	0	0	0	0	0	0
445	177	0	82	76	0	17	1	0	0	1	0	0	0	0
	789	**3**	**378**	**324**	**0**	**79**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**1**
500	247	1	129	95	4	18	0	0	0	0	0	0	0	0
515	235	2	118	86	0	27	1	0	0	0	1	0	0	0
530	231	0	96	105	2	24	2	0	1	1	0	0	0	0
545	209	1	96	79	1	30	1	0	1	0	0	0	0	0
	922	**4**	**439**	**365**	**7**	**99**	**4**	**0**	**2**	**1**	**1**	**0**	**0**	**0**
600	210	1	94	84	2	25	1	0	0	2	1	0	0	0
615	212	3	96	87	0	26	0	0	0	0	0	0	0	0
630	182	0	88	80	0	13	0	0	0	0	1	0	0	0
645	192	1	84	94	0	12	0	0	1	0	0	0	0	0
	796	**5**	**362**	**345**	**2**	**76**	**1**	**0**	**1**	**2**	**2**	**0**	**0**	**0**
700	173	0	83	73	1	15	0	0	0	0	1	0	0	0
715	234	2	125	95	0	9	2	0	0	0	1	0	0	0
730	300	4	180	91	0	21	3	0	1	0	0	0	0	0
745	236	1	140	75	0	15	0	0	1	0	3	0	0	1
	943	**7**	**528**	**334**	**1**	**60**	**5**	**0**	**2**	**0**	**5**	**0**	**0**	**1**
800	257	2	120	114	0	19	0	0	0	1	1	0	0	0
815	279	0	171	89	4	14	0	0	0	0	1	0	0	0
830	251	0	145	93	0	11	2	0	0	0	0	0	0	0
845	232	3	119	89	0	18	0	0	1	3	1	0	0	0
	1019	**5**	**555**	**385**	**4**	**60**	**2**	**0**	**1**	**4**	**3**	**0**	**0**	**0**
900	263	0	152	83	2	23	2	0	1	0	0	0	0	0
915	251	2	153	75	1	18	2	0	0	0	0	0	0	0
930	244	2	135	80	0	23	0	0	1	3	0	0	0	0
945	267	0	146	98	0	19	0	0	1	3	2	0	0	0
	1025	**4**	**586**	**334**	**3**	**83**	**4**	**0**	**3**	**6**	**2**	**0**	**0**	**0**
1000	220	4	107	86	0	17	1	0	1	1	3	0	0	0
1015	277	1	164	93	0	15	1	0	0	2	1	0	0	0
	497	**5**	**271**	**179**	**0**	**32**	**2**	**0**	**1**	**3**	**4**	**0**	**0**	**0**
[24]	19027	113	10026	7036	50	1512	115	0	35	78	46	2	0	16

* Time	Grand Total	Total Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls
		1	2	3	4	5	6	7	8	9	10	11	12	13
[–]	19027	113	10026	7036	50	1512	115	0	35	78	46	2	0	16

Site: [14509S] SR-111 South of SR-98
Direction: 3 - South bound, A hit first., Lane: 0
Survey Du 9:50 Tuesday, May 03, 2005 => 11:11 Sunday, May 08, 2005
File: Z:\mcdata\LLG\2005\145\14509S08MAY2005.EC0 (Plus)
Identifier: A594KV0T MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm: Factory default
Data type: Axle sensors - Paired (Class, Speed, Count)

Profile:
Filter time: 10:30 Wednesday, May 04, 2005 => 10:30 Thursday, May 05, 2005
Included cl 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed ran 0 - 100 mph.
Direction: South (bound)
Separation All - (Headway)
Name: Factory default profile
Scheme: Vehicle classification (Scheme F99)

Time	Total	Cls 1	Cls 2	Cls 3	Cls 4	Cls 5	Cls 6	Cls 7	Cls 8	Cls 9	Cls 10	Cls 11	Cls 12	Cls 13
1030	238	0	186	38	0	10	2	0	0	2	0	0	0	0
1045	287	2	226	52	0	3	1	0	0	2	1	0	0	0
	525	**2**	**412**	**90**	**0**	**13**	**3**	**0**	**0**	**4**	**1**	**0**	**0**	**0**
1100	283	3	213	50	0	5	5	0	0	4	1	0	0	2
1115	263	4	204	38	1	8	2	0	0	2	2	0	0	2
1130	278	0	213	49	2	5	4	0	1	1	2	0	0	1
1145	294	3	231	48	0	6	3	0	1	1	1	0	0	0
	1118	**10**	**861**	**185**	**3**	**24**	**14**	**0**	**2**	**8**	**6**	**0**	**0**	**5**
1200	283	1	242	44	0	2	1	0	0	0	1	0	0	2
1215	278	2	218	48	0	2	4	0	0	1	1	0	0	2
1230	294	1	241	40	0	7	2	0	0	0	0	0	0	3
1245	293	0	241	36	0	10	4	0	0	1	0	0	0	1
	1158	**4**	**942**	**168**	**0**	**21**	**11**	**0**	**0**	**2**	**2**	**0**	**0**	**8**
1300	298	0	230	49	0	13	3	0	0	2	1	0	0	0
1315	270	1	208	50	0	5	3	0	1	1	1	0	0	0
1330	300	0	240	51	0	5	1	0	1	1	1	0	0	0
1345	282	0	223	45	0	9	0	0	0	1	2	0	0	2
	1150	**1**	**901**	**195**	**0**	**32**	**7**	**0**	**2**	**5**	**5**	**0**	**0**	**2**
1400	276	1	221	44	0	5	0	0	1	0	4	0	0	0
1415	285	0	233	43	0	5	1	0	0	2	0	0	0	1
1430	292	2	233	48	0	4	2	0	0	0	1	0	0	2
1445	284	0	212	64	0	2	4	0	0	1	1	0	0	0
	1137	**3**	**899**	**199**	**0**	**16**	**7**	**0**	**1**	**3**	**6**	**0**	**0**	**3**
1500	299	1	229	55	0	7	2	0	0	1	1	1	0	2
1515	299	0	224	56	0	6	3	0	0	0	4	0	0	6
1530	357	0	272	73	0	3	2	0	0	2	3	0	0	2
1545	285	2	224	51	0	2	4	0	0	1	0	0	0	1
	1240	**3**	**949**	**235**	**0**	**18**	**11**	**0**	**0**	**4**	**8**	**1**	**0**	**11**
1600	331	1	259	62	0	4	0	0	0	2	2	0	0	1
1615	335	2	253	68	0	5	5	0	0	1	1	0	0	0
1630	328	0	238	73	0	7	5	0	1	1	1	0	0	2
1645	350	1	274	65	0	5	3	0	0	1	0	0	0	1
	1342	**4**	**1022**	**268**	**0**	**21**	**13**	**0**	**1**	**5**	**4**	**0**	**0**	**4**
1700	333	1	258	65	0	2	1	0	0	1	3	0	0	2
1715	332	1	252	61	1	10	3	0	0	1	2	0	0	1
1730	362	0	293	58	0	4	4	0	0	0	0	0	0	3
1745	333	2	257	69	0	2	0	0	0	0	2	0	0	1
	1360	**4**	**1060**	**253**	**1**	**18**	**8**	**0**	**0**	**2**	**7**	**0**	**0**	**7**
1800	286	0	219	56	0	4	1	0	0	2	3	0	0	1
1815	311	0	243	58	0	4	1	0	1	1	3	0	0	0
1830	292	1	220	58	0	10	3	0	0	0	0	0	0	0
1845	236	4	187	38	0	3	2	0	1	0	0	1	0	0
	1125	**5**	**869**	**210**	**0**	**21**	**7**	**0**	**2**	**3**	**6**	**1**	**0**	**1**
1900	283	0	225	48	0	1	4	0	1	1	2	0	0	1
1915	261	0	215	36	0	4	1	0	0	2	2	0	0	1
1930	212	0	163	44	0	2	2	0	0	1	0	0	0	0
1945	211	1	166	37	1	0	1	0	0	4	1	0	0	0
	967	**1**	**769**	**165**	**1**	**7**	**8**	**0**	**1**	**8**	**5**	**0**	**0**	**2**
2000	183	1	146	28	0	2	3	0	0	0	2	0	0	1
2015	221	1	182	33	1	1	1	0	0	2	0	0	0	0
2030	194	1	158	31	0	1	0	0	0	0	2	0	0	1
2045	237	1	188	41	1	2	1	0	1	0	1	0	0	1
	835	**4**	**674**	**133**	**2**	**6**	**5**	**0**	**1**	**2**	**5**	**0**	**0**	**3**
2100	207	1	164	38	0	1	1	0	0	1	1	0	0	0

2115	202	0	166	30	1	2	0	0	0	2	1	0	0	0
2130	186	0	152	31	0	3	0	0	0	0	0	0	0	0
2145	176	1	131	40	0	1	2	0	0	1	0	0	0	0
	771	2	613	139	1	7	3	0	0	4	2	0	0	0
2200	177	1	146	25	1	1	2	0	0	0	0	0	0	1
2215	183	1	159	19	0	1	0	0	0	1	1	0	0	1
2230	149	0	128	19	0	1	0	0	0	1	0	0	0	0
2245	124	0	101	18	1	3	0	0	0	0	1	0	0	0
	633	2	534	81	2	6	2	0	0	2	2	0	0	2
2300	104	0	79	23	0	1	1	0	0	0	0	0	0	0
2315	108	0	91	15	0	2	0	0	0	0	0	0	0	0
2330	85	0	67	15	0	2	0	0	0	1	0	0	0	0
2345	82	0	65	12	1	2	0	0	1	0	0	1	0	0
	379	0	302	65	1	7	1	0	1	1	0	1	0	0
0	63	0	48	9	1	2	2	0	0	0	1	0	0	0
15	57	1	42	10	2	2	0	0	0	0	0	0	0	0
30	56	0	43	10	1	0	0	0	0	1	0	1	0	0
45	42	2	30	6	0	3	1	0	0	0	0	0	0	0
	218	3	163	35	4	7	3	0	0	1	1	1	0	0
100	44	0	34	10	0	0	0	0	0	0	0	0	0	0
115	34	0	23	9	1	0	1	0	0	0	0	0	0	0
130	38	1	25	6	1	2	0	0	0	0	1	0	0	0
145	32	0	28	4	0	0	0	0	0	0	0	0	0	0
	146	1	110	29	2	2	1	0	0	0	1	0	0	0
200	30	0	25	4	1	0	0	0	0	0	0	0	0	0
215	18	0	16	1	0	1	0	0	0	0	0	0	0	0
230	31	0	19	7	0	2	2	0	0	1	0	0	0	0
245	42	0	27	7	2	6	0	0	0	0	0	0	0	0
	121	0	87	19	3	9	2	0	0	1	0	0	0	0
300	26	0	19	4	0	3	0	0	0	0	0	0	0	0
315	41	0	32	8	0	1	0	0	0	0	0	0	0	0
330	24	0	19	3	0	1	0	0	0	0	1	0	0	0
345	35	0	24	8	0	3	0	0	0	0	0	0	0	0
	126	0	94	23	0	8	0	0	0	0	1	0	0	0
400	34	1	26	6	0	0	0	0	0	1	0	0	0	0
415	22	0	16	5	0	1	0	0	0	0	0	0	0	0
430	21	0	17	3	0	1	0	0	0	0	0	0	0	0
445	28	0	19	6	1	2	0	0	0	0	0	0	0	0
	105	1	78	20	1	4	0	0	0	1	0	0	0	0
500	22	0	20	2	0	0	0	0	0	0	0	0	0	0
515	31	0	23	7	0	1	0	0	0	0	0	0	0	0
530	30	0	23	5	0	1	0	0	0	0	0	0	0	1
545	39	0	33	4	0	2	0	0	0	0	0	0	0	0
	122	0	99	18	0	4	0	0	0	0	0	0	0	1
600	46	0	37	5	0	4	0	0	0	0	0	0	0	0
615	55	0	40	14	0	1	0	0	0	0	0	0	0	0
630	51	0	38	10	0	0	2	0	0	1	0	0	0	0
645	98	1	74	17	0	3	0	0	0	3	0	0	0	0
	250	1	189	46	0	8	2	0	0	4	0	0	0	0
700	84	0	66	14	0	2	1	0	0	1	0	0	0	0
715	68	0	48	16	0	3	1	0	0	0	0	0	0	0
730	113	0	95	18	1	1	0	0	0	0	0	0	0	0
745	115	1	89	21	0	1	1	0	1	0	1	0	0	0
	380	1	298	67	1	7	3	0	1	1	1	0	0	0
800	179	0	150	26	0	2	0	0	0	1	0	0	0	0
815	146	0	118	25	0	1	0	0	0	2	0	0	0	0
830	192	0	150	35	0	5	1	0	0	0	0	0	0	1
845	188	0	154	33	0	0	0	0	0	1	0	0	0	0
	705	0	572	119	0	8	1	0	0	4	0	0	0	1
900	201	1	155	34	2	4	3	0	1	1	0	0	0	0
915	198	0	149	39	0	3	3	0	1	0	1	0	0	0
930	216	1	160	47	0	4	3	0	0	0	1	0	0	0
945	213	1	156	49	0	3	3	0	0	0	1	0	0	0
	826	3	620	169	2	14	12	0	2	1	3	0	0	0
1000	214	1	166	40	1	4	1	0	0	0	1	0	0	0
1015	182	1	142	30	0	6	0	0	0	1	1	0	0	1
	396	2	308	70	1	10	1	0	0	1	2	0	0	1
[24]	17135	57	13425	3001	25	298	125	0	14	67	68	4	0	51

Time	Grand Total	Total Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls	Cls
		1	2	3	4	5	6	7	8	9	10	11	12	13
[–]	17135	57	13425	3001	25	298	125	0	14	67	68	4	0	51

Traffic Data Service Southwest
Vehicle Counts

VehicleCount-14 -- English (ENU)

Datasets:

Site:	**[04806] Dogwood Road N/O SR-98**
Direction:	5 - South bound A>B, North bound B>A., **Lane:** 0
Survey Duration:	19:05 Wednesday, March 08, 2006 => 15:18 Sunday, March 12, 2006
File:	C:\Traffic Data\MCData\LLG\2006\048\0480612MAR2006.EC0 (Plus)
Identifier:	A594KV0T MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**20:00 Wednesday, March 08, 2006 => 12:00 Friday, March 10, 2006**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range:	0 - 100 mph.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (Scheme F99)
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Vehicles = 3849 / 17377 (22.15%)

*** Wednesday, March 08, 2006 - Total=82 (Incomplete) , 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0**	**32**	**28**	**22**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	8	6	6
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	5	7	4
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	12	11	1	5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	11	4	8	5

*** Thursday, March 09, 2006 - Total=2563, 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
20	**8**	**14**	**33**	**63**	**132**	**174**	**194**	**178**	**145**	**149**	**156**	**152**	**154**	**173**	**187**	**126**	**147**	**123**	**84**	**45**	**51**	**38**	**17**	
6	3	2	2	16	32	40	41	**38**	30	31	32	37	42	39	**43**	29	38	27	20	15	13	14	3	4
4	0	4	12	9	23	38	41	**46**	42	43	32	43	45	40	**49**	18	24	38	23	10	10	13	5	4
5	3	5	10	29	35	53	**51**	47	40	42	46	31	29	42	**44**	33	43	29	21	8	14	6	6	1
5	2	3	9	9	42	43	**61**	47	33	33	46	41	38	**52**	51	46	42	29	20	12	14	5	3	4

AM Peak 0730 - 0830 (196), AM PHF=0.80 PM Peak 1445 - 1545 (188), PM PHF=0.90

*** Friday, March 10, 2006 - Total=1204 (Incomplete) , 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
13	**10**	**18**	**20**	**61**	**117**	**172**	**161**	**178**	**159**	**143**	**152**	-	-	-	-	-	-	-	-	-	-	-	-	
4	5	2	3	14	21	29	31	48	35	39	35	-	-	-	-	-	-	-	-	-	-	-	-	-
4	3	6	3	15	22	46	32	44	36	39	40	-	-	-	-	-	-	-	-	-	-	-	-	-
1	2	7	8	19	42	44	47	46	43	36	31	-	-	-	-	-	-	-	-	-	-	-	-	-
4	0	3	6	13	32	53	51	40	45	29	46	-	-	-	-	-	-	-	-	-	-	-	-	-

2563 + 3137 = 5700

Traffic Data Service Southwest
Vehicle Counts

VehicleCount-15 -- English (ENU)

Datasets:

Site:	**[04806] Dogwood Road N/O SR-98**
Direction:	5 - South bound A>B, North bound B>A., **Lane:** 0
Survey Duration:	19:05 Wednesday, March 08, 2006 => 15:18 Sunday, March 12, 2006
File:	C:\Traffic Data\MCData\LLG\2006\048\0480612MAR2006.EC0 (Plus)
Identifier:	A594KV0T MC56-1 [MC55] (c)Microcom 07/06/99
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**20:00 Wednesday, March 08, 2006 => 12:00 Friday, March 10, 2006**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range:	0 - 100 mph.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (Scheme F99)
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Vehicles = 4258 / 17377 (24.50%)

*** Wednesday, March 08, 2006 - Total=196 (Incomplete) , 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0**	**69**	**77**	**50**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	12	14	14
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	18	36	12	5
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	31	19	10	8
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	20	10	14	10

*** Thursday, March 09, 2006 - Total=3137, 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
37	**21**	**15**	**22**	**18**	**44**	**65**	**73**	**129**	**118**	**163**	**173**	**169**	**161**	**217**	**322**	**373**	**333**	**196**	**151**	**114**	**101**	**69**	**53**	
14	5	3	1	3	8	12	16	48	29	39	38	**35**	36	60	81	84	**80**	40	33	35	28	20	16	11
5	10	3	6	5	14	11	21	30	32	40	40	**39**	36	52	86	101	**119**	61	49	20	23	13	13	9
8	5	3	5	5	9	17	19	25	33	36	49	**57**	43	47	64	**88**	74	57	39	28	29	22	15	4
10	1	6	10	5	13	25	17	26	24	48	**46**	38	46	58	91	**100**	60	38	30	31	21	14	9	6

AM Peak 1145 - 1245 (177), AM PHF=0.78 PM Peak 1630 - 1730 (387), PM PHF=0.81

*** Friday, March 10, 2006 - Total=925 (Incomplete) , 15 minute drops**

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
30	**22**	**17**	**19**	**30**	**47**	**59**	**92**	**134**	**130**	**150**	**195**	-	-	-	-	-	-	-	-	-	-	-	-	
11	8	6	3	12	11	9	19	35	36	31	57	-	-	-	-	-	-	-	-	-	-	-	-	-
9	5	5	5	4	13	18	17	36	28	35	38	-	-	-	-	-	-	-	-	-	-	-	-	-
4	5	2	2	4	9	21	24	30	29	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-
6	4	4	9	10	14	11	32	33	37	34	50	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX C

EXISTING SIGNAL TIMING PLANS

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	12	1	12	1	12	1	12	CLK RST
1	DONT WALK	1	19	1	18	1	19	1	18	
2	MIN GREEN	5	5	5	5	8	5	5	5	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	PASSAGE	2.0	5.6	2.0	2.0	4.0	5.6	2.0	2.0	
6	MAX GAP	2.0	7.0	2.0	2.0	4.0	7.0	2.0	2.0	
7	MIN GAP	2.0	2.0	2.0	2.0	4.0	2.0	2.0	2.0	
8	MAX EXT	20	35	20	30	20	35	20	30	
9	MAX 2							35		YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	DOW
D	EVERY	1.0	0.6	1.0	1.0	1.0	0.6	1.0	1.0	HR
E	YELLOW	3.2	4.3	3.2	4.0	3.2	4.3	3.2	4.0	MIN
F	RED	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	SEC
	PED XING FT		97		83		97		83	

PRE-EMPTION E		F FLAGS	1	2	3	4	5	6	7	8	
EV SEL	0	PERMIT	1	2	3	4	5	6	7	8	0
RR1 CLR	15	RED LOCK	1	2	3	4	5	6	7	8	1
EVA DLY	0	YEL LOCK									2
EVA CLR	5	V RECALL		2				6			3
EVB DLY	0	P RECALL									4
EVB CLR	5	PED PHASES		2		4		6		8	5
EVC DLY	0	RT OLA									6
EVC CLR	5	RT OLB									7
EVD DLY	0	DBL ENTRY									8
EVD CLR	5	MAX 2 PHASES							7		9
MAX EV	255	LAG PHASES	READ ONLY								A
RR2 CLR	15	RED REST									B
		REST-IN-WALK									C
		MAX 3 PHASES									D
		YEL START UP		2				6			E
		FIRST PHASE			3				7		F
			1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FC0	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

SWB

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

Cycle Length in "Free" 144 seconds								
Phases	1	2	3	4	5	6	7	8
Phase Total Green Time	25	40	25	35	28	40	25	35
Phase Yellow/Red	4.2	5.3	4.2	5.0	4.2	5.3	4.2	5.0
Total Phase Time	29.2	45.3	29.2	40.0	32.2	45.3	29.2	40.0
% of cycle	20%	32%	20%	28%	22%	32%	20%	28%

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TIME OF DAY ACTIVITY TABLE

7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS

	HR	MIN	ACT	ON OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	07	30	2	ON		2	3	4	5	6	
1	08	30	2			2	3	4	5	6	
2	14	30	2	ON		2	3	4	5	6	
3	15	30	2			2	3	4	5	6	
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED
7 ENERGIZE AUX OUTPUT-GREEN
8 ENERGIZE AUX OUTPUT-YELLOW
9 TIME OF DAY MAX RECALL (1ST SELECT)

F+C+F+1+2+3+E+B+ E+PHASES or TYPE+EVENT NO.

		PHASES C		TYPE D			PHASES E		TYPE F	
0	I1	1		5,6		J1	5		5,6	
1	I2U	2		5,6		J2U	6		5,6	
2	I2L	2		5,6		J2L	6		5,6	
3	I3U	2		5,6		J3U	6		5,6	
4	I3L	2		5		J3L	6		5	
5	I4	2		7,8	5	J4	6		7,8	5
6	I5	3		5,6		J5	7		5,6	
7	I6U	4	7	5,6		J6U	8		5,6	
8	I6L	4		5,6		J6L	8		5,6	
9	I7U	4		5,6		J7U	8		5,6	
A	I7L	4		5		J7L	8	3	5	
B	I8	4		7,8		J8	8		7,8	
C	I9U	1		5,6		J9U	5		5,6	
D	I9L	3		5,6		J9L	7		5,6	

REASSIGNS DETECTORS TO VARIOUS PHASES / FUNCTIONS

F-C-F MUST EQUAL ZERO WHEN FINISHED

LOWER CASE NUMBERS ARE DEFAULT VALUES

BLANK SPACES CONTAIN DEFAULTS (DO NOT ZERO OUT)

ACTIVITY CODE CONTINUED

A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

DETECTOR SETTINGS

I FILE					J FILE				
	DELAY	CARRYOVER				DELAY	CARRYOVER		
I1	D10	2.0	D30		J1	D20		D40	
I2U	D11	2.0	D31	1.0	J2U	D21	2.0	D41	1.0
I2L	D12		D32		J2L	D22		D42	
I3U	D13		D33		J3U	D23		D43	
I3L	D14		D34		J3L	D24		D44	
I4	D15		D35		J4	D25		D45	
I5	D16		D36		J5	D26		D46	
I6U	D17	2.0	D37		J6U	D27		D47	
I6L	D18		D38		J6L	D28		D48	
I7U	D19		D39		J7U	D29	7.0	D49	
I7L	D1A	7.0	D3A		J7L	D2A	2.0	D4A	
I8	D1B		D3B		J8	D2B		D4B	
I9U	D1C		D3C		J9U	D2C		D4C	
I9L	D1D		D3D		J9L	D2D		D4D	

DETECTOR TYPE

1 RED LOCK
2 YELLOW LOCK
5 EXTENSION
6 COUNT
7 CALLING
8 TYPE 3 DISCONNECT

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NOTE:

1. RS TYPE 19, 25'sma, 8'lma, 200W hps, SV-1-T, MAS.
2. RS TYPE 19, 30'sma, 12'lma, 200W hps, SV-1-T, MAS, SP-1-T.
3. EXISTING 3-SECTION SIGNAL HEAD (12"). REPLACE ALL CIRCULAR LENSES WITH ARROW INDICATIONS. REWIRE FOR PHASE DESIGNATION INDICATED.
4. INSTALL STATE-FURNISHED R73-2 SIGN ON SIGNAL MAST ARM. DETAIL "U" REQUIRED. SEE ES-6T.
5. INSTALL STATE-FURNISHED G7 SIGN ON SIGNAL MAST ARM.
6. RS TYPE I PEDESTRIAN BARRICADE.
7. TERMINATE EVDLC IN RED SECTION . LEAVE ONE FOOT OF SLACK. TAPE ENDS WATER TIGHT.

CONDUIT NOTES:

1. 2" C REUSE CONDUCTORS FROM 2.
2. EX. 2" C 1-12/14, 2*10(L), 1 EVDLC
   RR ALL EX. CONDUCTORS. ABANDON CONDUIT.
3. NAC EX. 2 1/2" C 1-12/14, 2*10(L), 1 dlc 1 EVDLC
4. NAC EX. 3" C 2-3/14, 2-12/14, 2*8(fb) 4 dlc, 1 EVDLC
5. NAC EX. 2-3" C 5-3/14, 5-12/14, 2*10(L) 2*8(fb), 6 dlc, 3 EVDLC
6. NAC EX. 2-2½" C 3-3/14, 3-12/14, 2*10(L) 5 dlc
7. NAC 3-3" C 8-3/14, 8-12/14, 2*6(SERVICE) 14 dlc, 4 EVDLC
8. NAC EX. 2" C 1-3/14, 1-12/14 2 dlc
9. NAC EX. 2½" C 2-3/14, 2-12/14, 2*10(L) 2 dlc, 1 EVDLC
10. EX. 2" C 1-3/14, 1-12/14, 2*10(L) 1 EVDLC
    RR ALL EX. CONDUCTORS. ABANDON CONDUIT.
11. 2" C REUSE CONDUCTORS FROM 10.
12. NAC EX. 2½" C 2-3/14, 2-12/14, 2*10(L) 4 dlc

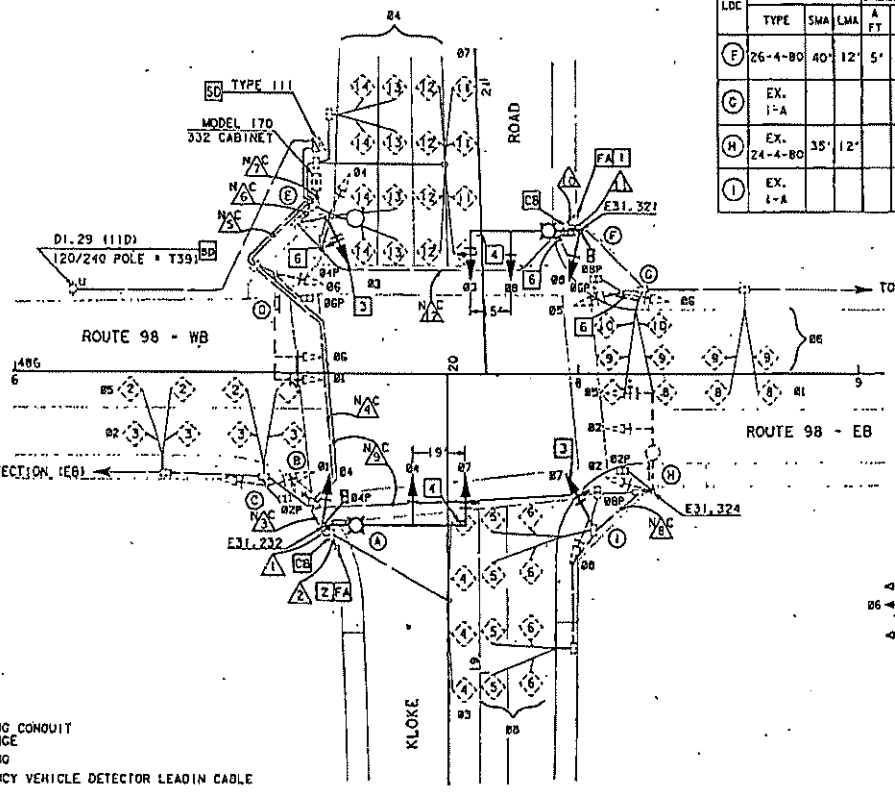
LEGEND:

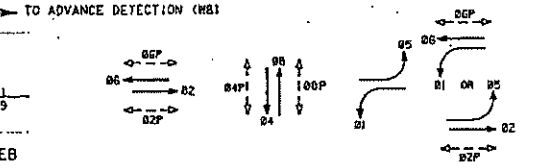
- NAC - EXISTING CONDUIT NO CHANGE
- L - LIGHTING
- EVDLC - EMERGENCY VEHICLE DETECTOR LEADIN CABLE
- 3/14 - THREE CONDUCTOR CABLE
- 12/14 - TWELVE CONDUCTOR CABLE
- T - SIGN PANEL

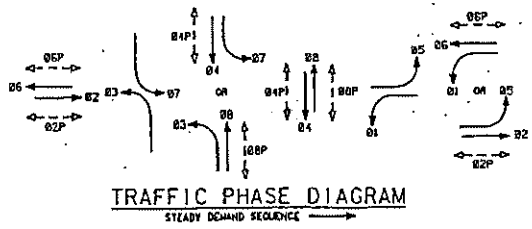
EQUIPMENT AND POLE SCHEDULE (ALL SIGNAL HEADS SHALL BE 12")

LOC	STANDARD TYPE	SMA	LMA	PLACEMENT DIMENSIONS A FT	B FT	SIGNAL MOUNTING AND PLACEMENT VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	REMARKS
A	29-5-80	50'	15'	26'	7½'	SV-1-T	MAS-84 7 MAT-07	SP-1-T		200W HPS 4 REUSE EXIST. G7 SIGN
B	EX. PPB POST									NO WORK REQUIRED.
C	EX. 1-A									NO WORK REQUIRED.
D	EX. 23-4-80	35'								5
E	EX. 15		12'			SV-2-T 3				

LOC	STANDARD TYPE	SMA	LMA	PLACEMENT DIMENSIONS A FT	B FT	SIGNAL MOUNTING AND PLACEMENT VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	REMARKS
F	26-4-80	40'	12'	5'	9½'	SV-1-T	MAS-88 7 MAT-83	SP-1-T		200W HPS 4 5
C	EX. 1-A									NO WORK REQUIRED.
H	EX. 24-4-80	35'	12'							NO WORK REQUIRED.
I	EX. 1-A					TV-2-T 3				







SIGNAL AND LIGHTING

SCALE: 1"=20'

NOTE : THIS PLAN ACCURATE FOR ELECTRICAL WORK ONLY

DIST	COUNTY	ROUTE	TOTAL PROJECT	NO. SHEETS
11	IMP	98	31.3	2	2

REGISTERED ELECTRICAL ENGINEER — R. J. WILSON No. 13750 Exp. 6-30-05 ELECTRICAL STATE OF CALIFORNIA

PLANS APPROVAL DATE

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DATE	REVISED BY	DATE REVISED
12/94	ALD	DJW

CALCULATED/DESIGNED BY — CHECKED BY

PROJECT ENGINEER: D J WILSON

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans TRAFFIC ELECTRICAL

E-1

LAST REVISED 00-00-00

FORM DC-OE-82-MF (REV. 3/96)

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 2 3

MC 94-027 | CU 11221 | EA 309301

10/25/2005 14:22 FAX 8584673026 CALTRANS TRAF ADMIN 005

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	10		1	1	10		10	CLK RST
1	DONT WALK	1	13		1	1	15		22	
2	MIN GREEN	5	5		5	5	5		5	
3	TYPE 3 DET	0	0		0	0	0		0	
4	ADD/VEH	0.0	0.0		0.0	0.0	0.0		0.0	
5	PASSAGE	2.0	2.0		2.0	2.0	2.0		2.0	
6	MAX GAP	2.0	2.0		2.0	2.0	2.0		2.0	
7	MIN GAP	2.0	2.0		2.0	2.0	2.0		2.0	
8	MAX EXT	20	40		25	20	40		25	
9	MAX 2									YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.0		0.0	0.0	0.0		0.0	DOW
D	EVERY	1.0	1.0		1.0	1.0	1.0		1.0	HR
E	YELLOW	3.2	4.3		3.6	3.2	4.3		3.6	MIN
F	RED	1.0	1.0		1.0	1.0	1.0		1.0	SEC
	PED XING FT		53				61		90	

	PRE-EMPTION E		F FLAGS	1	2	3	4	5	6	7	8	
	EV SEL	0	PERMIT	1	2		4	5	6		8	0
	RR1 CLR	15	RED LOCK	1	2		4	5	6		8	1
	EVA DLY	0	YEL LOCK									2
	EVA CLR	5	V RECALL		2				6			3
	EVB DLY	0	P RECALL									4
	EVB CLR	5	PED PHASES		2				6		8	5
	EVC DLY	0	RT OLA									6
	EVC CLR	5	RT OLB									7
	EVD DLY	0	DBL ENTRY				4				8	8
	EVD CLR	5	MAX 2 PHASES									9
	MAX EV	255	LAG PHASES	READ ONLY								A
	RR2 CLR	15	RED REST									B
			REST-IN-WALK									C
			MAX 3 PHASES									D
			YEL START UP		2				6			E
			FIRST PHASE				4				8	F
				1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

SWB

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

Cycle Length in "Free" 114 seconds								
Phases	1	2	3	4	5	6	7	8
Phase Total Green Time	25	45	0	30	25	45	0	30
Phase Yellow/Red	4.2	5.3	0.0	4.6	4.2	5.3	0.0	4.6
Total Phase Time	29.2	50.3	0.0	34.6	29.2	50.3	0.0	34.6
% of cycle	26%	44%	0%	30%	26%	44%	0%	30%

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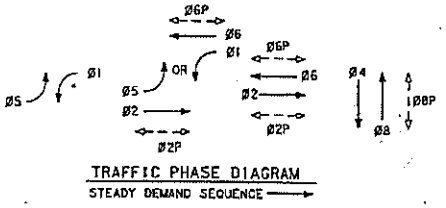
10/25/2005 14:24 FAX 8584673026 CALTRANS TRAF ADMN 007

POLE AND EQUIPMENT SCHEDULE
ALL SIGNAL SECTIONS SHALL BE 300 mm.

LOC	STANDARD TYPE	SMA (m)	LMA (m)	ATTACHMENT DIMENSIONS A (m)	B (m)	SIGNAL MOUNTING AND PLACEMENT VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	REMARKS
(A)	29-5-129	15.2	3.7	PER PLAN		SV-2-TD	1-MAT 1-MAS	SP-1-T	Ø6P	SNS "EADY Ave" 200 W HPS
(B)	17-2-129	9.1	3.7	PER PLAN	2.0	SV-2-TD	1-MAS	SP-2-T	Ø6P Ø8P	SNS 200 W HPS
(C)	19-3-129	10.7	3.7	PER PLAN		SV-2-TD	1-MAT 1-MAS	SP-2-T		SNS "EADY Ave" 200 W HPS
(D)	17-2-129	6.1	3.7	1.0	4.0	SV-2-TD	1-MAS	SP-1-T	Ø2P	SNS 200 W HPS, PEU
(E)	STATE FURNISHED MODEL 170 CONTROLLER ASSEMBLY (TYPE 332 CABINET)									
(F)	TYPE III-BF SERVICE EQUIPMENT ENCLOSURE CABINET (SEE WIRING DIAGRAM SHEET E-3) CONDUIT PER IID REQUIREMENT.									



TRAFFIC PHASE DIAGRAM
STEADY DEMAND SEQUENCE →

Caltrans Metric

DIST	COUNTY	ROUTE	TOTAL PROJECT	NO.	SHEETS
11	Imp	98	50.9/51.7	17	21

Enrique P. Bernal 01-21-00
REGISTERED ELECTRICAL ENGINEER
3-20-00
PLANS APPROVAL DATE
E. P. BERNAL 15675 R-30-02 ELECTRICAL STATE OF CALIFORNIA
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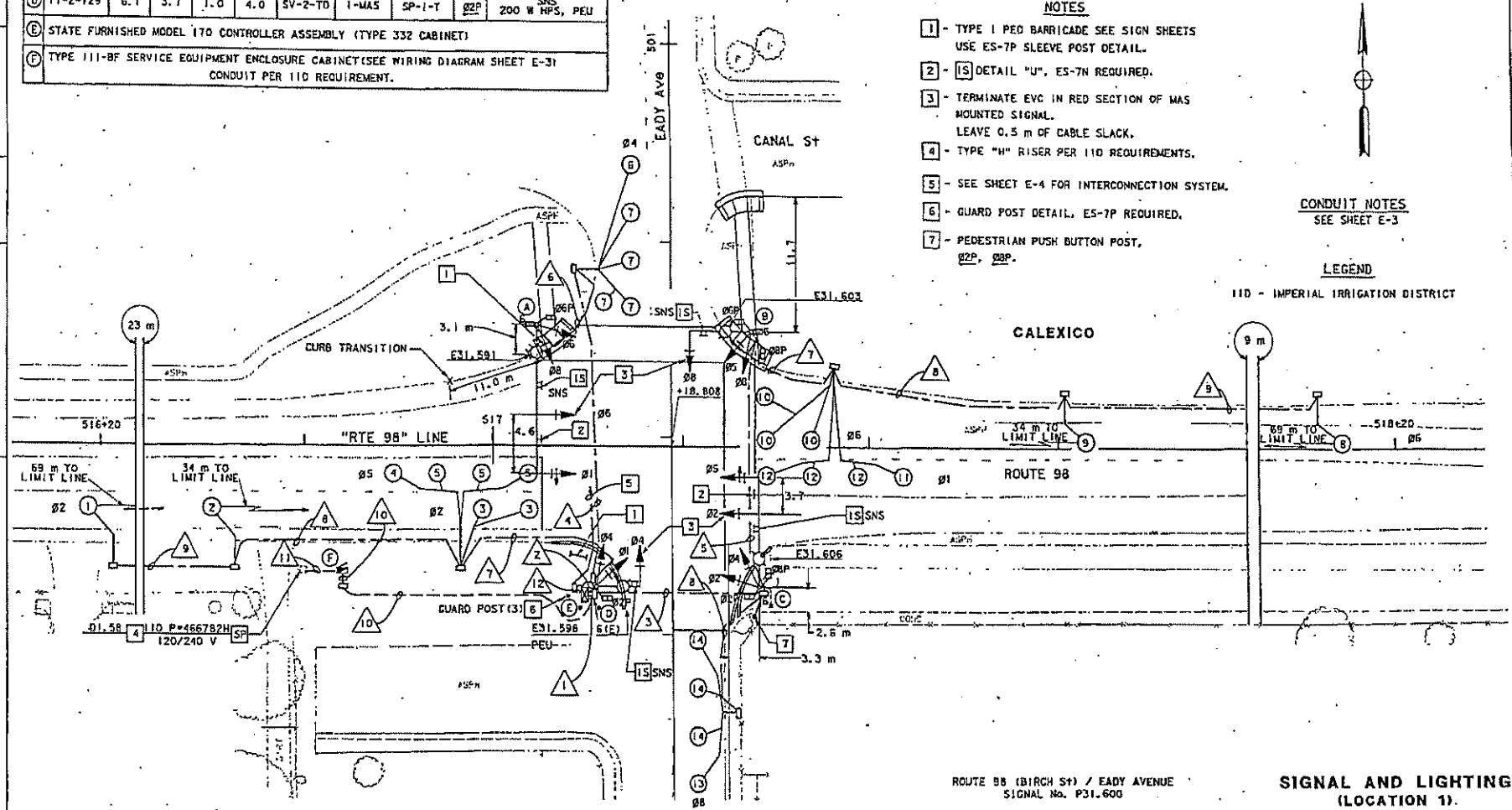
Caltrans now has a web site! To get to the web site, go to http://www.dot.ca.gov

NOTES
1. TYPE I PED BARRICADE SEE SIGN SHEETS USE ES-7P SLEEVE POST DETAIL.
2. IS DETAIL "U", ES-7N REQUIRED.
3. TERMINATE EVC IN RED SECTION OF MAS MOUNTED SIGNAL. LEAVE 0.5 m OF CABLE SLACK.
4. TYPE "H" RISER PER IID REQUIREMENTS.
5. SEE SHEET E-4 FOR INTERCONNECTION SYSTEM.
6. GUARD POST DETAIL, ES-7P REQUIRED.
7. PEDESTRIAN PUSH BUTTON POST, Ø2P, Ø8P.

CONDUIT NOTES
SEE SHEET E-3

LEGEND
IID - IMPERIAL IRRIGATION DISTRICT



ROUTE 98 (BIRCH St) / EADY AVENUE
SIGNAL No. P31.600

SIGNAL AND LIGHTING (LOCATION 1).

NOTE : THIS PLAN ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

SCALE 1:200

E-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans TRAFFIC ELECTRICAL
PROJECT ENGINEER E. P. BERNAL
CALCULATED/DESIGNED BY JJH
CHECKED BY
DATE REVISED BY
DATE REVISED
LAST REVISION 01-21-00 DATE PLOTTED => 3-Apr-2000 TIME PLOTTED => 16:34

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80
USERNAME => YYNOCIOS
DGN FILE => 11-157861-0017_03095043
CU 11393
EA 157861

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	7	1	7	1	7			CLK RST
1	DONT WALK	1	14	1	21	1	16			
2	MIN GREEN	5	5	5	5	5	5			
3	TYPE 3 DET	0	0	0	0	0	0			
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0			
5	PASSAGE	2.0	2.0	2.0	2.0	2.0	2.0			
6	MAX GAP	2.0	2.0	2.0	2.0	2.0	2.0			
7	MIN GAP	2.0	2.0	2.0	2.0	2.0	2.0			
8	MAX EXT	20	35	25	25	20	35			
9	MAX 2						65			YR
A	MAX 3			35	55					MO
B										DAY
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0			DOW
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0			HR
E	YELLOW	3.2	4.3	4.0	4.0	3.2	4.3			MIN
F	RED	1.0	1.0	1.0	1.0	1.0	1.0			SEC
	PED XING FT		56		86		72			

	PRE-EMPTION E	
	EV SEL	0
	RR1 CLR	15
	EVA DLY	0
	EVA CLR	5
	EVB DLY	0
	EVB CLR	5
	EVC DLY	0
	EVC CLR	5
	EVD DLY	0
	EVD CLR	5
	MAX EV	255
	RR2 CLR	15

F FLAGS	1	2	3	4	5	6	7	8	
PERMIT	1	2	3	4	5	6			0
RED LOCK	1	2	3	4	5	6			1
YEL LOCK									2
V RECALL		2				6			3
P RECALL									4
PED PHASES		2		4		6			5
RT OLA									6
RT OLB									7
DBL ENTRY									8
MAX 2 PHASES						6			9
LAG PHASES	READ ONLY								A
RED REST									B
REST-IN-WALK									C
MAX 3 PHASES			3	4					D
YEL START UP		2				6			E
FIRST PHASE				4					F
	1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FC0	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

SWB

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

Cycle Length in "Free"	145 seconds							
Phases	1	2	3	4	5	6	7	8
Phase Total Green Time	25	40	30	30	25	40	0	0
Phase Yellow/Red	4.2	5.3	5.0	5.0	4.2	5.3	0.0	0.0
Total Phase Time	29.2	45.3	35.0	35.0	29.2	45.3	0.0	0.0
% of cycle	20%	31%	24%	24%	20%	31%	0%	0%

10/25/2005 14:25 FAX 8584673026 CALTRANS TRAF ADMN 008

		CONTROL PLANS									Y-COORD			LAG PHASE		FLAG									
		1	2	3	4	5	6	7	8	9		C	D	E		F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH	120	130	140												LAG FZ FREE		2	3			6		8	0
1	FZ1 GRN FCTR	12	15	15										GAPOUT CP1	1	LAG FZ CP 1		2	3		5			8	1
2														GAPOUT CP2	1	LAG FZ CP 2		2	3		5			8	2
3	FZ3 GRN FCTR	20	20	20										GAPOUT CP3	1	LAG FZ CP 3		2	3		5			8	3
4	FZ4 GRN FCTR	20	30	30							PERM TIME			GAPOUT CP4	1	LAG FZ CP 4									4
5	FZ5 GRN FCTR	15	15	15							LAG OFFSET			GAPOUT CP5	1	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	1	LAG FZ CP 6									6
7	FZ7 GRN FCTR	0	0	0							LONG GRN			GAPOUT CP7	1	LAG FZ CP 7									7
8	FZ8 GRN FCTR	0	0	0							NO GREEN			GAPOUT CP8	1	LAG FZ CP 8									8
9	MULTI CYCLE	0	0	0										GAPOUT CP9	1	LAG FZ CP 9									9
A	OFFSET A	45	55	56							OFFSET					LAG C COORD									A
B	OFFSET B															LAG D COORD									B
C	OFFSET C															COORD FAZES		2				6			C
D	FZ 3 EXT																								D
E	FZ 7 EXT																								E
F	OFFSET INTRPT																								F
																	1	2	3	4	5	6	7	8	

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0	08	30	1	A	1	2	3	4	5	6	7
1	15	00	E		1	2	3	4	5	6	7
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

C01 MANUAL CP
C02 MASTER CP
C03 CURRENT CP
C04 LAST CP
C07 TRNSMT CP
C0D MANUAL OFFSET
CA0 LOCAL CYCLE TIMER
CB0 MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1	1	1
2	2	
3	4	
4	8	8
5	16	
6	32	
7		
8		

C00 = 9

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

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D PAGE

	D MAX RCL	FLAGS 1	2	3	4	5	6	7	8	E MIN RCL	FLAGS 1	2	3	4	5	6	7	8	F PED RCL	FLAGS 1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1					5				CP 1								
2	CP 2									CP 2					5				CP 2								
3	CP 3									CP 3					5				CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E FUNCTION	FLAGS 1	2	3	4	5	6	7	8	F FUNCTION	FLAGS 1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4																			4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

D-E-E = C8 VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

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TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
				ON	S	M	T	W	T	F	S
	HR	MIN	ACT	OFF	1	2	3	4	5	6	7
0	15	00	E	ON	1	2	3	4	5	6	7
1	18	00	E		1	2	3	4	5	6	7
2	15	15	2	ON		2	3	4	5	6	
3	17	30	2			2	3	4	5	6	
4	11	00	3	ON				4			
5	17	00	3					4			
6	10	00	E	ON				4			
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED
7 ENERGIZE AUX OUTPUT-GREEN
8 ENERGIZE AUX OUTPUT-YELLOW
9 TIME OF DAY MAX RECALL (1ST SELECT)

F+C+F+1+2+3+E+B+ E+PHASES or TYPE+EVENT NO.										
		PHASES		TYPE			PHASES		TYPE	
		C		D			E		F	
0	I1	1		5,6		J1	5		5,6	
1	I2U	2		5,6		J2U	6		5,6	
2	I2L	2		5,6	5	J2L	6		5,6	
3	I3U	2		5,6		J3U	6		5,6	
4	I3L	2		5		J3L	6		5	5,6
5	I4	2		7,8		J4	6		7,8	5
6	I5	3		5,6		J5	7		5,6	
7	I6U	4		5,6		J6U	8	3	5,6	
8	I6L	4		5,6	5	J6L	8	3	5,6	5
9	I7U	4		5,6		J7U	8	3	5,6	
A	I7L	4		5		J7L	8	3	5	
B	I8	4		7,8	5	J8	8		7,8	
C	I9U	1		5,6		J9U	5		5,6	
D	I9L	3	1	5,6	5	J9L	7	5	5,6	5

DETECTOR SETTINGS									
I FILE					J FILE				
DELAY		CARRYOVER			DELAY		CARRYOVER		
I1	D10		D30		J1	D20		D40	
I2U	D11		D31	1.0	J2U	D21		D41	
I2L	D12		D32		J2L	D22		D42	
I3U	D13		D33		J3U	D23		D43	1.0
I3L	D14		D34		J3L	D24		D44	1.0
I4	D15		D35		J4	D25		D45	
I5	D16		D36		J5	D26		D46	
I6U	D17		D37		J6U	D27		D47	
I6L	D18		D38		J6L	D28		D48	
I7U	D19		D39		J7U	D29		D49	
I7L	D1A		D3A		J7L	D2A		D4A	
I8	D1B		D3B		J8	D2B		D4B	
I9U	D1C		D3C		J9U	D2C		D4C	
I9L	D1D		D3D		J9L	D2D		D4D	

REASSIGNS DETECTORS TO VARIOUS PHASES / FUNCTIONS

F-C-F MUST EQUAL ZERO WHEN FINISHED

LOWER CASE NUMBERS ARE DEFAULT VALUES

BLANK SPACES CONTAIN DEFAULTS (DO NOT ZERO OUT)

ACTIVITY CODE CONTINUED

A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

DETECTOR TYPE

1 RED LOCK
2 YELLOW LOCK
5 EXTENSION
6 COUNT
7 CALLING
8 TYPE 3 DISCONNECT

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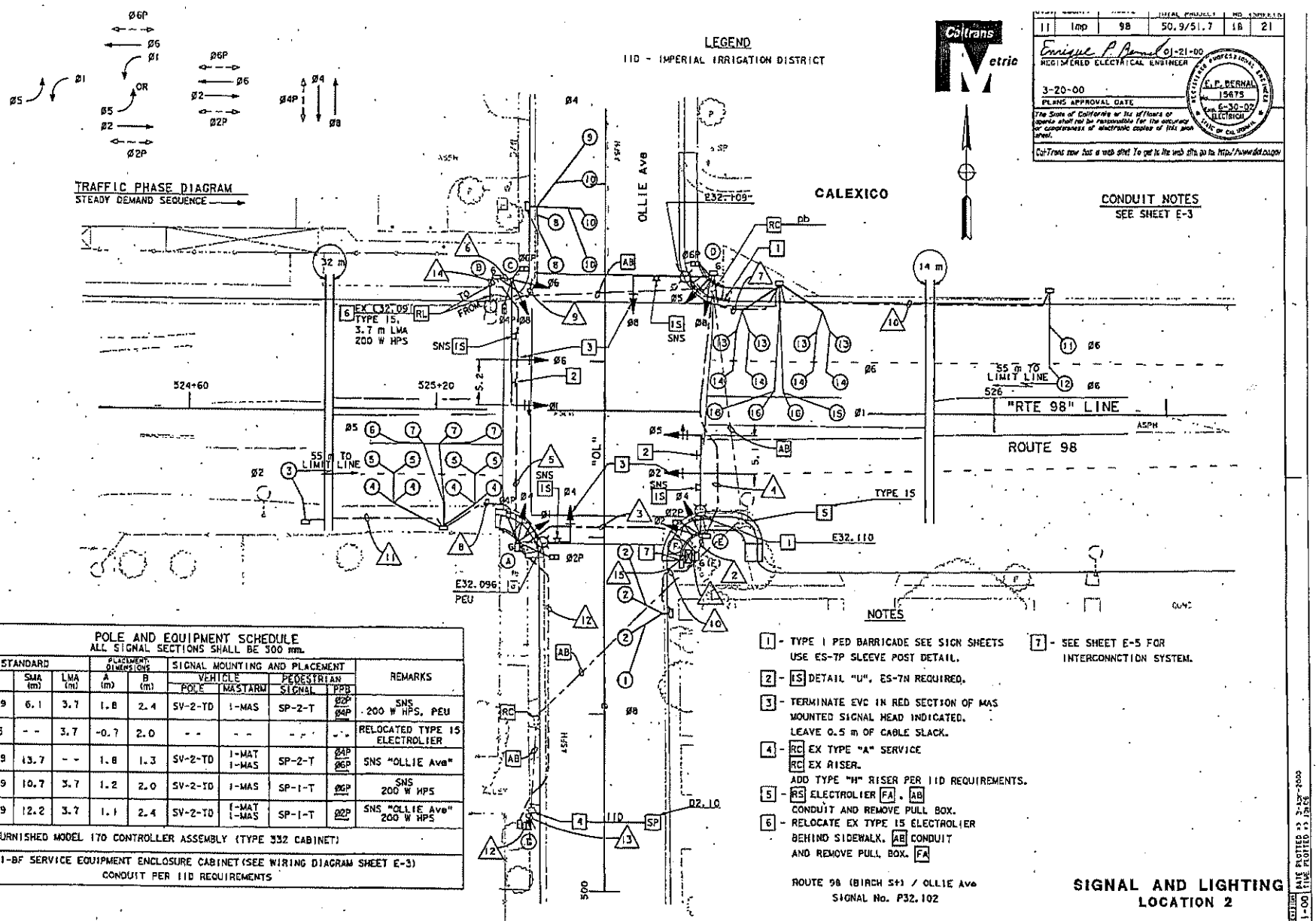

POLE AND EQUIPMENT SCHEDULE
ALL SIGNAL SECTIONS SHALL BE 300 mm.

Loc	STANDARD TYPE	SMA (m)	LMA (m)	PLACEMENT DIMENSIONS A (m)	B (m)	SIGNAL MOUNTING AND PLACEMENT VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PED PPB	REMARKS
(A)	17-2-129	6.1	3.7	1.8	2.4	SV-2-TD	1-MAS	SP-2-T	Ø2P Ø4P	SNS 200 W HPS, PEU
(B)	TYPE 15	- -	3.7	-0.7	2.0	- -	- -	- - -	- -	RELOCATED TYPE 15 ELECTROLIER
(C)	27-4-129	13.7	- -	1.8	1.3	SV-2-TD	1-MAT 1-MAS	SP-2-T	Ø4P Ø6P	SNS "OLLIE Ave"
(D)	24-3-129	10.7	3.7	1.2	2.0	SV-2-TD	1-MAS	SP-1-T	Ø6P	SNS 200 W HPS
(E)	26-4-129	12.2	3.7	1.1	2.4	SV-2-TD	1-MAT 1-MAS	SP-1-T	Ø2P	SNS "OLLIE Ave" 200 W HPS
(F)	STATE FURNISHED MODEL 170 CONTROLLER ASSEMBLY (TYPE 332 CABINET)									
(G)	TYPE 111-BF SERVICE EQUIPMENT ENCLOSURE CABINET (SEE WIRING DIAGRAM SHEET E-3) CONDUIT PER IID REQUIREMENTS									

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	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9
0	WALK	1	5	1	5	1	5	1	5	CLK RST
1	DONT WALK	1	21	1	21	1	23	1	23	
2	MIN GREEN	5	5	5	5	5	5	5	5	
3	TYPE 3 DET	0	0	0	0	0	0	0	0	
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	
5	PASSAGE	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
6	MAX GAP	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
7	MIN GAP	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
8	MAX EXT	20	35	20	35	20	35	20	35	
9	MAX 2								65	YR
A	MAX 3									MO
B										DAY
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR
E	YELLOW	3.2	3.6	3.2	3.6	3.2	3.6	3.2	3.6	MIN
F	RED	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	.SEC
	PED XING FT		104		103		113		109	

PRE-EMPTION E		F FLAGS	1	2	3	4	5	6	7	8	
EV SEL	0	PERMIT	1	2	3	4	5	6	7	8	0
RR1 CLR	15	RED LOCK	1	2	3	4	5	6	7	8	1
EVA DLY	0	YEL LOCK									2
EVA CLR	5	V RECALL				4				8	3
EVB DLY	0	P RECALL									4
EVB CLR	5	PED PHASES		2		4		6		8	5
EVC DLY	0	RT OLA									6
EVC CLR	5	RT OLB									7
EVD DLY	0	DBL ENTRY									8
EVD CLR	5	MAX 2 PHASES								8	9
MAX EV	255	LAG PHASES	READ ONLY								A
RR2 CLR	15	RED REST									B
		REST-IN-WALK									C
		MAX 3 PHASES									D
		YEL START UP		2				6			E
		FIRST PHASE			3				7		F
			1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	26
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FDO TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

SWB

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

Cycle Length in "Free" 150 seconds								
Phases	1	2	3	4	5	6	7	8
Phase Total Green Time	25	40	25	40	25	40	25	40
Phase Yellow/Red	4.7	5.1	4.7	5.1	4.7	5.1	4.7	5.1
Total Phase Time	29.7	45.1	29.7	45.1	29.7	45.1	29.7	45.1
% of cycle	20%	30%	20%	30%	20%	30%	20%	30%

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CALTRANS C8

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C PAGE

9 PAGE C09 = 0 or 1

		CONTROL PLANS									Y-COORD			LAG PHASE		FLAG									
		1	2	3	4	5	6	7	8	9		C	D	E		F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH	120	130	140												LAG FZ FREE		2		4		6		8	0
1	FZ1 GRN FCTR	25	25	25										GAPOUT CP1	1	LAG FZ CP 1	1			4		6	7		1
2														GAPOUT CP2	1	LAG FZ CP 2	1			4		6	7		2
3	FZ3 GRN FCTR	15	20	20										GAPOUT CP3	1	LAG FZ CP 3	1			4		6	7		3
4	FZ4 GRN FCTR	25	25	25							PERM TIME			GAPOUT CP4	1	LAG FZ CP 4									4
5	FZ5 GRN FCTR	20	25	25							LAG OFFSET			GAPOUT CP5	1	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	1	LAG FZ CP 6									6
7	FZ7 GRN FCTR	15	20	20							LONG GRN			GAPOUT CP7	1	LAG FZ CP 7									7
8	FZ8 GRN FCTR	30	30	30							NO GREEN			GAPOUT CP8	1	LAG FZ CP 8									8
9	MULTI CYCLE	0	0	0										GAPOUT CP9	1	LAG FZ CP 9									9
A	OFFSET A	91	121	131							OFFSET					LAG C COORD									A
B	OFFSET B															LAG D COORD									B
C	OFFSET C															COORD FAZES		2				6			C
D	FZ 3 EXT																								D
E	FZ 7 EXT																								E
F	OFFSET INTRPT																								F
																	1	2	3	4	5	6	7	8	

CONTROL PLAN TIME OF DAY												
9+EVENT+HR+MIN+CP+OS+E+DOW												
					S	M	T	W	T	F	S	
	HR	MIN	CP	OS	1	2	3	4	5	6	7	
0	08	30	1	A	1	2	3	4	5	6	7	
1	15	00	E		1	2	3	4	5	6	7	
2												
3												
4												
5												
6												
7												
8												
9												
A												
B												
C												
D												
E												
F												

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

FEATURE		OFF	ON
	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		

LOCATION	OFF	ON
1	1	
2	2	2
3	3	
4	4	
5	15	
6	6	
7		
8		

COO = 2

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

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D PAGE

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1								8	CP 1	1								CP 1								
2	CP 2								8	CP 2	1								CP 2								
3	CP 3								8	CP 3	1								CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4																			4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

D-E-E = C8 VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

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TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	07	30	2	ON		2	3	4	5	6	
1	08	30	2			2	3	4	5	6	
2	15	30	2	ON		2	3	4	5	6	
3	17	30	2			2	3	4	5	6	
4	15	00	E	ON	1	2	3	4	5	6	7
5	18	00	E		1	2	3	4	5	6	7
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED
7 ENERGIZE AUX OUTPUT-GREEN
8 ENERGIZE AUX OUTPUT-YELLOW
9 TIME OF DAY MAX RECALL (1ST SELECT)

F+C+F+1+2+3+E+B+ E+PHASES or TYPE+EVENT NO.										
		PHASES		TYPE			PHASES		TYPE	
		C		D			E		F	
0	I1	1		5,6	5	J1	5		5,6	5
1	I2U	2	1	5,6		J2U	6	2	5,6	
2	I2L	2	1	5,6		J2L	6	2	5,6	
3	I3U	2	8	5,6	5	J3U	6		5,6	
4	I3L	2	8	5		J3L	6		5	5,6
5	I4	2	8	7,8	5	J4	6		7,8	5
6	I5	3		5,6	5	J5	7	6	5,6	5
7	I6U	4	3	5,6		J6U	8		5,6	
8	I6L	4	3	5,6		J6L	8		5,6	5
9	I7U	4	7	5,6		J7U	8		5,6	
A	I7L	4	7	5		J7L	8		5	5,6
B	I8	4		7,8	5	J8	8		7,8	5
C	I9U	1	4	5,6	5	J9U	5	7	5,6	
D	I9L	3	6	5,6		J9L	7	4	5,6	5

DETECTOR SETTINGS									
I FILE					J FILE				
	DELAY	CARRYOVER				DELAY	CARRYOVER		
I1	D10	2.0	D30		J1	D20		D40	
I2U	D11		D31		J2U	D21		D41	
I2L	D12		D32		J2L	D22		D42	
I3U	D13		D33		J3U	D23		D43	1.0
I3L	D14		D34		J3L	D24		D44	1.0
I4	D15		D35		J4	D25		D45	
I5	D16	2.0	D36		J5	D26		D46	2.0
I6U	D17		D37		J6U	D27		D47	
I6L	D18		D38		J6L	D28		D48	
I7U	D19		D39		J7U	D29		D49	2.0
I7L	D1A		D3A		J7L	D2A		D4A	2.0
I8	D1B		D3B		J8	D2B		D4B	
I9U	D1C		D3C		J9U	D2C		D4C	
I9L	D1D		D3D	1.0	J9L	D2D		D4D	

REASSIGNS DETECTORS TO VARIOUS PHASES / FUNCTIONS

F-C-F MUST EQUAL ZERO WHEN FINISHED

LOWER CASE NUMBERS ARE DEFAULT VALUES

BLANK SPACES CONTAIN DEFAULTS (DO NOT ZERO OUT)

ACTIVITY CODE CONTINUED

A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

DETECTOR TYPE

1 RED LOCK
2 YELLOW LOCK
5 EXTENSION
6 COUNT
7 CALLING
8 TYPE 3 DISCONNECT

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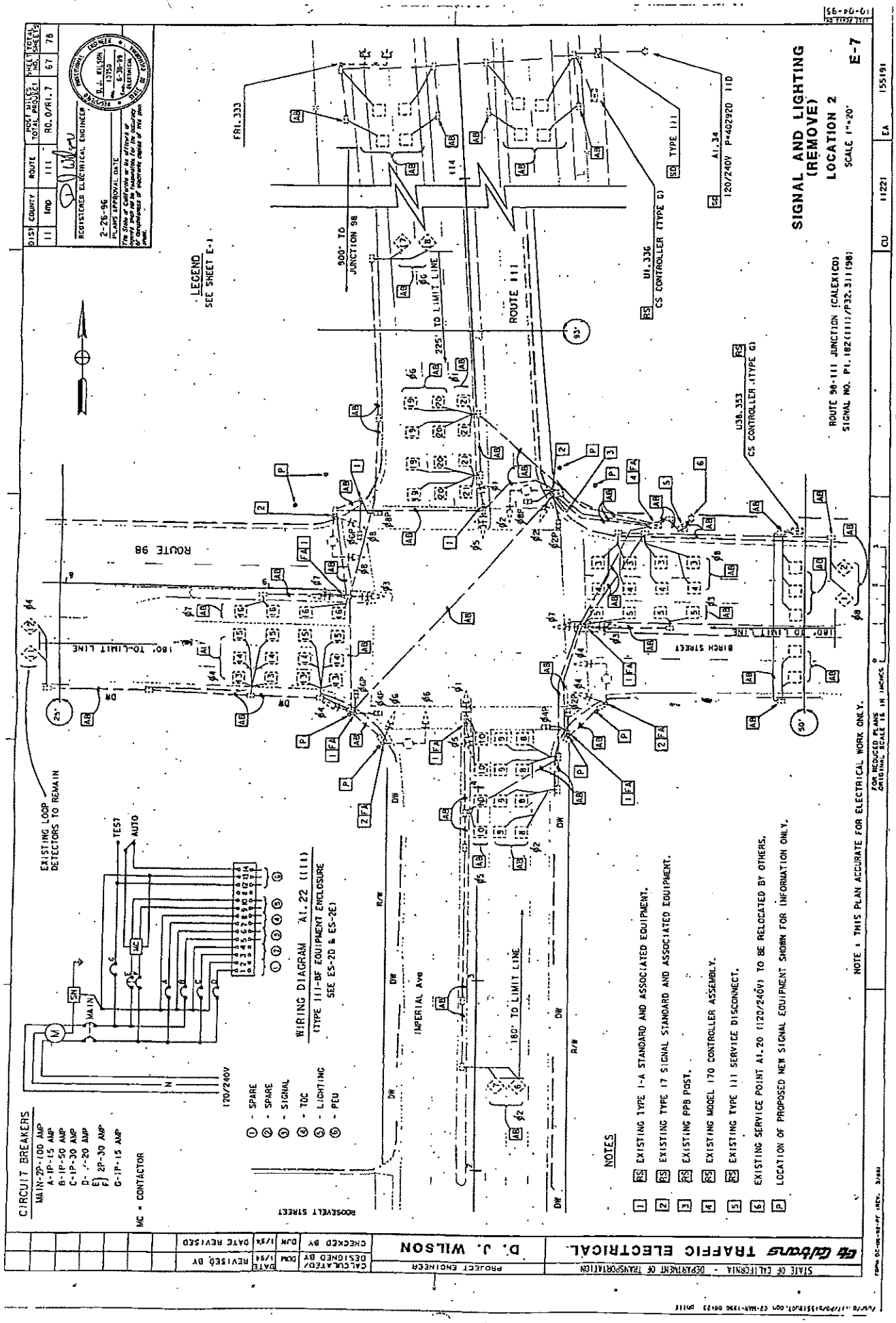

SIGNAL AND LIGHTING (REMOVE)
LOCATION 2
SCALE 1"=20'
E-7
ROUTE 98-111 JUNCTION (CALEXICO)
SIGNAL NO. P1.182(111)/P32.311(98)
LEGEND
SEE SHEET E-1
ROUTE 111
ROUTE 98
900' TO JUNCTION 98
225' TO LIMIT LINE
180' TO-LIMIT LINE
180' TO LIMIT LINE
EXISTING LOOP DETECTORS TO REMAIN
WIRING DIAGRAM A1.22 (111)
(TYPE 111-BF EQUIPMENT ENCLOSURE
SEE ES-2D & ES-2E)
1 - SPARE
2 - SPARE
3 - SIGNAL
4 - TDC
5 - LIGHTING
6 - PEU
CIRCUIT BREAKERS
MAIN-2P-100 AMP
A-1P-15 AMP
B-1P-50 AMP
C-1P-30 AMP
D-1P-20 AMP
E-2P-30 AMP
G-1P-15 AMP
MC = CONTACTOR
120/240V
MAIN
TEST
AUTO
IMPERIAL Ave
BOOSEVELT STREET
BIRCH STREET
A1.34 120/240V P=402920 11D
U1.336 CS CONTROLLER (TYPE G)
U36.353 CS CONTROLLER (TYPE G)
TYPE 111
NOTES
1 RS EXISTING TYPE 1-A STANDARD AND ASSOCIATED EQUIPMENT.
2 RS EXISTING TYPE 17 SIGNAL STANDARD AND ASSOCIATED EQUIPMENT.
3 RS EXISTING PPB POST.
4 RS EXISTING MODEL 170 CONTROLLER ASSEMBLY.
5 RS EXISTING TYPE 111 SERVICE DISCONNECT.
6 RS EXISTING SERVICE POINT A1.20 (120/240V) TO BE RELOCATED BY OTHERS.
P LOCATION OF PROPOSED NEW SIGNAL EQUIPMENT SHOWN FOR INFORMATION ONLY.
NOTE : THIS PLAN ACCURATE FOR ELECTRICAL WORK ONLY.
FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES
DIST 11 COUNTY IMP ROUTE 111 POST MILES TOTAL PROJECT R0.0/R1.7 SHEET NO. 67 TOTAL SHEETS 78
REGISTERED ELECTRICAL ENGINEER D. J. WILSON No. 13750 Exp. 6-30-98 ELECTRICAL
2-26-96 PLANS APPROVAL DATE
CU 11221 EA 155191
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans TRAFFIC ELECTRICAL
PROJECT ENGINEER D. J. WILSON
CALCULATED/DESIGNED BY DJW 1/96
CHECKED BY DJW 1/96
REVISED BY
DATE REVISED

APPENDIX D

TRAFFIC FORECAST MODEL PLOTS

Average Daily Traffic (ADT)--2025 CalexGP+ (Modified ICTM Network) Oct. 13, 2005

N
W E
S

Thomas Roads Network

ADT

50000 25000 12500

0 .1 .2 .3

Miles

TransCAD Licensed to Caltrans

PLANNING DIVISION
Planning Leads To Superior Solutions

Average Daily Traffic (ADT)--2025 CalexGP+ (Modified ICTM Network)

Oct. 13, 2005

N W E S

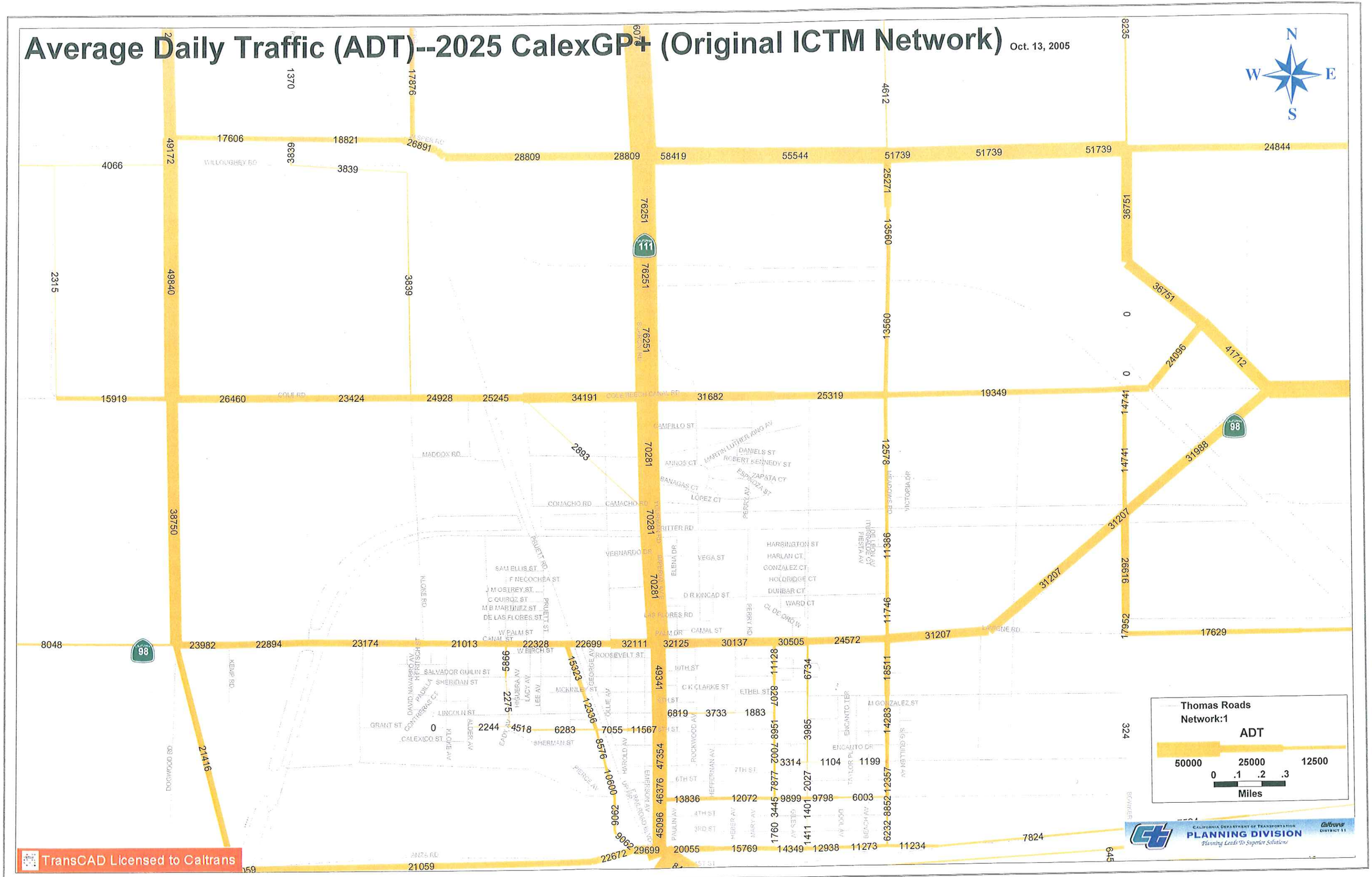
WILLOUGHBY RD
JASPER RD
COLE RD
MADDOX RD
LOS BARONS CANAL RD
AMPILLO ST
ANNOS CT
MARTIN LUTHER KING AV
DANIELS ST
ROBERT KENNEDY ST
ZAPATA CT
ESPINOZA ST
BANAGAS CT
LOPEZ CT
PERRY AV
RITTER RD
VERNARDO DR
VEGA ST
ELENA DR
HARRINGTON ST
HARLAN CT
GONZALEZ CT
HOLDRIDGE CT
DUNBAR CT
WARD CT
CL DE ORO W
D R KINCAD ST
LAS FLORES RD
SAM ELLIS ST
F NECOCHEA ST
J M OSTREY ST
C QUIROZ ST
M B MARTINEZ ST
DE LAS FLORES ST
PRUETT RD
PRUETT ST
NUNEZ RD
KEMP RD
W PALM ST
CAMAL ST
LA VISNE RD
ROOSEVELT ST
SALVADOR GUILIN ST
SHERIDAN ST
DAVID NAVARRO ST
H FRITSCH
PADILLA
CONTRERAS CT
MCKINLEY ST
OLLIE AV
LACY AV
LEE AV
HIGUERA AV
LINCOLN ST
GRANT ST
CALEXICO ST
ALDER AV
EADY AV
SHERMAN ST
HAROLD AV
EMERSON AV
PIERCE AV
5TH ST
6TH ST
7TH ST
8TH ST
9TH ST
10TH ST
MAIDEN LN
C K CLARKE ST
ETHEL ST
M GONZALEZ ST
ENCANTO TER
ENCANTO DR
TAYLOR PL
ROCKWOOD AV
ENCINAS AV
S GUILLEN AV
PAULINA AV
HEBER AV
GILES AV
BEACH AV
HERBERT CT
DOOLITTLE AV
PERRY AV
HARTLEY RD
BLAIR AV
DAVID AV
1ST ST
ANZA RD
VICTORIA DR
FIESTA AV
ITURRALDE CT
DE LEON AV
BOWKER RD
98
111

Thomas Roads
Network
ADT
50000 25000 12500
0 .1 .2 .3
Miles

TransCAD Licensed to Caltrans

CALIFORNIA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION
Planning Leads To Superior Solutions
DISTRICT 11

Average Daily Traffic (ADT)--2025 CalexGP+ (Original ICTM Network) Oct. 13, 2005



Average Daily Traffic (ADT)--2025 CalexGP+ (Original ICTM Network) Oct. 13, 2005

N
W E
S

WILLOUGHBY RD
JASPER RD
COLE RD
COLE BEECH CANAL RD
CAMPILLO ST
MADDOX RD
COMACHO RD
RITTER RD
VERNARDO DR
SAM ELLIS ST
F NECOCHEA ST
J M OSTREY ST
C QUIROZ ST
M B MARTINEZ ST
DE LAS FLORES ST
W PALM ST
CANAL ST
SALVADOR GUILIN ST
SHERIDAN ST
MCKINLEY ST
LINCOLN ST
GRANT ST
CALEXICO ST
SHERMAN ST
10TH ST
C K CLARKE ST
6TH ST
5TH ST
4TH ST
3RD ST
7TH ST
ETHEL ST
M GONZALEZ ST
ENCANTO DR
ENCANTO TER
TAYLOR PL
HARRINGTON ST
HARLAN CT
GONZALEZ CT
HOLDRIDGE CT
DUNBAR CT
WARD CT
D R KINCAD ST
LAS FLORES RD
CL DE ORO W
VEGA ST
DANIELS ST
ROBERT KENNEDY ST
ZAPATA CT
ESPINOZA ST
LOPEZ CT
SANAGAS CT
ANNOS CT
CAMPILLO ST
LAVERNE RD
HEBER AV
ROCKWOOD AV
ELENA DR
PERRY RD
PERRY AV
PRUETT RD
KEMP RD
KLOKE RD
ALDER AV
EADY AV
HIGUERA AV
LACY AV
LEE AV
OLLIE AV
HAROLD AV
DAVID NAVARRO AV
H FRITSCH
CONTRERAS CT
PADILLA
GILES AV
MEADOW VIEW DR
VICTORIA DR
PIESTA AV
ROBERT BUTLER SQ
AV BUTLER SQ
MARTIN LUTHER KING AV
IMPERIAL AV W
SCARBOROUGH RD
YOUNGMAN RD
PACHECO RD
ANZA RD
IMPERIAL AV E

98
111

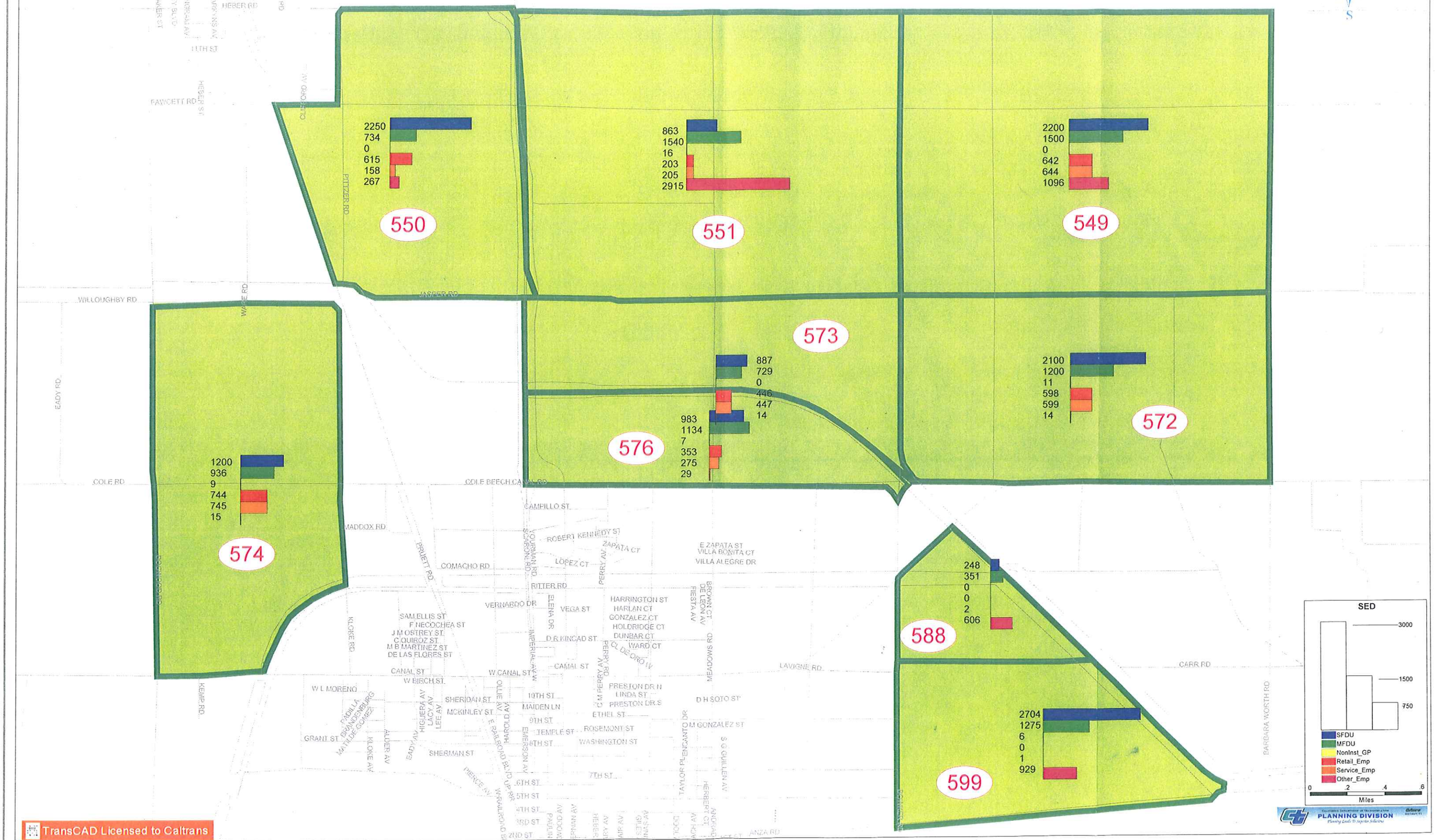
Thomas Roads
Network:1
ADT
50000 25000 12500
0 .1 .2 .3
Miles

CALIFORNIA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION
Planning Leads To Superior Solutions
DISTRICT 11

TransCAD Licensed to Caltrans

SED Forecasts--2025 CalexGP+

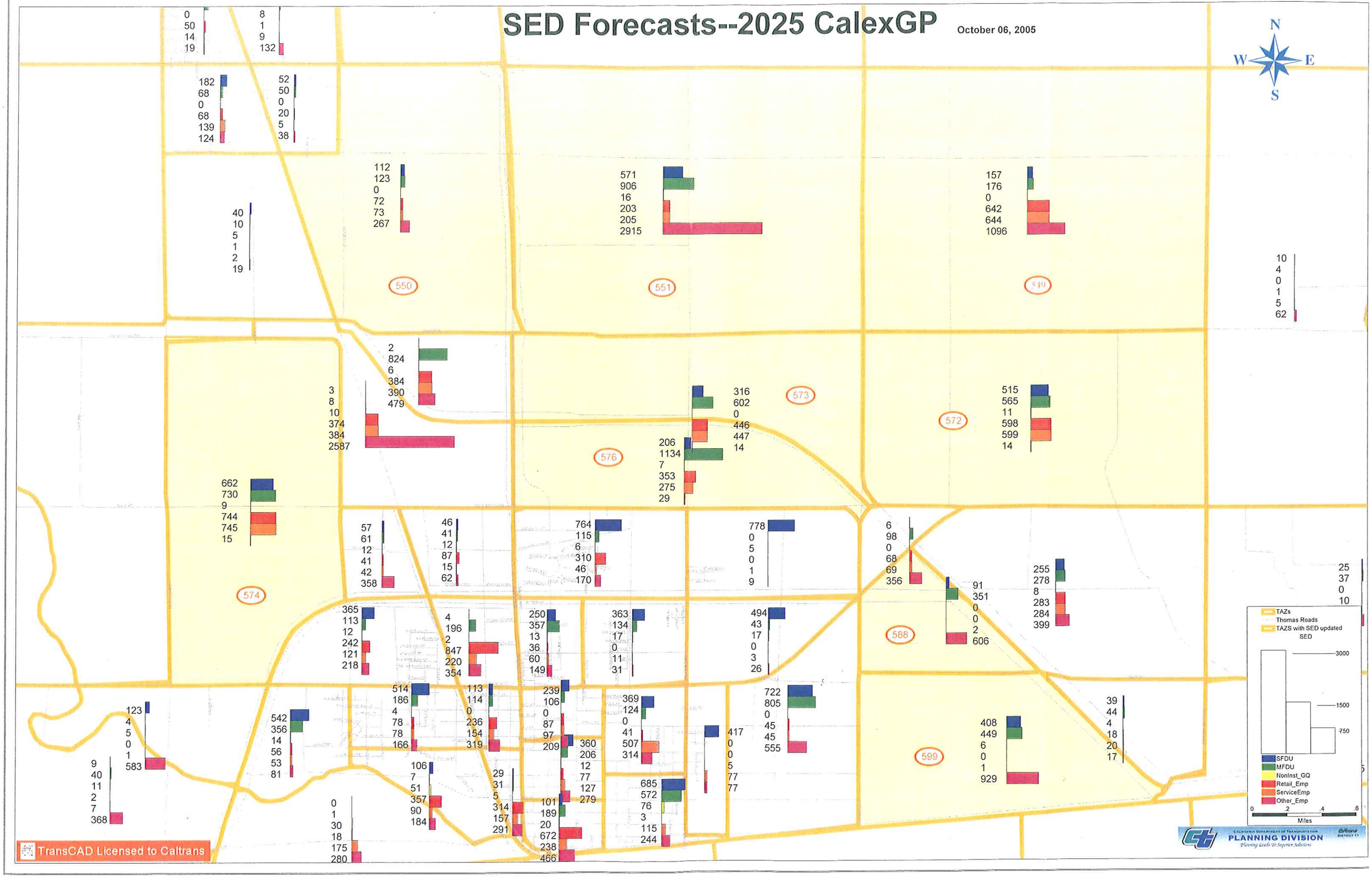
October 06, 2005



TransCAD Licensed to Caltrans

SED Forecasts--2025 CalexGP

October 06, 2005



APPENDIX E

LOS CRITERIA – INTERSECTIONS AND STREET SEGMENTS

3.3 Level of Service

The Circulation Element has been developed in recognition of the need to relieve existing congestion and to provide a circulation system that can accommodate future anticipated growth. Levels of Service (LOS) standards are used to assess the performance of a street or highway system and the capacity of a roadway. An important goal when planning the transportation system is to maintain acceptable levels of service along the federal and state highways and the local roadway network. To accomplish this, the California Department of Transportation (Caltrans), City of Calexico, County of Imperial, and the other local agencies adopt minimum levels of service to determine future infrastructure needs.

Traffic analysis uses the Level of Service (LOS) system of categorization to evaluate the project area roadway intersections. Traffic engineers use this LOS system of categorization to describe how well an intersection or roadway is functioning. The LOS measures several factors including operating speeds, freedom to maneuver, traffic interruptions, and average vehicle delay at intersections. The LOS approach uses a ranking system, similar to education, with level 'A' being best and level 'F' being worst. On the following page, Table ##, Level of Service (LOS) Standards, describes LOS levels in terms the average driver can understand.

The circulation system of the city of Calexico is primarily composed of a system of signalized and unsignalized arterial and collector facilities. The majority of vehicle delay occurs at the signalized intersections because vehicles are stopped to allow cross traffic to clear. Tables ## and ## illustrate ranges of average stop time delay for vehicle at signalized and unsignalized intersections for the various levels of service ranging from "A" through "F". The definitions for the signalized and unsignalized LOS were taken from the 2000 Highway Capacity Manual.

Table C-A
Level of Service (LOS) Standards

Level of Service (LOS)	Quality of Traffic Flow
A	Free flow: Low volumes; high speeds; speed not restricted by other vehicles; all signal cycles clear with no vehicles waiting through more than one signal cycle.
B	Stable flow: Operating speeds beginning to be affected by other traffic; between 1% and 10% of the signal cycles have one or more vehicles waiting through more than one signal cycle during peak traffic periods.
C	Stable Flow, Increased Density: Operating speeds and maneuverability closely controlled by other traffic; between 11% and 30% of the signal cycles have one or more vehicles waiting through more than one signal cycle during peak traffic periods; recommended ideal design standards.
D	Stable Flow, High Density: Tolerable operating speeds; 31% to 70% of the signal cycles have one or more vehicles waiting through more than one signal cycle during peak traffic periods; often used as design standards in urban areas.
E	Flow at or Near Capacity: maximum traffic volume an intersection can accommodate; restricted speeds; 71% to 100% of the signal cycles have one or more vehicles waiting through more than one signal cycle during peak traffic periods.
F	Forced or Breakdown Flow: Long queues of traffic; unstable flow; stoppages of long duration; traffic volume and traffic speed can drop to zero; traffic volume will be less than the volume occurring at LOS 'E' due to decreased speeds.

Source: "Highway Capacity Manual," Highway Research Board Special Report 209, National Research Council, Washington D.C., 2000.

Table C-B
Signalized Intersections LOS Definitions

LOS	Definition	Avg Delay (seconds/vehicle)
A	Describes operations with very low delay.	<10.0
B	Describes operations with moderately low delay. This level occurs with good progression, short cycle lengths, or both.	>10.0 and <20.0
C	Describes operations with average delays. These higher delays may result from fair progression, longer cycle lengths, or both.	>20.0 and <35.0
D	Describes a crowded operation, with below average delays. At level D, the influence of congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines.	>35.0 and <50.0
E	Describes operations at or near capacity. This level is considered by many agencies to be the limit of acceptable delay.	>55.0 and >80.0
F	Describes operations that are at the failure point. This level, considered unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection.	>80.0

Source: "Highway Capacity Manual," Highway Research Board Special Report 209, National Research Council, Washington D.C., 2000

Table C-C
Unsignalized Intersections LOS Definitions

LOS	Definition	Avg Delay (seconds/vehicle)
A	Describes operations with very low delay. This level of service occurs when there is no conflicting traffic for minor street.	<10.0
B	Describes operations with moderately low delay. This level generally occurs with a small amount of conflicting traffic causing higher levels of average delay.	>10.0 and <15.0
C	Describes operations with average delays. These higher delays may result from moderate amount of minor street traffic. Queues begin to get longer.	>15.0 and <25.0
D	Describes a crowded operation, with below average delays. At level D, the influence of congestion becomes more noticeable. Longer delays may result from shorter gaps on the mainline and an increase of minor street traffic. The queues of vehicles are incrassing.	>25.0 and <35.0
E	Describes operations at or near capacity. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor gaps for the minor street to cross and large queues.	>35.0 and >50.0
F	Describes operations that are at the failure point. This level, considered unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. Insufficient gaps of suitable size exist therefore not allowing minor traffic to cross safely.	>80.0

Source: "Highway Capacity Manual," Highway Research Board Special Report 209, National Research Council, Washington D.C., 2000

3.3.1 Traffic Studies

The City of Calexico conducted a traffic study as part of the 2005 General Plan update to determine the level of service of the major roads within the city limits as well as to provide essential information on the levels of service of all roads within Calexico's sphere of influence. The study was conducted in order to research all available options on alleviating congestion along Imperial Avenue and other primary/major roadways, as well as anticipating and accommodating future growth. (Not yet complete)

Traffic studies are also required by the City for major development projects and even small projects that prose traffic/congestion issues.

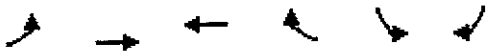
IMPERIAL COUNTY STANDARD STREET CLASSIFICATION
AVERAGE DAILY VEHICLE TRIPS

ROAD		LEVEL OF SERVICE				
CLASS	**X-SECTION**	**A**	**B**	**C**	**D**	**E**
Prime Arterial	106/126	22,200	37,000	44,600	50,000	57,000
Major Road	82/102	14,800	24,700	29,600	33,400	37,000
Secondary Arterial	64/84	13,700	22,800	27,400	30,800	34,200
Collector Street	40/70	1,900	4,100	7,100	10,900	16,200
Local Street	40/60	*	*	<4,500	*	*
Residential Street	40/60	*	*	<1,500	*	*
Residential Cul-de-Sac or Loop Street	40/60	*	*	< 200	*	*

* Levels of service are not applicable to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

APPENDIX F

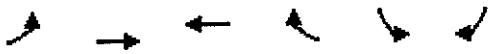
INTERSECTION CAPACITY WORKSHEETS – EXISTING CONDITIONS



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			
Lane Util. Factor	1.00	1.00	1.00			
Frt	1.00	1.00	1.00			
Flt Protected	0.95	1.00	1.00			
Satd. Flow (prot)	1770	1863	1863			
Flt Permitted	0.45	1.00	1.00			
Satd. Flow (perm)	837	1863	1863			
Volume (vph)	1	103	356	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	112	387	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1	112	387	0	0	0
Turn Type	Perm			pm+ov		
Protected Phases		4	8	6	6	
Permitted Phases	4			8		
Actuated Green, G (s)	67.0	67.0	67.0			
Effective Green, g (s)	67.0	67.0	67.0			
Actuated g/C Ratio	0.56	0.56	0.56			
Clearance Time (s)	4.0	4.0	4.0			
Lane Grp Cap (vph)	467	1040	1040			
v/s Ratio Prot		0.06	c0.21			
v/s Ratio Perm	0.00					
v/c Ratio	0.00	0.11	0.37			
Uniform Delay, d1	11.7	12.5	14.8			
Progression Factor	1.00	1.00	1.00			
Incremental Delay, d2	0.0	0.2	1.0			
Delay (s)	11.7	12.7	15.8			
Level of Service	B	B	B			
Approach Delay (s)		12.7	15.8		0.0	
Approach LOS		B	B		A	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	53.0
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	1.00	
Flt Protected	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (prot)	1770	1863	1863	1583	1769	
Flt Permitted	0.65	1.00	1.00	1.00	0.95	
Satd. Flow (perm)	1202	1863	1863	1583	1769	
Volume (vph)	15	269	129	124	355	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	292	140	135	386	13
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	16	292	140	135	398	0
Turn Type	Perm			pm+ov		
Protected Phases		4	8	6	6	
Permitted Phases	4			8		
Actuated Green, G (s)	52.0	52.0	52.0	112.0	60.0	
Effective Green, g (s)	52.0	52.0	52.0	112.0	60.0	
Actuated g/C Ratio	0.43	0.43	0.43	0.93	0.50	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	521	807	807	1583	885	
v/s Ratio Prot		c0.16	0.08	0.04	c0.22	
v/s Ratio Perm	0.01			0.04		
v/c Ratio	0.03	0.36	0.17	0.09	0.45	
Uniform Delay, d1	19.5	22.8	20.8	0.3	19.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.3	0.5	0.1	1.7	
Delay (s)	19.6	24.1	21.3	0.4	21.0	
Level of Service	B	C	C	A	C	
Approach Delay (s)		23.9	11.0		21.0	
Approach LOS		C	B		C	

Intersection Summary				
HCM Average Control Delay	19.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	41.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	6	152	21	45	242	83	99	108	60	111	80	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	165	23	49	263	90	108	117	65	121	87	34

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	7	188	49	353	225	65	208	34
Volume Left (vph)	7	0	49	0	108	0	121	0
Volume Right (vph)	0	23	0	90	0	65	0	34
Hadj (s)	0.53	-0.05	0.53	-0.14	0.27	-0.67	0.32	-0.67
Departure Headway (s)	7.3	6.8	7.0	6.3	7.0	6.0	7.1	6.1
Degree Utilization, x	0.01	0.35	0.10	0.62	0.44	0.11	0.41	0.06
Capacity (veh/h)	454	499	486	540	481	553	476	543
Control Delay (s)	9.2	12.2	9.5	17.9	14.1	8.6	13.7	8.3
Approach Delay (s)	12.1		16.9		12.8		13.0	
Approach LOS	B		C		B		B	

Intersection Summary				
Delay	14.2			
HCM Level of Service	B			
Intersection Capacity Utilization	48.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	48	398	55	64	240	79	45	57	20	76	59	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	433	60	70	261	86	49	62	22	83	64	18

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	52	492	70	347	111	22	147	18
Volume Left (vph)	52	0	70	0	49	0	83	0
Volume Right (vph)	0	60	0	86	0	22	0	18
Hadj (s)	0.53	-0.05	0.53	-0.14	0.25	-0.67	0.32	-0.67
Departure Headway (s)	6.7	6.1	6.8	6.2	7.6	6.7	7.6	6.6
Degree Utilization, x	0.10	0.83	0.13	0.59	0.23	0.04	0.31	0.03
Capacity (veh/h)	516	578	503	556	440	491	442	500
Control Delay (s)	9.2	31.0	9.7	16.6	11.7	8.8	12.7	8.6
Approach Delay (s)	28.9		15.4		11.2		12.3	
Approach LOS	D		C		B		B	

Intersection Summary				
Delay	20.4			
HCM Level of Service	C			
Intersection Capacity Utilization	51.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1845		1770	1863	1583	1770	3323		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1845		1770	1863	1583	1770	3323		1770	3539	1583
Volume (vph)	47	266	18	83	240	396	39	216	149	303	253	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	289	20	90	261	430	42	235	162	329	275	98
RTOR Reduction (vph)	0	2	0	0	0	297	0	104	0	0	0	61
Lane Group Flow (vph)	51	307	0	90	261	133	42	293	0	329	275	37
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	12.0	34.0		15.0	37.0	37.0	10.0	19.0		36.0	45.0	45.0
Effective Green, g (s)	12.0	34.0		15.0	37.0	37.0	10.0	19.0		36.0	45.0	45.0
Actuated g/C Ratio	0.10	0.28		0.12	0.31	0.31	0.08	0.16		0.30	0.38	0.38
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	177	523		221	574	488	148	526		531	1327	594
v/s Ratio Prot	0.03	c0.17		c0.05	c0.14		0.02	c0.09		c0.19	0.08	
v/s Ratio Perm						0.08						0.02
v/c Ratio	0.29	0.59		0.41	0.45	0.27	0.28	0.56		0.62	0.21	0.06
Uniform Delay, d1	50.0	37.0		48.4	33.4	31.3	51.6	46.6		36.1	25.4	24.0
Progression Factor	1.00	1.00		0.86	1.39	4.26	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	4.8		4.4	2.1	1.1	4.7	4.2		5.4	0.4	0.2
Delay (s)	54.1	41.7		45.9	48.5	134.6	56.4	50.9		41.5	25.8	24.2
Level of Service	D	D		D	D	F	E	D		D	C	C
Approach Delay (s)		43.5			95.6			51.4			32.9	
Approach LOS		D			F			D			C	

Intersection Summary				
HCM Average Control Delay	59.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	60.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1838		1770	1863	1583	1770	3284		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1838		1770	1863	1583	1770	3284		1770	3539	1583
Volume (vph)	23	391	38	115	263	260	48	128	119	289	212	73
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	425	41	125	286	283	52	139	129	314	230	79
RTOR Reduction (vph)	0	3	0	0	0	163	0	111	0	0	0	53
Lane Group Flow (vph)	25	463	0	125	286	120	52	157	0	314	230	26
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	5.0	41.0		15.0	51.0	51.0	9.0	17.0		31.0	39.0	39.0
Effective Green, g (s)	5.0	41.0		15.0	51.0	51.0	9.0	17.0		31.0	39.0	39.0
Actuated g/C Ratio	0.04	0.34		0.12	0.42	0.42	0.08	0.14		0.26	0.32	0.32
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	74	628		221	792	673	133	465		457	1150	514
v/s Ratio Prot	0.01	c0.25		c0.07	0.15		0.03	c0.05		c0.18	0.06	
v/s Ratio Perm						0.08						0.02
v/c Ratio	0.34	0.74		0.57	0.36	0.18	0.39	0.34		0.69	0.20	0.05
Uniform Delay, d1	55.9	34.8		49.4	23.4	21.5	52.9	46.4		40.1	29.2	27.8
Progression Factor	1.00	1.00		1.12	1.07	2.69	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.9	7.6		8.7	1.1	0.5	8.4	2.0		8.2	0.4	0.2
Delay (s)	67.8	42.3		63.9	26.3	58.1	61.3	48.4		48.3	29.6	28.0
Level of Service	E	D		E	C	E	E	D		D	C	C
Approach Delay (s)		43.6			46.0			50.5			38.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97			0.98	
Satd. Flow (prot)	1770	1832		1770	1863	1583		1748			1749	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.68			0.82	
Satd. Flow (perm)	1770	1832		1770	1863	1583		1216			1452	
Volume (vph)	39	613	76	38	513	12	164	43	70	58	56	58
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	666	83	41	558	13	178	47	76	63	61	63
RTOR Reduction (vph)	0	4	0	0	0	7	0	10	0	0	15	0
Lane Group Flow (vph)	42	745	0	41	558	7	0	291	0	0	172	0
Turn Type	Prot			Prot		Perm	Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	7.0	61.0		6.0	60.0	60.0		41.0			41.0	
Effective Green, g (s)	7.0	61.0		6.0	60.0	60.0		41.0			41.0	
Actuated g/C Ratio	0.06	0.51		0.05	0.50	0.50		0.34			0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)	103	931		89	932	792		415			496	
v/s Ratio Prot	c0.02	c0.41		0.02	0.30							
v/s Ratio Perm						0.00		c0.24			0.12	
v/c Ratio	0.41	0.80		0.46	0.60	0.01		0.70			0.35	
Uniform Delay, d1	54.5	24.5		55.4	21.4	15.1		34.2			29.5	
Progression Factor	0.91	1.23		0.95	1.04	1.35		1.00			1.00	
Incremental Delay, d2	9.3	5.8		14.4	2.5	0.0		9.5			1.9	
Delay (s)	59.1	35.9		67.2	24.7	20.3		43.7			31.4	
Level of Service	E	D		E	C	C		D			C	
Approach Delay (s)		37.1			27.5			43.7			31.4	
Approach LOS		D			C			D			C	

Intersection Summary				
HCM Average Control Delay	34.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.94			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	1846		1770	1863	1583		1722			1727	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.81			0.78	
Satd. Flow (perm)	1770	1846		1770	1863	1583		1420			1368	
Volume (vph)	46	703	46	48	569	11	51	25	56	53	23	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	764	50	52	618	12	55	27	61	58	25	54
RTOR Reduction (vph)	0	2	0	0	0	5	0	22	0	0	20	0
Lane Group Flow (vph)	50	812	0	52	618	7	0	121	0	0	117	0
Turn Type	Prot			Prot		Perm	Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	12.0	73.0		13.0	74.0	74.0		22.0			22.0	
Effective Green, g (s)	12.0	73.0		13.0	74.0	74.0		22.0			22.0	
Actuated g/C Ratio	0.10	0.61		0.11	0.62	0.62		0.18			0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)	177	1123		192	1149	976		260			251	
v/s Ratio Prot	0.03	c0.44		c0.03	0.33							
v/s Ratio Perm						0.00		0.09			c0.09	
v/c Ratio	0.28	0.72		0.27	0.54	0.01		0.47			0.47	
Uniform Delay, d1	50.0	16.4		49.1	13.2	8.9		43.7			43.8	
Progression Factor	0.80	1.13		0.77	1.80	1.96		1.00			1.00	
Incremental Delay, d2	2.9	3.0		3.2	1.7	0.0		5.9			6.1	
Delay (s)	43.0	21.6		41.1	25.5	17.3		49.6			49.9	
Level of Service	D	C		D	C	B		D			D	
Approach Delay (s)		22.8			26.5			49.6			49.9	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	28.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	44	715	4	32	627	179	3	13	54	87	13	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	777	4	35	682	195	3	14	59	95	14	47
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		1109										
pX, platoon unblocked				0.67			0.67	0.67	0.67	0.67	0.67	
vC, conflicting volume	876			782			1680	1821	779	1690	1628	682
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	876			674			2015	2225	671	2029	1938	682
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			94			81	45	81	0	64	90
cM capacity (veh/h)	771			614			17	26	306	12	39	450

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	48	782	35	682	195	76	155
Volume Left	48	0	35	0	0	3	95
Volume Right	0	4	0	0	195	59	47
cSH	771	1700	614	1700	1700	82	19
Volume to Capacity	0.06	0.46	0.06	0.40	0.11	0.93	8.39
Queue Length 95th (ft)	5	0	4	0	0	125	Err
Control Delay (s)	10.0	0.0	11.2	0.0	0.0	171.2	Err
Lane LOS	A		B			F	F
Approach Delay (s)	0.6		0.4			171.2	Err
Approach LOS						F	F

Intersection Summary			
Average Delay	795.3		
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	713	6	19	540	152	4	12	46	148	9	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	775	7	21	587	165	4	13	50	161	10	35
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		1109										
pX, platoon unblocked				0.70			0.70	0.70	0.70	0.70	0.70	
vC, conflicting volume	752			782			1494	1620	778	1508	1458	587
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	752			686			1709	1890	682	1729	1657	587
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			89	72	84	0	85	93
cM capacity (veh/h)	858			632			39	46	313	30	64	510

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	24	782	21	587	165	67	205
Volume Left	24	0	21	0	0	4	161
Volume Right	0	7	0	0	165	50	35
cSH	858	1700	632	1700	1700	122	37
Volume to Capacity	0.03	0.46	0.03	0.35	0.10	0.55	5.52
Queue Length 95th (ft)	2	0	3	0	0	67	Err
Control Delay (s)	9.3	0.0	10.9	0.0	0.0	66.4	Err
Lane LOS	A		B			F	F
Approach Delay (s)	0.3		0.3			66.4	Err
Approach LOS						F	F

Intersection Summary			
Average Delay	1112.4		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	783	87	121	810	56	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	851	95	132	880	61	76
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				896		
pX, platoon unblocked					0.74	
vC, conflicting volume			946		2042	898
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			946		2414	898
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		0	77
cM capacity (veh/h)			726		22	338

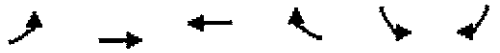
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	946	132	880	61	76
Volume Left	0	132	0	61	0
Volume Right	95	0	0	0	76
cSH	1700	726	1700	22	338
Volume to Capacity	0.56	0.18	0.52	2.81	0.23
Queue Length 95th (ft)	0	16	0	195	21
Control Delay (s)	0.0	11.1	0.0	1189.0	18.7
Lane LOS		B		F	C
Approach Delay (s)	0.0	1.4		538.8	
Approach LOS				F	

Intersection Summary			
Average Delay	35.9		
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	681	208	147	627	58	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	740	226	160	682	63	111
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				896		
pX, platoon unblocked					0.81	
vC, conflicting volume			966		1854	853
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			966		2056	853
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			78		0	69
cM capacity (veh/h)			713		38	359

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	966	160	682	63	111
Volume Left	0	160	0	63	0
Volume Right	226	0	0	0	111
cSH	1700	713	1700	38	359
Volume to Capacity	0.57	0.22	0.40	1.66	0.31
Queue Length 95th (ft)	0	21	0	167	32
Control Delay (s)	0.0	11.5	0.0	551.1	19.5
Lane LOS		B		F	C
Approach Delay (s)	0.0	2.2		212.2	
Approach LOS				F	

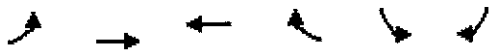
Intersection Summary			
Average Delay	19.6		
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	864	906	16	0	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	939	985	17	0	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			448			
pX, platoon unblocked	0.75				0.75	0.75
vC, conflicting volume	1002				1933	993
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1003				2238	991
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	520				35	225

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	939	1002	13
Volume Left	0	0	0
Volume Right	0	17	13
cSH	1700	1700	225
Volume to Capacity	0.55	0.59	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	22.0
Lane LOS			C
Approach Delay (s)	0.0	0.0	22.0
Approach LOS			C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	792	715	68	0	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	861	777	74	0	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			448			
pX, platoon unblocked	0.80				0.80	0.80
vC, conflicting volume	851				1675	814
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	815				1840	769
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	653				67	322

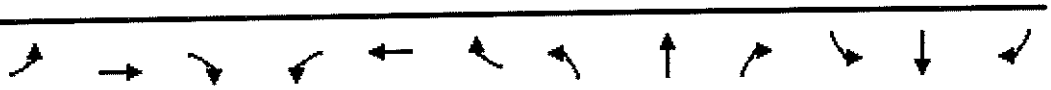
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	861	851	18
Volume Left	0	0	0
Volume Right	0	74	18
cSH	1700	1700	322
Volume to Capacity	0.51	0.50	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	16.8
Lane LOS			C
Approach Delay (s)	0.0	0.0	16.8
Approach LOS			C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3531		1770	3539	1583	1770	1799		1770	1649	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3531		1770	3539	1583	1770	1799		1770	1649	
Volume (vph)	102	738	11	6	718	76	106	34	10	129	24	77
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	802	12	7	780	83	115	37	11	140	26	84
RTOR Reduction (vph)	0	1	0	0	0	55	0	9	0	0	69	0
Lane Group Flow (vph)	111	813	0	7	780	28	115	39	0	140	41	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	20.0	51.0		9.0	40.0	40.0	22.0	22.0		22.0	22.0	
Effective Green, g (s)	20.0	51.0		9.0	40.0	40.0	22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.17	0.42		0.08	0.33	0.33	0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	295	1501		133	1180	528	325	330		325	302	
v/s Ratio Prot	0.06	c0.23		0.00	c0.22		c0.06	0.02		c0.08	0.03	
v/s Ratio Perm						0.02						
v/c Ratio	0.38	0.54		0.05	0.66	0.05	0.35	0.12		0.43	0.14	
Uniform Delay, d1	44.5	25.8		51.5	34.2	27.1	42.8	40.9		43.4	41.0	
Progression Factor	1.16	1.30		1.36	1.12	2.49	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	1.2		0.6	2.3	0.1	3.0	0.7		4.1	0.9	
Delay (s)	54.6	34.7		70.7	40.5	67.6	45.8	41.6		47.6	42.0	
Level of Service	D	C		E	D	E	D	D		D	D	
Approach Delay (s)		37.1			43.4			44.6			45.1	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	41.0	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.52				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	49.3%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3523		1770	3539	1583	1770	1811		1770	1670	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3523		1770	3539	1583	1770	1811		1770	1670	
Volume (vph)	128	618	19	34	564	142	119	81	18	312	61	136
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	672	21	37	613	154	129	88	20	339	66	148
RTOR Reduction (vph)	0	2	0	0	0	114	0	7	0	0	67	0
Lane Group Flow (vph)	139	691	0	37	613	40	129	101	0	339	147	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	19.0	42.0		8.0	31.0	31.0	18.0	18.0		36.0	36.0	
Effective Green, g (s)	19.0	42.0		8.0	31.0	31.0	18.0	18.0		36.0	36.0	
Actuated g/C Ratio	0.16	0.35		0.07	0.26	0.26	0.15	0.15		0.30	0.30	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	280	1233		118	914	409	266	272		531	501	
v/s Ratio Prot	c0.08	c0.20		0.02	c0.17		c0.07	0.06		c0.19	0.09	
v/s Ratio Perm						0.03						
v/c Ratio	0.50	0.56		0.31	0.67	0.10	0.48	0.37		0.64	0.29	
Uniform Delay, d1	46.1	31.5		53.4	39.9	33.9	46.8	45.9		36.4	32.2	
Progression Factor	1.21	1.07		1.41	0.68	0.62	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	1.7		5.3	3.0	0.4	6.2	3.9		5.8	1.5	
Delay (s)	61.5	35.3		80.8	30.4	21.4	53.0	49.8		42.1	33.7	
Level of Service	E	D		F	C	C	D	D		D	C	
Approach Delay (s)		39.7			31.0			51.5			38.9	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	3470		3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	3470		3433	3539	1583
Volume (vph)	98	657	139	131	687	299	262	567	85	246	407	78
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	107	714	151	142	747	325	285	616	92	267	442	85
RTOR Reduction (vph)	0	0	99	0	0	228	0	10	0	0	0	61
Lane Group Flow (vph)	107	714	52	142	747	98	285	698	0	267	442	24
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	16.0	41.0	41.0	11.0	36.0	36.0	18.0	35.0		17.0	34.0	34.0
Effective Green, g (s)	16.0	41.0	41.0	11.0	36.0	36.0	18.0	35.0		17.0	34.0	34.0
Actuated g/C Ratio	0.13	0.34	0.34	0.09	0.30	0.30	0.15	0.29		0.14	0.28	0.28
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	236	1209	541	315	1062	475	515	1012		486	1003	449
v/s Ratio Prot	c0.06	0.20		0.04	c0.21		c0.08	c0.20		0.08	0.12	
v/s Ratio Perm			0.03			0.06						0.02
v/c Ratio	0.45	0.59	0.10	0.45	0.70	0.21	0.55	0.69		0.55	0.44	0.05
Uniform Delay, d1	48.0	32.6	26.9	51.6	37.3	31.3	47.3	37.7		47.9	35.2	31.3
Progression Factor	1.10	1.20	2.92	1.00	1.00	1.00	0.76	1.14		1.00	1.00	1.00
Incremental Delay, d2	5.4	1.9	0.3	4.6	3.9	1.0	4.2	3.8		4.4	1.4	0.2
Delay (s)	58.4	41.1	78.8	56.2	41.2	32.3	40.0	46.8		52.4	36.6	31.5
Level of Service	E	D	E	E	D	C	D	D		D	D	C
Approach Delay (s)		48.8			40.6			44.9			41.4	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM Average Control Delay	43.8	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.62				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	63.2%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	3467		3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	3467		3433	3539	1583
Volume (vph)	160	612	233	286	538	256	249	608	96	395	885	177
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	665	253	311	585	278	271	661	104	429	962	192
RTOR Reduction (vph)	0	0	185	0	0	215	0	10	0	0	0	122
Lane Group Flow (vph)	174	665	68	311	585	63	271	755	0	429	962	70
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	19.0	30.0	30.0	16.0	27.0	27.0	14.0	37.0		21.0	44.0	44.0
Effective Green, g (s)	19.0	30.0	30.0	16.0	27.0	27.0	14.0	37.0		21.0	44.0	44.0
Actuated g/C Ratio	0.16	0.25	0.25	0.13	0.22	0.22	0.12	0.31		0.18	0.37	0.37
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	280	885	396	458	796	356	401	1069		601	1298	580
v/s Ratio Prot	0.10	c0.19		c0.09	0.17		0.08	0.22		c0.12	c0.27	
v/s Ratio Perm			0.04			0.04						0.04
v/c Ratio	0.62	0.75	0.17	0.68	0.73	0.18	0.68	0.71		0.71	0.74	0.12
Uniform Delay, d1	47.1	41.6	35.3	49.6	43.2	37.5	50.8	36.7		46.7	33.0	25.2
Progression Factor	1.00	1.47	4.13	1.00	1.00	1.00	0.94	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.5	5.0	0.8	7.9	6.0	1.1	8.8	3.9		7.1	3.8	0.4
Delay (s)	55.5	65.9	146.4	57.4	49.1	38.6	56.5	40.7		53.7	36.9	25.6
Level of Service	E	E	F	E	D	D	E	D		D	D	C
Approach Delay (s)		82.9			48.8			44.8			40.1	
Approach LOS		F			D			D			D	

Intersection Summary				
HCM Average Control Delay	52.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	16	255	82	32	177	120	32	132	30	39	109	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	277	89	35	192	130	35	143	33	42	118	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	323			366			696	749	322	743	728	258
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	323			366			696	749	322	743	728	258
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			86	56	95	79	65	98
cM capacity (veh/h)	1237			1192			244	326	719	201	335	781

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	17	366	35	323	107	104	102	78
Volume Left	17	0	35	0	35	0	42	0
Volume Right	0	89	0	130	0	33	0	18
cSH	1237	1700	1192	1700	294	393	262	388
Volume to Capacity	0.01	0.22	0.03	0.19	0.36	0.27	0.39	0.20
Queue Length 95th (ft)	1	0	2	0	40	26	44	18
Control Delay (s)	8.0	0.0	8.1	0.0	24.1	17.4	27.2	16.6
Lane LOS	A		A		C	C	D	C
Approach Delay (s)	0.4		0.8		20.8		22.6	
Approach LOS					C		C	

Intersection Summary				
Average Delay	7.8			
Intersection Capacity Utilization	45.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	22	214	78	60	154	48	63	111	37	60	268	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	233	85	65	167	52	68	121	40	65	291	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	220			317			803	673	275	705	689	193
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220			317			803	673	275	705	689	193
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			95			13	66	95	72	15	96
cM capacity (veh/h)	1350			1243			78	351	764	232	343	848

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	24	317	65	220	129	101	211	183
Volume Left	24	0	65	0	68	0	65	0
Volume Right	0	85	0	52	0	40	0	37
cSH	1350	1700	1243	1700	123	447	299	390
Volume to Capacity	0.02	0.19	0.05	0.13	1.05	0.22	0.71	0.47
Queue Length 95th (ft)	1	0	4	0	183	21	124	60
Control Delay (s)	7.7	0.0	8.1	0.0	162.5	15.4	41.5	22.1
Lane LOS	A		A		F	C	E	C
Approach Delay (s)	0.5		1.8		98.0		32.5	
Approach LOS					F		D	

Intersection Summary			
Average Delay	28.8		
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.99	
Flt Protected		0.99	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3500	1583		3330		1770	3531		1770	3505	
Flt Permitted		0.83	1.00		0.79		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2954	1583		2688		1770	3531		1770	3505	
Volume (vph)	33	115	105	89	109	83	108	473	7	101	474	33
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	125	114	97	118	90	117	514	8	110	515	36
RTOR Reduction (vph)	0	0	80	0	38	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	161	34	0	267	0	117	521	0	110	547	0
Turn Type	Perm		Perm	Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		36.0	36.0		36.0		31.0	41.0		31.0	41.0	
Effective Green, g (s)		36.0	36.0		36.0		31.0	41.0		31.0	41.0	
Actuated g/C Ratio		0.30	0.30		0.30		0.26	0.34		0.26	0.34	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		886	475		806		457	1206		457	1198	
v/s Ratio Prot							c0.07	0.15		0.06	c0.16	
v/s Ratio Perm		0.05	0.02		c0.10							
v/c Ratio		0.18	0.07		0.33		0.26	0.43		0.24	0.46	
Uniform Delay, d1		31.1	30.0		32.6		35.3	30.5		35.2	30.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.03	0.43	
Incremental Delay, d2		0.5	0.3		1.1		1.3	1.1		1.2	1.2	
Delay (s)		31.5	30.3		33.8		36.7	31.6		37.5	14.6	
Level of Service		C	C		C		D	C		D	B	
Approach Delay (s)		31.0			33.8			32.6			18.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	27.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

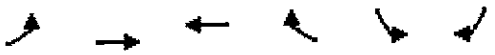
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3498	1583		3347		1770	3517		1770	3527	
Flt Permitted		0.77	1.00		0.74		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2739	1583		2554		1770	3517		1770	3527	
Volume (vph)	32	106	259	185	113	78	65	421	18	86	1526	36
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	115	282	201	123	85	71	458	20	93	1659	39
RTOR Reduction (vph)	0	0	123	0	19	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	150	159	0	390	0	71	475	0	93	1697	0
Turn Type	Perm		Perm	Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		27.0	27.0		27.0		10.0	69.0		12.0	71.0	
Effective Green, g (s)		27.0	27.0		27.0		10.0	69.0		12.0	71.0	
Actuated g/C Ratio		0.22	0.22		0.22		0.08	0.57		0.10	0.59	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		616	356		575		148	2022		177	2087	
v/s Ratio Prot							0.04	0.14		c0.05	c0.48	
v/s Ratio Perm		0.05	0.10		c0.15							
v/c Ratio		0.24	0.45		0.68		0.48	0.24		0.53	0.81	
Uniform Delay, d1		38.1	40.1		42.5		52.5	12.5		51.3	19.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.08	1.03	
Incremental Delay, d2		0.9	4.0		6.3		10.7	0.3		8.9	3.0	
Delay (s)		39.1	44.1		48.8		63.2	12.8		64.2	22.8	
Level of Service		D	D		D		E	B		E	C	
Approach Delay (s)		42.3			48.8			19.3			24.9	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

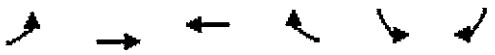
APPENDIX G

INTERSECTION CAPACITY WORKSHEETS
YEAR 2015 WITHOUT ANZA ROAD EXTENSION



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.97	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	1863	1863	1583	1740	
Flt Permitted	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	1770	1863	1863	1583	1740	
Volume (vph)	30	220	360	580	510	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	239	391	630	554	152
RTOR Reduction (vph)	0	0	0	39	7	0
Lane Group Flow (vph)	33	239	391	591	699	0
Turn Type	Prot			pm+ov		
Protected Phases	7	4	8	6	6	
Permitted Phases				8		
Actuated Green, G (s)	2.2	33.0	26.8	94.5	67.7	
Effective Green, g (s)	2.2	33.0	26.8	94.5	67.7	
Actuated g/C Ratio	0.02	0.30	0.25	0.87	0.62	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	36	566	459	1434	1084	
v/s Ratio Prot	c0.02	0.13	c0.21	0.26	c0.40	
v/s Ratio Perm				0.12		
v/c Ratio	0.92	0.42	0.85	0.41	0.64	
Uniform Delay, d1	53.2	30.2	39.1	1.4	12.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	115.4	0.5	14.1	0.2	3.0	
Delay (s)	168.6	30.7	53.2	1.6	15.9	
Level of Service	F	C	D	A	B	
Approach Delay (s)		47.5	21.4		15.9	
Approach LOS		D	C		B	

Intersection Summary				
HCM Average Control Delay	23.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	108.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.99	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	1863	1863	1583	1764	
Flt Permitted	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	1770	1863	1863	1583	1764	
Volume (vph)	40	450	340	510	550	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	489	370	554	598	43
RTOR Reduction (vph)	0	0	0	28	2	0
Lane Group Flow (vph)	43	489	370	526	639	0
Turn Type	Prot			pm+ov		
Protected Phases	7	4	8	6	6	
Permitted Phases				8		
Actuated Green, G (s)	3.1	34.5	27.4	94.8	67.4	
Effective Green, g (s)	3.1	34.5	27.4	94.8	67.4	
Actuated g/C Ratio	0.03	0.31	0.25	0.86	0.61	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	50	585	464	1423	1082	
v/s Ratio Prot	0.02	c0.26	0.20	0.23	c0.36	
v/s Ratio Perm				0.11		
v/c Ratio	0.86	0.84	0.80	0.37	0.59	
Uniform Delay, d1	53.2	35.1	38.6	1.5	12.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	76.1	10.0	9.2	0.2	2.4	
Delay (s)	129.3	45.1	47.9	1.7	15.3	
Level of Service	F	D	D	A	B	
Approach Delay (s)		51.9	20.2		15.3	
Approach LOS		D	C		B	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	109.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	720	30	60	750	110	180	120	90	170	90	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	783	33	65	815	120	196	130	98	185	98	54

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	11	815	65	935	326	98	283	54
Volume Left (vph)	11	0	65	0	196	0	185	0
Volume Right (vph)	0	33	0	120	0	98	0	54
Hadj (s)	0.53	0.01	0.53	-0.06	0.33	-0.67	0.36	-0.67
Departure Headway (s)	9.1	8.6	9.1	8.5	9.2	8.2	9.4	8.4
Degree Utilization, x	0.03	1.95	0.16	2.21	0.83	0.22	0.74	0.13
Capacity (veh/h)	386	425	390	431	386	430	373	419
Control Delay (s)	11.2	454.1	12.7	570.1	43.3	12.4	33.5	11.4
Approach Delay (s)	448.3		533.7		36.2		30.0	
Approach LOS	F		F		E		D	

Intersection Summary				
Delay	359.3			
HCM Level of Service	F			
Intersection Capacity Utilization	79.5%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	70	840	90	90	740	100	80	60	30	110	60	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	913	98	98	804	109	87	65	33	120	65	33

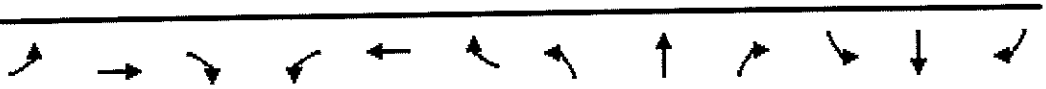
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	76	1011	98	913	152	33	185	33
Volume Left (vph)	76	0	98	0	87	0	120	0
Volume Right (vph)	0	98	0	109	0	33	0	33
Hadj (s)	0.53	-0.03	0.53	-0.05	0.32	-0.67	0.36	-0.67
Departure Headway (s)	7.7	7.1	7.7	7.1	8.7	7.8	8.7	7.7
Degree Utilization, x	0.16	2.00	0.21	1.80	0.37	0.07	0.44	0.07
Capacity (veh/h)	457	513	462	514	404	450	407	458
Control Delay (s)	11.0	473.4	11.5	383.4	15.6	10.2	17.2	10.0
Approach Delay (s)	441.1		347.4		14.6		16.2	
Approach LOS	F		F		B		C	

Intersection Summary				
Delay	334.7			
HCM Level of Service	F			
Intersection Capacity Utilization	80.6%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1871		1787	1881	1599	1787	3333		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1787	1871		1787	1881	1599	1787	3333		1787	3574	1599
Volume (vph)	130	830	30	90	680	510	70	220	180	380	260	170
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	902	33	98	739	554	76	239	196	413	283	185
RTOR Reduction (vph)	0	1	0	0	0	248	0	125	0	0	0	151
Lane Group Flow (vph)	141	934	0	98	739	306	76	310	0	413	283	34
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	7.0	59.0		7.0	59.0	59.0	16.0	16.0		22.0	22.0	22.0
Effective Green, g (s)	7.0	59.0		7.0	59.0	59.0	16.0	16.0		22.0	22.0	22.0
Actuated g/C Ratio	0.06	0.49		0.06	0.49	0.49	0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	104	920		104	925	786	238	444		328	655	293
v/s Ratio Prot	c0.08	c0.50		0.05	0.39		0.04	c0.09		c0.23	0.08	
v/s Ratio Perm						0.19						0.02
v/c Ratio	1.36	1.02		0.94	0.80	0.39	0.32	0.70		1.26	0.43	0.12
Uniform Delay, d1	56.5	30.5		56.3	25.5	19.2	47.1	49.7		49.0	43.5	40.9
Progression Factor	1.00	1.00		0.98	0.89	1.41	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	210.3	33.5		14.7	0.7	0.1	3.5	8.8		139.0	2.1	0.8
Delay (s)	266.8	64.0		70.1	23.5	27.1	50.6	58.5		188.0	45.5	41.7
Level of Service	F	E		E	C	C	D	E		F	D	D
Approach Delay (s)		90.6			28.2			57.3			111.5	
Approach LOS		F			C			E			F	

Intersection Summary				
HCM Average Control Delay	68.5	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	96.7%	ICU Level of Service	F	
Analysis Period (min)	15			

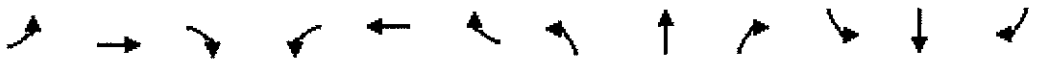
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1864		1787	1881	1599	1787	3287		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1787	1864		1787	1881	1599	1787	3287		1787	3574	1599
Volume (vph)	40	900	60	120	680	330	90	130	150	370	220	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	978	65	130	739	359	98	141	163	402	239	152
RTOR Reduction (vph)	0	2	0	0	0	156	0	133	0	0	0	124
Lane Group Flow (vph)	43	1041	0	130	739	203	98	171	0	402	239	28
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	5.6	59.0		7.0	60.4	60.4	16.0	16.0		22.0	22.0	22.0
Effective Green, g (s)	5.6	59.0		7.0	60.4	60.4	16.0	16.0		22.0	22.0	22.0
Actuated g/C Ratio	0.05	0.49		0.06	0.50	0.50	0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	83	916		104	947	805	238	438		328	655	293
v/s Ratio Prot	0.02	c0.56		c0.07	0.39		c0.05	0.05		c0.22	0.07	
v/s Ratio Perm						0.13						0.02
v/c Ratio	0.52	1.14		1.25	0.78	0.25	0.41	0.39		1.23	0.36	0.10
Uniform Delay, d1	55.9	30.5		56.5	24.4	16.9	47.7	47.5		49.0	42.9	40.7
Progression Factor	1.00	1.00		1.10	0.81	1.46	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.4	74.8		119.8	0.6	0.1	5.2	2.6		125.6	1.6	0.6
Delay (s)	61.3	105.3		182.2	20.3	24.9	52.9	50.2		174.6	44.5	41.4
Level of Service	E	F		F	C	C	D	D		F	D	D
Approach Delay (s)		103.6			38.8			50.8			109.8	
Approach LOS		F			D			D			F	

Intersection Summary				
HCM Average Control Delay	76.3	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	99.9%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97			0.98	
Satd. Flow (prot)	1770	1844		1770	1863	1583		1744			1740	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97			0.98	
Satd. Flow (perm)	1770	1844		1770	1863	1583		1744			1740	
Volume (vph)	40	1240	90	40	1040	15	190	50	90	80	60	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1348	98	43	1130	16	207	54	98	87	65	87
RTOR Reduction (vph)	0	2	0	0	0	5	0	11	0	0	17	0
Lane Group Flow (vph)	43	1444	0	43	1130	11	0	348	0	0	222	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	65.5		4.0	63.9	63.9		17.8			16.7	
Effective Green, g (s)	5.6	65.5		4.0	63.9	63.9		17.8			16.7	
Actuated g/C Ratio	0.05	0.55		0.03	0.53	0.53		0.15			0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	83	1007		59	992	843		259			242	
v/s Ratio Prot	c0.02	c0.78		0.02	0.61			c0.20			c0.13	
v/s Ratio Perm						0.01						
v/c Ratio	0.52	1.43		0.73	1.14	0.01		1.34			0.92	
Uniform Delay, d1	55.9	27.2		57.5	28.1	13.2		51.1			51.0	
Progression Factor	0.94	0.87		0.91	0.56	0.10		1.00			1.00	
Incremental Delay, d2	0.5	195.7		29.0	72.5	0.0		178.1			35.8	
Delay (s)	52.8	219.5		81.2	88.3	1.3		229.2			86.7	
Level of Service	D	F		F	F	A		F			F	
Approach Delay (s)		214.7			86.9			229.2			86.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	160.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	0.95	0.95			1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	1852		1770	1863	1583	1681	1577			1731	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	1852		1770	1863	1583	1681	1577			1731	
Volume (vph)	50	1250	50	60	1060	15	70	30	80	70	30	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1359	54	65	1152	16	76	33	87	76	33	65
RTOR Reduction (vph)	0	1	0	0	0	4	0	75	0	0	18	0
Lane Group Flow (vph)	54	1412	0	65	1152	12	76	45	0	0	156	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	67.1		5.8	67.3	67.3	16.0	16.0			15.1	
Effective Green, g (s)	5.6	67.1		5.8	67.3	67.3	16.0	16.0			15.1	
Actuated g/C Ratio	0.05	0.56		0.05	0.56	0.56	0.13	0.13			0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	83	1036		86	1045	888	224	210			218	
v/s Ratio Prot	0.03	c0.76		c0.04	0.62		c0.05	0.03			c0.09	
v/s Ratio Perm						0.01						
v/c Ratio	0.65	1.36		0.76	1.10	0.01	0.34	0.21			0.71	
Uniform Delay, d1	56.2	26.5		56.4	26.4	11.7	47.2	46.4			50.4	
Progression Factor	0.92	0.91		0.93	0.62	0.34	1.00	1.00			1.00	
Incremental Delay, d2	1.7	163.8		27.2	58.6	0.0	4.1	2.3			10.6	
Delay (s)	53.5	187.9		79.7	75.0	4.0	51.3	48.7			60.9	
Level of Service	D	F		E	E	A	D	D			E	
Approach Delay (s)		183.0			74.3			49.7			60.9	
Approach LOS		F			E			D			E	

Intersection Summary				
HCM Average Control Delay	123.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	91.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	50	1340	10	40	1040	190	10	20	70	110	20	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	1457	11	43	1130	207	11	22	76	120	22	65
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		1109										
pX, platoon unblocked				0.46			0.46	0.46	0.46	0.46	0.46	
vC, conflicting volume	1337			1467			2864	2995	1462	2870	2793	1130
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1337			2007			5015	5295	1995	5026	4862	1130
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			67			0	0	0	0	0	74
cM capacity (veh/h)	516			132			0	0	35	0	0	248

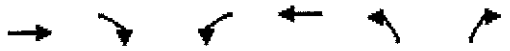
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	54	1467	43	1130	207	109	207
Volume Left	54	0	43	0	0	11	120
Volume Right	0	11	0	0	207	76	65
cSH	516	1700	132	1700	1700	0	0
Volume to Capacity	0.11	0.86	0.33	0.66	0.12	Err	Err
Queue Length 95th (ft)	9	0	33	0	0	Err	Err
Control Delay (s)	12.8	0.0	45.1	0.0	0.0	Err	Err
Lane LOS	B		E			F	F
Approach Delay (s)	0.5		1.4			Err	Err
Approach LOS						F	F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	95.3%	ICU Level of Service	F	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	30	1330	10	20	1030	160	10	20	50	180	10	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	1446	11	22	1120	174	11	22	54	196	11	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		1109										
pX, platoon unblocked				0.45			0.45	0.45	0.45	0.45	0.45	
vC, conflicting volume	1293			1457			2728	2853	1451	2739	2685	1120
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1293			2013			4837	5114	2001	4861	4740	1120
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			83			0	0	0	0	0	83
cM capacity (veh/h)	536			127			0	0	34	0	0	251

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	33	1457	22	1120	174	87	250
Volume Left	33	0	22	0	0	11	196
Volume Right	0	11	0	0	174	54	43
cSH	536	1700	127	1700	1700	0	0
Volume to Capacity	0.06	0.86	0.17	0.66	0.10	Err	Err
Queue Length 95th (ft)	5	0	15	0	0	Err	Err
Control Delay (s)	12.2	0.0	39.0	0.0	0.0	Err	Err
Lane LOS	B		E			F	F
Approach Delay (s)	0.3		0.6			Err	Err
Approach LOS						F	F

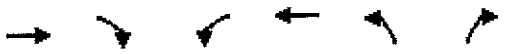
Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1260	250	280	1150	160	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1370	272	304	1250	174	217
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				896		
pX, platoon unblocked					0.57	
vC, conflicting volume			1641		3364	1505
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1641		5164	1505
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			23		0	0
cM capacity (veh/h)			394		0	149

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	1641	304	1250	174	217
Volume Left	0	304	0	174	0
Volume Right	272	0	0	0	217
cSH	1700	394	1700	0	149
Volume to Capacity	0.97	0.77	0.74	2580.67	1.46
Queue Length 95th (ft)	0	161	0	Err	357
Control Delay (s)	0.0	39.0	0.0	Err	295.9
Lane LOS		E		F	F
Approach Delay (s)	0.0	7.6	4608.4		
Approach LOS				F	

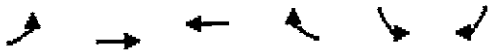
Intersection Summary			
Average Delay	506.0		
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1040	490	330	960	190	300
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1130	533	359	1043	207	326
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				896		
pX, platoon unblocked					0.65	
vC, conflicting volume			1663		3158	1397
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1663		4330	1397
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			7		0	0
cM capacity (veh/h)			387		0	173

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	1663	359	1043	207	326
Volume Left	0	359	0	207	0
Volume Right	533	0	0	0	326
cSH	1700	387	1700	0	173
Volume to Capacity	0.98	0.93	0.61	2258.17	1.89
Queue Length 95th (ft)	0	249	0	Err	606
Control Delay (s)	0.0	62.4	0.0	Err	465.7
Lane LOS		F		F	F
Approach Delay (s)	0.0	16.0		4162.3	
Approach LOS				F	

Intersection Summary			
Average Delay	622.4		
Intersection Capacity Utilization	123.4%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1460	1400	20	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1587	1522	22	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			448			
pX, platoon unblocked	0.56				0.56	0.56
vC, conflicting volume	1543				3120	1533
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1976				4806	1956
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	51
cM capacity (veh/h)	163				1	44

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1587	1543	22
Volume Left	0	0	0
Volume Right	0	22	22
cSH	1700	1700	44
Volume to Capacity	0.93	0.91	0.49
Queue Length 95th (ft)	0	0	44
Control Delay (s)	0.0	0.0	147.4
Lane LOS			F
Approach Delay (s)	0.0	0.0	147.4
Approach LOS			F

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1350	1220	70	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1467	1326	76	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			448			
pX, platoon unblocked	0.63				0.63	0.63
vC, conflicting volume	1402				2832	1364
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1641				3917	1580
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	74
cM capacity (veh/h)	248				2	84

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1467	1402	22
Volume Left	0	0	0
Volume Right	0	76	22
cSH	1700	1700	84
Volume to Capacity	0.86	0.82	0.26
Queue Length 95th (ft)	0	0	23
Control Delay (s)	0.0	0.0	61.9
Lane LOS			F
Approach Delay (s)	0.0	0.0	61.9
Approach LOS			F

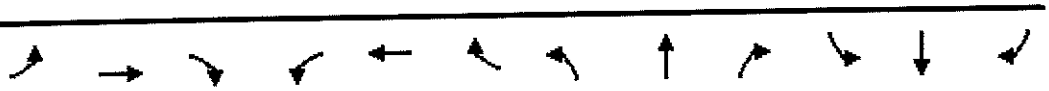
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3532		1770	3539	1583	1770	1806		1770	1654	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3532		1770	3539	1583	1770	1806		1770	1654	
Volume (vph)	110	1380	20	10	1230	80	130	40	10	150	30	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	1500	22	11	1337	87	141	43	11	163	33	98
RTOR Reduction (vph)	0	0	0	0	0	34	0	7	0	0	85	0
Lane Group Flow (vph)	120	1522	0	11	1337	53	141	47	0	163	46	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	12.7	64.2		1.8	53.3	53.3	22.0	22.0		16.0	16.0	
Effective Green, g (s)	12.7	64.2		1.8	53.3	53.3	22.0	22.0		16.0	16.0	
Actuated g/C Ratio	0.11	0.54		0.02	0.44	0.44	0.18	0.18		0.13	0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	187	1890		27	1572	703	325	331		236	221	
v/s Ratio Prot	0.07	c0.43		0.01	c0.38		c0.08	0.03		c0.09	0.03	
v/s Ratio Perm						0.03						
v/c Ratio	0.64	0.81		0.41	0.85	0.08	0.43	0.14		0.69	0.21	
Uniform Delay, d1	51.5	22.8		58.6	29.8	19.2	43.5	41.1		49.6	46.4	
Progression Factor	1.13	0.52		0.67	0.53	0.37	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.4		4.8	3.0	0.1	4.2	0.9		8.4	0.5	
Delay (s)	58.9	12.2		43.9	18.8	7.1	47.7	42.0		58.1	46.8	
Level of Service	E	B		D	B	A	D	D		E	D	
Approach Delay (s)		15.6			18.3			46.1			53.1	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	21.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	67.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3530		1770	3539	1583	1770	1812		1770	1665	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3530		1770	3539	1583	1770	1812		1770	1665	
Volume (vph)	140	1200	20	40	1030	160	140	90	20	360	70	170
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	1304	22	43	1120	174	152	98	22	391	76	185
RTOR Reduction (vph)	0	1	0	0	0	91	0	7	0	0	73	0
Lane Group Flow (vph)	152	1325	0	43	1120	83	152	113	0	391	188	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	14.7	54.6		5.4	45.3	45.3	22.0	22.0		22.0	22.0	
Effective Green, g (s)	14.7	54.6		5.4	45.3	45.3	22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.12	0.46		0.05	0.38	0.38	0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	217	1606		80	1336	598	325	332		325	305	
v/s Ratio Prot	0.09	c0.38		0.02	c0.32		c0.09	0.06		c0.22	0.11	
v/s Ratio Perm						0.05						
v/c Ratio	0.70	0.82		0.54	0.84	0.14	0.47	0.34		1.20	0.62	
Uniform Delay, d1	50.5	28.5		56.1	34.0	24.5	43.8	42.7		49.0	45.1	
Progression Factor	1.06	0.61		0.64	0.43	0.21	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	2.7		4.5	4.4	0.3	4.8	2.8		117.0	3.7	
Delay (s)	58.7	20.3		40.2	19.0	5.6	48.5	45.5		166.0	48.8	
Level of Service	E	C		D	B	A	D	D		F	D	
Approach Delay (s)		24.2			17.9			47.2			119.1	
Approach LOS		C			B			D			F	

Intersection Summary				
HCM Average Control Delay	40.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	76.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1881	3762	1683	3650	3762	1683	3650	3702		3650	3762	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1881	3762	1683	3650	3762	1683	3650	3702		3650	3762	1683
Volume (vph)	280	930	300	160	850	460	320	830	100	380	590	120
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	304	1011	326	174	924	500	348	902	109	413	641	130
RTOR Reduction (vph)	0	0	51	0	0	22	0	8	0	0	0	85
Lane Group Flow (vph)	304	1011	275	174	924	478	348	1003	0	413	641	46
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	18.0	37.4	52.4	9.6	29.0	48.1	15.0	37.9		19.1	42.0	42.0
Effective Green, g (s)	18.0	37.4	52.4	9.6	29.0	48.1	15.0	37.9		19.1	42.0	42.0
Actuated g/C Ratio	0.15	0.31	0.44	0.08	0.24	0.40	0.12	0.32		0.16	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	282	1172	735	292	909	675	456	1169		581	1317	589
v/s Ratio Prot	c0.16	0.27	0.05	0.05	c0.25	0.11	0.10	c0.27		c0.11	0.17	
v/s Ratio Perm			0.12			0.17						0.03
v/c Ratio	1.08	0.86	0.37	0.60	1.02	0.71	0.76	0.86		0.71	0.49	0.08
Uniform Delay, d1	51.0	38.9	22.8	53.3	45.5	30.1	50.8	38.5		47.8	30.6	26.1
Progression Factor	0.62	0.52	0.43	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	65.2	5.6	0.2	3.3	34.0	3.4	7.4	8.3		4.1	1.3	0.3
Delay (s)	96.9	25.6	10.1	56.6	79.5	33.5	58.2	46.8		51.9	31.8	26.3
Level of Service	F	C	B	E	E	C	E	D		D	C	C
Approach Delay (s)		35.8			62.6			49.7			38.2	
Approach LOS		D			E			D			D	

Intersection Summary				
HCM Average Control Delay	47.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	85.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1881	3762	1683	3650	3762	1683	3650	3695		3650	3762	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1881	3762	1683	3650	3762	1683	3650	3695		3650	3762	1683
Volume (vph)	240	880	350	350	720	390	300	880	120	600	1280	270
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	957	380	380	783	424	326	957	130	652	1391	293
RTOR Reduction (vph)	0	0	2	0	0	28	0	9	0	0	0	132
Lane Group Flow (vph)	261	957	378	380	783	396	326	1079	0	652	1391	161
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	18.0	37.0	52.0	10.0	29.0	51.0	15.0	35.0		22.0	42.0	42.0
Effective Green, g (s)	18.0	37.0	52.0	10.0	29.0	51.0	15.0	35.0		22.0	42.0	42.0
Actuated g/C Ratio	0.15	0.31	0.43	0.08	0.24	0.42	0.12	0.29		0.18	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	282	1160	729	304	909	715	456	1078		669	1317	589
v/s Ratio Prot	0.14	c0.25	0.06	c0.10	c0.21	0.10	0.09	c0.29		0.18	c0.37	
v/s Ratio Perm			0.16			0.13						0.10
v/c Ratio	0.93	0.82	0.52	1.25	0.86	0.55	0.71	1.00		0.97	1.06	0.27
Uniform Delay, d1	50.3	38.5	24.8	55.0	43.6	26.0	50.4	42.5		48.7	39.0	28.0
Progression Factor	0.65	0.56	0.41	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.2	3.1	0.3	136.8	10.5	0.9	5.3	27.5		28.3	41.1	1.1
Delay (s)	52.2	24.6	10.6	191.8	54.1	26.9	55.7	70.0		77.0	80.1	29.2
Level of Service	D	C	B	F	D	C	E	E		E	F	C
Approach Delay (s)		25.7			79.8			66.7			72.8	
Approach LOS		C			E			E			E	

Intersection Summary				
HCM Average Control Delay	62.3	HCM Level of Service	E	
HCM Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	88.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	30	300	140	60	200	270	50	330	40	70	270	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	326	152	65	217	293	54	359	43	76	293	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	511			478			995	1109	402	1109	1038	364
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	511			478			995	1109	402	1109	1038	364
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			94			0	0	93	0	0	95
cM capacity (veh/h)	1054			1084			0	191	648	0	210	681

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	478	65	511	234	223	223	179
Volume Left	33	0	65	0	54	0	76	0
Volume Right	0	152	0	293	0	43	0	33
cSH	1054	1700	1084	1700	0	221	0	240
Volume to Capacity	0.03	0.28	0.06	0.30	Err	1.01	Err	0.75
Queue Length 95th (ft)	2	0	5	0	Err	231	Err	131
Control Delay (s)	8.5	0.0	8.5	0.0	Err	108.4	Err	53.8
Lane LOS	A		A		F	F	F	F
Approach Delay (s)	0.5		1.0		Err		Err	
Approach LOS					F		F	

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	66.0%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	50	250	140	110	180	110	90	270	60	120	660	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	272	152	120	196	120	98	293	65	130	717	76
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	315			424			1326	1011	348	1087	1027	255
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	315			424			1326	1011	348	1087	1027	255
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			89			0	0	91	0	0	90
cM capacity (veh/h)	1245			1135			0	205	695	0	200	783

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	54	424	120	315	245	212	489	435
Volume Left	54	0	120	0	98	0	130	0
Volume Right	0	152	0	120	0	65	0	76
cSH	1245	1700	1135	1700	0	262	0	230
Volume to Capacity	0.04	0.25	0.11	0.19	Err	0.81	Err	1.89
Queue Length 95th (ft)	3	0	9	0	Err	158	Err	771
Control Delay (s)	8.0	0.0	8.5	0.0	Err	58.7	Err	450.3
Lane LOS	A		A		F	F	F	F
Approach Delay (s)	0.9		2.3		Err		Err	
Approach LOS					F		F	

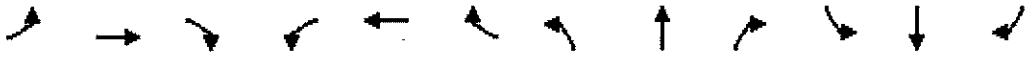
Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.99	
Flt Protected		0.99	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3676	1667		3526		1863	3717		1863	3671	
Flt Permitted		0.99	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3676	1667		3526		1863	3717		1863	3671	
Volume (vph)	80	220	240	140	200	120	210	650	10	120	650	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	239	261	152	217	130	228	707	11	130	707	76
RTOR Reduction (vph)	0	0	125	0	30	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	326	136	0	469	0	228	717	0	130	778	0
Turn Type	Split		pm+ov	Split			Prot			Prot		
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		14.1	31.6		17.7		17.5	40.5		12.2	35.2	
Effective Green, g (s)		14.1	31.6		17.7		17.5	40.5		12.2	35.2	
Actuated g/C Ratio		0.14	0.31		0.18		0.17	0.40		0.12	0.35	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		516	524		621		324	1498		226	1286	
v/s Ratio Prot		c0.09	0.05		c0.13		c0.12	0.19		0.07	c0.21	
v/s Ratio Perm			0.04									
v/c Ratio		0.63	0.26		0.76		0.70	0.48		0.58	0.60	
Uniform Delay, d1		40.8	25.7		39.3		39.1	22.2		41.7	26.9	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.5	0.3		5.2		6.8	1.1		3.5	2.1	
Delay (s)		43.3	26.0		44.6		45.8	23.3		45.2	29.0	
Level of Service		D	C		D		D	C		D	C	
Approach Delay (s)		35.6			44.6			28.7			31.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



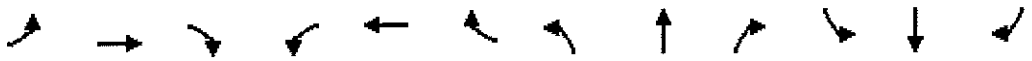
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3678	1667		3540		1863	3707		1863	3708	
Flt Permitted		0.61	1.00		0.68		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2256	1667		2469		1863	3707		1863	3708	
Volume (vph)	70	200	600	280	210	110	130	580	20	100	2110	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	217	652	304	228	120	141	630	22	109	2293	76
RTOR Reduction (vph)	0	0	67	0	18	0	0	2	0	0	1	0
Lane Group Flow (vph)	0	293	585	0	634	0	141	650	0	109	2368	0
Turn Type	Prot		pm+ov	Prot			Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		21.8	37.4		21.8		15.6	40.3		8.6	33.3	
Effective Green, g (s)		21.8	37.4		21.8		15.6	40.3		8.6	33.3	
Actuated g/C Ratio		0.26	0.45		0.26		0.19	0.49		0.10	0.40	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		595	835		651		351	1806		194	1493	
v/s Ratio Prot			c0.13				0.08	0.18		0.06	c0.64	
v/s Ratio Perm		0.13	0.22		c0.26							
v/c Ratio		4.47dl	0.70		8.69dl		0.40	0.36		0.56	1.59	
Uniform Delay, d1		25.8	18.2		30.2		29.5	13.2		35.3	24.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6	2.7		28.5		0.8	0.6		3.7	266.9	
Delay (s)		26.4	20.8		58.6		30.2	13.7		38.9	291.6	
Level of Service		C	C		E		C	B		D	F	
Approach Delay (s)		22.6			58.6			16.7			280.5	
Approach LOS		C			E			B			F	

Intersection Summary			
HCM Average Control Delay	157.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	119.4%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

APPENDIX H

INTERSECTION CAPACITY WORKSHEETS
YEAR 2015 WITH ANZA ROAD EXTENSION



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	650	30	60	580	90	160	110	90	120	80	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	707	33	65	630	98	174	120	98	130	87	43

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	11	739	65	728	293	98	217	43
Volume Left (vph)	11	0	65	0	174	0	130	0
Volume Right (vph)	0	33	0	98	0	98	0	43
Hadj (s)	0.53	0.00	0.53	-0.06	0.33	-0.67	0.33	-0.67
Departure Headway (s)	8.6	8.1	8.6	8.0	8.9	7.9	9.2	8.3
Degree Utilization, x	0.03	1.67	0.16	1.62	0.73	0.22	0.56	0.10
Capacity (veh/h)	406	447	412	453	396	445	374	425
Control Delay (s)	10.7	330.1	12.0	310.1	31.1	11.9	22.1	11.0
Approach Delay (s)	325.5		285.6		26.3		20.2	
Approach LOS	F		F		D		C	

Intersection Summary				
Delay	221.5			
HCM Level of Service	F			
Intersection Capacity Utilization	70.7%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	50	780	70	80	530	80	80	60	30	80	60	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	848	76	87	576	87	87	65	33	87	65	22

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	54	924	87	663	152	33	152	22
Volume Left (vph)	54	0	87	0	87	0	87	0
Volume Right (vph)	0	76	0	87	0	33	0	22
Hadj (s)	0.53	-0.02	0.53	-0.06	0.32	-0.67	0.32	-0.67
Departure Headway (s)	7.5	6.9	7.4	6.8	8.6	7.6	8.6	7.6
Degree Utilization, x	0.11	1.78	0.18	1.26	0.36	0.07	0.36	0.05
Capacity (veh/h)	469	527	476	534	412	461	409	459
Control Delay (s)	10.2	372.8	10.8	153.0	15.2	10.0	15.2	9.8
Approach Delay (s)	352.7		136.5		14.3		14.6	
Approach LOS	F		F		B		B	

Intersection Summary				
Delay	216.9			
HCM Level of Service	F			
Intersection Capacity Utilization	74.0%	ICU Level of Service		D
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1874		1787	1881	1599	1787	3357		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1787	1874		1787	1881	1599	1787	3357		1787	3574	1599
Volume (vph)	70	740	20	90	530	460	60	220	150	340	260	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	804	22	98	576	500	65	239	163	370	283	152
RTOR Reduction (vph)	0	1	0	0	0	254	0	100	0	0	0	124
Lane Group Flow (vph)	76	825	0	98	576	246	65	302	0	370	283	28
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	7.0	54.7		11.3	59.0	59.0	16.0	16.0		22.0	22.0	22.0
Effective Green, g (s)	7.0	54.7		11.3	59.0	59.0	16.0	16.0		22.0	22.0	22.0
Actuated g/C Ratio	0.06	0.46		0.09	0.49	0.49	0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	104	854		168	925	786	238	448		328	655	293
v/s Ratio Prot	c0.04	c0.44		c0.05	0.31		0.04	c0.09		c0.21	0.08	
v/s Ratio Perm						0.15						0.02
v/c Ratio	0.73	0.97		0.58	0.62	0.31	0.27	0.67		1.13	0.43	0.10
Uniform Delay, d1	55.6	31.8		52.1	22.3	18.3	46.8	49.5		49.0	43.5	40.7
Progression Factor	1.00	1.00		0.96	1.00	2.51	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	23.0	23.7		1.3	0.8	0.3	2.8	7.9		88.9	2.1	0.6
Delay (s)	78.6	55.4		51.3	23.2	46.2	49.6	57.4		137.9	45.5	41.4
Level of Service	E	E		D	C	D	D	E		F	D	D
Approach Delay (s)		57.4			35.3			56.3			87.2	
Approach LOS		E			D			E			F	

Intersection Summary			
HCM Average Control Delay	56.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1868		1787	1881	1599	1787	3317		1787	3574	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1787	1868		1787	1881	1599	1787	3317		1787	3574	1599
Volume (vph)	30	820	40	120	520	300	70	130	120	340	220	120
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	891	43	130	565	326	76	141	130	370	239	130
RTOR Reduction (vph)	0	2	0	0	0	158	0	113	0	0	0	106
Lane Group Flow (vph)	33	932	0	130	565	168	76	158	0	370	239	24
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	4.2	56.0		10.0	61.8	61.8	16.0	16.0		22.0	22.0	22.0
Effective Green, g (s)	4.2	56.0		10.0	61.8	61.8	16.0	16.0		22.0	22.0	22.0
Actuated g/C Ratio	0.04	0.47		0.08	0.51	0.51	0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	63	872		149	969	823	238	442		328	655	293
v/s Ratio Prot	0.02	c0.50		c0.07	0.30		0.04	c0.05		c0.21	0.07	
v/s Ratio Perm						0.10						0.01
v/c Ratio	0.52	1.07		0.87	0.58	0.20	0.32	0.36		1.13	0.36	0.08
Uniform Delay, d1	56.9	32.0		54.4	20.2	15.8	47.1	47.3		49.0	42.9	40.6
Progression Factor	1.00	1.00		1.12	0.92	2.26	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.6	50.7		21.0	1.1	0.2	3.5	2.3		88.9	1.6	0.5
Delay (s)	64.6	82.7		81.7	19.6	35.9	50.6	49.6		137.9	44.5	41.2
Level of Service	E	F		F	B	D	D	D		F	D	D
Approach Delay (s)		82.1			32.7			49.8			90.7	
Approach LOS		F			C			D			F	

Intersection Summary			
HCM Average Control Delay	64.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97			0.98	
Satd. Flow (prot)	1770	1844		1770	1863	1583		1749			1744	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97			0.98	
Satd. Flow (perm)	1770	1844		1770	1863	1583		1749			1744	
Volume (vph)	40	1090	80	40	850	20	200	50	80	70	60	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1185	87	43	924	22	217	54	87	76	65	76
RTOR Reduction (vph)	0	2	0	0	0	8	0	9	0	0	16	0
Lane Group Flow (vph)	43	1270	0	43	924	14	0	349	0	0	201	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	66.0		4.0	64.4	64.4		17.8			16.2	
Effective Green, g (s)	5.6	66.0		4.0	64.4	64.4		17.8			16.2	
Actuated g/C Ratio	0.05	0.55		0.03	0.54	0.54		0.15			0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	83	1014		59	1000	850		259			235	
v/s Ratio Prot	c0.02	c0.69		0.02	0.50			c0.20			c0.11	
v/s Ratio Perm						0.01						
v/c Ratio	0.52	1.25		0.73	0.92	0.02		1.35			0.85	
Uniform Delay, d1	55.9	27.0		57.5	25.6	13.0		51.1			50.7	
Progression Factor	0.88	0.80		0.91	0.52	0.07		1.00			1.00	
Incremental Delay, d2	1.4	115.7		31.5	13.4	0.0		179.2			24.7	
Delay (s)	50.8	137.3		83.6	26.7	1.0		230.3			75.4	
Level of Service	D	F		F	C	A		F			E	
Approach Delay (s)		134.5			28.6			230.3			75.4	
Approach LOS		F			C			F			E	

Intersection Summary			
HCM Average Control Delay	105.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.94			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	1851		1770	1863	1583		1721			1728	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (perm)	1770	1851		1770	1863	1583		1721			1728	
Volume (vph)	50	1130	50	50	880	20	60	30	70	60	30	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1228	54	54	957	22	65	33	76	65	33	65
RTOR Reduction (vph)	0	1	0	0	0	7	0	23	0	0	20	0
Lane Group Flow (vph)	54	1281	0	54	957	15	0	151	0	0	143	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	68.2		4.0	66.6	66.6		17.8			14.0	
Effective Green, g (s)	5.6	68.2		4.0	66.6	66.6		17.8			14.0	
Actuated g/C Ratio	0.05	0.57		0.03	0.55	0.55		0.15			0.12	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	83	1052		59	1034	879		255			202	
v/s Ratio Prot	c0.03	c0.69		0.03	0.51			c0.09			c0.08	
v/s Ratio Perm						0.01						
v/c Ratio	0.65	1.22		0.92	0.93	0.02		0.59			0.71	
Uniform Delay, d1	56.2	25.9		57.8	24.4	12.0		47.7			51.0	
Progression Factor	0.88	0.84		0.94	0.65	0.25		1.00			1.00	
Incremental Delay, d2	1.7	98.7		81.0	13.7	0.0		9.7			10.7	
Delay (s)	51.4	120.4		135.3	29.6	3.0		57.4			61.7	
Level of Service	D	F		F	C	A		E			E	
Approach Delay (s)		117.6			34.5			57.4			61.7	
Approach LOS		F			C			E			E	

Intersection Summary			
HCM Average Control Delay	78.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	50	1170	10	40	880	180	10	20	60	100	20	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	1272	11	43	957	196	11	22	65	109	22	54
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		1109										
pX, platoon unblocked				0.46			0.46	0.46	0.46	0.46	0.46	
vC, conflicting volume	1152			1283			2495	2625	1277	2500	2435	957
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1152			1614			4248	4531	1602	4260	4118	957
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			77			0	0	0	0	0	83
cM capacity (veh/h)	606			186			0	0	60	0	1	313

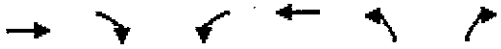
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	54	1283	43	957	196	98	185
Volume Left	54	0	43	0	0	11	109
Volume Right	0	11	0	0	196	65	54
cSH	606	1700	186	1700	1700	0	0
Volume to Capacity	0.09	0.75	0.23	0.56	0.12	Err	Err
Queue Length 95th (ft)	7	0	22	0	0	Err	Err
Control Delay (s)	11.5	0.0	30.2	0.0	0.0	Err	Err
Lane LOS	B		D			F	F
Approach Delay (s)	0.5		1.1			Err	Err
Approach LOS						F	F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	85.2%	ICU Level of Service	E	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	30	1200	10	20	870	160	10	20	50	170	10	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	1304	11	22	946	174	11	22	54	185	11	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		1109										
pX, platoon unblocked				0.44			0.44	0.44	0.44	0.44	0.44	
vC, conflicting volume	1120			1315			2413	2538	1310	2424	2370	946
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1120			1714			4202	4485	1702	4227	4104	946
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			87			0	0	0	0	0	86
cM capacity (veh/h)	624			163			0	0	50	0	1	317

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	33	1315	22	946	174	87	239
Volume Left	33	0	22	0	0	11	185
Volume Right	0	11	0	0	174	54	43
cSH	624	1700	163	1700	1700	0	0
Volume to Capacity	0.05	0.77	0.13	0.56	0.10	Err	Err
Queue Length 95th (ft)	4	0	11	0	0	Err	Err
Control Delay (s)	11.1	0.0	30.4	0.0	0.0	Err	Err
Lane LOS	B		D			F	F
Approach Delay (s)	0.3		0.6			Err	Err
Approach LOS						F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1090	170	260	1080	120	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1185	185	283	1174	130	152
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				896		
pX, platoon unblocked					0.59	
vC, conflicting volume			1370		3016	1277
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1370		4408	1277
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			44		0	25
cM capacity (veh/h)			501		0	203

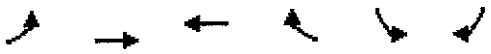
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	1370	283	1174	130	152
Volume Left	0	283	0	130	0
Volume Right	185	0	0	0	152
cSH	1700	501	1700	0	203
Volume to Capacity	0.81	0.56	0.69	293.16	0.75
Queue Length 95th (ft)	0	86	0	Err	125
Control Delay (s)	0.0	21.1	0.0	Err	61.9
Lane LOS		C		F	F
Approach Delay (s)	0.0	4.1	4648.3		
Approach LOS				F	

Intersection Summary			
Average Delay	424.5		
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	890	400	320	890	140	210
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	967	435	348	967	152	228
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				896		
pX, platoon unblocked					0.71	
vC, conflicting volume			1402		2848	1185
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1402		3601	1185
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			29		0	1
cM capacity (veh/h)			487		1	230

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	1402	348	967	152	228
Volume Left	0	348	0	152	0
Volume Right	435	0	0	0	228
cSH	1700	487	1700	1	230
Volume to Capacity	0.82	0.71	0.57	124.25	0.99
Queue Length 95th (ft)	0	141	0	Err	228
Control Delay (s)	0.0	28.8	0.0	Err	102.3
Lane LOS		D		F	F
Approach Delay (s)	0.0	7.6		4061.0	
Approach LOS				F	

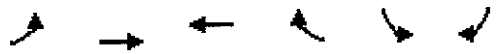
Intersection Summary			
Average Delay	501.9		
Intersection Capacity Utilization	106.7%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1310	1250	20	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1424	1359	22	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			448			
pX, platoon unblocked	0.55				0.55	0.55
vC, conflicting volume	1380				2793	1370
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1694				4272	1674
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	66
cM capacity (veh/h)	206				1	65

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1424	1380	22
Volume Left	0	0	0
Volume Right	0	22	22
cSH	1700	1700	65
Volume to Capacity	0.84	0.81	0.34
Queue Length 95th (ft)	0	0	31
Control Delay (s)	0.0	0.0	86.6
Lane LOS			F
Approach Delay (s)	0.0	0.0	86.6
Approach LOS			F

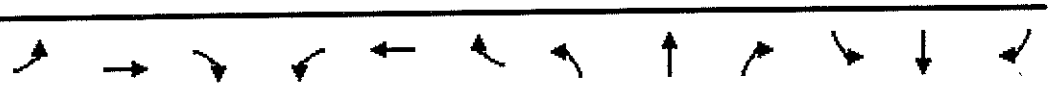
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1150	1070	70	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1250	1163	76	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			448			
pX, platoon unblocked	0.67				0.67	0.67
vC, conflicting volume	1239				2451	1201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1358				3173	1301
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	83
cM capacity (veh/h)	338				8	131

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1250	1239	22
Volume Left	0	0	0
Volume Right	0	76	22
cSH	1700	1700	131
Volume to Capacity	0.74	0.73	0.17
Queue Length 95th (ft)	0	0	14
Control Delay (s)	0.0	0.0	37.8
Lane LOS			E
Approach Delay (s)	0.0	0.0	37.8
Approach LOS			E

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

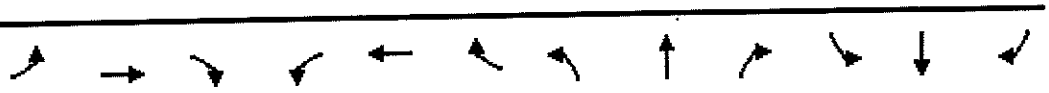


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3531		1770	3539	1583	1770	1806		1770	1660	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3531		1770	3539	1583	1770	1806		1770	1660	
Volume (vph)	110	1220	20	10	1090	80	120	40	10	130	30	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	1326	22	11	1185	87	130	43	11	141	33	87
RTOR Reduction (vph)	0	1	0	0	0	37	0	7	0	0	76	0
Lane Group Flow (vph)	120	1347	0	11	1185	50	130	47	0	141	44	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	12.7	65.7		1.8	54.8	54.8	22.0	22.0		14.5	14.5	
Effective Green, g (s)	12.7	65.7		1.8	54.8	54.8	22.0	22.0		14.5	14.5	
Actuated g/C Ratio	0.11	0.55		0.02	0.46	0.46	0.18	0.18		0.12	0.12	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	187	1933		27	1616	723	325	331		214	201	
v/s Ratio Prot	0.07	c0.38		0.01	c0.33		c0.07	0.03		c0.08	0.03	
v/s Ratio Perm						0.03						
v/c Ratio	0.64	0.70		0.41	0.73	0.07	0.40	0.14		0.66	0.22	
Uniform Delay, d1	51.5	19.9		58.6	26.6	18.3	43.2	41.1		50.4	47.6	
Progression Factor	1.14	0.53		0.51	0.21	0.05	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	1.0		5.9	1.8	0.1	3.6	0.9		7.1	0.5	
Delay (s)	62.0	11.6		36.0	7.3	1.1	46.8	42.0		57.5	48.2	
Level of Service	E	B		D	A	A	D	D		E	D	
Approach Delay (s)		15.7			7.1			45.4			53.2	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM Average Control Delay	17.0	HCM Level of Service		B
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		16.0
Intersection Capacity Utilization	61.6%	ICU Level of Service		B
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3529		1770	3539	1583	1770	1812		1770	1676	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3529		1770	3539	1583	1770	1812		1770	1676	
Volume (vph)	130	1020	20	40	910	150	140	90	20	320	70	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	1109	22	43	989	163	152	98	22	348	76	152
RTOR Reduction (vph)	0	1	0	0	0	96	0	7	0	0	60	0
Lane Group Flow (vph)	141	1130	0	43	989	67	152	113	0	348	168	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	14.2	52.8		7.2	45.8	45.8	22.0	22.0		22.0	22.0	
Effective Green, g (s)	14.2	52.8		7.2	45.8	45.8	22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.12	0.44		0.06	0.38	0.38	0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	209	1553		106	1351	604	325	332		325	307	
v/s Ratio Prot	0.08	c0.32		0.02	c0.28		c0.09	0.06		c0.20	0.10	
v/s Ratio Perm						0.04						
v/c Ratio	0.67	0.73		0.41	0.73	0.11	0.47	0.34		1.07	0.55	
Uniform Delay, d1	50.7	27.7		54.3	31.8	24.0	43.8	42.7		49.0	44.5	
Progression Factor	1.06	0.66		0.51	0.27	0.05	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	2.0		2.0	2.8	0.3	4.8	2.8		70.0	2.0	
Delay (s)	59.4	20.3		29.6	11.4	1.6	48.5	45.5		119.0	46.5	
Level of Service	E	C		C	B	A	D	D		F	D	
Approach Delay (s)		24.7			10.7			47.2			90.3	
Approach LOS		C			B			D			F	

Intersection Summary				
HCM Average Control Delay	32.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1881	3762	1683	3650	3762	1683	3650	3700		3650	3762	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1881	3762	1683	3650	3762	1683	3650	3700		3650	3762	1683
Volume (vph)	230	940	250	150	830	440	280	810	100	370	580	110
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	1022	272	163	902	478	304	880	109	402	630	120
RTOR Reduction (vph)	0	0	83	0	0	21	0	8	0	0	0	78
Lane Group Flow (vph)	250	1022	189	163	902	457	304	981	0	402	630	42
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	15.0	36.5	51.5	10.5	32.0	50.9	15.0	38.1		18.9	42.0	42.0
Effective Green, g (s)	15.0	36.5	51.5	10.5	32.0	50.9	15.0	38.1		18.9	42.0	42.0
Actuated g/C Ratio	0.12	0.30	0.43	0.09	0.27	0.42	0.12	0.32		0.16	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	235	1144	722	319	1003	714	456	1175		575	1317	589
v/s Ratio Prot	c0.13	0.27	0.03	0.04	c0.24	0.10	0.08	c0.27		c0.11	0.17	
v/s Ratio Perm			0.08			0.17						0.02
v/c Ratio	1.06	0.89	0.26	0.51	0.90	0.64	0.67	0.84		0.70	0.48	0.07
Uniform Delay, d1	52.5	39.9	22.0	52.3	42.4	27.3	50.1	38.0		47.9	30.4	26.0
Progression Factor	0.68	0.59	0.59	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	69.5	8.6	0.2	1.4	12.6	1.9	3.7	7.1		3.7	1.2	0.2
Delay (s)	105.3	32.2	13.2	53.7	55.0	29.2	53.8	45.1		51.6	31.7	26.2
Level of Service	F	C	B	D	D	C	D	D		D	C	C
Approach Delay (s)		40.7			46.9			47.2			38.1	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	43.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	81.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1881	3762	1683	3650	3762	1683	3650	3693		3650	3762	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1881	3762	1683	3650	3762	1683	3650	3693		3650	3762	1683
Volume (vph)	230	800	280	330	650	380	270	860	120	590	1090	220
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	870	304	359	707	413	293	935	130	641	1185	239
RTOR Reduction (vph)	0	0	11	0	0	19	0	9	0	0	0	126
Lane Group Flow (vph)	250	870	293	359	707	394	293	1056	0	641	1185	113
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	15.0	31.3	46.3	15.7	32.0	54.0	15.0	35.0		22.0	42.0	42.0
Effective Green, g (s)	15.0	31.3	46.3	15.7	32.0	54.0	15.0	35.0		22.0	42.0	42.0
Actuated g/C Ratio	0.12	0.26	0.39	0.13	0.27	0.45	0.12	0.29		0.18	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	235	981	649	478	1003	757	456	1077		669	1317	589
v/s Ratio Prot	c0.13	c0.23	0.06	0.10	c0.19	0.10	0.08	c0.29		0.18	c0.31	
v/s Ratio Perm			0.12			0.14						0.07
v/c Ratio	1.06	0.89	0.45	0.75	0.70	0.52	0.64	0.98		0.96	0.90	0.19
Uniform Delay, d1	52.5	42.6	27.4	50.3	39.7	23.7	49.9	42.2		48.5	37.0	27.2
Progression Factor	0.62	0.55	0.47	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	62.7	7.3	0.3	6.5	4.2	0.6	3.1	23.1		24.6	10.0	0.7
Delay (s)	95.4	30.7	13.0	56.8	43.9	24.4	53.0	65.2		73.1	47.0	27.9
Level of Service	F	C	B	E	D	C	D	E		E	D	C
Approach Delay (s)		38.3			41.6			62.6			52.9	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM Average Control Delay	49.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	85.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	30	260	90	40	180	210	40	220	40	60	190	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	283	98	43	196	228	43	239	43	65	207	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	424			380			804	908	332	908	842	310
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	424			380			804	908	332	908	842	310
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			61	7	94	0	27	97
cM capacity (veh/h)	1135			1178			112	258	710	43	281	730

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	380	43	424	163	163	168	125
Volume Left	33	0	43	0	43	0	65	0
Volume Right	0	98	0	228	0	43	0	22
cSH	1135	1700	1178	1700	191	310	89	315
Volume to Capacity	0.03	0.22	0.04	0.25	0.85	0.53	1.90	0.40
Queue Length 95th (ft)	2	0	3	0	156	72	359	46
Control Delay (s)	8.3	0.0	8.2	0.0	81.7	28.7	521.5	23.8
Lane LOS	A		A		F	D	F	C
Approach Delay (s)	0.7		0.8		55.2		309.5	
Approach LOS					F		F	

Intersection Summary				
Average Delay	73.0			
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	30	220	90	80	160	80	70	190	40	90	460	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	239	98	87	174	87	76	207	43	98	500	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	261			337			995	788	288	842	793	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	261			337			995	788	288	842	793	217
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			93			0	29	94	9	0	95
cM capacity (veh/h)	1304			1222			0	293	751	107	291	822

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	337	87	261	179	147	348	293
Volume Left	33	0	87	0	76	0	98	0
Volume Right	0	98	0	87	0	43	0	43
cSH	1304	1700	1222	1700	0	357	196	321
Volume to Capacity	0.03	0.20	0.07	0.15	Err	0.41	1.77	0.91
Queue Length 95th (ft)	2	0	6	0	Err	49	608	222
Control Delay (s)	7.8	0.0	8.2	0.0	Err	21.9	408.4	67.2
Lane LOS	A		A		F	C	F	F
Approach Delay (s)	0.7		2.0		Err		252.3	
Approach LOS					F		F	

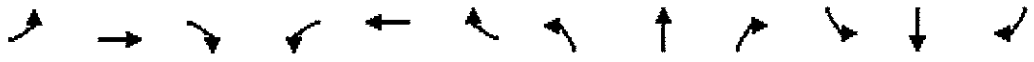
Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	60.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.99	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3676	1667		3553		1863	3717		1863	3662	
Flt Permitted		0.99	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3676	1667		3553		1863	3717		1863	3662	
Volume (vph)	80	220	270	130	250	110	280	620	10	110	620	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	239	293	141	272	120	304	674	11	120	674	87
RTOR Reduction (vph)	0	0	128	0	22	0	0	1	0	0	7	0
Lane Group Flow (vph)	0	326	165	0	511	0	304	684	0	120	754	0
Turn Type	Split		pm+ov	Split			Prot			Prot		
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		13.9	35.2		18.3		21.3	41.1		9.9	29.7	
Effective Green, g (s)		13.9	35.2		18.3		21.3	41.1		9.9	29.7	
Actuated g/C Ratio		0.14	0.35		0.18		0.21	0.41		0.10	0.30	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		515	592		655		400	1540		186	1096	
v/s Ratio Prot		c0.09	0.06		c0.14		c0.16	0.18		0.06	c0.21	
v/s Ratio Perm			0.04									
v/c Ratio		0.63	0.28		0.78		0.76	0.44		0.65	0.69	
Uniform Delay, d1		40.2	22.9		38.5		36.6	20.9		43.0	30.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.5	0.3		6.0		8.3	0.9		7.5	3.5	
Delay (s)		42.8	23.2		44.5		44.8	21.8		50.4	34.2	
Level of Service		D	C		D		D	C		D	C	
Approach Delay (s)		33.5			44.5			28.9			36.4	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM Average Control Delay	34.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	99.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.99	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3673	1667		3560		1863	3706		1863	3701	
Flt Permitted		0.99	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3673	1667		3560		1863	3706		1863	3701	
Volume (vph)	80	200	670	270	260	100	170	550	20	90	2000	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	217	728	293	283	109	185	598	22	98	2174	98
RTOR Reduction (vph)	0	0	10	0	13	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	304	718	0	672	0	185	618	0	98	2269	0
Turn Type	Split		pm+ov	Split			Prot			Prot		
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		14.2	34.2		16.0		20.0	60.5		11.5	52.0	
Effective Green, g (s)		14.2	34.2		16.0		20.0	60.5		11.5	52.0	
Actuated g/C Ratio		0.12	0.29		0.14		0.17	0.51		0.10	0.44	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		441	482		482		315	1897		181	1628	
v/s Ratio Prot		0.08	c0.25		c0.19		0.10	0.17		0.05	c0.61	
v/s Ratio Perm			0.18									
v/c Ratio		0.69	1.49		1.39		0.59	0.33		0.54	1.39	
Uniform Delay, d1		49.9	42.0		51.1		45.3	16.9		50.8	33.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.5	231.2		189.8		2.8	0.5		3.3	181.1	
Delay (s)		54.3	273.2		240.9		48.1	17.4		54.1	214.2	
Level of Service		D	F		F		D	B		D	F	
Approach Delay (s)		208.7			240.9			24.4			207.5	
Approach LOS		F			F			C			F	

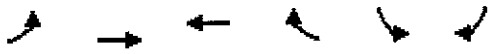
Intersection Summary			
HCM Average Control Delay	182.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	118.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	122.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX I

INTERSECTION CAPACITY WORKSHEETS
YEAR 2035 WITHOUT ANZA ROAD EXTENSION

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.97	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	1863	1863	1583	1739	
Flt Permitted	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	1770	1863	1863	1583	1739	
Volume (vph)	40	300	500	800	700	200
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	326	543	870	761	217
RTOR Reduction (vph)	0	0	0	26	8	0
Lane Group Flow (vph)	43	326	543	844	970	0
Turn Type	Prot			pm+ov		
Protected Phases	7	4	8	6	6	
Permitted Phases				8		
Actuated Green, G (s)	3.1	42.7	35.6	102.8	67.2	
Effective Green, g (s)	3.1	42.7	35.6	102.8	67.2	
Actuated g/C Ratio	0.03	0.36	0.30	0.87	0.57	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	47	675	563	1434	991	
v/s Ratio Prot	c0.02	0.18	c0.29	0.34	c0.56	
v/s Ratio Perm				0.20		
v/c Ratio	0.91	0.48	0.96	0.59	0.98	
Uniform Delay, d1	57.3	29.1	40.5	2.0	24.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	98.6	0.5	28.9	0.6	23.9	
Delay (s)	155.9	29.6	69.4	2.6	48.5	
Level of Service	F	C	E	A	D	
Approach Delay (s)		44.3	28.3		48.5	
Approach LOS		D	C		D	

Intersection Summary			
HCM Average Control Delay	37.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	117.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.99	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	1863	1863	1583	1765	
Flt Permitted	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	1770	1863	1863	1583	1765	
Volume (vph)	60	620	470	700	760	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	674	511	761	826	54
RTOR Reduction (vph)	0	0	0	11	2	0
Lane Group Flow (vph)	65	674	511	750	878	0
Turn Type	Prot			pm+ov		
Protected Phases	7	4	8	6	6	
Permitted Phases				8		
Actuated Green, G (s)	4.0	44.2	36.2	103.2	67.0	
Effective Green, g (s)	4.0	44.2	36.2	103.2	67.0	
Actuated g/C Ratio	0.03	0.37	0.30	0.87	0.56	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	59	691	566	1424	992	
v/s Ratio Prot	0.04	c0.36	0.27	0.30	c0.50	
v/s Ratio Perm				0.18		
v/c Ratio	1.10	0.98	0.90	0.53	0.89	
Uniform Delay, d1	57.6	37.0	39.8	2.0	22.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	148.0	27.9	17.7	0.4	11.5	
Delay (s)	205.6	64.9	57.5	2.3	34.2	
Level of Service	F	E	E	A	C	
Approach Delay (s)		77.3	24.5		34.2	
Approach LOS		E	C		C	

Intersection Summary			
HCM Average Control Delay	40.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	119.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	20	1000	40	80	1030	150	210	120	110	190	90	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	1087	43	87	1120	163	228	130	120	207	98	65

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	22	1130	87	1283	359	120	304	65
Volume Left (vph)	22	0	87	0	228	0	207	0
Volume Right (vph)	0	43	0	163	0	120	0	65
Hadj (s)	0.53	0.01	0.53	-0.05	0.35	-0.67	0.37	-0.67
Departure Headway (s)	9.4	8.9	9.4	8.8	9.4	8.4	9.6	8.6
Degree Utilization, x	0.06	2.79	0.23	3.13	0.93	0.28	0.81	0.16
Capacity (veh/h)	375	416	379	423	378	424	370	412
Control Delay (s)	11.8	830.8	13.9	983.3	60.3	13.4	41.4	11.9
Approach Delay (s)	815.4		921.7		48.6		36.2	
Approach LOS	F		F		E		E	

Intersection Summary				
Delay	664.3			
HCM Level of Service	F			
Intersection Capacity Utilization	97.8%	ICU Level of Service	F	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	100	1160	120	120	1020	140	100	60	40	130	60	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	1261	130	130	1109	152	109	65	43	141	65	43

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	109	1391	130	1261	174	43	207	43
Volume Left (vph)	109	0	130	0	109	0	141	0
Volume Right (vph)	0	130	0	152	0	43	0	43
Hadj (s)	0.53	-0.03	0.53	-0.05	0.35	-0.67	0.38	-0.67
Departure Headway (s)	8.0	7.5	8.0	7.4	8.9	7.9	8.9	7.8
Degree Utilization, x	0.24	2.88	0.29	2.60	0.43	0.10	0.51	0.09
Capacity (veh/h)	439	487	443	498	386	441	399	448
Control Delay (s)	12.3	867.3	13.0	740.2	17.3	10.6	19.4	10.5
Approach Delay (s)	805.4		672.0		16.0		17.9	
Approach LOS	F		F		C		C	

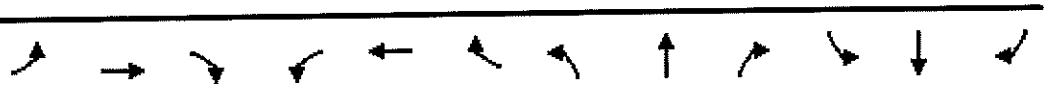
Intersection Summary				
Delay	640.4			
HCM Level of Service	F			
Intersection Capacity Utilization	102.0%	ICU Level of Service	G	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1853		1770	1863	1583	1770	3302		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1853		1770	1863	1583	1770	3302		1770	3539	1583
Volume (vph)	180	1150	40	120	940	700	80	260	210	450	300	200
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	1250	43	130	1022	761	87	283	228	489	326	217
RTOR Reduction (vph)	0	1	0	0	0	236	0	122	0	0	0	179
Lane Group Flow (vph)	196	1292	0	130	1022	525	87	389	0	489	326	38
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	17.1	52.1		12.9	47.9	47.9	18.0	18.0		21.0	21.0	21.0
Effective Green, g (s)	17.1	52.1		12.9	47.9	47.9	18.0	18.0		21.0	21.0	21.0
Actuated g/C Ratio	0.14	0.43		0.11	0.40	0.40	0.15	0.15		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	252	805		190	744	632	266	495		310	619	277
v/s Ratio Prot	c0.11	c0.70		0.07	0.55		0.05	c0.12		c0.28	0.09	
v/s Ratio Perm						0.33						0.02
v/c Ratio	0.78	1.60		0.68	1.37	0.83	0.33	0.79		1.58	0.53	0.14
Uniform Delay, d1	49.6	34.0		51.6	36.0	32.4	45.6	49.1		49.5	45.0	41.8
Progression Factor	1.00	1.00		0.95	1.12	1.30	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.0	278.0		0.9	168.9	1.2	3.3	11.8		274.8	3.2	1.0
Delay (s)	63.6	311.9		50.2	209.2	43.5	48.8	61.0		324.3	48.2	42.9
Level of Service	E	F		D	F	D	D	E		F	D	D
Approach Delay (s)		279.2			132.5			59.2			177.9	
Approach LOS		F			F			E			F	

Intersection Summary				
HCM Average Control Delay	176.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.37			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	121.8%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1846		1770	1863	1583	1770	3257		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1846		1770	1863	1583	1770	3257		1770	3539	1583
Volume (vph)	50	1240	80	160	940	460	100	150	170	440	250	160
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1348	87	174	1022	500	109	163	185	478	272	174
RTOR Reduction (vph)	0	2	0	0	0	141	0	153	0	0	0	139
Lane Group Flow (vph)	54	1433	0	174	1022	359	109	195	0	478	272	35
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	7.8	50.0		12.0	54.2	54.2	18.0	18.0		24.0	24.0	24.0
Effective Green, g (s)	7.8	50.0		12.0	54.2	54.2	18.0	18.0		24.0	24.0	24.0
Actuated g/C Ratio	0.06	0.42		0.10	0.45	0.45	0.15	0.15		0.20	0.20	0.20
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	115	769		177	841	715	266	489		354	708	317
v/s Ratio Prot	0.03	c0.78		c0.10	0.55		c0.06	0.06		c0.27	0.08	
v/s Ratio Perm						0.23						0.02
v/c Ratio	0.47	1.86		0.98	1.22	0.50	0.41	0.40		1.35	0.38	0.11
Uniform Delay, d1	54.1	35.0		53.9	32.9	23.3	46.2	46.1		48.0	41.6	39.3
Progression Factor	1.00	1.00		0.99	1.15	1.60	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.0	393.7		16.3	97.9	0.2	4.6	2.4		175.3	1.6	0.7
Delay (s)	57.1	428.7		69.8	135.6	37.5	50.8	48.5		223.3	43.2	40.0
Level of Service	E	F		E	F	D	D	D		F	D	D
Approach Delay (s)		415.2			99.9			49.1			135.7	
Approach LOS		F			F			D			F	

Intersection Summary				
HCM Average Control Delay	204.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.39			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	126.3%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97			0.98	
Satd. Flow (prot)	1770	1844		1770	1863	1583		1739			1741	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97			0.98	
Satd. Flow (perm)	1770	1844		1770	1863	1583		1739			1741	
Volume (vph)	60	1710	120	60	1440	20	220	50	110	90	70	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1859	130	65	1565	22	239	54	120	98	76	98
RTOR Reduction (vph)	0	2	0	0	0	5	0	12	0	0	17	0
Lane Group Flow (vph)	65	1987	0	65	1565	17	0	401	0	0	255	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	65.2		5.8	65.4	65.4		16.0			17.0	
Effective Green, g (s)	5.6	65.2		5.8	65.4	65.4		16.0			17.0	
Actuated g/C Ratio	0.05	0.54		0.05	0.55	0.55		0.13			0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	83	1002		86	1015	863		232			247	
v/s Ratio Prot	c0.04	c1.08		0.04	0.84			c0.23			c0.15	
v/s Ratio Perm						0.01						
v/c Ratio	0.78	1.98		0.76	1.54	0.02		1.73			1.03	
Uniform Delay, d1	56.6	27.4		56.4	27.3	12.6		52.0			51.5	
Progression Factor	0.80	0.74		0.90	0.61	0.08		1.00			1.00	
Incremental Delay, d2	4.4	442.6		10.8	245.3	0.0		345.0			65.7	
Delay (s)	49.4	463.0		61.7	262.1	1.1		397.0			117.2	
Level of Service	D	F		E	F	A		F			F	
Approach Delay (s)		449.9			250.7			397.0			117.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	349.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	139.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.94			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	1852		1770	1863	1583		1715			1727	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (perm)	1770	1852		1770	1863	1583		1715			1727	
Volume (vph)	70	1720	70	80	1460	20	80	30	90	80	30	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1870	76	87	1587	22	87	33	98	87	33	76
RTOR Reduction (vph)	0	1	0	0	0	5	0	24	0	0	19	0
Lane Group Flow (vph)	76	1945	0	87	1587	17	0	194	0	0	177	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	7.0	67.6		5.0	65.6	65.6		16.0			15.4	
Effective Green, g (s)	7.0	67.6		5.0	65.6	65.6		16.0			15.4	
Actuated g/C Ratio	0.06	0.56		0.04	0.55	0.55		0.13			0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	103	1043		74	1018	865		229			222	
v/s Ratio Prot	0.04	c1.05		c0.05	0.85			c0.11			c0.10	
v/s Ratio Perm						0.01						
v/c Ratio	0.74	1.86		1.18	1.56	0.02		0.85			0.80	
Uniform Delay, d1	55.6	26.2		57.5	27.2	12.5		50.8			50.8	
Progression Factor	0.72	0.62		0.93	0.64	0.33		1.00			1.00	
Incremental Delay, d2	2.5	389.4		137.5	254.6	0.0		30.1			17.7	
Delay (s)	42.6	405.7		190.9	272.1	4.1		80.9			68.5	
Level of Service	D	F		F	F	A		F			E	
Approach Delay (s)		392.1			264.4			80.9			68.5	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	307.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	115.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	70	1850	20	50	1440	260	10	20	80	130	20	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	2011	22	54	1565	283	11	22	87	141	22	76
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		1109										
pX, platoon unblocked				0.47			0.47	0.47	0.47	0.47	0.47	
vC, conflicting volume	1848			2033			3935	4130	2022	3935	3859	1565
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1848			3212			7286	7706	3189	7286	7123	1565
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	77			0			0	0	0	0	0	45
cM capacity (veh/h)	328			44			0	0	6	0	0	137

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	76	2033	54	1565	283	120	239
Volume Left	76	0	54	0	0	11	141
Volume Right	0	22	0	0	283	87	76
cSH	328	1700	44	1700	1700	0	0
Volume to Capacity	0.23	1.20	1.23	0.92	0.17	Err	Err
Queue Length 95th (ft)	22	0	130	0	0	Err	Err
Control Delay (s)	19.3	0.0	358.5	0.0	0.0	Err	Err
Lane LOS	C		F			F	F
Approach Delay (s)	0.7		10.2			Err	Err
Approach LOS						F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	124.4%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	40	1840	20	30	1420	220	10	20	60	210	10	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	2000	22	33	1543	239	11	22	65	228	11	54
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		1109										
pX, platoon unblocked				0.45			0.45	0.45	0.45	0.45	0.45	
vC, conflicting volume	1783			2022			3766	3946	2011	3772	3717	1543
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1783			3289			7199	7601	3265	7211	7089	1543
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			17			0	0	0	0	0	62
cM capacity (veh/h)	348			39			0	0	5	0	0	141

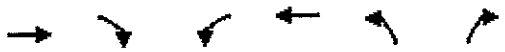
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	43	2022	33	1543	239	98	293
Volume Left	43	0	33	0	0	11	228
Volume Right	0	22	0	0	239	65	54
cSH	348	1700	39	1700	1700	0	0
Volume to Capacity	0.13	1.19	0.83	0.91	0.14	Err	Err
Queue Length 95th (ft)	11	0	78	0	0	Err	Err
Control Delay (s)	16.8	0.0	248.4	0.0	0.0	Err	Err
Lane LOS	C		F			F	F
Approach Delay (s)	0.4		4.5			Err	Err
Approach LOS						F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	126.6%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1740	350	380	1580	220	280
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1891	380	413	1717	239	304
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				896		
pX, platoon unblocked					0.54	
vC, conflicting volume			2272		4625	2082
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2272		7659	2082
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			0		0	0
cM capacity (veh/h)			224		0	67

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	2272	413	1717	239	304
Volume Left	0	413	0	239	0
Volume Right	380	0	0	0	304
cSH	1700	224	1700	0	67
Volume to Capacity	1.34	1.84	1.01	Err	4.55
Queue Length 95th (ft)	0	724	0	Err	Err
Control Delay (s)	0.0	433.2	0.0	Err	Err
Lane LOS		F		F	F
Approach Delay (s)	0.0	84.0		Err	
Approach LOS				F	

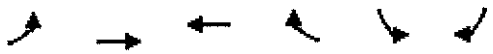
Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	156.1%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1440	680	450	1320	260	410
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1565	739	489	1435	283	446
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				896		
pX, platoon unblocked					0.61	
vC, conflicting volume			2304		4348	1935
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2304		6491	1935
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			0		0	0
cM capacity (veh/h)			217		0	82

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	2304	489	1435	283	446
Volume Left	0	489	0	283	0
Volume Right	739	0	0	0	446
cSH	1700	217	1700	0	82
Volume to Capacity	1.36	2.25	0.84	Err	5.42
Queue Length 95th (ft)	0	967	0	Err	Err
Control Delay (s)	0.0	612.0	0.0	Err	Err
Lane LOS		F		F	F
Approach Delay (s)	0.0	155.6		Err	
Approach LOS				F	

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	166.6%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	2020	1940	20	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2196	2109	22	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			448			
pX, platoon unblocked	0.57				0.57	0.57
vC, conflicting volume	2130				4315	2120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2999				6864	2980
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	65				0	10

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	2196	2130	22
Volume Left	0	0	0
Volume Right	0	22	22
cSH	1700	1700	10
Volume to Capacity	1.29	1.25	2.08
Queue Length 95th (ft)	0	0	91
Control Delay (s)	0.0	0.0	1210.2
Lane LOS			F
Approach Delay (s)	0.0	0.0	1210.2
Approach LOS			F

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	113.3%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑↱			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1860	1680	100	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2022	1826	109	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			448			
pX, platoon unblocked	0.62				0.62	0.62
vC, conflicting volume	1935				3902	1880
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2507				5678	2419
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	16
cM capacity (veh/h)	112				0	26

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	2022	1935	22
Volume Left	0	0	0
Volume Right	0	109	22
cSH	1700	1700	26
Volume to Capacity	1.19	1.14	0.84
Queue Length 95th (ft)	0	0	65
Control Delay (s)	0.0	0.0	343.2
Lane LOS			F
Approach Delay (s)	0.0	0.0	343.2
Approach LOS			F

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3534		1770	3539	1583	1770	1806		1770	1644	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3534		1770	3539	1583	1770	1806		1770	1644	
Volume (vph)	150	1900	20	10	1700	110	150	40	10	180	30	110
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	2065	22	11	1848	120	163	43	11	196	33	120
RTOR Reduction (vph)	0	0	0	0	0	36	0	7	0	0	102	0
Lane Group Flow (vph)	163	2087	0	11	1848	84	163	47	0	196	51	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	15.2	62.6		1.8	49.2	49.2	22.0	22.0		17.6	17.6	
Effective Green, g (s)	15.2	62.6		1.8	49.2	49.2	22.0	22.0		17.6	17.6	
Actuated g/C Ratio	0.13	0.52		0.02	0.41	0.41	0.18	0.18		0.15	0.15	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	224	1844		27	1451	649	325	331		260	241	
v/s Ratio Prot	0.09	c0.59		0.01	c0.52		c0.09	0.03		c0.11	0.03	
v/s Ratio Perm						0.05						
v/c Ratio	0.73	1.13		0.41	1.27	0.13	0.50	0.14		0.75	0.21	
Uniform Delay, d1	50.4	28.7		58.6	35.4	22.1	44.1	41.1		49.1	45.1	
Progression Factor	1.11	0.55		0.62	0.49	0.50	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	59.9		0.9	123.6	0.0	5.4	0.9		11.7	0.4	
Delay (s)	56.8	75.7		37.1	141.1	11.1	49.5	42.0		60.8	45.5	
Level of Service	E	E		D	F	B	D	D		E	D	
Approach Delay (s)		74.3			132.6			47.6			54.1	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM Average Control Delay	95.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3530		1770	3539	1583	1770	1816		1770	1663	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3530		1770	3539	1583	1770	1816		1770	1663	
Volume (vph)	190	1660	30	50	1420	220	160	100	20	420	80	200
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	1804	33	54	1543	239	174	109	22	457	87	217
RTOR Reduction (vph)	0	1	0	0	0	94	0	6	0	0	75	0
Lane Group Flow (vph)	207	1836	0	54	1543	145	174	125	0	457	229	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	17.4	52.8		7.2	42.6	42.6	22.0	22.0		22.0	22.0	
Effective Green, g (s)	17.4	52.8		7.2	42.6	42.6	22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.14	0.44		0.06	0.36	0.36	0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	257	1553		106	1256	562	325	333		325	305	
v/s Ratio Prot	0.12	c0.52		0.03	c0.44		c0.10	0.07		c0.26	0.14	
v/s Ratio Perm						0.09						
v/c Ratio	0.81	1.18		0.51	1.23	0.26	0.54	0.38		1.41	0.75	
Uniform Delay, d1	49.7	33.6		54.7	38.7	27.5	44.4	43.0		49.0	46.4	
Progression Factor	1.05	0.66		0.60	0.41	0.10	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	82.6		1.3	105.4	0.4	6.2	3.2		200.3	9.9	
Delay (s)	54.1	104.8		34.2	121.4	3.2	50.6	46.2		249.3	56.3	
Level of Service	D	F		C	F	A	D	D		F	E	
Approach Delay (s)		99.7			103.5			48.7			172.2	
Approach LOS		F			F			D			F	

Intersection Summary				
HCM Average Control Delay	109.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.13			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	93.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	3433	3481		3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	3433	3481		3433	3539	1583
Volume (vph)	380	1280	420	220	1180	630	440	1140	140	520	810	160
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	413	1391	457	239	1283	685	478	1239	152	565	880	174
RTOR Reduction (vph)	0	0	11	0	0	4	0	8	0	0	0	122
Lane Group Flow (vph)	413	1391	446	239	1283	681	478	1383	0	565	880	52
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	16.0	38.2	57.5	10.8	33.0	57.0	19.3	31.0		24.0	35.7	35.7
Effective Green, g (s)	16.0	38.2	57.5	10.8	33.0	57.0	19.3	31.0		24.0	35.7	35.7
Actuated g/C Ratio	0.13	0.32	0.48	0.09	0.28	0.48	0.16	0.26		0.20	0.30	0.30
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	236	1127	811	309	973	805	552	899		687	1053	471
v/s Ratio Prot	c0.23	0.39	0.09	0.07	c0.36	0.17	0.14	c0.40		0.16	c0.25	
v/s Ratio Perm			0.19			0.26						0.03
v/c Ratio	1.75	1.23	0.55	0.77	1.32	0.85	0.87	1.54		0.82	0.84	0.11
Uniform Delay, d1	52.0	40.9	22.1	53.4	43.5	27.7	49.1	44.5		46.0	39.4	30.6
Progression Factor	0.72	0.65	0.29	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	339.1	106.2	0.1	11.4	150.7	8.2	13.4	247.8		7.9	7.9	0.5
Delay (s)	376.8	132.8	6.5	64.8	194.2	35.8	62.5	292.3		53.8	47.3	31.1
Level of Service	F	F	A	E	F	D	E	F		D	D	C
Approach Delay (s)		151.8			131.0			233.5			47.8	
Approach LOS		F			F			F			D	

Intersection Summary				
HCM Average Control Delay	144.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.31			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	117.8%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1881	3762	1683	3650	3762	1683	3650	3697		3650	3762	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1881	3762	1683	3650	3762	1683	3650	3697		3650	3762	1683
Volume (vph)	330	1220	480	480	990	540	410	1220	160	830	1770	370
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	1326	522	522	1076	587	446	1326	174	902	1924	402
RTOR Reduction (vph)	0	0	1	0	0	4	0	9	0	0	0	131
Lane Group Flow (vph)	359	1326	521	522	1076	583	446	1492	0	902	1924	271
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	15.0	30.0	45.0	17.0	32.0	54.0	15.0	35.0		22.0	42.0	42.0
Effective Green, g (s)	15.0	30.0	45.0	17.0	32.0	54.0	15.0	35.0		22.0	42.0	42.0
Actuated g/C Ratio	0.12	0.25	0.38	0.14	0.27	0.45	0.12	0.29		0.18	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	235	941	631	517	1003	757	456	1078		669	1317	589
v/s Ratio Prot	0.19	c0.35	0.10	0.14	c0.29	0.14	0.12	c0.40		0.25	c0.51	
v/s Ratio Perm			0.21			0.21						0.16
v/c Ratio	1.53	1.41	0.83	1.01	1.07	0.77	0.98	1.38		1.35	1.46	0.46
Uniform Delay, d1	52.5	45.0	33.9	51.5	44.0	27.8	52.3	42.5		49.0	39.0	30.2
Progression Factor	0.56	0.49	0.52	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	239.4	184.7	0.9	42.0	50.1	4.7	36.0	178.4		166.5	211.6	2.6
Delay (s)	269.0	206.9	18.5	93.5	94.1	32.5	88.4	220.9		215.5	250.6	32.8
Level of Service	F	F	B	F	F	C	F	F		F	F	C
Approach Delay (s)		172.5			77.4			190.6			213.7	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	168.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.37			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	117.8%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	40	350	170	70	240	320	70	450	60	100	370	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	380	185	76	261	348	76	489	65	109	402	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	609			565			1217	1321	473	1364	1239	435
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	609			565			1217	1321	473	1364	1239	435
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			92			0	0	89	0	0	93
cM capacity (veh/h)	970			1007			0	138	591	0	155	621

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	43	565	76	609	321	310	310	245
Volume Left	43	0	76	0	76	0	109	0
Volume Right	0	185	0	348	0	65	0	43
cSH	970	1700	1007	1700	0	165	0	179
Volume to Capacity	0.04	0.33	0.08	0.36	Err	1.88	Err	1.37
Queue Length 95th (ft)	4	0	6	0	Err	578	Err	364
Control Delay (s)	8.9	0.0	8.9	0.0	Err	464.2	Err	247.0
Lane LOS	A		A		F	F	F	F
Approach Delay (s)	0.6		1.0		Err		Err	
Approach LOS					F		F	

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	60	290	160	130	210	130	130	380	80	160	910	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	315	174	141	228	141	141	413	87	174	989	98
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	370			489			1636	1185	402	1321	1201	299
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	370			489			1636	1185	402	1321	1201	299
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			87			0	0	87	0	0	87
cM capacity (veh/h)	1189			1074			0	155	648	0	152	741

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	65	489	141	370	348	293	668	592
Volume Left	65	0	141	0	141	0	174	0
Volume Right	0	174	0	141	0	87	0	98
cSH	1189	1700	1074	1700	0	200	0	175
Volume to Capacity	0.05	0.29	0.13	0.22	Err	1.47	Err	3.39
Queue Length 95th (ft)	4	0	11	0	Err	446	Err	Err
Control Delay (s)	8.2	0.0	8.9	0.0	Err	278.9	Err	Err
Lane LOS	A		A		F	F	F	F
Approach Delay (s)	1.0		2.5		Err		Err	
Approach LOS					F		F	

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.99	
Flt Protected		0.99	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3494	1583		3352		1770	3533		1770	3491	
Flt Permitted		0.55	1.00		0.65		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1947	1583		2222		1770	3533		1770	3491	
Volume (vph)	90	260	280	160	240	140	290	900	10	170	900	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	283	304	174	261	152	315	978	11	185	978	98
RTOR Reduction (vph)	0	0	85	0	35	0	0	1	0	0	6	0
Lane Group Flow (vph)	0	381	219	0	552	0	315	988	0	185	1070	0
Turn Type	Prot		pm+ov	Prot			Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		22.0	44.1		22.0		22.1	48.1		15.1	41.1	
Effective Green, g (s)		22.0	44.1		22.0		22.1	48.1		15.1	41.1	
Actuated g/C Ratio		0.23	0.45		0.23		0.23	0.49		0.16	0.42	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		441	783		503		402	1748		275	1476	
v/s Ratio Prot			0.06				c0.18	0.28		0.10	c0.31	
v/s Ratio Perm		0.20	0.07		c0.25							
v/c Ratio		0.86	0.28		3.87dl		0.78	0.57		0.67	0.73	
Uniform Delay, d1		36.2	16.6		37.6		35.3	17.2		38.7	23.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		16.0	0.2		69.5		9.6	1.3		6.3	3.1	
Delay (s)		52.1	16.8		107.1		44.9	18.6		45.1	26.5	
Level of Service		D	B		F		D	B		D	C	
Approach Delay (s)		36.4			107.1			24.9			29.2	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM Average Control Delay	41.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3496	1583		3364		1770	3520		1770	3523	
Flt Permitted		0.59	1.00		0.60		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2096	1583		2064		1770	3520		1770	3523	
Volume (vph)	80	240	700	330	250	130	180	800	30	140	2910	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	261	761	359	272	141	196	870	33	152	3163	98
RTOR Reduction (vph)	0	0	16	0	18	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	348	745	0	754	0	196	901	0	152	3259	0
Turn Type	Prot		pm+ov	Prot			Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		16.0	29.0		16.0		13.0	58.5		13.5	59.0	
Effective Green, g (s)		16.0	29.0		16.0		13.0	58.5		13.5	59.0	
Actuated g/C Ratio		0.16	0.29		0.16		0.13	0.58		0.14	0.59	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		335	522		330		230	2059		239	2079	
v/s Ratio Prot			c0.19				0.11	0.26		0.09	c0.93	
v/s Ratio Perm		0.17	0.29		c0.37							
v/c Ratio		1.04	1.43		16.32dl		0.85	0.44		0.64	1.57	
Uniform Delay, d1		42.0	35.5		42.0		42.6	11.6		40.9	20.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		59.6	203.5		587.1		24.9	0.7		5.5	257.9	
Delay (s)		101.6	239.0		629.1		67.5	12.3		46.4	278.4	
Level of Service		F	F		F		E	B		D	F	
Approach Delay (s)		195.9			629.1			22.1			268.0	
Approach LOS		F			F			C			F	

Intersection Summary			
HCM Average Control Delay	256.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	157.3%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

APPENDIX J

INTERSECTION CAPACITY WORKSHEETS
YEAR 2035 WITH ANZA ROAD EXTENSION

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	20	900	40	80	800	100	190	120	110	130	90	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	978	43	87	870	109	207	130	120	141	98	43

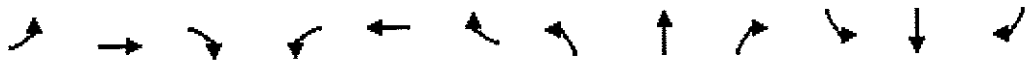
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	22	1022	87	978	337	120	239	43
Volume Left (vph)	22	0	87	0	207	0	141	0
Volume Right (vph)	0	43	0	109	0	120	0	43
Hadj (s)	0.53	0.00	0.53	-0.04	0.34	-0.67	0.33	-0.67
Departure Headway (s)	9.0	8.5	8.9	8.4	9.0	8.1	9.4	8.5
Degree Utilization, x	0.05	2.40	0.22	2.28	0.85	0.27	0.63	0.10
Capacity (veh/h)	391	434	397	438	394	440	370	416
Control Delay (s)	11.3	655.7	13.2	598.8	44.4	12.8	25.7	11.2
Approach Delay (s)	642.3		551.0		36.1		23.5	
Approach LOS	F		F		E		C	

Intersection Summary				
Delay	449.6			
HCM Level of Service	F			
Intersection Capacity Utilization	87.7%	ICU Level of Service	E	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	60	1080	100	110	730	90	90	60	40	90	60	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	1174	109	120	793	98	98	65	43	98	65	22

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	65	1283	120	891	163	43	163	22
Volume Left (vph)	65	0	120	0	98	0	98	0
Volume Right (vph)	0	109	0	98	0	43	0	22
Hadj (s)	0.53	-0.03	0.53	-0.04	0.33	-0.67	0.33	-0.67
Departure Headway (s)	7.7	7.1	7.6	7.0	8.7	7.7	8.7	7.7
Degree Utilization, x	0.14	2.53	0.25	1.74	0.39	0.09	0.39	0.05
Capacity (veh/h)	458	519	466	518	408	457	404	453
Control Delay (s)	10.7	709.6	11.9	357.7	15.9	10.3	16.1	9.9
Approach Delay (s)	675.8		316.8		14.8		15.3	
Approach LOS	F		F		B		C	

Intersection Summary				
Delay	449.8			
HCM Level of Service	F			
Intersection Capacity Utilization	93.8%	ICU Level of Service		F
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1855		1770	1863	1583	1770	3337		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1855		1770	1863	1583	1770	3337		1770	3539	1583
Volume (vph)	90	1020	30	100	730	640	70	260	160	400	300	170
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	1109	33	109	793	696	76	283	174	435	326	185
RTOR Reduction (vph)	0	1	0	0	0	290	0	78	0	0	0	151
Lane Group Flow (vph)	98	1141	0	109	793	406	76	379	0	435	326	34
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	7.0	54.2		11.8	59.0	59.0	16.0	16.0		22.0	22.0	22.0
Effective Green, g (s)	7.0	54.2		11.8	59.0	59.0	16.0	16.0		22.0	22.0	22.0
Actuated g/C Ratio	0.06	0.45		0.10	0.49	0.49	0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	103	838		174	916	778	236	445		325	649	290
v/s Ratio Prot	c0.06	c0.62		c0.06	0.43		0.04	c0.11		c0.25	0.09	
v/s Ratio Perm						0.26						0.02
v/c Ratio	0.95	1.36		0.63	0.87	0.52	0.32	0.85		1.34	0.50	0.12
Uniform Delay, d1	56.3	32.9		52.0	27.0	20.9	47.1	50.8		49.0	44.1	40.9
Progression Factor	1.00	1.00		0.95	1.04	1.80	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	72.8	170.4		0.6	1.1	0.2	3.6	18.2		171.7	2.8	0.8
Delay (s)	129.1	203.3		49.9	29.2	37.8	50.7	69.1		220.7	46.8	41.7
Level of Service	F	F		D	C	D	D	E		F	D	D
Approach Delay (s)		197.4			34.4			66.5			125.8	
Approach LOS		F			C			E			F	

Intersection Summary			
HCM Average Control Delay	105.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	108.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1849		1770	1863	1583	1770	3283		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1849		1770	1863	1583	1770	3283		1770	3539	1583
Volume (vph)	40	1140	60	140	720	420	80	150	140	400	250	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1239	65	152	783	457	87	163	152	435	272	152
RTOR Reduction (vph)	0	2	0	0	0	188	0	132	0	0	0	124
Lane Group Flow (vph)	43	1302	0	152	783	269	87	183	0	435	272	28
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	5.6	52.7		13.3	60.4	60.4	16.0	16.0		22.0	22.0	22.0
Effective Green, g (s)	5.6	52.7		13.3	60.4	60.4	16.0	16.0		22.0	22.0	22.0
Actuated g/C Ratio	0.05	0.44		0.11	0.50	0.50	0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	83	812		196	938	797	236	438		325	649	290
v/s Ratio Prot	0.02	c0.70		c0.09	0.42		0.05	c0.06		c0.25	0.08	
v/s Ratio Perm						0.17						0.02
v/c Ratio	0.52	1.60		0.78	0.83	0.34	0.37	0.42		1.34	0.42	0.10
Uniform Delay, d1	55.9	33.6		51.9	25.5	17.8	47.4	47.7		49.0	43.3	40.7
Progression Factor	1.00	1.00		1.07	1.02	2.19	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.4	277.5		1.8	0.9	0.1	4.4	2.9		171.7	2.0	0.7
Delay (s)	61.3	311.1		57.4	27.0	39.1	51.8	50.7		220.7	45.3	41.4
Level of Service	E	F		E	C	D	D	D		F	D	D
Approach Delay (s)		303.2			34.3			50.9			133.5	
Approach LOS		F			C			D			F	

Intersection Summary				
HCM Average Control Delay	147.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.26			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	115.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97			0.98	
Satd. Flow (prot)	1770	1845		1770	1863	1583		1744			1745	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97			0.98	
Satd. Flow (perm)	1770	1845		1770	1863	1583		1744			1745	
Volume (vph)	50	1500	100	50	1180	20	230	50	100	80	70	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1630	109	54	1283	22	250	54	109	87	76	87
RTOR Reduction (vph)	0	2	0	0	0	6	0	10	0	0	16	0
Lane Group Flow (vph)	54	1737	0	54	1283	16	0	403	0	0	234	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	65.2		4.0	63.6	63.6		17.8			17.0	
Effective Green, g (s)	5.6	65.2		4.0	63.6	63.6		17.8			17.0	
Actuated g/C Ratio	0.05	0.54		0.03	0.53	0.53		0.15			0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	83	1002		59	987	839		259			247	
v/s Ratio Prot	c0.03	c0.94		0.03	0.69			c0.23			c0.13	
v/s Ratio Perm						0.01						
v/c Ratio	0.65	1.73		0.92	1.30	0.02		1.56			0.95	
Uniform Delay, d1	56.2	27.4		57.8	28.2	13.4		51.1			51.0	
Progression Factor	0.86	0.87		0.90	0.56	0.06		1.00			1.00	
Incremental Delay, d2	1.7	330.5		57.0	138.8	0.0		268.0			42.2	
Delay (s)	50.0	354.5		109.3	154.6	0.8		319.1			93.3	
Level of Service	D	F		F	F	A		F			F	
Approach Delay (s)		345.3			150.3			319.1			93.3	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	256.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.48			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	128.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.94			0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	1851		1770	1863	1583		1718			1724	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (perm)	1770	1851		1770	1863	1583		1718			1724	
Volume (vph)	60	1560	70	70	1210	20	70	30	80	70	30	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1696	76	76	1315	22	76	33	87	76	33	76
RTOR Reduction (vph)	0	1	0	0	0	5	0	24	0	0	21	0
Lane Group Flow (vph)	65	1771	0	76	1315	17	0	172	0	0	164	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	67.2		5.8	67.4	67.4		16.0			15.0	
Effective Green, g (s)	5.6	67.2		5.8	67.4	67.4		16.0			15.0	
Actuated g/C Ratio	0.05	0.56		0.05	0.56	0.56		0.13			0.12	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	83	1037		86	1046	889		229			216	
v/s Ratio Prot	0.04	c0.96		c0.04	0.71			c0.10			c0.10	
v/s Ratio Perm						0.01						
v/c Ratio	0.78	1.71		0.88	1.26	0.02		0.75			0.76	
Uniform Delay, d1	56.6	26.4		56.8	26.3	11.7		50.1			50.8	
Progression Factor	0.81	0.80		0.93	0.64	0.28		1.00			1.00	
Incremental Delay, d2	4.4	318.8		47.5	121.4	0.0		20.0			14.2	
Delay (s)	50.3	339.8		100.1	138.3	3.2		70.1			64.9	
Level of Service	D	F		F	F	A		E			E	
Approach Delay (s)		329.6			134.1			70.1			64.9	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM Average Control Delay	226.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	60	1620	20	40	1220	240	10	20	70	120	20	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	1761	22	43	1326	261	11	22	76	130	22	65
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		1109										
pX, platoon unblocked				0.47			0.47	0.47	0.47	0.47	0.47	
vC, conflicting volume	1587			1783			3391	3576	1772	3391	3326	1326
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1587			2677			6124	6520	2654	6124	5984	1326
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			40			0	0	0	0	0	66
cM capacity (veh/h)	414			72			0	0	14	0	0	190

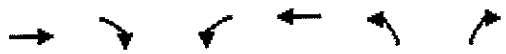
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	65	1783	43	1326	261	109	217
Volume Left	65	0	43	0	0	11	130
Volume Right	0	22	0	0	261	76	65
cSH	414	1700	72	1700	1700	0	0
Volume to Capacity	0.16	1.05	0.60	0.78	0.15	Err	Err
Queue Length 95th (ft)	14	0	66	0	0	Err	Err
Control Delay (s)	15.3	0.0	111.9	0.0	0.0	Err	Err
Lane LOS	C		F			F	F
Approach Delay (s)	0.5		3.0			Err	Err
Approach LOS						F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	111.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	30	1660	20	30	1200	200	10	20	60	200	10	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	1804	22	33	1304	217	11	22	65	217	11	54
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		1109										
pX, platoon unblocked				0.45			0.45	0.45	0.45	0.45	0.45	
vC, conflicting volume	1522			1826			3310	3467	1815	3315	3261	1304
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1522			2837			6137	6488	2813	6149	6029	1304
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			46			0	0	0	0	0	72
cM capacity (veh/h)	438			60			0	0	11	0	0	196

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	33	1826	33	1304	217	98	283
Volume Left	33	0	33	0	0	11	217
Volume Right	0	22	0	0	217	65	54
cSH	438	1700	60	1700	1700	0	0
Volume to Capacity	0.07	1.07	0.54	0.77	0.13	Err	Err
Queue Length 95th (ft)	6	0	54	0	0	Err	Err
Control Delay (s)	13.9	0.0	120.9	0.0	0.0	Err	Err
Lane LOS	B		F			F	F
Approach Delay (s)	0.2		2.5			Err	Err
Approach LOS						F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	116.6%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1600	250	340	1400	160	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1739	272	370	1522	174	217
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				896		
pX, platoon unblocked					0.55	
vC, conflicting volume			2011		4000	1739
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2011		6504	1739
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			0		0	0
cM capacity (veh/h)			283		0	108

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	1739	272	370	1522	174	217
Volume Left	0	0	370	0	174	0
Volume Right	0	272	0	0	0	217
cSH	1700	1700	283	1700	0	108
Volume to Capacity	1.02	0.16	1.30	0.90	Err	2.01
Queue Length 95th (ft)	0	0	458	0	Err	454
Control Delay (s)	0.0	0.0	196.2	0.0	Err	553.8
Lane LOS			F		F	F
Approach Delay (s)	0.0		38.3		Err	
Approach LOS					F	

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	121.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1300	590	410	1160	200	290
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1413	641	446	1261	217	315
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				896		
pX, platoon unblocked					0.62	
vC, conflicting volume			2054		3886	1734
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2054		5673	1734
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			0		0	0
cM capacity (veh/h)			273		0	109

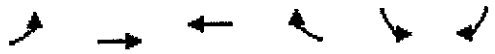
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	2054	446	1261	217	315
Volume Left	0	446	0	217	0
Volume Right	641	0	0	0	315
cSH	1700	273	1700	0	109
Volume to Capacity	1.21	1.63	0.74	Err	2.90
Queue Length 95th (ft)	0	692	0	Err	745
Control Delay (s)	0.0	334.6	0.0	Err	940.9
Lane LOS		F		F	F
Approach Delay (s)	0.0	87.4		Err	
Approach LOS				F	

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	148.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1800	1720	20	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1957	1870	22	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			448			
pX, platoon unblocked	0.56				0.56	0.56
vC, conflicting volume	1891				3837	1880
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2602				6100	2583
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	0
cM capacity (veh/h)	92				0	18

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1957	1891	22
Volume Left	0	0	0
Volume Right	0	22	22
cSH	1700	1700	18
Volume to Capacity	1.15	1.11	1.19
Queue Length 95th (ft)	0	0	77
Control Delay (s)	0.0	0.0	573.1
Lane LOS			F
Approach Delay (s)	0.0	0.0	573.1
Approach LOS			F

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	101.7%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1580	1480	90	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1717	1609	98	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			448			
pX, platoon unblocked	0.62				0.62	0.62
vC, conflicting volume	1707				3375	1658
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2148				4859	2069
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	48
cM capacity (veh/h)	154				1	42

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1717	1707	22
Volume Left	0	0	0
Volume Right	0	98	22
cSH	1700	1700	42
Volume to Capacity	1.01	1.00	0.52
Queue Length 95th (ft)	0	0	46
Control Delay (s)	0.0	0.0	160.8
Lane LOS			F
Approach Delay (s)	0.0	0.0	160.8
Approach LOS			F

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3533		1770	3539	1583	1770	1806		1770	1644	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3533		1770	3539	1583	1770	1806		1770	1644	
Volume (vph)	140	1680	20	10	1500	100	140	40	10	170	30	110
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	1826	22	11	1630	109	152	43	11	185	33	120
RTOR Reduction (vph)	0	0	0	0	0	37	0	7	0	0	103	0
Lane Group Flow (vph)	152	1848	0	11	1630	72	152	47	0	185	50	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	14.6	63.1		1.8	50.3	50.3	22.0	22.0		17.1	17.1	
Effective Green, g (s)	14.6	63.1		1.8	50.3	50.3	22.0	22.0		17.1	17.1	
Actuated g/C Ratio	0.12	0.53		0.02	0.42	0.42	0.18	0.18		0.14	0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1858		27	1483	664	325	331		252	234	
v/s Ratio Prot	0.09	c0.52		0.01	c0.46		c0.09	0.03		c0.10	0.03	
v/s Ratio Perm						0.05						
v/c Ratio	0.71	0.99		0.41	1.10	0.11	0.47	0.14		0.73	0.21	
Uniform Delay, d1	50.6	28.3		58.6	34.9	21.2	43.8	41.1		49.3	45.5	
Progression Factor	1.12	0.52		0.54	0.35	0.08	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	5.1		0.9	45.8	0.0	4.8	0.9		10.5	0.5	
Delay (s)	57.6	19.8		32.3	58.0	1.7	48.5	42.0		59.8	46.0	
Level of Service	E	B		C	E	A	D	D		E	D	
Approach Delay (s)		22.7			54.4			46.8			53.6	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	39.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	79.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3528		1770	3539	1583	1770	1816		1770	1666	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3528		1770	3539	1583	1770	1816		1770	1666	
Volume (vph)	180	1400	30	40	1260	190	160	100	20	380	80	190
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	1522	33	43	1370	207	174	109	22	413	87	207
RTOR Reduction (vph)	0	1	0	0	0	91	0	6	0	0	71	0
Lane Group Flow (vph)	196	1554	0	43	1370	116	174	125	0	413	223	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	16.8	54.6		5.4	43.2	43.2	22.0	22.0		22.0	22.0	
Effective Green, g (s)	16.8	54.6		5.4	43.2	43.2	22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.14	0.46		0.05	0.36	0.36	0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	248	1605		80	1274	570	325	333		325	305	
v/s Ratio Prot	0.11	c0.44		0.02	c0.39		c0.10	0.07		c0.23	0.13	
v/s Ratio Perm						0.07						
v/c Ratio	0.79	0.97		0.54	1.08	0.20	0.54	0.38		1.27	0.73	
Uniform Delay, d1	49.9	31.9		56.1	38.4	26.5	44.4	43.0		49.0	46.2	
Progression Factor	1.06	0.62		0.58	0.37	0.09	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	2.6		3.4	41.9	0.4	6.2	3.2		143.9	8.7	
Delay (s)	54.4	22.3		35.8	56.1	2.7	50.6	46.2		192.9	54.9	
Level of Service	D	C		D	E	A	D	D		F	D	
Approach Delay (s)		25.9			48.7			48.7			135.5	
Approach LOS		C			D			D			F	

Intersection Summary				
HCM Average Control Delay	53.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	85.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1881	3762	1683	3650	3762	1683	3650	3699		3650	3762	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1881	3762	1683	3650	3762	1683	3650	3699		3650	3762	1683
Volume (vph)	320	1300	350	210	1150	610	390	1110	140	510	800	150
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	348	1413	380	228	1250	663	424	1207	152	554	870	163
RTOR Reduction (vph)	0	0	39	0	0	6	0	8	0	0	0	106
Lane Group Flow (vph)	348	1413	341	228	1250	657	424	1351	0	554	870	57
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	15.0	34.4	49.4	12.6	32.0	53.4	15.0	35.6		21.4	42.0	42.0
Effective Green, g (s)	15.0	34.4	49.4	12.6	32.0	53.4	15.0	35.6		21.4	42.0	42.0
Actuated g/C Ratio	0.12	0.29	0.41	0.10	0.27	0.44	0.12	0.30		0.18	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	235	1078	693	383	1003	749	456	1097		651	1317	589
v/s Ratio Prot	0.18	c0.38	0.06	0.06	c0.33	c0.16	0.12	c0.37		0.15	0.23	
v/s Ratio Perm			0.14			0.23						0.03
v/c Ratio	1.48	1.31	0.49	0.60	1.25	0.88	0.93	1.23		0.85	0.66	0.10
Uniform Delay, d1	52.5	42.8	26.0	51.3	44.0	30.3	52.0	42.2		47.8	33.0	26.2
Progression Factor	0.68	0.61	0.61	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	226.8	143.0	0.3	2.5	119.3	11.3	25.3	112.4		10.4	2.6	0.3
Delay (s)	262.4	169.2	16.1	53.7	163.3	41.7	77.3	154.6		58.1	35.6	26.6
Level of Service	F	F	B	D	F	D	E	F		E	D	C
Approach Delay (s)		157.2			113.9			136.2			42.5	
Approach LOS		F			F			F			D	

Intersection Summary				
HCM Average Control Delay	116.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	107.6%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1881	3762	1683	3650	3762	1683	3650	3695		3650	3762	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1881	3762	1683	3650	3762	1683	3650	3695		3650	3762	1683
Volume (vph)	310	1100	380	460	900	530	370	1190	160	810	1500	310
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	337	1196	413	500	978	576	402	1293	174	880	1630	337
RTOR Reduction (vph)	0	0	3	0	0	6	0	9	0	0	0	129
Lane Group Flow (vph)	337	1196	411	500	978	570	402	1459	0	880	1630	208
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot			Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	15.0	30.0	45.0	17.0	32.0	54.0	15.0	35.0		22.0	42.0	42.0
Effective Green, g (s)	15.0	30.0	45.0	17.0	32.0	54.0	15.0	35.0		22.0	42.0	42.0
Actuated g/C Ratio	0.12	0.25	0.38	0.14	0.27	0.45	0.12	0.29		0.18	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	235	941	631	517	1003	757	456	1078		669	1317	589
v/s Ratio Prot	0.18	c0.32	0.08	0.14	c0.26	0.14	0.11	c0.39		0.24	c0.43	
v/s Ratio Perm			0.16			0.20						0.12
v/c Ratio	1.43	1.27	0.65	0.97	0.98	0.75	0.88	1.35		1.32	1.24	0.35
Uniform Delay, d1	52.5	45.0	31.0	51.2	43.6	27.5	51.6	42.5		49.0	39.0	28.9
Progression Factor	0.61	0.55	0.46	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	197.6	122.7	0.2	31.0	23.0	4.3	17.8	165.0		152.4	113.6	1.7
Delay (s)	229.4	147.4	14.6	82.2	66.6	31.7	69.4	207.5		201.4	152.6	30.6
Level of Service	F	F	B	F	E	C	E	F		F	F	C
Approach Delay (s)		133.4			60.6			177.8			153.3	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	132.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.28			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	112.7%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	30	280	110	50	190	250	40	310	50	80	260	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	304	120	54	207	272	43	337	54	87	283	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	478			424			918	1016	364	1043	940	342
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	478			424			918	1016	364	1043	940	342
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			95			0	0	92	0	0	95
cM capacity (veh/h)	1084			1135			0	220	681	0	243	700

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	33	424	54	478	212	223	228	174
Volume Left	33	0	54	0	43	0	87	0
Volume Right	0	120	0	272	0	54	0	33
cSH	1084	1700	1135	1700	0	263	0	277
Volume to Capacity	0.03	0.25	0.05	0.28	Err	0.85	Err	0.63
Queue Length 95th (ft)	2	0	4	0	Err	174	Err	97
Control Delay (s)	8.4	0.0	8.3	0.0	Err	64.3	Err	37.5
Lane LOS	A		A		F	F	F	E
Approach Delay (s)	0.6		0.9		Err		Err	
Approach LOS					F		F	

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	40	230	100	90	170	100	80	260	60	120	640	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	250	109	98	185	109	87	283	65	130	696	65
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	293			359			1185	880	304	978	880	239
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	293			359			1185	880	304	978	880	239
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			92			0	0	91	0	0	92
cM capacity (veh/h)	1268			1200			0	253	735	0	253	800

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	43	359	98	293	228	207	478	413
Volume Left	43	0	98	0	87	0	130	0
Volume Right	0	109	0	109	0	65	0	65
cSH	1268	1700	1200	1700	0	319	0	284
Volume to Capacity	0.03	0.21	0.08	0.17	Err	0.65	Err	1.45
Queue Length 95th (ft)	3	0	7	0	Err	106	Err	572
Control Delay (s)	7.9	0.0	8.3	0.0	Err	34.7	Err	256.8
Lane LOS	A		A		F	D	F	F
Approach Delay (s)	0.9		2.1		Err		Err	
Approach LOS					F		F	

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	0.98	
Flt Protected		0.99	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3677	1667		3551		1863	3719		1863	3662	
Flt Permitted		0.99	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3677	1667		3551		1863	3719		1863	3662	
Volume (vph)	110	310	370	150	290	130	380	860	10	150	860	110
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	337	402	163	315	141	413	935	11	163	935	120
RTOR Reduction (vph)	0	0	69	0	23	0	0	1	0	0	9	0
Lane Group Flow (vph)	0	457	333	0	596	0	413	945	0	163	1047	0
Turn Type	Split		pm+ov	Split			Prot			Prot		
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		16.0	36.0		16.0		20.0	57.4		14.6	52.0	
Effective Green, g (s)		16.0	36.0		16.0		20.0	57.4		14.6	52.0	
Actuated g/C Ratio		0.13	0.30		0.13		0.17	0.48		0.12	0.43	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		490	500		473		311	1779		227	1587	
v/s Ratio Prot		c0.12	0.11		c0.17		c0.22	0.25		0.09	c0.29	
v/s Ratio Perm			0.09									
v/c Ratio		0.93	0.67		1.26		1.33	0.53		0.72	0.66	
Uniform Delay, d1		51.5	36.7		52.0		50.0	21.9		50.7	27.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		24.8	3.3		133.6		168.2	1.1		10.3	2.2	
Delay (s)		76.3	40.1		185.6		218.2	23.0		61.1	29.1	
Level of Service		E	D		F		F	C		E	C	
Approach Delay (s)		59.3			185.6			82.3			33.4	
Approach LOS		E			F			F			C	

Intersection Summary			
HCM Average Control Delay	78.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↑	↱		↰↑↑↳			↑↑↳			↑↑↳	
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00		0.95		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.99	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3674	1667		3558		1863	3704		1863	3702	
Flt Permitted		0.60	1.00		0.60		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		2243	1667		2177		1863	3704		1863	3702	
Volume (vph)	110	280	920	320	300	120	230	760	30	130	2760	120
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	304	1000	348	326	130	250	826	33	141	3000	130
RTOR Reduction (vph)	0	0	16	0	15	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	424	984	0	789	0	250	857	0	141	3128	0
Turn Type	Prot		pm+ov	Prot			Prot			Prot		
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		16.0	36.0		16.0		20.0	59.4		12.6	52.0	
Effective Green, g (s)		16.0	36.0		16.0		20.0	59.4		12.6	52.0	
Actuated g/C Ratio		0.16	0.36		0.16		0.20	0.59		0.13	0.52	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		359	667		348		373	2200		235	1925	
v/s Ratio Prot			c0.30				0.13	0.23		0.08	c0.84	
v/s Ratio Perm		0.19	0.30		c0.36							
v/c Ratio		12.00dl	1.48		13.92dl		0.67	0.39		0.60	1.62	
Uniform Delay, d1		42.0	32.0		42.0		37.0	10.7		41.3	24.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		106.5	221.9		579.2		4.7	0.5		4.1	283.5	
Delay (s)		148.5	253.9		621.2		41.6	11.2		45.4	307.5	
Level of Service		F	F		F		D	B		D	F	
Approach Delay (s)		222.5			621.2			18.1			296.2	
Approach LOS		F			F			B			F	

Intersection Summary				
HCM Average Control Delay	273.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.67			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	160.6%	ICU Level of Service	H	
Analysis Period (min)	15			

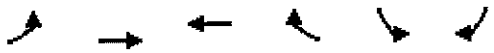
dl Defacto Left Lane. Recode with 1 though lane as a left lane.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

APPENDIX K

INTERSECTION CAPACITY WORKSHEETS
YEAR 2015 WITH IMPROVEMENTS (WITHOUT ANZA ROAD EXTENSION)

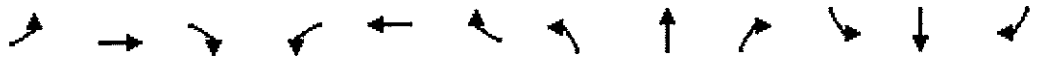
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.97	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	3539	3539	1583	1740	
Flt Permitted	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	1770	3539	3539	1583	1740	
Volume (vph)	30	220	360	580	510	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	239	391	630	554	152
RTOR Reduction (vph)	0	0	0	71	8	0
Lane Group Flow (vph)	33	239	391	559	698	0
Turn Type	Prot			pm+ov		
Protected Phases	7	4	8	6	6	
Permitted Phases				8		
Actuated Green, G (s)	4.2	48.0	39.8	103.8	64.0	
Effective Green, g (s)	4.2	48.0	39.8	103.8	64.0	
Actuated g/C Ratio	0.04	0.40	0.33	0.86	0.53	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	62	1416	1174	1422	928	
v/s Ratio Prot	c0.02	0.07	0.11	c0.21	c0.40	
v/s Ratio Perm				0.14		
v/c Ratio	0.53	0.17	0.33	0.39	0.75	
Uniform Delay, d1	56.9	23.2	30.1	1.7	21.8	
Progression Factor	1.00	1.00	0.70	11.36	1.00	
Incremental Delay, d2	8.5	0.3	0.6	0.7	5.6	
Delay (s)	65.4	23.4	21.7	19.5	27.4	
Level of Service	E	C	C	B	C	
Approach Delay (s)		28.5	20.3		27.4	
Approach LOS		C	C		C	

Intersection Summary			
HCM Average Control Delay	23.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.99	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	3539	3539	1583	1764	
Flt Permitted	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	1770	3539	3539	1583	1764	
Volume (vph)	40	450	340	510	550	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	489	370	554	598	43
RTOR Reduction (vph)	0	0	0	26	2	0
Lane Group Flow (vph)	43	489	370	528	639	0
Turn Type	Prot			pm+ov		
Protected Phases	7	4	8	6	6	
Permitted Phases				8		
Actuated Green, G (s)	3.2	45.0	37.8	104.8	67.0	
Effective Green, g (s)	3.2	45.0	37.8	104.8	67.0	
Actuated g/C Ratio	0.03	0.38	0.31	0.87	0.56	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	47	1327	1115	1435	985	
v/s Ratio Prot	c0.02	c0.14	0.10	0.21	c0.36	
v/s Ratio Perm				0.13		
v/c Ratio	0.91	0.37	0.33	0.37	0.65	
Uniform Delay, d1	58.3	27.2	31.4	1.4	18.3	
Progression Factor	1.00	1.00	0.56	9.89	1.00	
Incremental Delay, d2	98.6	0.8	0.7	0.6	3.3	
Delay (s)	156.9	28.0	18.2	14.7	21.7	
Level of Service	F	C	B	B	C	
Approach Delay (s)		38.4	16.1		21.7	
Approach LOS		D	B		C	

Intersection Summary			
HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3518		1770	3471			1808	1583		1804	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (perm)	1770	3518		1770	3471			1808	1583		1804	1583
Volume (vph)	10	720	30	60	750	110	180	120	90	170	90	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	783	33	65	815	120	196	130	98	185	98	54
RTOR Reduction (vph)	0	3	0	0	9	0	0	0	81	0	0	46
Lane Group Flow (vph)	11	814	0	65	926	0	0	326	17	0	283	8
Turn Type	Prot			Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	0.8	60.0		5.0	64.2			21.0	21.0		18.0	18.0
Effective Green, g (s)	0.8	60.0		5.0	64.2			21.0	21.0		18.0	18.0
Actuated g/C Ratio	0.01	0.50		0.04	0.54			0.18	0.18		0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	12	1759		74	1857			316	277		271	237
v/s Ratio Prot	0.01	0.23		c0.04	c0.27			c0.18			c0.16	
v/s Ratio Perm									0.01			0.01
v/c Ratio	0.92	0.46		0.88	0.50			1.03	0.06		1.04	0.03
Uniform Delay, d1	59.6	19.5		57.2	17.7			49.5	41.3		51.0	43.6
Progression Factor	1.07	0.86		1.12	0.96			1.00	1.00		1.00	1.00
Incremental Delay, d2	193.1	0.7		61.0	0.9			59.0	0.1		66.7	0.1
Delay (s)	256.6	17.4		125.0	18.0			108.5	41.4		117.7	43.6
Level of Service	F	B		F	B			F	D		F	D
Approach Delay (s)		20.6			24.9			93.0			105.8	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	45.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3488		1770	3476			1811	1583		1804	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (perm)	1770	3488		1770	3476			1811	1583		1804	1583
Volume (vph)	70	840	90	90	740	100	80	60	30	110	60	30
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	913	98	98	804	109	87	65	33	120	65	33
RTOR Reduction (vph)	0	7	0	0	9	0	0	0	29	0	0	28
Lane Group Flow (vph)	76	1004	0	98	904	0	0	152	4	0	185	5
Turn Type	Prot			Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	9.7	61.1		11.5	62.9			15.0	15.0		16.4	16.4
Effective Green, g (s)	9.7	61.1		11.5	62.9			15.0	15.0		16.4	16.4
Actuated g/C Ratio	0.08	0.51		0.10	0.52			0.12	0.12		0.14	0.14
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	143	1776		170	1822			226	198		247	216
v/s Ratio Prot	0.04	c0.29		c0.06	0.26			c0.08			c0.10	
v/s Ratio Perm									0.00			0.00
v/c Ratio	0.53	0.57		0.58	0.50			0.67	0.02		0.75	0.02
Uniform Delay, d1	53.0	20.3		51.9	18.4			50.2	46.1		49.8	44.8
Progression Factor	0.95	1.02		1.11	0.90			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.3	1.1		4.4	0.9			7.7	0.0		11.7	0.0
Delay (s)	53.4	21.7		62.1	17.5			57.8	46.1		61.6	44.9
Level of Service	D	C		E	B			E	D		E	D
Approach Delay (s)		24.0			21.8			55.7			59.0	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	28.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.91	0.91	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (prot)	1787	3555		1787	3574	1599	1787	3333		1626	3357	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (perm)	1787	3555		1787	3574	1599	1787	3333		1626	3357	1599
Volume (vph)	130	830	30	90	680	510	70	220	180	380	260	170
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	902	33	98	739	554	76	239	196	413	283	185
RTOR Reduction (vph)	0	2	0	0	0	282	0	125	0	0	0	151
Lane Group Flow (vph)	141	933	0	98	739	272	76	310	0	224	472	34
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	7.0	59.0		7.0	59.0	59.0	16.0	16.0		22.0	22.0	22.0
Effective Green, g (s)	7.0	59.0		7.0	59.0	59.0	16.0	16.0		22.0	22.0	22.0
Actuated g/C Ratio	0.06	0.49		0.06	0.49	0.49	0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	104	1748		104	1757	786	238	444		298	615	293
v/s Ratio Prot	c0.08	c0.26		0.05	0.21		0.04	c0.09		0.14	c0.14	
v/s Ratio Perm						0.17						0.02
v/c Ratio	1.36	0.53		0.94	0.42	0.35	0.32	0.70		0.75	0.77	0.12
Uniform Delay, d1	56.5	21.0		56.3	19.5	18.7	47.1	49.7		46.4	46.6	40.9
Progression Factor	1.19	0.55		0.92	1.23	4.69	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	204.1	1.0		60.0	0.6	0.9	3.5	8.8		16.0	8.9	0.8
Delay (s)	271.5	12.5		111.7	24.7	88.6	50.6	58.5		62.4	55.5	41.7
Level of Service	F	B		F	C	F	D	E		E	E	D
Approach Delay (s)		46.5			56.3			57.3			54.3	
Approach LOS		D			E			E			D	

Intersection Summary				
HCM Average Control Delay	53.2	HCM Level of Service		D
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		16.0
Intersection Capacity Utilization	66.2%	ICU Level of Service		C
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.91	0.91	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (prot)	1787	3541		1787	3574	1599	1787	3287		1626	3348	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (perm)	1787	3541		1787	3574	1599	1787	3287		1626	3348	1599
Volume (vph)	40	900	60	120	680	330	90	130	150	370	220	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	978	65	130	739	359	98	141	163	402	239	152
RTOR Reduction (vph)	0	4	0	0	0	178	0	133	0	0	0	124
Lane Group Flow (vph)	43	1039	0	130	739	181	98	171	0	206	435	28
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	5.6	59.0		7.0	60.4	60.4	16.0	16.0		22.0	22.0	22.0
Effective Green, g (s)	5.6	59.0		7.0	60.4	60.4	16.0	16.0		22.0	22.0	22.0
Actuated g/C Ratio	0.05	0.49		0.06	0.50	0.50	0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	83	1741		104	1799	805	238	438		298	614	293
v/s Ratio Prot	0.02	c0.29		c0.07	0.21		c0.05	0.05		0.13	c0.13	
v/s Ratio Perm						0.11						0.02
v/c Ratio	0.52	0.60		1.25	0.41	0.22	0.41	0.39		0.69	0.71	0.10
Uniform Delay, d1	55.9	21.9		56.5	18.7	16.7	47.7	47.5		45.8	46.0	40.7
Progression Factor	1.18	0.39		1.07	1.11	3.62	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.5	1.3		162.3	0.6	0.5	5.2	2.6		12.4	6.8	0.6
Delay (s)	70.5	9.8		222.5	21.4	61.0	52.9	50.2		58.2	52.8	41.4
Level of Service	E	A		F	C	E	D	D		E	D	D
Approach Delay (s)		12.2			54.2			50.8			52.0	
Approach LOS		B			D			D			D	

Intersection Summary				
HCM Average Control Delay	40.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	66.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.95	0.95			1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.99			0.98	
Satd. Flow (prot)	1770	3503		1770	3539	1583	1681	1616			1740	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.99			0.98	
Satd. Flow (perm)	1770	3503		1770	3539	1583	1681	1616			1740	
Volume (vph)	40	1240	90	40	1040	15	190	50	90	80	60	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1348	98	43	1130	16	207	54	98	87	65	87
RTOR Reduction (vph)	0	5	0	0	0	7	0	32	0	0	17	0
Lane Group Flow (vph)	43	1441	0	43	1130	9	171	156	0	0	222	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	65.5		4.0	63.9	63.9	17.8	17.8			16.7	
Effective Green, g (s)	5.6	65.5		4.0	63.9	63.9	17.8	17.8			16.7	
Actuated g/C Ratio	0.05	0.55		0.03	0.53	0.53	0.15	0.15			0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	83	1912		59	1885	843	249	240			242	
v/s Ratio Prot	c0.02	c0.41		0.02	0.32		c0.10	0.10			c0.13	
v/s Ratio Perm						0.01						
v/c Ratio	0.52	0.75		0.73	0.60	0.01	0.69	0.65			0.92	
Uniform Delay, d1	55.9	21.0		57.5	19.3	13.2	48.5	48.2			51.0	
Progression Factor	0.88	0.74		0.55	0.19	0.35	1.00	1.00			1.00	
Incremental Delay, d2	4.2	2.2		31.2	1.2	0.0	14.4	12.8			35.8	
Delay (s)	53.2	17.7		63.0	4.9	4.6	62.8	61.0			86.7	
Level of Service	D	B		E	A	A	E	E			F	
Approach Delay (s)		18.7			7.0			61.9			86.7	
Approach LOS		B			A			E			F	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.95	0.95			1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.89			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3519		1770	3539	1583	1681	1577			1731	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3519		1770	3539	1583	1681	1577			1731	
Volume (vph)	50	1250	50	60	1060	15	70	30	80	70	30	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1359	54	65	1152	16	76	33	87	76	33	65
RTOR Reduction (vph)	0	2	0	0	0	7	0	75	0	0	18	0
Lane Group Flow (vph)	54	1411	0	65	1152	9	76	45	0	0	156	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	67.1		5.8	67.3	67.3	16.0	16.0			15.1	
Effective Green, g (s)	5.6	67.1		5.8	67.3	67.3	16.0	16.0			15.1	
Actuated g/C Ratio	0.05	0.56		0.05	0.56	0.56	0.13	0.13			0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	83	1968		86	1985	888	224	210			218	
v/s Ratio Prot	0.03	c0.40		c0.04	0.33		c0.05	0.03			c0.09	
v/s Ratio Perm						0.01						
v/c Ratio	0.65	0.72		0.76	0.58	0.01	0.34	0.21			0.71	
Uniform Delay, d1	56.2	19.5		56.4	17.2	11.6	47.2	46.4			50.4	
Progression Factor	0.85	0.97		0.63	0.36	0.45	1.00	1.00			1.00	
Incremental Delay, d2	13.5	1.8		26.6	1.0	0.0	4.1	2.3			10.6	
Delay (s)	61.2	20.6		62.2	7.2	5.2	51.3	48.7			60.9	
Level of Service	E	C		E	A	A	D	D			E	
Approach Delay (s)		22.1			10.1			49.7			60.9	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM Average Control Delay	21.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.91			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.97	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1679			1734	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.97	
Satd. Flow (perm)	1770	3535		1770	3539	1583		1679			1734	
Volume (vph)	50	1340	10	40	1040	190	10	20	70	110	20	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1457	11	43	1130	207	11	22	76	120	22	65
RTOR Reduction (vph)	0	0	0	0	0	85	0	71	0	0	14	0
Lane Group Flow (vph)	54	1468	0	43	1130	122	0	38	0	0	193	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	6.6	72.5		4.7	70.6	70.6		8.4			18.4	
Effective Green, g (s)	6.6	72.5		4.7	70.6	70.6		8.4			18.4	
Actuated g/C Ratio	0.05	0.60		0.04	0.59	0.59		0.07			0.15	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	97	2136		69	2082	931		118			266	
v/s Ratio Prot	c0.03	c0.42		0.02	0.32			c0.02			c0.11	
v/s Ratio Perm						0.08						
v/c Ratio	0.56	0.69		0.62	0.54	0.13		0.32			0.73	
Uniform Delay, d1	55.3	16.1		56.8	14.9	11.0		53.1			48.4	
Progression Factor	1.18	0.47		1.09	0.73	1.87		1.00			1.00	
Incremental Delay, d2	4.4	1.2		14.6	0.9	0.3		1.6			9.5	
Delay (s)	69.8	8.7		76.6	11.8	20.9		54.7			57.9	
Level of Service	E	A		E	B	C		D			E	
Approach Delay (s)		10.8			15.2			54.7			57.9	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (prot)	1676	3349		1676	3353	1500		1696			1751	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (perm)	1676	3349		1676	3353	1500		1696			1751	
Volume (vph)	30	1330	10	20	1030	160	10	20	50	180	10	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	1446	11	22	1120	174	11	22	54	196	11	43
RTOR Reduction (vph)	0	0	0	0	0	77	0	50	0	0	6	0
Lane Group Flow (vph)	33	1457	0	22	1120	97	0	37	0	0	244	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.1	68.8		3.4	67.1	67.1		8.2			23.6	
Effective Green, g (s)	5.1	68.8		3.4	67.1	67.1		8.2			23.6	
Actuated g/C Ratio	0.04	0.57		0.03	0.56	0.56		0.07			0.20	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	71	1920		47	1875	839		116			344	
v/s Ratio Prot	c0.02	c0.43		0.01	0.33			c0.02			c0.14	
v/s Ratio Perm						0.06						
v/c Ratio	0.46	0.76		0.47	0.60	0.12		0.32			0.71	
Uniform Delay, d1	56.1	19.3		57.4	17.5	12.5		53.2			45.0	
Progression Factor	1.23	0.62		1.14	0.62	1.16		1.00			1.00	
Incremental Delay, d2	3.4	2.0		6.6	1.3	0.3		1.6			6.8	
Delay (s)	72.4	14.0		71.9	12.2	14.8		54.8			51.8	
Level of Service	E	B		E	B	B		D			D	
Approach Delay (s)		15.3			13.5			54.8			51.8	
Approach LOS		B			B			D			D	

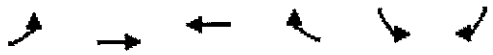
Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑	↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	1770	3539	1770	1583
Volume (vph)	1260	250	280	1150	160	200
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1370	272	304	1250	174	217
RTOR Reduction (vph)	0	113	0	0	0	190
Lane Group Flow (vph)	1370	159	304	1250	174	27
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	70.3	70.3	22.9	97.2	14.8	14.8
Effective Green, g (s)	70.3	70.3	22.9	97.2	14.8	14.8
Actuated g/C Ratio	0.59	0.59	0.19	0.81	0.12	0.12
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2073	927	338	2867	218	195
v/s Ratio Prot	c0.39		c0.17	0.35	c0.10	
v/s Ratio Perm		0.10				0.02
v/c Ratio	0.66	0.17	0.90	0.44	0.80	0.14
Uniform Delay, d1	16.8	11.4	47.4	3.3	51.1	46.9
Progression Factor	0.90	1.53	0.63	2.80	1.00	1.00
Incremental Delay, d2	1.2	0.3	22.2	0.4	18.1	0.3
Delay (s)	16.3	17.8	52.2	9.8	69.3	47.2
Level of Service	B	B	D	A	E	D
Approach Delay (s)	16.5			18.1	57.0	
Approach LOS	B			B	E	

Intersection Summary				
HCM Average Control Delay	21.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑	↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	1770	3539	1770	1583
Volume (vph)	1040	490	330	960	190	300
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1130	533	359	1043	207	326
RTOR Reduction (vph)	0	215	0	0	0	283
Lane Group Flow (vph)	1130	318	359	1043	207	43
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	68.0	68.0	24.3	96.3	15.7	15.7
Effective Green, g (s)	68.0	68.0	24.3	96.3	15.7	15.7
Actuated g/C Ratio	0.57	0.57	0.20	0.80	0.13	0.13
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2005	897	358	2840	232	207
v/s Ratio Prot	c0.32		c0.20	0.29	c0.12	
v/s Ratio Perm		0.20				0.03
v/c Ratio	0.56	0.35	1.00	0.37	0.89	0.21
Uniform Delay, d1	16.6	14.1	47.9	3.3	51.3	46.6
Progression Factor	0.99	2.57	0.72	2.17	1.00	1.00
Incremental Delay, d2	0.8	0.7	44.5	0.3	31.9	0.5
Delay (s)	17.2	37.0	78.9	7.5	83.2	47.1
Level of Service	B	D	E	A	F	D
Approach Delay (s)	23.5			25.8	61.1	
Approach LOS	C			C	E	

Intersection Summary				
HCM Average Control Delay	30.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↱			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1460	1400	20	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1587	1522	22	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		448	448			
pX, platoon unblocked	0.77				0.84	0.77
vC, conflicting volume	1543				2326	772
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1410				1582	414
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	371				84	455

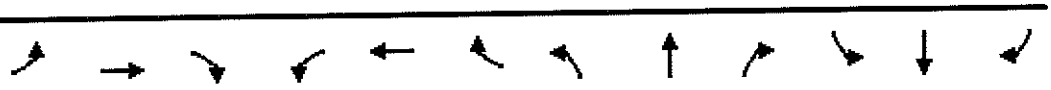
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	793	793	1014	529	22
Volume Left	0	0	0	0	0
Volume Right	0	0	0	22	22
cSH	1700	1700	1700	1700	455
Volume to Capacity	0.47	0.47	0.60	0.31	0.05
Queue Length 95th (ft)	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	13.3
Lane LOS					B
Approach Delay (s)	0.0		0.0		13.3
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↱			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1350	1220	70	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1467	1326	76	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		448	448			
pX, platoon unblocked	0.80				0.89	0.80
vC, conflicting volume	1402				2098	701
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1256				1448	384
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	442				109	494

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	734	734	884	518	22
Volume Left	0	0	0	0	0
Volume Right	0	0	0	76	22
cSH	1700	1700	1700	1700	494
Volume to Capacity	0.43	0.43	0.52	0.30	0.04
Queue Length 95th (ft)	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	12.6
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.6
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5074		1770	5085	1583	1770	1806		1770	1654	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5074		1770	5085	1583	1770	1806		1770	1654	
Volume (vph)	110	1380	20	10	1230	80	130	40	10	150	30	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	1500	22	11	1337	87	141	43	11	163	33	98
RTOR Reduction (vph)	0	1	0	0	0	48	0	7	0	0	85	0
Lane Group Flow (vph)	120	1521	0	11	1337	39	141	47	0	163	46	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	12.2	64.2		1.8	53.8	53.8	22.0	22.0		16.0	16.0	
Effective Green, g (s)	12.2	64.2		1.8	53.8	53.8	22.0	22.0		16.0	16.0	
Actuated g/C Ratio	0.10	0.54		0.02	0.45	0.45	0.18	0.18		0.13	0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	180	2715		27	2280	710	325	331		236	221	
v/s Ratio Prot	c0.07	0.30		0.01	c0.26		c0.08	0.03		c0.09	0.03	
v/s Ratio Perm						0.02						
v/c Ratio	0.67	0.56		0.41	0.59	0.05	0.43	0.14		0.69	0.21	
Uniform Delay, d1	51.9	18.5		58.6	24.8	18.7	43.5	41.1		49.6	46.4	
Progression Factor	1.29	0.22		0.67	0.48	0.36	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.1	0.7		4.8	0.5	0.1	4.2	0.9		8.4	0.5	
Delay (s)	74.2	4.8		43.9	12.5	6.8	47.7	42.0		58.1	46.8	
Level of Service	E	A		D	B	A	D	D		E	D	
Approach Delay (s)		9.9			12.4			46.1			53.1	
Approach LOS		A			B			D			D	

Intersection Summary				
HCM Average Control Delay	16.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	55.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

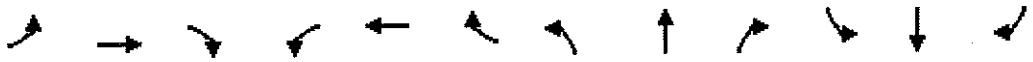
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5073		1770	5085	1583	1770	1812		1770	1665	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5073		1770	5085	1583	1770	1812		1770	1665	
Volume (vph)	140	1200	20	40	1030	160	140	90	20	360	70	170
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	1304	22	43	1120	174	152	98	22	391	76	185
RTOR Reduction (vph)	0	1	0	0	0	107	0	7	0	0	73	0
Lane Group Flow (vph)	152	1325	0	43	1120	67	152	113	0	391	188	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	13.9	54.6		5.4	46.1	46.1	22.0	22.0		22.0	22.0	
Effective Green, g (s)	13.9	54.6		5.4	46.1	46.1	22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.12	0.46		0.05	0.38	0.38	0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	205	2308		80	1953	608	325	332		325	305	
v/s Ratio Prot	c0.09	c0.26		0.02	c0.22		c0.09	0.06		c0.22	0.11	
v/s Ratio Perm						0.04						
v/c Ratio	0.74	0.57		0.54	0.57	0.11	0.47	0.34		1.20	0.62	
Uniform Delay, d1	51.3	24.1		56.1	29.2	23.8	43.8	42.7		49.0	45.1	
Progression Factor	1.06	0.34		0.62	0.43	0.24	1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.2	0.9		4.6	0.8	0.2	4.8	2.8		117.0	3.7	
Delay (s)	65.7	9.1		39.5	13.5	5.9	48.5	45.5		166.0	48.8	
Level of Service	E	A		D	B	A	D	D		F	D	
Approach Delay (s)		14.9			13.4			47.2			119.1	
Approach LOS		B			B			D			F	

Intersection Summary				
HCM Average Control Delay	34.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1881	3762	1683	3650	3762	1683	3650	5406	1683	3650	5406	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1881	3762	1683	3650	3762	1683	3650	5406	1683	3650	5406	1683
Volume (vph)	280	930	300	160	850	460	320	830	100	380	590	120
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	304	1011	326	174	924	500	348	902	109	413	641	130
RTOR Reduction (vph)	0	0	51	0	0	22	0	0	75	0	0	85
Lane Group Flow (vph)	304	1011	275	174	924	478	348	902	34	413	641	46
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	18.0	37.4	52.4	9.6	29.0	48.1	15.0	37.9	37.9	19.1	42.0	42.0
Effective Green, g (s)	18.0	37.4	52.4	9.6	29.0	48.1	15.0	37.9	37.9	19.1	42.0	42.0
Actuated g/C Ratio	0.15	0.31	0.44	0.08	0.24	0.40	0.12	0.32	0.32	0.16	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	282	1172	735	292	909	675	456	1707	532	581	1892	589
v/s Ratio Prot	c0.16	0.27	0.05	0.05	c0.25	0.11	c0.10	c0.17		c0.11	0.12	
v/s Ratio Perm			0.12			0.17			0.02			0.03
v/c Ratio	1.08	0.86	0.37	0.60	1.02	0.71	0.76	0.53	0.06	0.71	0.34	0.08
Uniform Delay, d1	51.0	38.9	22.8	53.3	45.5	30.1	50.8	33.7	28.7	47.8	28.8	26.1
Progression Factor	0.67	0.57	0.52	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	71.7	7.3	0.3	3.3	34.0	3.4	7.4	1.2	0.2	4.1	0.5	0.3
Delay (s)	105.6	29.4	12.0	56.6	79.5	33.5	58.2	34.9	28.9	51.9	29.2	26.3
Level of Service	F	C	B	E	E	C	E	C	C	D	C	C
Approach Delay (s)		40.1			62.6			40.4			36.8	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	45.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



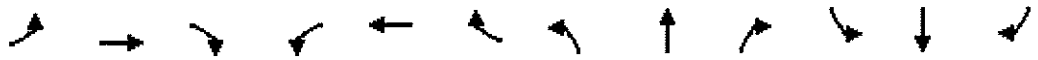
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1881	3762	1683	3650	3762	1683	3650	5406	1683	3650	5406	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1881	3762	1683	3650	3762	1683	3650	5406	1683	3650	5406	1683
Volume (vph)	240	880	350	350	720	390	300	880	120	600	1280	270
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	957	380	380	783	424	326	957	130	652	1391	293
RTOR Reduction (vph)	0	0	2	0	0	28	0	0	92	0	0	190
Lane Group Flow (vph)	261	957	378	380	783	396	326	957	38	652	1391	103
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	18.0	37.0	52.0	10.0	29.0	51.0	15.0	35.0	35.0	22.0	42.0	42.0
Effective Green, g (s)	18.0	37.0	52.0	10.0	29.0	51.0	15.0	35.0	35.0	22.0	42.0	42.0
Actuated g/C Ratio	0.15	0.31	0.43	0.08	0.24	0.42	0.12	0.29	0.29	0.18	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	282	1160	729	304	909	715	456	1577	491	669	1892	589
v/s Ratio Prot	0.14	c0.25	0.06	c0.10	c0.21	0.10	c0.09	0.18		c0.18	c0.26	
v/s Ratio Perm			0.16			0.13			0.02			0.06
v/c Ratio	0.93	0.82	0.52	1.25	0.86	0.55	0.71	0.61	0.08	0.97	0.74	0.18
Uniform Delay, d1	50.3	38.5	24.8	55.0	43.6	26.0	50.4	36.6	30.8	48.7	34.1	27.0
Progression Factor	0.76	0.70	0.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.9	4.8	0.4	136.8	10.5	0.9	5.3	1.7	0.3	28.3	2.6	0.6
Delay (s)	65.3	31.7	16.4	191.8	54.1	26.9	55.7	38.3	31.1	77.0	36.7	27.7
Level of Service	E	C	B	F	D	C	E	D	C	E	D	C
Approach Delay (s)		33.5			79.8			41.7			46.8	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM Average Control Delay	50.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3482		1770	3485	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3482		1770	3485	
Volume (vph)	30	300	140	60	200	270	50	330	40	70	270	30
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	326	152	65	217	293	54	359	43	76	293	33
RTOR Reduction (vph)	0	0	111	0	0	202	0	7	0	0	9	0
Lane Group Flow (vph)	33	326	41	65	217	91	54	395	0	76	317	0
Turn Type	Prot		Perm	Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						
Actuated Green, G (s)	2.0	16.6	16.6	4.3	18.9	18.9	12.7	12.7		11.4	11.4	
Effective Green, g (s)	2.0	16.6	16.6	4.3	18.9	18.9	12.7	12.7		11.4	11.4	
Actuated g/C Ratio	0.03	0.27	0.27	0.07	0.31	0.31	0.21	0.21		0.19	0.19	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	58	507	431	125	577	490	369	725		331	651	
v/s Ratio Prot	0.02	c0.18		c0.04	0.12		0.03	c0.11		0.04	c0.09	
v/s Ratio Perm			0.03			0.06						
v/c Ratio	0.57	0.64	0.10	0.52	0.38	0.19	0.15	0.54		0.23	0.49	
Uniform Delay, d1	29.1	19.6	16.6	27.4	16.4	15.4	19.7	21.6		21.1	22.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.2	2.8	0.1	3.9	0.4	0.2	0.2	0.8		0.4	0.6	
Delay (s)	41.3	22.4	16.7	31.2	16.9	15.6	19.9	22.4		21.4	22.8	
Level of Service	D	C	B	C	B	B	B	C		C	C	
Approach Delay (s)		21.9			17.8			22.1			22.5	
Approach LOS		C			B			C			C	

Intersection Summary				
HCM Average Control Delay	20.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	46.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3443		1770	3488	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3443		1770	3488	
Volume (vph)	50	250	140	110	180	110	90	270	60	120	660	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	272	152	120	196	120	98	293	65	130	717	76
RTOR Reduction (vph)	0	0	124	0	0	92	0	15	0	0	7	0
Lane Group Flow (vph)	54	272	28	120	196	28	98	343	0	130	786	0
Turn Type	Prot		Perm	Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						
Actuated Green, G (s)	3.4	14.5	14.5	7.0	18.1	18.1	14.5	14.5		25.6	25.6	
Effective Green, g (s)	3.4	14.5	14.5	7.0	18.1	18.1	14.5	14.5		25.6	25.6	
Actuated g/C Ratio	0.04	0.19	0.19	0.09	0.23	0.23	0.19	0.19		0.33	0.33	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	78	348	296	160	435	369	331	643		584	1151	
v/s Ratio Prot	0.03	c0.15		c0.07	c0.11		0.06	c0.10		0.07	c0.23	
v/s Ratio Perm			0.02			0.02						
v/c Ratio	0.69	0.78	0.10	0.75	0.45	0.08	0.30	0.53		0.22	0.68	
Uniform Delay, d1	36.6	30.0	26.1	34.4	25.5	23.2	27.2	28.5		18.8	22.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	23.3	10.9	0.1	17.8	0.7	0.1	0.5	0.9		0.2	1.7	
Delay (s)	59.9	40.9	26.3	52.2	26.2	23.3	27.7	29.3		19.0	24.2	
Level of Service	E	D	C	D	C	C	C	C		B	C	
Approach Delay (s)		38.4			32.6			29.0			23.5	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	29.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	77.6	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	58.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.98			1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	1770	3486			3523	1583		1778		1681	1693	1583
Flt Permitted	0.95	1.00			1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	1770	3486			3523	1583		1778		1681	1693	1583
Volume (vph)	70	90	10	10	100	400	10	20	10	380	20	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	98	11	11	109	435	11	22	11	413	22	65
RTOR Reduction (vph)	0	7	0	0	0	263	0	9	0	0	0	46
Lane Group Flow (vph)	76	102	0	0	120	172	0	35	0	212	223	19
Turn Type	Split			Split		pm+ov	Split			Split		Perm
Protected Phases	4	4		8	8	6	2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	5.9	5.9			5.4	19.3		7.6		13.9	13.9	13.9
Effective Green, g (s)	5.9	5.9			5.4	19.3		7.6		13.9	13.9	13.9
Actuated g/C Ratio	0.12	0.12			0.11	0.40		0.16		0.28	0.28	0.28
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	214	421			390	626		277		479	482	451
v/s Ratio Prot	c0.04	0.03			c0.03	0.08		c0.02		0.13	c0.13	
v/s Ratio Perm						0.03						0.01
v/c Ratio	0.36	0.24			0.31	0.27		0.13		0.44	0.46	0.04
Uniform Delay, d1	19.7	19.4			20.0	10.0		17.7		14.3	14.4	12.6
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	0.3			0.5	0.2		0.2		0.7	0.7	0.0
Delay (s)	20.7	19.7			20.4	10.2		17.9		14.9	15.1	12.7
Level of Service	C	B			C	B		B		B	B	B
Approach Delay (s)		20.1			12.4			17.9			14.7	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	48.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99			1.00	0.85		0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00		0.98		0.95	0.95	1.00
Satd. Flow (prot)	1770	3516			3508	1583		1750		1681	1688	1583
Flt Permitted	0.95	1.00			0.99	1.00		0.98		0.95	0.95	1.00
Satd. Flow (perm)	1770	3516			3508	1583		1750		1681	1688	1583
Volume (vph)	140	220	10	30	140	290	10	10	10	700	10	120
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	239	11	33	152	315	11	11	11	761	11	130
RTOR Reduction (vph)	0	3	0	0	0	165	0	10	0	0	0	82
Lane Group Flow (vph)	152	247	0	0	185	150	0	23	0	381	391	48
Turn Type	Split			Split		pm+ov	Split			Split		Perm
Protected Phases	4	4		8	8	6	2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	8.4	8.4			6.8	29.6		8.2		22.8	22.8	22.8
Effective Green, g (s)	8.4	8.4			6.8	29.6		8.2		22.8	22.8	22.8
Actuated g/C Ratio	0.14	0.14			0.11	0.48		0.13		0.37	0.37	0.37
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	239	475			384	753		231		616	619	580
v/s Ratio Prot	c0.09	0.07			c0.05	0.07		c0.01		0.23	c0.23	
v/s Ratio Perm						0.02						0.03
v/c Ratio	0.64	0.52			0.48	0.20		0.10		0.62	0.63	0.08
Uniform Delay, d1	25.5	25.0			26.0	9.4		23.8		16.1	16.2	12.9
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	5.5	1.0			1.0	0.1		0.2		1.9	2.1	0.1
Delay (s)	30.9	26.1			27.0	9.6		24.0		18.0	18.3	12.9
Level of Service	C	C			C	A		C		B	B	B
Approach Delay (s)		27.9			16.0			24.0			17.4	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	1.00	0.91		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1863	3725	2933	3614	3725	1667	1863	5341		1863	6745	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	3725	2933	3614	3725	1667	1863	5341		1863	6745	1667
Volume (vph)	80	220	240	140	200	120	210	650	10	120	650	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	239	261	152	217	130	228	707	11	130	707	76
RTOR Reduction (vph)	0	0	181	0	0	114	0	1	0	0	0	44
Lane Group Flow (vph)	87	239	80	152	217	16	228	717	0	130	707	32
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	7.7	10.9	26.2	7.2	10.4	10.4	15.3	41.9		9.3	35.9	35.9
Effective Green, g (s)	7.7	10.9	26.2	7.2	10.4	10.4	15.3	41.9		9.3	35.9	35.9
Actuated g/C Ratio	0.09	0.13	0.31	0.08	0.12	0.12	0.18	0.49		0.11	0.42	0.42
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	168	476	1038	305	454	203	334	2624		203	2839	702
v/s Ratio Prot	c0.05	c0.06	0.01	0.04	0.06		c0.12	c0.13		0.07	0.10	
v/s Ratio Perm			0.01			0.01						0.02
v/c Ratio	0.52	0.50	0.08	0.50	0.48	0.08	0.68	0.27		0.64	0.25	0.05
Uniform Delay, d1	37.0	34.7	21.0	37.3	34.9	33.2	32.7	12.8		36.4	16.0	14.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	0.8	0.0	1.3	0.8	0.2	5.7	0.3		6.7	0.2	0.1
Delay (s)	39.7	35.5	21.0	38.6	35.7	33.4	38.4	13.0		43.1	16.2	14.7
Level of Service	D	D	C	D	D	C	D	B		D	B	B
Approach Delay (s)		29.7			36.0			19.1			19.9	
Approach LOS		C			D			B			B	

Intersection Summary				
HCM Average Control Delay	24.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	42.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	1.00	0.91		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1863	3725	2933	3614	3725	1667	1863	5326		1863	6745	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	3725	2933	3614	3725	1667	1863	5326		1863	6745	1667
Volume (vph)	70	200	600	280	210	110	130	580	20	100	2110	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	217	652	304	228	120	141	630	22	109	2293	76
RTOR Reduction (vph)	0	0	75	0	0	98	0	3	0	0	0	28
Lane Group Flow (vph)	76	217	577	304	228	22	141	649	0	109	2293	48
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	7.5	11.4	24.4	12.6	16.5	16.5	13.0	40.9		8.9	36.8	36.8
Effective Green, g (s)	7.5	11.4	24.4	12.6	16.5	16.5	13.0	40.9		8.9	36.8	36.8
Actuated g/C Ratio	0.08	0.13	0.27	0.14	0.18	0.18	0.14	0.46		0.10	0.41	0.41
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	156	473	928	507	684	306	270	2426		185	2764	683
v/s Ratio Prot	0.04	0.06	c0.09	c0.08	0.06		0.08	0.12		0.06	c0.34	
v/s Ratio Perm			0.11			0.01						0.03
v/c Ratio	0.49	0.46	0.62	0.60	0.33	0.07	0.52	0.27		0.59	0.83	0.07
Uniform Delay, d1	39.3	36.3	28.7	36.2	31.9	30.3	35.5	15.2		38.7	23.7	16.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.4	0.7	1.3	1.9	0.3	0.1	1.8	0.3		4.7	3.0	0.2
Delay (s)	41.7	37.0	30.0	38.1	32.2	30.4	37.3	15.4		43.4	26.7	16.3
Level of Service	D	D	C	D	C	C	D	B		D	C	B
Approach Delay (s)		32.5			34.6			19.3			27.2	
Approach LOS		C			C			B			C	

Intersection Summary				
HCM Average Control Delay	27.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	89.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

APPENDIX L

INTERSECTION CAPACITY WORKSHEETS
YEAR 2015 WITH IMPROVEMENTS (WITH ANZA ROAD EXTENSION)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	10	120	110	30	220	430	140	510	140	470	530	150
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	130	120	33	239	467	152	554	152	511	576	163
RTOR Reduction (vph)	0	0	100	0	0	69	0	0	117	0	0	76
Lane Group Flow (vph)	11	130	20	33	239	398	152	554	35	511	576	87
Turn Type	Prot		Perm	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	1.2	20.3	20.3	4.7	23.8	74.8	15.1	28.0	28.0	51.0	63.9	63.9
Effective Green, g (s)	1.2	20.3	20.3	4.7	23.8	74.8	15.1	28.0	28.0	51.0	63.9	63.9
Actuated g/C Ratio	0.01	0.17	0.17	0.04	0.20	0.62	0.13	0.23	0.23	0.42	0.53	0.53
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	18	315	268	69	369	1040	223	826	369	752	1885	843
v/s Ratio Prot	0.01	0.07		c0.02	c0.13	0.16	0.09	c0.16		c0.29	0.16	
v/s Ratio Perm			0.01			0.09			0.02			0.05
v/c Ratio	0.61	0.41	0.08	0.48	0.65	0.38	0.68	0.67	0.10	0.68	0.31	0.10
Uniform Delay, d1	59.2	44.5	42.0	56.4	44.2	11.2	50.2	41.8	36.1	27.9	15.7	13.9
Progression Factor	1.00	1.00	1.00	0.92	1.31	0.87	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.7	4.0	0.5	4.6	7.7	1.0	8.3	2.2	0.1	4.9	0.4	0.2
Delay (s)	107.9	48.5	42.5	56.6	65.6	10.6	58.4	44.0	36.2	32.8	16.1	14.1
Level of Service	F	D	D	E	E	B	E	D	D	C	B	B
Approach Delay (s)		48.2			30.4			45.2			22.7	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	32.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	40	290	160	30	130	480	130	510	140	450	530	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	315	174	33	141	522	141	554	152	489	576	43
RTOR Reduction (vph)	0	0	142	0	0	64	0	0	117	0	0	21
Lane Group Flow (vph)	43	315	32	33	141	458	141	554	35	489	576	22
Turn Type	Prot		Perm	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	6.7	22.3	22.3	4.7	20.3	69.3	14.4	28.0	28.0	49.0	62.6	62.6
Effective Green, g (s)	6.7	22.3	22.3	4.7	20.3	69.3	14.4	28.0	28.0	49.0	62.6	62.6
Actuated g/C Ratio	0.06	0.19	0.19	0.04	0.17	0.58	0.12	0.23	0.23	0.41	0.52	0.52
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	99	658	294	69	599	967	212	826	369	723	1846	826
v/s Ratio Prot	c0.02	c0.09		0.02	0.04	0.19	0.08	c0.16		c0.28	0.16	
v/s Ratio Perm			0.02			0.10			0.02			0.01
v/c Ratio	0.43	0.48	0.11	0.48	0.24	0.47	0.67	0.67	0.10	0.68	0.31	0.03
Uniform Delay, d1	54.8	43.7	40.6	56.4	43.1	14.7	50.5	41.8	36.1	29.0	16.4	13.9
Progression Factor	1.00	1.00	1.00	1.27	0.73	0.62	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	2.5	0.8	4.9	0.9	1.6	7.6	2.2	0.1	5.0	0.4	0.1
Delay (s)	57.9	46.1	41.4	76.5	32.6	10.8	58.1	44.0	36.2	34.0	16.8	14.0
Level of Service	E	D	D	E	C	B	E	D	D	C	B	B
Approach Delay (s)		45.5			18.3			44.9			24.3	
Approach LOS		D			B			D			C	

Intersection Summary				
HCM Average Control Delay	32.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3516		1770	3468			1809	1583		1809	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (perm)	1770	3516		1770	3468			1809	1583		1809	1583
Volume (vph)	10	650	30	60	580	90	160	110	90	120	80	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	707	33	65	630	98	174	120	98	130	87	43
RTOR Reduction (vph)	0	3	0	0	10	0	0	0	81	0	0	37
Lane Group Flow (vph)	11	737	0	65	718	0	0	294	17	0	217	6
Turn Type	Prot			Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	0.8	60.5		5.7	65.4			20.8	20.8		17.0	17.0
Effective Green, g (s)	0.8	60.5		5.7	65.4			20.8	20.8		17.0	17.0
Actuated g/C Ratio	0.01	0.50		0.05	0.55			0.17	0.17		0.14	0.14
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	12	1773		84	1890			314	274		256	224
v/s Ratio Prot	0.01	c0.21		c0.04	0.21			c0.16			c0.12	
v/s Ratio Perm									0.01			0.00
v/c Ratio	0.92	0.42		0.77	0.38			0.94	0.06		0.85	0.03
Uniform Delay, d1	59.6	18.7		56.5	15.7			48.9	41.4		50.2	44.4
Progression Factor	0.69	1.60		1.17	0.94			1.00	1.00		1.00	1.00
Incremental Delay, d2	192.4	0.6		33.7	0.6			34.1	0.1		22.0	0.0
Delay (s)	233.4	30.4		99.6	15.3			83.1	41.5		72.3	44.4
Level of Service	F	C		F	B			F	D		E	D
Approach Delay (s)		33.4			22.2			72.7			67.7	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	40.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3496		1770	3470			1811	1583		1811	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (perm)	1770	3496		1770	3470			1811	1583		1811	1583
Volume (vph)	50	780	70	80	530	80	80	60	30	80	60	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	848	76	87	576	87	87	65	33	87	65	22
RTOR Reduction (vph)	0	5	0	0	9	0	0	0	29	0	0	19
Lane Group Flow (vph)	54	919	0	87	654	0	0	152	4	0	152	3
Turn Type	Prot			Prot			Split		Perm	Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	8.1	62.9		11.5	66.3			15.0	15.0		14.6	14.6
Effective Green, g (s)	8.1	62.9		11.5	66.3			15.0	15.0		14.6	14.6
Actuated g/C Ratio	0.07	0.52		0.10	0.55			0.12	0.12		0.12	0.12
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	119	1832		170	1917			226	198		220	193
v/s Ratio Prot	0.03	c0.26		c0.05	c0.19			c0.08			c0.08	
v/s Ratio Perm									0.00			0.00
v/c Ratio	0.45	0.50		0.51	0.34			0.67	0.02		0.69	0.01
Uniform Delay, d1	53.8	18.4		51.6	14.8			50.2	46.1		50.5	46.4
Progression Factor	1.10	0.98		1.15	0.98			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.3	0.8		2.5	0.5			7.7	0.0		9.0	0.0
Delay (s)	61.3	18.9		61.6	15.0			57.8	46.1		59.5	46.4
Level of Service	E	B		E	B			E	D		E	D
Approach Delay (s)		21.2			20.4			55.7			57.9	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.91	0.91	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (prot)	1787	3560		1787	3574	1599	1787	3357		1626	3363	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (perm)	1787	3560		1787	3574	1599	1787	3357		1626	3363	1599
Volume (vph)	70	740	20	90	530	460	60	220	150	340	260	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	804	22	98	576	500	65	239	163	370	283	152
RTOR Reduction (vph)	0	2	0	0	0	254	0	100	0	0	0	124
Lane Group Flow (vph)	76	824	0	98	576	246	65	302	0	210	443	28
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	7.0	56.5		9.5	59.0	59.0	16.0	16.0		22.0	22.0	22.0
Effective Green, g (s)	7.0	56.5		9.5	59.0	59.0	16.0	16.0		22.0	22.0	22.0
Actuated g/C Ratio	0.06	0.47		0.08	0.49	0.49	0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	104	1676		141	1757	786	238	448		298	617	293
v/s Ratio Prot	0.04	c0.23		c0.05	0.16		0.04	c0.09		0.13	c0.13	
v/s Ratio Perm						0.15						0.02
v/c Ratio	0.73	0.49		0.70	0.33	0.31	0.27	0.67		0.70	0.72	0.10
Uniform Delay, d1	55.6	21.9		53.8	18.5	18.3	46.8	49.5		46.0	46.1	40.7
Progression Factor	1.24	0.51		0.91	1.26	4.96	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.0	0.9		11.9	0.4	0.9	2.8	7.9		13.1	7.0	0.6
Delay (s)	89.9	12.0		60.8	23.8	91.7	49.6	57.4		59.1	53.1	41.4
Level of Service	F	B		E	C	F	D	E		E	D	D
Approach Delay (s)		18.6			55.8			56.3			52.5	
Approach LOS		B			E			E			D	

Intersection Summary				
HCM Average Control Delay	45.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.91	0.91	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (prot)	1787	3550		1787	3574	1599	1787	3317		1626	3353	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (perm)	1787	3550		1787	3574	1599	1787	3317		1626	3353	1599
Volume (vph)	30	820	40	120	520	300	70	130	120	340	220	120
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	891	43	130	565	326	76	141	130	370	239	130
RTOR Reduction (vph)	0	3	0	0	0	158	0	113	0	0	0	106
Lane Group Flow (vph)	33	931	0	130	565	168	76	158	0	196	413	24
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	4.2	56.0		10.0	61.8	61.8	16.0	16.0		22.0	22.0	22.0
Effective Green, g (s)	4.2	56.0		10.0	61.8	61.8	16.0	16.0		22.0	22.0	22.0
Actuated g/C Ratio	0.04	0.47		0.08	0.51	0.51	0.13	0.13		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	63	1657		149	1841	823	238	442		298	615	293
v/s Ratio Prot	0.02	c0.26		c0.07	0.16		0.04	c0.05		0.12	c0.12	
v/s Ratio Perm						0.10						0.01
v/c Ratio	0.52	0.56		0.87	0.31	0.20	0.32	0.36		0.66	0.67	0.08
Uniform Delay, d1	56.9	23.1		54.4	16.8	15.8	47.1	47.3		45.5	45.6	40.6
Progression Factor	1.21	0.23		1.07	1.29	4.51	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.7	1.2		35.8	0.4	0.5	3.5	2.3		10.8	5.8	0.5
Delay (s)	75.8	6.5		93.8	22.0	71.6	50.6	49.6		56.3	51.4	41.2
Level of Service	E	A		F	C	E	D	D		E	D	D
Approach Delay (s)		8.9			47.0			49.8			50.9	
Approach LOS		A			D			D			D	

Intersection Summary				
HCM Average Control Delay	36.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	62.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.95	0.95			1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.99			0.98	
Satd. Flow (prot)	1770	3503		1770	3539	1583	1681	1625			1744	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.99			0.98	
Satd. Flow (perm)	1770	3503		1770	3539	1583	1681	1625			1744	
Volume (vph)	40	1090	80	40	850	20	200	50	80	70	60	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1185	87	43	924	22	217	54	87	76	65	76
RTOR Reduction (vph)	0	5	0	0	0	10	0	26	0	0	16	0
Lane Group Flow (vph)	43	1268	0	43	924	12	173	159	0	0	201	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	66.0		4.0	64.4	64.4	17.8	17.8			16.2	
Effective Green, g (s)	5.6	66.0		4.0	64.4	64.4	17.8	17.8			16.2	
Actuated g/C Ratio	0.05	0.55		0.03	0.54	0.54	0.15	0.15			0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	83	1927		59	1899	850	249	241			235	
v/s Ratio Prot	c0.02	c0.36		0.02	0.26		c0.10	0.10			c0.11	
v/s Ratio Perm						0.01						
v/c Ratio	0.52	0.66		0.73	0.49	0.01	0.69	0.66			0.85	
Uniform Delay, d1	55.9	19.0		57.5	17.4	13.0	48.5	48.2			50.7	
Progression Factor	0.77	0.62		0.57	0.25	0.22	1.00	1.00			1.00	
Incremental Delay, d2	4.4	1.5		32.9	0.8	0.0	14.8	13.2			24.7	
Delay (s)	47.3	13.3		65.6	5.2	2.9	63.4	61.5			75.4	
Level of Service	D	B		E	A	A	E	E			E	
Approach Delay (s)		14.4			7.8			62.4			75.4	
Approach LOS		B			A			E			E	

Intersection Summary					
HCM Average Control Delay	22.7	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.67				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	63.8%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.95	0.95			1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90			0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3517		1770	3539	1583	1681	1585			1728	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (perm)	1770	3517		1770	3539	1583	1681	1585			1728	
Volume (vph)	50	1130	50	50	880	20	60	30	70	60	30	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1228	54	54	957	22	65	33	76	65	33	65
RTOR Reduction (vph)	0	3	0	0	0	10	0	65	0	0	20	0
Lane Group Flow (vph)	54	1279	0	54	957	12	65	44	0	0	143	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.6	68.2		4.0	66.6	66.6	17.8	17.8			14.0	
Effective Green, g (s)	5.6	68.2		4.0	66.6	66.6	17.8	17.8			14.0	
Actuated g/C Ratio	0.05	0.57		0.03	0.55	0.55	0.15	0.15			0.12	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	83	1999		59	1964	879	249	235			202	
v/s Ratio Prot	c0.03	c0.36		0.03	0.27		c0.04	0.03			c0.08	
v/s Ratio Perm						0.01						
v/c Ratio	0.65	0.64		0.92	0.49	0.01	0.26	0.19			0.71	
Uniform Delay, d1	56.2	17.6		57.8	16.3	12.0	45.3	44.8			51.0	
Progression Factor	0.83	0.97		0.69	0.26	0.03	1.00	1.00			1.00	
Incremental Delay, d2	13.9	1.3		81.9	0.8	0.0	2.5	1.8			10.7	
Delay (s)	60.6	18.3		121.7	5.1	0.4	47.8	46.5			61.7	
Level of Service	E	B		F	A	A	D	D			E	
Approach Delay (s)		20.0			11.1			47.0			61.7	
Approach LOS		C			B			D			E	

Intersection Summary				
HCM Average Control Delay	20.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.91			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.97	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1686			1738	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.97	
Satd. Flow (perm)	1770	3535		1770	3539	1583		1686			1738	
Volume (vph)	50	1170	10	40	880	180	10	20	60	100	20	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1272	11	43	957	196	11	22	65	109	22	54
RTOR Reduction (vph)	0	0	0	0	0	79	0	61	0	0	12	0
Lane Group Flow (vph)	54	1283	0	43	957	117	0	37	0	0	173	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	7.4	73.5		5.3	71.4	71.4		8.3			16.9	
Effective Green, g (s)	7.4	73.5		5.3	71.4	71.4		8.3			16.9	
Actuated g/C Ratio	0.06	0.61		0.04	0.60	0.60		0.07			0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	109	2165		78	2106	942		117			245	
v/s Ratio Prot	c0.03	c0.36		0.02	0.27			c0.02			c0.10	
v/s Ratio Perm						0.07						
v/c Ratio	0.50	0.59		0.55	0.45	0.12		0.32			0.71	
Uniform Delay, d1	54.5	14.1		56.2	13.5	10.6		53.2			49.2	
Progression Factor	1.16	0.68		1.18	0.57	1.20		1.00			1.00	
Incremental Delay, d2	2.6	0.9		7.5	0.7	0.2		1.6			8.9	
Delay (s)	65.8	10.5		73.7	8.4	13.0		54.8			58.1	
Level of Service	E	B		E	A	B		D			E	
Approach Delay (s)		12.7			11.5			54.8			58.1	
Approach LOS		B			B			D			E	

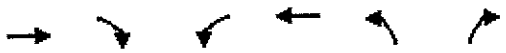
Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.92			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1696			1750	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (perm)	1770	3535		1770	3539	1583		1696			1750	
Volume (vph)	30	1200	10	20	870	160	10	20	50	170	10	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	1304	11	22	946	174	11	22	54	185	11	43
RTOR Reduction (vph)	0	0	0	0	0	71	0	50	0	0	7	0
Lane Group Flow (vph)	33	1315	0	22	946	103	0	37	0	0	232	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	2.4	71.1		2.4	71.1	71.1		8.2			22.3	
Effective Green, g (s)	2.4	71.1		2.4	71.1	71.1		8.2			22.3	
Actuated g/C Ratio	0.02	0.59		0.02	0.59	0.59		0.07			0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	35	2094		35	2097	938		116			325	
v/s Ratio Prot	c0.02	c0.37		0.01	0.27			c0.02			c0.13	
v/s Ratio Perm						0.07						
v/c Ratio	0.94	0.63		0.63	0.45	0.11		0.32			0.72	
Uniform Delay, d1	58.7	15.9		58.4	13.6	10.7		53.2			45.9	
Progression Factor	1.22	0.61		1.15	0.61	1.46		1.00			1.00	
Incremental Delay, d2	112.0	1.1		28.8	0.7	0.2		1.6			7.3	
Delay (s)	183.6	10.7		95.7	9.0	15.8		54.8			53.2	
Level of Service	F	B		F	A	B		D			D	
Approach Delay (s)		15.0			11.7			54.8			53.2	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	18.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	59.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

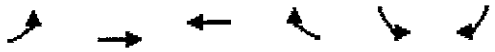
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑	↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	1770	3539	1770	1583
Volume (vph)	1090	170	260	1080	120	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1185	185	283	1174	130	152
RTOR Reduction (vph)	0	73	0	0	0	135
Lane Group Flow (vph)	1185	112	283	1174	130	17
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	72.4	72.4	22.3	98.7	13.3	13.3
Effective Green, g (s)	72.4	72.4	22.3	98.7	13.3	13.3
Actuated g/C Ratio	0.60	0.60	0.19	0.82	0.11	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2135	955	329	2911	196	175
v/s Ratio Prot	c0.33		c0.16	0.33	c0.07	
v/s Ratio Perm		0.07				0.01
v/c Ratio	0.56	0.12	0.86	0.40	0.66	0.10
Uniform Delay, d1	14.2	10.2	47.3	2.8	51.2	47.9
Progression Factor	0.87	1.38	0.66	4.43	1.00	1.00
Incremental Delay, d2	0.8	0.2	18.3	0.4	8.2	0.2
Delay (s)	13.2	14.2	49.6	12.9	59.4	48.2
Level of Service	B	B	D	B	E	D
Approach Delay (s)	13.4			20.0	53.3	
Approach LOS	B			C	D	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑	↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1583	1770	3539	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1583	1770	3539	1770	1583
Volume (vph)	890	400	320	890	140	210
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	967	435	348	967	152	228
RTOR Reduction (vph)	0	186	0	0	0	201
Lane Group Flow (vph)	967	249	348	967	152	27
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	68.6	68.6	25.4	98.0	14.0	14.0
Effective Green, g (s)	68.6	68.6	25.4	98.0	14.0	14.0
Actuated g/C Ratio	0.57	0.57	0.21	0.82	0.12	0.12
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2023	905	375	2890	207	185
v/s Ratio Prot	c0.27		c0.20	0.27	c0.09	
v/s Ratio Perm		0.16				0.02
v/c Ratio	0.48	0.27	0.93	0.33	0.73	0.14
Uniform Delay, d1	15.1	13.1	46.4	2.8	51.2	47.6
Progression Factor	0.93	2.62	0.78	3.07	1.00	1.00
Incremental Delay, d2	0.6	0.6	26.8	0.3	12.6	0.4
Delay (s)	14.7	34.8	62.9	8.8	63.9	48.0
Level of Service	B	C	E	A	E	D
Approach Delay (s)	20.9			23.1	54.3	
Approach LOS	C			C	D	

Intersection Summary				
HCM Average Control Delay	25.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	60.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↱			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1310	1250	20	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1424	1359	22	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		448	448			
pX, platoon unblocked	0.81				0.89	0.81
vC, conflicting volume	1380				2082	690
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1236				1455	385
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	454				107	497

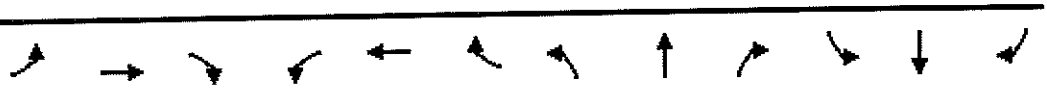
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	712	712	906	475	22
Volume Left	0	0	0	0	0
Volume Right	0	0	0	22	22
cSH	1700	1700	1700	1700	497
Volume to Capacity	0.42	0.42	0.53	0.28	0.04
Queue Length 95th (ft)	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	12.6
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.6
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↱			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1150	1070	70	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1250	1163	76	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		448	448			
pX, platoon unblocked	0.83				0.91	0.83
vC, conflicting volume	1239				1826	620
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1087				1275	343
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	531				145	544

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	625	625	775	464	22
Volume Left	0	0	0	0	0
Volume Right	0	0	0	76	22
cSH	1700	1700	1700	1700	544
Volume to Capacity	0.37	0.37	0.46	0.27	0.04
Queue Length 95th (ft)	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	11.9
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.9
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5073		1770	5085	1583	1770	1806		1770	1660	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5073		1770	5085	1583	1770	1806		1770	1660	
Volume (vph)	110	1220	20	10	1090	80	120	40	10	130	30	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	1326	22	11	1185	87	130	43	11	141	33	87
RTOR Reduction (vph)	0	1	0	0	0	47	0	7	0	0	76	0
Lane Group Flow (vph)	120	1347	0	11	1185	40	130	47	0	141	44	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	12.0	65.7		1.8	55.5	55.5	22.0	22.0		14.5	14.5	
Effective Green, g (s)	12.0	65.7		1.8	55.5	55.5	22.0	22.0		14.5	14.5	
Actuated g/C Ratio	0.10	0.55		0.02	0.46	0.46	0.18	0.18		0.12	0.12	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	177	2777		27	2352	732	325	331		214	201	
v/s Ratio Prot	c0.07	0.27		0.01	c0.23		c0.07	0.03		c0.08	0.03	
v/s Ratio Perm						0.03						
v/c Ratio	0.68	0.49		0.41	0.50	0.05	0.40	0.14		0.66	0.27	
Uniform Delay, d1	52.1	16.7		58.6	22.6	17.8	43.2	41.1		50.4	47.6	
Progression Factor	1.25	0.24		0.42	0.14	0.01	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.7	0.5		7.9	0.6	0.1	3.6	0.9		7.1	0.5	
Delay (s)	73.9	4.5		32.2	3.8	0.2	46.8	42.0		57.5	48.2	
Level of Service	E	A		C	A	A	D	D		E	D	
Approach Delay (s)		10.2			3.8			45.4			53.2	
Approach LOS		B			A			D			D	

Intersection Summary					
HCM Average Control Delay	13.2	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.52				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	51.2%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5070		1770	5085	1583	1770	1812		1770	1676	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5070		1770	5085	1583	1770	1812		1770	1676	
Volume (vph)	130	1020	20	40	910	150	140	90	20	320	70	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	141	1109	22	43	989	163	152	98	22	348	76	152
RTOR Reduction (vph)	0	2	0	0	0	99	0	7	0	0	60	0
Lane Group Flow (vph)	141	1129	0	43	989	64	152	113	0	348	168	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	13.1	52.8		7.2	46.9	46.9	22.0	22.0		22.0	22.0	
Effective Green, g (s)	13.1	52.8		7.2	46.9	46.9	22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.11	0.44		0.06	0.39	0.39	0.18	0.18		0.18	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	193	2231		106	1987	619	325	332		325	307	
v/s Ratio Prot	c0.08	c0.22		0.02	c0.19		c0.09	0.06		c0.20	0.10	
v/s Ratio Perm						0.04						
v/c Ratio	0.73	0.51		0.41	0.50	0.10	0.47	0.34		1.07	0.55	
Uniform Delay, d1	51.7	24.2		54.3	27.6	23.2	43.8	42.7		49.0	44.5	
Progression Factor	0.97	0.35		0.53	0.25	0.04	1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.0	0.7		2.2	0.8	0.3	4.8	2.8		70.0	2.0	
Delay (s)	62.3	9.3		30.9	7.6	1.3	48.5	45.5		119.0	46.5	
Level of Service	E	A		C	A	A	D	D		F	D	
Approach Delay (s)		15.2			7.6			47.2			90.3	
Approach LOS		B			A			D			F	

Intersection Summary				
HCM Average Control Delay	28.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.94	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3650	5406	1683	3650	5406	1683	3650	5406	1683	5305	5406	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3650	5406	1683	3650	5406	1683	3650	5406	1683	5305	5406	1683
Volume (vph)	230	940	250	150	830	440	280	810	100	370	580	110
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	1022	272	163	902	478	304	880	109	402	630	120
RTOR Reduction (vph)	0	0	83	0	0	22	0	0	72	0	0	78
Lane Group Flow (vph)	250	1022	189	163	902	456	304	880	37	402	630	42
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.0	36.5	51.5	10.5	32.0	47.9	15.0	41.1	41.1	15.9	42.0	42.0
Effective Green, g (s)	15.0	36.5	51.5	10.5	32.0	47.9	15.0	41.1	41.1	15.9	42.0	42.0
Actuated g/C Ratio	0.12	0.30	0.43	0.09	0.27	0.40	0.12	0.34	0.34	0.13	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	456	1644	722	319	1442	672	456	1852	576	703	1892	589
v/s Ratio Prot	0.07	c0.19	0.03	0.04	0.17	c0.09	c0.08	c0.16		0.08	0.12	
v/s Ratio Perm			0.08			0.18			0.02			0.02
v/c Ratio	0.55	0.62	0.26	0.51	0.63	0.68	0.67	0.48	0.06	0.57	0.33	0.07
Uniform Delay, d1	49.3	35.8	22.0	52.3	38.7	29.7	50.1	31.0	26.5	48.9	28.7	26.0
Progression Factor	0.62	0.50	0.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	1.6	0.2	1.4	2.1	2.7	3.7	0.9	0.2	1.1	0.5	0.2
Delay (s)	31.8	19.4	15.2	53.7	40.8	32.4	53.8	31.9	26.7	50.0	29.2	26.2
Level of Service	C	B	B	D	D	C	D	C	C	D	C	C
Approach Delay (s)		20.7			39.6			36.6			36.1	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	32.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	57.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.94	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3650	5406	1683	3650	5406	1683	3650	5406	1683	5305	5406	1683
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3650	5406	1683	3650	5406	1683	3650	5406	1683	5305	5406	1683
Volume (vph)	230	800	280	330	650	380	270	860	120	590	1090	220
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	870	304	359	707	413	293	935	130	641	1185	239
RTOR Reduction (vph)	0	0	11	0	0	19	0	0	90	0	0	155
Lane Group Flow (vph)	250	870	293	359	707	394	293	935	40	641	1185	84
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.0	31.3	46.3	15.7	32.0	52.2	15.0	36.8	36.8	20.2	42.0	42.0
Effective Green, g (s)	15.0	31.3	46.3	15.7	32.0	52.2	15.0	36.8	36.8	20.2	42.0	42.0
Actuated g/C Ratio	0.12	0.26	0.39	0.13	0.27	0.44	0.12	0.31	0.31	0.17	0.35	0.35
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	456	1410	649	478	1442	732	456	1658	516	893	1892	589
v/s Ratio Prot	0.07	c0.16	0.06	c0.10	0.13	0.09	0.08	c0.17		c0.12	c0.22	
v/s Ratio Perm			0.12			0.14			0.02			0.05
v/c Ratio	0.55	0.62	0.45	0.75	0.49	0.54	0.64	0.56	0.08	0.72	0.63	0.14
Uniform Delay, d1	49.3	39.1	27.4	50.3	37.1	25.0	49.9	34.9	29.5	47.2	32.5	26.7
Progression Factor	0.64	0.56	0.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	1.6	0.4	6.5	1.2	0.8	3.1	1.4	0.3	2.8	1.6	0.5
Delay (s)	32.8	23.3	17.8	56.8	38.3	25.8	53.0	36.3	29.8	50.0	34.0	27.2
Level of Service	C	C	B	E	D	C	D	D	C	D	C	C
Approach Delay (s)		23.8			39.3			39.3			38.2	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	35.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3458		1770	3488	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3458		1770	3488	
Volume (vph)	30	260	90	40	180	210	40	220	40	60	190	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	283	98	43	196	228	43	239	43	65	207	22
RTOR Reduction (vph)	0	0	77	0	0	177	0	12	0	0	8	0
Lane Group Flow (vph)	33	283	21	43	196	51	43	270	0	65	221	0
Turn Type	Prot		Perm	Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.9	10.3	10.3	2.3	10.7	10.7	10.1	10.1		9.4	9.4	
Effective Green, g (s)	1.9	10.3	10.3	2.3	10.7	10.7	10.1	10.1		9.4	9.4	
Actuated g/C Ratio	0.04	0.21	0.21	0.05	0.22	0.22	0.21	0.21		0.20	0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	70	399	339	85	414	352	372	726		346	682	
v/s Ratio Prot	0.02	c0.15		c0.02	0.11		0.02	c0.08		0.04	c0.06	
v/s Ratio Perm			0.01			0.03						
v/c Ratio	0.47	0.71	0.06	0.51	0.47	0.14	0.12	0.37		0.19	0.32	
Uniform Delay, d1	22.6	17.5	15.1	22.3	16.3	15.0	15.4	16.3		16.2	16.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.9	5.7	0.1	4.7	0.9	0.2	0.1	0.3		0.3	0.3	
Delay (s)	27.6	23.2	15.1	27.0	17.1	15.2	15.5	16.6		16.4	16.9	
Level of Service	C	C	B	C	B	B	B	B		B	B	
Approach Delay (s)		21.6			17.1			16.5			16.8	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM Average Control Delay	18.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	48.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	41.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3448		1770	3497	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3448		1770	3497	
Volume (vph)	30	220	90	80	160	80	70	190	40	90	460	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	239	98	87	174	87	76	207	43	98	500	43
RTOR Reduction (vph)	0	0	79	0	0	67	0	15	0	0	6	0
Lane Group Flow (vph)	33	239	19	87	174	20	76	235	0	98	537	0
Turn Type	Prot		Perm	Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						
Actuated Green, G (s)	2.0	11.0	11.0	4.4	13.4	13.4	10.6	10.6		15.5	15.5	
Effective Green, g (s)	2.0	11.0	11.0	4.4	13.4	13.4	10.6	10.6		15.5	15.5	
Actuated g/C Ratio	0.03	0.19	0.19	0.08	0.23	0.23	0.18	0.18		0.27	0.27	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	62	356	303	135	434	369	326	636		477	943	
v/s Ratio Prot	0.02	c0.13		c0.05	0.09		0.04	c0.07		0.06	c0.15	
v/s Ratio Perm			0.01			0.01						
v/c Ratio	0.53	0.67	0.06	0.64	0.40	0.05	0.23	0.37		0.21	0.57	
Uniform Delay, d1	27.3	21.6	19.0	25.8	18.7	17.1	20.0	20.5		16.2	18.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.5	4.9	0.1	10.1	0.6	0.1	0.4	0.4		0.2	0.8	
Delay (s)	35.8	26.5	19.1	35.9	19.3	17.2	20.4	20.9		16.5	18.9	
Level of Service	D	C	B	D	B	B	C	C		B	B	
Approach Delay (s)		25.4			22.9			20.8			18.5	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM Average Control Delay	21.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	57.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	47.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	0.99			1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	1770	3508			3531	1583		1778		1681	1694	1583
Flt Permitted	0.95	1.00			1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	1770	3508			3531	1583		1778		1681	1694	1583
Volume (vph)	100	160	10	10	200	320	10	20	10	360	20	100
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	174	11	11	217	348	11	22	11	391	22	109
RTOR Reduction (vph)	0	3	0	0	0	208	0	9	0	0	0	80
Lane Group Flow (vph)	109	182	0	0	228	140	0	35	0	201	212	29
Turn Type	Split			Split		pm+ov	Split			Split		Perm
Protected Phases	4	4		8	8	6	2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	6.8	6.8			6.8	20.6		7.9		13.8	13.8	13.8
Effective Green, g (s)	6.8	6.8			6.8	20.6		7.9		13.8	13.8	13.8
Actuated g/C Ratio	0.13	0.13			0.13	0.40		0.15		0.27	0.27	0.27
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	235	465			468	636		274		452	456	426
v/s Ratio Prot	c0.06	0.05			c0.06	0.06		c0.02		0.12	c0.13	
v/s Ratio Perm						0.03						0.02
v/c Ratio	0.46	0.39			0.49	0.22		0.13		0.44	0.46	0.07
Uniform Delay, d1	20.6	20.4			20.6	10.1		18.7		15.6	15.7	14.0
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	0.5			0.8	0.2		0.2		0.7	0.8	0.1
Delay (s)	22.0	20.9			21.4	10.3		18.9		16.3	16.4	14.0
Level of Service	C	C			C	B		B		B	B	B
Approach Delay (s)		21.3			14.7			18.9			15.9	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	51.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00		0.95	0.95	1.00
Frt	1.00	1.00			1.00	0.85		0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00		0.98		0.95	0.95	1.00
Satd. Flow (prot)	1770	3526			3521	1583		1750		1681	1688	1583
Flt Permitted	0.95	1.00			0.99	1.00		0.98		0.95	0.95	1.00
Satd. Flow (perm)	1770	3526			3521	1583		1750		1681	1688	1583
Volume (vph)	200	410	10	30	260	230	10	10	10	660	10	200
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	446	11	33	283	250	11	11	11	717	11	217
RTOR Reduction (vph)	0	2	0	0	0	130	0	10	0	0	0	148
Lane Group Flow (vph)	217	455	0	0	316	120	0	23	0	359	369	69
Turn Type	Split			Split		pm+ov	Split			Split		Perm
Protected Phases	4	4		8	8	6	2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	15.3	15.3			11.7	35.1		6.9		23.4	23.4	23.4
Effective Green, g (s)	15.3	15.3			11.7	35.1		6.9		23.4	23.4	23.4
Actuated g/C Ratio	0.21	0.21			0.16	0.48		0.09		0.32	0.32	0.32
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	369	736			562	758		165		537	539	505
v/s Ratio Prot	0.12	c0.13			c0.09	0.05		c0.01		0.21	c0.22	
v/s Ratio Perm						0.03						0.04
v/c Ratio	0.59	0.62			0.56	0.16		0.14		0.67	0.68	0.14
Uniform Delay, d1	26.2	26.4			28.4	10.8		30.5		21.6	21.7	17.8
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	2.4	1.6			1.3	0.1		0.4		3.2	3.6	0.1
Delay (s)	28.6	27.9			29.7	10.9		30.9		24.7	25.3	17.9
Level of Service	C	C			C	B		C		C	C	B
Approach Delay (s)		28.1			21.4			30.9			23.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	24.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	73.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	1.00	0.91		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1863	3725	2933	3614	3725	1667	1863	5340		1863	6745	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	3725	2933	3614	3725	1667	1863	5340		1863	6745	1667
Volume (vph)	80	220	270	130	250	110	280	620	10	110	620	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	239	293	141	272	120	304	674	11	120	674	87
RTOR Reduction (vph)	0	0	187	0	0	104	0	1	0	0	0	55
Lane Group Flow (vph)	87	239	106	141	272	16	304	684	0	120	674	32
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	7.7	12.2	31.2	7.0	11.5	11.5	19.0	41.9		9.0	31.9	31.9
Effective Green, g (s)	7.7	12.2	31.2	7.0	11.5	11.5	19.0	41.9		9.0	31.9	31.9
Actuated g/C Ratio	0.09	0.14	0.36	0.08	0.13	0.13	0.22	0.49		0.10	0.37	0.37
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	167	528	1199	294	498	223	411	2599		195	2499	618
v/s Ratio Prot	c0.05	0.06	0.02	0.04	c0.07		c0.16	c0.13		0.06	0.10	
v/s Ratio Perm			0.02			0.01						0.02
v/c Ratio	0.52	0.45	0.09	0.48	0.55	0.07	0.74	0.26		0.62	0.27	0.05
Uniform Delay, d1	37.4	33.9	18.1	37.8	34.9	32.6	31.2	13.0		36.9	19.0	17.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.9	0.6	0.0	1.2	1.2	0.1	6.8	0.2		5.7	0.3	0.2
Delay (s)	40.4	34.5	18.1	39.0	36.1	32.8	38.1	13.3		42.6	19.2	17.6
Level of Service	D	C	B	D	D	C	D	B		D	B	B
Approach Delay (s)		27.6			36.1			20.9			22.2	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	1.00	0.91		1.00	0.86	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1863	3725	2933	3614	3725	1667	1863	5324		1863	6745	1667
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1863	3725	2933	3614	3725	1667	1863	5324		1863	6745	1667
Volume (vph)	80	200	670	270	260	100	170	550	20	90	2000	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	217	728	293	283	109	185	598	22	98	2174	98
RTOR Reduction (vph)	0	0	18	0	0	93	0	3	0	0	0	48
Lane Group Flow (vph)	87	217	710	293	283	16	185	617	0	98	2174	50
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	9.1	12.6	30.9	13.6	17.1	17.1	18.3	61.8		9.6	53.1	53.1
Effective Green, g (s)	9.1	12.6	30.9	13.6	17.1	17.1	18.3	61.8		9.6	53.1	53.1
Actuated g/C Ratio	0.08	0.11	0.27	0.12	0.15	0.15	0.16	0.54		0.08	0.47	0.47
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	149	413	901	433	561	251	300	2896		157	3153	779
v/s Ratio Prot	0.05	0.06	c0.13	c0.08	0.08		0.10	0.12		0.05	c0.32	
v/s Ratio Perm			0.12			0.01						0.03
v/c Ratio	0.58	0.53	0.79	0.68	0.50	0.07	0.62	0.21		0.62	0.69	0.06
Uniform Delay, d1	50.4	47.7	38.3	47.9	44.4	41.4	44.4	13.4		50.3	23.8	16.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.7	1.2	4.6	4.2	0.7	0.1	3.7	0.2		7.5	1.3	0.2
Delay (s)	56.1	48.9	42.9	52.1	45.1	41.5	48.1	13.5		57.8	25.0	16.8
Level of Service	E	D	D	D	D	D	D	B		E	C	B
Approach Delay (s)		45.3			47.5			21.5			26.0	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM Average Control Delay	32.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	113.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	67.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

APPENDIX M

INTERSECTION CAPACITY WORKSHEETS
YEAR 2035 WITH IMPROVEMENTS (WITH ANZA ROAD EXTENSION)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.96		1.00	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3158		1770	3539	2563	1770	3539	1460	3433	3539	1460
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3158		1770	3539	2563	1770	3539	1460	3433	3539	1460
Volume (vph)	20	160	150	40	300	600	200	700	200	620	700	200
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	174	163	43	326	652	217	761	217	674	761	217
RTOR Reduction (vph)	0	112	0	0	0	27	0	0	152	0	0	142
Lane Group Flow (vph)	22	225	0	43	326	625	217	761	65	674	761	75
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	3.0	37.4		5.6	40.0	65.0	19.3	36.0	36.0	25.0	41.7	41.7
Effective Green, g (s)	3.0	37.4		5.6	40.0	65.0	19.3	36.0	36.0	25.0	41.7	41.7
Actuated g/C Ratio	0.02	0.31		0.05	0.33	0.54	0.16	0.30	0.30	0.21	0.35	0.35
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	44	984		83	1180	1474	285	1062	438	715	1230	507
v/s Ratio Prot	0.01	0.07		c0.02	0.09	c0.09	0.12	c0.22		c0.20	0.22	
v/s Ratio Perm						0.16			0.04			0.05
v/c Ratio	0.50	0.23		0.52	0.28	0.42	0.76	0.72	0.15	0.94	0.62	0.15
Uniform Delay, d1	57.8	30.6		55.9	29.4	16.4	48.1	37.5	30.8	46.8	32.5	26.9
Progression Factor	1.00	1.00		1.16	0.74	0.65	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.7	0.5		4.5	0.5	0.8	11.4	2.3	0.2	22.2	2.3	0.6
Delay (s)	66.4	31.1		69.4	22.2	11.3	59.5	39.8	30.9	69.0	34.9	27.6
Level of Service	E	C		E	C	B	E	D	C	E	C	C
Approach Delay (s)		33.3			17.2			41.8			47.9	
Approach LOS		C			B			D			D	

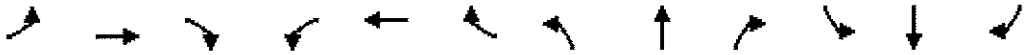
Intersection Summary			
HCM Average Control Delay	37.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.88	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	0.92	1.00	1.00	0.92	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3258		1770	3539	2557	1770	3539	1460	3433	3539	1460
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3258		1770	3539	2557	1770	3539	1460	3433	3539	1460
Volume (vph)	60	400	220	40	180	670	180	700	200	600	700	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	435	239	43	196	728	196	761	217	652	761	54
RTOR Reduction (vph)	0	61	0	0	0	11	0	0	143	0	0	35
Lane Group Flow (vph)	65	613	0	43	196	717	196	761	74	652	761	19
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot			Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	5.0	44.0		4.0	43.0	68.0	14.0	31.0	31.0	25.0	42.0	42.0
Effective Green, g (s)	5.0	44.0		4.0	43.0	68.0	14.0	31.0	31.0	25.0	42.0	42.0
Actuated g/C Ratio	0.04	0.37		0.03	0.36	0.57	0.12	0.26	0.26	0.21	0.35	0.35
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	74	1195		59	1268	1534	207	914	377	715	1239	511
v/s Ratio Prot	c0.04	c0.19		0.02	0.06	0.10	0.11	c0.22		c0.19	0.22	
v/s Ratio Perm						0.18			0.05			0.01
v/c Ratio	0.88	0.51		0.73	0.15	0.47	0.95	0.83	0.20	0.91	0.61	0.04
Uniform Delay, d1	57.2	29.6		57.5	26.2	15.3	52.6	42.0	34.8	46.4	32.3	25.7
Progression Factor	1.00	1.00		1.10	0.68	0.68	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	64.1	1.6		33.5	0.2	0.9	47.1	6.6	0.3	17.9	2.3	0.1
Delay (s)	121.3	31.2		96.8	18.1	11.4	99.8	48.6	35.0	64.4	34.6	25.8
Level of Service	F	C		F	B	B	F	D	D	E	C	C
Approach Delay (s)		39.1			16.5			54.6			47.5	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	41.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

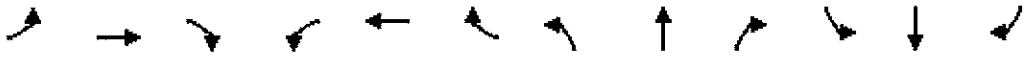
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.96		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.93		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3498		1770	3430		1770	1664		1770	1735	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3498		1770	3430		1770	1664		1770	1735	
Volume (vph)	20	900	40	80	800	100	190	120	110	130	90	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	978	43	87	870	109	207	130	120	141	98	43
RTOR Reduction (vph)	0	2	0	0	7	0	0	30	0	0	14	0
Lane Group Flow (vph)	22	1019	0	87	972	0	207	220	0	141	127	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	2.8	54.5		12.1	63.8		19.3	20.1		17.3	18.1	
Effective Green, g (s)	2.8	54.5		12.1	63.8		19.3	20.1		17.3	18.1	
Actuated g/C Ratio	0.02	0.45		0.10	0.53		0.16	0.17		0.14	0.15	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	41	1589		178	1824		285	279		255	262	
v/s Ratio Prot	0.01	c0.29		0.05	c0.28		0.12	c0.13		c0.08	0.07	
v/s Ratio Perm												
v/c Ratio	0.54	0.64		0.49	0.53		0.73	0.79		0.55	0.49	
Uniform Delay, d1	58.0	25.2		51.0	18.4		47.8	47.9		47.8	46.7	
Progression Factor	1.18	0.93		0.69	0.48		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.8	1.4		1.8	1.0		8.9	13.7		2.6	1.4	
Delay (s)	77.0	24.8		37.1	9.9		56.7	61.6		50.3	48.1	
Level of Service	E	C		D	A		E	E		D	D	
Approach Delay (s)		25.9			12.1			59.4			49.2	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

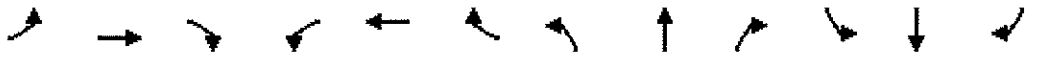
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3455		1770	3431		1770	1697		1770	1757	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3455		1770	3431		1770	1697		1770	1757	
Volume (vph)	60	1080	100	110	730	90	90	60	40	90	60	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1174	109	120	793	98	98	65	43	98	65	22
RTOR Reduction (vph)	0	6	0	0	8	0	0	20	0	0	10	0
Lane Group Flow (vph)	65	1277	0	120	883	0	98	88	0	98	77	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.0	56.2		15.8	65.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	7.0	56.2		15.8	65.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.06	0.47		0.13	0.54		0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	103	1618		233	1858		236	226		236	234	
v/s Ratio Prot	0.04	c0.37		0.07	c0.26		c0.06	0.05		c0.06	0.04	
v/s Ratio Perm												
v/c Ratio	0.63	0.79		0.52	0.48		0.42	0.39		0.42	0.33	
Uniform Delay, d1	55.2	26.9		48.5	17.0		47.7	47.5		47.7	47.1	
Progression Factor	1.05	0.53		0.70	0.39		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.8	2.9		1.8	0.8		1.2	1.1		1.2	0.8	
Delay (s)	66.9	17.1		35.8	7.4		48.9	48.7		48.9	47.9	
Level of Service	E	B		D	A		D	D		D	D	
Approach Delay (s)		19.5			10.8			48.8			48.4	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM Average Control Delay	20.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			

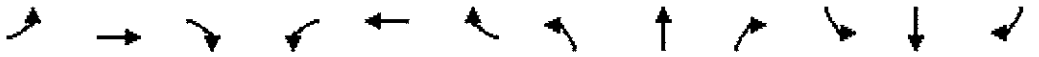
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.88	1.00	0.88		1.00	1.00	0.77
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (prot)	1770	3511		1770	3539	1390	1770	2939		1610	3329	1215
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (perm)	1770	3511		1770	3539	1390	1770	2939		1610	3329	1215
Volume (vph)	90	1020	30	100	730	640	70	260	160	400	300	170
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	1109	33	109	793	696	76	283	174	435	326	185
RTOR Reduction (vph)	0	2	0	0	0	319	0	78	0	0	0	145
Lane Group Flow (vph)	98	1140	0	109	793	377	76	380	0	245	516	40
Confl. Peds. (#/hr)			50			50			150			100
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	10.0	47.0		11.0	48.0	48.0	20.0	20.0		26.0	26.0	26.0
Effective Green, g (s)	10.0	47.0		11.0	48.0	48.0	20.0	20.0		26.0	26.0	26.0
Actuated g/C Ratio	0.08	0.39		0.09	0.40	0.40	0.17	0.17		0.22	0.22	0.22
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	148	1375		162	1416	556	295	490		349	721	263
v/s Ratio Prot	0.06	c0.32		c0.06	0.22		0.04	c0.13		0.15	c0.16	
v/s Ratio Perm						0.27						0.03
v/c Ratio	0.66	0.83		0.67	0.56	0.68	0.26	0.77		0.70	0.72	0.15
Uniform Delay, d1	53.4	32.9		52.8	27.8	29.7	43.5	47.8		43.4	43.6	38.1
Progression Factor	0.59	1.12		0.83	1.19	1.85	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.4	4.7		7.1	1.1	4.4	2.1	11.3		11.2	6.0	1.2
Delay (s)	39.7	41.4		50.9	34.3	59.2	45.6	59.2		54.6	49.6	39.3
Level of Service	D	D		D	C	E	D	E		D	D	D
Approach Delay (s)		41.3			46.3			57.3			48.9	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM Average Control Delay	46.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.88	1.00	0.85		1.00	1.00	0.64
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (prot)	1770	3491		1770	3539	1390	1770	2787		1610	3318	1017
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.98	1.00
Satd. Flow (perm)	1770	3491		1770	3539	1390	1770	2787		1610	3318	1017
Volume (vph)	40	1140	60	140	720	420	80	150	140	400	250	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1239	65	152	783	457	87	163	152	435	272	152
RTOR Reduction (vph)	0	3	0	0	0	230	0	126	0	0	0	124
Lane Group Flow (vph)	43	1301	0	152	783	227	87	189	0	227	480	28
Confl. Peds. (#/hr)			50			50			150			250
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	5.6	51.2		14.0	59.6	59.6	16.8	16.8		22.0	22.0	22.0
Effective Green, g (s)	5.6	51.2		14.0	59.6	59.6	16.8	16.8		22.0	22.0	22.0
Actuated g/C Ratio	0.05	0.43		0.12	0.50	0.50	0.14	0.14		0.18	0.18	0.18
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	83	1489		207	1758	690	248	390		295	608	186
v/s Ratio Prot	0.02	c0.37		c0.09	0.22		0.05	c0.07		0.14	c0.14	
v/s Ratio Perm						0.16						0.03
v/c Ratio	0.52	0.87		0.73	0.45	0.33	0.35	0.48		0.77	0.79	0.15
Uniform Delay, d1	55.9	31.4		51.2	19.5	18.2	46.7	47.6		46.6	46.8	41.1
Progression Factor	0.73	0.97		0.78	1.29	5.05	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.6	5.2		9.5	0.6	0.9	3.9	4.2		17.4	10.0	1.7
Delay (s)	44.7	35.5		49.4	25.8	92.7	50.5	51.8		64.0	56.8	42.8
Level of Service	D	D		D	C	F	D	D		E	E	D
Approach Delay (s)		35.8			50.3			51.6			56.3	
Approach LOS		D			D			D			E	

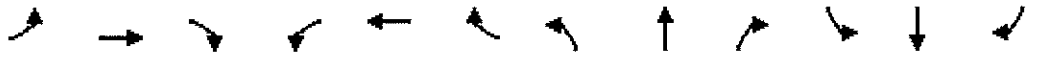
Intersection Summary			
HCM Average Control Delay	46.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.87	1.00	1.00	0.87	1.00	0.95		1.00	0.96	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1377	1770	3539	1377	1770	1588		1770	1642	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1377	1770	3539	1377	1770	1588		1770	1642	
Volume (vph)	50	1500	100	50	1180	20	230	50	100	80	70	80
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1630	109	54	1283	22	250	54	109	87	76	87
RTOR Reduction (vph)	0	0	42	0	0	11	0	59	0	0	35	0
Lane Group Flow (vph)	54	1630	67	54	1283	11	250	104	0	87	128	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	7.2	60.2	60.2	4.8	57.8	57.8	23.0	23.0		16.0	16.0	
Effective Green, g (s)	7.2	60.2	60.2	4.8	57.8	57.8	23.0	23.0		16.0	16.0	
Actuated g/C Ratio	0.06	0.50	0.50	0.04	0.48	0.48	0.19	0.19		0.13	0.13	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	106	1775	691	71	1705	663	339	304		236	219	
v/s Ratio Prot	c0.03	c0.46		0.03	0.36		c0.14	0.07		0.05	c0.08	
v/s Ratio Perm			0.05			0.01						
v/c Ratio	0.51	0.92	0.10	0.76	0.75	0.02	0.74	0.34		0.37	0.59	
Uniform Delay, d1	54.7	27.6	15.7	57.0	25.3	16.3	45.7	42.0		47.4	48.9	
Progression Factor	0.69	0.36	0.21	0.59	0.25	0.33	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	6.1	0.2	28.0	2.2	0.0	13.4	3.0		1.0	4.0	
Delay (s)	39.9	16.1	3.5	61.5	8.4	5.3	59.1	45.0		48.4	52.9	
Level of Service	D	B	A	E	A	A	E	D		D	D	
Approach Delay (s)		16.1			10.5			53.5			51.3	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	20.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

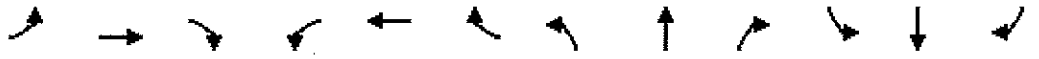
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.87	1.00	1.00	0.87	1.00	0.94		1.00	0.95	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1377	1770	3539	1377	1770	1566		1770	1577	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1377	1770	3539	1377	1770	1566		1770	1577	
Volume (vph)	60	1560	70	70	1210	20	70	30	80	70	30	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1696	76	76	1315	22	76	33	87	76	33	76
RTOR Reduction (vph)	0	0	28	0	0	11	0	74	0	0	66	0
Lane Group Flow (vph)	65	1696	48	76	1315	11	76	46	0	76	43	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	7.2	63.2	63.2	6.4	62.4	62.4	18.4	18.4		16.0	16.0	
Effective Green, g (s)	7.2	63.2	63.2	6.4	62.4	62.4	18.4	18.4		16.0	16.0	
Actuated g/C Ratio	0.06	0.53	0.53	0.05	0.52	0.52	0.15	0.15		0.13	0.13	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	106	1864	725	94	1840	716	271	240		236	210	
v/s Ratio Prot	0.04	c0.48		c0.04	0.37		c0.04	c0.03		0.04	0.03	
v/s Ratio Perm			0.03			0.01						
v/c Ratio	0.61	0.91	0.07	0.81	0.71	0.02	0.28	0.19		0.32	0.21	
Uniform Delay, d1	55.0	25.8	13.9	56.2	22.0	13.9	44.9	44.3		47.1	46.3	
Progression Factor	0.75	0.30	0.12	0.71	0.13	0.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.7	4.8	0.1	30.4	1.8	0.0	2.6	1.8		0.8	0.5	
Delay (s)	47.0	12.5	1.8	70.4	4.6	0.1	47.5	46.1		47.9	46.8	
Level of Service	D	B	A	E	A	A	D	D		D	D	
Approach Delay (s)		13.2			8.0			46.7			47.3	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

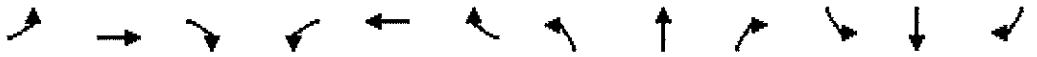
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.87		0.95			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.91			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.97	
Satd. Flow (prot)	1770	3527		1770	3539	1377		1587			1695	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.97	
Satd. Flow (perm)	1770	3527		1770	3539	1377		1587			1695	
Volume (vph)	60	1620	20	40	1220	240	10	20	70	120	20	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1761	22	43	1326	261	11	22	76	130	22	65
RTOR Reduction (vph)	0	1	0	0	0	119	0	66	0	0	13	0
Lane Group Flow (vph)	65	1782	0	43	1326	142	0	43	0	0	204	0
Confl. Peds. (#/hr)			30			30			30			30
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	7.2	68.0		3.2	64.0	64.0		16.0			16.8	
Effective Green, g (s)	7.2	68.0		3.2	64.0	64.0		16.0			16.8	
Actuated g/C Ratio	0.06	0.57		0.03	0.53	0.53		0.13			0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	106	1999		47	1887	734		212			237	
v/s Ratio Prot	0.04	c0.51		0.02	c0.37			c0.03			c0.12	
v/s Ratio Perm						0.10						
v/c Ratio	0.61	0.89		0.91	0.70	0.19		0.20			0.86	
Uniform Delay, d1	55.0	22.8		58.3	20.9	14.6		46.3			50.5	
Progression Factor	0.74	0.50		1.40	0.20	0.16		1.00			1.00	
Incremental Delay, d2	5.3	3.5		90.5	1.9	0.5		0.5			25.9	
Delay (s)	46.3	14.9		172.2	6.1	2.8		46.8			76.3	
Level of Service	D	B		F	A	A		D			E	
Approach Delay (s)		16.0			10.0			46.8			76.3	
Approach LOS		B			A			D			E	

Intersection Summary				
HCM Average Control Delay	17.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	75.4%	ICU Level of Service	D	
Analysis Period (min)	15			

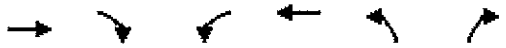
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.87		0.95			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.91			0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (prot)	1770	3527		1770	3539	1377		1599			1721	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.96	
Satd. Flow (perm)	1770	3527		1770	3539	1377		1599			1721	
Volume (vph)	30	1660	20	30	1200	200	10	20	60	200	10	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	1804	22	33	1304	217	11	22	65	217	11	54
RTOR Reduction (vph)	0	1	0	0	0	100	0	56	0	0	8	0
Lane Group Flow (vph)	33	1825	0	33	1304	117	0	42	0	0	275	0
Confl. Peds. (#/hr)	30		30	30		30			30			30
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	3.6	65.6		2.4	64.4	64.4		16.0			20.0	
Effective Green, g (s)	3.6	65.6		2.4	64.4	64.4		16.0			20.0	
Actuated g/C Ratio	0.03	0.55		0.02	0.54	0.54		0.13			0.17	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	53	1928		35	1899	739		213			287	
v/s Ratio Prot	0.02	c0.52		0.02	c0.37			c0.03			c0.16	
v/s Ratio Perm						0.08						
v/c Ratio	0.62	0.95		0.94	0.69	0.16		0.20			0.96	
Uniform Delay, d1	57.5	25.6		58.7	20.4	14.1		46.3			49.6	
Progression Factor	0.81	0.63		1.25	0.69	0.53		1.00			1.00	
Incremental Delay, d2	10.8	6.5		122.5	1.9	0.4		0.5			41.0	
Delay (s)	57.6	22.5		196.1	15.9	8.0		46.7			90.6	
Level of Service	E	C		F	B	A		D			F	
Approach Delay (s)		23.1			18.6			46.7			90.6	
Approach LOS		C			B			D			F	

Intersection Summary				
HCM Average Control Delay	26.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	75.1%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frpb, ped/bikes	1.00	0.92	1.00	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1460	3433	3539	3433	1460
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1460	3433	3539	3433	1460
Volume (vph)	1600	250	340	1400	160	200
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1739	272	370	1522	174	217
RTOR Reduction (vph)	0	94	0	0	0	188
Lane Group Flow (vph)	1739	178	370	1522	174	29
Confl. Peds. (#/hr)		30	30		30	30
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	75.0	75.0	17.0	96.0	16.0	16.0
Effective Green, g (s)	75.0	75.0	17.0	96.0	16.0	16.0
Actuated g/C Ratio	0.62	0.62	0.14	0.80	0.13	0.13
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2212	913	486	2831	458	195
v/s Ratio Prot	c0.49		c0.11	0.43	c0.05	
v/s Ratio Perm		0.12				0.02
v/c Ratio	0.79	0.20	0.76	0.54	0.38	0.15
Uniform Delay, d1	16.6	9.6	49.5	4.2	47.5	46.0
Progression Factor	0.14	0.00	0.83	3.63	1.00	1.00
Incremental Delay, d2	1.5	0.2	3.2	0.3	0.5	0.4
Delay (s)	3.7	0.2	44.1	15.6	48.0	46.3
Level of Service	A	A	D	B	D	D
Approach Delay (s)	3.3			21.2	47.1	
Approach LOS	A			C	D	

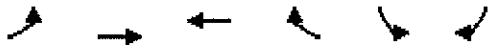
Intersection Summary			
HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frpb, ped/bikes	1.00	0.92	1.00	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1460	3433	3539	3433	1460
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1460	3433	3539	3433	1460
Volume (vph)	1300	590	410	1160	200	290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1413	641	446	1261	217	315
RTOR Reduction (vph)	0	229	0	0	0	271
Lane Group Flow (vph)	1413	412	446	1261	217	44
Confl. Peds. (#/hr)		30	30		30	30
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	70.2	70.2	21.2	95.4	16.6	16.6
Effective Green, g (s)	70.2	70.2	21.2	95.4	16.6	16.6
Actuated g/C Ratio	0.59	0.59	0.18	0.80	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2070	854	606	2814	475	202
v/s Ratio Prot	c0.40		c0.13	0.36	c0.06	
v/s Ratio Perm		0.28				0.03
v/c Ratio	0.68	0.48	0.74	0.45	0.46	0.22
Uniform Delay, d1	17.2	14.4	46.8	3.9	47.6	45.9
Progression Factor	0.20	0.01	0.65	3.23	1.00	1.00
Incremental Delay, d2	0.7	0.8	2.1	0.2	0.7	0.5
Delay (s)	4.2	0.9	32.7	12.9	48.3	46.5
Level of Service	A	A	C	B	D	D
Approach Delay (s)	3.1			18.1	47.2	
Approach LOS	A			B	D	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

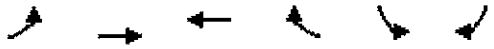
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↱			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1800	1720	20	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1957	1870	22	0	22
Pedestrians		30	30		30	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		2	2		2	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		448	448			
pX, platoon unblocked	0.55				0.75	0.55
vC, conflicting volume	1921				2919	1006
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1857				1664	193
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	173				62	427

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	978	978	1246	645	22
Volume Left	0	0	0	0	0
Volume Right	0	0	0	22	22
cSH	1700	1700	1700	1700	427
Volume to Capacity	0.58	0.58	0.73	0.38	0.05
Queue Length 95th (ft)	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	13.9
Lane LOS					B
Approach Delay (s)	0.0		0.0		13.9
Approach LOS					B

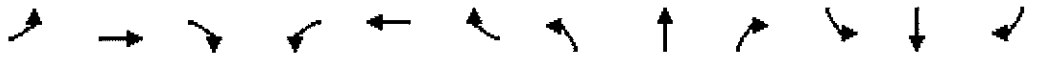
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↱			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1580	1480	90	0	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1717	1609	98	0	22
Pedestrians		30	30		30	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		3	3		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		448	448			
pX, platoon unblocked	0.62				0.76	0.62
vC, conflicting volume	1737				2576	913
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1574				1629	244
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	250				67	445

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	859	859	1072	634	22
Volume Left	0	0	0	0	0
Volume Right	0	0	0	98	22
cSH	1700	1700	1700	1700	445
Volume to Capacity	0.51	0.51	0.63	0.37	0.05
Queue Length 95th (ft)	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	13.5
Lane LOS					B
Approach Delay (s)	0.0		0.0		13.5
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.87	1.00	1.00		1.00	0.90	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (prot)	1770	5068		1770	3539	1377	1770	1806		1681	1424	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (perm)	1770	5068		1770	3539	1377	1770	1806		1681	1424	
Volume (vph)	140	1680	20	10	1500	100	140	40	10	170	30	110
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	1826	22	11	1630	109	152	43	11	185	33	120
RTOR Reduction (vph)	0	1	0	0	0	41	0	8	0	0	63	0
Lane Group Flow (vph)	152	1847	0	11	1630	68	152	46	0	161	114	0
Confl. Peds. (#/hr)			30			30						60
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	12.5	70.4		1.6	59.5	59.5	16.0	16.0		16.0	16.0	
Effective Green, g (s)	12.5	70.4		1.6	59.5	59.5	16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.10	0.59		0.01	0.50	0.50	0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	2973		24	1755	683	236	241		224	190	
v/s Ratio Prot	c0.09	0.36		0.01	c0.46		c0.09	0.03		c0.10	0.08	
v/s Ratio Perm						0.05						
v/c Ratio	0.83	0.62		0.46	0.93	0.10	0.64	0.19		0.72	0.60	
Uniform Delay, d1	52.7	16.1		58.8	28.3	16.0	49.3	46.2		49.8	49.0	
Progression Factor	0.97	0.85		0.59	0.24	0.05	1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.5	0.6		7.9	6.5	0.2	12.8	1.8		10.5	5.0	
Delay (s)	68.5	14.4		42.9	13.4	1.0	62.1	48.0		60.3	54.0	
Level of Service	E	B		D	B	A	E	D		E	D	
Approach Delay (s)		18.5			12.8			58.4			57.0	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

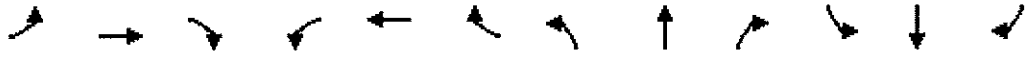
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.87	1.00	0.99		1.00	0.95	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.97		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (prot)	1770	5055		1770	3539	1377	1770	1792		1681	1528	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.99	
Satd. Flow (perm)	1770	5055		1770	3539	1377	1770	1792		1681	1528	
Volume (vph)	180	1400	30	40	1260	190	160	100	20	380	80	190
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	1522	33	43	1370	207	174	109	22	413	87	207
RTOR Reduction (vph)	0	2	0	0	0	95	0	6	0	0	42	0
Lane Group Flow (vph)	196	1553	0	43	1370	112	174	125	0	352	313	0
Confl. Peds. (#/hr)	30		30	30		30			30	30		30
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	14.0	57.4		5.6	49.0	49.0	16.0	16.0		25.0	25.0	
Effective Green, g (s)	14.0	57.4		5.6	49.0	49.0	16.0	16.0		25.0	25.0	
Actuated g/C Ratio	0.12	0.48		0.05	0.41	0.41	0.13	0.13		0.21	0.21	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	207	2418		83	1445	562	236	239		350	318	
v/s Ratio Prot	c0.11	0.31		0.02	c0.39		c0.10	0.07		c0.21	0.20	
v/s Ratio Perm						0.08						
v/c Ratio	0.95	0.64		0.52	0.95	0.20	0.74	0.52		1.01	0.98	
Uniform Delay, d1	52.6	23.6		55.9	34.3	22.9	50.0	48.4		47.5	47.3	
Progression Factor	1.07	0.40		0.56	0.30	0.01	1.00	1.00		1.00	1.00	
Incremental Delay, d2	39.2	1.0		3.9	11.0	0.6	18.5	8.0		49.5	45.9	
Delay (s)	95.3	10.4		35.3	21.3	0.8	68.5	56.4		97.0	93.2	
Level of Service	F	B		D	C	A	E	E		F	F	
Approach Delay (s)		19.9			19.0			63.3			95.1	
Approach LOS		B			B			E			F	

Intersection Summary			
HCM Average Control Delay	34.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

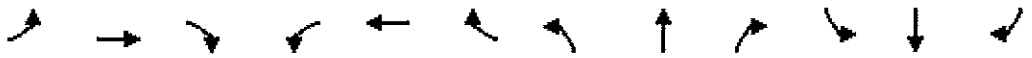
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.94	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.92	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	5136	1519	3467	5136	1527	3467	5136	1474	5040	5136	1474
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	5136	1519	3467	5136	1527	3467	5136	1474	5040	5136	1474
Volume (vph)	320	1300	350	210	1150	610	390	1110	140	510	800	150
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	348	1413	380	228	1250	663	424	1207	152	554	870	163
RTOR Reduction (vph)	0	0	7	0	0	2	0	0	110	0	0	114
Lane Group Flow (vph)	348	1413	373	228	1250	661	424	1207	42	554	870	49
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.0	38.0	59.0	9.0	33.0	57.2	21.0	32.8	32.8	24.2	36.0	36.0
Effective Green, g (s)	14.0	38.0	59.0	9.0	33.0	57.2	21.0	32.8	32.8	24.2	36.0	36.0
Actuated g/C Ratio	0.12	0.32	0.49	0.08	0.28	0.48	0.18	0.27	0.27	0.20	0.30	0.30
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	404	1626	747	260	1412	728	607	1404	403	1016	1541	442
v/s Ratio Prot	0.10	c0.28	0.09	0.07	0.24	c0.18	0.12	c0.24		0.11	0.17	
v/s Ratio Perm			0.16			0.25			0.03			0.03
v/c Ratio	0.86	0.87	0.50	0.88	0.89	0.91	0.70	0.86	0.10	0.55	0.56	0.11
Uniform Delay, d1	52.0	38.7	20.5	55.0	41.7	29.0	46.5	41.4	32.6	43.0	35.4	30.4
Progression Factor	0.51	0.34	0.37	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.4	5.5	0.4	26.4	8.5	15.0	3.5	7.1	0.5	0.6	1.5	0.5
Delay (s)	40.7	18.7	8.1	81.4	50.1	44.0	50.0	48.5	33.1	43.6	36.9	30.9
Level of Service	D	B	A	F	D	D	D	D	C	D	D	C
Approach Delay (s)		20.4			51.6			47.5			38.6	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.94	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.92	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	5136	1515	3467	5136	1522	3467	5136	1474	5040	5136	1474
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	5136	1515	3467	5136	1522	3467	5136	1474	5040	5136	1474
Volume (vph)	310	1100	380	460	900	530	370	1190	160	810	1500	310
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	337	1196	413	500	978	576	402	1293	174	880	1630	337
RTOR Reduction (vph)	0	0	2	0	0	2	0	0	121	0	0	173
Lane Group Flow (vph)	337	1196	411	500	978	574	402	1293	53	880	1630	164
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		Perm
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.0	31.0	46.0	18.0	35.0	57.0	15.0	33.0	33.0	22.0	40.0	40.0
Effective Green, g (s)	14.0	31.0	46.0	18.0	35.0	57.0	15.0	33.0	33.0	22.0	40.0	40.0
Actuated g/C Ratio	0.12	0.26	0.38	0.15	0.29	0.48	0.12	0.28	0.28	0.18	0.33	0.33
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	404	1327	581	520	1498	723	433	1412	405	924	1712	491
v/s Ratio Prot	0.10	c0.23	0.09	c0.14	0.19	0.15	0.12	c0.25		0.17	c0.32	
v/s Ratio Perm			0.18			0.23			0.04			0.11
v/c Ratio	0.83	0.90	0.71	0.96	0.65	0.79	0.93	0.92	0.13	0.95	0.95	0.33
Uniform Delay, d1	51.9	43.0	31.3	50.7	37.2	26.5	52.0	42.2	32.7	48.5	39.1	30.0
Progression Factor	0.64	0.56	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.9	7.3	2.7	29.8	2.2	6.0	26.0	10.8	0.7	19.0	13.0	1.8
Delay (s)	43.0	31.5	23.6	80.4	39.4	32.5	78.0	52.9	33.4	67.5	52.1	31.8
Level of Service	D	C	C	F	D	C	E	D	C	E	D	C
Approach Delay (s)		31.8			47.5			56.5			54.4	
Approach LOS		C			D			E			D	

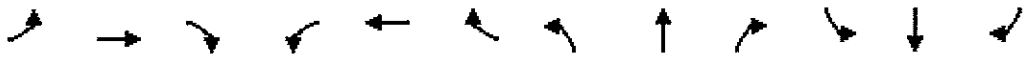
Intersection Summary			
HCM Average Control Delay	48.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.96	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1512	1770	1863	1512	1770	3430		1770	3457	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1512	1770	1863	1512	1770	3430		1770	3457	
Volume (vph)	30	280	110	50	190	250	40	310	50	80	260	30
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	304	120	54	207	272	43	337	54	87	283	33
RTOR Reduction (vph)	0	0	88	0	0	191	0	11	0	0	7	0
Lane Group Flow (vph)	33	304	32	54	207	81	43	380	0	87	309	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot		Perm	Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						
Actuated Green, G (s)	2.4	15.9	15.9	4.2	17.7	17.7	12.4	12.4		11.3	11.3	
Effective Green, g (s)	2.4	15.9	15.9	4.2	17.7	17.7	12.4	12.4		11.3	11.3	
Actuated g/C Ratio	0.04	0.27	0.27	0.07	0.30	0.30	0.21	0.21		0.19	0.19	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	71	495	402	124	551	448	367	711		334	653	
v/s Ratio Prot	0.02	c0.16		c0.03	0.11		0.02	c0.11		0.05	c0.09	
v/s Ratio Perm			0.02			0.05						
v/c Ratio	0.46	0.61	0.08	0.44	0.38	0.18	0.12	0.53		0.26	0.47	
Uniform Delay, d1	28.1	19.3	16.5	26.7	16.7	15.7	19.3	21.1		20.7	21.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.7	2.3	0.1	2.4	0.4	0.2	0.1	0.8		0.4	0.5	
Delay (s)	32.8	21.5	16.5	29.1	17.1	15.8	19.4	21.9		21.1	22.1	
Level of Service	C	C	B	C	B	B	B	C		C	C	
Approach Delay (s)		21.0			17.7			21.7			21.9	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	59.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

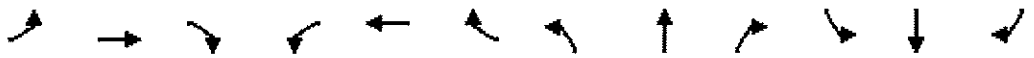
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1499	1770	1863	1499	1770	3383		1770	3467	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1499	1770	1863	1499	1770	3383		1770	3467	
Volume (vph)	40	230	100	90	170	100	80	260	60	120	640	60
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	250	109	98	185	109	87	283	65	130	696	65
RTOR Reduction (vph)	0	0	89	0	0	84	0	16	0	0	5	0
Lane Group Flow (vph)	43	250	20	98	185	25	87	332	0	130	756	0
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot		Perm	Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.1	13.5	13.5	7.6	17.0	17.0	14.4	14.4		23.5	23.5	
Effective Green, g (s)	4.1	13.5	13.5	7.6	17.0	17.0	14.4	14.4		23.5	23.5	
Actuated g/C Ratio	0.05	0.18	0.18	0.10	0.23	0.23	0.19	0.19		0.31	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	97	335	270	179	422	340	340	650		555	1086	
v/s Ratio Prot	0.02	c0.13		c0.06	c0.10		0.05	c0.10		0.07	c0.22	
v/s Ratio Perm			0.01			0.02						
v/c Ratio	0.44	0.75	0.07	0.55	0.44	0.07	0.26	0.51		0.23	0.70	
Uniform Delay, d1	34.3	29.1	25.5	32.1	24.9	22.8	25.7	27.1		19.1	22.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	8.7	0.1	3.4	0.7	0.1	0.4	0.7		0.2	2.0	
Delay (s)	37.6	37.9	25.7	35.5	25.6	22.9	26.1	27.8		19.3	24.6	
Level of Service	D	D	C	D	C	C	C	C		B	C	
Approach Delay (s)		34.5			27.3			27.5			23.8	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	55.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98		0.98		1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00		0.96	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	1770	3471		1700	3539	1557		1712		1681	1691	1509
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	1770	3471		1700	3539	1557		1712		1681	1691	1509
Volume (vph)	140	220	20	10	270	440	10	20	20	500	20	140
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	239	22	11	293	478	11	22	22	543	22	152
RTOR Reduction (vph)	0	5	0	0	0	221	0	19	0	0	0	105
Lane Group Flow (vph)	152	256	0	11	293	257	0	36	0	275	290	47
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot			Prot		pm+ov	Split			Split		Perm
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	8.6	18.3		0.9	10.6	30.0		8.7		19.4	19.4	19.4
Effective Green, g (s)	8.6	18.3		0.9	10.6	30.0		8.7		19.4	19.4	19.4
Actuated g/C Ratio	0.14	0.29		0.01	0.17	0.47		0.14		0.31	0.31	0.31
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	240	1003		24	593	738		235		515	518	462
v/s Ratio Prot	c0.09	0.07		0.01	c0.08	0.11		c0.02		0.16	c0.17	
v/s Ratio Perm						0.06						0.03
v/c Ratio	0.63	0.26		0.46	0.49	0.35		0.15		0.53	0.56	0.10
Uniform Delay, d1	25.9	17.3		31.0	23.9	10.5		24.1		18.2	18.4	15.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	5.4	0.1		13.2	0.7	0.3		0.3		1.1	1.3	0.1
Delay (s)	31.2	17.4		44.2	24.6	10.8		24.4		19.3	19.7	15.8
Level of Service	C	B		D	C	B		C		B	B	B
Approach Delay (s)		22.5			16.4			24.4			18.7	
Approach LOS		C			B			C			B	

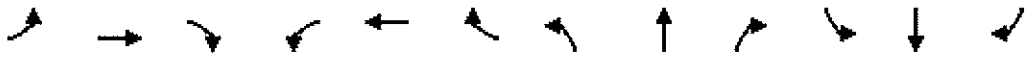
Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		0.98		1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.95	1.00
Satd. Flow (prot)	1770	3523		1770	3539	1550		1713		1681	1687	1482
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.95	1.00
Satd. Flow (perm)	1770	3523		1770	3539	1550		1713		1681	1687	1482
Volume (vph)	270	560	10	40	360	320	10	10	10	910	10	280
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	293	609	11	43	391	348	11	11	11	989	11	304
RTOR Reduction (vph)	0	1	0	0	0	147	0	10	0	0	0	193
Lane Group Flow (vph)	293	619	0	43	391	201	0	23	0	495	505	111
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot			Prot		pm+ov	Split			Split		Perm
Protected Phases	7	4		3	8	6	2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	19.7	31.7		4.8	16.8	51.1		7.2		34.3	34.3	34.3
Effective Green, g (s)	19.7	31.7		4.8	16.8	51.1		7.2		34.3	34.3	34.3
Actuated g/C Ratio	0.21	0.34		0.05	0.18	0.54		0.08		0.36	0.36	0.36
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	371	1188		90	633	843		131		613	616	541
v/s Ratio Prot	c0.17	0.18		0.02	c0.11	0.09		c0.01		0.29	c0.30	
v/s Ratio Perm						0.04						0.07
v/c Ratio	0.79	0.52		0.48	0.62	0.24		0.17		0.81	0.82	0.21
Uniform Delay, d1	35.2	25.0		43.4	35.6	11.2		40.6		26.9	27.0	20.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	10.7	0.4		4.0	1.8	0.1		0.6		7.7	8.4	0.2
Delay (s)	45.9	25.5		47.3	37.4	11.4		41.3		34.6	35.4	20.7
Level of Service	D	C		D	D	B		D		C	D	C
Approach Delay (s)		32.0			26.4			41.3			31.7	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM Average Control Delay	30.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	69.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	1.00	0.91		1.00	0.86	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.93	1.00	1.00		1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	2715	3433	3539	1473	1770	5072		1770	6408	1473
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	2715	3433	3539	1473	1770	5072		1770	6408	1473
Volume (vph)	110	310	370	150	290	130	380	860	10	150	860	110
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	337	402	163	315	141	413	935	11	163	935	120
RTOR Reduction (vph)	0	0	65	0	0	118	0	1	0	0	0	84
Lane Group Flow (vph)	120	337	337	163	315	23	413	945	0	163	935	36
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	10.5	17.2	46.6	10.2	16.9	16.9	29.4	46.6		14.4	31.6	31.6
Effective Green, g (s)	10.5	17.2	46.6	10.2	16.9	16.9	29.4	46.6		14.4	31.6	31.6
Actuated g/C Ratio	0.10	0.16	0.45	0.10	0.16	0.16	0.28	0.45		0.14	0.30	0.30
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	178	583	1316	335	573	238	498	2264		244	1940	446
v/s Ratio Prot	c0.07	c0.10	0.07	0.05	0.09		c0.23	0.19		0.09	c0.15	
v/s Ratio Perm			0.05			0.02						0.02
v/c Ratio	0.67	0.58	0.26	0.49	0.55	0.10	0.83	0.42		0.67	0.48	0.08
Uniform Delay, d1	45.3	40.3	18.1	44.6	40.2	37.2	35.1	19.7		42.7	29.7	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.7	1.4	0.1	1.1	1.1	0.2	10.9	0.6		6.8	0.9	0.4
Delay (s)	55.0	41.6	18.2	45.7	41.3	37.4	46.1	20.2		49.5	30.6	26.4
Level of Service	D	D	B	D	D	D	D	C		D	C	C
Approach Delay (s)		32.5			41.6			28.1			32.7	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM Average Control Delay	32.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	104.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.88	0.97	0.95	1.00	1.00	0.91		1.00	0.86	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.92	1.00	1.00		1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	2700	3433	3539	1462	1770	5041		1770	6408	1462
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	2700	3433	3539	1462	1770	5041		1770	6408	1462
Volume (vph)	110	280	920	320	300	120	230	760	30	130	2560	120
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	304	1000	348	326	130	250	826	33	141	2783	130
RTOR Reduction (vph)	0	0	5	0	0	111	0	3	0	0	0	52
Lane Group Flow (vph)	120	304	995	348	326	19	250	856	0	141	2783	78
Confl. Peds. (#/hr)	30		30	30		30	30		30	30		30
Turn Type	Prot		pm+ov	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.7	14.4	35.4	15.1	16.8	16.8	21.0	58.2		13.9	51.1	51.1
Effective Green, g (s)	12.7	14.4	35.4	15.1	16.8	16.8	21.0	58.2		13.9	51.1	51.1
Actuated g/C Ratio	0.11	0.12	0.30	0.13	0.14	0.14	0.18	0.49		0.12	0.43	0.43
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	191	433	905	441	506	209	316	2495		209	2784	635
v/s Ratio Prot	0.07	0.09	c0.20	c0.10	0.09		0.14	0.17		0.08	c0.43	
v/s Ratio Perm			0.17			0.01						0.05
v/c Ratio	0.63	0.70	1.10	0.79	0.64	0.09	0.79	0.34		0.67	1.00	0.12
Uniform Delay, d1	50.2	49.5	41.1	49.7	47.6	43.8	46.2	18.1		49.7	33.2	19.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.3	5.1	61.0	9.1	2.8	0.2	12.7	0.4		8.3	17.0	0.4
Delay (s)	56.5	54.6	102.1	58.8	50.4	43.9	58.9	18.4		58.0	50.2	20.3
Level of Service	E	D	F	E	D	D	E	B		E	D	C
Approach Delay (s)		88.1			53.0			27.6			49.3	
Approach LOS		F			D			C			D	

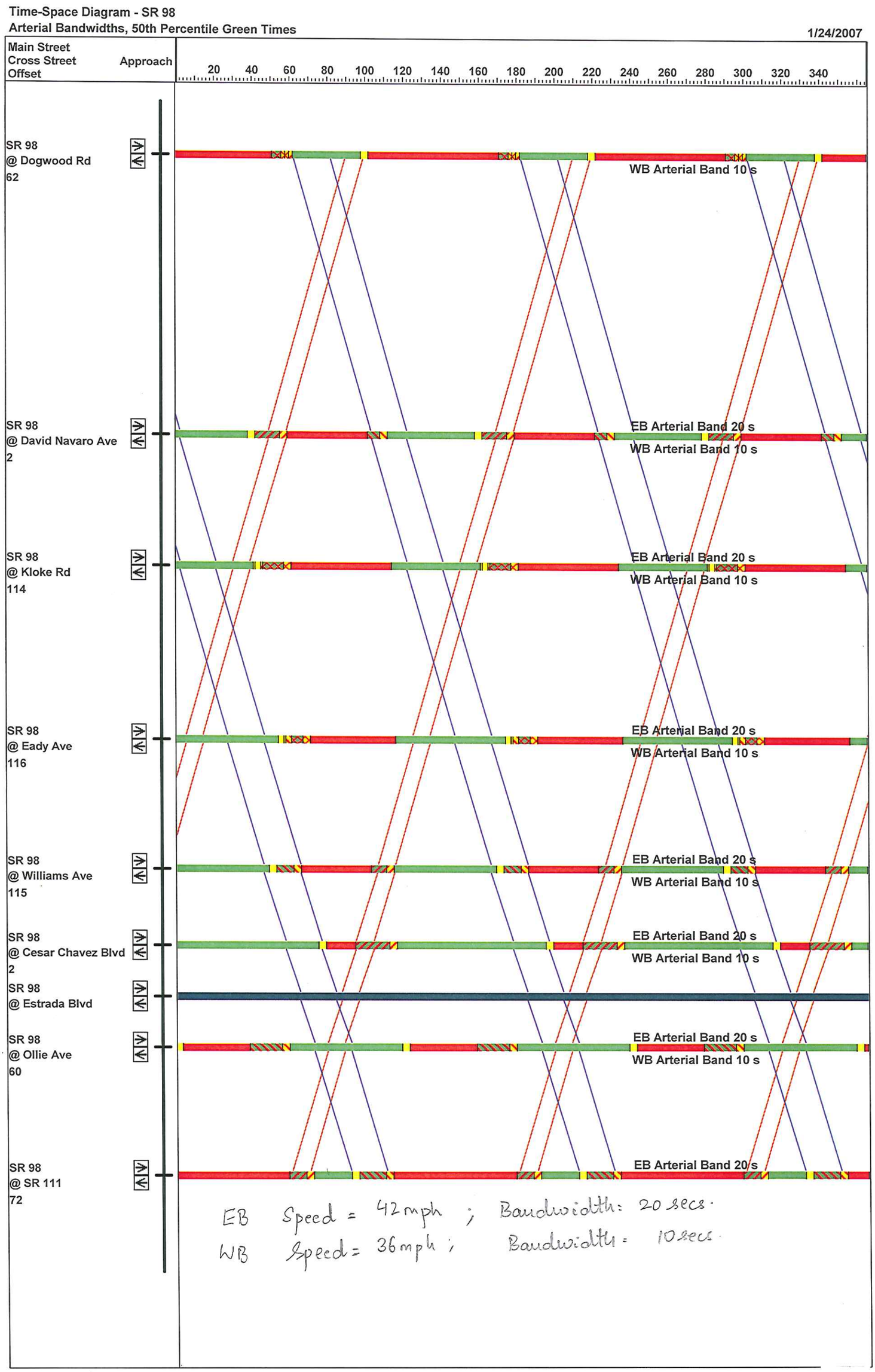
Intersection Summary			
HCM Average Control Delay	54.6	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	117.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX N

TIME SPACE DIAGRAM FOR SR 98 CORRIDOR YEAR 2035 WITH IMPROVEMENTS (WITH ANZA ROAD EXTENSION)

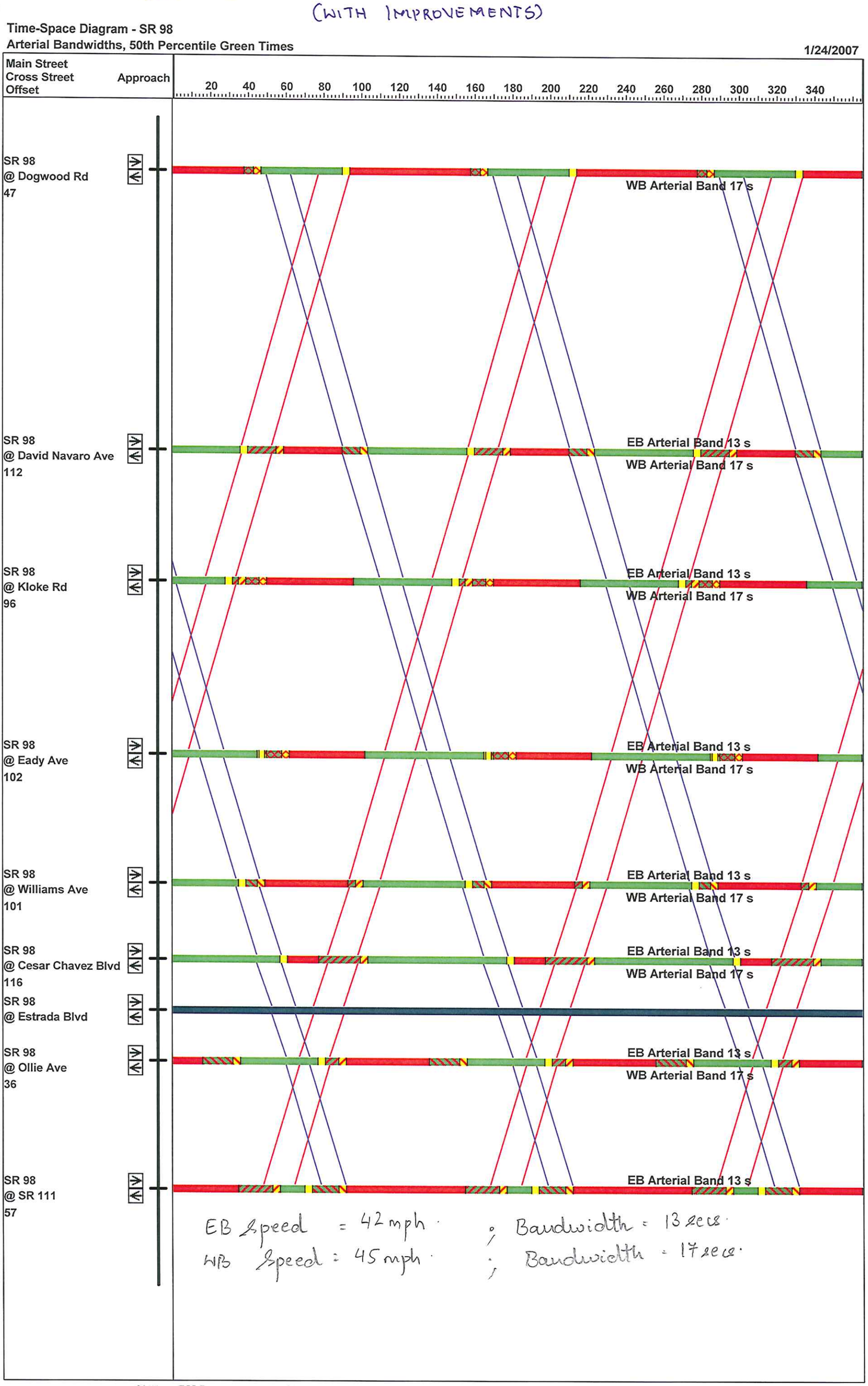
Year 2035 WITH ANZA ROAD — AM PEAK.
(WITH IMPROVEMENTS)



EB Speed = 42 mph ; Bandwidth: 20 secs.

WB Speed = 36 mph ; Bandwidth = 10 secs

Year 2035 WITH ANZA ROAD – PM PEAK
(WITH IMPROVEMENTS)



EB Speed = 42 mph ; Bandwidth = 13 secs.

WB Speed = 45 mph ; Bandwidth = 17 secs.

sai_win@dot.ca.gov ()
09/17/2008 05:03 PM

To linda_greene@dot.ca.gov
cc
bcc
Subject Ticket Request Form

Below is the result of your feedback form. It was submitted by (sai_win@dot.ca.gov) on Wednesday, September 17, 2008 at 17:03:40

User_Info: Win, Sai

Address: DO 3-333, SD, 057

Division: Design

Telephone: 619 767-2361

TITLE: Project Engineer

Location Type: Highway

List_Accidents: Include List of Accidents

EA_Number: 11-08020

FAECode: 2

MSA_Code: 180

Time_Frame: Most Recent 3 Years of Data

POSTFROM: 30.0

POSTTO: 32.5

County: IMP

Route: 98

FORMATTYPE: Table B (Accident Rate)

Comments: Our consultant is updating the accident data that we have for the project. Current data is dated from Jun 1st, 2003 to Mar 31st, 2006. Thank you.

DIRECTION: East + West Combined

Submit to TASAS: Submit to TASAS

---

sai_win@dot.ca.gov ()
09/17/2008 05:09 PM

To linda_greene@dot.ca.gov
cc
bcc
Subject Ticket Request Form

Below is the result of your feedback form. It was submitted by (sai_win@dot.ca.gov) on Wednesday, September 17, 2008 at 17:09:10

User_Info: Win, Sai

Address: DO 3-333, SD, 057

Division: Design

Telephone: 619 767-2361

TITLE: Project Engineer

Location Type: Highway

List_Accidents: Include List of Accidents

EA_Number: 11-08020

FAECode: 2

MSA_Code: 180

Time_Frame: Most Recent 3 Years of Data

POSTFROM: 32.5

POSTTO: 30.0

County: IMP

Route: 98

FORMATTYPE: Table B (Accident Rate)

Comments: Our consultant is updating the accident data that we have for the project. Current data is dated from Jun 1st, 2003 to Mar 31st, 2006. Thank you.

DIRECTION: West

Submit to TASAS: Submit to TASAS

California Department of Transportation

OTM22130

Table B - Selective Accident Rate Calculation

Policy controlling the use of Traffic Accident Surveillance and Analysis System (TASAS) - Transportation Systems Network (TSN) Reports

1. TASAS - TSN has officially replaced the TASAS - "Legacy" database.

2. Reports from TSN are to be used and interpreted by the California Department of Transportation (Caltrans) officials or authorized representative.

3. Electronic versions of these reports may be emailed between Caltrans' employees only using the State computer system.

4. The contents of these reports shall be considered confidential and may be privileged pursuant to 23 U.S.C. Section 409, and are for the sole use of the intended recipient(s). Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy all copies of the original message. Do not print, copy or forward.

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 2643785
Request Name: IMP-98 E/W 30.0-32.5
Ref Date: 09/18/2008

Request- & Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates			Override ADT		Req. Type	Com- bine?	Excl Ramp?
									Rate	Inj%	Fat%	Main	Cross			
1 1	H	T	I	11 IMP 098 030.000 - 11 IMP 098 032.500	01-DEC-04	30-NOV-07	N	L						N	N	N

Event Log:

Job id is : 370847 Accidents Table B Request IMP-98 E/W 30.0-32.5 Submitted by TBLGREE
11 IMP 098 30 - 11 IMP 098 32.5 12/01/2004 TO 11/30/2007

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	Actual F+I	Average Tot	Average Fat	Average F+I	Average Tot
11 IMP 098 030.000 - 11 IMP 098 032.499	2.500 MI H	89	0	18	18	80	0	17	0	15.8	43.32	0.000	.42	2.05	0.025	.73	1.59
0001-0001 2004-12-01 2007-11-30 *36 mo.*	NA	**H97**							31								

Accident Rates expressed as: **# of accidents / Million vehicle miles**

+ denotes that **Million Vehicles** (MV) used in accident rates instead (for intersections and ramps).

For Ramps RUS only considers R(Rural) U(Urban)

California Department of Transportation

OTM22131

Table B Accident Records

Policy controlling the use of Traffic Accident Surveillance and Analysis System (TASAS) - Transportation Systems Network (TSN) Reports

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California Department of Transportation

OTM22131

Table B Accident Records

Report Parameters:

REPORT DATE:	09/18/2008
REFERENCE DATE:	09/18/2008
SUBMITTOR:	TBLGREE
REPORT TITLE:	IMP-98 E/W 30.0-32.5
EVENT ID:	2643785

Total Accidents Retrieved

89

Table B Accident Records

REQUEST-& LINE		ARS	P P	POST MILE	P S	I F T	R L	S O H	D A Y	ACCIDENT DATE MM-DD-YY	TIME HHMM	COMMON ACCIDENT NUMBER	P C F	ENVIR COND W	L	S	R C	R W	T O C	NO MTR VEH	P T	D I R	V H I	S I	PERSON K	I	O L S P	O L O C	O L S O	O L O C	O L S O	O L O C	OA F 12	M O V	SD P 12
1	1	11 IMP 098		030.160		H	-	E	4	08-03-05	1140	962512816	6	A	A	A	H	D	G	01	A	E	1	<	00	00	V2F	---	---	---	N<	4	G<
																					U	S	-	C	00	01	V1-	---	---	---	N<	4	A<
1	1	11 IMP 098		030.510		H	-	E	6	06-09-06	0030	962517731	4	A	D	A	H	D	E	01	D	E	1	C	00	01	27H	44H	---	---	N<	C	AI
1	1	11 IMP 098		030.530		H	-	W	4	09-13-06	0750	962514839	5	A	A	A	H	D	E	01	A	W	1	C	00	01	27B	44B	---	---	N<	C	A<
1	1	11 IMP 098		031.136		I	5	E	7	04-02-05	1348	130200540	D	A	A	A	H	D	B	02	A	W	1	C	00	00	V2D	---	---	---	N<	E	A<
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1	1	11 IMP 098		031.136		I	5	E	2	05-23-05	1710	130201081	3	A	A	A	H	A	D	02	A	N	2	C	00	00	V2D	---	---	---	N<	E	A<
																					A	E	1	C	00	00	V1F	---	---	---	N<	B	A<
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1	1	11 IMP 098		031.280		H	-	E	3	01-23-07	0816	130200521	6	A	A	A	H	<	D	02	A	E	1	C	00	00	V2F	---	---	---	5<	B	A<
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1	1	11 IMP 098		031.300		H	-	E	4	01-26-05	1049	130200543	5	B	A	A	H	B	C	02	A	E	1	C	00	00	V2F	---	---	---	N<	B	A<
																					A	E	1	C	00	00	V1F	---	---	---	N<	A	A<
1	1	11 IMP 098		031.320		H	-	E	6	05-05-06	0806	130201081	5	A	A	A	<	D	C	02	A	E	1	C	00	00	V2F	---	---	---	N<	A	A<
																					D	E	1	C	00	00	V1F	---	---	---	N<	B	A<
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1	1	11 IMP 098		031.380		H	-	E	1	10-08-06	1549	130200523	6	A	A	A	H	A	A	02	A	E	1	C	00	00	V2D	---	---	---	<<	A	H<
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1	1	11 IMP 098		031.500		H	-	E	6	12-02-05	1649	130200028	5	A	B	A	H	A	C	03	A	E	1	C	00	00	V2F	---	---	---	<<	B	A<
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																					A	E	1	C	00	00	---	V2F	---	---	<<	A	A<
1	1	11 IMP 098		031.520		H	-	E	4	04-05-06	1524	130200517	5	A	A	A	H	A	C	03	A	E	1	C	00	00	V2F	---	---	---	F<	B	A<
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1	1	11 IMP 098		031.560		H	-	W	1	03-20-05	1021	130201081	D	A	A	A	D	D	C	02	A	N	1	C	00	00	V2B	---	---	---	N<	E	A<
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1	1	11 IMP 098		031.570		H	-	E	6	07-07-06	1830	130200544	5	A	A	A	H	A	C	03	D	E	1	B	00	00	V2F	---	---	---	F<	B	A<
																					A	E	1	C	00	00	V1F	V3F	---	---	N<	A	A<
																					M	E	1	<	00	00	---	V2F	---	---	N<	A	A<
1	1	11 IMP 098		031.590		H	-	E	7	09-17-05	1419	130200528	5	A	A	A	H	A	C	02	A	E	1	C	00	00	V2F	---	---	---	N<	B	A<
																					D	E	1	C	00	00	V1F	---	---	---	N<	H	A<
1	1	11 IMP 098		031.590		H	-	E	7	09-16-06	1542	130200522	5	A	A	A	H	A	C	03	D	E	1	C	00	00	V2F	---	---	---	N<	B	A<
																					D	E	1	C	00	00	V1F	V3F	---	---	N<	H	A<
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																					A	S	2	<	00	00	V1F	---	---	---	<<	B	<<
1	1	11 IMP 098		031.600		I	5	E	3	07-17-07	1756	130200541	D	A	A	A	H	A	D	02	A	E	1	C	00	01	V2D	---	---	---	G<	B	A<
																					A	N	2	C	00	01	V1D	---	---	---	G<	B	A<

Table B Accident Records

REQUEST-& LINE		ARS	P P	POST MILE	P S	I F T	R L	S O H	D A Y	ACCIDENT DATE MM-DD-YY	TIME HHMM	COMMON ACCIDENT NUMBER	P C F	ENVIR COND W	L	S	R C	R W	T O C	NO MTR VEH	P T	D I R	V H I	S I	PERSON K	I	O L S P	O S O C	L O O C	O S O C	L O O C	O S O C	L O O C	OA F 12	M O V	SD P 12
1	1	11 IMP 098		031.600		I	5	W	2	09-17-07	0941	130200037	4	A	A	A	H	D	E	01	F	S	1	<	00	00	18B	43B	---	---	<<	<	<<
1	1	11 IMP 098		031.610		H	-	E	2	12-06-04	1653	130200521	5	A	C	A	H	A	C	02	A	E	1	C	00	00	V2F	---	---	---	N<	B	A<
																					A	E	1	C	00	00	V1F	---	---	---	N<	A	A<
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																					D	E	1	C	00	00	V1F	V3F	---	---	N<	A	A<
																					A	E	1	C	00	00	---	V2F	---	---	N<	A	A<
1	1	11 IMP 098		031.610		H	-	W	3	04-25-06	1241	130200517	5	A	A	A	H	A	C	02	A	W	1	C	00	00	V2F	---	---	---	N<	H	A<
																					A	W	1	C	00	01	V1F	18H	---	---	S<	H	A<
1	1	11 IMP 098		031.660		H	-	W	3	05-17-05	1318	130201081	5	A	A	A	H	A	C	02	A	W	1	C	00	00	V2F	---	---	---	N<	B	A<
																					A	W	1	C	00	00	V1F	---	---	---	N<	H	A<
1	1	11 IMP 098		031.743		I	5	W	7	11-18-06	1706	130200546	5	A	C	A	H	A	C	02	A	W	1	C	00	00	V2F	---	---	---	N<	B	A<
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1	1	11 IMP 098		031.743		I	5	E	6	06-08-07	1457	130200531	5	A	A	A	H	A	C	02	A	W	1	C	00	00	V2F	---	---	---	N<	B	A<
																					A	W	1	C	00	00	V1F	---	---	---	N<	A	A<
1	1	11 IMP 098		031.750		H	-	W	2	09-12-05	1330	130201081	5	A	A	A	H	D	C	02	D	W	1	C	00	00	V2F	---	---	---	N<	B	A<
																					D	W	1	C	00	00	V1F	---	---	---	N<	E	A<
1	1	11 IMP 098		031.750		H	-	W	5	10-06-05	1926	130200512	5	A	A	A	H	D	C	02	A	W	1	C	00	00	V2F	---	---	---	N<	B	A<
																					A	W	1	C	00	02	V1F	---	---	---	N<	H	A<
1	1	11 IMP 098		031.760		H	-	E	4	11-16-05	1235	130200154	5	A	A	A	H	D	C	02	A	E	1	C	00	00	V2F	---	---	---	N<	B	A<
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1	1	11 IMP 098		031.790		H	-	E	7	03-19-05	1648	130200154	5	A	A	A	H	D	C	02	A	W	1	C	00	01	V2F	---	---	---	N<	B	G<
																					A	W	1	C	00	01	V1F	---	---	---	N<	E	G<
1	1	11 IMP 098		031.790		H	-	E	2	07-23-07	0807	130200537	6	A	C	A	A	A	F	01	A	E	1	C	00	01	44H	26H	---	---	FN	B	B<
1	1	11 IMP 098		031.800		I	5	E	2	01-02-06	1504	130200533	3	A	A	A	H	A	B	02	D	N	2	C	00	00	V2F	---	---	---	N<	L	A<
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1	1	11 IMP 098		031.810		H	-	W	4	01-19-05	1052	130201081	5	A	A	A	H	D	C	02	D	W	1	C	00	00	V2F	---	---	---	G<	B	A<
																					A	W	1	C	00	00	V1F	---	---	---	G<	H	A<
1	1	11 IMP 098		031.810		H	-	W	6	08-04-06	1717	130200047	5	A	A	A	H	A	C	03	A	W	1	C	00	00	---	V2F	---	---	M<	A	A<
																					A	W	1	C	00	01	V3F	V1F	---	---	N<	A	A<
																					A	W	1	C	00	00	V2F	---	---	---	5<	B	A<
1	1	11 IMP 098		031.810		H	-	W	5	10-18-07	1225	130200544	5	A	A	A	H	A	B	02	A	W	1	C	00	00	V2F	---	---	---	F<	B	A<
																					A	W	1	C	00	00	V1J	---	---	---	N<	A	A<
1	1	11 IMP 098		031.910		H	-	E	7	04-09-05	1423	130200544	5	A	A	A	H	D	C	02	A	E	1	C	00	00	V2F	---	---	---	5<	B	A<
																					D	E	1	C	00	00	V1F	---	---	---	<<	A	A<
1	1	11 IMP 098		031.920		I	5	E	1	12-12-04	1118	130200512	5	A	A	A	H	D	C	02	A	E	1	C	00	00	V2F	---	---	---	N<	B	A<
																					D	E	1	C	00	00	V1F	---	---	---	N<	H	A<
1	1	11 IMP 098		031.920		I	5	E	4	08-23-06	1059	130200547	6	A	A	A	G	A	B	02	A	E	1	C	00	00	V2G	---	---	---	G<	D	A<
																					I	E	1	C	00	00	V1F	---	---	---	G<	D	A<
1	1	11 IMP 098		031.920		I	5	E	4	04-18-07	2101	130200042	6	A	C	A	H	A	D	02	A	N	2	C	00	01	V2F	---	---	---	3N	D	A<
																					D	E	1	C	00	00	V1F	---	---	---	N<	B	A<
1	1	11 IMP 098		031.930		H	-	E	6	05-13-05	1459	130201081	5	A	A	A	H	D	C	02	A	E	1	C	00	00	V2F	---	---	---	N<	B	A<
																					A	E	1	C	00	00	V1F	---	---	---	N<	A	A<
1	1	11 IMP 098		031.930		H	-	E	3	11-01-05	1445	130201081	5	A	A	A	H	A	C	02	D	E	1	C	00	00	V2F	---	---	---	N<	B	A<
																					A	E	1	C	00	00	V1F	---	---	---	N<	A	A<
1	1	11 IMP 098		031.930		H	-	E	1	12-18-05	1214	130200515	5	A	A	A	H	D	C	02	A	E	1	C	00	00	V2F	---	---	---	<<	B	A<
																					A	E	1	C	00	00	V1F	---	---	---	<<	B	A<

Table B Accident Records

REQUEST-& LINE		ARS	P P	POST MILE	P S	F T	I R L	S O H	D A Y	ACCIDENT DATE MM-DD-YY	TIME HHMM	COMMON ACCIDENT NUMBER	P C F	ENVIR COND W	L	S	R C	R W C	T O C	NO MTR VEH	P T	D I R	V H I	S I	PERSON K	I	O L S P	O S O C	L O C	O S O C	L O C	O S O C	L O C	OA F 12	M O V	SD P 12
1	1	11 IMP 098		031.930		H	-	E	4	12-20-06	1126	130200521	5	A	A	A	H	<	C	03	D	E	1	C	00	00	V2F	---	---	---	6<	B	A<
																					A	E	1	C	00	00	V1F	V3F	---	---	N<	H	A<
																					A	E	1	C	00	00	---	V2F	---	---	N<	H	A<
1	1	11 IMP 098		031.930		H	-	E	3	02-27-07	0806	130200516	C	A	A	A	H	A	E	01	A	E	1	B	00	00	41F	---	---	---	N<	B	A<
1	1	11 IMP 098		031.940		H	-	E	5	03-09-06	1533	130200528	5	A	A	A	H	A	C	05	D	E	1	C	00	00	V2F	---	---	---	F<	H	A<
																					A	E	1	C	00	01	V1F	V3F	---	---	N<	H	A<
																					A	E	1	C	00	00	---	V2F	V4F	---	N<	H	A<
																					A	E	1	C	00	01	---	V3F	V5F	---	N<	A	A<
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1	1	11 IMP 098		031.940		H	-	E	5	08-31-06	0802	130200541	5	A	A	A	H	D	C	03	A	E	1	C	00	00	V2F	---	---	---	N<	H	A<
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1	1	11 IMP 098		031.950		H	-	E	3	10-18-05	2157	130200544	6	A	C	A	H	D	G	01	U	S	-	<	00	01	V2-	---	---	---	6N	4	C<
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																					A	E	1	C	00	00	V1F	---	---	---	N<	B	A<
1	1	11 IMP 098		032.090		H	-	W	3	01-17-06	0823	130200517	5	A	A	A	H	A	C	02	A	W	1	C	00	00	V2F	---	---	---	N<	B	A<
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1	1	11 IMP 098		032.090		H	-	E	7	02-24-07	1855	130200511	6	A	C	A	H	A	C	02	A	E	1	C	00	00	V2F	---	---	---	6<	B	A<
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1	1	11 IMP 098		032.100		H	-	E	2	05-22-06	1614	130200540	C	A	A	A	H	A	C	03	A	E	1	C	00	01	V2F	10H	---	---	N<	B	A<
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1	1	11 IMP 098		032.102		I	5	W	4	10-11-06	1242	130200517	3	A	A	A	H	A	D	02	D	N	2	C	00	00	V2A	---	---	---	3<	E	A<
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1	1	11 IMP 098		032.110		H	-	W	4	12-08-04	0940	130201081	4	<	A	<	<	<	<	02	A	W	1	C	00	00	V2F	---	---	---	N<	J	A<
																					F	W	1	<	00	00	V1D	---	---	---	<<	<	<<
1	1	11 IMP 098		032.110		H	-	E	2	04-10-06	1658	130200536	5	A	A	A	H	A	C	03	A	W	1	C	00	00	V2D	---	---	---	N<	B	C<
																					D	W	1	C	00	00	V1D	---	---	---	N<	A	C<
																					A	W	1	C	00	00	---	---	---	---	N<	A	C<
1	1	11 IMP 098		032.110		H	-	W	4	08-02-06	1222	130200047	5	A	A	A	G	A	C	02	A	W	1	C	00	00	V2F	---	---	---	G<	B	H<
																					A	W	1	C	00	00	V1F	---	---	---	<<	A	H<
1	1	11 IMP 098		032.110		H	-	W	3	06-19-07	1340	130200523	5	A	A	A	H	A	C	02	A	E	1	<	00	00	V2F	---	---	---	F<	B	A<
																					D	E	1	<	00	00	V1F	---	---	---	N<	A	A<
1	1	11 IMP 098		032.160		H	-	W	5	03-10-05	1621	130200528	3	A	A	A	H	A	D	02	A	S	1	C	00	00	V2D	---	---	---	N<	L	A<
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1	1	11 IMP 098		032.172		I	5	E	6	12-08-06	1929	130200531	6	A	C	A	H	A	A	02	A	W	1	C	00	00	18B	V2A	---	---	JN	N	A<
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1	1	11 IMP 098		032.230		H	-	E	4	05-24-06	1137	130201081	6	A	A	A	H	D	C	02	A	E	1	C	00	01	V2F	---	---	---	N<	L	A<
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1	1	11 IMP 098		032.244		I	5	E	6	02-11-05	1537	130200528	3	A	B	A	H	A	D	02	A	N	2	C	00	00	V2F	---	---	---	N<	L	A<
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1	1	11 IMP 098		032.260		H	-	E	6	03-25-05	1658	130201081	6	A	A	A	H	D	B	02	A	E	1	C	00	00	V2F	---	---	---	N<	J	A<
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Table B Accident Records

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Table B Accident Records

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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REGISTERED CIVIL ENGINEER — DATE 02/21/06

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — JASON W. LEMONS — No. C66224 — Exp 6/30/06 — CIVIL — STATE OF CALIFORNIA

Dokken Engineering
5675 Ruffin Road
Suite 250
San Diego, CA 92123

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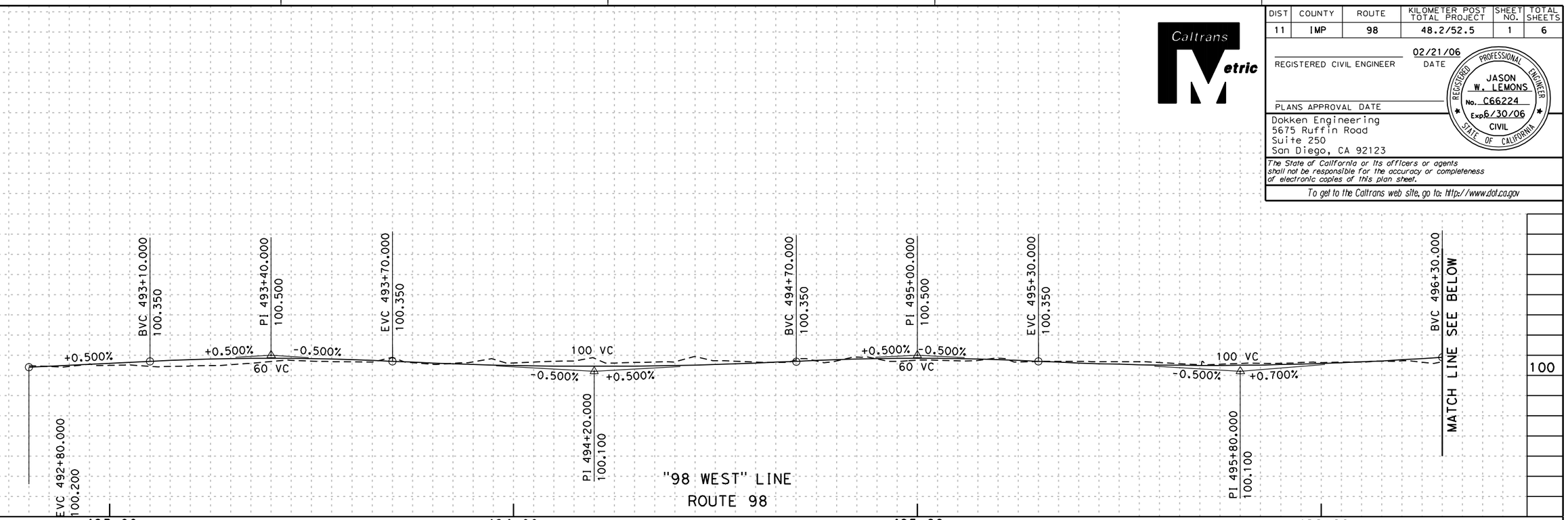

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02/21/06
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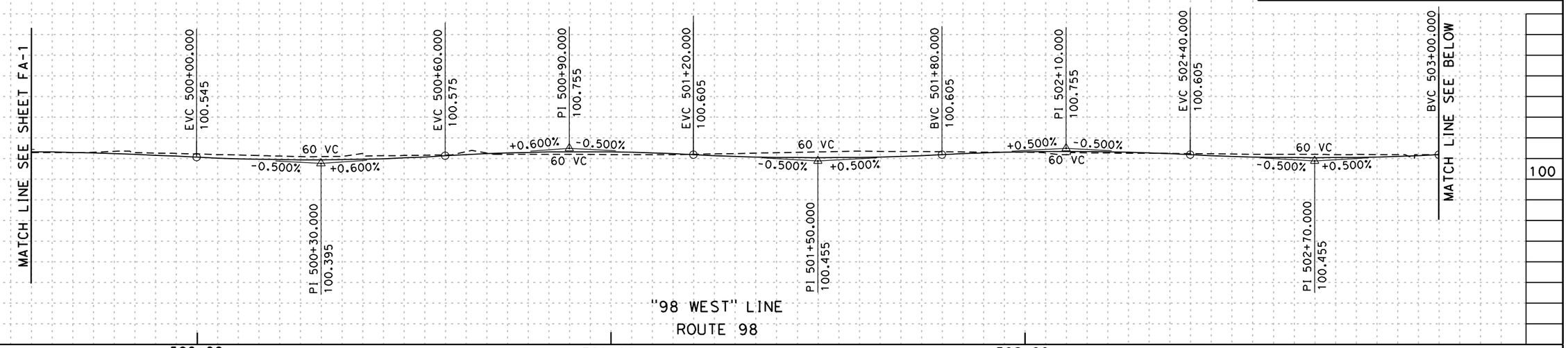

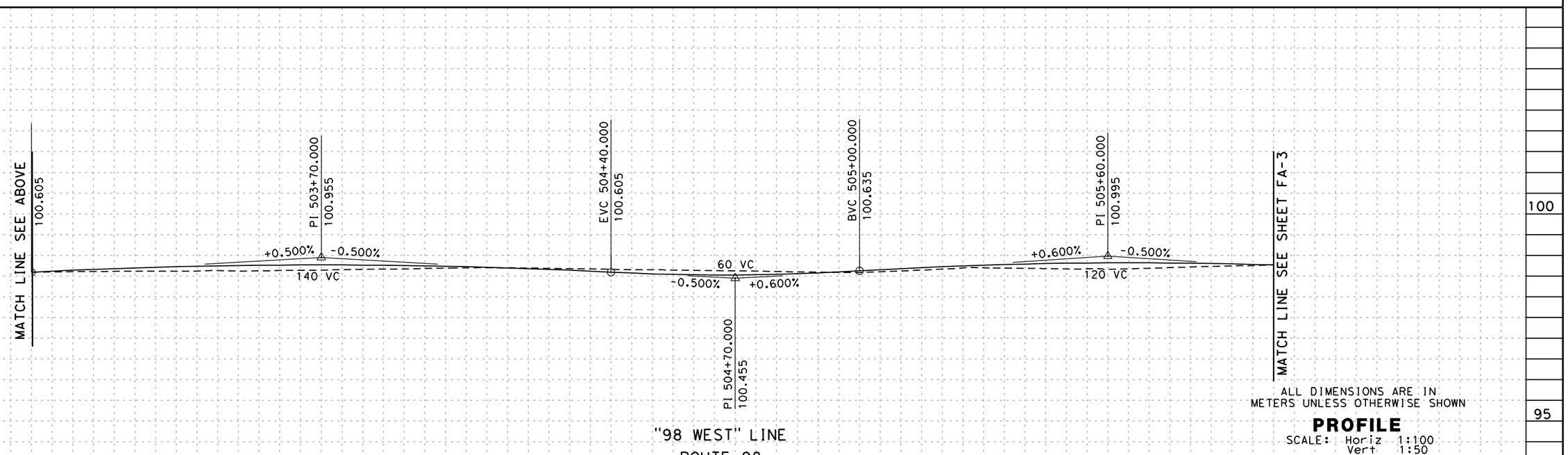

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Suite 250
San Diego, CA 92123

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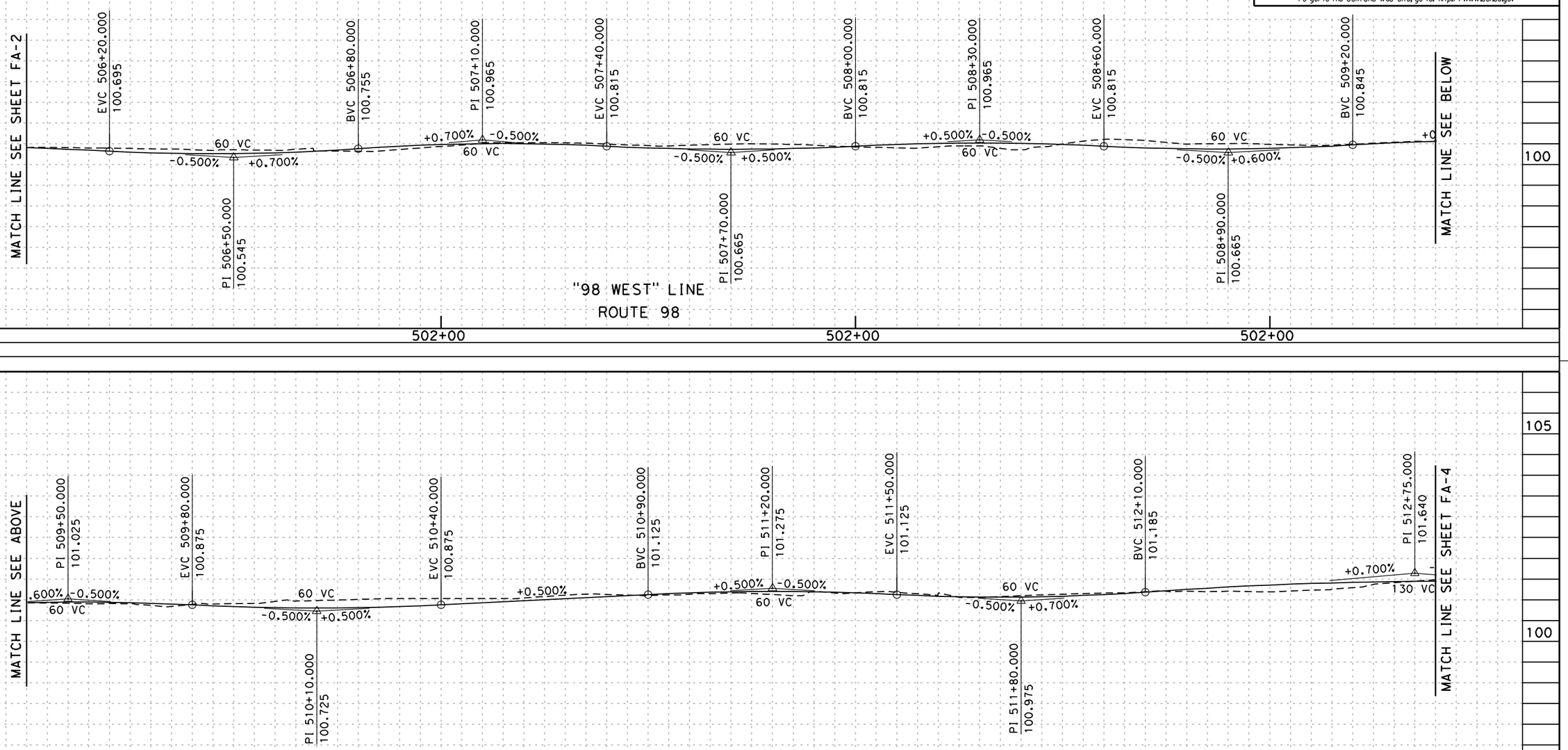

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REGISTERED CIVIL ENGINEER — DATE 02/21/06

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No. C66224
Exp 6/30/06
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

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Suite 250
San Diego, CA 92123

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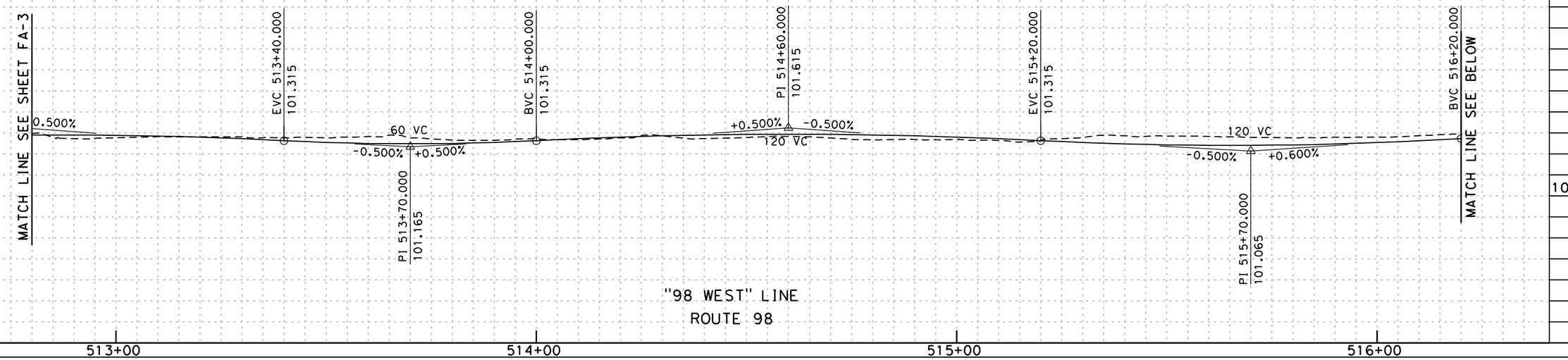

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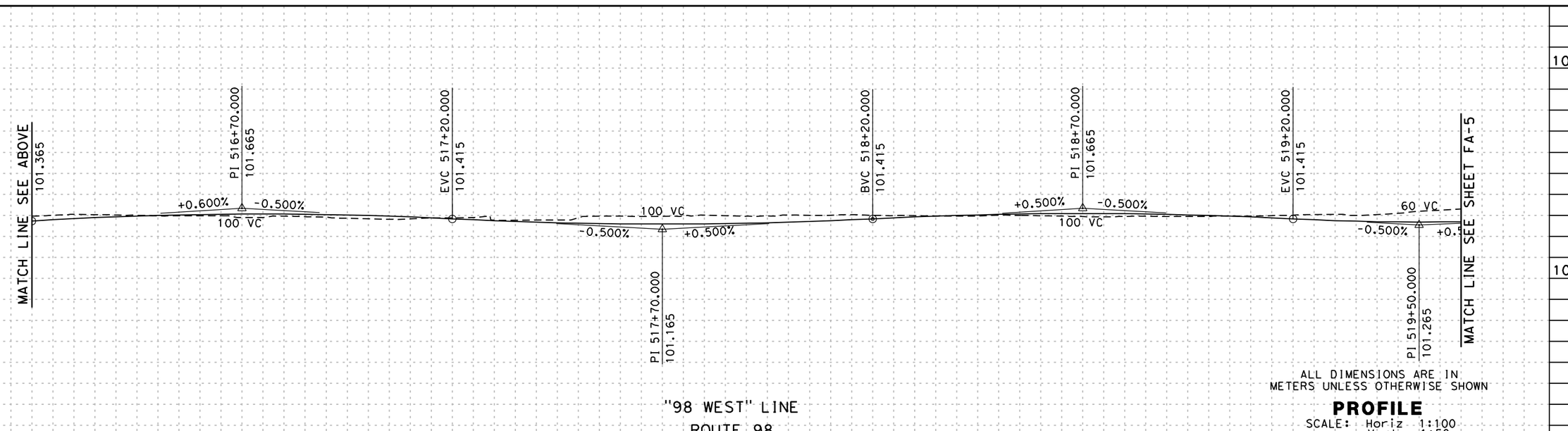
ROUTE 98



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ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

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K. MAMDANI

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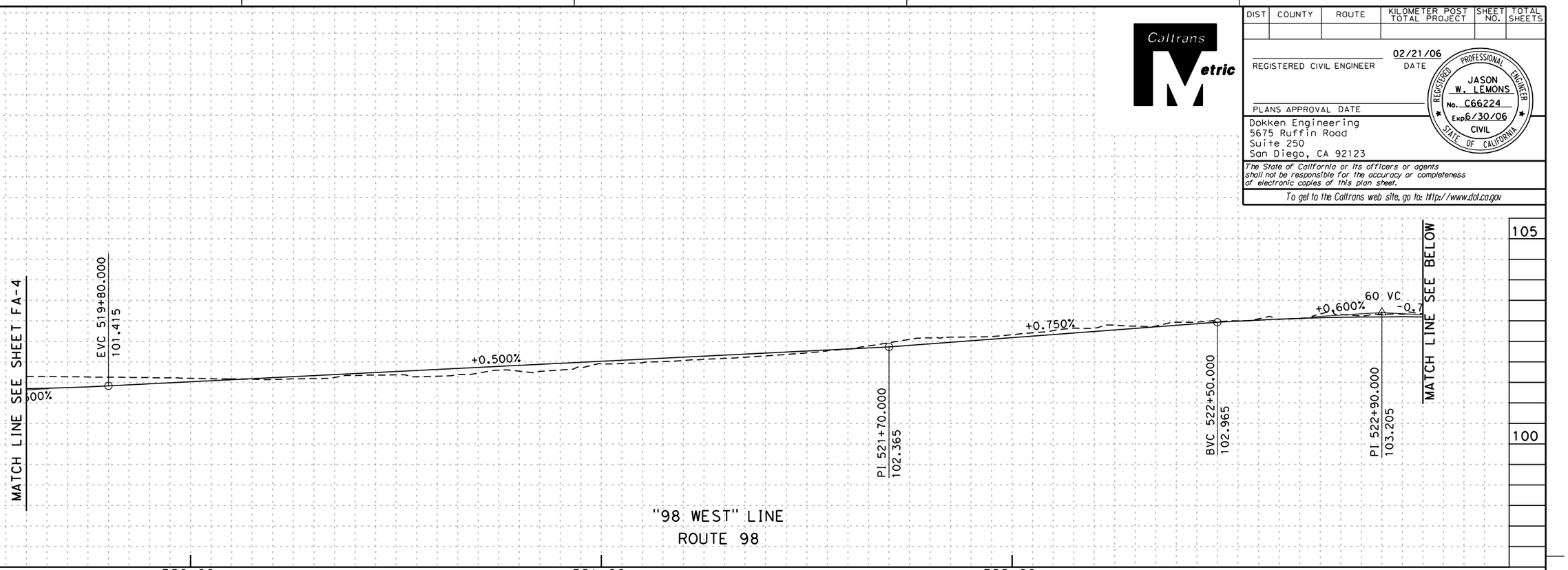

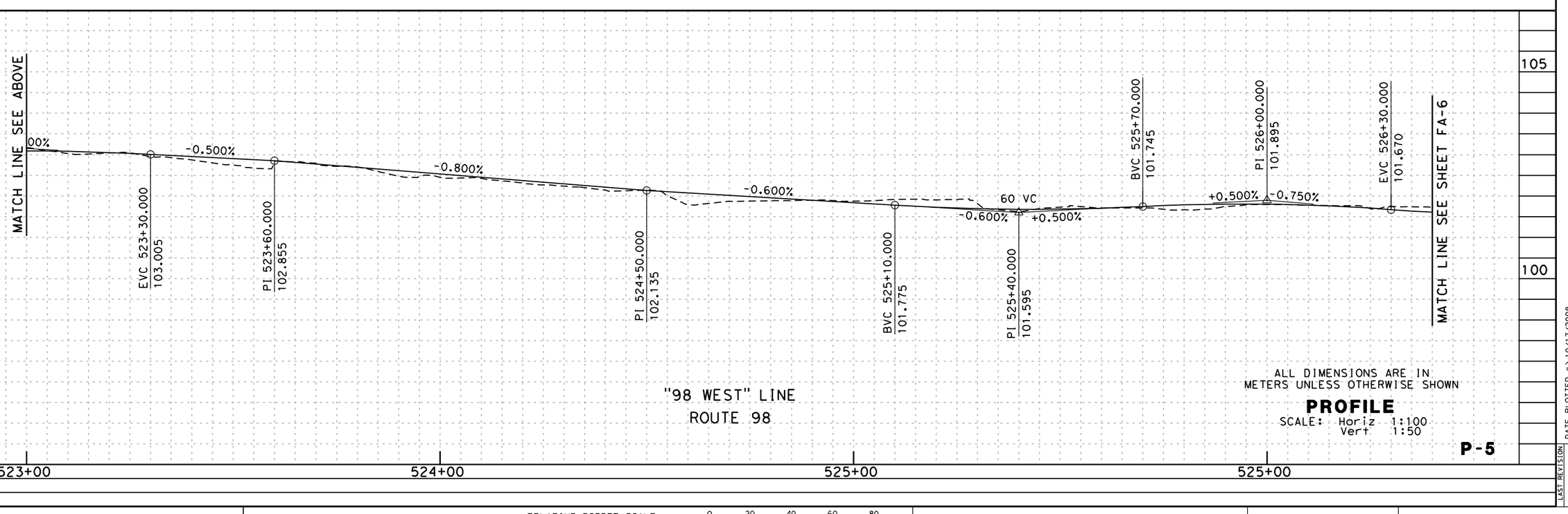

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER — 02/21/06 DATE

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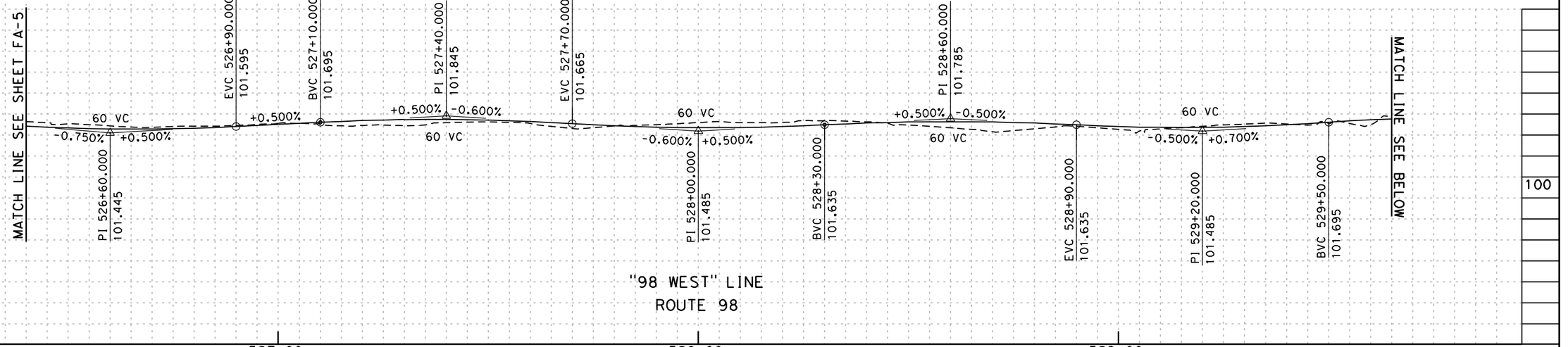

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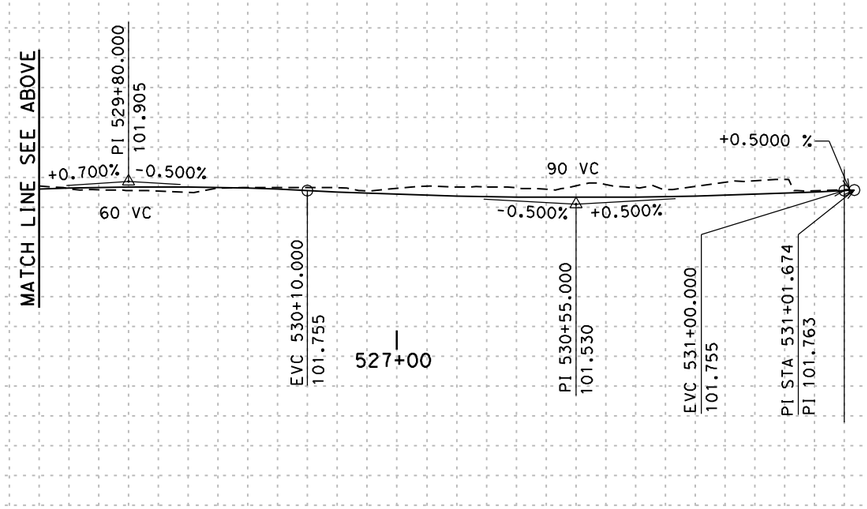
ROUTE 98



"98 WEST" LINE
ROUTE 98

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11-IMP-98
KP 48.2/52.5
(PM 30.0/32.6)
EA 080200

State Route 98
Preliminary Drainage Study

Prepared For:
Caltrans District 11
4050 Taylor Street
San Diego, CA 92110

Performed By:
Dokken Engineering
5675 Ruffin Road, Suite 250
San Diego, CA 92123
(858) 514-8377

June 2008

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APPENDIX C - Preliminary Drainage Exhibit

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Imperial Irrigation District Drain Standard Plans

1.0 EXECUTIVE SUMMARY

This preliminary drainage report investigates the existing drainage conditions of State Route 98 (SR-98) from KP 48.2 to KP 52.5 and the modifications required to correlate with the Build Alternative proposed in the Project Report. The California Department of Transportation (Caltrans) in cooperation with the City of Calexico (City) propose to improve traffic operations, increase bicycle and pedestrian safety, and enhance drainage performance on SR-98 from 0.35 kilometers west of Dogwood Road to Rockwood Avenue. Existing contours were utilized to develop drainage basin areas and the Caltrans Intensity Duration Frequency (IDF) program provided rainfall intensities for 25-year and 100-year storm events. The IDF curves and formulas obtained from the program are included as Figures 2 and 3. Schematics illustrating the existing drainage system and the delineated drainage areas for both existing and proposed conditions are included with this document in Appendix A. In addition, preliminary flow rates for existing and proposed conditions and preliminary schematics of proposed facilities are included in Appendix B and C, respectively. Improvements include widening the SR-98 from two to four lanes from Dogwood Road to just west of Ollie Avenue, and from four to six lanes from Ollie Avenue to State Route 111 (SR-111). The preferred drainage alternative proposes to detain and slowly release as much storm water as feasible by using a combination of detention basins, curb inlets, curb outlets, as well as a pump station located east of Kloke Road on the north side of SR-98.

2.0 PROJECT LOCATION AND VICINITY MAP

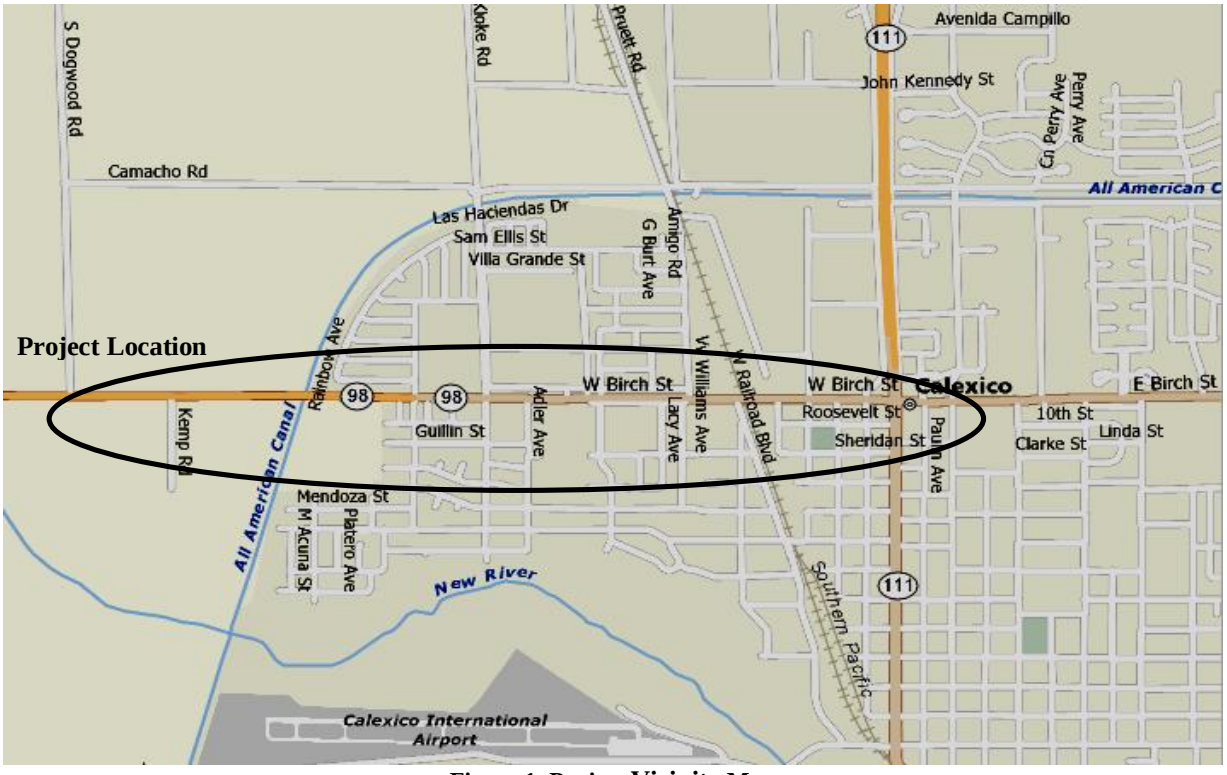

Figure 1: Project Vicinity Map

3.0 HYDROLOGY

Throughout SR-98, roadway runoff typically sheet flows off of the highway and out of state right of way. The overall drainage pattern throughout the site is from the northeast to the southwest. The project watershed is divided into three subareas: west of the All American Canal, east of the All American Canal to the Union Pacific Railroad (UPRR), and east of the UPRR.

The terrain west of the All American Canal is primarily rural housing and agricultural fields. The northern boundary of the watersheds consists of elevated Imperial Irrigation District (IID) agriculture water supply canals. The southern boundaries consist of earthen berms and graded drainage ditches to direct and capture the sheet flow. The landscape of the region between the All American Canal and the UPRR is residential with a series of graded earth drainage ditches on the southern side of SR-98. The land type east of the UPRR is more developed residential and commercial area, with curbs and gutters.

The typical drainage pattern along the studied segment consists of sheet flow off of SR-98 onto the surrounding terrain where runoff drains to local low points and infiltrates back into the ground or evaporates over time, often in non-state right of way. Rainfall from the north side of SR-98 is largely contained by a variety of earthen berms which are used for irrigation, noise abatement and partitions for housing developments. These berms maintain separation from offsite runoff to the north and roadway runoff from SR-98. Rainfall from the south either flows overland in a southern direction or infiltrates into local low points. A minimal amount of offsite runoff from the south drains toward SR-98. The quantity of rainfall that was considered in the design of proposed drainage facilities for this segment of roadway primarily consisted of the rainfall that falls directly on SR-98 and not offsite runoff, since little drains into the project site.

The following hydrologic criteria apply to the drainage system within the project vicinity:

Design Frequency – District 11 policy is to consider the 100-year storm for onsite hydrology in the desert. The 100-year 24hr design storm was used for this drainage design.

Time of Concentration – The existing watershed flow patterns consist mainly of sheet flow off the existing pavement to offsite low points adjacent to the roadway where the storm water ponds. The existing times of concentration would be less than the recommended minimum time of concentration of 5 minutes. The contributing watershed of the proposed drainage area is primarily composed of paved areas. Therefore, the recommended minimum time of concentration of 5 minutes was used for both the existing and proposed hydrology calculations.

Rainfall Intensity – the project is approximately located at the following latitude/longitude: 32°46’01” N / 115°34'01" W. The El Centro 2 SSW gauging station, located approximately 6.5 miles northwest of the project, was utilized to determine the appropriate IDF curves for the 25-year and 100-year storm events. The existing and proposed drainage calculations used a minimum time of concentration of 5 minutes to calculate the peak discharge. The curves and corresponding formulas are included in Figures 2 and 3.

Runoff Coefficient – The project's watershed area is comprised of asphalt pavement, concrete driveways and sidewalks, and bare earth surfaces. The Runoff Coefficient for both existing and proposed conditions was based on a 100% impervious surface (C = 1.00).

Peak Discharge – the Rational Method was utilized to estimate the peak discharge, Q, for all design flows since all drainage areas are substantially smaller than 130 hectares. According to the Caltrans Highway Design Manual, the Rational Method incorporates the following formula:

$$Q = 0.28CiA$$

Q = design discharge (cubic meters per second)
C = coefficient of runoff
i = rainfall intensity (millimeters per hour) for the selected frequency and for a duration equal to the time of concentration per the Caltrans's IDF program.
A = drainage area (square kilometers)

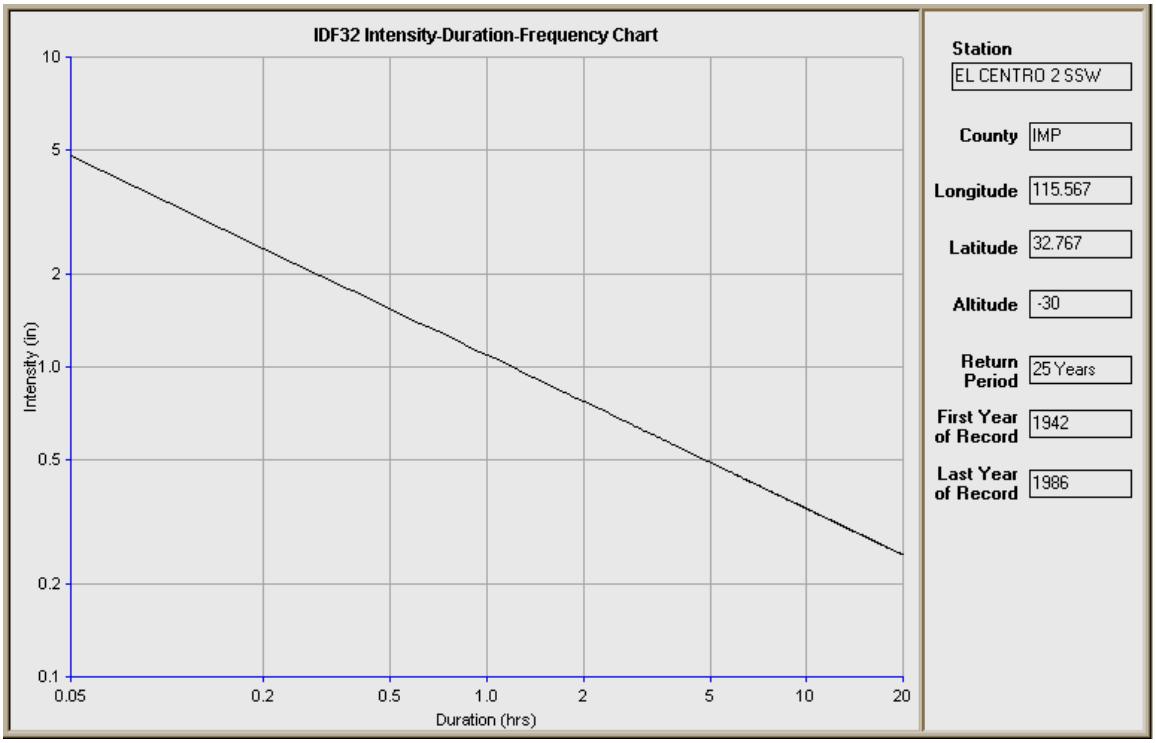

Figure 2: 25-YEAR STORM IDF CURVE
$I(5,25)= 1.09(5/60)^{-0.495}= 3.729$ in/hr = 94.717 mm/hr

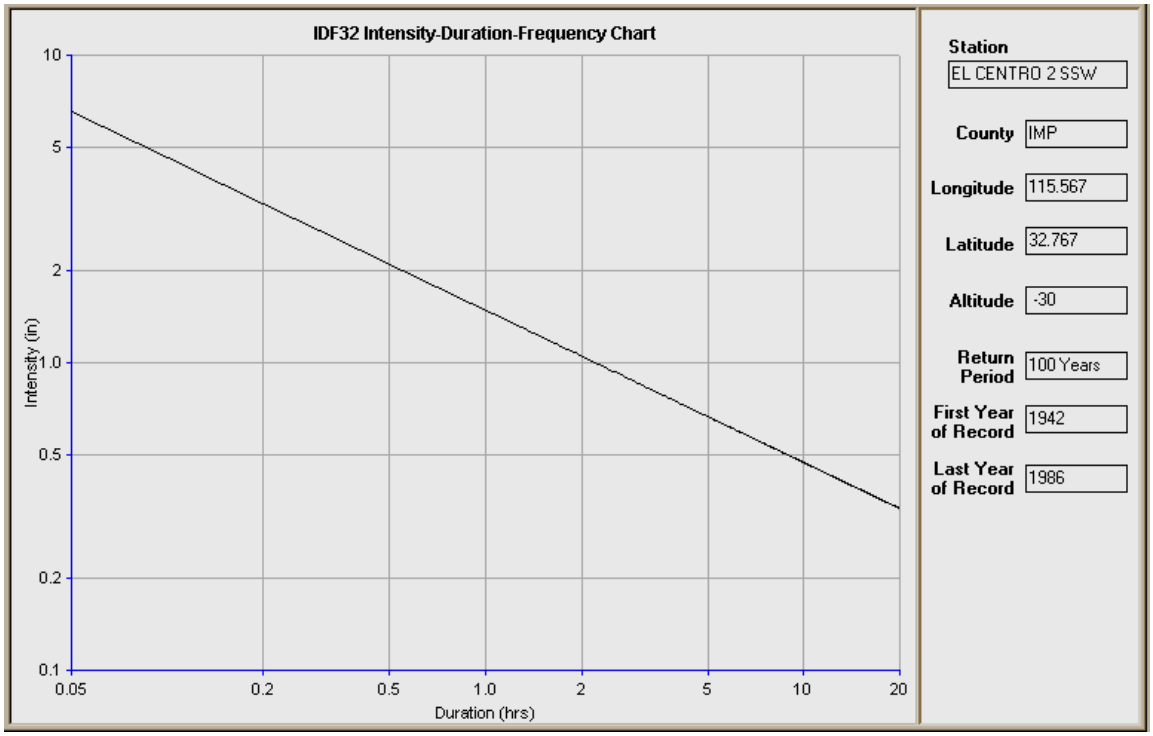

Figure 3: 100-YEAR STORM IDF CURVE
$I(5,100) = 1.48(5/60)^{-0.495} = 5.064$ in/hr = 128.626 mm/hr

4.0 EXISTING DRAINAGE SYSTEM

From as-built research and field visits, the existing storm drain systems located within the project vicinity include: a 450 mm (18 inch) CMP at the Kloke Road/SR-98 intersection, four grate inlets at the SR-98/SR-111 intersection that drain south to a 600 mm (24 inch) CMP, the All American Canal Drains #9 and #10 which parallel the All American Canal, broken sections of road side ditches running parallel along SR-98, and miscellaneous curb outlets which discharge to adjacent properties.

Approximately 55 meters west of the All American Canal on the north side of SR-98, a drainage inlet and slotted drain collect water and convey it south by means of a cross culvert. The culvert discharges stormwater into the All American Canal Drain #9.

The landscape of the region between the All American Canal and the UPRR is residential with a series of graded earth drainage ditches on the southern side. The ditches run parallel to SR-98 from approximately 90 meters east of Kloke Road to Lee Road. The storm water collected in these ditches drains to a 450 mm (18 inch) CMP which travels south down Kloke Road. The northern boundary of the watershed consists of embankments and sidewalks. Today, two curb inlets are in place on both sides of SR-98, directly east of Kloke Road.

The land type for the location east of the UPRR is also residential with two methods of storm water removal. The first method consists of curb outlets passing beneath the sidewalks and

discharging the water into nearby vacant fields. There are two curb outlets located approximately 95 meters east of the UPRR and 30 meters west of the United State Post Office on the north side of SR-98; however, both outlets were noted to be clogged with dirt and debris at the time of inspection. The second method of storm water drainage is a series of curb inlets located at the intersection of SR-98 and SR-111, which drain the water south to a 600 mm (24inch) CMP.

The Preliminary Drainage Design Exhibit, included in Appendix C, identifies the existing inlet locations and cross culverts. Table A in Appendix B provides the preliminary watershed calculations associated with the existing conditions.

5.0 PROPOSED DRAINAGE SYSTEM

Existing drainage issues for this project are as follows:

- Flat terrain.
- Existing drainage systems are spaced far apart.
- Existing drainage patterns create ponds of standing water.
- Proposed roadway improvements increase the impervious drainage area by approximately 0.716 hectares.

The major components of the proposed drainage system include: curb outlets, curb inlets, cross culverts, detention basins, and a pump station to manage the stormwater runoff along this section of SR-98. The curb outlets would include downstream erosion protection to prevent any damage to adjacent properties. The cross culverts and the connecting culverts between detention basins are proposed at a 0.3% minimum slope. This grade is required for Detention Basins A, B, C, and D to be able to drain under gravity flow to the All American Canal Drains. In addition, the flat slope is required to reduce the depth of the invert elevation for the pump station wet well. A 600 mm RCP with a 0.3% slope flowing half full, would typically have a velocity of 1.2 m/s (see Appendix D for calculation worksheet). This exceeds the Caltrans Highway Design Manual required self cleaning velocity of 1.0 m/s when flowing half full. The detention basins would have appropriate outlets so that they drain within 48 hours to avoid any possible vector issues. The pump station would be outfitted with a double float switch, so that the pumping would not overload the downstream receiving system.

The cross culverts connecting the curb inlets to the detention basins were analyzed using Bentley CulvertMaster software to study if there would be any backwater effect from the tailwater in the basins or the minimum 0.3% proposed culvert slopes (see Appendix D CulvertMaster Worksheets for 0.6 m RCP Cross Culverts). The tailwater elevation in the detention basins would not affect the ability of the curb inlets to accept stormwater drainage from the roadway during the 100-yr 24-hr storm.

West of Dogwood Road, the stormwater runoff would be unchanged from the existing condition, and would continue to sheet flow onto the adjacent properties. Between Dogwood Road and the All American Canal, the roadway runoff is proposed to be collected by curb and gutter and drain

through curb inlets into detention basins A and B. Detention basins A and B are interconnected and would discharge to the All American Canal Drain #9 through a flap gate (see Appendix D Imperial Irrigation District standard plans).

Four detention basins are proposed between the All American Canal and the UPRR. The stormwater would be collected by curb and gutter and drained through curb inlets into the detention basins. Detention Basins C and D are interconnected and would drain to the All American Canal Drain #10 through a flap gate. Detention Basins E and F are interconnected and would be drained via the proposed pump station to the existing 450 mm (18 inch) CMP at Kloke Road. The pump station would be located north of SR-98 at the west end of basin E.

Between the UPRR and Olive Avenue, two curb outlets would allow the stormwater pattern to be unchanged from the existing drainage condition and discharge to empty fields north of SR-98. East of Olive Avenue, proposed curb inlets would drain the stormwater to an existing 600 mm (24 inch) CMP, located south of the SR-98/ SR-111 intersection.

Detention Basins - A detention basin is used to temporarily store or detain excess stormwater runoff and then release it at a regulated rate to downstream areas. They also provide water quality treatment for low flow events and during the detention of larger storm events.

The proposed drainage improvements include a series of six detention basins that would collect roadway runoff and drain to either the All American Canal Drains #9 and #10 or be pumped to the existing 450 mm (18 inch) CMP at the intersection of Kloke Road and SR-98. The six detention basins are split into three pairs which are connected in-line. The total storage between two basins is allowed to equalize between them. A minimum freeboard of 9 inches is provided in the detention basins when detaining the entire volume of the 100-yr 24-hr storm event. The elongated basins have been positioned to meet right of way restrictions and fit into dedicated easements provided by local developments. In addition, the basins are designed with 1:2 side slopes, and bottom widths ranging from 2.5 meters (8 feet) to 10.2 meters (33 feet) wide. The Caltrans project development team directed that the detention basins would be concrete lined and the inverts would be lined with permeable concrete.

Groundwater was encountered in the geotechnical boring at a depth of about 5 meters (16.4 feet) below the ground surface. The groundwater level can be expected to vary depending on local irrigation, rainfall, and runoff. However, per Appendix B.3.6.1 of the Caltrans Storm Water Quality Handbook: Project Planning and Design Guide, the invert depth should be 3 meters above the groundwater elevation, which is within the requirement.

Additional discussions of risks are provided in Attachment I of the State Route 98 West Widening Project Report, dated October 2008.

6.0 PUMP STATION

Stormwater pump stations are designed to provide protection from flooding of properties and transportation routes. In Southern California, they operate infrequently usually during the rainy period from late November to mid March.

The proposed design includes two submersible main stormwater pumps. The pumps would be located in a wet well with access hatches at the western end of Detention Basin E (see Appendix C for the Preliminary Drainage Exhibit). The discharge pipe manifold and check valves would be located in a below grade vault located adjacent to the wet well with hatches over major equipment and valves. The electric service, motor control center and other electrical/control systems would be housed in an appropriate exterior enclosure adjacent to the wet well at grade.

The pump well would have an invert elevation approximately 3.8 meters (12.5 feet) deep. The invert of the well would be above the groundwater table present during the geotechnical borings. In addition the station would contain a smaller pump that could be utilized to pump nuisance flows.

The pump station would contain one duty and one standby main stormwater pump. If one pump is removed for service the remaining pump would replace it in duty. Each main stormwater pump would be able to discharge between 1 cfs and 2 cfs, depending on the water in the wet well and in the receiving 450 mm (18 inch) CMP at Kloke Road. This would assure Detention Basin E and F could be drained within 48 hours. The smaller pump would handle nuisance flows.

7.0 REJECTED DRAINAGE ALTERNATIVES

The preferred alternative proposed in this drainage report, resulted from the study and consideration and ultimate rejection of the following four alternatives.

Infiltration Basins

Infiltration basins in place of the proposed detention basins were studied and rejected. The very low infiltration rates present in the project vicinity, approximately 0.0036 cm/hr (0.0014 in/hr), make infiltration basins impractical.

Future Kloke Road Main Line

The possibility of removing the pump station proposed in the middle drainage area was considered. If 720 m (2362 ft) of 1200 mm (48inch) RCP main line was installed down Kloke Road, draining to the New River, the stormwater between the All American Canal and the UPRR could be drained by gravity flow without the four detention basins proposed. This idea was rejected because it proposed work outside of the project footprint and the possible environmental and utility conflicts along Kloke Road would make the cost prohibitive. The preliminary cost estimate for this alternative is approximately $4 million, not including utility conflicts and any additional environmental mitigation costs. However, if in the future, the City of Calexico installs

a new stormwater main line, the proposed pump station would no longer be necessary. In addition, the basins could be replaced with a system that directly drained to this new storm drain.

Curb Outlets

Curb outlets along the entire length of the project were studied and rejected. Most of the adjacent properties are developed or are planned for development. This alternative would cause localized flooding problems in the adjacent properties during storm events.

Underground Basins

Underground basins were studied and rejected because of prohibitive costs. This alternative proposed to locate the required detention basins beneath the proposed sidewalks and roadway. Underground basins require an elevated level of maintenance to operate properly and any repair work would require excavation of the roadway.

8.0 CONCLUSION

There is no existing comprehensive storm drain system within the studied segment of SR-98. The majority of the existing roadway runoff sheet flows off of SR-98 and travels to local low points where it ponds until infiltration and evaporation remove the water. Many of these low points are located in areas outside of state right of way. The entire project area is extremely flat, making it difficult to install storm drain inlets and culverts with appropriate downward slope for the lengths required. The existing invert elevations within the project area require connecting culverts with minimum slopes, detention basins, and a pump station to intercept and discharge storm water runoff.

Curb inlets draining to a series of detention basins, a pump station and curb outlets are proposed for the drainage design to improve localized flooding. These improvements prevent as much overland runoff as possible from discharging out of the state right of way. The detention basins store the entire volume of the 100-yr 24-hr storm, keeping the traveled lanes open during the design storm event.

9.0 REFERENCES

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National Oceanic & Atmospheric Administration Atlas 2, Volume XI, 1973. *Western U.S. Precipitation Frequency Maps – Southern California 100 Yr, 24 Hr.*

Southern California Soil and Testing, Inc., September 19, 2006. *Geotechnical Design Report – State Route 98.*

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APPENDIX A

Existing Watershed Exhibit

Proposed Watershed Exhibit

LEGEND

- Existing Right of Way
- Existing Watershed Boundary
- Flow Direction
- Existing Drainage Facilities
- Watershed Area Labels

DOGWOOD RD.

STATE ROUTE 98

LOS LAGOS DEVELOPMENT

CALEXICO MINI-STORAGE

AA DRAIN No. 9

ALL AMERICAN CANAL

SEE MATCH LINE BELOW

SEE MATCH LINE ABOVE

BRIDGE # 58-0180 (CONCRETE SIPHON) BUILT IN 1938

BLANCHE CHARLES ELEMENTARY

WILLIAM MORENO JR. HIGH SCHOOL

LINDA PLAZA

RIVERVIEW DEVELOPMENT

DAVID NAVARRO AVE

ARCO

KLOKE RD

CHEVRON

JACK IN THE BOX

REMINGTON CONDOS

EADY AVE

MAINS ELEMENTARY SCHOOL

CASA SONOMA APARTMENTS

W CANAL ST

VV WILLIAMS AVE

SANTO TOMAS SWAP MEET

UNION PACIFIC RAILROAD

ESTRADA AVE

EXISTING OUTLET

UNITED STATES POST OFFICE

FOOD FOR LESS

CARL'S JR.

SHOPPING CENTER

IMPERIAL AVENUE W

SR-111 (IMPERIAL AVE)

CALEXICO CHAMBER OF COMMERCE

PAULIN AVE

ROCKWOOD AVE

BIRCH ST

AUTO MART

PROPOSED GAS STATION

RENT-A-CAR

CESAR CHAVEZ BLVD

GEORGE AVE

OLLIE AVE

HAROLD AVE

EMERSON AVE

ALLSTATE

PAYLESS

FILL CO.

BIG JOHN

CALEXICO FAMILY RESOURCE CENTER

LACY AVE

LEE AVE

VINCENT MEMORIAL HIGH SCHOOL

ROOSEVELT STREET

SCALE 1"=125m

DOKKEN ENGINEERING

7670 Opportunity Road
Suite 220
San Diego, CA 92123
(858) 514-8377

STATE ROUTE 98 EXISTING WATERSHED EXHIBIT

JUNE 2008

LEGEND

- Existing Watershed Boundary
- Proposed Watershed Boundary
- Existing Storm Water Facilities
- Proposed Storm Water Facilities
- Proposed Headwall
- Proposed Manhole
- Proposed Curb Inlet
- Proposed Curb Outlet
- Proposed Watershed Labels
- Proposed Grading
- Existing Topo
- Proposed Basin Inlet
- Proposed Flapper Valve
- Proposed Pump Discharge Line

DOGWOOD RD

STATE ROUTE 98

LOS LAGOS DEVELOPMENT

CALEXICO MINI-STORAGE

AA DRAIN No. 9

ALL AMERICAN CANAL

SEE MATCH LINE BELOW

SEE MATCH LINE ABOVE

BRIDGE # 58-0180 (CONCRETE SIPHON) BUILT IN 1938

RIVERVIEW DEVELOPMENT

AA DRAIN No. 10

BLANCHE CHARLES ELEMENTARY

WILLIAM MORENO JR. HIGH SCHOOL

LINDA PLAZA

Proposed StormWater Pump Station

ARCO

CHEVRON

JACK IN THE BOX

KLOKE RD

DAVID NAVARRO AVE

REMINGTON CONDOS

EADY AVE

MAINS ELEMENTARY SCHOOL

CASA SONOMA APARTMENTS

SANTO TOMAS SWAP MEET

W CANAL ST

VV WILLIAMS AVE

UNION PACIFIC RAILROAD

ESTRADA AVE

EXISTING OUTLET

EXISTING OUTLET

UNITED STATES POST OFFICE

FOOD FOR LESS

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CALEXICO FAMILY RESOURCE CENTER

LACY AVE

LEE AVE

VINCENT MEMORIAL HIGH SCHOOL

ROOSEVELT STREET

SCALE 1":125m

DOKKEN ENGINEERING

3611 Rutan Road
San Diego, CA 92123
(858) 514-8377

STATE ROUTE 98
PROPOSED
WATERSHED
EXHIBIT
JUNE 2008

APPENDIX B

Table A: Flow Rates for Existing Conditions

Table B: Flow Rates for Proposed Conditions

TABLE A: FLOW RATES FOR EXISTING CONDITIONS

	Drainage Areas	Drainage Areas	Intensity		Runoff Coefficient C	C(25)	C(100)	Q(25)	Q(100)	Water Quality Storm
			i(25)	i(100)						
	(sq m)	(sq Kilometer)	(mm/hr)	(mm/hr)				m^3/s	m^3/s	m^3/s
1.1	20,424	0.0204	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.542	0.736	0.0277
1.2	18,842	0.0188	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.500	0.679	0.0256
1.3	5,047	0.0050	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.134	0.182	0.0068
1.4	2,287	0.0023	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.061	0.082	0.0031
1.5	1,199	0.0012	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.032	0.043	0.0016
1.6	1,185	0.0012	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.031	0.043	0.0016
1.7	1,598	0.0016	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.042	0.058	0.0022
1.8	15,365	0.0154	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.407	0.553	0.0208
1.9	10,702	0.0107	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.284	0.385	0.0145
1.10	950	0.0010	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.025	0.034	0.0013
1.11	6,970	0.0070	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.185	0.251	0.0095
1.12	883	0.0009	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.023	0.032	0.0012
1.13	2,416	0.0024	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.064	0.087	0.0033
1.14	741	0.0007	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.020	0.027	0.0010
1.15	646	0.0006	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.017	0.023	0.0009
1.16	3,603	0.0036	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.096	0.130	0.0049
1.17	5,115	0.0051	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.136	0.184	0.0069
1.18	9,487	0.0095	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.252	0.342	0.0129
2.1	4,715	0.0047	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.125	0.170	0.0064
2.2	1,329	0.0013	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.035	0.048	0.0018
2.3	1,315	0.0013	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.035	0.047	0.0018
2.4	20,951	0.0210	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.556	0.755	0.0284
2.5	4,936	0.0049	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.131	0.178	0.0067
2.6	7,553	0.0076	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.200	0.272	0.0102
2.7	3,603	0.0036	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.096	0.130	0.0049

Intensity

i(25) = Rainfall Intensity for 25 year storm (mm/hr)

$$i(25) = 25.4 \cdot \left[1.09 \cdot \left(\frac{t}{60} \right)^{-0.495} \right]$$

i(100) = Rainfall Intnesity for 100 year storm (mm/hr)

$$i(100) = 25.4 \cdot \left[1.48 \cdot \left(\frac{t}{60} \right)^{-0.495} \right]$$

t = Design time of concentration (min)

Discharge

C =	Standard Run-Off Coefficient
C(25) =	25 Year Storm Run-Off Coefficient
C(100) =	100 Year Storm Run-Off Coefficient
Q(25) =	25 Year StormTotal Discharge
Q(100) =	100 Year Storm Total Discharge

Water Quality Storm

Q = Discharge (m3/sec)	Q = CiA
C = Runoff Coefficient	HDM Table 819.3B
i = Rainfall Intensity (mm/hr)	5.1mm/hr (0.20"/hr), *Caltrans Storm Water Quality Handbook: Project Planning and Design Guide* , dated May 2007
A = Tributary Area (sq kilometers)	Watershed Area in square kilometers

TABLE B: FLOW RATES FOR PROPOSED CONDITIONS

	Drainage Areas	Drainage Areas	Intensity		Runoff Coefficient C	C(25)	C(100)	Q(25)	Q(100)	Water Quality Storm
			i(25)	i(100)						
	(sq m)	(sq kilometer)	(mm/hr)	(mm/hr)				m^3/s	m^3/s	m^3/s
1A	1,598.58	0.0016	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.042	0.058	0.0022
1B	902.24	0.0009	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.024	0.032	0.0012
1C	4,073.87	0.0041	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.108	0.147	0.0055
1D	2,067.91	0.0021	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.055	0.074	0.0028
1E	3,168.76	0.0032	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.084	0.114	0.0043
1F	1,920.68	0.0019	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.051	0.069	0.0026
1G	3,917.50	0.0039	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.104	0.141	0.0053
1H	2,588.75	0.0026	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.069	0.093	0.0035
1I	3,797.62	0.0038	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.101	0.137	0.0052
1J	2,504.24	0.0025	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.066	0.090	0.0034
1K	3,219.88	0.0032	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.085	0.116	0.0044
1L	1,699.39	0.0017	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.045	0.061	0.0023
1M	4,273.07	0.0043	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.113	0.154	0.0058
1N	2,299.66	0.0023	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.061	0.083	0.0031
1o	4,653.36	0.0047	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.123	0.168	0.0063
1P	3,194.13	0.0032	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.085	0.115	0.0043
ALL AMERICAN CANAL										
1Q	2,837.41	0.0028	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.075	0.102	0.0038
1R	3,224.78	0.0032	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.086	0.116	0.0044
1S	1,888.13	0.0019	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.050	0.068	0.0026
1T1	328.67	0.0003	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.009	0.012	0.0004
1T2	1,717.46	0.0017	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.046	0.062	0.0048
1U	2,155.24	0.0022	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.057	0.078	0.0029
1V	2,078.49	0.0021	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.055	0.075	0.0028
1W	3,405.88	0.0034	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.090	0.123	0.0046
1X	3,291.07	0.0033	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.087	0.119	0.0045
1Y	3,537.56	0.0035	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.094	0.127	0.0048
1Z	2,231.50	0.0022	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.059	0.080	0.0030
KLOKE ROAD										
2A	4,157.96	0.0042	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.110	0.150	0.0056
2B	2,929.49	0.0029	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.078	0.106	0.0040
2C	5,207.48	0.0052	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.138	0.188	0.0071
2D	3,621.59	0.0036	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.096	0.130	0.0049
2E	3,030.74	0.0030	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.080	0.109	0.0041
2F	5,765.57	0.0058	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.153	0.208	0.0078
2G	7,230.00	0.0072	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.192	0.260	0.0098
2H	8,050.53	0.0081	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.214	0.290	0.0109

TABLE B: FLOW RATES FOR PROPOSED CONDITIONS

	Drainage Areas	Drainage Areas	Intensity		Runoff Coefficient C	C(25)	C(100)	Q(25)	Q(100)	Water Quality Storm
			i(25)	i(100)						
	(sq m)	(sq kilometer)	(mm/hr)	(mm/hr)				m^3/s	m^3/s	m^3/s
UNION PACIFIC RAILROAD TRACKS										
2I	7,254.99	0.0073	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.192	0.261	0.0098
2J	6,171.84	0.0062	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.164	0.222	0.0084
2K	3,141.28	0.0031	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.083	0.113	0.0043
2L	2,353.25	0.0024	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.062	0.085	0.0032
2M	19,903.66	0.0199	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.528	0.717	0.0270
2N	7,623.68	0.0076	94.7	128.6	100% Asphaltic/Impervious Soil	1.00	1.00	0.202	0.275	0.0103

Intensity

i(25) = Rainfall Intensity for 25 year storm (mm/hr)

$$i(25) = 25.4 \cdot \left[1.09 \cdot \left(\frac{t}{60} \right)^{-0.495} \right]$$

i(100) = Rainfall Intnesity for 100 year storm (mm/hr)

$$i(100) = 25.4 \cdot \left[1.48 \cdot \left(\frac{t}{60} \right)^{-0.495} \right]$$

t = Design time of concentration (min)

Discharge

C = Standard Run-Off Coefficient
C(25) = 25 Year Storm Run-Off Coefficient
C(100) = 100 Year Storm Run-Off Coefficient
Q(25) = 25 Year StormTotal Discharge
Q(100) = 100 Year Storm Total Discharge

Water Quality Storm

Q = Discharge (m3/sec) — Q = CiA
C = Runoff Coefficient — HDM Table 819.3B
i = Rainfall Intensity (mm/hr) — 5.1mm/hr (0.20"/hr), *Caltrans Storm Water Quality Handbook: Project Planning and Design Guide*, dated May 2007
A = Tributary Area (sq kilometers) — Watershed Area in square kilometers

APPENDIX C

Preliminary Drainage Design Exhibit

LEGEND

- Existing Right of Way
- Existing Storm Water Facilities
- Proposed Storm Drain Lateral
- Proposed Headwall
- Proposed Manhole
- Proposed Curb Inlet
- Proposed Curb Outlet
- Proposed Basin Inlet
- PUMP Discharge Line
- Proposed Grading
- Existing Topography
- 100 Year Water Surface Elevation
- Proposed Watershed Label
- Proposed Watershed Boundary
- Existing Watershed Boundary

DOGWOOD RD

STATE ROUTE 98

Basin A (1:2 slope)
BASIN IE 98.7
WSE = 100.14 m

IE 98.70

0.3%

LOS LAGOS DEVELOPMENT

Basin B (1:2 slope)
BASIN IE 98.8
WSE = 100.14 m

IE 97.30

1.1%

IE 96.85

CALEXICO MINI-STORAGE

AA DRAIN No. 9

ALL AMERICAN CANAL

SEE MATCH LINE BELOW

SEE MATCH LINE ABOVE

ALL AMERICAN CANAL

BRIDGE # 58-0180
(CONCRETE SIPHON)
BUILT IN 1938

STATE ROUTE 98

2.2%

IE 97.54

IE 96.85

Basin C (1:2 slope)
BASIN IE 98.95
WSE = 100.23 m

AA DRAIN No. 10

RIVERVIEW DEVELOPMENT

BLANCHE CHARLES ELEMENTARY

Basin D (1:2 slope)
BASIN IE 98.95
WSE = 100.23

IE 98.95

0.3%

DAVID NAVARRO AVE

ARCO

WILLIAM MORENO JR. HIGH SCHOOL

LINDA PLAZA

Proposed StormWater Pump Station

IE 98.5

Basin E (1:2 slope)
BASIN IE 99.6
WSE = 100.77

0.3%

STATE ROUTE 98

KLOKE RD

CHEVRON

JACK IN THE BOX

IE 99.50

Basin F (1:2 slope)
BASIN IE 99.5
WSE = 100.77

REMINGTON CONDOS

EADY AVE

MAINS ELEMENTARY SCHOOL

SEE MATCH LINE ABOVE

CASA SONOMA APARTMENTS

W CANAL ST

VV WILLIAMS AVE

SANTO TOMAS SWAP MEET

UNION PACIFIC RAILROAD

ESTRADA AVE

EXISTING OUTLET

EXISTING OUTLET

UNITED STATES POST OFFICE

FOOD FOR LESS

SHOPPING CENTER

CARL'S JR.

IMPERIAL AVENUE W

SR-111 (IMPERIAL AVE)

CALEXICO CHAMBER OF COMMERCE

PAULIN AVE

ROCKWOOD AVE

STATE ROUTE 98

BIRCH ST

Basin F (1:2 slope)
BASIN IE 99.5
WSE = 100.77

IE 99.95

AUTO MART

PROPOSED GAS STATION

RENT-A-CAR

ALLSTATE

PAYLESS

FILL CO.

BIG JOHN

CALEXICO FAMILY RESOURCE CENTER

LACY AVE

LEE AVE

CESAR CHAVEZ BLVD

GEORGE AVE

OLLIE AVE

HAROLD AVE

EMERSON AVE

VINCENT MEMORIAL HIGH SCHOOL

ROOSEVELT STREET

SCALE 1"=25m

DOKKEN ENGINEERING
7670 Opportunity Road, Suite 220
San Diego, CA 92123
(858) 514-8377

STATE ROUTE 98
PRELIMINARY
DRAINAGE DESIGN
EXHIBIT
JUNE 2008

APPENDIX D

Detention Basin Volume Calculations

Water Volume Calculations

Isopluvials of 100-yr 24-hr Precipitation Map

Worksheet for Self Cleaning Velocity of 0.6m RCP 0.3%

CulvertMaster Worksheets for 0.6m RCP Cross Culverts

Imperial Irrigation District Drain Standard Plans

SR-98 West - Detention Basin Volume Calculations

End Area Method

Variables

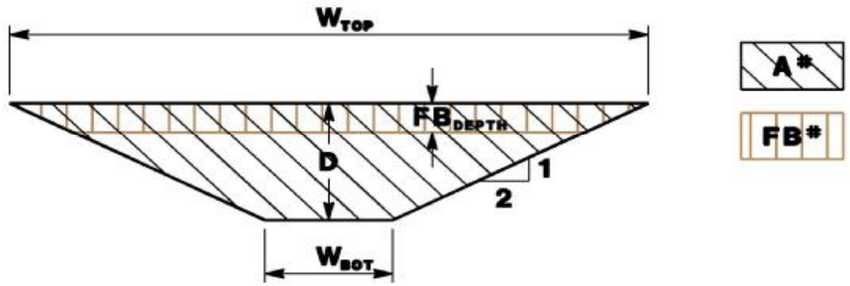
V	Volume of Detention Basin	**d**	Distance Between End Area Cross Sections
A#	Detention Basin Cross Section End Area	**FB#**	Freeboard Cross Section End Area
W_{TOP}	Top Width of Detention Basin	**FB_{DEPTH}**	Depth of Freeborad
W_{BOT}	Bottom Width of Detention Basin	**WSE**	Water Surface Elevation
D	Depth of Basin		

Equations

$V= d(A1+A2)/2 + d(A2+A3)/2 +……+ d(An-1+An)/2$

$FB\#= FB_{DEPTH}(W_{TOP}+W_{TOP}-4(FB_{DEPTH}))/2$

$FB_{VOLUME}= d(FB1+FB2)/2 + d(FB2+FB3)/2 +……+ d(FBn-1+FBn)/2$



BASIN A		BASIN B	
FB_{DEPTH}	0.262 m	FB_{DEPTH}	0.262 m
WSE 100.14 m			

BASIN C		BASIN D	
FB_{DEPTH}	0.369 m	FB_{DEPTH}	0.369 m
WSE 100.23 m			

BASIN E		BASIN F	
FB_{DEPTH}	0.227 m	FB_{DEPTH}	0.227 m
WSE 100.77 m			

			A_2						A_3						A_4						A_5						A_6							Minus FB		
BASIN	A_1	d_{1-2}	W_{BOT}	W_{TOP}	D	A_2	FB_2	d_{2-3}	W_{BOT}	W_{TOP}	D	A_3	FB_3	d_{3-4}	W_{BOT}	W_{TOP}	D	A_4	FB_4	d_{4-5}	W_{BOT}	W_{TOP}	D	A_5	FB_5	d_{5-6}	W_{BOT}	W_{TOP}	D	A_6	FB_6	d_{6-7}	A_7	Drainage Volume	Volume of Freeboard	Total Drainage Volume	Basin Water Volume	Basin Volume Grouping Balance
	m^2	m	m	m	m	m^2	m^2	m	m	m	m	m^2	m^2	m	m	m	m	m^2	m^2	m	m	m	m	m^2	m^2	m	m	m	m	m^2	m^2	m	m^2	m^3	m^3	m^3	m^3	m^3
A	0.00	3.03	2.50	6.50	1.00	4.50	1.57	79.42	2.50	7.29	1.20	5.86	1.77	60.58	2.70	7.90	1.30	6.89	1.93	70.00	2.60	8.60	1.50	8.40	2.12	68.66	2.88	9.28	1.60	9.73	2.29	4.40	0.00	1,983.43	545.31	1,438	1,364	74 / 3
B	0.00	2.52	2.76	5.56	0.70	2.91	1.32	86.10	2.82	6.42	0.90	4.16	1.54	85.00	2.87	7.27	1.10	5.58	1.77	97.53	2.64	8.24	1.40	7.62	2.02	75.58	2.50	8.90	1.60	9.12	2.19	4.20	0.00	2,016.74	614.44	1,402	1,474	-71
C	0.00	3.90	2.70	9.10	1.60	9.44	3.09	69.50	2.80	8.40	1.40	7.84	2.83	89.74	2.70	7.50	1.20	6.12	2.50	38.45	2.72	7.12	1.10	5.41	2.35	56.81	2.55	6.55	1.00	4.55	2.14	3.12	0.00	1,757.02	674.70	1,082	1,084	-2 / 2
D	0.00	3.90	2.70	9.10	1.60	9.44	3.09	49.77	2.64	8.64	1.50	8.46	2.92	49.80	2.54	8.14	1.40	7.48	2.73	49.80	2.85	7.65	1.20	6.30	2.55	50.79	2.74	7.14	1.10	5.43	2.36	2.92	0.00	1,509.64	555.72	954	950	4
E	0.00	4.75	3.50	8.70	1.30	7.93	1.87	61.23	3.57	8.37	1.20	7.17	1.80	60.00	3.37	7.77	1.10	6.13	1.66	60.00	3.57	7.17	0.90	4.84	1.53	52.23	3.55	6.64	0.77	3.94	1.41	3.72	0.00	1,445.63	395.89	1,050	1,213	-163 / 0
F	0.00	8.10	10.24	16.24	1.50	19.86	3.59	40.00	9.93	15.84	1.48	19.05	3.50	40.00	9.62	14.56	1.23	14.93	3.21	40.00	9.30	12.94	0.91	10.12	2.84	44.37	7.60	12.00	1.10	10.78	2.62	6.72	0.00	2,539.05	541.29	1,998	1,835	163
																																		TOTALS:	**11,251.51**	**3,327.36**	**7,924**	**7,919**	

SR-98 West - Water Volume Calculations

100 yr 24 hr Storm Depth = **0.0762** **m**
3.0 *in*

	Proposed Watershed Labels	Basin WS Area	Water Volume	Q(100)
		m^2	m^3	m^3/s
A	1E, 1F, 1G, 1H, 1I, 1J	17,897.55	1,363.79	0.645
B	1K, 1L, 1M, 1N, 1o, 1P	19,339.49	1,473.67	0.697
C1	1Q, 1R, 1S, 1T1	8,278.99	630.86	0.298
C2	1T2, 1U, 1V	5,951.19	453.48	0.214
D	1W, 1X, 1Y, 1Z	12,466.01	949.91	0.449
E	2A, 2B, 2C, 2D	15,916.52	1,212.84	0.573
F	2E, 2F, 2G, 2H	24,076.84	1,834.66	0.867
			0.00	
		103,927	**7,919**	**3.743**

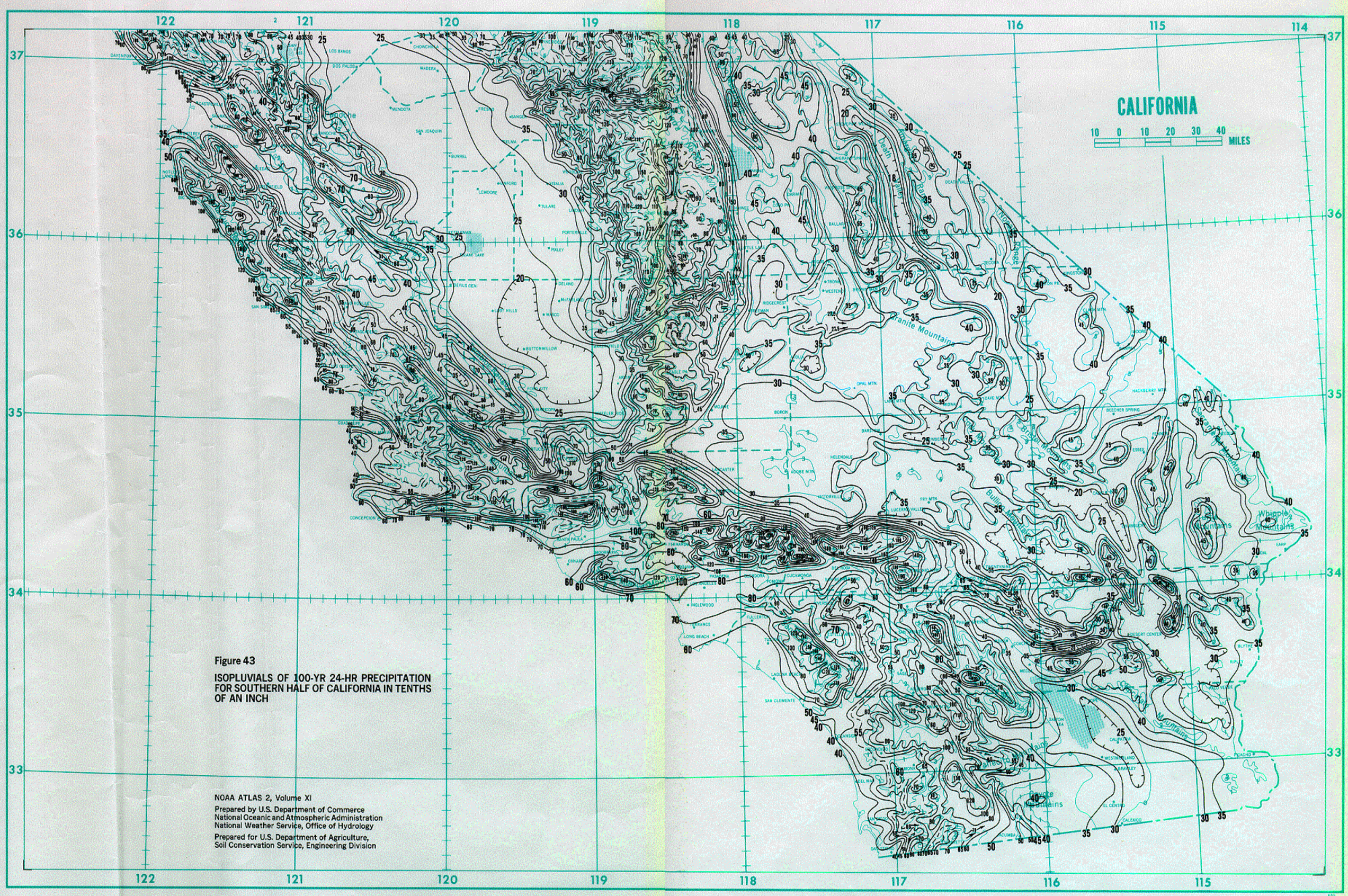


Figure 43

ISOPLUVIALS OF 100-YR 24-HR PRECIPITATION FOR SOUTHERN HALF OF CALIFORNIA IN TENTHS OF AN INCH

NOAA ATLAS 2, Volume XI

Prepared by U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service, Office of Hydrology

Prepared for U.S. Department of Agriculture,
Soil Conservation Service, Engineering Division

☆ U.S. GOVERNMENT PRINTING OFFICE : 1974 O—507-862

Worksheet for Self Cleaning Vel of 0.6m RCP 0.3%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00300	m/m
Normal Depth	0.30	m
Diameter	0.60	m

Results

Discharge	0.17	m^3/s
Flow Area	0.14	m^2
Wetted Perimeter	0.94	m
Top Width	0.60	m
Critical Depth	0.26	m
Percent Full	50.0	%
Critical Slope	0.00469	m/m
Velocity	1.19	m/s
Velocity Head	0.07	m
Specific Energy	0.37	m
Froude Number	0.78	
Maximum Discharge	0.36	m^3/s
Discharge Full	0.34	m^3/s
Slope Full	0.00075	m/m
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	m
Length	0.0000	m
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	m
Profile Description		
Profile Headloss	0.00	m
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	50.00	%
Downstream Velocity	Infinity	m/s
Upstream Velocity	Infinity	m/s

Worksheet for Self Cleaning Vel of 0.6m RCP 0.3%

GVF Output Data

Normal Depth	0.30	m
Critical Depth	0.26	m
Channel Slope	0.00300	m/m
Critical Slope	0.00469	m/m

Messages

Notes	This worksheet shows that the half full velocity of a 0.6m RCP at 0.3% slope will be greater than 1m/s.

Culvert Calculator Report
Basin A - 497+20

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.17	m	Headwater Depth/Height	1.40	
Computed Headwater Elevation	100.16	m	Discharge	0.1830	m3/s
Inlet Control HW Elev.	100.10	m	Tailwater Elevation	100.10	m
Outlet Control HW Elev.	100.16	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.52	m	Downstream Invert	99.40	m
Length	40.00	m	Constructed Slope	0.003000	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	0.70	m
Slope Type	N/A		Normal Depth	0.25	m
Flow Regime	N/A		Critical Depth	0.21	m
Velocity Downstream	0.56	m/s	Critical Slope	0.005189	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.46	m
Section Size	450 mm		Rise	0.46	m
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	100.16	m	Upstream Velocity Head	0.02	m
Ke	0.50		Entrance Loss	0.01	m

Inlet Control Properties					
Inlet Control HW Elev.	100.10	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin A - 498+40

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.26	m	Headwater Depth/Height	1.48	
Computed Headwater Elevation	100.19	m	Discharge	0.2340	m3/s
Inlet Control HW Elev.	100.10	m	Tailwater Elevation	100.10	m
Outlet Control HW Elev.	100.19	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.28	m	Downstream Invert	99.20	m
Length	27.00	m	Constructed Slope	0.002963	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	0.90	m
Slope Type	N/A		Normal Depth	0.37	m
Flow Regime	N/A		Critical Depth	0.31	m
Velocity Downstream	0.80	m/s	Critical Slope	0.004926	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	100.19	m	Upstream Velocity Head	0.03	m
Ke	0.50		Entrance Loss	0.02	m

Inlet Control Properties					
Inlet Control HW Elev.	100.10	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin A - 500+13

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.42	m	Headwater Depth/Height	2.13	
Computed Headwater Elevation	100.18	m	Discharge	0.2270	m3/s
Inlet Control HW Elev.	100.10	m	Tailwater Elevation	100.10	m
Outlet Control HW Elev.	100.18	m	Control Type	Outlet Control	

Grades					
Upstream Invert	98.88	m	Downstream Invert	98.80	m
Length	27.00	m	Constructed Slope	0.002963	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.30	m
Slope Type	N/A		Normal Depth	0.36	m
Flow Regime	N/A		Critical Depth	0.31	m
Velocity Downstream	0.78	m/s	Critical Slope	0.004890	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	100.18	m	Upstream Velocity Head	0.03	m
Ke	0.50		Entrance Loss	0.02	m

Inlet Control Properties					
Inlet Control HW Elev.	100.10	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin B - 501+50

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.41	m	Headwater Depth/Height	1.02	
Computed Headwater Elevation	100.15	m	Discharge	0.1770	m3/s
Inlet Control HW Elev.	100.10	m	Tailwater Elevation	100.10	m
Outlet Control HW Elev.	100.15	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.68	m	Downstream Invert	99.60	m
Length	27.30	m	Constructed Slope	0.002930	m/m

Hydraulic Profile					
Profile	CompositePressureProfileM1		Depth, Downstream	0.50	m
Slope Type	N/A		Normal Depth	0.24	m
Flow Regime	Subcritical		Critical Depth	0.21	m
Velocity Downstream	0.54	m/s	Critical Slope	0.005163	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.46	m
Section Size	450 mm		Rise	0.46	m
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	100.15	m	Upstream Velocity Head	0.02	m
Ke	0.50		Entrance Loss	0.01	m

Inlet Control Properties					
Inlet Control HW Elev.	100.10	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin B - 502+70

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.41	m	Headwater Depth/Height	1.32	
Computed Headwater Elevation	100.19	m	Discharge	0.2370	m3/s
Inlet Control HW Elev.	100.10	m	Tailwater Elevation	100.10	m
Outlet Control HW Elev.	100.19	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.38	m	Downstream Invert	99.30	m
Length	26.30	m	Constructed Slope	0.003042	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	0.80	m
Slope Type	N/A		Normal Depth	0.37	m
Flow Regime	N/A		Critical Depth	0.31	m
Velocity Downstream	0.81	m/s	Critical Slope	0.004941	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	100.19	m	Upstream Velocity Head	0.03	m
Ke	0.50		Entrance Loss	0.02	m

Inlet Control Properties					
Inlet Control HW Elev.	100.10	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin B - 504+67

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.41	m	Headwater Depth/Height	2.21	
Computed Headwater Elevation	100.22	m	Discharge	0.2830	m3/s
Inlet Control HW Elev.	100.10	m	Tailwater Elevation	100.10	m
Outlet Control HW Elev.	100.22	m	Control Type	Outlet Control	

Grades					
Upstream Invert	98.88	m	Downstream Invert	98.80	m
Length	24.60	m	Constructed Slope	0.003049	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.30	m
Slope Type	N/A		Normal Depth	0.41	m
Flow Regime	N/A		Critical Depth	0.34	m
Velocity Downstream	0.97	m/s	Critical Slope	0.005201	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	100.22	m	Upstream Velocity Head	0.05	m
Ke	0.50		Entrance Loss	0.02	m

Inlet Control Properties					
Inlet Control HW Elev.	100.10	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin C - 506+45

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.51	m	Headwater Depth/Height	2.15	
Computed Headwater Elevation	100.49	m	Discharge	0.2180	m3/s
Inlet Control HW Elev.	100.42	m	Tailwater Elevation	100.42	m
Outlet Control HW Elev.	100.49	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.18	m	Downstream Invert	99.10	m
Length	25.00	m	Constructed Slope	0.003200	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.32	m
Slope Type	N/A		Normal Depth	0.34	m
Flow Regime	N/A		Critical Depth	0.30	m
Velocity Downstream	0.75	m/s	Critical Slope	0.004849	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	100.49	m	Upstream Velocity Head	0.03	m
Ke	0.50		Entrance Loss	0.01	m

Inlet Control Properties					
Inlet Control HW Elev.	100.42	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin C - 507+60

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.62	m	Headwater Depth/Height	1.55	
Computed Headwater Elevation	100.46	m	Discharge	0.1420	m3/s
Inlet Control HW Elev.	100.42	m	Tailwater Elevation	100.42	m
Outlet Control HW Elev.	100.46	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.51	m	Downstream Invert	99.40	m
Length	37.30	m	Constructed Slope	0.002949	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.02	m
Slope Type	N/A		Normal Depth	0.27	m
Flow Regime	N/A		Critical Depth	0.24	m
Velocity Downstream	0.49	m/s	Critical Slope	0.004554	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	100.46	m	Upstream Velocity Head	0.01	m
Ke	0.50		Entrance Loss	0.01	m

Inlet Control Properties					
Inlet Control HW Elev.	100.42	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin C - 508+89

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.62	m	Headwater Depth/Height	1.19	
Computed Headwater Elevation	100.47	m	Discharge	0.1520	m3/s
Inlet Control HW Elev.	100.42	m	Tailwater Elevation	100.42	m
Outlet Control HW Elev.	100.47	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.74	m	Downstream Invert	99.60	m
Length	47.50	m	Constructed Slope	0.002947	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	0.82	m
Slope Type	N/A		Normal Depth	0.28	m
Flow Regime	N/A		Critical Depth	0.25	m
Velocity Downstream	0.52	m/s	Critical Slope	0.004585	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	100.47	m	Upstream Velocity Head	0.01	m
Ke	0.50		Entrance Loss	0.01	m

Inlet Control Properties					
Inlet Control HW Elev.	100.42	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin D - 510+43

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.75	m	Headwater Depth/Height	2.35	
Computed Headwater Elevation	100.51	m	Discharge	0.2410	m3/s
Inlet Control HW Elev.	100.42	m	Tailwater Elevation	100.42	m
Outlet Control HW Elev.	100.51	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.08	m	Downstream Invert	99.00	m
Length	27.50	m	Constructed Slope	0.002909	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.42	m
Slope Type	N/A		Normal Depth	0.37	m
Flow Regime	N/A		Critical Depth	0.32	m
Velocity Downstream	0.83	m/s	Critical Slope	0.004962	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	100.51	m	Upstream Velocity Head	0.03	m
Ke	0.50		Entrance Loss	0.02	m

Inlet Control Properties					
Inlet Control HW Elev.	100.42	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin D - 511+75

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	100.94	m	Headwater Depth/Height	1.82	
Computed Headwater Elevation	100.49	m	Discharge	0.2080	m3/s
Inlet Control HW Elev.	100.42	m	Tailwater Elevation	100.42	m
Outlet Control HW Elev.	100.49	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.38	m	Downstream Invert	99.30	m
Length	27.50	m	Constructed Slope	0.002909	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.12	m
Slope Type	N/A		Normal Depth	0.34	m
Flow Regime	N/A		Critical Depth	0.29	m
Velocity Downstream	0.71	m/s	Critical Slope	0.004801	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	100.49	m	Upstream Velocity Head	0.03	m
Ke	0.50		Entrance Loss	0.01	m

Inlet Control Properties					
Inlet Control HW Elev.	100.42	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.3	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin E - 513+62

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	101.05	m	Headwater Depth/Height	1.58	
Computed Headwater Elevation	101.04	m	Discharge	0.2550	m3/s
Inlet Control HW Elev.	100.98	m	Tailwater Elevation	100.98	m
Outlet Control HW Elev.	101.04	m	Control Type	Outlet Control	

Grades					
Upstream Invert	100.08	m	Downstream Invert	99.70	m
Length	126.00	m	Constructed Slope	0.003016	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.28	m
Slope Type	N/A		Normal Depth	0.25	m
Flow Regime	N/A		Critical Depth	0.23	m
Velocity Downstream	0.44	m/s	Critical Slope	0.004515	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	101.04	m	Upstream Velocity Head	0.01	m
Ke	0.50		Entrance Loss	0.00	m

Inlet Control Properties					
Inlet Control HW Elev.	100.98	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.6	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin E - 515+66

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	101.07	m	Headwater Depth/Height	1.39	
Computed Headwater Elevation	101.04	m	Discharge	0.3180	m3/s
Inlet Control HW Elev.	100.98	m	Tailwater Elevation	100.98	m
Outlet Control HW Elev.	101.04	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.98	m	Downstream Invert	99.90	m
Length	27.00	m	Constructed Slope	0.002963	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.08	m
Slope Type	N/A		Normal Depth	0.38	m
Flow Regime	N/A		Critical Depth	0.34	m
Velocity Downstream	0.70	m/s	Critical Slope	0.004358	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.76	m
Section Size	750 mm		Rise	0.76	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	101.04	m	Upstream Velocity Head	0.02	m
Ke	0.50		Entrance Loss	0.01	m

Inlet Control Properties					
Inlet Control HW Elev.	100.98	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.5	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin F - 517+70

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	101.09	m	Headwater Depth/Height	1.77	
Computed Headwater Elevation	101.04	m	Discharge	0.3170	m3/s
Inlet Control HW Elev.	100.98	m	Tailwater Elevation	100.98	m
Outlet Control HW Elev.	101.04	m	Control Type	Outlet Control	

Grades					
Upstream Invert	99.69	m	Downstream Invert	99.60	m
Length	31.00	m	Constructed Slope	0.002903	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.38	m
Slope Type	N/A		Normal Depth	0.38	m
Flow Regime	N/A		Critical Depth	0.34	m
Velocity Downstream	0.70	m/s	Critical Slope	0.004356	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.76	m
Section Size	750 mm		Rise	0.76	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	101.04	m	Upstream Velocity Head	0.02	m
Ke	0.50		Entrance Loss	0.01	m

Inlet Control Properties					
Inlet Control HW Elev.	100.98	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.5	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
Basin F - 519+50

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	101.22	m	Headwater Depth/Height	1.36	
Computed Headwater Elevation	101.12	m	Discharge	0.4050	m3/s
Inlet Control HW Elev.	100.98	m	Tailwater Elevation	100.98	m
Outlet Control HW Elev.	101.12	m	Control Type	Outlet Control	

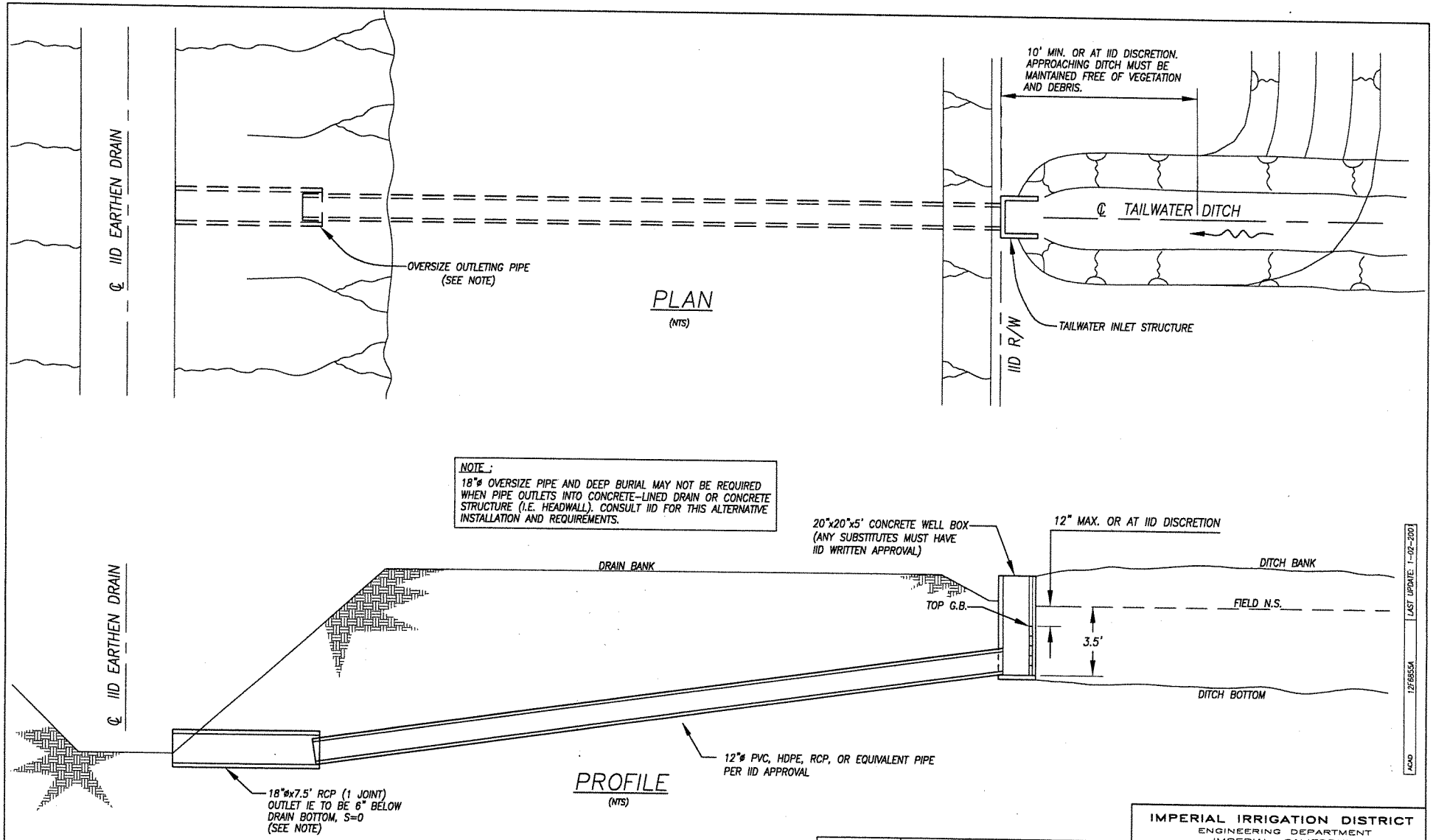
Grades					
Upstream Invert	100.08	m	Downstream Invert	99.90	m
Length	61.50	m	Constructed Slope	0.002927	m/m

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.08	m
Slope Type	N/A		Normal Depth	0.45	m
Flow Regime	N/A		Critical Depth	0.39	m
Velocity Downstream	0.89	m/s	Critical Slope	0.004562	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	0.76	m
Section Size	750 mm		Rise	0.76	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	101.12	m	Upstream Velocity Head	0.04	m
Ke	0.50		Entrance Loss	0.02	m

Inlet Control Properties					
Inlet Control HW Elev.	100.98	m	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	0.5	m2
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				



LEGEND

RCP = REINFORCED CONCRETE PIPE
PVC = POLYVINYL CHLORIDE
HDPE = HIGH DENSITY POLYETHYLENE
MH = MANHOLE
℄ = CENTER LINE
N.S. = NATURAL SURFACE
G.B. = GRADE BOARD
S = SLOPE
IE = INVERT ELEVATION
R/W = RIGHT OF WAY

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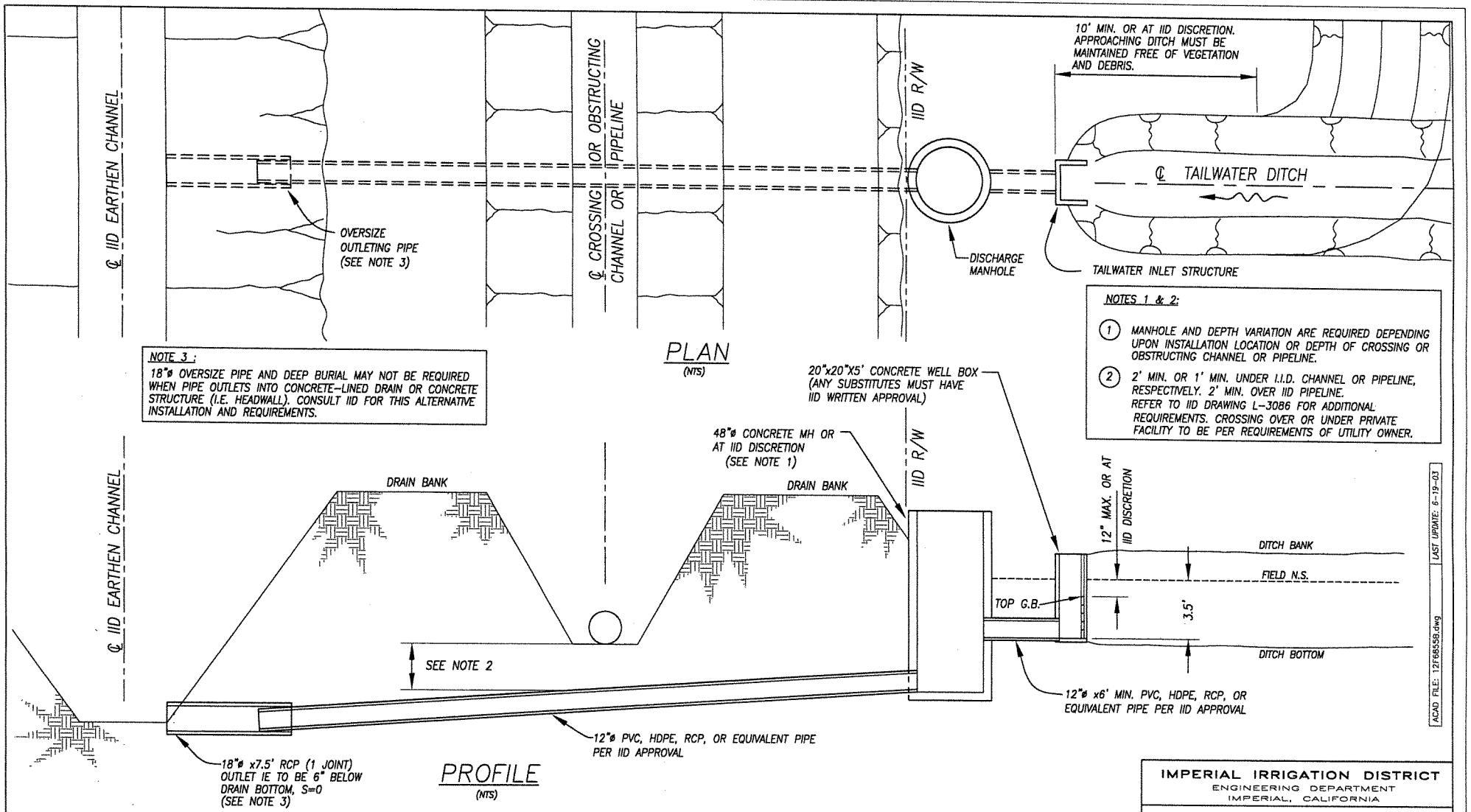
ISSUE	4	REVISED 10-01-96 B.V.
ISSUE	3	REVISED 7-26-95 D.D.
ISSUE	2	REVISED 10-29-84 D.D.
ISSUE	1	7-12-84 D.D.

IMPERIAL IRRIGATION DISTRICT
ENGINEERING DEPARTMENT
IMPERIAL, CALIFORNIA

AGRICULTURAL SURFACE DISCHARGE STANDARDS
PRIVATE TAILWATER FACILITY INSTALLATION
DISCHARGING INTO IMPERIAL IRRIGATION DISTRICT (IID)
DRAIN CHANNEL

SH. 1 OF 7

DWG. NO. 12F-6855



LEGEND

RCP = REINFORCED CONCRETE PIPE	MH = MANHOLE	G.B. = GRADE BOARD	R/W = RIGHT OF WAY
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ISSUE	5	REVISED 6-19-03 SIC
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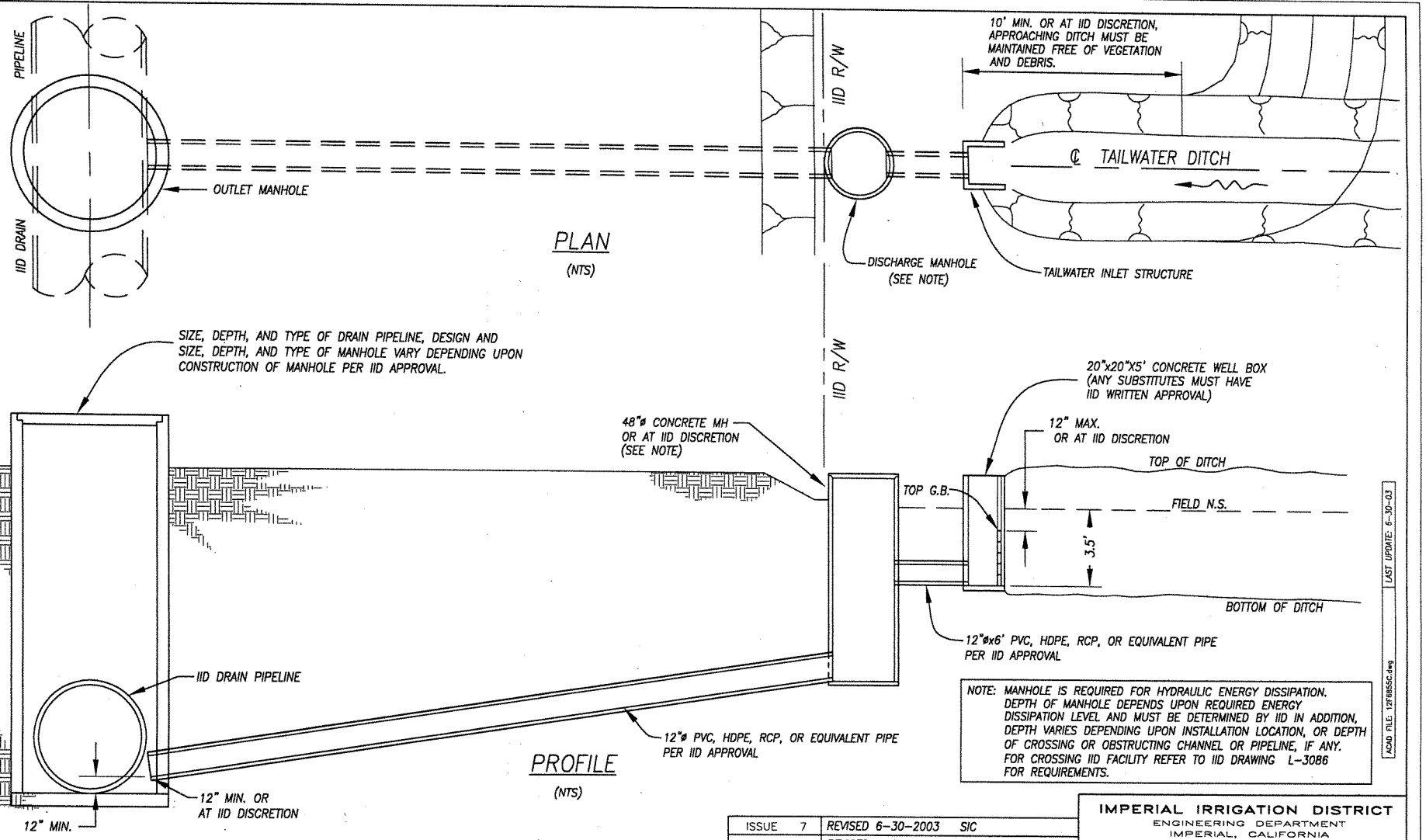
ISSUE	3	REVISED 4-7-98 A.J.
ISSUE	2	REVISED 10-29-84 D.D.
ISSUE	1	7-12-84 D.D.

IMPERIAL IRRIGATION DISTRICT
ENGINEERING DEPARTMENT
IMPERIAL, CALIFORNIA

AGRICULTURAL SURFACE DISCHARGE STANDARDS
PRIVATE TAILWATER FACILITY INSTALLATION CROSSING IID OR PRIVATE CHANNEL OR PIPELINE AND DISCHARGING INTO IMPERIAL IRRIGATION DISTRICT (IID) DRAIN CHANNEL

SH. 2 OF 7

DWG. NO. 12F-6855



NOTE: MANHOLE IS REQUIRED FOR HYDRAULIC ENERGY DISSIPATION. DEPTH OF MANHOLE DEPENDS UPON REQUIRED ENERGY DISSIPATION LEVEL AND MUST BE DETERMINED BY IID IN ADDITION, DEPTH VARIES DEPENDING UPON INSTALLATION LOCATION, OR DEPTH OF CROSSING OR OBSTRUCTING CHANNEL OR PIPELINE, IF ANY. FOR CROSSING IID FACILITY REFER TO IID DRAWING L-3086 FOR REQUIREMENTS.

LAST UPDATE: 6-30-03

ACAD FILE: 12F6855C.dwg

LEGEND

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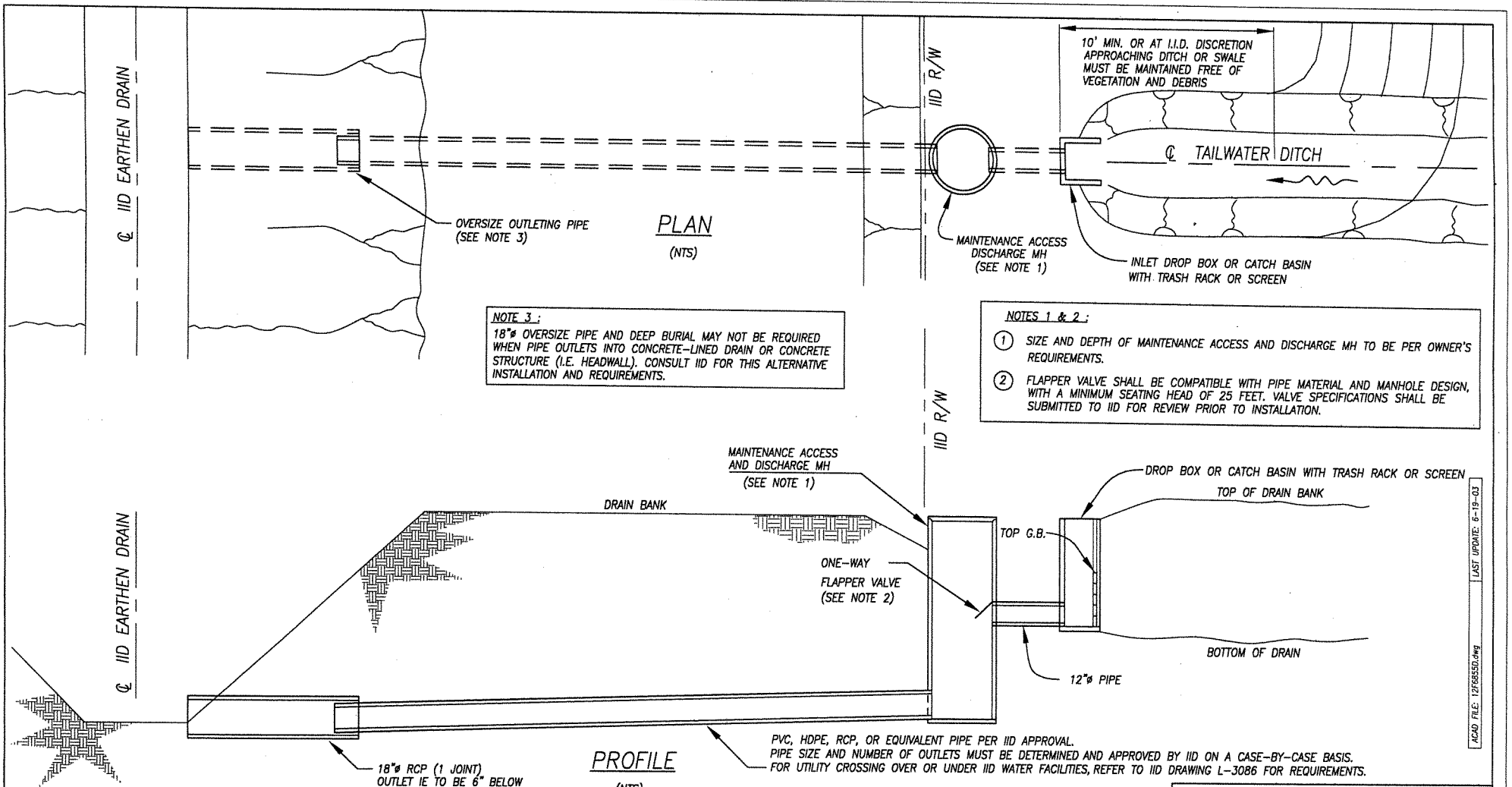
ISSUE	2	REVISED 10-29-84 D.D.
ISSUE	1	7-12-84 D.D.

IMPERIAL IRRIGATION DISTRICT
ENGINEERING DEPARTMENT
IMPERIAL, CALIFORNIA

AGRICULTURAL SURFACE DISCHARGE STANDARDS
PRIVATE TAILWATER FACILITY INSTALLATION DISCHARGING INTO IMPERIAL IRRIGATION DISTRICT (IID) DRAIN PIPELINE

SH. 3 OF 7

DWG. NO. 12F-6855



LEGEND

RCP = REINFORCED CONCRETE PIPE	MH = MANHOLE	G.B. = GRADE BOARD	R/W = RIGHT OF WAY
PVC = POLYVINYL CHLORIDE	℄ = CENTER LINE	S = SLOPE	
HDPE = HIGH DENSITY POLYETHYLENE	N.S. = NATURAL SURFACE	IE = INVERT ELEVATION	

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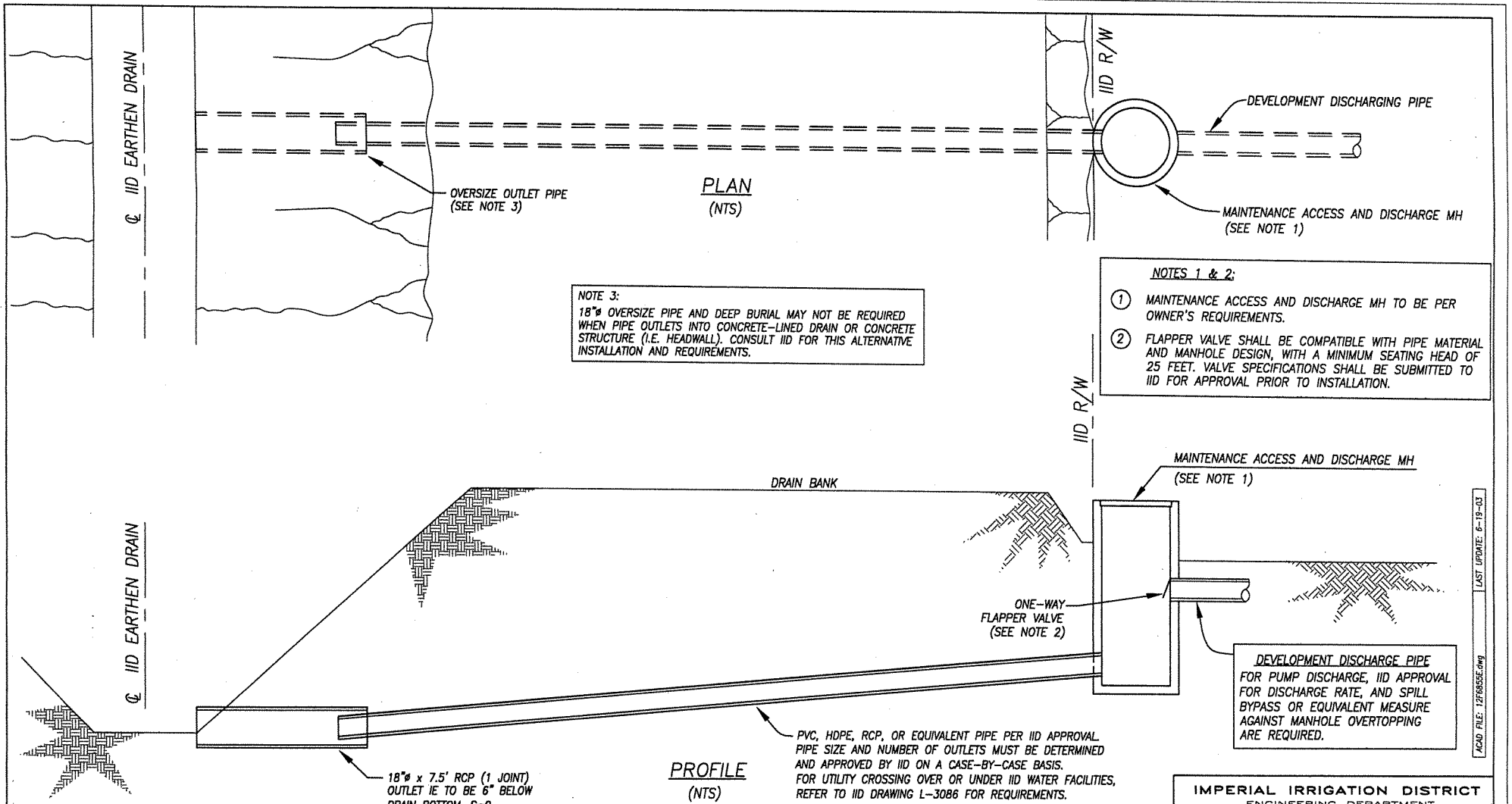
ISSUE 4	REVISED 4-30-98	A.J.
ISSUE 3	REVISED 7-26-95	D.D.
ISSUE 2	REVISED 10-29-84	D.D.
ISSUE 1	7-12-84	D.D.

IMPERIAL IRRIGATION DISTRICT
ENGINEERING DEPARTMENT
IMPERIAL, CALIFORNIA

ROADWAY STORM DRAIN DISCHARGE STANDARDS
PRIVATE FACILITY INSTALLATION DISCHARGING INTO IMPERIAL IRRIGATION DISTRICT (IID) DRAIN CHANNEL

DWG. NO. 12F-6855



LEGEND

RCP = REINFORCED CONCRETE PIPE	MH = MANHOLE	G.B. = GRADE BOARD	R/W = RIGHT OF WAY
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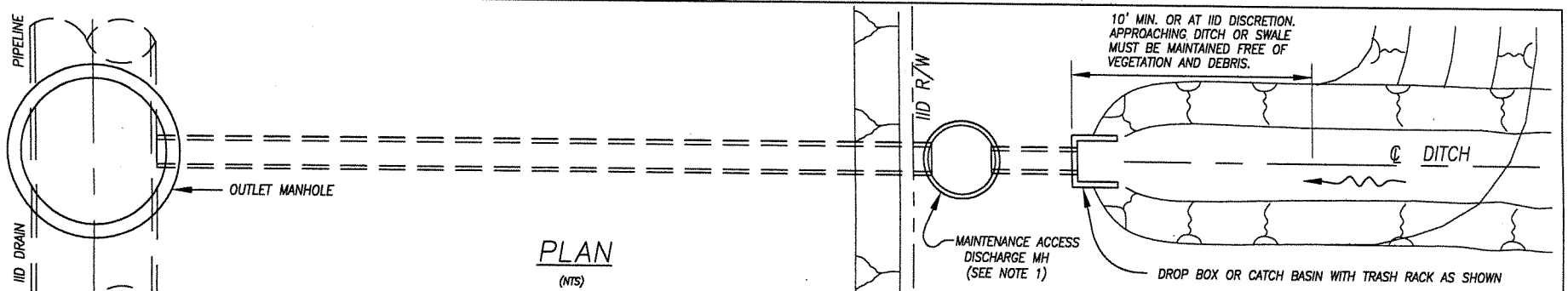
ISSUE	1	10-27-93 B.V.

IMPERIAL IRRIGATION DISTRICT
ENGINEERING DEPARTMENT
IMPERIAL, CALIFORNIA

DEVELOPMENT
DISCHARGE STANDARDS
PRIVATE FACILITY INSTALLATION DISCHARGING INTO
IMPERIAL IRRIGATION DISTRICT (IID) DRAIN CHANNEL

SH. 5 OF 7

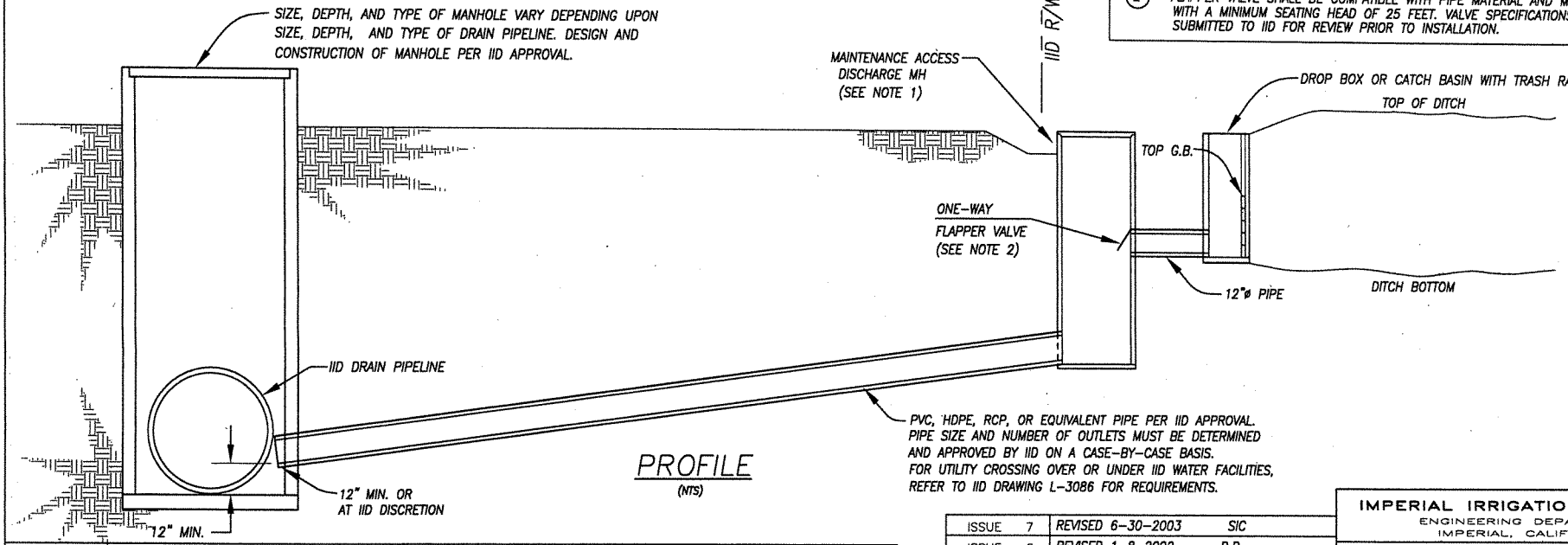
DWG. NO. 12F-6855



PLAN
(NTS)

NOTES 1 & 2:

1. SIZE AND DEPTH OF MAINTENANCE ACCESS AND DISCHARGE MANHOLE TO BE PER OWNER'S REQUIREMENTS.
2. FLAPPER VALVE SHALL BE COMPATIBLE WITH PIPE MATERIAL AND MANHOLE DESIGN, WITH A MINIMUM SEATING HEAD OF 25 FEET. VALVE SPECIFICATIONS SHALL BE SUBMITTED TO IID FOR REVIEW PRIOR TO INSTALLATION.



PROFILE
(NTS)

LAST UPDATE: 06-30-03
ACAD FILE: 12F6855F.dwg

LEGEND

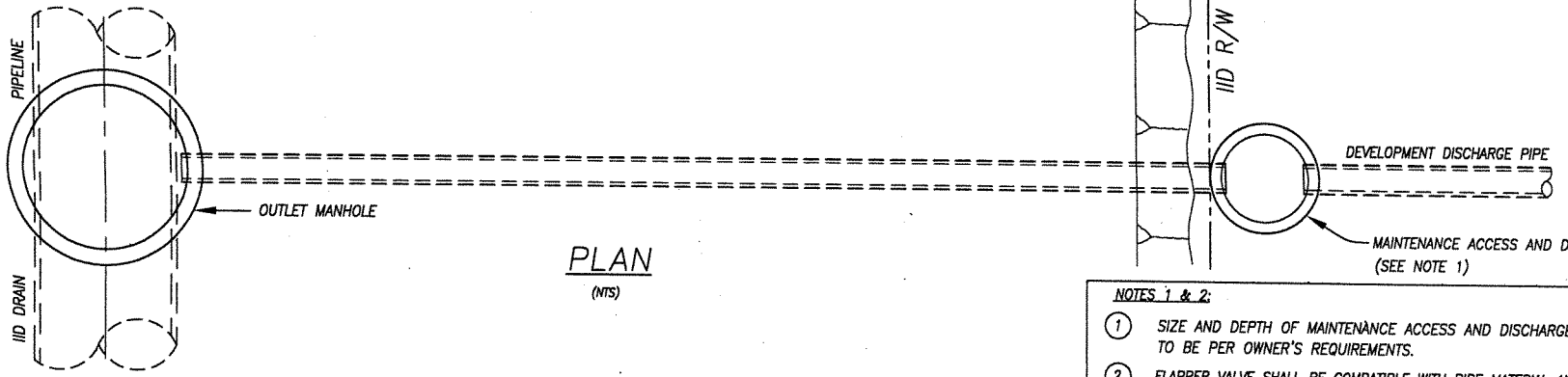
RCP = REINFORCED CONCRETE PIPE	MH = MANHOLE	G.B. = GRADE BOARD	R/W = RIGHT OF WAY
PVC = POLYVINYL CHLORIDE	℄ = CENTER LINE	S = SLOPE	
HDPE = HIGH DENSITY POLYETHYLENE	N.S. = NATURAL SURFACE	IE = INVERT ELEVATION	

ISSUE	7	REVISED 6-30-2003	SIC
ISSUE	6	REVISED 1-8-2002	D.D.
ISSUE	5	REVISED 6-27-2000	D.D.
ISSUE	4	REVISED 4-30-98	A.J.
ISSUE	3	REVISED 7-26-95	D.D.
ISSUE	2	REVISED 10-29-84	D.D.
ISSUE	1	7-12-84	D.D.

IMPERIAL IRRIGATION DISTRICT
ENGINEERING DEPARTMENT
IMPERIAL, CALIFORNIA

ROADWAY STORM DRAIN DISCHARGE STANDARDS
PRIVATE FACILITY INSTALLATION DISCHARGING INTO IMPERIAL IRRIGATION DISTRICT (IID) DRAIN PIPELINE

DWG. NO. 12F-6855



PLAN
(NTS)

NOTES 1 & 2:

1. SIZE AND DEPTH OF MAINTENANCE ACCESS AND DISCHARGE MANHOLE TO BE PER OWNER'S REQUIREMENTS.
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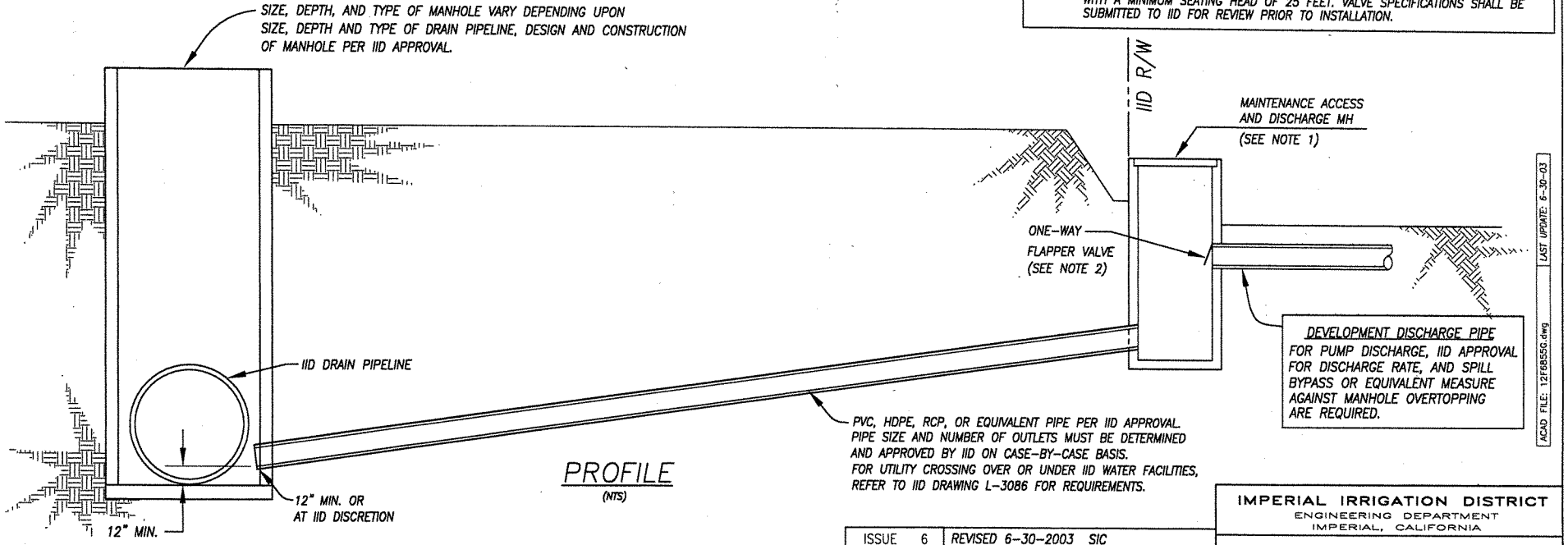

PROFILE
(NTS)

LAST UPDATE: 6-30-03
ACAD FILE: 12F6855G.dwg

LEGEND

RCP = REINFORCED CONCRETE PIPE	MH = MANHOLE	G.B. = GRADE BOARD	R/W = RIGHT OF WAY
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ISSUE	6	REVISED 6-30-2003 SIC
ISSUE	5	REVISED 1-08-2002 D.D.
ISSUE	4	REVISED 6-27-2000 D.D.
ISSUE	3	REVISED 10-01-96 B.V.
ISSUE	2	REVISED 7-26-95 B.V.
ISSUE	1	10-12-84

IMPERIAL IRRIGATION DISTRICT
ENGINEERING DEPARTMENT
IMPERIAL, CALIFORNIA

SUBDIVISION OR VARIOUS DEVELOPMENT DISCHARGE PRIVATE FACILITY INSTALLATION DISCHARGE INTO IMPERIAL IRRIGATION DISTRICT (IID) DRAIN PIPELINE

SH. 7 OF 7

DWG. NO. 12F-6855

11-080200
11-IMP-98
KP 48.5/52.2

DRAINAGE RISK ANALYSIS

The drainage proposal of series of connected detention basins that are also connected directly to the proposed on-site drainage systems for SR-98 (preferred alternative) and the complexity of these proposed drainage systems necessitates a discussion on the risks associated with the current preferred proposal.

Detention Basin Systems
Typically, detention basins are used to meter proposed drainage outflow to existing outflow conditions. In this project, the outlet options within the proposed project limits are extremely limited as well as subject to delayed outlet flow conditions. Therefore, the proposed detention basins are required to not only meter the proposed flow but to also act as retention basins during times where outflow is not possible. Therefore, the basins will serve as retention basins until such time as they are able to drain. Once the basins begin to drain, they act as detention basins.

Detention Basins System 1: Between Dogwood Rd and All American Canal there are two detention basins connected in series that drain east to the All American Canal Drain No. 9 (west side of the All American Canal). SR-98 on site drainage systems drain directly in to these in-line detention basins

Detention Basin System 2: Between All American Canal and Kloke Rd there are two detention basins connected in series that drain west to the All American Canal Drain No. 10 (east side of the All American Canal. SR-98 on site drainage systems drain directly in to these in-line detention basins

Detention Basin System 3: Between Kloke Rd and Union Pacific Railroad there are two detention basins connected in series that drain west to a pump station that will pump water into an existing 600mm pipe on Kloke Rd.

The basins are interconnected with pipes and as a result the water surface elevations will reach equilibrium between the basins. Since these basins act as systems, they must continue to be analyzed this way during the PS&E. In the PR phase the three basin systems were each analyzed as two retention basins functioning in series. The drainage exhibit submitted with the preliminary drainage report demonstrates that each system has a uniform water surface elevation, based on a cumulative 100-year 24-hour storm volume. In each system, a pair of basins was interconnected with storm drain to allow two basins to rise uniformly to a common water surface elevation. All three of the interconnected systems are capable of containing the entire volume of a 100-year, 24-hour storm, with an average freeboard of 12 inches.

During the retention phase of the basin systems there is a risk that the backwater effect on the roadway inlets could cause localized flooding. This should be analyzed carefully in the PS&E phase. During the PR phase the on-site cross culverts connecting the curb inlets to the detention basins were analyzed using Bentley CulvertMaster software to study if there would be any backwater effect from the tailwater elevation in the basins or the minimum 0.3% proposed culvert slopes. A worst case scenario was analyzed; a theoretical situation where the basins had already received the full 100-year 24-hour storm volume and the curb inlet continued to receive peak flow from the roadway runoff. The analysis concluded that the headwater elevation in the curb inlet would be below the edge of traveled way, indicating that flooding into the traveled lanes would not occur. The tailwater elevation in the detention basins does affect the ability of the curb inlets to accept stormwater drainage from the roadway during the 100-yr 24-hr storm, but not enough to back up into the traveled lanes.

In the case of Detention Basin System 1 and 2 the basins are draining in union to a single 300mm pipe (per IID regulations). The design in the PR phase assumes a worst case scenario, in that the design assumes that there is no free outfall to accept the roadway drainage. The basins were designed to retain the entire volume of a 100 year, 24 hour storm for the times when the receiving drains are at capacity. With the capacity of the basins, the output hydrograph can be designed to accommodate various downstream conditions. The risk at the PS&E phase is the potential for a designer to reduce the size/volume of these basins under the assumption that some of the storm flow would flow into the All American drains. This reduction in basin size can be explored. However, it should be done with caution since the true operation of the All-American canal drain system is unknown. To reduce the basin size, the PS&E designer would need to analyze the operation of the All-American canal drain first, including seepage, farm water run-off and rain watersheds – assuming that all would happen simultaneously. The design study itself would be costly, and the benefit may not be worth the effort.
In the case of Detention Basin System 3 the basins are draining in union to a pump station that will then pump the water to an existing 600mm pipe with an undetermined water surface elevation (HGL) at the point of connection. The design proposed assumes, similarly to system 1 and 2, that there will be a restricted outfall into the existing 600mm pipe. Due to this potential restriction the design proposes that a low volume pump be used to avoid pushing the existing pipe over capacity. The design calculates that an outfall rate of 1 CFS (449 gpm) would drain the entire volume of a 100 year, 24 hour storm in less than 30 hours. Design is cautioned that there will need to be two switches to control the pump, one in the basin that determines that there is indeed water in the basin, and a switch in the outfall pipe to determine that the pipe is not exceeding capacity. The Caltrans Office of Electrical, Mechanical, Water and Wastewater will need to be consulted to receive approval of the system design. Due to the complex nature of these drainage systems, additional design time and support monies should be allocated in the PS&E phase.

GEOTECHNICAL DESIGN REPORT
STATE ROUTE 98
CALEXICO
CALTRANS DISTRICT 11
IMPERIAL COUNTY, CALIFORNIA

PREPARED FOR:

MR. CHRIS JOHNSON
DOKKEN ENGINEERING
9665 CHESAPEAKE DRIVE, SUITE 435
SAN DIEGO, CALIFORNIA 92123

PREPARED BY:

SOUTHERN CALIFORNIA SOIL & TESTING, INC.
6280 RIVERDALE STREET
SAN DIEGO, CALIFORNIA 92120

Providing Professional Engineering Services Since 1959

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

San Diego Office

PHONE (619) 280-4321
TOLL FREE (877) 215-4321
FAX (619) 280-4717

P.O. Box 600627
San Diego, CA 92160-0627
6280 Riverdale Street
San Diego, CA 92120
www.scst.com

Indio Office

PHONE (760) 775-5983
TOLL FREE (877) 215-4321
FAX (760) 775-8362

83-740 Citrus Avenue
Suite G
Indio, CA 92201-3438
www.scst.com

September 19, 2006

SCS&T No. 0511121p
Report No. 2

Mr. Chris Johnson
Dokken Engineering
9665 Chesapeake Drive, Suite 435
San Diego, California 92123

Subject: GEOTECHNICAL DESIGN REPORT
STATE ROUTE 98
CALEXICO
IMPERIAL COUNTY, CALIFORNIA

Dear Mr. Johnson:

This letter transmits Southern California Soil & Testing Inc.'s (SCS&T) report describing the geotechnical investigation performed at State Route 98 in Imperial County, California. This investigation was conducted in general conformance with the scope of work presented in SCS&T's proposal dated January 5, 2005.

If you have any questions concerning this report, or need additional information, please call us at (619) 280-4321.

Respectfully submitted,
SOUTHERN CALIFORNIA SOIL AND TESTING, INC.

James J. Stone, RGE 808
Principal Geotechnical Engineering
Date 09

John R. High, CEG 1237
Senior Engineering Geologist
Date

Garrett B. Fountain, RCE 63885
Project Engineer
Date 9/19/06

JJS:JRH:GBF:kv

(6) Addressee

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EXECUTIVE SUMMARY

This report presents the results of the geotechnical investigation performed for State Route 98 (SR-98) modifications in the city of Calexico, California.

We understand the modifications will consist of widening and improving SR-98 (Birch Street) from Dogwood Road to SR-111 (Imperial Avenue).

Sixteen exploratory borings were drilled to depths between approximately 1.5 meters (m) and 15.1 m with a hollow-stem auger. Selected samples from the borings were tested to evaluate pertinent classification and engineering properties. The results of the field and laboratory programs were analyzed to develop conclusions and recommendations for geotechnical design.

Fill was encountered in all of the borings. The fill consists of silty sands, sandy clays and clays. Quaternary lake deposits were encountered below the fill. These deposits consist of interbedded clays, silts and sands.

Recommendations for site preparation, grading, and pavement sections are contained in the body of the report.

1. INTRODUCTION

1.1 PROJECT DESCRIPTION

This report presents the results of the geotechnical investigation performed for the design and construction of the planned modifications to State Route 98 (SR-98) in the city of Calexico, California. A site location map is presented on Figure 1.

1.2 PROPOSED CONSTRUCTION

The planned improvements consist of widening and improving SR-98 (Birch Street) from Dogwood Road to SR-111 (Imperial Avenue).

Grading will include minimal cuts and fills in order to achieve finished grades.

1.3 SCOPE OF WORK

SCS&T developed a drilling program to explore subsurface conditions beneath the planned improvements. Selected samples were tested in the laboratory to evaluate pertinent classification and engineering properties. SCS&T also developed seismic and geologic information and groundwater data along with seismic and geologic hazards that may have a significant impact on the design and construction of the project.

Available existing subsurface information for the project area, including geologic maps published by the California Geological Survey and the United States Geological Survey were reviewed. Existing pavement structural sections were measured in test borings drilled for the Geotechnical Design Report. R-values were measured and alternatives for pavement structural sections were prepared, along with recommendations for the most suitable pavement types.

SCS&T prepared this Geotechnical Design Report containing a project description, table of existing structural sections at boring locations (identifying thickness and material types for pavement, base and subgrade), recommendations for bedding and backfill of pipeline trenches, test results, traffic indices, proposed structural sections, proposed subgrade preparation for unsuitable or saturated material (estimated depths, quantities of over excavation, and treatment procedures), other recommendations, boring logs and location maps (showing depths of borings, horizontal distances from known points to boring locations, and geotechnical analyses).

2. FIELD EXPLORATION AND LABORATORY TESTING

2.1 FIELD EXPLORATION

Sixteen exploratory borings were drilled with a hollow stem auger to depths of between 1.5 to 15.1 meters (m). Selected samples from the borings were tested to evaluate pertinent classification and engineering properties of the earth materials and enable development of geotechnical conclusions and recommendations. Approximate locations of borings are shown on Figures 2 and 3.

Drilling was performed under the direction of a SCS&T engineer who also logged the test borings and obtained samples for examination and laboratory testing. Disturbed samples were obtained from cuttings. Relatively undisturbed samples were obtained in the borings by driving a 64-millimeter (mm) inner diameter sampler with a 63.5-kilogram (kg) hammer. Blow counts for the last 305mm of a 457mm drive (or less) were recorded and are noted on the Log of Test Borings (LOTB) in Appendix I.

Subsurface materials are classified in accordance with the Caltrans "Soil and Rock Logging Classification Manual."

2.2 LABORATORY TESTING

Selected samples were tested to evaluate pertinent classification and engineering properties. The program included in-situ density and moisture content determinations, grain-size analyses, atterberg limits, sand equivalences, consolidation tests, direct shear tests, R-value determinations, and pH, resistivity, soluble sulfate content and chloride content measurements. In-situ density and moisture content test results are shown on the LOTBs in Appendix I. Descriptions of test procedures and laboratory test results are contained in Appendix II.

3. SITE CONDITIONS

3.1 SITE DESCRIPTION

The project site extends approximately from SR 98 Station 495+00 to 529+00. The mainline of this portion of SR-98 is comprised of a 2 to 4-lane highway that runs in an east-west direction. Topographically, the project area is relatively flat.

The elevations along the SR 98 mainline range from approximately mean sea level (MSL) at the western end of the project to approximately 1.5 m above MSL at the eastern end. Drainage in the vicinity is accomplished via sheet flow toward drainage inlets. Storm drains and other utility lines are located in the project area. Vegetation is limited to landscaped areas and is comprised of ground cover and trees.

3.1.1 Existing Pavement Conditions

Sixteen soil borings were drilled in the right hand wheel track of the traveled way. The pavement sections consisted of Asphalt Concrete/Aggregate Base, Asphalt Concrete/Sand and Asphalt Concrete/Portland Cement Concrete Pavement (PCCP). The PCCP could not be penetrated with conventional coring equipment. The existing pavement sections measured in the test borings are shown in Table 1.

Table 1 – Existing Pavement Structural Sections

Location	Asphalt Concrete Section (mm)	Portland Cement Concrete (mm)	Aggregate Base or Sand (mm)
B-1 Station 510+00, 4 meters left	229	Unable to determine depth	N/A
B-2 Station 511+40, 4 meters right	178	None	457 (AB)
B-3 Station Number 513+95 4 meters right	178	None	457 (AB)
B-4 Station 515+20, 4 meters right	254	None	None
B-5 Station 516+40, 4 meters left	254	Unable to determine depth	None
B-6 Station 517+95, 4 meters right	229	None	None
B-7 Station 518+95, 4 meters left	254	Unable to determine depth	None
B-8 Station 519+95, 4 meters left	254	Unable to determine depth	None
B-9 Station 521+00, 4 meters right	178	None	203 (Sand)
B-10 Station 521+85, 4 meters left	178	None	305 (AB)
B-11 Station 524+00, 1 meter right	305	None	457 (Sand)
B-12 Station 495+45, 4 meters right	200	None	305 (AB)
B-14 Station 498+16, 4 meters right	150	None	480 (AB)
B-15 Station 502+85, 4 meters right	165	None	305 (AB)

Typically, the distress consists of shrinkage cracks and cracks that appear to reflect trench lines for subsurface utilities.

In addition to measuring the existing pavement sections a deflection analysis was performed for the subject project. The results are presented in Appendix IV.

3.2 GENERAL GEOLOGY

3.2.1 Geologic Setting

The project site is underlain by fill and quaternary lake deposits associated with the Ancient Lake Coahuilla. The lake deposits are comprised of interbedded clays, silts and sands. A local geology map is shown on Figure 4.

3.2.2 Tectonic Setting

No faults have been mapped within the limits of the planned improvements. Much of Southern California, including the Imperial County area, is characterized by a series of Quaternary-age fault zones that typically consist of several individual en echelon faults that generally strike in a northerly to northwesterly direction. Some of these fault zones (and the individual faults within each zone) are classified as active while others are classified as potentially active. Active fault zones are those that have shown conclusive evidence of faulting during the Holocene Epoch (the most recent 11,000 years) while potentially active fault zones have demonstrated movement during the Pleistocene Epoch (11,000 to 2 million years before the present) but no movement during Holocene time.

The active Brawley-Imperial West Fault is located approximately 10 kilometers east of the alignment. Other active fault zones in the region that could possibly affect the project include the Laguna Salada Fault and the Centinela Fault to the west, and the Superstition Hills Fault to the north.

3.3 GEOLOGIC HAZARDS

3.3.1 Groundshaking

A likely geologic hazard to affect the project is groundshaking as a result of movement along one of the active fault zones mentioned above. The Brawley-Imperial West Fault is the closest fault likely to cause the most severe ground shaking (California Seismic Hazard Map 1996, Mualchin, L.). This fault is shown as capable of producing a 7.0 magnitude earthquake. The potential peak acceleration is approximately 0.3g (g = acceleration due to gravity).

3.3.2 Surface Rupture and Soil Cracking

Based on our literature review, the site is not subject to surface rupture or soil cracking. The potential for surface rupture and soil cracking from active sources is considered negligible.

3.3.3 Liquefaction

Liquefaction is a phenomenon that can result in large total and differential ground surface settlements and possible lateral spreading during an earthquake. Liquefaction occurs when loose, saturated, generally fine sands are subject to strong ground shaking. The soils lose shear strength and become liquid. The fill and lake deposits underlying the alignment are not considered liquefiable due to their relatively high density and substantial clay content.

3.4 SUBSURFACE CONDITIONS

Fill and Lacustrine deposits underlie the subject site.

3.4.1 Fill

Fill was encountered in the exploratory borings to depths ranging from about ½ to 1½ m. The fill consists of silty sands, sandy clays and clays.

3.4.2 Quaternary Lake Deposits

Quaternary lake deposits were encountered below the fill. These deposits consist of interbedded clays, silts and silty sands. The clays and silts have a stiff to very stiff consistency and the silty sand is medium dense. These deposits extended to the maximum depth explored of about 15 m below the existing ground surface.

3.5 GROUNDWATER

Groundwater was encountered in boring B-16 at a depth of about 5 m below the ground surface (-4.1 m MSL). The groundwater level can be expected to vary depending on local irrigation, rainfall, and runoff.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 EARTHWORK

4.1.1 General

Earthwork should be performed in conformance with Sections 6-3, 19-3, 19-5 and 19-6 of the Caltrans Standard Specifications. Consideration should be given to including the following amendments to the Standard Specification in the project special provisions:

- Section 19-3.06 – Ponding or jetting of backfill should not be permitted.
- Section 19-3.065 – Pervious backfill should have a gradation which will minimize migration of fines from the adjacent soil. Alternatively, a non-woven geotextile (e.g. Supac 4NP or Nilex N45) can be placed between pervious backfill and adjacent soil. A geocomposite drain (e.g. Tensar DC1100) can be used behind retaining walls in lieu of pervious backfill.

Representative samples of the upper 1.2 m of material below the pavement subgrade (total depth of 1.2 m plus pavement structural section thickness below final pavement surface grade) in both cut and embankment areas should be obtained and tested to evaluate expansion potentials and R-values after grading and before the pavement is constructed.

The project geotechnical engineer should observe excavation and fill placement within 1.2 m of pavement subgrade.

Excavated native materials placed as fill are estimated to shrink approximately 5 percent in volume for earthwork estimating purposes.

4.1.2 Surface Drainage

Roadway drainage should be directed to appropriate collection and discharge facilities. Temporary erosion control measures should be kept in place until permanent vegetation is established.

4.1.3 Construction Considerations

Conventional heavy equipment in good working order is expected to be able to excavate the materials on-site. Soft, wet, spongy areas could be encountered that will require drying prior to compaction.

4.2 SETTLEMENT

New fills up to about 1 m in height are anticipated along the planned alignment. Post-construction surface settlement due to static loads is expected to be slight. Settlement is expected to be complete within approximately 30 days after fill loads are applied.

4.3 CORROSION

Based on Caltrans “Corrosion Guidelines, Version 1.0”, dated September 2003, laboratory test results indicate that most of the materials underlying the site form a non-corrosive environment with respect to steel and reinforced concrete. The results of the tests to determine the potential corrosivity of the site are presented on page II-24 of Appendix II. CAP and 18 gage CSP/CASP can be used for flow velocities less than 1.5 m/s with non-abrasive conditions. Standard reinforced concrete pipe design should be suitable for this level of chlorides.

For structural elements, the Division of Engineering Services Materials Engineering and Testing Services Corrosion Technology Branch considers a site to be corrosive if one or more of the following conditions exist for the representative soil and/or water samples taken at the site:

- Chloride concentration is 500 parts per million (ppm) or greater
- Sulfate concentration is 2000 ppm or greater
- pH is 5.5 or less

Type II modified portland cement is recommended for use in concrete in contact with ground. Standard reinforced concrete pipe design can be used.

It should be noted that thicker gages might be needed for abrasion, strength, and overfill requirements. Gravelly soils and cobbles might be considered potentially abrasive.

4.4 PAVEMENT STRUCTURAL SECTIONS

Five R-value tests were performed on bulk samples obtained from test borings B-2, B-6, B-11, B-12 and B-15. These samples are considered to be reasonably representative of materials likely to comprise final pavement subgrades along the alignment (see Appendix II). The lowest R-value measured in the tests was <5. An R-Value <5 was used for the design of the pavement structural sections. Additional tests should be performed during final grading, when actual subgrade materials can be determined. Dokken Engineering provided Traffic Indices (TIs). Based on this information, the pavement structural sections were calculated. These pavement sections are shown in Table 2.

Table 2 –Pavement Structural Sections

SR - 98 (R-Value <5)		
Location	**Traffic Index**	**Flexible Pavement Section**
SR-111 to Lee Avenue/ V.V. Williams Avenue	12.5	195mm AC (Type A)/ 840mm Cl 2 AB
Lee Avenue/ V.V. Williams Avenue to Kloke Road	13.5	210mm AC (Type A)/ 915mm Cl 2 AB
Kloke Road to Dogwood	12.5	195mm AC (Type A)/ 840mm Cl 2 AB

AC (TYPE A) – Asphalt Concrete Pavement
Cl 2 AB – Class 2 Aggregate Base

Improving the subgrade can reduce the overall thickness of the design pavement sections. The subgrade can be improved through removal and replacement of the existing soil with material having a higher R-value. Typically, removal and replacement would extend to a depth of 1 m below the bottom of the flexible pavement structural section. If soft or loose soils are exposed in the bottom of the excavation, a reinforcing fabric such as Mirafi Geolon HP570 can be placed on the bottom of the excavation before new fill is placed. An additional alternative is to improve subgrade conditions through lime stabilization. Detailed recommendations for lime stabilization can be prepared if this alternative is selected.

The pavement sections in Table 3 represent possible alternatives that can be used if existing soils are removed and replaced with material having an R-value of at least 35. Potential imported materials should be tested to determine their R-values when sources have been identified.

Table 3 - Pavement Sections for an Improved Subgrade

SR - 98 (R-Value - 35)		
Location	**Traffic Index**	**Flexible Pavement Section**
SR-111 to Lee Avenue/ V.V. Williams Avenue	12.5	195mm AC (Type A)/ 480mm Cl 2 AB
Lee Avenue/ V.V. Williams Avenue to Kloke Road	13.5	210mm AC (Type A)/ 525mm Cl 2 AB
Kloke Road to Dogwood	12.5	195mm AC (Type A)/ 480mm Cl 2 AB

AC (TYPE A) – Asphalt Concrete Pavement
Cl 2 AB – Class 2 Aggregate Base

Alternate pavement sections also can be used. Final pavement alternatives will be developed in consultation with Caltrans and city representatives. Unsuitable subgrade material should be removed and replaced with suitable material as identified by the project geotechnical engineer. The removal should extend to a depth beyond the influence of the planned construction.

5. CLOSURE

5.1 GEOTECHNICAL REVIEW

The foundation and earthwork plans and pertinent sections of the project specifications should be reviewed by the geotechnical engineer to evaluate conformance with the intent of the conclusions and recommendations contained in this report. If project conditions or final design vary from those described in this report, SCST should be contacted regarding the applicability of, and the necessity for, any revisions to the conclusions and recommendations presented in this report.

Removal of unsuitable soils, placement and compaction of structural fill, and excavations for footings should be observed by the geotechnical engineer and engineering geologist of record. Appropriate field tests should be performed to provide quality control and quality assurance for structural fills and related earthwork elements.

5.2 LIMITATIONS

This report is based on the project as described and the information obtained from the test borings at the approximate locations indicated on Figures 2 and 3. The findings are based on the results of the field, laboratory, and office investigations, combined with interpolation and extrapolation of conditions between and beyond the boring locations and reflect interpretation of the direct evidence obtained.

This report has been prepared for the use of Dokken Engineering in design of the described project. It may not contain sufficient information for other users or other purposes. This report has been prepared in accordance with generally accepted geotechnical practice in Imperial County and Caltrans guidelines and standards. It may not contain sufficient information for other projects or users.

6. REFERENCES

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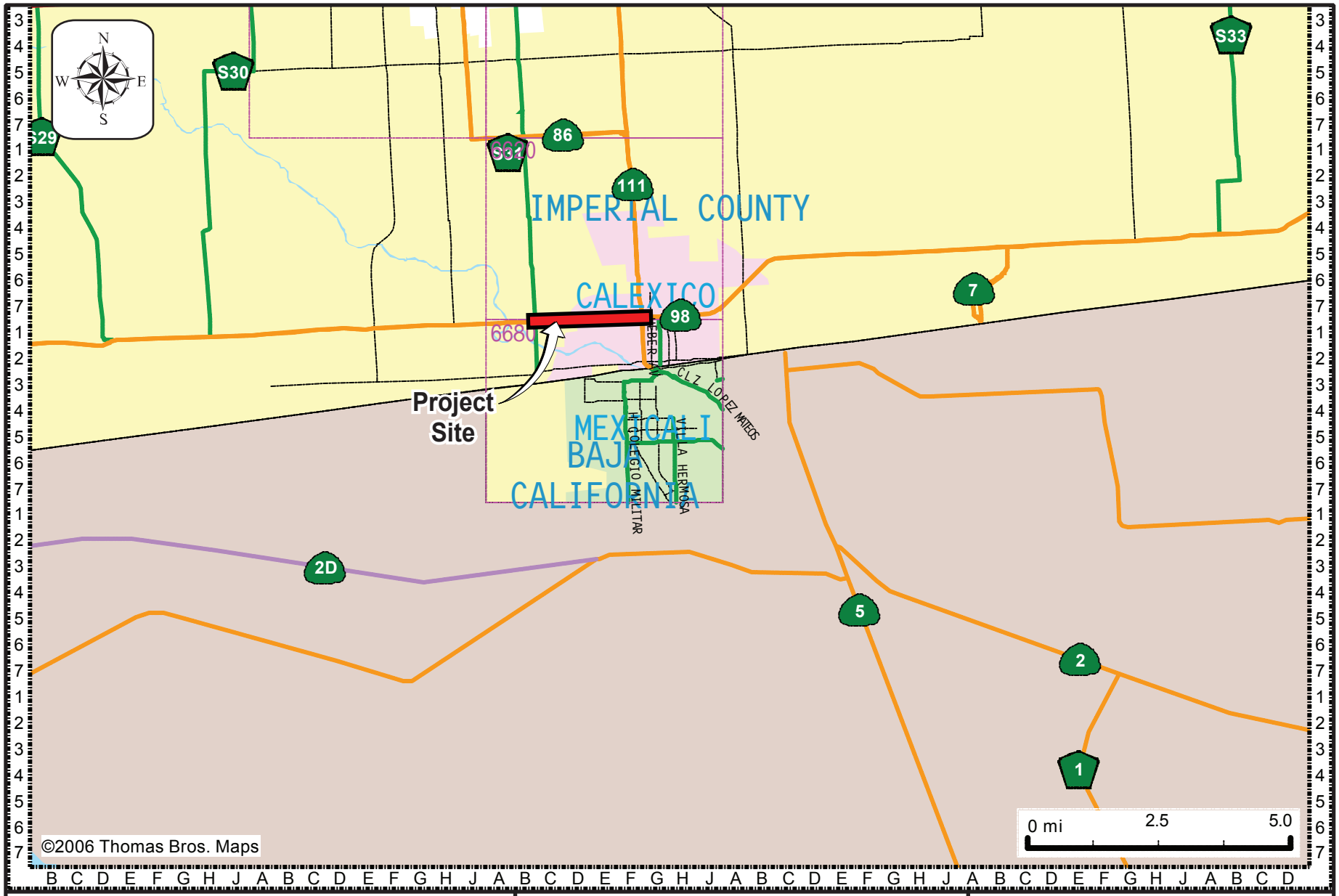
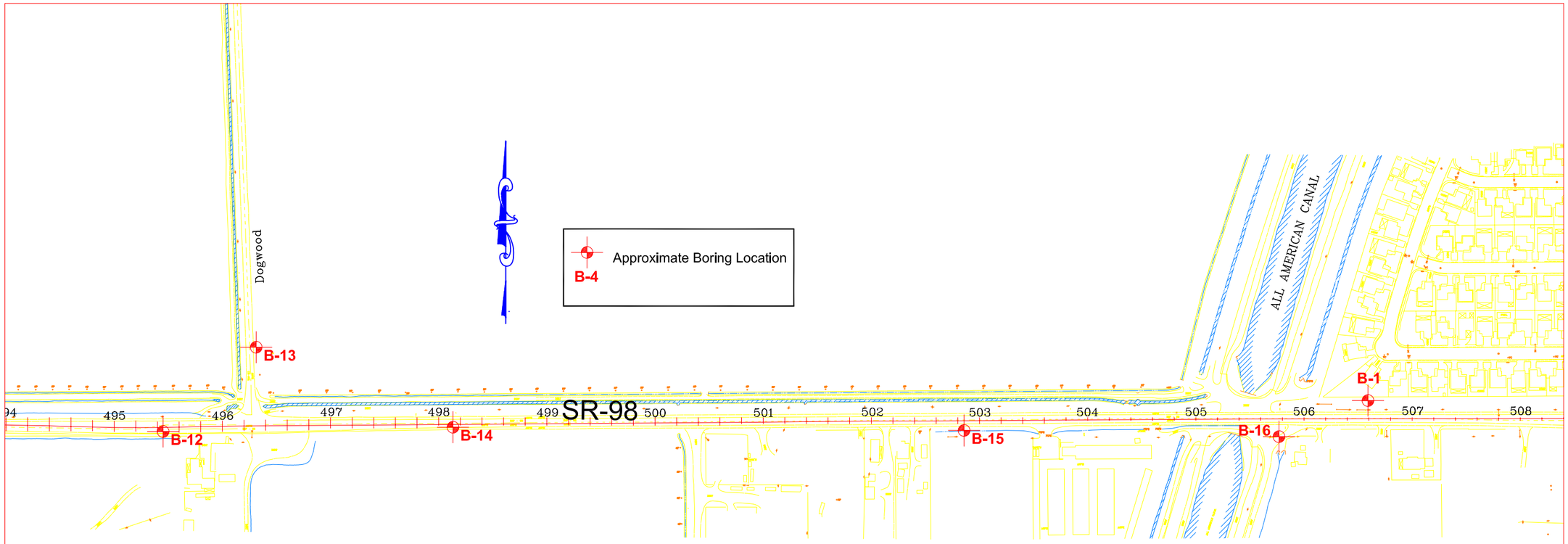


SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

SITE LOCATION MAP
SR-98 Calexico
Calexico, California

Job No. 0511121-2

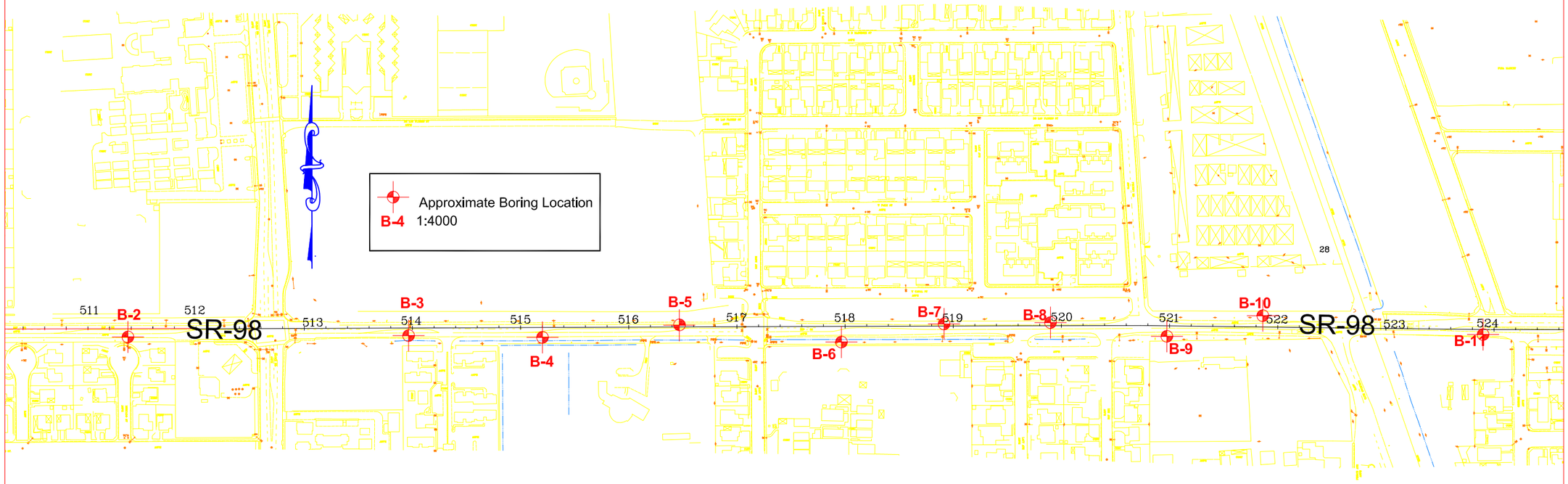
Figure: 1



SUBSURFACE INVESTIGATION LOCATION MAP

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

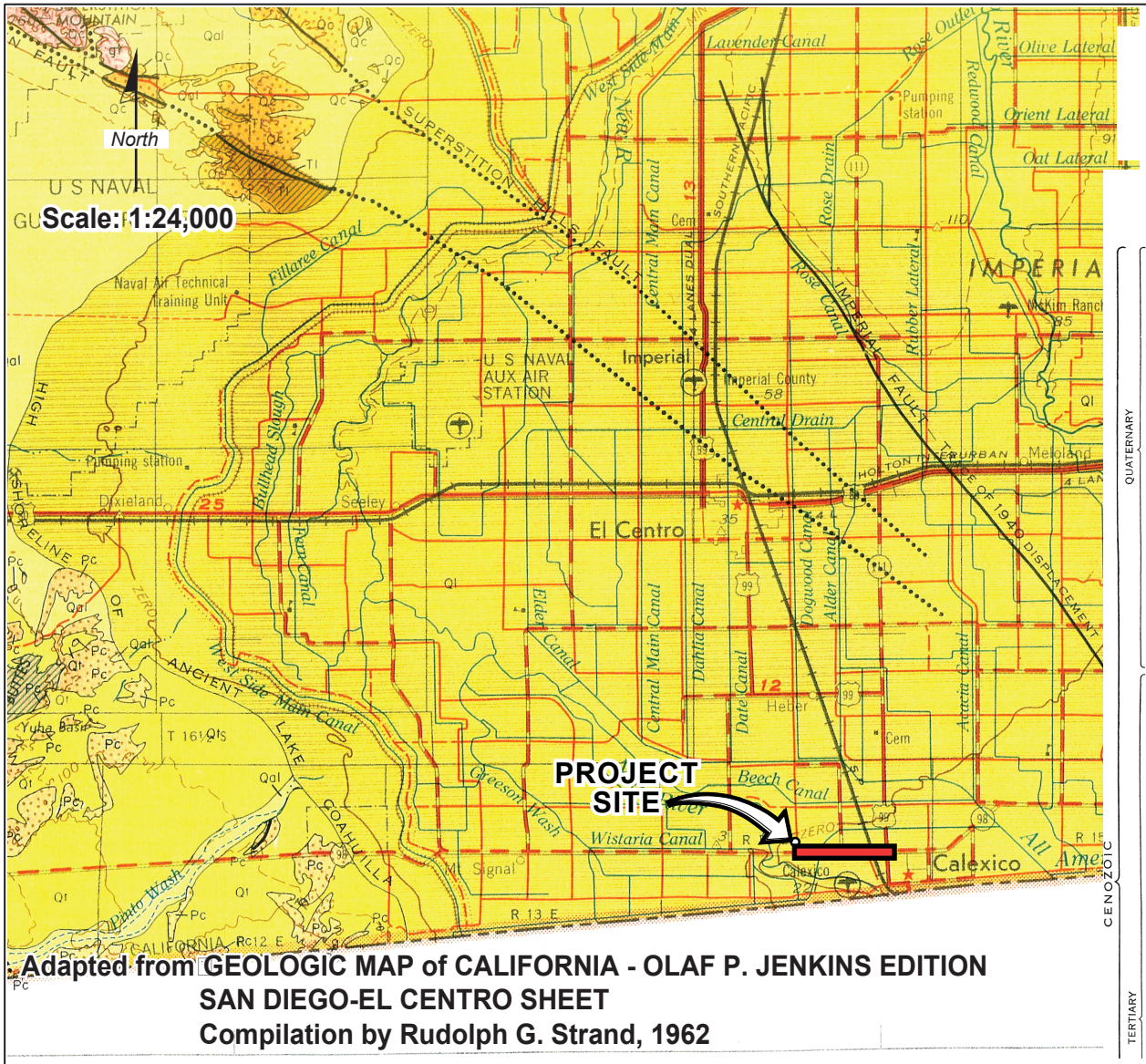
SR-98 CALEXICO		
By: GF/DAS/DCD	Scale: 1:4000	Date: 3/09/05
JOB No.: 0511121P-1	Figure: 2	



SUBSURFACE INVESTIGATION LOCATION MAP

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

SR-98 CALEXICO		
By: GF/DAS/DCD	**Scale:** 1:4000	**Date:** 3/09/05
JOB No.: 0511121P-1	**Figure:** 3	



GEOLOGIC MAP OF CALIFORNIA

OLAF P. JENKINS EDITION

SAN DIEGO-EL CENTRO SHEET

COMPILATION BY RUDOLPH G. STRAND, 1962

FOURTH PRINTING 1993

EXPLANATION

SEDIMENTARY AND METASEDIMENTARY ROCKS

IGNEOUS AND META-IGNEOUS ROCKS

CENOZOIC

QUATERNARY

Recent

- Qs — Dune sand
- Qal — Alluvium
- Qsc — Stream channel deposits (GREAT VALLEY)
- Qf — Fan deposits (GREAT VALLEY)
- Qb — Basin deposits (GREAT VALLEY)
- Qsl — Salt deposits
- Ql — Quaternary lake deposits
- Qg — Glacial deposits

Pleistocene

- Qt — Quaternary nonmarine terrace deposits
- Qm — Pleistocene marine and marine terrace deposits
- Qc — Pleistocene nonmarine
- QP — Plio-Pleistocene nonmarine

TERTIARY

Pliocene

- Pc — Undivided Pliocene nonmarine
- Puc — Upper Pliocene nonmarine
- Pu — Upper Pliocene marine
- Pmc — Middle and/or lower Pliocene nonmarine
- Pml — Middle and/or lower Pliocene marine

Miocene

- Mc — Undivided Miocene nonmarine
- Muc — Upper Miocene nonmarine
- Mu — Upper Miocene marine
- Mmc — Middle Miocene nonmarine

- Qrv — Recent volcanic: Q_{rv}^{r} —rhyolite; Q_{rv}^{a} —andesite; Q_{rv}^{b} —basalt; Q_{rv}^{p} —pyroclastic rocks
- Qpv — Pleistocene volcanic: Q_{pv}^{r} —rhyolite; Q_{pv}^{a} —andesite; Q_{pv}^{b} —basalt; Q_{pv}^{p} —pyroclastic rocks
- Quaternary and/or Pliocene cinder cones
- Pv — Pliocene volcanic: P_{v}^{r} —rhyolite; P_{v}^{a} —andesite; P_{v}^{b} —basalt; P_{v}^{p} —pyroclastic rocks
- Mv — Miocene volcanic: M_{v}^{r} —rhyolite; M_{v}^{a} —andesite; M_{v}^{b} —basalt; M_{v}^{p} —pyroclastic rocks

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

LOCAL GEOLOGY MAP
SR-98 CALEXICO
Calexico, California

Job Number: 0511121-2
Figure: 4

APPENDIX I

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	1.12	1	7

REGISTERED PROFESSIONAL ENGINEER

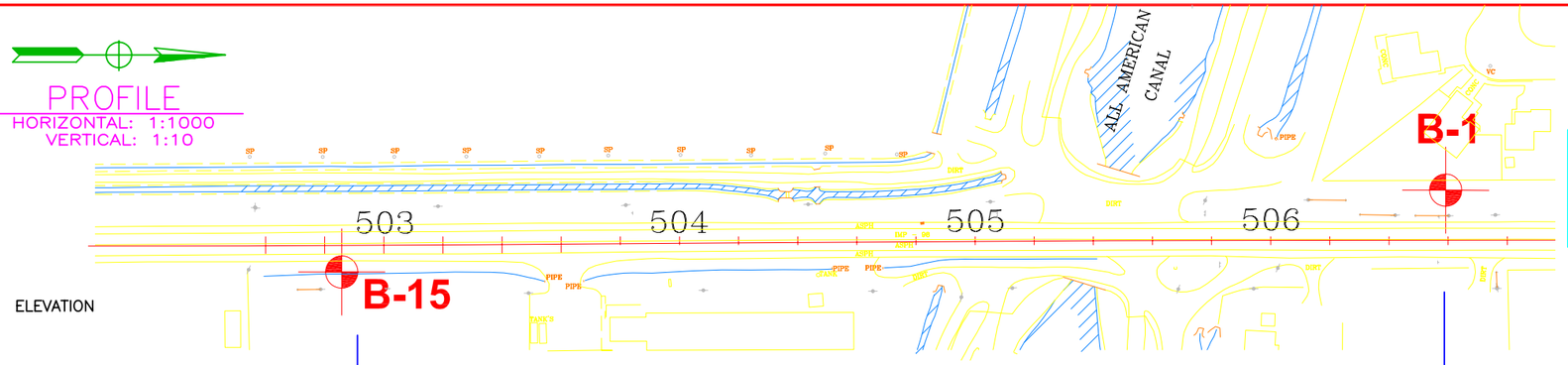
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JAMES J. STONE
No. GE 808
Exp. 12/31/07
GEOTECHNICAL
STATE OF CALIFORNIA

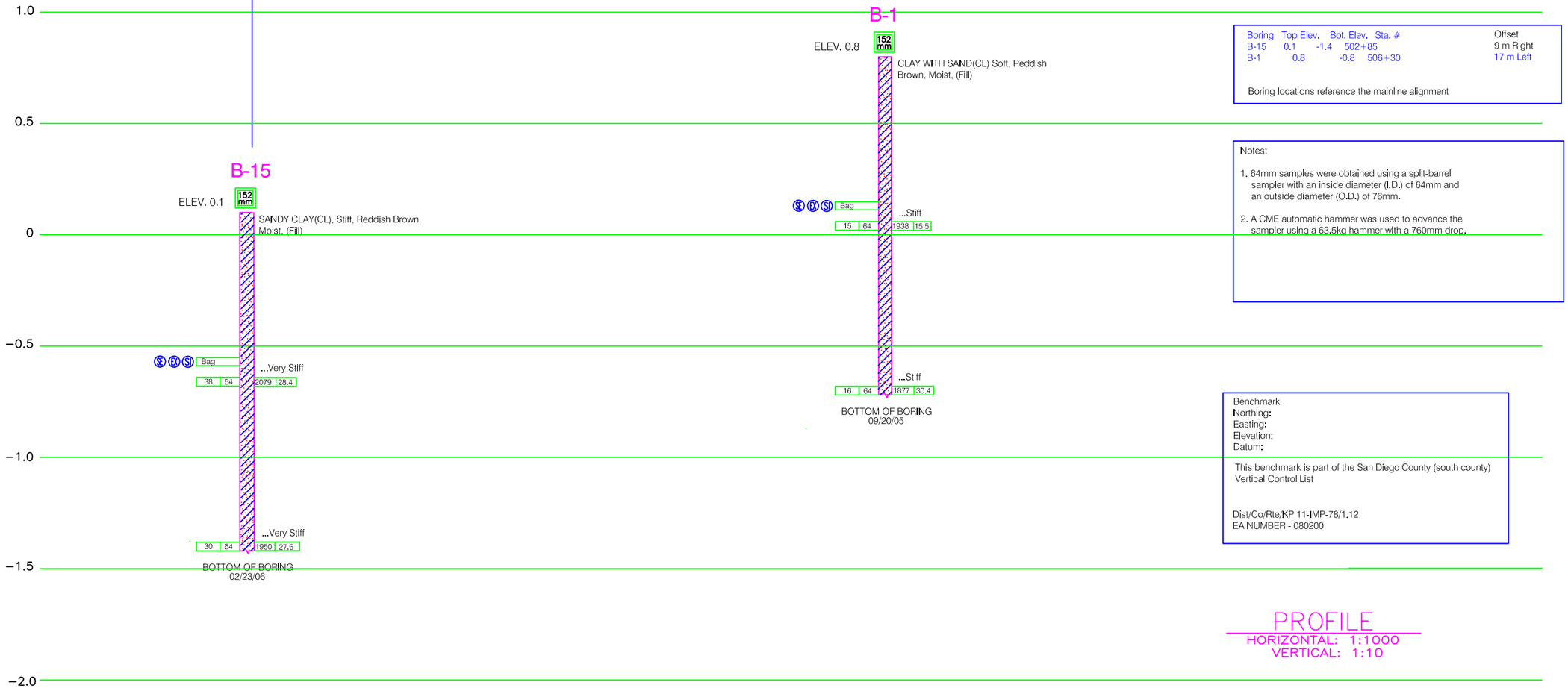
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10



ELEVATION



Boring	Top Elev.	Bot. Elev.	Sta. #	Offset
B-15	0.1	-1.4	502+85	9 m Right
B-1	0.8	-0.8	506+30	17 m Left

Boring locations reference the mainline alignment

Notes:

1. 64mm samples were obtained using a split-barrel sampler with an inside diameter (I.D.) of 64mm and an outside diameter (O.D.) of 76mm.
2. A CME automatic hammer was used to advance the sampler using a 63.5kg hammer with a 760mm drop.

Benchmark
Northing:
Easting:
Elevation:
Datum:

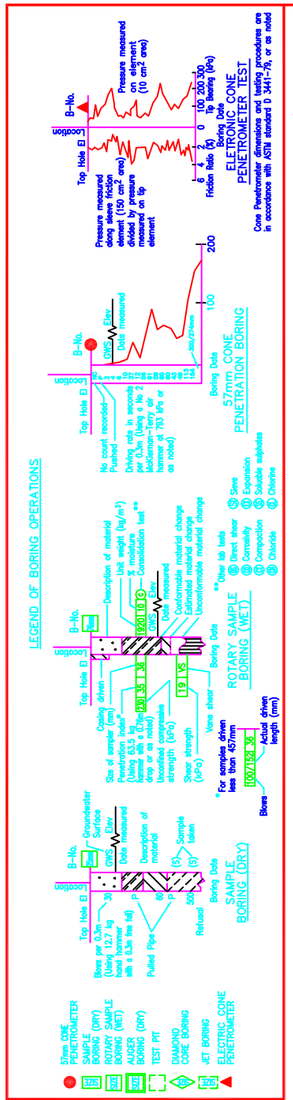
This benchmark is part of the San Diego County (south county) Vertical Control List

Dist/Co/Rte/KP 11-IMP-78/1.12
EA NUMBER - 080200

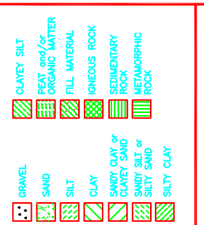
PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10

SCS&T JOB No. 0511121P
Appendix I-1

LEGEND OF BORING OPERATIONS



LEGEND OF EARTH MATERIALS



CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test

Cohesive	Penetration Index (blows/0.3m)	Very soft	Soft	Firm	Stiff	Very stiff	Hard
	<2	2–4	5–8	9–15	16–30	>31	
Granular	Penetration Index (blows/0.3m)	0–4	5–10	11–30	31–50	>50	
		Very loose	Loose	Medium dense	Dense	Very dense	

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DESIGN OVERSIGHT		DRAWN BY	G. FOUNTAIN	G. FOUNTAIN/ M. METHA		PROJECT ENGINEER	BRIDGE NO. N/A
SIGN OFF DATE		CHECK BY	J.J. STONE	FIELD INVESTIGATOR	DATE SEPT.20, 2005/FEB.23, 2006		KILOMETER POST 1.12

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 98–CALEXICO
LOG OF TEST BORINGS

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 20 40 60 80 100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF
--	1	7

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	1.12	2	7

REGISTERED PROFESSIONAL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JAMES J. STONE
No. GE 808
Exp. 12/31/07
GEOTECHNICAL
STATE OF CALIFORNIA

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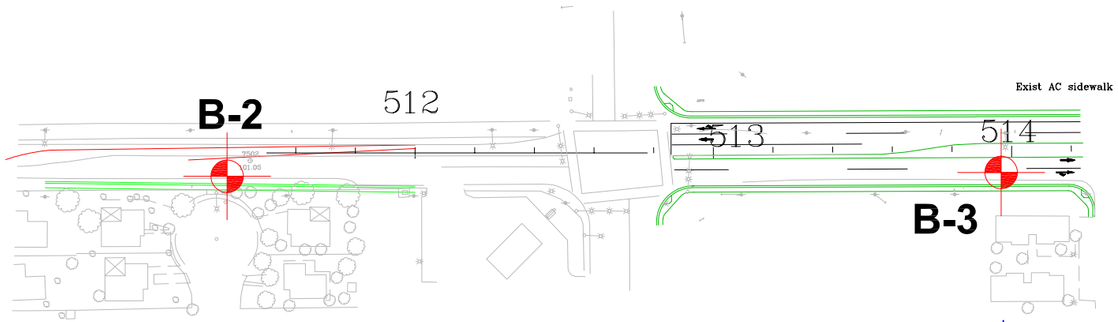
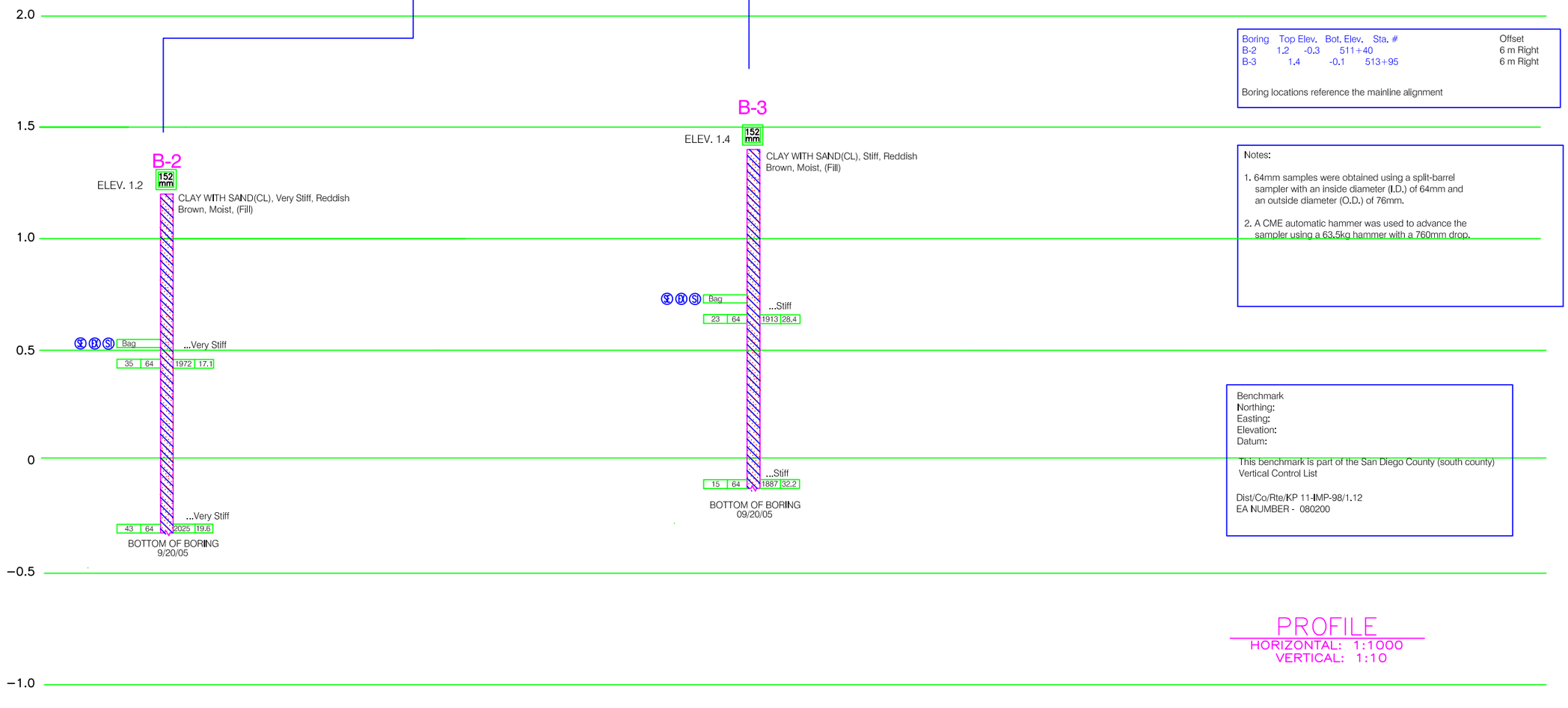
Metric

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10



ELEVATION



Boring	Top Elev.	Bot. Elev.	Sta. #	Offset
B-2	1.2	-0.3	511+40	6 m Right
B-3	1.4	-0.1	513+95	6 m Right

Boring locations reference the mainline alignment

Notes:

1. 64mm samples were obtained using a split-barrel sampler with an inside diameter (I.D.) of 64mm and an outside diameter (O.D.) of 76mm.
2. A CME automatic hammer was used to advance the sampler using a 63.5kg hammer with a 760mm drop.

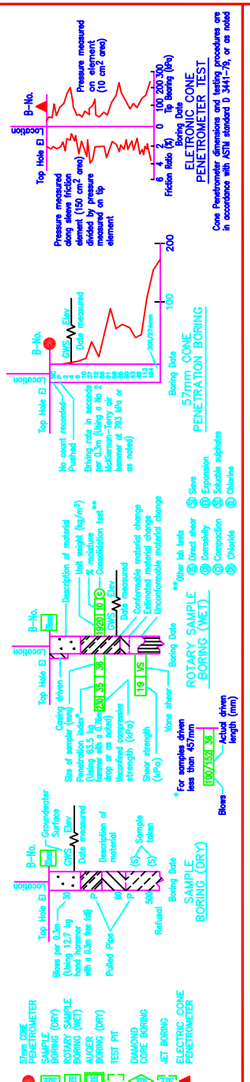
Benchmark
Northing:
Easting:
Elevation:
Datum:

This benchmark is part of the San Diego County (south county) Vertical Control List

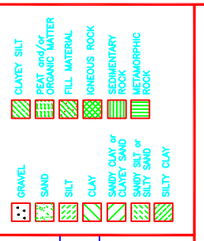
Dist/Co/Rte/KP 11-IMP-98/1.12
EA NUMBER - 080200

SCS&T JOB No. 0511121P
Appendix I-2

LEGEND OF BORING OPERATIONS



LEGEND OF EARTH MATERIALS



CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

Cohesive	Very soft	
	Soft	
	Firm	
	Stiff	
	Very Stiff	
	Hard	
Penetration Index (Blows/0.3m)	<2	
	2–4	
	5–8	
	9–15	
	16–30	
	>31	
Granular	Very loose	
	Loose	
	Medium dense	
	Dense	
	Very dense	
Penetration Index (Blows/0.3m)	0–4	
	5–10	
	11–30	
	31–50	
	>50	

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DESIGN OVERSIGHT	DRAWN BY	G. FOUNTAIN	G. FOUNTAIN	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER	BRIDGE NO. N/A	STATE ROUTE 98–CALEXICO
SIGN OFF DATE	CHECK BY	J.J. STONE	FIELD INVESTIGATOR			KILOMETER POST 1.12	LOG OF TEST BORINGS
			DATE SEPTEMBER 20, 2005				

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 20 40 60 80 100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF
--	2	7

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	1.12	3	7

REGISTERED PROFESSIONAL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JAMES J. STONE
No. GE 808
Exp. 12/31/07
GEOTECHNICAL
STATE OF CALIFORNIA

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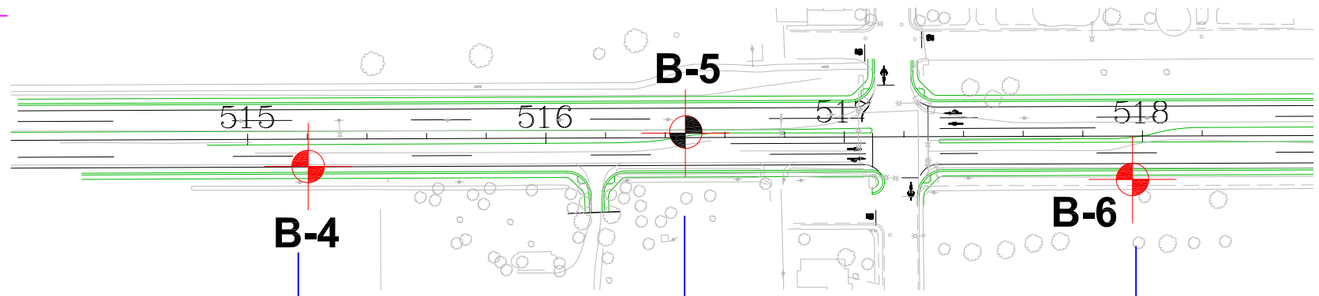
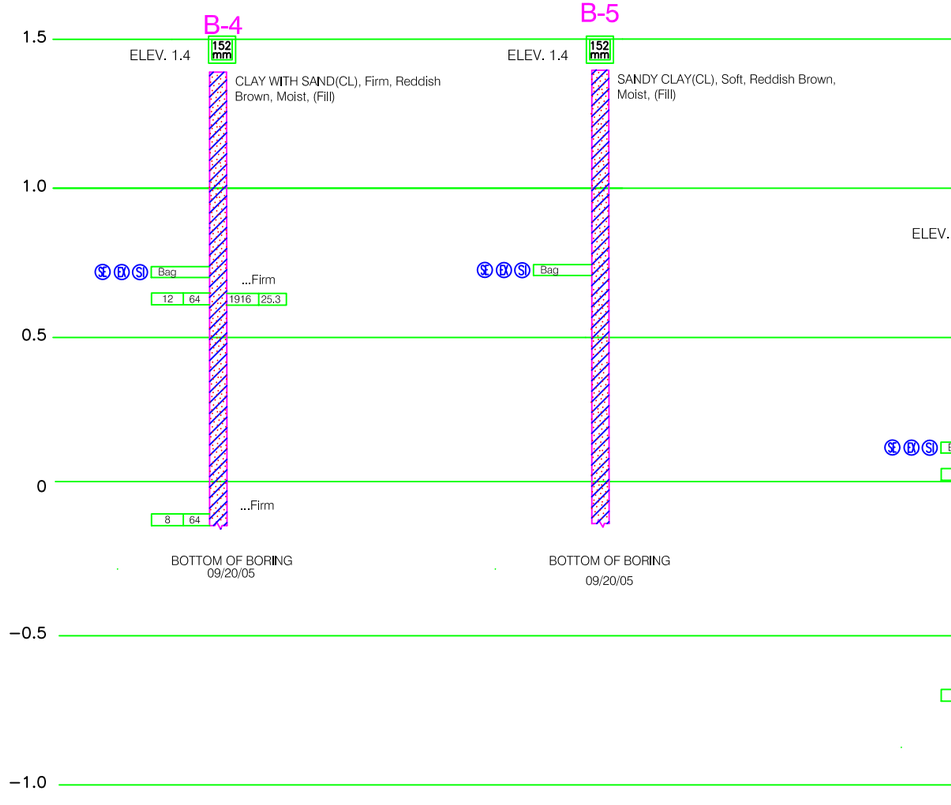
Metric

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10

ELEVATION





Boring	Top Elev.	Bot. Elev.	Sta. #	Offset
B-4	1.4	-0.1	511+20	7 m Right
B-5	1.4	-0.1	513+95	3 m Left
B-6	0.8	-0.7	517+95	12 m Right

Boring locations reference the mainline alignment

Notes:

1. 64mm samples were obtained using a split-barrel sampler with an inside diameter (I.D.) of 64mm and an outside diameter (O.D.) of 76mm.
2. A CME automatic hammer was used to advance the sampler using a 63.5kg hammer with a 760mm drop.

Benchmark
Northing:
Easting:
Elevation:
Datum:

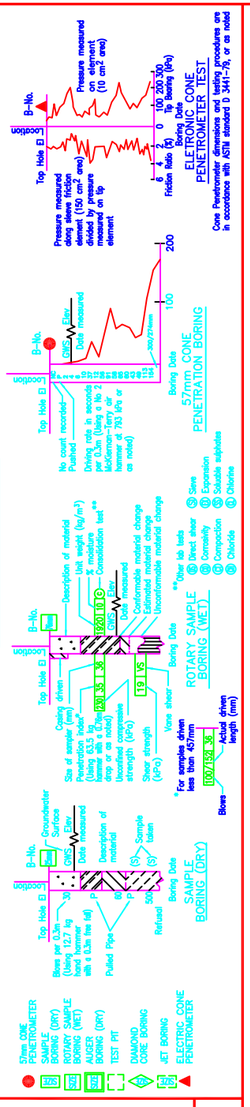
This benchmark is part of the San Diego County (south county) Vertical Control List

Dist/Co/Rte/KP 11-IMP-98/1.12
EA NUMBER - 080200

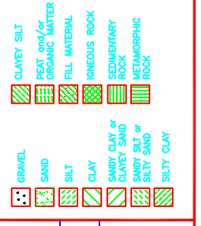
PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10

SCS&T JOB No. 0511121P
Appendix I-3

LEGEND OF BORING OPERATIONS



LEGEND OF EARTH MATERIALS



CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

	Cohesive	Very soft	Soft	Firm	Stiff	Very Stiff	Hard
Penetration Index (Blows/0.3m)		<2	2–4	5–8	9–15	16–30	>31
	Granular	Very loose	Loose	Medium dense	Dense	Very dense	
Penetration Index (Blows/0.3m)		0–4	5–10	11–30	31–50	>50	

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DESIGN OVERSIGHT	DRAWN BY	G. FOUNTAIN	
SIGN OFF DATE	CHECK BY	J.J. STONE	
	G. FOUNTAIN FIELD INVESTIGATOR	DATE SEPTEMBER 20, 2005	

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT ENGINEER

BRIDGE NO. N/A
KILOMETER POST 1.12

STATE ROUTE 98–CALEXICO
LOG OF TEST BORINGS

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 20 40 60 80 100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)										SHEET	OF
--										3	7

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	1.12	4	7

REGISTERED PROFESSIONAL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JAMES J. STONE
No. GE 808
Exp. 12/31/07
GEOTECHNICAL
STATE OF CALIFORNIA

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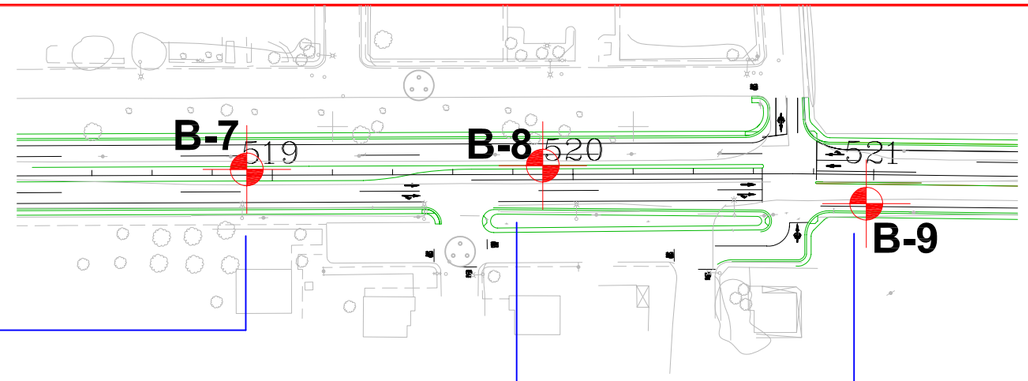
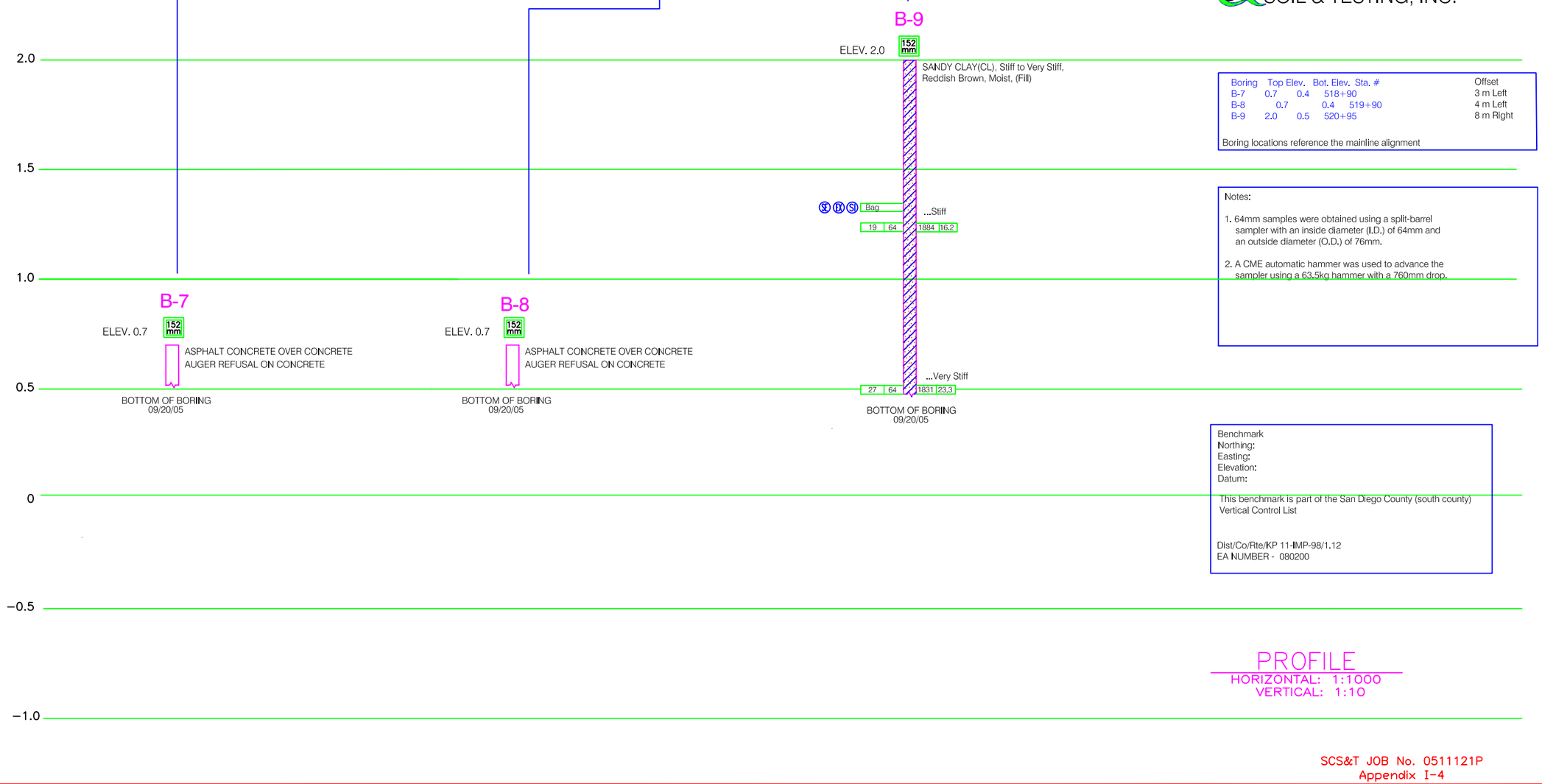
SOUTHERN CALIFORNIA SOIL & TESTING, INC.

PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10



ELEVATION



Boring	Top Elev.	Bot. Elev.	Sta. #	Offset
B-7	0.7	0.4	518+90	3 m Left
B-8	0.7	0.4	519+90	4 m Left
B-9	2.0	0.5	520+95	8 m Right

Boring locations reference the mainline alignment

Notes:

1. 64mm samples were obtained using a split-barrel sampler with an inside diameter (I.D.) of 64mm and an outside diameter (O.D.) of 76mm.
2. A CME automatic hammer was used to advance the sampler using a 63.5kg hammer with a 760mm drop.

Benchmark
Northing:
Easting:
Elevation:
Datum:

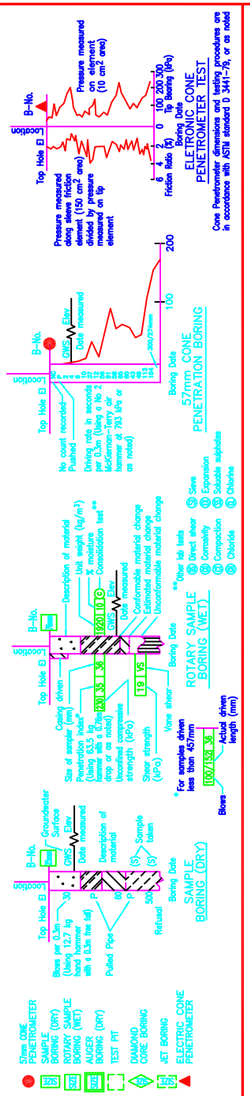
This benchmark is part of the San Diego County (south county) Vertical Control List

Dist/Co/Rte/KP 11-IMP-98/1.12
EA NUMBER - 080200

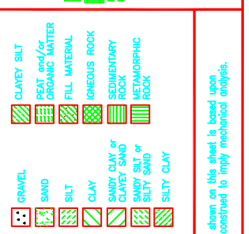
PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10

SCS&T JOB No. 0511121P
Appendix I-4

LEGEND OF BORING OPERATIONS



LEGEND OF EARTH MATERIALS



CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

Cohesive	Very soft	
	Soft	
	Firm	
	Stiff	
	Very Stiff	
	Hard	
Penetration Index (Blows/0.3m)	<2	
	2–4	
	5–8	
	9–15	
	16–30	
	>31	
Granular	Very loose	
	Loose	
	Medium dense	
	Dense	
	Very dense	
Penetration Index (Blows/0.3m)	0–4	
	5–10	
	11–30	
	31–50	
	>50	

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DESIGN OVERSIGHT	DRAWN BY	G. FOUNTAIN	G. FOUNTAIN		PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION		BRIDGE NO. N/A
SIGN OFF DATE	CHECK BY	J.J. STONE	FIELD INVESTIGATOR			PROJECT ENGINEER	KILOMETER POST 1.12
			DATE SEPTEMBER 20, 2005				

STATE ROUTE 98–CALEXICO
LOG OF TEST BORINGS

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 20 40 60 80 100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF
--	4	7

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	1.12	5	7

REGISTERED PROFESSIONAL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
JAMES J. STONE
No. GE 808
Exp. 12/31/07
GEOTECHNICAL
STATE OF CALIFORNIA

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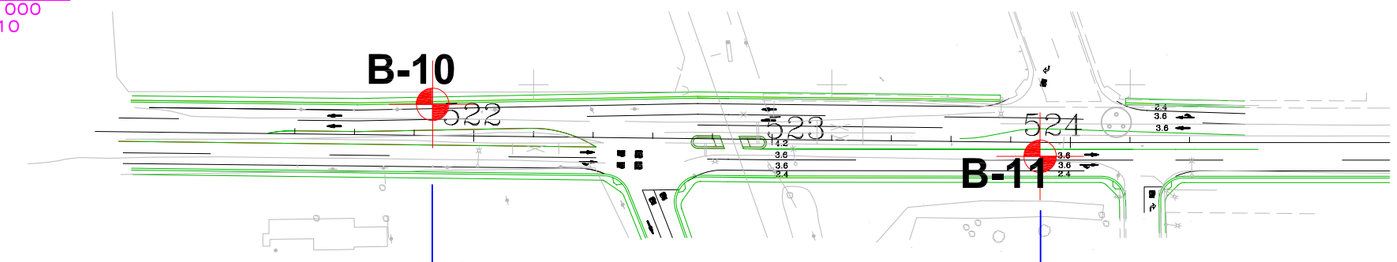
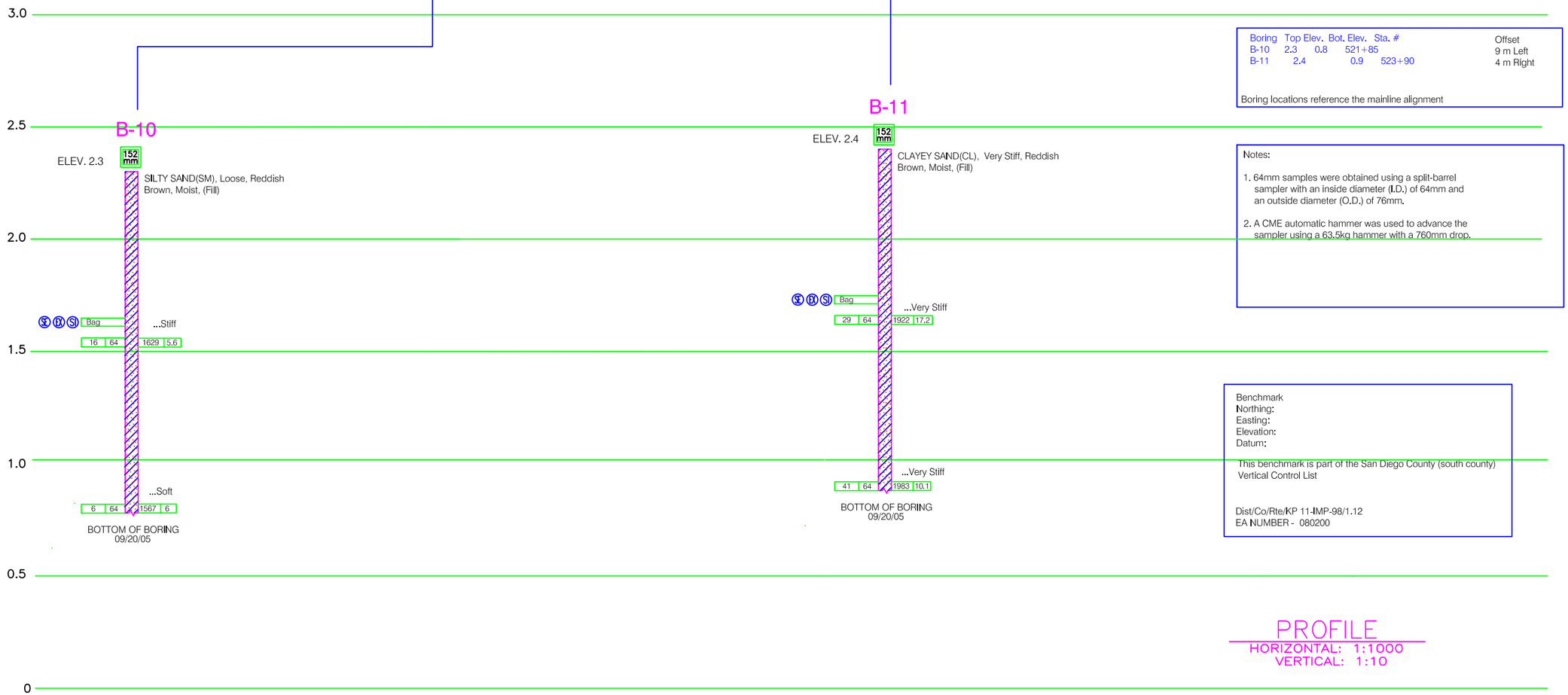
SOUTHERN CALIFORNIA SOIL & TESTING, INC.

annie0116@hotmail.com

PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10



ELEVATION



Boring	Top Elev.	Bot. Elev.	Sta. #	Offset
B-10	2.3	0.8	521+85	9 m Left
B-11	2.4	0.9	523+90	4 m Right

Boring locations reference the mainline alignment

Notes:

1. 64mm samples were obtained using a split-barrel sampler with an inside diameter (I.D.) of 64mm and an outside diameter (O.D.) of 76mm.
2. A CME automatic hammer was used to advance the sampler using a 63.5kg hammer with a 760mm drop.

Benchmark
Northing:
Easting:
Elevation:
Datum:

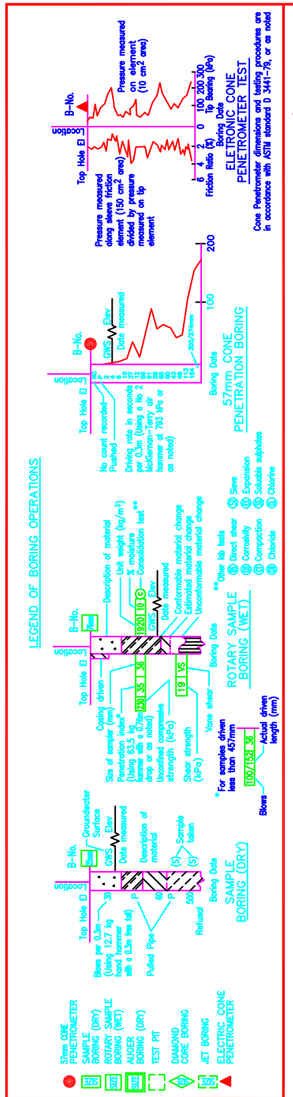
This benchmark is part of the San Diego County (south county) Vertical Control List

Dist/Co/Rte/KP 11-IMP-98/1.12
EA NUMBER - 080200

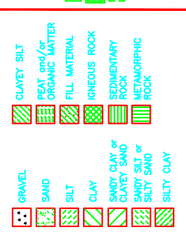
PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10

SCS&T JOB No. 0511121P
Appendix I-5

LEGEND OF BORING OPERATIONS



LEGEND OF EARTH MATERIALS



CONSISTENCY CLASSIFICATION FOR SOILS

According to the Standard Penetration Test

Cohesive	Very soft	Soft	Firm	Stiff	Very stiff	Hard
Penetration Resist. (Blows/0.3m)	<2	2–4	5–8	9–15	16–30	>31
Granular	Very loose	Loose	Medium dense	Dense	Very dense	
Penetration Resist. (Blows/0.3m)	0–4	5–10	11–30	31–50	>50	

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply reasoned analysis.

DESIGN OVERSIGHT	DRAWN BY	G. FOUNTAIN	G. FOUNTAIN		PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER	BRIDGE NO. N/A
SIGN OFF DATE	CHECK BY	J.J. STONE	FIELD INVESTIGATOR				KILOMETER POST 1.12
			DATE SEPTEMBER 20, 2005				

STATE ROUTE 98–CALEXICO
LOG OF TEST BORINGS

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 20 40 60 80 100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF
--	5	7

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	1.12	6	7

REGISTERED PROFESSIONAL ENGINEER

PLANS APPROVAL DATE

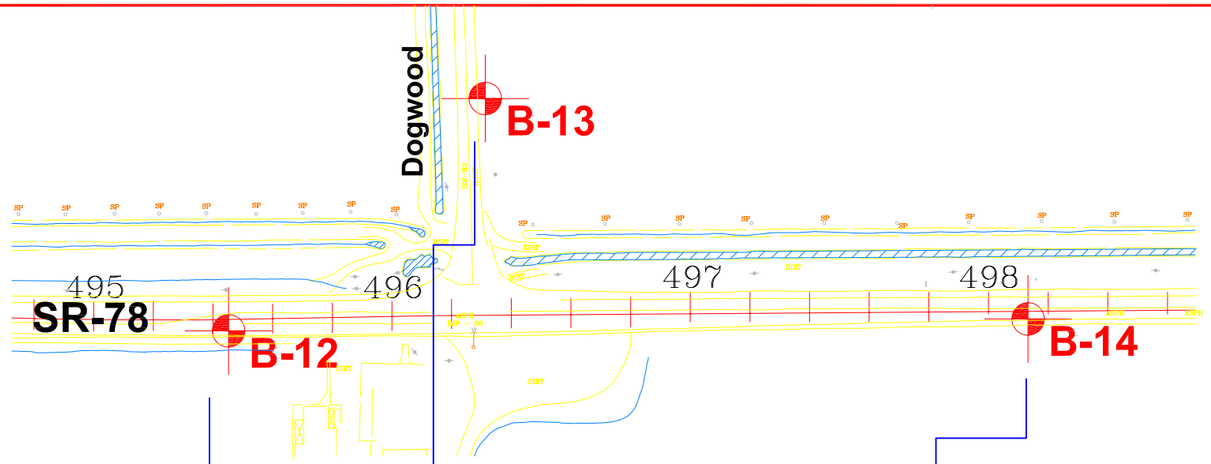
REGISTERED PROFESSIONAL ENGINEER
JAMES J. STONE
No. GE 808
Exp. 12/31/07
GEOTECHNICAL
STATE OF CALIFORNIA

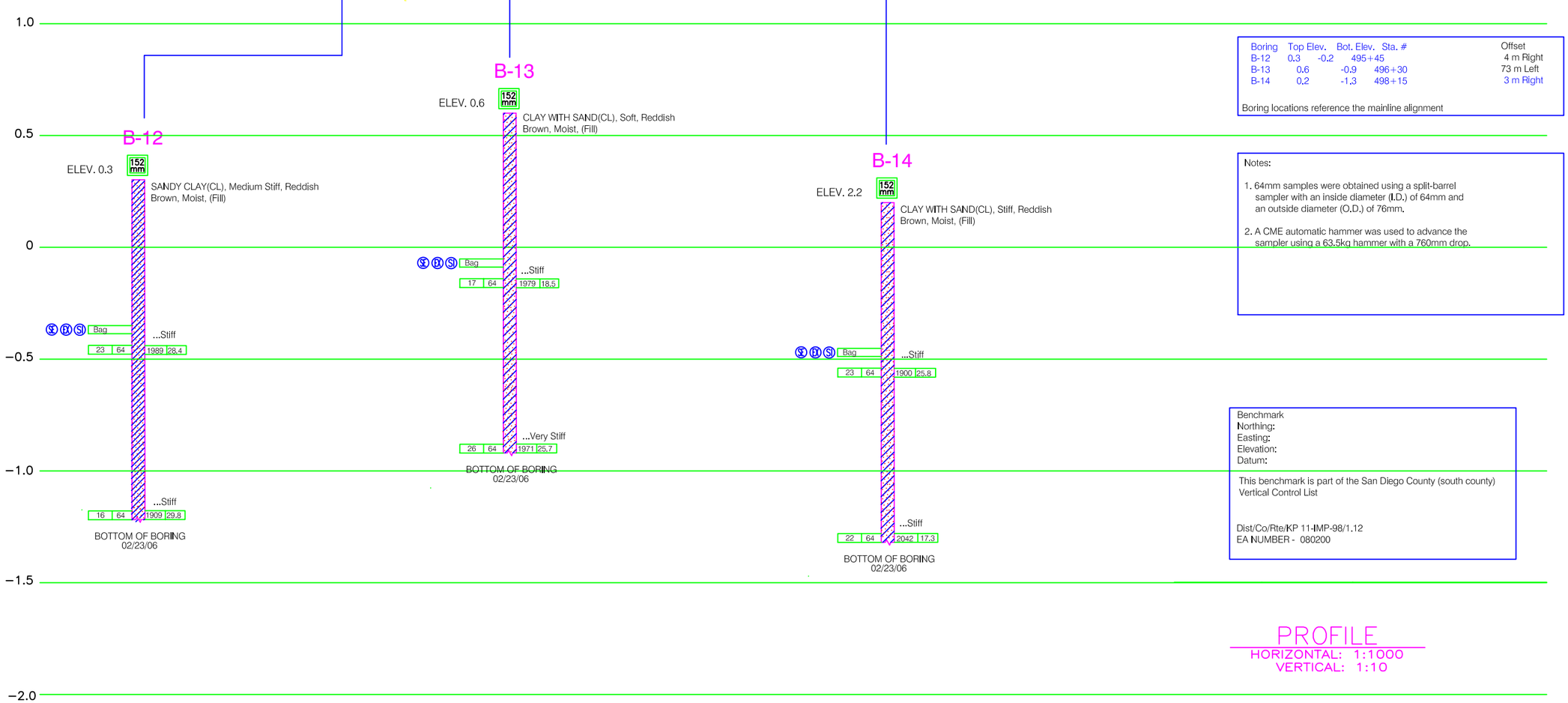
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10

ELEVATION





Boring	Top Elev.	Bot. Elev.	Sta. #	Offset
B-12	0.3	-0.2	495+45	4 m Right
B-13	0.6	-0.9	496+30	73 m Left
B-14	0.2	-1.3	498+15	3 m Right

Boring locations reference the mainline alignment

Notes:

1. 64mm samples were obtained using a split-barrel sampler with an inside diameter (I.D.) of 64mm and an outside diameter (O.D.) of 76mm.
2. A CME automatic hammer was used to advance the sampler using a 63.5kg hammer with a 760mm drop.

Benchmark
Northing:
Easting:
Elevation:
Datum:

This benchmark is part of the San Diego County (south county) Vertical Control List

Dist/Co/Rte/KP 11-IMP-98/1.12
EA NUMBER - 080200

PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:10

SCS&T JOB No. 0511121P
Appendix I-6

LEGEND OF BORING OPERATIONS

ELECTRONIC CONE PENETROMETER TEST
Cone Penetrometer dimensions and testing procedures are in accordance with ASTM standard D 3441-79, or as noted

57mm CONE PENETRATION BORING

ROTARY SAMPLE BORING (WET)

SAMPLE BORING (DRY)

57mm CONE PENETROMETER
SAMPLE BORING (DRY)
ROTARY SAMPLE BORING (WET)
AUGER BORING (DRY)
TEST PIT
DIAMOND CORE BORING
JET BORING
ELECTRIC CONE PENETROMETER

LEGEND OF EARTH MATERIALS

GRAVEL
SAND
SILT
CLAY
SANDY CLAY or CLAYEY SAND
SANDY SILT or SILTY SAND
SILTY CLAY
CLAYEY SILT
PEAT, and/or ORGANIC MATTER
FILL MATERIAL
IGNEOUS ROCK
SEDIMENTARY ROCK
METAMORPHIC ROCK

CONSISTENCY CLASSIFICATION FOR SOILS
According to the Standard Penetration Test

Cohesive	Very soft	Soft	Firm	Stiff	Very stiff	Hard
Penetration Resist. (Blows/0.3m)	<2	2–4	5–8	9–15	16–30	>31
Granular	Very loose	Loose	Medium dense	Dense	Very dense	
Penetration Resist. (Blows/0.3m)	0–4	5–10	11–30	31–50	>50	

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DESIGN OVERSIGHT	DRAWN BY	G. FOUNTAIN	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER	BRIDGE NO. N/A
SIGN OFF DATE	CHECK BY	J.J. STONE	M. METHA FIELD INVESTIGATOR		KILOMETER POST 1.12
			DATE FEBRUARY 23, 2006		

STATE ROUTE 98–CALEXICO
LOG OF TEST BORINGS

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 20 40 60 80 100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF
--	6	7

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	IMP	98	1.12	7	7

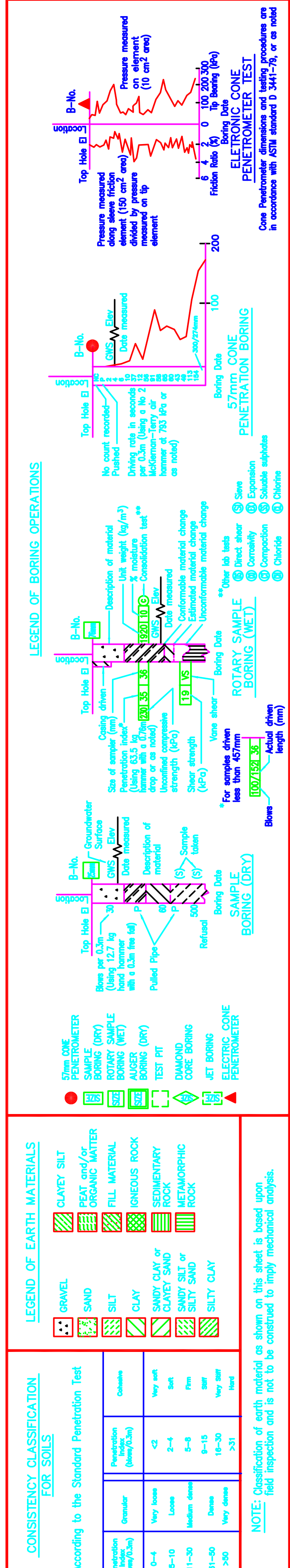
REGISTERED PROFESSIONAL ENGINEER

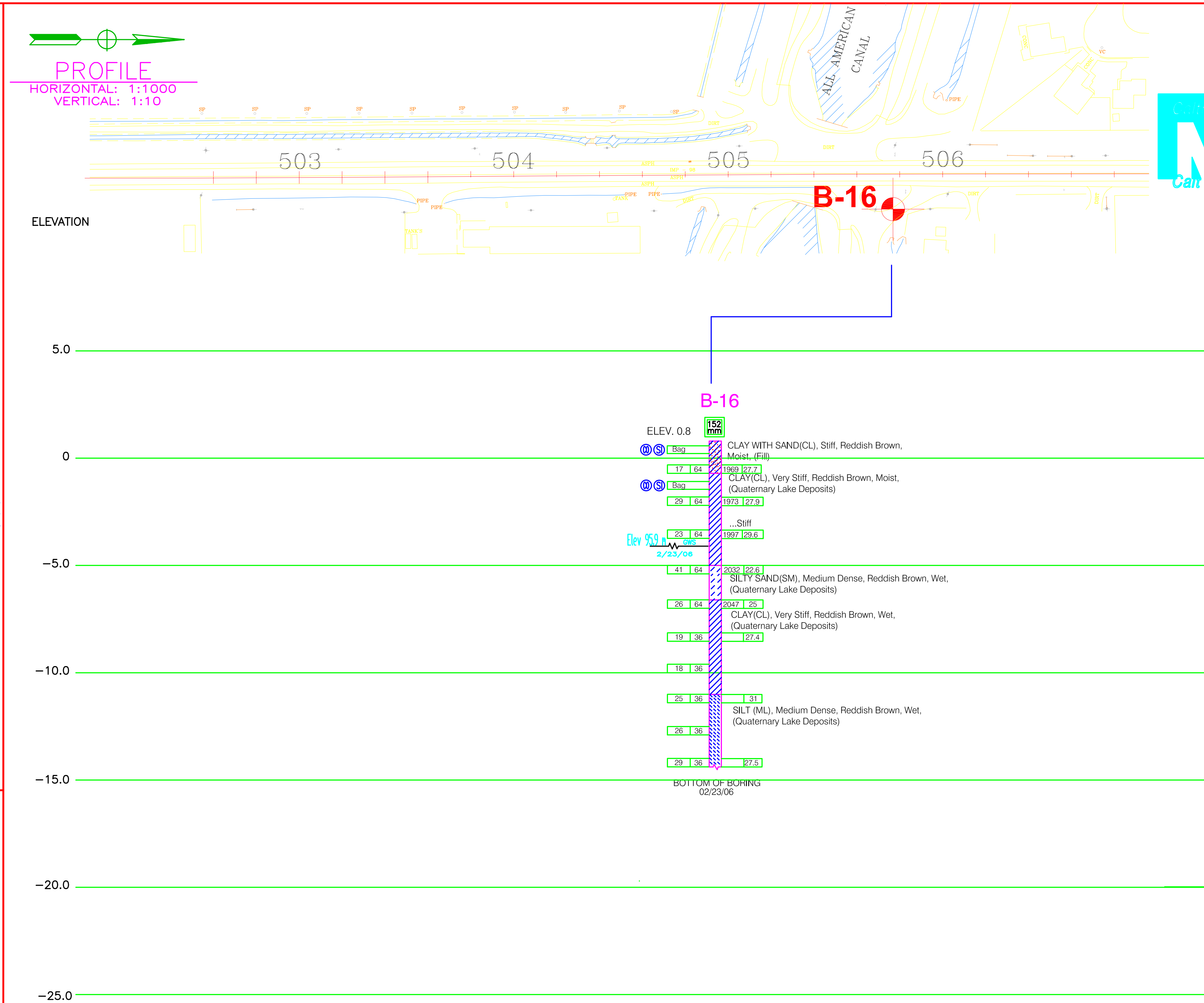
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER JAMES J. STONE No. GE 808 Exp. 12/31/07 GEOTECHNICAL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

SOUTHERN CALIFORNIA SOIL & TESTING, INC.





Boring	Top Elev.	Bot. Elev.	Sta. #	Offset
B-16	0.8	-14.4	505+77	6 m Right

Boring locations reference the mainline alignment

Notes:

1. 64mm samples were obtained using a split-barrel sampler with an inside diameter (I.D.) of 64mm and an outside diameter (O.D.) of 76mm.
2. A CME automatic hammer was used to advance the sampler using a 63.5kg hammer with a 760mm drop.

Benchmark
Northing:
Easting:
Elevation:
Datum:

This benchmark is part of the San Diego County (south county) Vertical Control List

Dist/Co/Rte/KP 11-IMP-98/1.12
EA NUMBER - 080200

PROFILE
HORIZONTAL: 1:1000
VERTICAL: 1:100

SCS&T JOB No. 0511121P
Appendix I-7

DESIGN OVERSIGHT

SIGN OFF DATE

DRAWN BY G. FOUNTAIN

CHECK BY J.J. STONE

M. METHA
FIELD INVESTIGATOR

DATE FEBRUARY 23, 2006

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

PROJECT ENGINEER

BRIDGE NO. N/A

KILOMETER POST 1.12

STATE ROUTE 98–CALEXICO
LOG OF TEST BORINGS

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 20 40 60 80 100

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) --

SHEET 7 OF 7

APPENDIX II
LABORATORY TEST RESULTS

The laboratory test program was designed to fit the specific needs of this project and was limited to testing on-site materials. A brief description of each type of test is presented below. Results are given on the following pages and on the boring logs in Appendix I.

Moisture contents and dry densities were determined for numerous relatively undisturbed samples. Results are listed on the boring logs in Appendix I.

The grain size distributions of 19 samples were determined in general accordance with ASTM D 422. Results are plotted on Appendix II-1 through II-19.

Expansion index tests were performed on remolded samples of soil likely to be present at finished grade. The tests were performed in accordance with ASTM D 4829. Results are presented on page II-20 of Appendix II.

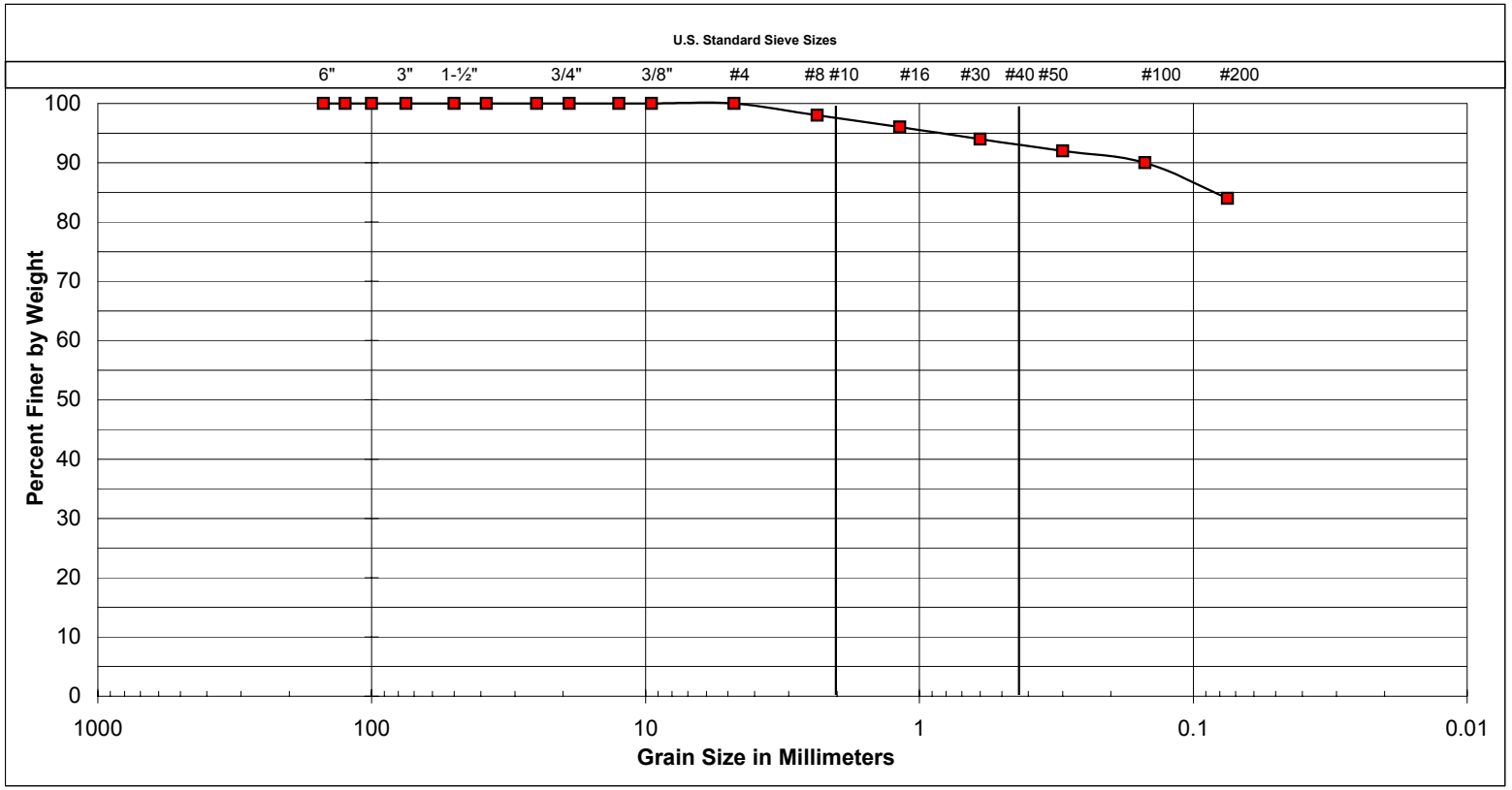
R-value tests were performed on 5 samples of soil considered reasonably representative of final subgrade materials. The tests were performed in accordance with California Test 301 procedures. Results are presented on page II-21 of Appendix II.

A one-dimensional consolidation test was performed on 2 relatively undisturbed samples in general accordance with ASTM D 2435. Results are presented on pages II-22 and II-23 of Appendix II.

Corrosivity tests were performed on 3 samples. The pH and minimum resistivity were determined in general accordance with California Test 643. Soluble sulfate content was determined in accordance with California Test 417. Total chloride ion content was determined in accordance with California Test 532. Results are presented on page II-24 of Appendix II.

In addition to in-situ field tests, strength characteristics of the subsurface soils were determined in the laboratory by direct shear tests performed on 1 relatively undisturbed sample. Specimens were submerged and tested at 3 normal loads. All samples were tested in a 71.4mm I.D. circular shear box, using a controlled displacement rate. The direct shear tests were performed in general accordance with ASTM D 3080. Results are shown on Pages II-25 of Appendix II.

Soil samples not tested are now stored in our laboratory for future reference and analysis, if needed. Unless notified to the contrary, all samples will be disposed of 30 days from the date of this report.



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B1@0.3-1.52 m

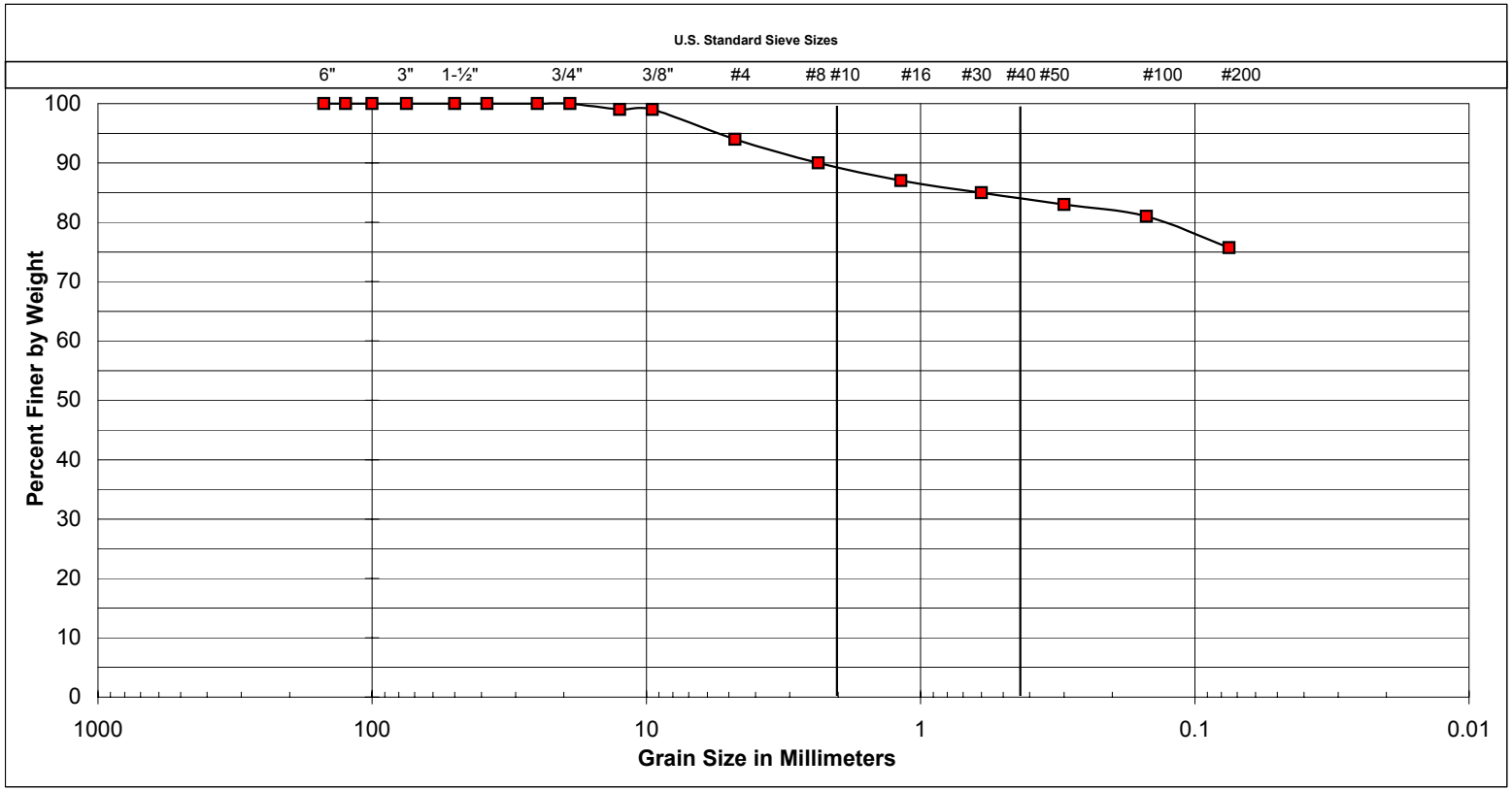
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	CLAY WITH SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-1



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B2@0.3-1.52 m

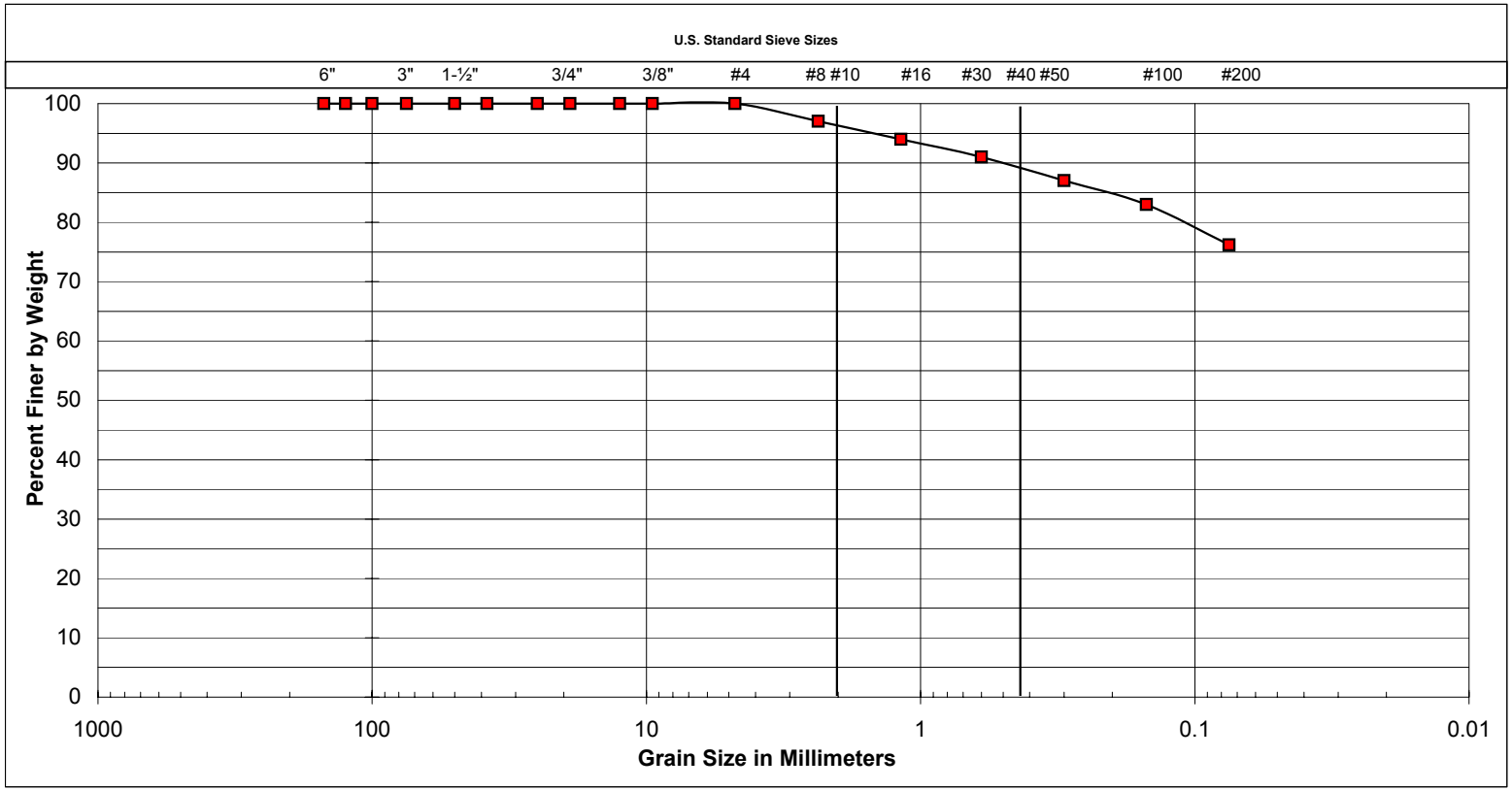
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	CLAY WITH SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-2



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B3@0.3-1.52 m

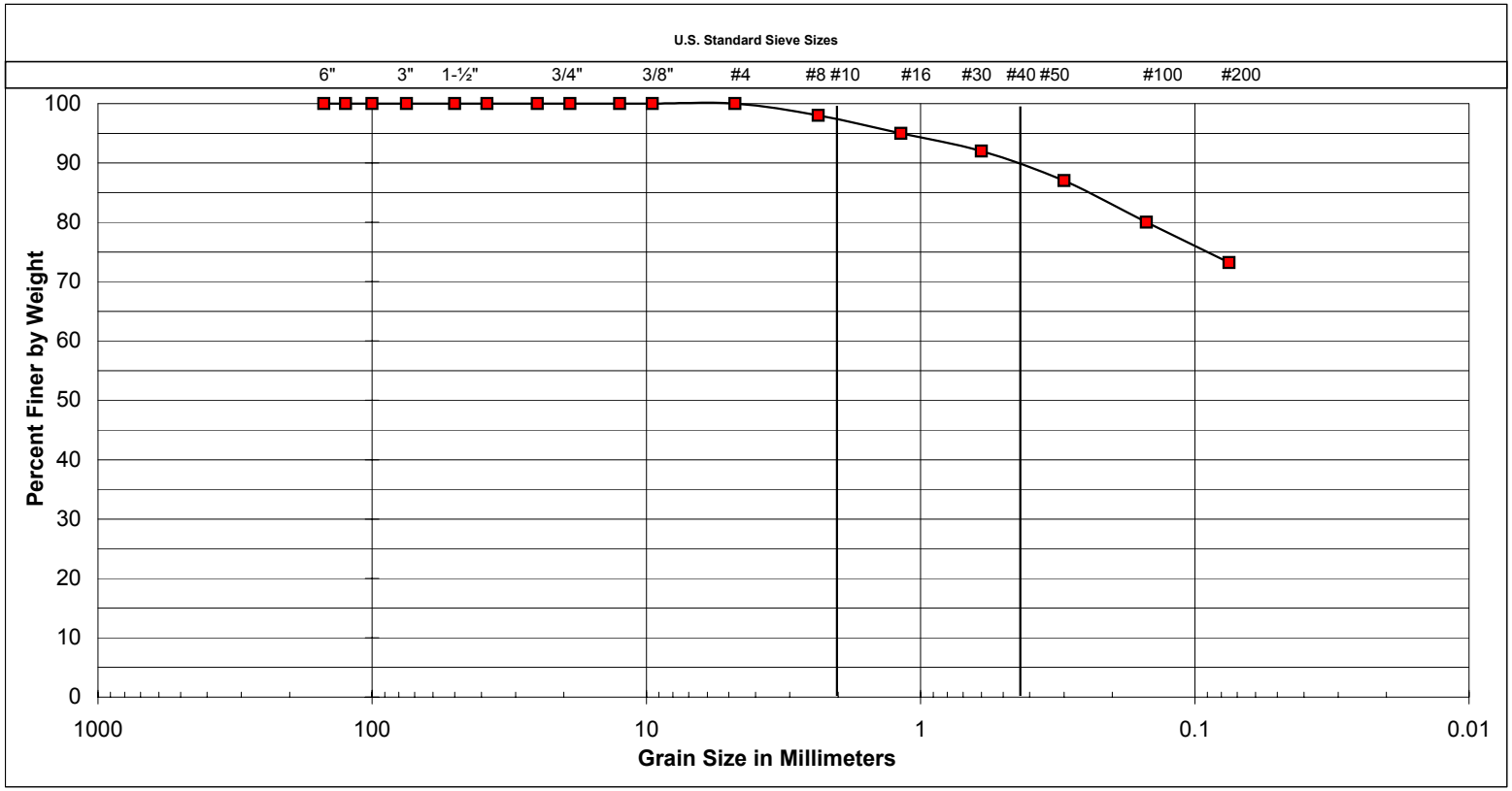
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	CLAY WITH SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-3



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B4@0.3-1.52 m

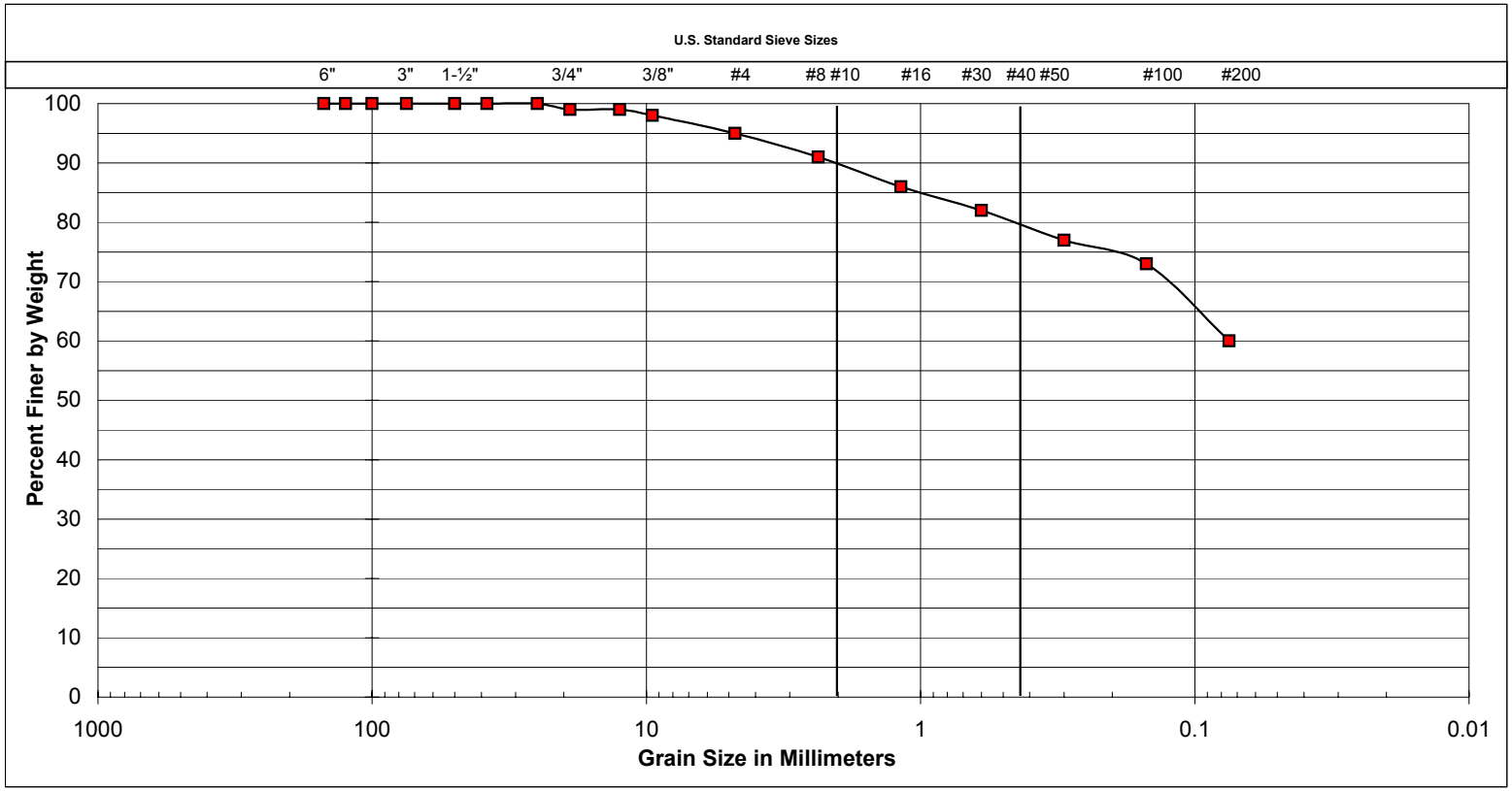
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	CLAY WITH SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-4



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B5@0.3-1.52 m

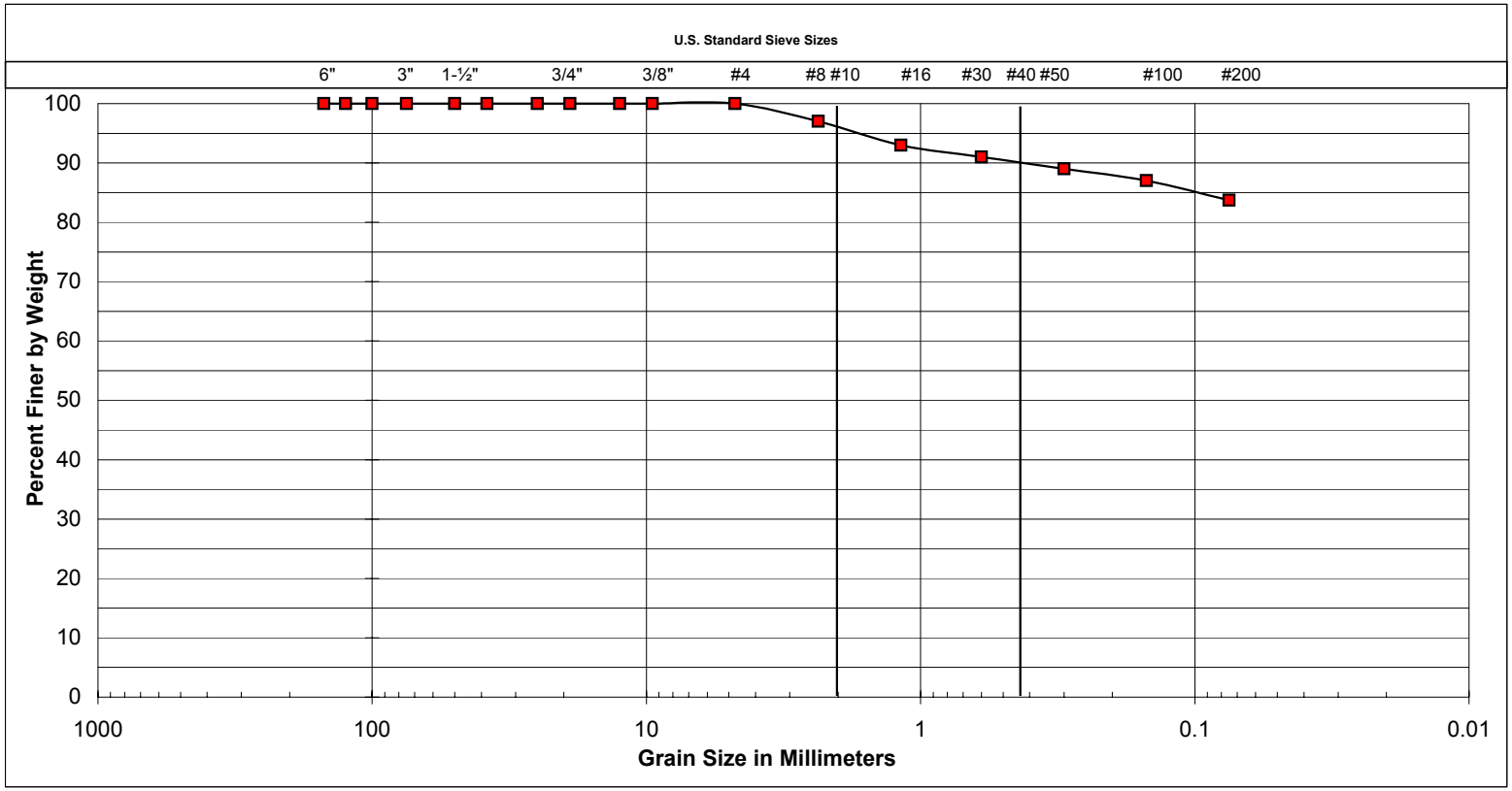
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	SANDY CLAY

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-5



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B6@0.3-1.52 m

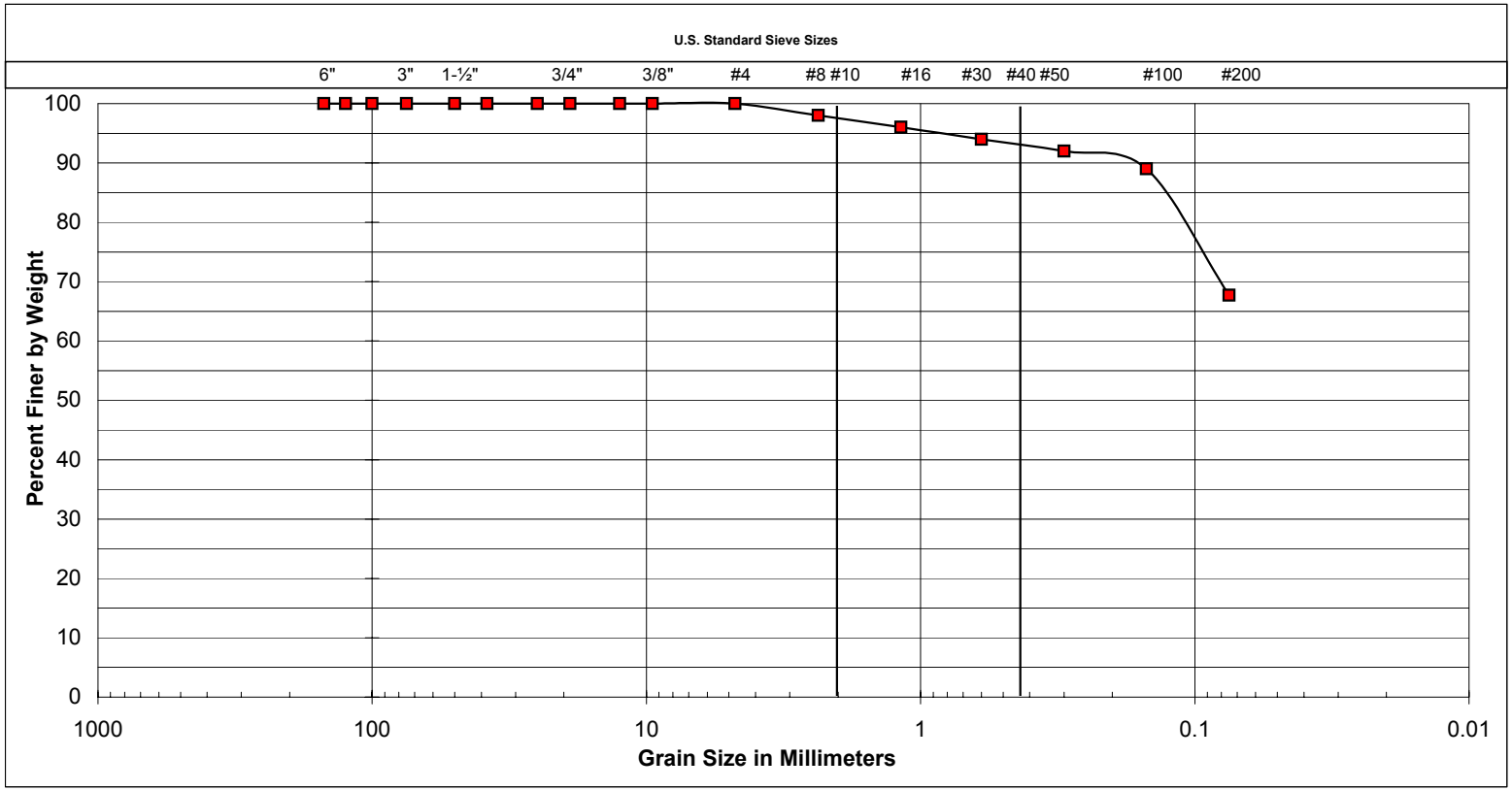
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	CLAY WITH SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/16/06
Job Number	0511121P	Appendix	II-6



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B9@0.3-1.52 m

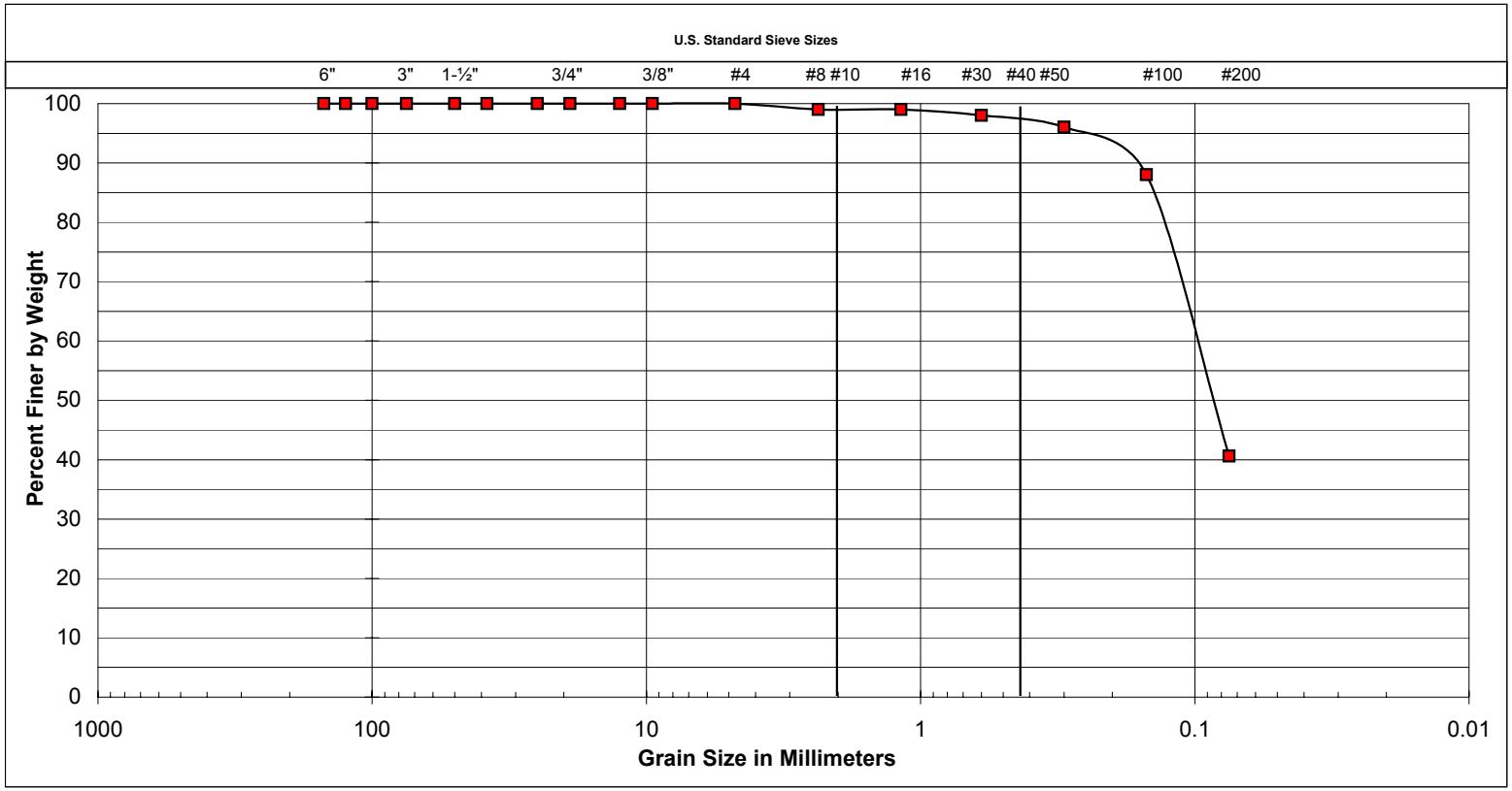
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	SANDY CLAY

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/16/06
Job Number	0511121P	Appendix	II-7



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B10@0.3-1.52 m

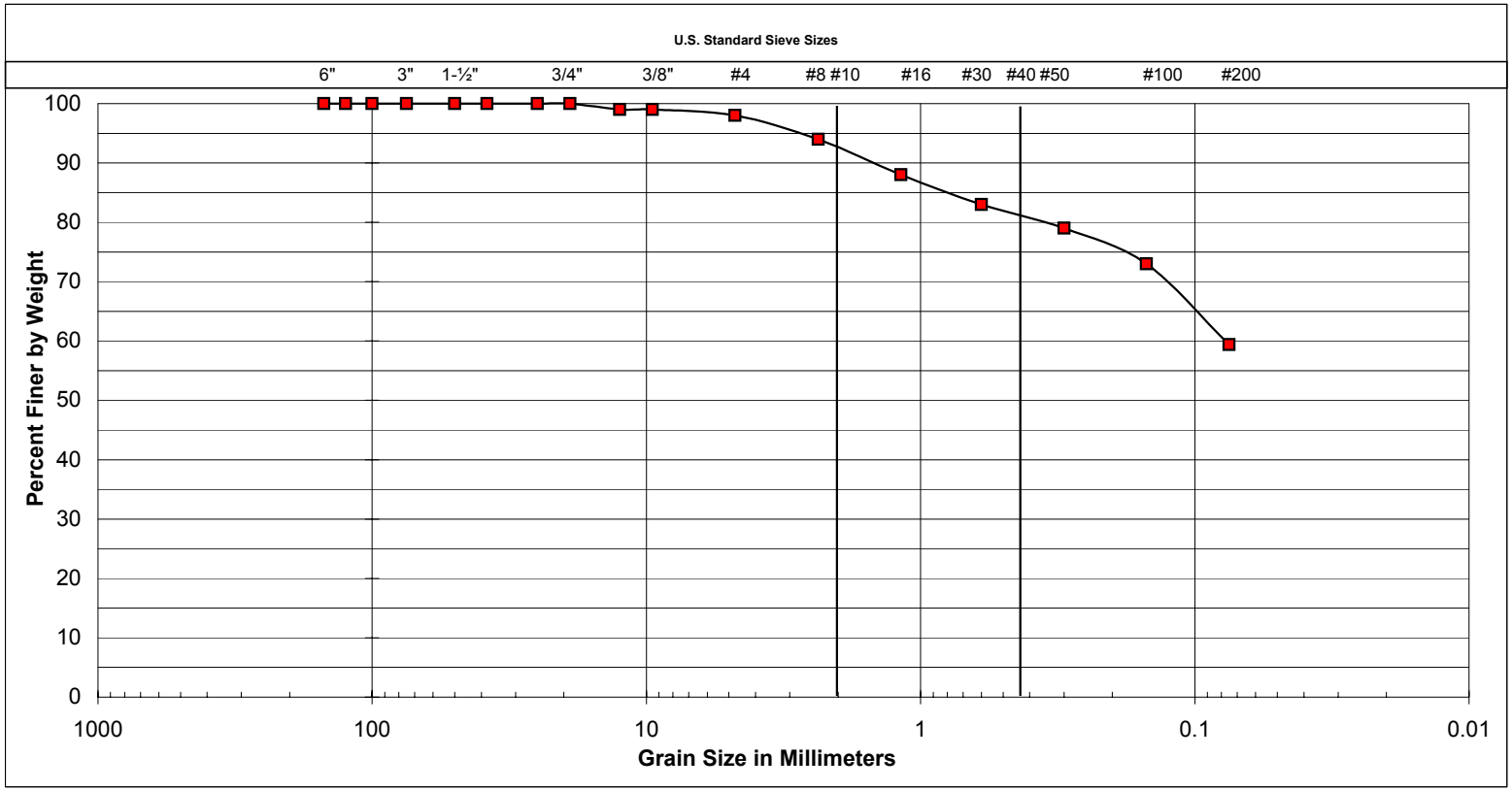
UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/16/06
Job Number	0511121P	Appendix	II-8



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B11@0.3-1.52 m

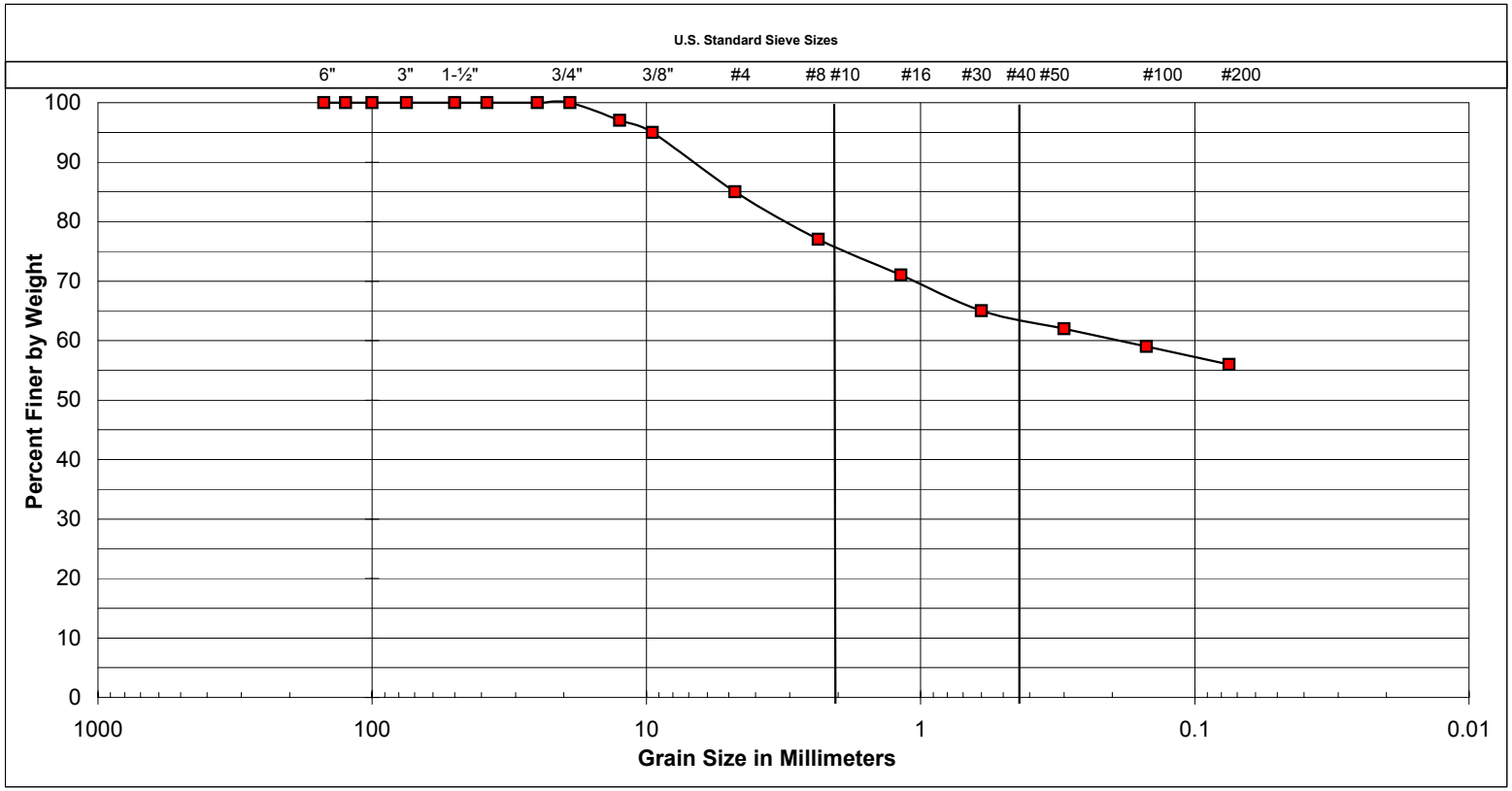
UNIFIED SOIL CLASSIFICATION:	SC
DESCRIPTION	CLAYEY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/16/06
Job Number	0511121P	Appendix	II-9



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B12@0.3-1.52

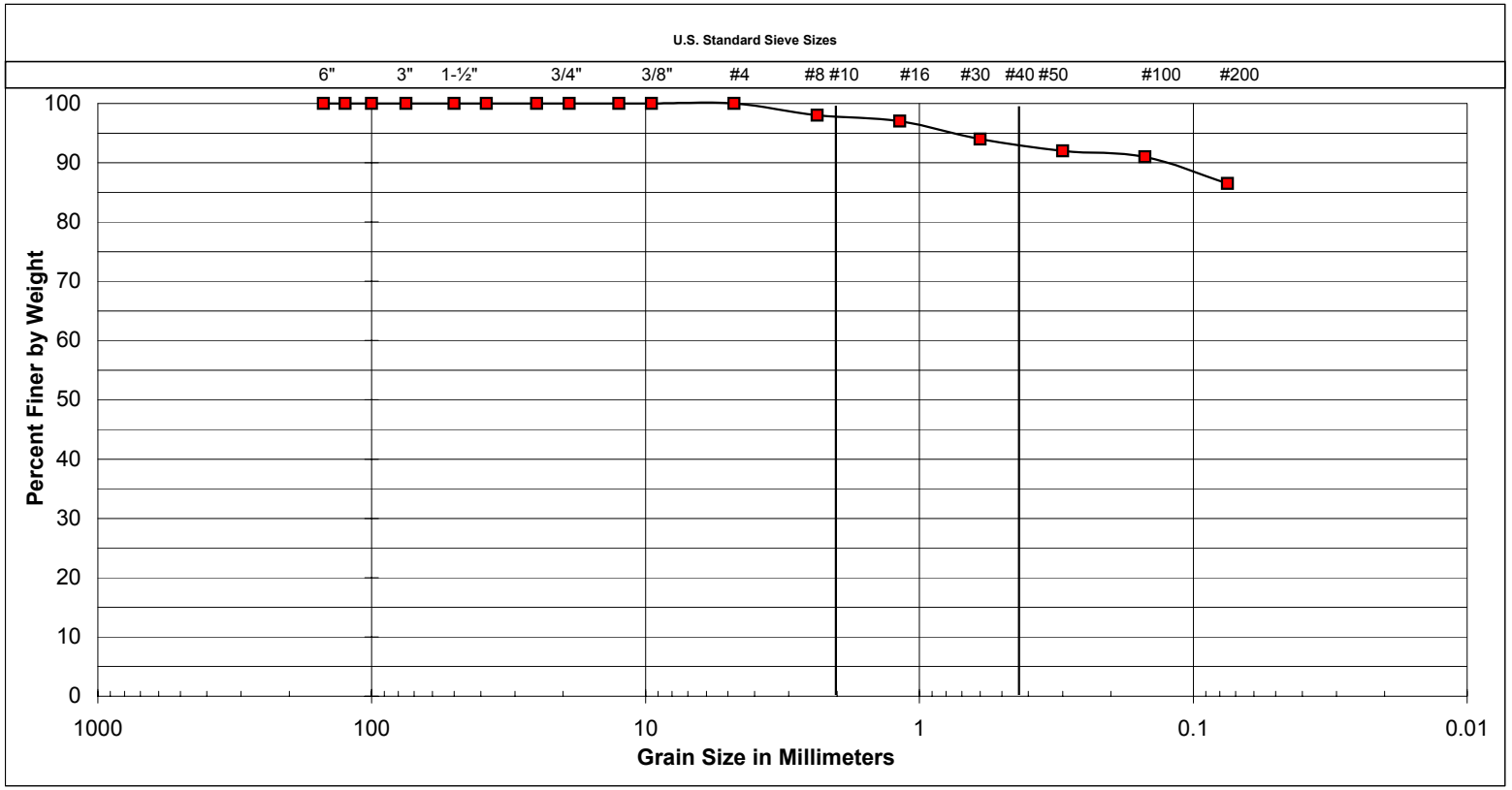
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	SANDY CLAY

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-10



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B13@0.3-1.52

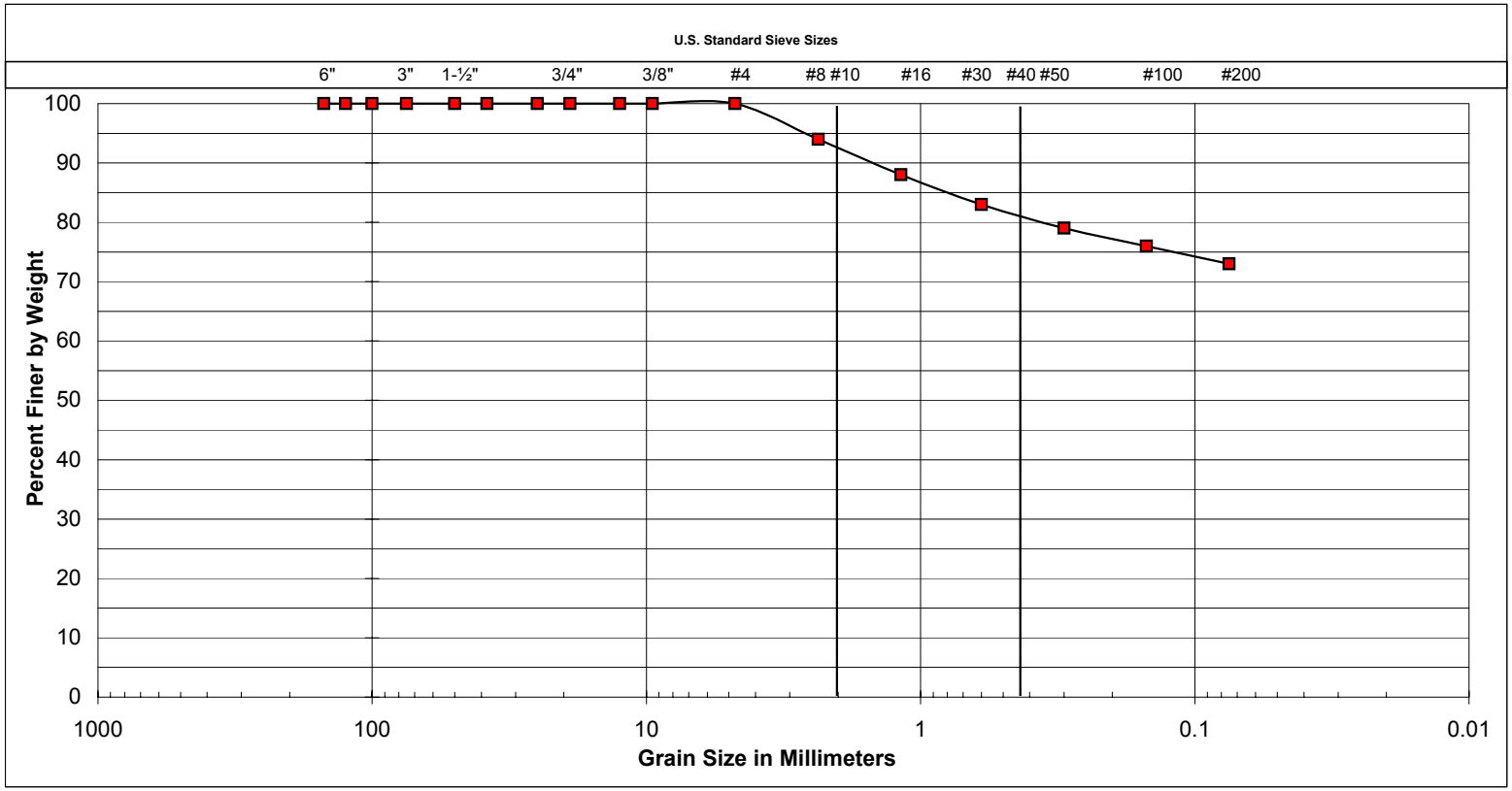
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	CLAY WITH SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-11



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B14@0.3-1.52

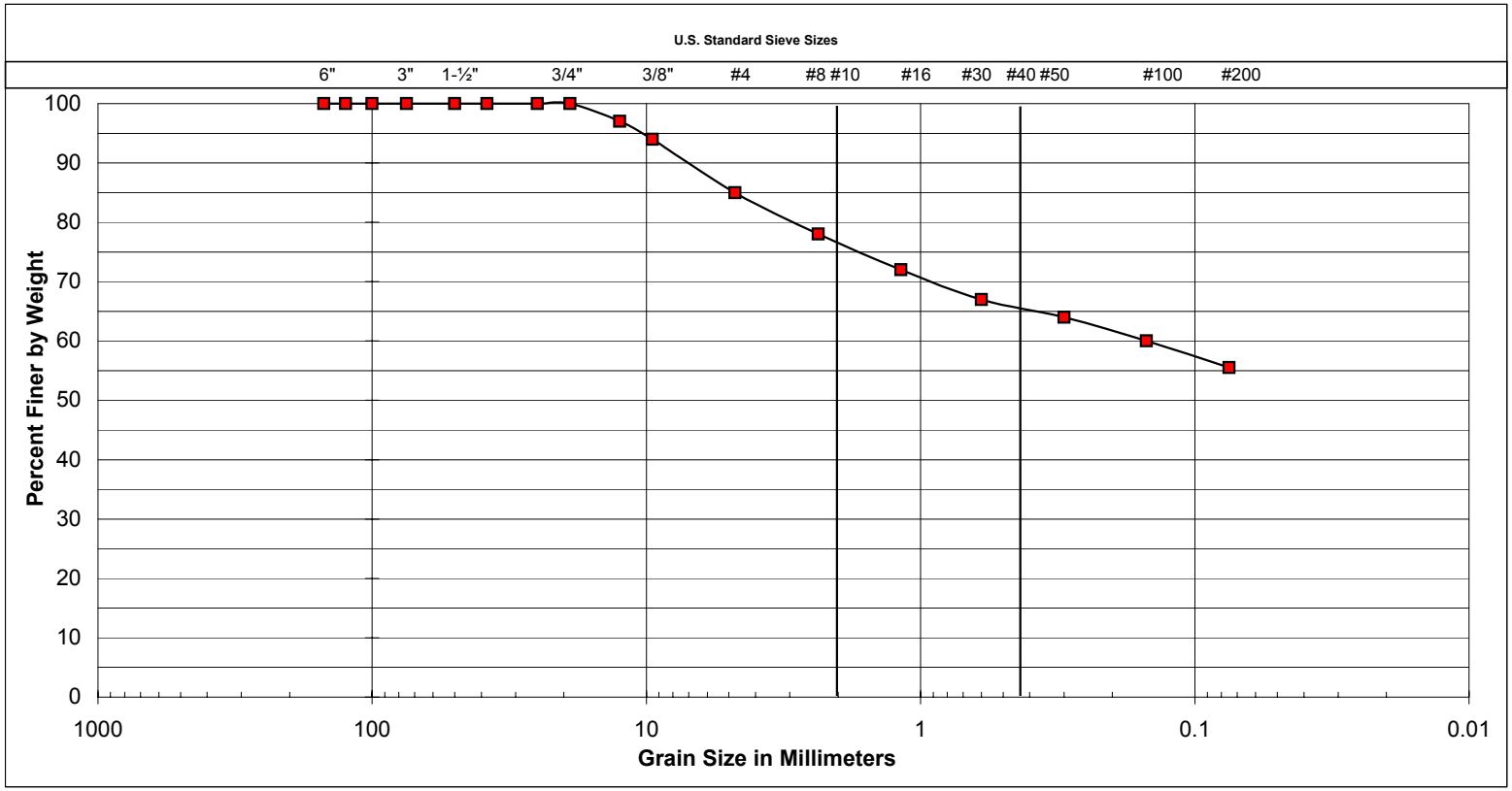
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	CLAY WITH SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-12



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B15@0.3-1.52

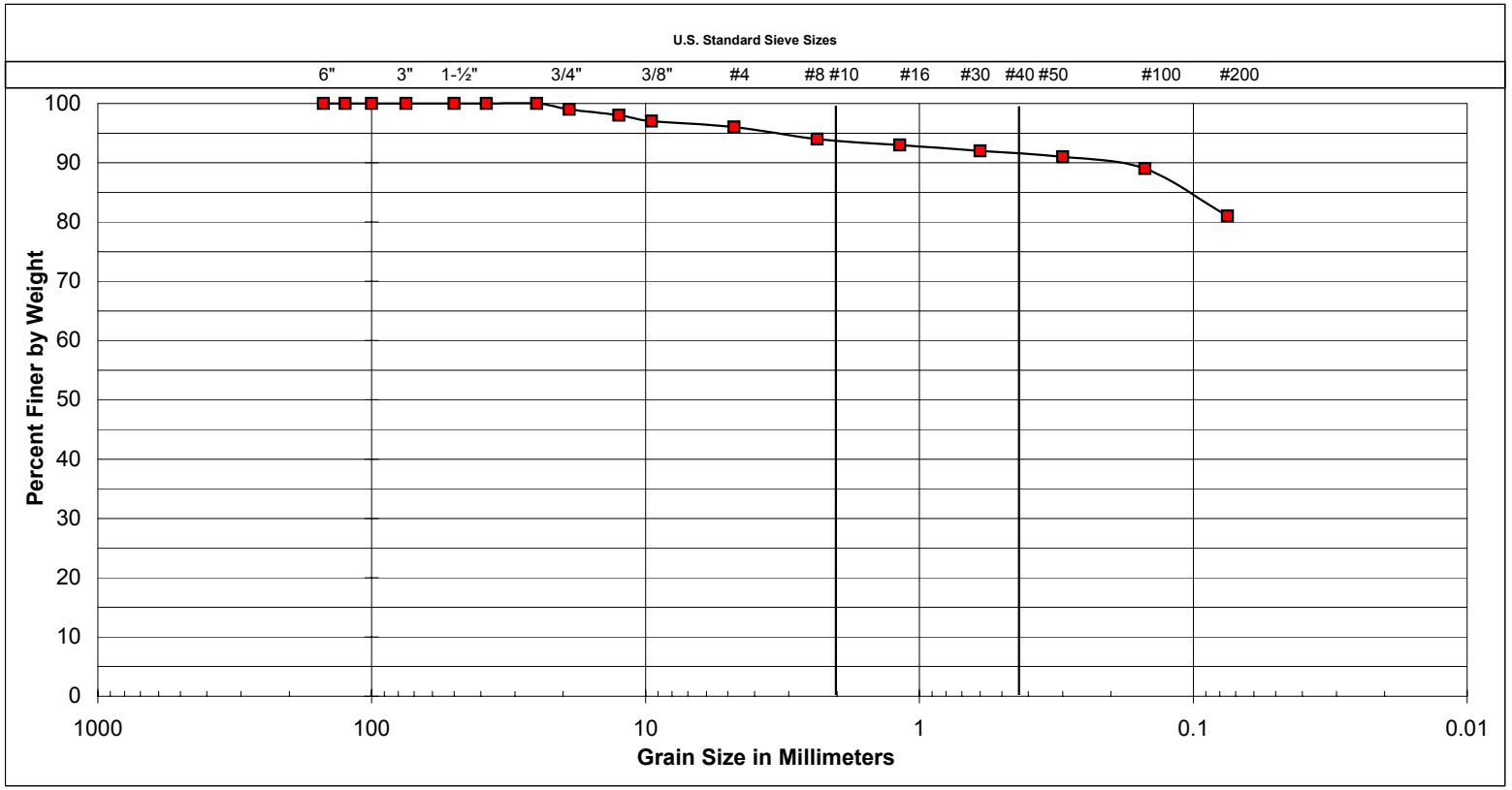
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	SANDY CLAY

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-13



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B16@0.3-1.52

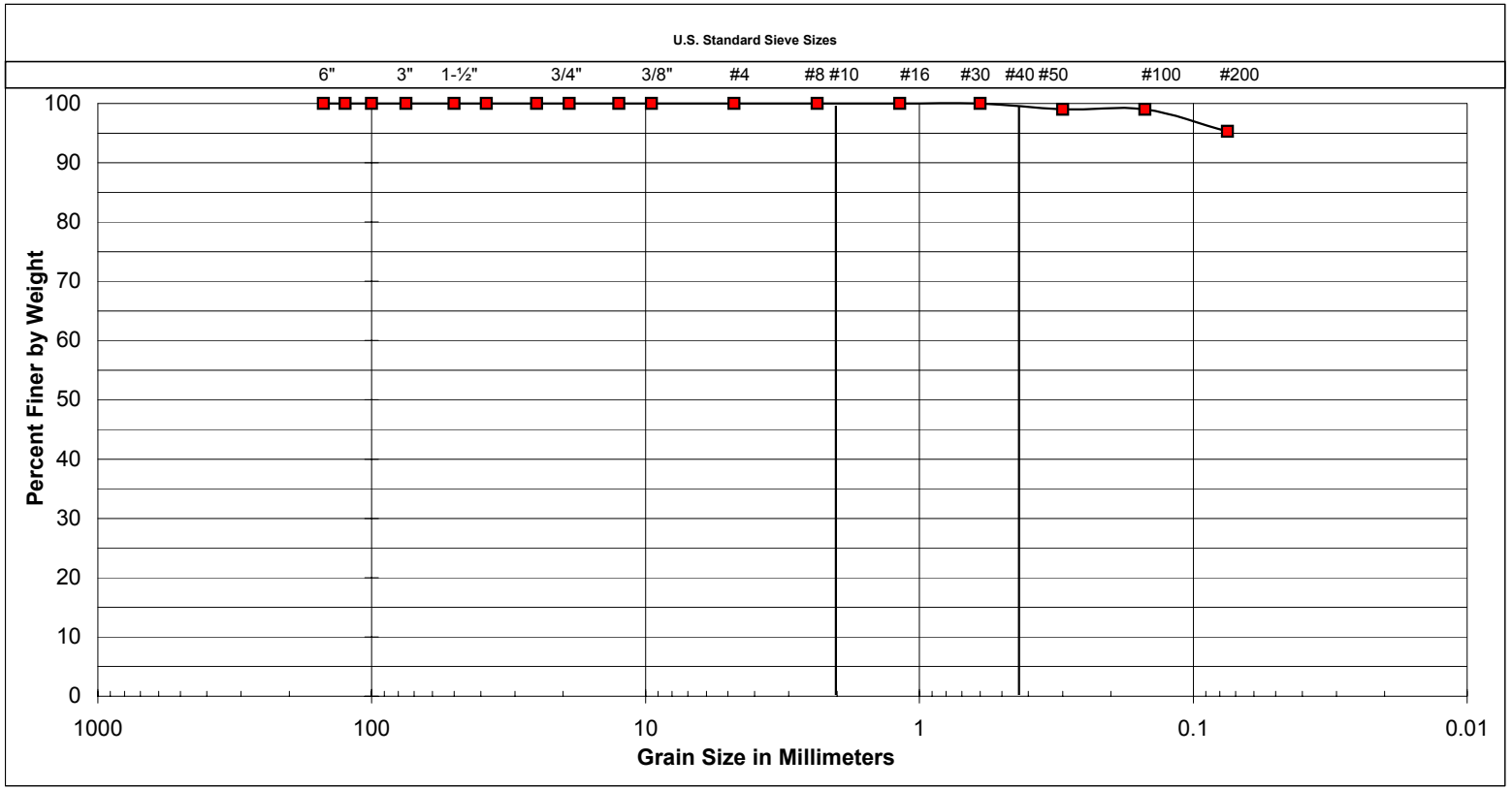
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	CLAY WITH SAND

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-14



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B16@2.4-3.7

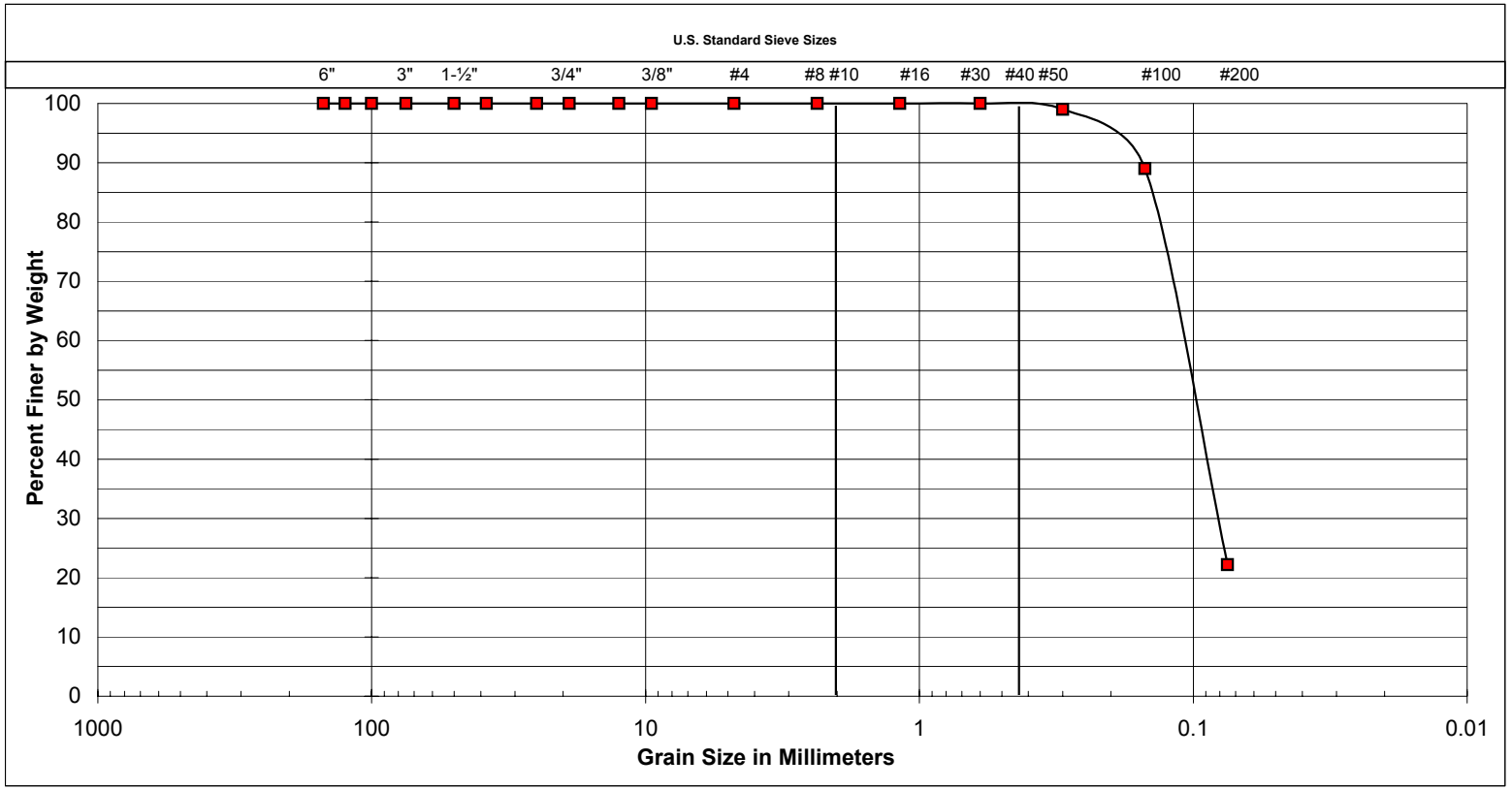
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	CLAY

ATTERBERG LIMITS	
LIQUID LIMIT	
PLASTIC LIMIT	
PLASTICITY INDEX	

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-15



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B16@6.1m

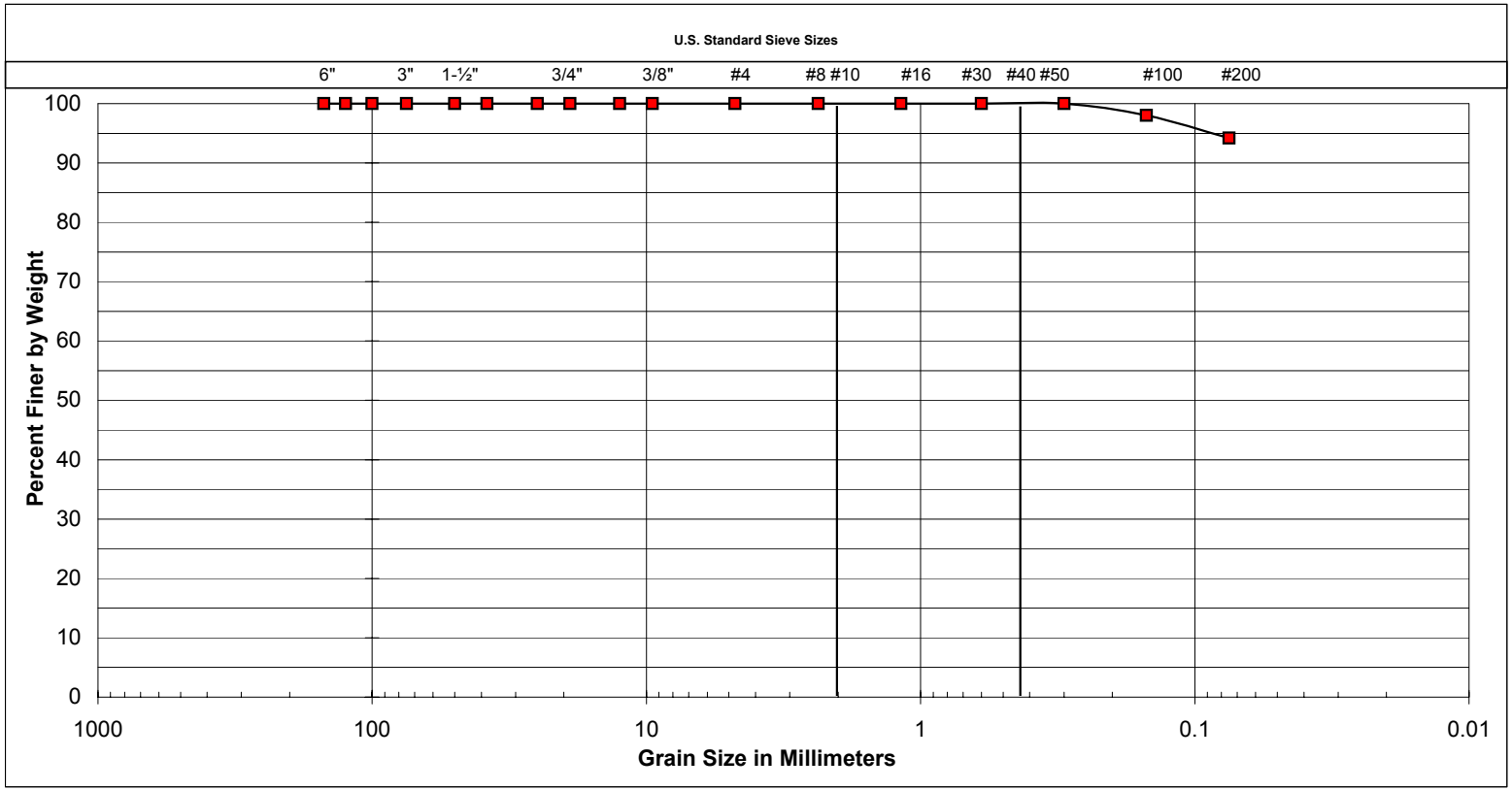
UNIFIED SOIL CLASSIFICATION:	SM
DESCRIPTION	SILTY SAND

ATTERBERG LIMITS	
LIQUID LIMIT	N/A
PLASTIC LIMIT	N/A
PLASTICITY INDEX	N/A

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-16



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B16@9.1m

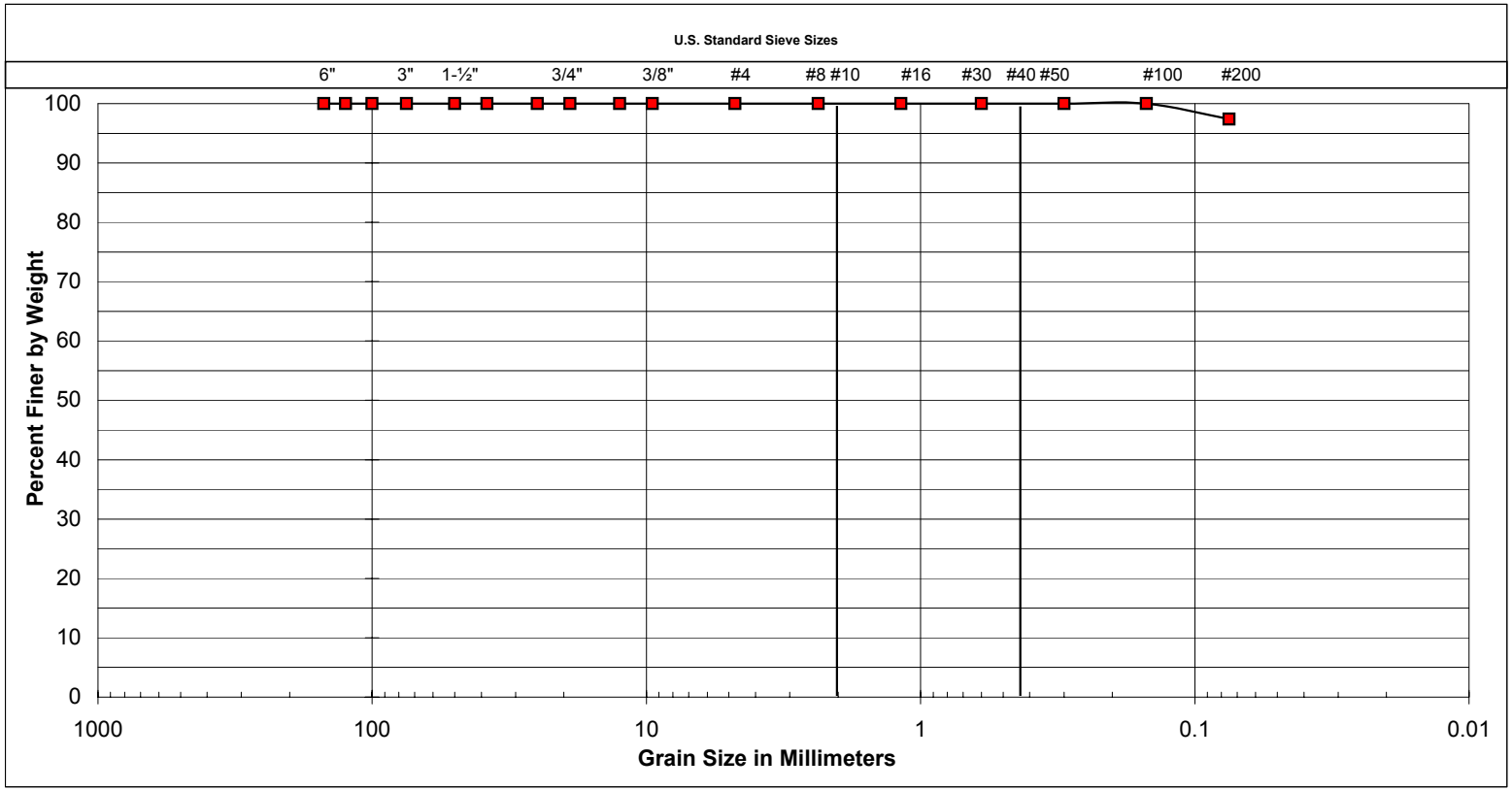
UNIFIED SOIL CLASSIFICATION:	CL
DESCRIPTION	CLAY

ATTERBERG LIMITS	
LIQUID LIMIT	62
PLASTIC LIMIT	25
PLASTICITY INDEX	38

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-17



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B16@12.1m

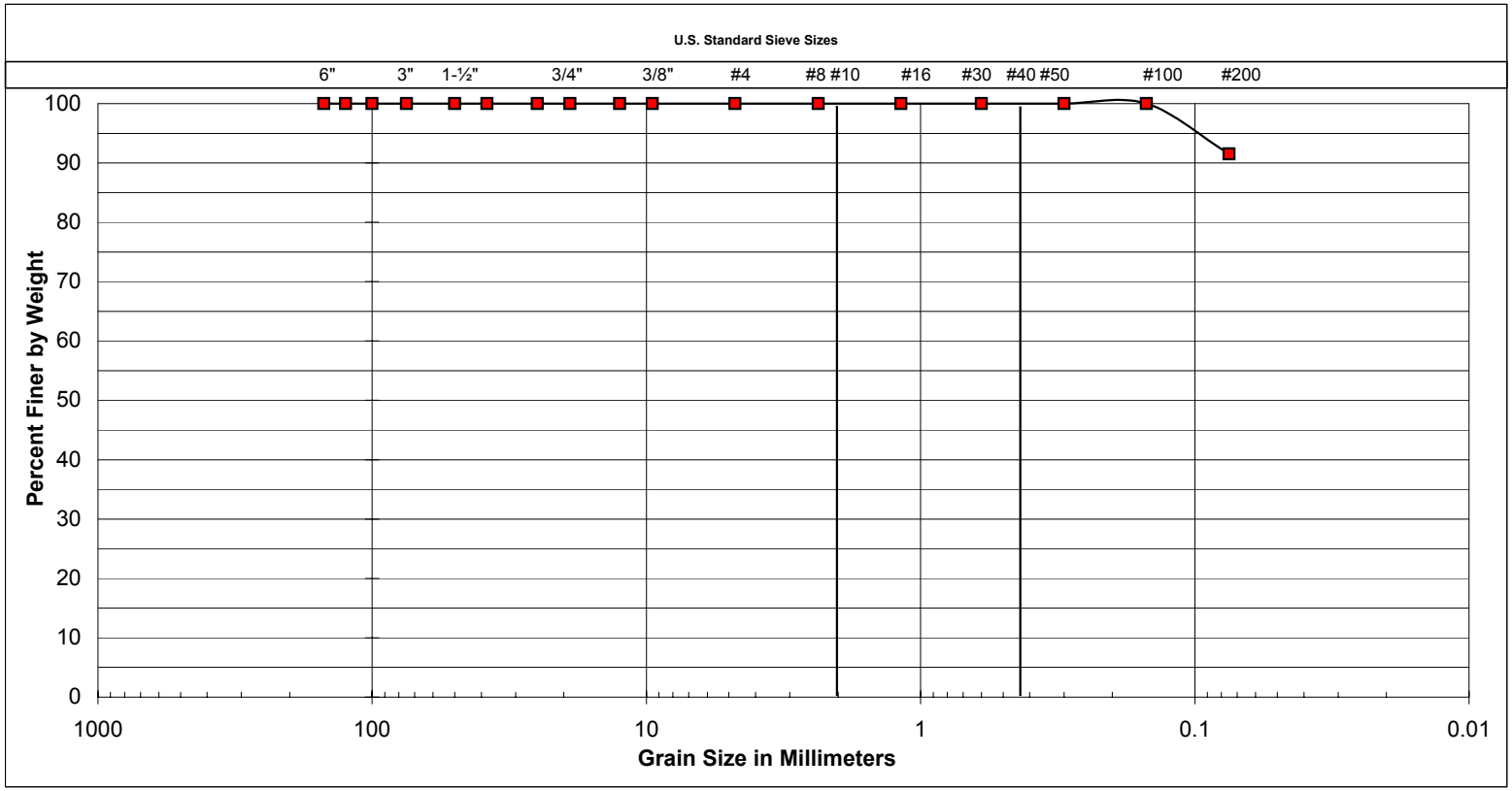
UNIFIED SOIL CLASSIFICATION:	ML
DESCRIPTION	SILT

ATTERBERG LIMITS	
LIQUID LIMIT	N/A
PLASTIC LIMIT	N/A
PLASTICITY INDEX	N/A

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	GF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-18



Cobbles	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

SAMPLE LOCATION
B16@15.1m

UNIFIED SOIL CLASSIFICATION:	ML
DESCRIPTION	SILT

ATTERBERG LIMITS	
LIQUID LIMIT	N/A
PLASTIC LIMIT	N/A
PLASTICITY INDEX	N/A

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

SR 98 CALEXICO

By	DF/EL	Date	10/13/06
Job Number	0511121P	Appendix	II-19

EXPANSION INDEX TEST RESULTS

SAMPLE	B1 @ 0.3-1.52 m	B3 @ 0.3-1.52 m	B5 @ 0.3-1.52 m	B9 @ 0.3-1.52 m
CONDITION	**remolded**	**remolded**	**remolded**	**remolded**
INITIAL MOISTURE CONTENT, %	9.8	10.8	10	10.4
INITIAL DENSITY, kg/m^3	1171.8	1710.9	1760.6	1739.8
FINAL MOISTURE CONTENT, %	22.0	24.9	22.9	20.4
NORMAL STRESS, kPa	6.9	6.9	6.9	6.9
EXPANSION INDEX	77	92	70	34

SAMPLE	B12 @ 0.3-1.52 m	B13 @ 0.3-1.52 m	B14 @ 0.3-1.52 m	B15 @ 0.3-1.52 m
CONDITION	**remolded**	**remolded**	**remolded**	**remolded**
INITIAL MOISTURE CONTENT, %	9.2	10.6	10.3	9.5
INITIAL DENSITY, kg/m^3	1813.3	1725.2	1742.8	1814.9
FINAL MOISTURE CONTENT, %	20.1	25.5	22.9	20.7
NORMAL STRESS, kPa	6.9	6.9	6.9	6.9
EXPANSION INDEX	76	94	83	66

CLASSIFICATION OF EXPANSIVE SOIL	
EXPANSION INDEX	**POTENTIAL EXPANSION**
1 - 20	Very low
21 - 50	Low
51 - 90	Medium
91 -130	High
Above 130	Very High

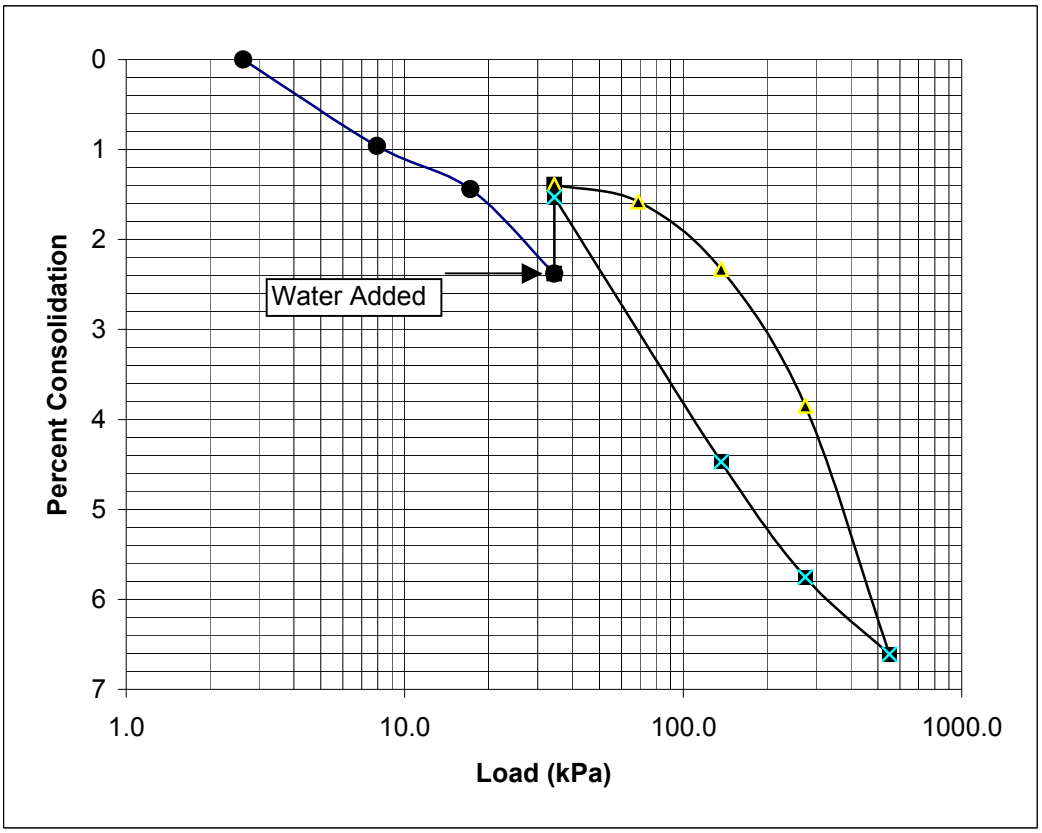
SAMPLE	"R" VALUE
B2 @ 0.3-1.52 m	< 5
B6 @ 0.3-1.52 m	< 5
B11 @ 0.3-1.52 m	13
B12 @ 0.3-1.52 m	< 5
B15 @ 0.3-1.52 m	< 5

"R" Values determined in accordance with California test 301

SAMPLE	Sand Equivalent Test
B1 @ 0.3-1.52 m	3
B2 @ 0.3-1.52 m	13
B3 @ 0.3-1.52 m	3
B4 @ 0.3-1.52 m	3
B5 @ 0.3-1.52 m	5
B6 @ 0.3-1.52 m	3
B9 @ 0.3-1.52 m	3
B10 @ 0.3-1.52 m	16
B11 @ 0.3-1.52 m	5
B12 @ 0.3-1.52 m	9
B13 @ 0.3-1.52 m	3
B14 @ 0.3-1.52 m	7
B15 @ 0.3-1.52 m	8

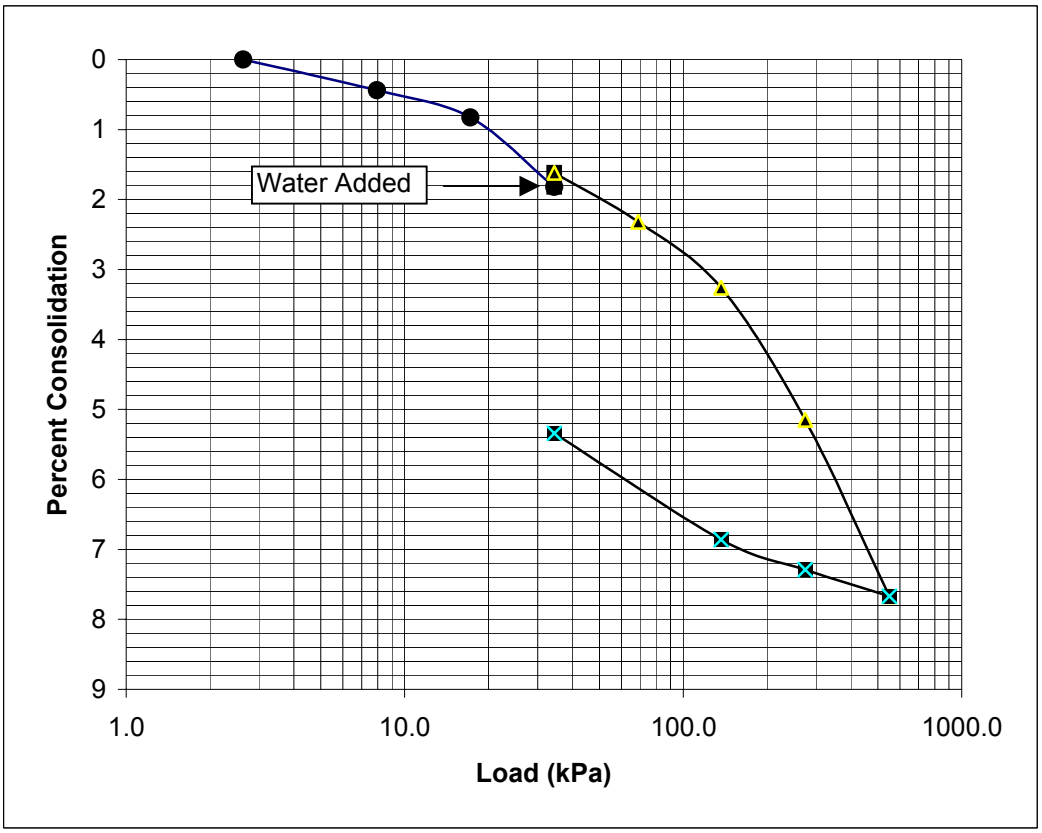
Sand Equivalent Test determined in accordance with ASTM D 2419

Consolidation
Sample Location
B16 @ 4.6 m



SOUTHEREN CALIFORNIA SOIL & TESTING, INC.	SR 98 CALEXICO			
	BY:	GF/JJS	DATE	10/16/2006
	JOB No.:	0511121P	APPENDIX	II-22

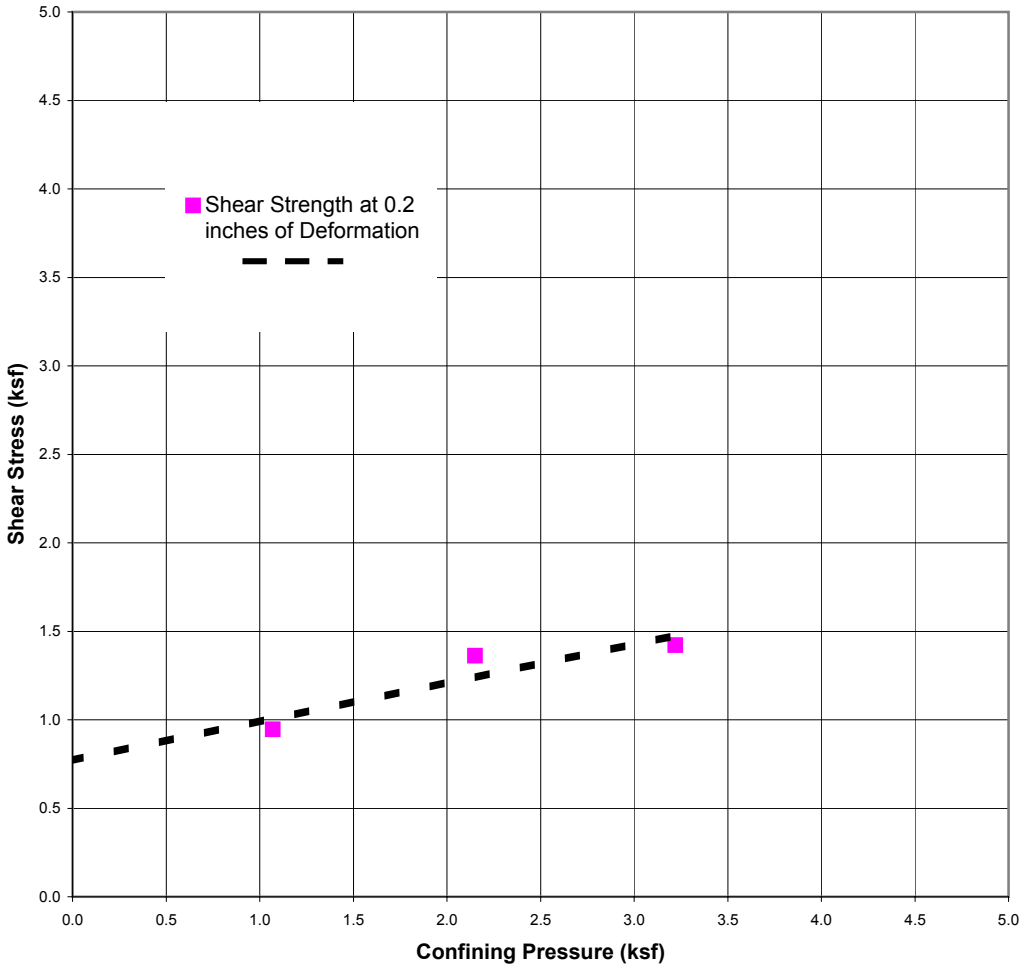
Consolidation
Sample Location
B16 @ 7.6 m



SOUTHEREN CALIFORNIA SOIL & TESTING, INC.	SR 98 CALEXICO			
	BY:	GF/JJS	DATE	10/16/2006
	JOB No.:	0511121P	APPENDIX	II-23

SAMPLE IDENTIFICATION	RESISTIVITY (W - cm)	pH	SOLUBLE SULFATE (%)	CHLORIDE (%)
B-16 @ 0.3 to 1.52 m	314	8.2	0.114	0.031
B-16 @ 2.4 to 3.7 m	735	8.7	0.011	0.002
B-16 @ 0.3 to 1.52 m	640	8.6	0.008	0.002
CORROSIVITY ENVIRONMENT	<1000	<5.5	>0.2	>0.05

Direct Shear Test Results



SAMPLE	DESCRIPTION	INTERNAL FRICTION ANGLE(DEG.)	COHESION INTERCEPT (PSF)
B16 at 4.6m	Insitu - Clay		
Shear Strength at 0.2 inches of Deformation		12	768

SOUTHERN CALIFORNIA SOIL & TESTING

SR98 CALEXICO

BY:	JJS/GBF	DATE:	10/16/2006
JOB NUMBER:	0511121P	APPENDIX	II-25

APPENDIX III

CALCULATIONS

- Calculations consisted of pavement section design. The pavement section design was determined in accordance with the Caltrans Highway Design Manual.
- Pavement Sections are based on a R-value < 5 and traffic indices were provided by Dokken Engineering.

$R = 2$ $\quad GE = 0.975(T.I.)(100-R)$

$T.I. = 12.5$ $\quad GE_{TOTAL} = 0.975(12.5)(100-2)$

$GE_{TOTAL} = 1194$

$GE_{AC} = 0.975(12.5)(100-78)$

$= 268$ 60mm F.O.S

$= 328$ TABLE 633.1 ACTUAL THICKNESS 195mm

$GE_{BASE} = 1194 - 268$

$GE_{BASE} = 926$ GRAVEL FACTOR OF BASE $= 1.1$

ACTUAL THICKNESS $= 926/1.1 = 842$mm

195mm AC / 840mm CLASS 2 BASE

$R = 2$ $\quad GE = 0.975(T.I.)(100-R)$

$T.I = 13.5$ $\quad GE = 0.975(13.5)(100-2)$

$GE_{TOT} = 1290$

$GE_{AC} = 0.975(13.5)(100-78)$

$= 290$ 60mm F.O.S.

$= 350$ TABLE 633.1 ACTUAL THICKNESS 210mm

$GE_{BASE} = 1290 - 250$

$GE_{BASE} = 1000$ GRAVEL FACTOR CLASS 2 $= 1.1$

ACTUAL THICKNESS $= 1000/1.1 \approx 910$

210mm AC / 915mm CLASS 2 BASE

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

R = 35
T.I. 12.5

$GE_{TOTAL} = 0.975(T.I.)(100-R)$

$GE_{TOTAL} = 0.975(12.5)(100-35)$

$GE_{TOTAL} = 792.2$

$GE_{AC} = 0.975(12.5)(100-78)$

$= 268 + 60 = 328 \approx 329$

ACTUAL AC THICKNESS 195mm TABLE 633.1

$GE_{BASE} = GE_{TOTAL} - 268$

$= 792 - 268$

$GE_{BASE} = 524/1.1 = 476 \approx 480$

195mm AC / 480mm CLASS 2 AB

R = 35
T.I = 13.5

$GE_{TOTAL} = 0.975(TI)(100-R)$

$= 855.6 \approx 856$

$GE_{AC} = 0.975(13.5)(100-78)$

$= 289$

$GE_{AC} = GE_{AC} + F.O.S$

$GE_{AC} = 289 + 60 = 349$ ACTUAL THICKNESS 210mm

$GE_{BASE} = 856 - 299 = 567$ $GE_{BASE} = GE_{TOTAL} - GE_{AC}$

THICKNESS BASE $567/1.1 = 515$mm

210mm AC / 515mm CLASS 2 BASE

525 TO BE DIVISIBLE BY 15.

```
 NEWCON90   VERSION:  APR_30_91.1

 09-15-2006     14:56:09

 ENTER TITLE OF PROJECT.
 ? Calexico R-2

 ENTER OPTION FOR METHOD OF DESIGN:
   1 = PROGRAM WILL DESIGN THE LAYERS.
   2 = YOU WILL HELP PROGRAM DESIGN THE LAYERS.
 ? 1

 ENTER TRAFFIC INDEX (TI)
 (5  <=  TI  <= 15)
 ? 12.5

 ENTER R_VALUE OF BASEMENT (OR NATIVE) SOIL
 (0 <=  R_VALUE  <= 90)
 ? 2

      .0032*TI*(100-R_VALUE) =    3.92

 ENTER CODE FOR TYPE OF SUB_BASE MATERIAL
   0 = NO SUB_BASE MATERIAL
   1 = CLASS 1 AGGREGATE SUB_BASE  (R_VALUE = 60)
   2 = CLASS 2 AGGREGATE SUB_BASE  (R_VALUE = 50)
   3 = CLASS 3 AGGREGATE SUB_BASE  (R_VALUE = 40)
   4 = CLASS 4 AGGREGATE SUB_BASE  (R_VALUE = VARY)
   5 = LIME TREATED SUB_BASE (LTS) (R_VALUE = 100)
       (1.3  <=  GF  <=  1.6)
 ? 0

 ENTER CODE FOR TYPE OF BASE MATERIAL
   0 = NO BASE                                (GF = 0.0)
   1 = LEAN CONCRETE BASE (LCB)               (GF = 1.9)
   2 = CLASS A CEMENT TREATED BASE (CTB)      (GF = 1.7)
   3 = CLASS B CEMENT TREATED BASE (CTB)      (GF = 1.2)
   4 = CLASS 2 AGGREGATE BASE (AB)            (GF = 1.1)
   5 = SANDWICH - (E.G., DGAC, TPB, ACB)
   6 = LIME TREATED BASE (LTS)
       (1.3  <=  GF  <=  1.6)
 ? 4
 CARE TO SPECIFY MINIMUM DEPTH OF BASE MATERIAL
 (N=NO, Y=YES)
 ? N

      BASE R_VALUE            =   78.00
      .0032*TI*(100-R_VALUE)  =    0.88
      BASE GRAVEL FACTOR      =    1.10
      BASE MAX. DEPTH (FT)    =    3.00
      BASE MIN. DEPTH (FT)    =    0.35

 ENTER TYPE OF TREATED PERMEABLE BASE MATERIAL
   0 = NONE
   1 = ASPHALT (GF = 1.4; DEPTH = 0.25 FT)
   2 = CEMENT  (GF = 1.7; DEPTH = 0.35 FT)
 ? 0

 ENTER CODE FOR TYPE OF ASPHALT CONCRETE PAVEMENT
   1 = STANDARD_GF
   2 = ROAD_MIX_GF (GF = 0.8 * STANDARD_GF)
 ? 1
```

CALEXICO

AC MAX. DEPTH (FT) = 1.75
AC MIN. DEPTH (FT) = 0.20
AC SAFE FACTOR (GE) = 0.20

CARE TO ENTER 'COST PER CUBIC YARD' OF AC_PAVEMENT,
TPB, BASE/WORK, AND SUBBASE MATERIAL. (N=NO, Y=YES)
(NOTE: IF 'NO', THEN COSTS = 70, 60, 35, 25)
? N

NOTE: POSITIVE RESIDUAL_GE INDICATES OVER_DESIGN
NOTE: NEGATIVE SAFETY FACTOR IN LAYER = BASE

AC (FEET)	TPB (FEET)	BASE (FEET)	SUBBASE (FEET)	RESID GE	COST (SQ YD)	AC GR_FCT
0.65	0.00	2.55	0.00	-0.00	44.92	1.72
0.70	0.00	2.45	0.00	0.01	44.92	1.76
0.75	0.00	2.35	0.00	0.01	44.92	1.80
0.80	0.00	2.25	0.00	0.03	44.92	1.84
0.85	0.00	2.10	0.00	-0.02	44.33	1.88
0.90	0.00	2.00	0.00	0.00	44.33	1.91
0.95	0.00	1.90	0.00	0.02	44.33	1.95
1.00	0.00	1.75	0.00	-0.02	43.75	1.98
1.05	0.00	1.65	0.00	0.01	43.75	2.01
1.10	0.00	1.50	0.00	-0.02	43.17	2.04
1.15	0.00	1.40	0.00	0.01	43.17	2.07
1.20	0.00	1.25	0.00	-0.02	42.58	2.10
1.25	0.00	1.15	0.00	0.01	42.58	2.13
1.30	0.00	1.00	0.00	-0.01	42.00	2.16
1.35	0.00	0.90	0.00	0.02	42.00	2.19
1.40	0.00	0.75	0.00	0.01	41.42	2.21
1.45	0.00	0.60	0.00	-0.01	40.83	2.24
1.50	0.00	0.45	0.00	-0.03	40.25	2.27
1.55	0.00	0.35	0.00	0.02	40.25	2.29
1.60	0.00	0.35	0.00	0.17	41.42	2.32
1.65	0.00	0.35	0.00	0.33	42.58	2.34
1.70	0.00	0.35	0.00	0.48	43.75	2.36
1.75	0.00	0.35	0.00	0.64	44.92	2.39

R=2
TI=12.5

09-15-2006 14:59:00

ENTER TITLE OF PROJECT.
? TI-13.5 - R-2

ENTER OPTION FOR METHOD OF DESIGN:
1 = PROGRAM WILL DESIGN THE LAYERS.
2 = YOU WILL HELP PROGRAM DESIGN THE LAYERS.
? 1

ENTER TRAFFIC INDEX (TI)
(5 <= TI <= 15)
? 13.5

ENTER R_VALUE OF BASEMENT (OR NATIVE) SOIL
(0 <= R_VALUE <= 90)
? 2

.0032*TI*(100-R_VALUE) = 4.23

CALEXICO

```
ENTER CODE FOR TYPE OF SUB_BASE MATERIAL
  0 = NO SUB_BASE MATERIAL
  1 = CLASS 1 AGGREGATE SUB_BASE  (R_VALUE = 60)
  2 = CLASS 2 AGGREGATE SUB_BASE  (R_VALUE = 50)
  3 = CLASS 3 AGGREGATE SUB_BASE  (R_VALUE = 40)
  4 = CLASS 4 AGGREGATE SUB_BASE  (R_VALUE = VARY)
  5 = LIME TREATED SUB_BASE (LTS) (R_VALUE = 100)
      (1.3  <=  GF  <=  1.6)
? 0

ENTER CODE FOR TYPE OF BASE MATERIAL
  0 = NO BASE                                (GF = 0.0)
  1 = LEAN CONCRETE BASE (LCB)               (GF = 1.9)
  2 = CLASS A CEMENT TREATED BASE (CTB)      (GF = 1.7)
  3 = CLASS B CEMENT TREATED BASE (CTB)      (GF = 1.2)
  4 = CLASS 2 AGGREGATE BASE (AB)            (GF = 1.1)
  5 = SANDWICH - (E.G., DGAC, TPB, ACB)
  6 = LIME TREATED BASE (LTS)
      (1.3  <=  GF  <=  1.6)
? 4
CARE TO SPECIFY MINIMUM DEPTH OF BASE MATERIAL
(N=NO, Y=YES)
? N

     BASE R_VALUE            =   78.00
     .0032*TI*(100-R_VALUE)  =    0.95
     BASE GRAVEL FACTOR      =    1.10
     BASE MAX. DEPTH (FT)    =    3.00
     BASE MIN. DEPTH (FT)    =    0.35

ENTER TYPE OF TREATED PERMEABLE BASE MATERIAL
  0 = NONE
  1 = ASPHALT (GF = 1.4; DEPTH = 0.25 FT)
  2 = CEMENT  (GF = 1.7; DEPTH = 0.35 FT)
? 0

ENTER CODE FOR TYPE OF ASPHALT CONCRETE PAVEMENT
  1 = STANDARD_GF
  2 = ROAD_MIX_GF (GF = 0.8 * STANDARD_GF)
? 1

     AC   MAX. DEPTH  (FT)      =    1.90
     AC   MIN. DEPTH  (FT)      =    0.20
     AC   SAFE FACTOR (GE)      =    0.20


CARE TO ENTER 'COST PER CUBIC YARD' OF AC_PAVEMENT,
TPB, BASE/WORK, AND SUBBASE MATERIAL.  (N=NO, Y=YES)
(NOTE:  IF 'NO', THEN COSTS = 70, 60, 35, 25)
? N


   NOTE:  POSITIVE RESIDUAL_GE INDICATES OVER_DESIGN
   NOTE:  NEGATIVE SAFETY FACTOR IN LAYER = BASE
   ------------------------------------------------------
      AC        TPB       BASE    SUBBASE      RESID       COST         AC
   (FEET)    (FEET)    (FEET)    (FEET)         GE    (SQ YD)    GR_FCT

     0.70      0.00      2.75      0.00      -0.02      48.42      1.69
     0.75      0.00      2.65      0.00      -0.02      48.42      1.73
     0.80      0.00      2.55      0.00      -0.01      48.42      1.77
     0.85      0.00      2.45      0.00      -0.00      48.42      1.80
```

0.90	0.00	2.35	0.00	0.01	48.42	1.84
0.95	0.00	2.25	0.00	0.02	48.42	1.87
1.00	0.00	2.10	0.00	-0.02	47.83	1.91
1.05	0.00	2.00	0.00	-0.00	47.83	1.94
1.10	0.00	1.90	0.00	0.02	47.83	1.97
1.15	0.00	1.75	0.00	-0.01	47.25	2.00
1.20	0.00	1.65	0.00	0.01	47.25	2.02
1.25	0.00	1.50	0.00	-0.02	46.67	2.05
1.30	0.00	1.40	0.00	0.01	46.67	2.08
1.35	0.00	1.25	0.00	-0.02	46.08	2.11
1.40	0.00	1.15	0.00	0.02	46.08	2.13
1.45	0.00	1.00	0.00	-0.01	45.50	2.16
1.50	0.00	0.85	0.00	-0.03	44.92	2.18
1.55	0.00	0.75	0.00	0.01	44.92	2.20
1.60	0.00	0.60	0.00	-0.01	44.33	2.23
1.65	0.00	0.45	0.00	-0.02	43.75	2.25
1.70	0.00	0.35	0.00	0.02	43.75	2.27
1.75	0.00	0.35	0.00	0.17	44.92	2.30
1.80	0.00	0.35	0.00	0.32	46.08	2.32
1.85	0.00	0.35	0.00	0.48	47.25	2.34
1.90	0.00	0.35	0.00	0.63	48.42	2.36

R = 2
TI = 13.5

09-15-2006 15:01:31

ENTER TITLE OF PROJECT.
? TI-12.5 R-35

ENTER OPTION FOR METHOD OF DESIGN:
1 = PROGRAM WILL DESIGN THE LAYERS.
2 = YOU WILL HELP PROGRAM DESIGN THE LAYERS.
? 1

ENTER TRAFFIC INDEX (TI)
(5 <= TI <= 15)
? 12.5

ENTER R_VALUE OF BASEMENT (OR NATIVE) SOIL
(0 <= R_VALUE <= 90)
? 35

.0032*TI*(100-R_VALUE) = 2.60

ENTER CODE FOR TYPE OF SUB_BASE MATERIAL
0 = NO SUB_BASE MATERIAL
1 = CLASS 1 AGGREGATE SUB_BASE (R_VALUE = 60)
2 = CLASS 2 AGGREGATE SUB_BASE (R_VALUE = 50)
3 = CLASS 3 AGGREGATE SUB_BASE (R_VALUE = 40)
4 = CLASS 4 AGGREGATE SUB_BASE (R_VALUE = VARY)
5 = LIME TREATED SUB_BASE (LTS) (R_VALUE = 100)
(1.3 <= GF <= 1.6)
? 0

ENTER CODE FOR TYPE OF BASE MATERIAL
0 = NO BASE (GF = 0.0)
1 = LEAN CONCRETE BASE (LCB) (GF = 1.9)
2 = CLASS A CEMENT TREATED BASE (CTB) (GF = 1.7)
3 = CLASS B CEMENT TREATED BASE (CTB) (GF = 1.2)
4 = CLASS 2 AGGREGATE BASE (AB) (GF = 1.1)
5 = SANDWICH - (E.G., DGAC, TPB, ACB)
6 = LIME TREATED BASE (LTS)
(1.3 <= GF <= 1.6)
? 4
CARE TO SPECIFY MINIMUM DEPTH OF BASE MATERIAL

```
(N=NO, Y=YES)
? N

      BASE R_VALUE             =   78.00
      .0032*TI*(100-R_VALUE)   =    0.88
      BASE GRAVEL FACTOR       =    1.10
      BASE MAX. DEPTH (FT)     =    3.00
      BASE MIN. DEPTH (FT)     =    0.35

ENTER TYPE OF TREATED PERMEABLE BASE MATERIAL
  0 = NONE
  1 = ASPHALT (GF = 1.4; DEPTH = 0.25 FT)
  2 = CEMENT  (GF = 1.7; DEPTH = 0.35 FT)
? 0

ENTER CODE FOR TYPE OF ASPHALT CONCRETE PAVEMENT
  1 = STANDARD_GF
  2 = ROAD_MIX_GF (GF = 0.8 * STANDARD_GF)
? 1

      AC   MAX. DEPTH  (FT)      =    1.75
      AC   MIN. DEPTH  (FT)      =    0.20
      AC   SAFE FACTOR (GE)      =    0.20


CARE TO ENTER 'COST PER CUBIC YARD' OF AC_PAVEMENT,
TPB, BASE/WORK, AND SUBBASE MATERIAL.  (N=NO, Y=YES)
(NOTE:  IF 'NO', THEN COSTS = 70, 60, 35, 25)
? N


   NOTE:  POSITIVE RESIDUAL_GE INDICATES OVER_DESIGN
   NOTE:  NEGATIVE SAFETY FACTOR IN LAYER = BASE
   ---------------------------------------------------
      AC        TPB       BASE    SUBBASE      RESID       COST         AC
   (FEET)    (FEET)    (FEET)    (FEET)         GE    (SQ YD)    GR_FCT

     0.65      0.00      1.35      0.00      -0.00      30.92      1.72
     0.70      0.00      1.25      0.00       0.01      30.92      1.76
     0.75      0.00      1.15      0.00       0.01      30.92      1.80
     0.80      0.00      1.05      0.00       0.03      30.92      1.84
     0.85      0.00      0.90      0.00      -0.02      30.33      1.88
     0.90      0.00      0.80      0.00       0.00      30.33      1.91
     0.95      0.00      0.70      0.00       0.02      30.33      1.95
     1.00      0.00      0.55      0.00      -0.02      29.75      1.98
     1.05      0.00      0.45      0.00       0.01      29.75      2.01
     1.10      0.00      0.35      0.00       0.03      29.75      2.04
     1.15      0.00      0.35      0.00       0.17      30.92      2.07
     1.20      0.00      0.35      0.00       0.31      32.08      2.10
     1.25      0.00      0.35      0.00       0.45      33.25      2.13
     1.30      0.00      0.35      0.00       0.59      34.42      2.16

09-15-2006     15:04:14

ENTER TITLE OF PROJECT.
? TI-13.5 R-35

ENTER OPTION FOR METHOD OF DESIGN:
  1 = PROGRAM WILL DESIGN THE LAYERS.
  2 = YOU WILL HELP PROGRAM DESIGN THE LAYERS.
? 1
```

R=35
TI=12.5

CALEXICO

ENTER TRAFFIC INDEX (TI)
(5 <= TI <= 15)
? 13.5

WANT TO REPEAT VALUES FROM PREVIOUS DESIGN
(N=NO, Y=YES)
? Y

35
.0032*TI*(100-R.VALUE) = 2.81

NOTE: POSITIVE RESIDUAL_GE INDICATES OVER_DESIGN
NOTE: NEGATIVE SAFETY FACTOR IN LAYER = BASE

AC (FEET)	TPB (FEET)	BASE (FEET)	SUBBASE (FEET)	RESID GE	COST (SQ YD)	AC GR_FCT
0.70	0.00	1.50	0.00	0.03	33.83	1.69
0.75	0.00	1.35	0.00	-0.02	33.25	1.73
0.80	0.00	1.25	0.00	-0.02	33.25	1.77
0.85	0.00	1.15	0.00	-0.01	33.25	1.80
0.90	0.00	1.05	0.00	0.00	33.25	1.84
0.95	0.00	0.95	0.00	0.02	33.25	1.87
1.00	0.00	0.80	0.00	-0.02	32.67	1.91
1.05	0.00	0.70	0.00	-0.00	32.67	1.94
1.10	0.00	0.60	0.00	0.02	32.67	1.97
1.15	0.00	0.45	0.00	-0.02	32.08	2.00
1.20	0.00	0.35	0.00	0.01	32.08	2.02
1.25	0.00	0.35	0.00	0.14	33.25	2.05
1.30	0.00	0.35	0.00	0.28	34.42	2.08
1.35	0.00	0.35	0.00	0.42	35.58	2.11
1.40	0.00	0.35	0.00	0.56	36.75	2.13

TI = 13.5
R = 35

********** FINISH **********

APPENDIX IV

• ANALYSIS
• DESIGN

LaBelle • Marvin

• SOILS, ASPHALT TECHNOLOGY

PROFESSIONAL PAVEMENT ENGINEERING

A CALIFORNIA CORPORATION

DEFLECTION ANALYSIS

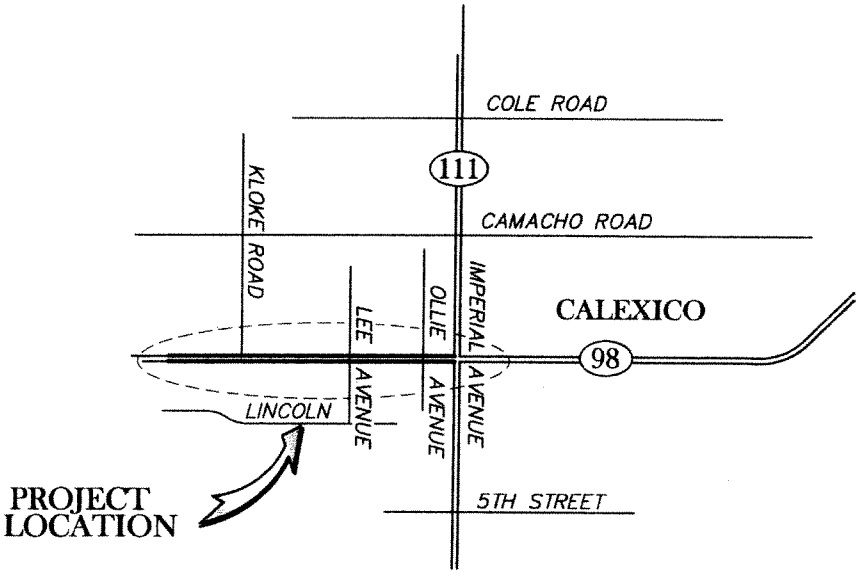
Of

HIGHWAY 98

(All American Canal to Highway 111)

Within The

City of Calexico, California



Reviewed By:

STEVEN R. MARVIN
RCE 30659

Client: Southern California Soil & Testing
September 2006

Project No. 32607

2700 S. GRAND AVENUE • SANTA ANA, CA 92705-5404 • (714) 546-3468 • FAX (714) 546-5841

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- B - Table Ones
- C - Deflection Data
- D - Explanation of Listing on Road Rater Data Sheets
- E - Technical Details on Road Rater and Deflection Analysis

Introduction

Improvement of Highway 98 from the All American Canal westerly to Highway 111, within the City of Calexico is in the final design and planning stages. Improvement of the roadway may include a combination of reconstruction and resurfacing combined with construction of new median or frontage improvements as required. The purpose of this investigation is to provide data and independent analysis of the present structural conditions and define or explore various means of possible rehabilitation using in place strength testing.

Based on the present structural integrity of the existing travel lanes, and on projected future traffic use, improvement requirements to meet long-term City performance expectations are developed. A challenge for rehabilitation of the roadway will be effective control or limiting of premature reflective cracking combined with the geometric limitations imposed by the existing crown and roadway cross slope.

Scope of Work

Investigation of Highway 98 included:

- Site Inspection
- In-Place Strength Testing

- Core sampling (by others) of the existing pavement including measurement of the:
  - Asphalt Concrete Layer Thickness
  - Portland Cement concrete Layer Thickness (if any)
  - Aggregate Base Layer Thickness (if any)

- Engineering Analysis Combining
  - In-place Strength Analysis
  - Site Condition Assessment

- Report Preparation.

Discussion

The investigation performed utilizes pavement core sampling to define the existing section thicknesses, in place strength testing to determine the combined effects of subgrade strength variations, historical traffic use, prior maintenance and resurfacing, laboratory testing to develop predicted subgrade strengths, and subgrade moisture testing to aid in characterizing subsurface conditions. The specific 'hard' data is combined with visual examination of the roadway to develop recommendations for maintenance, rehabilitation, or reconstruction.

During the course of combining the many variables associated with pavement performance and pavement rehabilitation, certain design challenges have to be addressed including current grades, crown heights and cross slopes, the impacts on surface grades and elevations for each of the rehabilitation or maintenance alternatives, projected short and long term performance and of course initial and projected long term costs. Balancing the costs and benefits then requires consideration of numerous alternative methods of construction, which along with the costs and benefits include certain risks.

The risks of pavement reconstruction are many, and include the potential for encountering as yet undefined subsurface conditions, utility conflicts, weather delays, and of course the increased costs which may actually prevent the project from moving forward, regardless of need or desire. Reconstruction also includes obvious disruption to residential and business life, and may be fraught with delays where subsurface conditions require design or construction changes. The specter of maintaining emergency access to businesses and residents impacted by the construction project are always most severe during roadway reconstruction projects.

Resurfacing of the existing roadway also includes risks, which are balanced with construction and personal cost savings, constructability, and a cost benefit ratio, projecting the necessary reoccurrence of maintenance with time, and the impact on future maintenance choices with the type of resurfacing procedure chosen. Pavement resurfacing must also address the reality of street variability, changes in past and future traffic patterns, such as the advent of street side recycling of green waste, bottles, and cans, and collection of normal household and business refuse. The increase in trash collection alone has tripled the weekly destruction of residential roadways in the community, with

lesser but proportional damage to the arterials and collectors. The least cost alternative available may therefore not always be the most cost effective alternative over time.

Evaluation of the roadway system, and ultimately selection of an appropriate course of corrective action must consider each of these objective issues, and combine these impacts with subjective values of the community such as appearance, curing periods, actual apparent work performed versus the total area within the City improved, i.e., the perceived value of work performed. Inherent in each of the construction procedures, including reconstruction, is the potential for unknown conditions, change orders, quality control and quality assurance procedures, the risks and implications of material variability, and in the case of resurfacing, grade impacts, grade restrictions along the roadway edges due to the presence or absence of curb or curb and gutter, prior construction history, the potential for reflection of existing cracking through the new wearing surface, etc.

Rehabilitation Procedures

The majority of resurfacing systems are designed to address these variables, simply and effectively utilizing cold milling along pavement edges, aggressive crack filling, and where cracking is extensive, use of materials or layers resistant to premature reflective cracking. A key element in each of the resurfacing procedures is a comparison of both structural and aesthetic need, combined with the foreseeable risk, long and short performance benefits of the

procedure and a comparison of resurfacing costs with the large expense of complete reconstruction.

Reconstruction

Reconstruction almost always provides the least risk at the highest cost of construction. Typical reconstruction costs range from 3 to 10 times more than each of the resurfacing alternatives and is therefore selected only when all other alternatives are exhausted. Reconstruction involves complete removal of the existing pavement section and any underlying aggregate base layers, typically along with a defined amount of underlying subgrade soils. Where utility conflicts exist, such as shallow telecommunications lines or utilities which were previously installed within the upper few feet of the pavement surface due to other depth restrictions or prior regulations, such utilities are either then relocated or somehow protected in place.

Subgrade conditions may also dictate changes in construction scheduling, such as where subgrade is wet and will not support conventional construction equipment, areas where high ground water tables prevent ready drying of materials, of where adjacent conditions such as lakes, landscape slopes, etc. provide continual infiltration of water into the excavation. Prevailing weather conditions, such as persistent fog, unforeseen rainfall, etc. will also adversely impact reconstruction activities. Reconstruction does however present certain advantages such as future uniformity of construction, greater opportunities for quality control, correction of past problematic conditions, etc.

Specific replacement section alternatives are provided within this report, utilizing both conventional asphalt concrete over aggregate base sections and full depth asphalt concrete sections constructed directly over the prepared

subgrade soils. The replacement sections are location and street specific, based on variations in subgrade strengths determined during laboratory testing, and projected future traffic use.

Replacement section alternatives are designed using methods outlined in the Flexible Pavement Structural Section Design Guide for California Cities and Counties, Third Edition, and the Caltrans Highway Design Manual Fourth and Fifth Editions.

Asphalt Concrete Overlay

Asphalt concrete overlay provides improvement of the roadway, utilizing the existing layers of asphalt concrete and aggregate base as support for a new wearing surface. Addition of a defined thickness of asphalt concrete provides structural reinforcement of the roadway, permitting the designer to address changes in traffic use, increases in traffic volumes and weights, correct riding qualities, and effectively extends the structural performance of the roadway for ten or even twenty years.

Placement of asphalt concrete overlays results in an increase in crown height and of course roadway cross slope. As such, repeated placement of asphalt concrete overlays ultimately becomes unacceptable, resulting in either full street cold milling or possibly reconstruction. Pavement grinding is used for most overlays to provide a transition along the edges of the roadway, adjoining curb or gutter, at cross streets, at the termination point of overlays and at transitions to other fixed elevations such as railroad crossings, large utility vaults, etc. Remaining fixed elevation improvements such as manhole covers,

valve covers, etc. are typically adjusted to the new finished elevation through use of risers or reconstruction of the item.

A significant consideration during design and ultimately construction of overlays is the potential for existing pavement cracking of differing severity to reflect through the new wearing surface, with obvious aesthetic impacts. The reflected cracks also eventually become future maintenance issues, and in severe cases, provide an avenue of water damage from the surface, through to the underlying base and subgrade layers. Asphalt concrete overlays must weight the risks of limited crack reflection versus the obvious cost and construction benefits of roadway reuse and extension of the useful life through cost effective overlay.

Asphalt concrete overlays are seldom placed over roadways that are completely free of cracks of some type or description. Reflection crack control systems have therefore been developed and include use of simple or involved crack filling, use of pavement reinforcing fabric and pavement grids, use of asphalt rubber aggregate membranes, etc. Each of these methods results in controlling a percentage of the reflective cracks, at varying costs. None of the systems are intended to address every type of crack, with the most aggressive systems achieving an 80% or greater reduction in premature reflective cracking. Since even new pavements following construction or reconstruction are subject to cracking over time, reasonable control of reflective cracking for a 10-year period is considered acceptable.

Placement of asphalt concrete overlays are limited by surrounding elevations such as existing curb and gutter, existing medians, the crown height or roadway elevation, and the cross slope resulting from placement of overlays. The overlay limit will vary, depending upon the specific roadway width and previous overlay history, etc. In general, a 4" thick maximum overlay thickness is considered for preparation of the materials report. Where the required overlay exceeds the limits imposed, reconstruction becomes necessary. Design elements during design such as widening, construction of new curbs and gutter, etc., will impact the potential for overlay placement.

Asphalt Rubber Hot Mix Overlay

Asphalt rubber hot mix overlay should be considered a hybrid of the asphalt concrete overlay pavement restoration procedure. Asphalt rubber binders, and more recently polymer-modified binders; have been developed to provide additional flexibility of the pavement layer, thereby providing further resistance to reflective cracking. The increased flexibility provides a greater tolerance for excessive deflection, and as such, although not providing inch per inch similar structural reinforcement of the existing pavement structure, provides comparable long-term performance characteristics.

Similar to asphalt concrete overlays addition of a defined thickness of asphalt rubber hot mix provides structural reinforcement of the roadway, permitting the designer to address changes in traffic use, increases in traffic volumes and weights, correct riding qualities, and effectively extend the structural performance of the roadway for 10 or more years.

Placement of asphalt rubber hot mix overlays also results in an increase in crown height and of course roadway cross slope. As such, repeated placement of asphalt concrete or asphalt rubber hot mix overlays ultimately becomes unacceptable, resulting in either full street cold milling or possibly reconstruction. Pavement grinding is used for most overlays to provide a transition along the edges of the roadway, adjoining curb or gutter, at cross streets, at the termination point of overlays and at transitions to other fixed elevations such as railroad crossings, large utility vaults, etc. Remaining fixed elevation improvements such as manhole covers, valve covers, etc. are typically adjusted to the new finished elevation through use of risers or reconstruction of the item.

Asphalt rubber hot mix overlays are seldom placed over roadways that are completely free of cracks of some type or description and are not used for new construction. Since even new pavements following construction or reconstruction are subject to cracking over time, reasonable control of reflective cracking for a 10-year period is considered acceptable.

In-Place Strength Testing

The net effect of as-built pavement thicknesses, variability of subgrade soil types and conditions, construction and maintenance history, weather and aging cycles, and of course, the impact of continued and ever increasing traffic weights and volumes is determined through specific measurement of the in place pavement strength. Pavement deflection testing, using the Model 400

Road Rater was performed in the right wheel path of each travel lane, at 100' intervals. Specific deflection test data are included in this report. Explanations of the test equipment, deflection testing performed, and the test data provided are included In Appendix F.

The pavement response to known loading criteria provides real time measurement of the present pavement strength. The pavement strength measurements are evaluated, using specific pavement performance models, combining all known information with projections of future traffic use as represented by the Traffic Index. The in-place strength testing permits development of rehabilitation alternatives, which aid in reinforcing the roadway, address present physical defects and distress, and provide the user with a serviceable roadway for an extended time period.

Traffic Use Estimates

Estimates of future traffic use or Traffic Index was provided by Southern California Soil and Testing. The 12.5 to 13.5 Traffic Indices includes estimates of current and future automobile, bus and truck use.

These estimates of future traffic use or Traffic Index were combined with in-place thickness information and measured section strengths to develop recommendations for rehabilitation. Additional Traffic Indices greater and lesser than the design Traffic Index were also evaluated to determine the potential impacts of differing growth over the 20-year design period. Recommendations

for improvement were based on Traffic Indices provided for each roadway segment.

Field Conditions

Highway 98 is a major arterial/highway and has historically been part of the State of California Highway system. The highway provides major east/west access through the City of Calexico and serves the truck and general border crossings into Mexicali. The roadway also serves the general farming community in the region.

The roadway parallels to the south Interstate 8 and may serve as an alternative transportation corridor. Highway 98 generally includes two travel lanes, one each east and westbound from the All American Canal to George Avenue. The roadway widens east of George Avenue to include four travel lanes and dedicated left turn lanes at Highway 111. Recent development north of Highway 98, between Ollie Avenue and Imperial Highway west/west of Canal Street includes a substantial roadway widening. The widening area is presently being used for right turn movements into the adjacent retail businesses.

Roadway alignment to provide additional turn lanes at Highway 111 and various other roadways tends to shift the thru lanes as required. Previous roadway widening, realignment, etc. has also shifted the travel way from the original roadway section. The specific original roadway width is unknown, however cracking patterns suggest the original highway was constructed of Portland

Cement Concrete. Core sampling by others has confirmed the presence of PCC below the present asphalt concrete surface at certain locations.

The roadway includes curb and gutter improvements at or near Kloke Road, Eady Avenue and from George Avenue to Highway 111. A dirt lined ditch defines the roadway edge along the south side of the roadway from near Lee Avenue to east of Kloke Road. The remainder of the roadway includes improved shoulders with or without asphalt concrete berms.

The existing pavement surface includes a variety of previous patches. A sustained patch coincides with the right wheel path of the eastbound number two lane and extends from Ollie Avenue to Harold Avenue. The patch likely corresponds to previous maintenance attempts to address pavement failures and rutting. Surface milling has been utilized extensively along the roadway to address previous pavement rutting.

Field Core Sampling and Laboratory Data

Pavement core sampling has been reported by others at ten (10) locations, along the roadway between David Navarro Avenue and George Avenue. The specific lateral location relative to the edge of the roadway, comparisons to the original roadway alignment, etc. are not known at this time.

Conclusions

The original Portland Cement Concrete roadway likely coincides with the westbound number one lane, the striped median (where present) and some portion of the westbound number one lane within specific limits. Based on site conditions, the original roadway alignment likely corresponds to the present alignment from the All American Canal, easterly to David Navarro Avenue. The original PCC pavement then likely corresponds to the westbound number one lane and striped or raised median only. The PCC also includes the north shoulder area in certain locations.

Previous roadway widening or minor realignment places the right wheel path of the westbound number one lane on and off the underlying PCC pavement. Similarly, previous utility cuts, both longitudinally and transversely have disrupted support from the original roadway alignment. Pavement core sampling observed includes locations within the median and within the 'shoulder' area. While the core provided access for subgrade sampling and testing, additional core sampling is necessary within the various roadway wheel paths to specifically determine the existing section in these critical locations.

In-place strength testing indicates significant structural reinforcement of Highway 98 is required in all areas where the roadway is not supported by the older PCC alignment. Additionally, the probable build up of fine, highly sanded asphalt concrete mixtures continues to contribute to pavement rutting, even where overall structural requirements are reduced.

Placement of additional asphalt concrete or asphalt rubber hot mix overlays over the present pavement surface must address the previous propensity for rutting. Use of deep cold milling to remove a significant portion of the previous asphalt concrete surfacing may therefore be required prior to resurfacing. The removed materials should then be replaced with asphalt concrete specifically designed to resist the combined truck and heat stresses associated with the region.

Recommendations

Construction records should be supplemented with additional pavement core sampling or excavation of trenches across the roadway to determine the specific alignment of the older, buried PCC pavement. Prior to coring or trenching, the present cracking pattern may be mapped on previous improvement plans, likely providing reasonable confirmation of the buried PCC location. Coring and trenching may then be utilized to confirm probable conditions, and explore areas without definitive cracking conditions.

Reconstruction of the roadway beyond the limits of the buried PCC pavement will then be necessary. Notable exceptions may include the recent widening along the north side of the roadway between Estrada Boulevard and W. Imperial Avenue. Construction records should be confirmed with additional core sampling as necessary to determine conditions within this widening area. Alternative recommendations have been prepared with varying grade impacts on the present crown height and cross slope.

Primary Recommendation

The Primary Recommendation is intended to increase the total pavement thickness and moderate the impact on crown height and cross slope. Moderation of grades will require streetwide cold milling to remove one or more of the previous thin asphalt concrete overlays.

Based on measured pavement strengths, limited or no reconstruction should be required in either the eastbound or westbound lanes from the All American Canal to David Navarro Avenue. Similarly, limited or no reconstruction should be necessary in the westbound lanes from W. Railroad Boulevard to David Navarro Avenue. The specific limits of reconstruction along the remainder of the roadway will be subject to verification of the previous PCC alignment.

- Reconstruct all pavement areas beyond or outside of the limits of the original highway alignment (beyond buried PCC pavement). Utilize pavement section staged to include necessary resurfacing of the original PCC pavement areas. Increase width of reconstruction as required for grade control.

- Construct new asphalt concrete and aggregate base section (if base is used) within all areas beyond the limits of the buried PCC pavement. Stage paving to permit concurrent paving in adjacent lanes utilizing the buried PCC pavement for support.

- Cold mill the original roadway alignment 6" below present elevations to remove older, rut prone or rut damaged asphalt concrete pavement.

- Clean and fill all exposed pavement cracking wider than 1/8"

- Construct new minimum 8" thick asphalt concrete pavement over the original PCC alignment using asphalt concrete specifically designed for the Calexico environment and observed use.

Replacement Section Alternatives

Reconstruction of the outer roadway edges along the roadway will be required. Additional reconstruction will also be required pending verification of the actual extent of PCC underlying the existing roadway surface. Grade limitations or construction staging may also require additional reconstruction. Replacement sections should be designed based on R-value testing performed on the prevailing sand subgrade.

Consistent with the current Caltrans Design Manual, the subgrade R-value should be limited to a maximum 50 value.

Material Recommendations

Materials – Aggregate Base

Aggregate base sections may utilize Crushed Aggregate Base (CAB) or Crushed Miscellaneous Base (CMB) complying with applicable sections of the Standard Specifications for Public Works Construction, latest edition, or Class 2 Aggregate Base complying with the applicable sections of the State of California Department of Transportation (Caltrans) Standard Specifications, latest edition.

Materials - Asphalt Concrete – New Construction

Asphalt concrete shall be designed specifically to resist the environment and use conditions along Highway 98. Recent developments in "high stability' mixes should be strictly followed.

Appendix A

Location and Strip Maps

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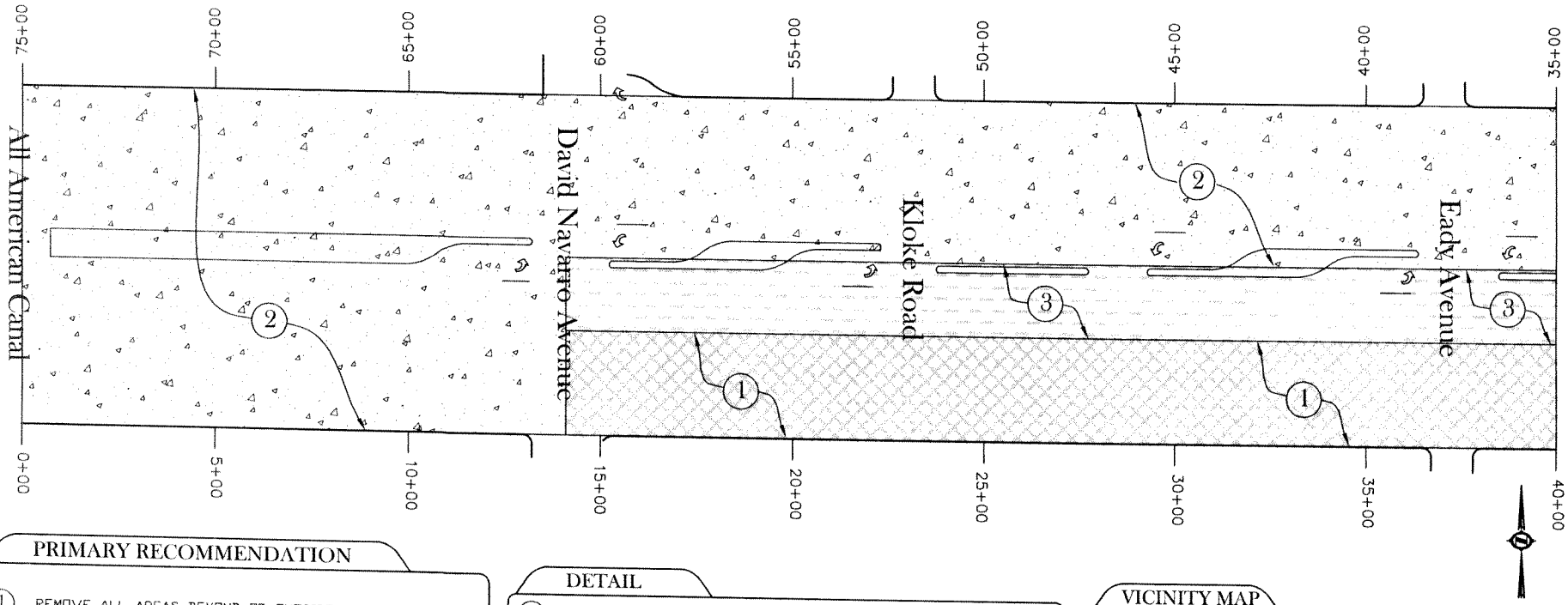
- ANALYSIS
- DESIGN
- SOIL TESTING
- ASPHALT TECHNOLOGY

HIGHWAY 98

CONCEPTUAL PURPOSES ONLY

DATE: 8/23/06



PRIMARY RECOMMENDATION

(1) REMOVE ALL AREAS BEYOND OR OUTSIDE OF THE LIMITS OF THE ORIGINAL HIGHWAY ALIGNMENT (BEYOND BURIED PCC PAVEMENT). RECONSTRUCT WITH WITH NEW ASPHALT CONCRETE AND AGGREGATE BASE SECTION (IF BASE IS USED).

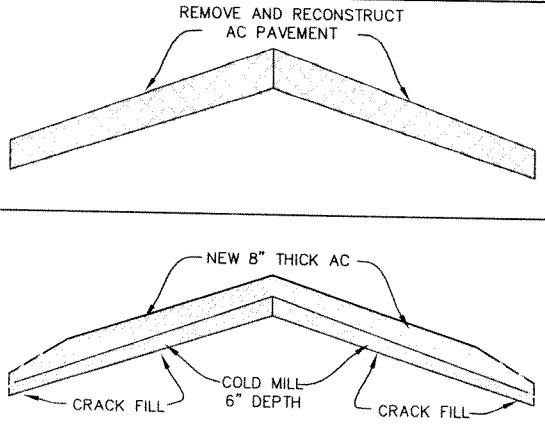
(2) I. COLD MILL ORIGINAL ROADWAY ALIGNMENT 6" DEPTH BELOW PRESENT ELEVATIONS.

II. CLEAN AND FILL ALL EXPOSED PAVEMENT CRACKING WIDER THAN 1/8".

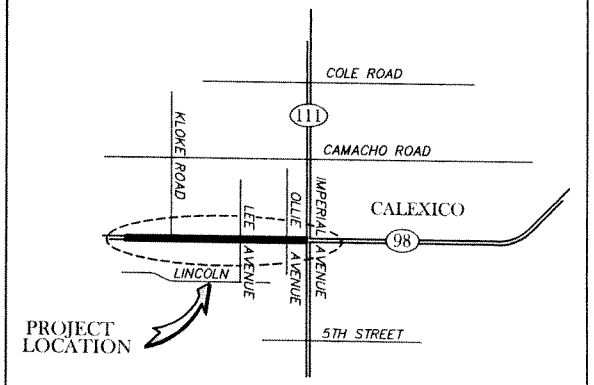
III. CONSTRUCT NEW MINIMUM 8" THICK ASPHALT CONCRETE OVER ORIGINAL PCC ALIGNMENT. (USE ASPHALT CONCRETE SPECIFICALLY DESIGNED FOR CALEXICO ENVIRONMENT AND OBSERVED USE.

(3) EITHER ITEM (1) OR (2) PENDING COMPLETION OF RECOMMENDED INVESTIGATION.

DETAIL



VICINITY MAP



SOUTHERN CALIFORNIA
SOIL AND TESTING
6280 RIVERDALE STREET
SAN DIEGO, CA 92120

PRIMARY

DESIGN
TRAFFIC INDEX:
R-VALUE:

HIGHWAY 98

PROJECT LIMITS

ALL AMERICAN CANAL TO HIGHWAY 111

LABELLE · MARVIN, INC.
PROFESSIONAL PAVEMENT ENGINEERING
WWW.LABELLEMARVIN.COM
2700 S. GRAND AVENUE SANTA ANA, CA 92705
PH (714) 546-3468 FAX (714) 546-58.41

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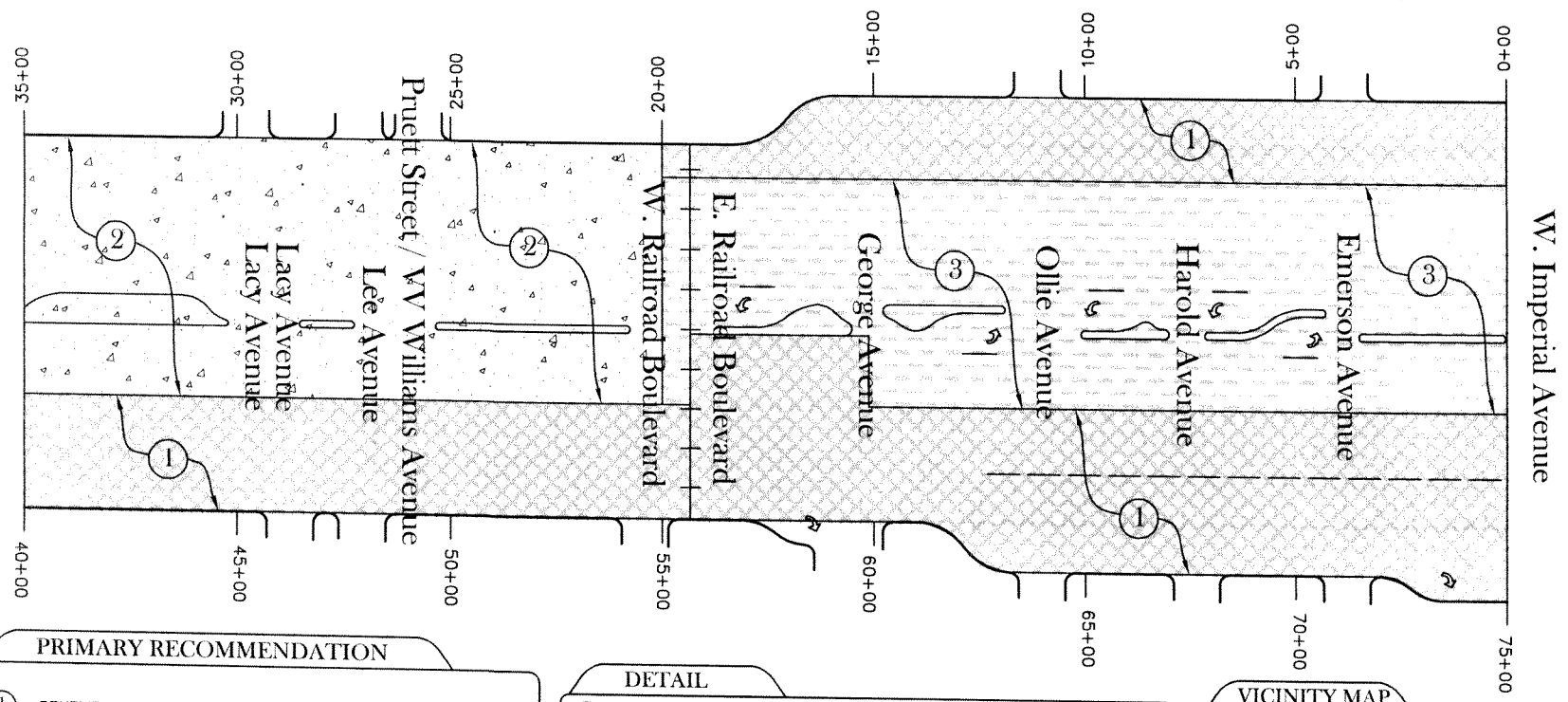
HIGHWAY 98

CONCEPTUAL PURPOSES ONLY



PRIMARY RECOMMENDATION

(1) REMOVE ALL AREAS BEYOND OR OUTSIDE OF THE LIMITS OF THE ORIGINAL HIGHWAY ALIGNMENT (BEYOND BURIED PCC PAVEMENT). RECONSTRUCT WITH WITH NEW ASPHALT CONCRETE AND AGGREGATE BASE SECTION (IF BASE IS USED).

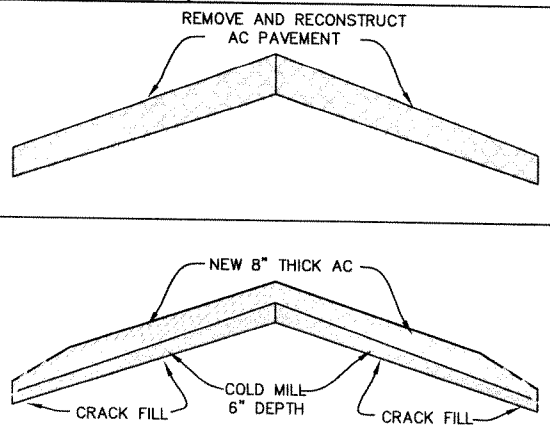
(2) I. COLD MILL ORIGINAL ROADWAY ALIGNMENT 6" DEPTH BELOW PRESENT ELEVATIONS.

II. CLEAN AND FILL ALL EXPOSED PAVEMENT CRACKING WIDER THAN 1/8".

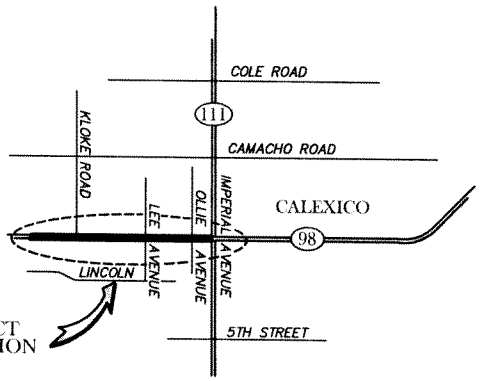
III. CONSTRUCT NEW MINIMUM 8" THICK ASPHALT CONCRETE OVER ORIGINAL PCC ALIGNMENT. (USE ASPHALT CONCRETE SPECIFICALLY DESIGNED FOR CALEXICO ENVIRONMENT AND OBSERVED USE.

(3) EITHER ITEM (1) OR (2) PENDING COMPLETION OF RECOMMENDED INVESTIGATION.

DETAIL



VICINITY MAP



SOUTHERN CALIFORNIA
SOIL AND TESTING
6280 RIVERDALE STREET
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PRIMARY

DESIGN
TRAFFIC INDEX:
R-VALUE:

HIGHWAY 98

PROJECT LIMITS

ALL AMERICAN CANAL TO HIGHWAY 111

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PROFESSIONAL PAVEMENT ENGINEERING
WWW.LABELLEMARVIN.COM
2700 S. GRAND AVENUE SANTA ANA, CA 92705
PH (714) 546-3468 FAX (714) 546-58.41

32607

Appendix B

TABLE ONES

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TABLE ONE

Street and Limits	Measured Deflection R.R.	Measured Deflection T.D.	T.I.	'T' (ft.)	Allowable Deflection R.R.	Allowable Deflection T.D.	Reduction Required (%)	G.E. Required (ft.)	A.C. Required (ft.)	NSL (yrs)
Highway 98 : All American Canal to Highway 111										
Eastbound - 1										
1+00 to 11+00	70	13.2	12.0	0.5	54	9.4	29	.21	.11	1
			12.5	0.5	52	8.9	32	.23	.12	1
			13.0	0.5	50	8.4	36	.33	.17	1
12+00 to 22+00	114	23.8	12.0	0.5	54	9.4	60	.86	.45	0
			12.5	0.5	52	8.9	63	.92	.48	0
			13.0	0.5	50	8.4	65	.97	.51	0
24+00 to 27+00	134	28.6	13.0	0.5	50	8.4	71	1.10	.58	0
			13.5	0.5	49	8.0	72	1.12	.59	0
			14.0	0.5	47	7.6	73	1.14	.60	0
28+00 to 45+00	100	20.4	13.0	0.5	50	8.4	59	.84	.44	0
			13.5	0.5	49	8.0	61	.88	.46	0
			14.0	0.5	47	7.6	63	.92	.48	0
46+00 to 48+00	82	16.1	13.0	0.5	50	8.4	48	.60	.32	0
			13.5	0.5	49	8.0	50	.64	.34	0
			14.0	0.5	47	7.6	53	.71	.37	0
49+00 to 57+00	100	20.4	12.0	0.5	54	9.4	54	.73	.38	0
			12.5	0.5	52	8.9	56	.77	.41	0
			13.0	0.5	50	8.4	59	.84	.44	0
58+00 to 74+00	88	17.5	12.0	0.5	54	9.4	46	.56	.29	0
			12.5	0.5	52	8.9	49	.62	.33	0
			13.0	0.5	50	8.4	52	.69	.36	0
Highway 98 : All American Canal to Highway 111										
Eastbound - 2										
63+50 to 67+50	153	33.2	12.0	0.5	54	9.4	72	1.12	.59	0
			12.5	0.5	52	8.9	73	1.14	.60	0
			13.0	0.5	50	8.4	75	1.18	.62	0
68+50 to 73+50	96	19.4	12.0	0.5	54	9.4	52	.69	.36	0
			12.5	0.5	52	8.9	54	.73	.38	0
			13.0	0.5	50	8.4	57	.79	.42	0
Highway 98 : Highway 111 to All American Canal										
Westbound - 1										
1+00 to 7+00	61	11.0	12.0	0.5	54	9.4	14	.04	.02	4
			12.5	0.5	52	8.9	19	.09	.05	3
			13.0	0.5	50	8.4	23	.14	.07	2
8+00 to 18+00	97	19.7	12.0	0.5	54	9.4	52	.69	.36	0
			12.5	0.5	52	8.9	55	.75	.39	0
			13.0	0.5	50	8.4	57	.79	.42	0
19+00 to 27+00	63	11.5	12.0	0.5	54	9.4	18	.09	.05	3
			12.5	0.5	52	8.9	23	.14	.07	2
			13.0	0.5	50	8.4	27	.18	.09	2
28+00 to 51+00	72	13.7	13.0	0.5	50	8.4	38	.38	.20	1

10 Year Design Period
No Growth Factor

Project No.32607

Street and Limits	Measured Deflection R.R.	Measured Deflection T.D.	T.I.	'T' (ft.)	Allowable Deflection R.R.	Allowable Deflection T.D.	Reduction Required (%)	G.E. Required (ft.)	A.C. Required (ft.)	NSL (yrs)
Highway 98 : Highway 111 to All American Canal										
Westbound - 1										
			13.5	0.5	49	8.0	41	.44	.23	0
			14.0	0.5	47	7.6	44	.51	.27	0
53+00 to 60+00	57	10.0	12.0	0.5	54	9.4	6	.02	.01	7
			12.5	0.5	52	8.9	11	.03	.02	5
			13.0	0.5	50	8.4	16	.08	.04	3
62+00 to 74+00	49	8.1	12.0	0.5	54	9.4	0	.00	.00	10+
			12.5	0.5	52	8.9	0	.00	.00	10+
			13.0	0.5	50	8.4	0	.00	.00	10+
Highway 98 : Highway 111 to All American Canal										
Westbound - 2										
1+50 to 3+50	67	12.5	12.0	0.5	54	9.4	24	.16	.08	2
			12.5	0.5	52	8.9	29	.21	.11	1
			13.0	0.5	50	8.4	32	.23	.12	1
4+50 to 13+50	136	29.1	12.0	0.5	54	9.4	68	1.03	.54	0
			12.5	0.5	52	8.9	69	1.05	.55	0
			13.0	0.5	50	8.4	71	1.10	.58	0
14+50 to 15+50	42	6.4	12.0	0.5	54	9.4	0	.00	.00	10+
			12.5	0.5	52	8.9	0	.00	.00	10+
			13.0	0.5	50	8.4	0	.00	.00	10+

10 Year Design Period
No Growth Factor

Project No.32607

Appendix C

DEFLECTION DATA

LaBelle • Marvin

Street: **Highway 98** *Project No.* **32607**

Limits: **All American Canal to Highway 111**

Direction: **Eastbound**

Lane: **1**

Feet X 100	*RR1*	*RR2*	*RR3*	*Ratio*	*Proj RR1*	*TD on 1*	*Comments*
●							Begin Test lane 1 Eastbound Highway 98
●0+00							All American Canal to Highway 111
●0+01							CL of All American Canal
●0+01							Bare Shoulder
1+00	80	59	39	0.74	89	15.58	
2+00	56	47	38	0.84	58	9.8	
3+00	45	39	31	0.87	49	7.14	Lateral Cracks
4+00	63	57	45	0.9	72	11.48	Lateral Cracks
5+00	58	49	38	0.84	63	10.28	Longitudinal Cracks Lateral Cracks
●5+30							Change in Pavement
6+00	36	31	25	0.86	38	4.98	
7+00	64	50	36	0.78	69	11.72	Slight Lateral Cracks
8+00	38	31	24	0.82	40	5.46	
9+00	29	25	21	0.86	30	3.29	
10+00	82	76	55	0.93	105	16.06	Longitudinal Cracks Lateral Cracks
●10+40							Change in Pavement
11+00	62	51	38	0.82	68	11.24	
●11+30							Begin LTP
12+00	116	93	63	0.8	137	24.26	
13+00	100	80	54	0.8	119	20.4	
●14+00							CL of David Navarro Ave
15+00	108	72	44	0.67	118	22.33	Longitudinal Cracks Lateral Cracks
16+00	91	70	47	0.77	104	18.23	Longitudinal Cracks Lateral Cracks
●16+70							Begin Median Painted
17+00	106	74	45	0.7	122	21.85	
18+00	73	55	36	0.75	84	13.89	Longitudinal Cracks Lateral Cracks
19+00	80	64	41	0.8	100	15.58	Longitudinal Cracks Lateral Cracks
20+00	121	89	57	0.74	139	25.46	Longitudinal Cracks Lateral Cracks
●20+50							Curb and Gutter
21+00	113	85	51	0.75	142	23.53	Lateral Cracks
●21+30							Begin LTP
22+00	98	70	43	0.71	114	19.92	Longitudinal Cracks Lateral Cracks
●23+50							CL of Kloke Rd
24+00	38	29	20	0.76	42	5.46	Longitudinal Cracks Lateral Cracks
25+00	119	86	58	0.72	128	24.98	Longitudinal Cracks Lateral Cracks
26+00	89	71	49	0.8	103	17.75	Longitudinal Cracks Lateral Cracks
27+00	141	108	70	0.77	167	30.28	Longitudinal Cracks Lateral Cracks
●27+20							End Curb and Gutter Begin Bare Shoulder
28+00	92	72	50	0.78	104	18.47	
29+00	66	55	42	0.83	72	12.21	
30+00	73	66	52	0.9	84	13.89	Lateral Cracks
31+00	115	97	69	0.84	136	24.02	Lateral Cracks
32+00	69	62	46	0.9	84	12.93	Lateral Cracks
33+00	79	71	34	0.9	148	15.34	Lateral Cracks
34+00	94	77	41	0.82	145	18.95	Longitudinal Cracks Lateral Cracks
35+00	86	73	54	0.85	99	17.03	Longitudinal Cracks
●35+90							Begin LTP
36+00	60	54	42	0.9	69	10.76	Lateral Cracks
37+00	76	69	58	0.91	82	14.62	
●37+60							CL of Eady Ave
38+00	70	66	50	0.94	87	13.17	Longitudinal Cracks Lateral Cracks
39+00	124	111	82	0.9	150	26.18	Longitudinal Cracks Lateral Cracks

● Not Included in Summary

Street: **Highway 98** *Project No.* **32607**
Limits: **All American Canal to Highway 111**
Direction: **Eastbound**
Lane: **1**

Feet X 100	*RR1*	*RR2*	*RR3*	*Ratio*	*Proj RR1*	*TD on 1*	*Comments*
40+00	90	78	58	0.87	105	17.99	Longitudinal Cracks Lateral Cracks
41+00	98	88	66	0.9	117	19.92	Longitudinal Cracks Lateral Cracks
●42+00	288	192	105	0.67	351	65.71	Longitudinal Cracks Lateral Cracks Alligator Cracks
43+00	79	67	48	0.85	94	15.34	Longitudinal Cracks Lateral Cracks Alligator Cracks
●43+80							Begin Longitudinal Trench
44+00	104	82	57	0.79	118	21.36	Longitudinal Cracks Lateral Cracks
●44+30							End Longitudinal Trench
45+00	75	61	44	0.81	85	14.38	Longitudinal Cracks Lateral Cracks
●45+40							CL of Lacy Ave
46+00	86	73	55	0.85	97	17.03	Longitudinal Cracks Lateral Cracks
47+00	59	50	38	0.85	66	10.52	Lateral Cracks
48+00	63	53	37	0.84	76	11.48	CL of Lee Ave Lateral Cracks
●48+90							CL of V.V. Williams Ave
49+00	50	37	26	0.74	53	8.35	Lateral Cracks
50+00	55	37	23	0.67	60	9.56	Lateral Cracks
51+00	80	59	35	0.74	99	15.58	Lateral Cracks
52+00	87	60	30	0.69	120	17.27	Lateral Cracks
53+00	91	59	36	0.65	97	18.23	Longitudinal Cracks Lateral Cracks
54+00	87	64	40	0.74	102	17.27	Lateral Cracks
●54+80							CL of W. Railroad Blvd
●55+90							CL of Railroad Tracks
56+00	43	33	25	0.77	44	6.66	
57+00	124	95	62	0.77	146	26.18	
●57+25							Curb and Gutter
●57+70							Begin RTP
●57+70							Median Raised
58+00	29	21	17	0.72	26	3.29	
59+00	34	20	15	0.59	27	4.49	
●59+90							CL of George Ave
60+00	70	59	32	0.84	109	13.17	
●60+40							Bare shoulder
61+00	120	86	57	0.72	130	25.22	Longitudinal Cracks Lateral Cracks
●61+50							Begin LTP
62+00	83	68	49	0.82	94	16.3	Lateral Cracks
63+00	74	61	42	0.82	89	14.13	Lateral Cracks
●63+30							Curb and Gutter
●63+70							CL of Ollie Ave
64+00	83	66	45	0.8	97	16.3	Lateral Cracks
65+00	95	73	34	0.77	157	19.2	Lateral Cracks
66+00	81	62	41	0.77	94	15.82	Lateral Cracks
67+00	63	48	33	0.76	70	11.48	Longitudinal Cracks Lateral Cracks
●67+40							CL of Harold Ave
68+00	41	34	26	0.83	44	6.18	Alligator Cracks Lateral Cracks
69+00	81	67	47	0.83	96	15.82	Alligator Cracks Lateral Cracks
●69+30							Begin LTP
70+00	75	60	41	0.8	88	14.38	Lateral Cracks
71+00	63	49	33	0.78	73	11.48	Alligator Cracks
●71+10							CL of Emerson Ave
72+00	60	50	35	0.83	71	10.76	
73+00	58	46	32	0.79	66	10.28	Lateral Cracks
74+00	65	52	35	0.8	77	11.96	Lateral Cracks
●75+00							CL of Highway 111

● Not Included in Summary

Street: **Highway 98**
Limits: **All American Canal to Highway 111**
Direction: **Eastbound**
Lane: **2**

Project No. **32607**

Feet X 100	*RR1*	*RR2*	*RR3*	*Ratio*	*Proj RR1*	*TD on 1*	*Comments*
●							Begin Test Lane 2 Eastbound Highway 98
●0+00							All American Canal to Highway 111
●0+01							All American Canal
●63+30							Lane 2 Begins
63+50	147	85	51	0.58	142	31.73	Longitudinal Cracks Lateral Cracks
●64+20							CL of Ollie Ave
64+50	104	80	52	0.77	123	21.36	Alligator Cracks Lateral Cracks
65+50	148	91	55	0.61	151	31.97	Alligator Cracks Lateral Cracks
66+50	143	85	51	0.59	142	30.76	Alligator Cracks Lateral Cracks
67+50	145	86	51	0.59	145	31.24	Alligator Cracks Lateral Cracks
●67+90							CL of Harold Ave
68+50	72	53	34	0.74	83	13.65	Lateral Cracks
69+50	95	71	48	0.75	105	19.2	Lateral Cracks
70+50	98	67	41	0.68	109	19.92	Lateral Cracks
71+50	91	66	43	0.73	101	18.23	CL of Emerson Ave Lateral Cracks
●72+20							Begin RTP
72+50	36	32	26	0.89	39	4.98	
73+50	35	32	25	0.91	41	4.74	
●75+00							CL of Highway 111

● Not Included in Summary

Street: **Highway 98** *Project No.* **32607**
Limits: **Highway 111 to All American Canal**
Direction: **Westbound**
Lane: **1**

Feet X 100	*RR1*	*RR2*	*RR3*	*Ratio*	*Proj RR1*	*TD on 1*	*Comments*
•							Begin Test Lane 1 Westbound Highway 98
•0+00							Highway 111 to All American Canal
•0+01							CL of Highway 111
•0+70							Median Raised
1+00	52	43	31	0.83	60	8.83	Lateral Cracks
2+00	44	40	32	0.91	50	6.9	Longitudinal Cracks Lateral Cracks
3+00	56	43	29	0.77	64	9.8	Lateral Cracks
4+00	50	42	33	0.84	53	8.35	Lateral Cracks
5+00	50	40	29	0.8	55	8.35	Lateral Cracks
6+00	73	58	41	0.79	82	13.89	Longitudinal Cracks Lateral Cracks
•6+25							Begin LTP
7+00	37	33	27	0.89	40	5.22	Longitudinal Cracks Lateral Cracks
•7+40							CL of Harold Ave (L)
8+00	80	67	47	0.84	96	15.58	Lateral Cracks
•8+70							Begin LTP
9+00	103	69	43	0.67	111	21.12	Lateral Cracks
10+00	96	76	51	0.79	113	19.44	Lateral Cracks
•11+05							CL of Ollie Ave
12+00	83	70	49	0.84	100	16.3	Lateral Cracks
13+00	86	68	50	0.79	92	17.03	Lateral Cracks
•13+70							Change in Pavement
14+00	68	63	45	0.93	88	12.69	Longitudinal Cracks Lateral Cracks
15+00	57	49	37	0.86	65	10.04	Lateral Cracks Longitudinal Cracks
•15+50							CL of Estrada Blvd
16+00	80	71	54	0.89	93	15.58	Lateral Cracks
17+00	109	89	64	0.82	124	22.57	Longitudinal Cracks
•17+25							End Median Begin LTP
•17+25							Begin Median Painted
18+00	80	65	46	0.81	92	15.58	
•18+80							Curb and Gutter Turns to Bare Shoulder
19+00	54	38	22	0.7	66	9.31	Longitudinal Cracks Lateral Cracks Raveling
•19+35							CL of Railroad Tracks
20+00	44	37	28	0.84	49	6.9	Longitudinal Cracks Lateral Cracks
•20+15							CL of W. Railroad Blvd
21+00	68	53	38	0.78	74	12.69	Longitudinal Cracks Lateral Cracks
•21+00							Begin Painted Median
•21+40							Begin Bike Lane
22+00	57	45	31	0.79	65	10.04	Longitudinal Cracks Lateral Cracks
23+00	62	45	28	0.73	72	11.24	Longitudinal Cracks Lateral Cracks
•23+40							End Painted Median Begin Median Painted line
24+00	65	49	31	0.75	77	11.96	Longitudinal Cracks Lateral Cracks
25+00	46	36	25	0.78	52	7.39	Longitudinal Cracks Lateral Cracks
26+00	44	33	24	0.75	45	6.9	CL of V.V. Williams Near Manhole
27+00	29	25	22	0.86	28	3.29	Lateral Cracks Longitudinal Cracks
•27+15							CL of Lee Ave
28+00	45	36	29	0.8	45	7.14	Longitudinal Cracks Lateral Cracks
29+00	32	29	28	0.91	30	4.01	Longitudinal Cracks Lateral Cracks
•29+60							CL of Lacy Ave
30+00	41	40	33	0.98	48	6.18	Longitudinal Cracks Lateral Cracks
31+00	37	34	29	0.92	40	5.22	Longitudinal Cracks Lateral Cracks
32+00	33	28	23	0.85	34	4.25	Lateral Cracks
33+00	46	38	32	0.83	45	7.39	Lateral Cracks

• Not Included in Summary

Street: **Highway 98** *Project No.* **32607**
Limits: **Highway 111 to All American Canal**
Direction: **Westbound**
Lane: **1**

Feet X 100	*RR1*	*RR2*	*RR3*	*Ratio*	*Proj RR1*	*TD on 1*	*Comments*
34+00	63	54	40	0.86	73	11.48	Lateral Cracks
35+00	58	51	39	0.88	67	10.28	Lateral Cracks
●35+70							Begin LTP
36+00	55	46	35	0.84	60	9.56	Longitudinal Cracks Lateral Cracks
37+00	90	75	54	0.83	104	17.99	Longitudinal Cracks Lateral Cracks
●37+50							CL of Eady Ave
38+00	44	38	32	0.86	45	6.9	Lateral Cracks
●38+10							Curb and Gutter Begins
39+00	57	49	38	0.86	63	10.04	Lateral Cracks
●39+50							Begin Median Painted
40+00	66	58	43	0.88	78	12.21	Longitudinal Cracks Lateral Cracks
41+00	63	56	46	0.89	68	11.48	Longitudinal Cracks Lateral Cracks
42+00	75	60	42	0.8	86	14.38	Longitudinal Cracks Lateral Cracks
43+00	118	83	61	0.7	113	24.74	Longitudinal Cracks Lateral Cracks
44+00	29	27	24	0.93	30	3.29	Longitudinal Cracks Lateral Cracks
●44+40							Begin LTP
45+00	42	38	32	0.9	45	6.42	Longitudinal Cracks Lateral Cracks
46+00	81	68	48	0.84	96	15.82	Longitudinal Cracks Lateral Cracks
47+00	64	59	49	0.92	71	11.72	Longitudinal Cracks Lateral Cracks
48+00	52	48	40	0.92	58	8.83	Longitudinal Cracks Lateral Cracks
49+00	40	34	28	0.85	41	5.94	Longitudinal Cracks Lateral Cracks
●49+20							Begin LTP
50+00	44	43	38	0.98	49	6.9	Longitudinal Cracks Lateral Cracks
51+00	34	32	27	0.94	38	4.49	Longitudinal Cracks Lateral Cracks
●51+80							CL of Kloke Rd
●52+50							Begin AC Berm
53+00	42	40	32	0.95	50	6.42	Lateral Cracks
54+00	53	48	40	0.91	58	9.07	Longitudinal Cracks Lateral Cracks
55+00	36	35	30	0.97	41	4.98	Longitudinal Cracks Lateral Cracks
56+00	34	31	26	0.91	37	4.49	Longitudinal Cracks Lateral Cracks
●56+70							Begin AC Berm with PCC gutter
57+00	42	37	31	0.88	44	6.42	Longitudinal Cracks Lateral Cracks
58+00	67	57	48	0.85	68	12.45	Longitudinal Cracks Lateral Cracks
●58+70							Begin LTP
59+00	48	46	40	0.96	53	7.87	Lateral Cracks
60+00	56	49	39	0.87	62	9.8	Lateral Cracks
●60+20							Begin RTP
●61+00							CL of David Navarro Ave
●62+00							Ended Pcc Gutter
62+00	35	34	29	0.97	40	4.74	Alligator Cracks Lateral Cracks
63+00	35	33	29	0.94	38	4.74	Lateral Cracks Longitudinal Cracks
64+00	38	37	34	0.97	40	5.46	Lateral Cracks Longitudinal Cracks
65+00	66	53	42	0.8	67	12.21	
66+00	25	23	20	0.92	26	2.33	
67+00	22	20	18	0.91	22	1.6	
68+00	41	37	31	0.9	44	6.18	Lateral Cracks
69+00	37	32	28	0.86	37	5.22	
●69+80							Change in Pavement
70+00	49	45	37	0.92	55	8.11	Longitudinal Cracks Lateral Cracks
71+00	46	42	34	0.91	52	7.39	Lateral Cracks
72+00	40	37	32	0.92	43	5.94	Lateral Cracks
73+00	43	40	35	0.93	46	6.66	Lateral Cracks

● Not Included in Summary

Street: **Highway 98**
Limits: **Highway 111 to All American Canal**
Direction: **Westbound**
Lane: **1**

Project No. **32607**

Feet X 100	*RR1*	*RR2*	*RR3*	*Ratio*	*Proj RR1*	*TD on 1*	*Comments*
74+00	36	32	27	0.89	38	4.98	Lateral Cracks
●75+00							CL of All American Canal

● Not Included in Summary

Street: **Highway 98**
Limits: **Highway 111 to All American Canal**
Direction: **Westbound**
Lane: **2**

Project No. **32607**

Feet X 100	*RR1*	*RR2*	*RR3*	*Ratio*	*Proj RR1*	*TD on 1*	*Comments*
•							Begin Test lane 2 Westbound Highway 98
•0+00							Highway 111 to All American Canal
•0+01							Highway 111
•0+80							Curb and Gutter
1+50	56	53	37	0.95	76	9.8	Lateral Cracks
2+50	62	52	38	0.84	71	11.24	Lateral Cracks
3+50	68	55	40	0.81	76	12.69	Longitudinal Cracks Lateral Cracks
•4+00							CL of W. Imperial Ave
•4+40							Begin RTP
4+50	105	76	49	0.72	118	21.6	Lateral Cracks
5+50	97	72	44	0.74	118	19.68	Alligator Cracks Lateral Cracks
6+50	120	84	52	0.7	136	25.22	Alligator Cracks Lateral Cracks
7+50	108	73	43	0.68	124	22.33	Alligator Cracks Lateral Cracks
8+50	97	71	45	0.73	112	19.68	Alligator Cracks Lateral Cracks
9+50	105	73	45	0.7	118	21.6	Lateral Cracks
10+50	83	60	39	0.72	92	16.3	Lateral Cracks
•11+10							CL of Ollie Ave
11+50	169	137	90	0.81	209	37.03	Longitudinal Cracks Lateral Cracks
12+50	123	100	68	0.81	147	25.94	Lateral Cracks Longitudinal Cracks
13+50	144	110	71	0.76	170	31	Alligator Cracks Lateral Cracks
•13+80							Change in Pavement
14+50	39	29	22	0.74	38	5.7	
15+50	42	27	20	0.64	36	6.42	CL of Estrada Blvd Longitudinal Cracks
•16+40							Lane 2 Ends

• Not Included in Summary

Appendix D

Explanation of Listings on Road Rater Data Sheets and Table Ones

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EXPLANATION OF LISTINGS ON ROAD RATER DATA SHEETS

The Road Rater Data Sheets provide a tabulation of all field test data, field observations and pertinent landmarks such as cross streets, patches, utility trenches, etc. The following is an explanation of the various information contained on the data sheets:

FEET X I00 - The stationing of test locations as measured in the direction of travel.

RR1, RR2, RR3 - The Road Rater deflection reading in 10^{-5} inches. RR1 represents the deflection directly beneath the load input with RR2 representing deflection one foot and RR3 representing deflection two feet from the load input point.

RATIO - The ratio of RR2 / RR1 or the inter-relationship of the deflection one-foot from the stress input to the deflection at the load center. This value indicates the extent of support provided directly beneath the pavement layer.

PROJ. RR1 - Evaluation of the pavement deflection basin is based upon deflected pavement shape. The pavement response one and two feet from the loading center is compared to an ideal flexible pavement model and the Projected Road Rater value calculated. Comparison of the Projected RR1 and the Measured RRI provides information relative to subgrade response and asphalt concrete stiffness.

TD ON 1 - The measured Road Rater sensor number one under load converted to an equivalent Traveling Deflectometer unit. The basis of conversion is:
T.D. = (R.R. x 0.01 x 24.I) - 3.7

EXPLANATION OF LISTINGS ON TABLE ONE

Table One is a statistical accumulation of measured deflection values obtained during field-testing. Individual deflection test data was reviewed and grouped according to data trends and engineering judgment. Contained within the Table One are the limits of evaluation, the 80th percentile measured deflection, the allowable deflection, overlay requirements and the Nominal Service Life. The following is a more detailed explanation of the various information contained in Table One:

STREET AND LIMITS - The roadway studied is separated by lane, direction of travel and stationing. The station limits selected represent areas of like deflection determined during the engineering review of data and field conditions.

MEASURED DEFLECTION

R.R. The 80th percentile deflection value, representing the strength under loading of the section being evaluated, reported in inches times 10^{-5}.

T.D. The 80th percentile deflection value in Traveling Deflectometer units, 10^{-3} inches.

T.I. The Traffic Index used for evaluation of the specific test loading. The Traffic Index represents the anticipated accumulation of equivalent axle loads within the design period.

'T' The thickness of existing surfacing material provided.

ALLOWABLE DEFLECTION - The maximum permissible deflection value where no reinforcement is necessary. The calculated maximum value is based upon asphalt concrete thickness and traffic index as determined per Caltrans Test Method 356. The allowable deflection is reported in both Road Rater (R.R.) and Traveling Deflectometer (T.D.) units.

RED. REQ'D (%) The percent reduction in measured deflection to match tolerable or allowable deflection levels, based upon Traveling Deflectometer conversions.

G.E. REQ'D (FT.) The equivalent thickness, in feet, of rock base required to effect the specified deflection reduction.

A.C. REQ'D (FT.) The equivalent asphalt concrete thickness required to effect the specified deflection reduction.

NSL (YRS.) The nominal service life is a computation of the time it would take to generate the number of equivalent axle loads permissible based upon measured strengths. The NSL should be considered as an ordering tool due to variations in growth rates and actual axle loading within specific times of the design period.

Appendix E

TECHNICAL DETAILS ON ROAD RATER AND DEFLECTION ANALYSIS

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TECHNICAL DETAILS ON ROAD RATER & DEFLECTION ANALYSIS

TEST EQUIPMENT - The Road Rater is a non-destructive hydraulic test apparatus that measures the stiffness of a pavement by applying a dynamic load. It is equipped with electronic instrumentation that measures and displays the deflection at the point where the force is applied and one or more other nearby points. Additional details will be provided if desired. Following are specific operation data for this study:

TEST FREQUENCY =	25 Hertz
AIR PRESSURE-Transfer Pods =	35 psig
AIR PRESSURE-Support Pods =	47 psig
STATIC LOADING =	5333 Newtons
OSCILLATING LOADING =	5340 Newtons

DEFLECTION ANALYSIS BIBLIOGRAPHY

1. The State of California, Department of Public Works, Division of Highways, Materials Manual-Volume I, Test Method CAL 356

2. The Asphalt Institute Publication, "Asphalt Overlays and Pavement Rehabilitation" MS-17

3. Flexible Pavement, Structural Section Design Guide for California Cities and Counties

4. International Conference on the Structural Design of Asphalt, Proceedings 1962, 1967, 1972 and 1982 - Various Papers

5. A Guide to the Structural Design of Flexible and Rigid Pavements in Canada; Canadian Good Roads Association, September 1975 and Australia Method, 1982

6. Various Technical Memorandums and Reports presented by:

   a) American Society of Civil Engineers, Soils Mechanics Division and Transportation Division

   b) Highway Research Board Records and Special Reports on Pavement Performance

   c) FHWA, FAA and miscellaneous Federal and State Reports relative to Deflection Analysis

DRAFT

11-IMP-98
KP 48.2/52.5
EA 080200
SR-98 West
Highway Widening

FACT SHEET

EXCEPTION TO MANDITORY DESIGN STANDARDS

Prepared by:

Jason Lemons
Project Engineer
Dokken Engineering

Submitted by: 10/30/08 858-514-8377

Jason Lemons — Date — Telephone
Project Engineer
Dokken Engineering

Recommended for Approval by: 2/4/09 (619) 688-2561

Mario Orso — Date — Telephone
Project Manager

Approved by: _____

Date Telephone

Deputy District Director for Design

1. PROPOSED PROJECT AND NONSTANDARD FEATURES:

A. Project Description

The California Department of Transportation (Caltrans) in cooperation with the City of Calexico (City) proposes to improve traffic operations, enhance bicycle and pedestrian safety, and improve drainage performance on State Route 98 (SR-98). The project is located on SR-98 from 0.5 kilometers (0.31 miles) west of Dogwood Road to 0.3 kilometers (0.19 miles) east of Rockwood Avenue, KP 48.2 to KP 52.5 (PM 30.0 to PM 32.6), in the city of Calexico in Imperial County..

The Build Alternative proposes to widen State Route 98 (SR-98) from two to four lanes from Dogwood Road through just west of Ollie Avenue, and from four to six lanes from Ollie Avenue through State Route 111 (SR-111), tying back to the existing road at Rockwood Avenue. The lane widths are a standard 3.6 meters (12 feet) and a raised median that averages 4.3 meters (14 feet) in width will be incorporated throughout the length of the project. In addition, the alternative will update the number of turning lanes according to traffic needs at each intersection within the project limits.

There will also be new intersections constructed or right-turn lanes lengthened to create access to new developments, listed below.

- Full intersection at the Los Lagos development
- Partial intersection at the Riverview development
- Right-in only at the Linda Plaza development
- Extended westbound right-turn lane at Kloke Road to allow for the Linda Plaza access
- Extended southbound right-turn lane at Cesar Chavez Boulevard to allow access for the proposed gas station

Some intersections will have access reduced from the existing conditions. These intersections are:

- SR-98/Harold Avenue
    - Existing Condition – Full access
    - Future Condition – Right in/right out
- SR-98/Paulin Avenue
    - Existing Condition – Full access
    - Future Condition – Right in/right out
- SR-98/Lee Avenue
    - Existing Condition – Full access
    - Future Condition – Modified access: Traffic that would normally exit Lee Avenue to go east on SR-98 will be diverted to Birch Street which will then lead to the realigned V.V. Williams Avenue.
- SR-98/Lacy Avenue
    - Existing Condition – Full access

- Future Condition – Modified access: Traffic that would normally exit Lacy Avenue to go east on SR-98 will be diverted to Birch Street which will then lead to the realigned V.V. Williams Avenue.

All full intersections will be signalized. The intersections that are currently unsignalized that will be signalized as a result of this project are as follows:

- SR-98/David Navarro Avenue
- SR-98/V.V.Williams Avenue/Lee Avenue
- SR-98/Cesar Chavez Boulevard.

Intersections that are currently signalized will remain signalized. New detection loops will need to be added to all through eastbound lanes east of SR-111 on SR-98.

Sidewalks are proposed along either side of SR-98 for the entire length of the project to encourage pedestrian use as well as enhance the safety of pedestrians. The sidewalks will be 1.5 meters (5 feet) in width.

This alternative will also incorporate a new Class II bike lane in order to promote bicycle use as well as enhance bicyclist safety. The bike lane will be adjacent to the sidewalk for the entire length of the project for both the eastbound and westbound directions. The bicycle lane will be 2.4 meters (8 feet) in width.

The project proposes to include a standard drainage system. Curb and gutter will be placed along the entire length of the project on both sides of the road. Water will drain through inlets to pipes that connect to proposed drainage basins. These six detention basins will be constructed along the project at various locations. The capacity of the basins will be sized to hold the volume generated by a 100-year, 24-hour storm. The collected water of the two basins west of the All American Canal and the two basins immediately east of the All American Canal will flow via pipes to the All American Canal drains numbers 9 and 10. The water collected by the two eastern most basins will be pumped to the existing 24 inch storm drain system at Kloke Road, which then drains south to the New River.

All staging areas will be located within the project footprint.

Construction would occur in two phases:

- Phase 1 – Location: From East of the All American Canal to Rockwood Avenue.
- Phase 2 – Location: From just west of Dogwood Road to east of the All American Canal.

Phase 2 construction is expected to be largely funded by private developers through fair share agreements.

B. Existing Highway Conditions:

SR-98 is a two-lane highway from Dogwood Road to just west of Ollie Avenue and a four-lane facility from Ollie Avenue to Rockwood Avenue. The setting of SR-98 ranges

from rural on the western portion of the project site with new proposed developments, to largely residential in the middle of the project site, to highly urbanized on the eastern portion of the project site. There are traffic signals at the intersections of SR-98/Dogwood Rd, SR-98/Kloke Road, SR-98/Eady Avenue, SR-98/Ollie Avenue, SR-98/SR-111, and SR-98/Rockwood Avenue, and left-turn pockets at each full intersection. The spacing between intersections is very close along SR-98 between David Navarro Avenue and Rockwood Avenue. There are no bike lanes or bus stops and parking along the curb is prohibited. Sidewalks exist sporadically along SR-98, many of them not going from one intersection to the next, but stopping somewhere in-between. Sidewalks, partial or full, exist at David Navarro on the northern and southern sides of SR-98 going west; at Kloke on the southern side of SR-98 going east; at Ollie on the southern side going west; and at SR-111 on the northern side of SR-98 going west. SR-98 is flanked on either side by residential and commercial development for most of the project. The terrain is very flat and no real existing drainage features are present. In large storms, the area floods and water sheet flows into adjacent private and commercial buildings.

C. Safety Improvements

The project design includes the following safety improvements:

a. The addition of traffic signals for the following intersections aid in vehicular and pedestrian safety:
   - SR-98/David Navarro Avenue
   - SR-98/V.V.Williams Avenue/Lee Avenue
   - SR-98/Cesar Chavez Boulevard.

b. The addition of left and right turn pockets along the project area will improve safety and traffic flow.

c. ADA standard sidewalks are designed along the eastbound and westbound sides of SR-98 for the length of the project to aid in pedestrian safety, especially for children from local schools.

d. Class II bicycle lanes are designed along the eastbound and westbound sides of SR-98 for the length of the project to aid in bicyclist safety.

e. The following intersections will be modified in order to improve safety:
   - SR-98/Harold Avenue
   - SR-98/Paulin Avenue
   - SR-98/Imperial Avenue West
   - SR-98/Cesar Chavez Boulevard
   - SR-98/V.V. Williams

D. Total project Cost

Cost estimations for the Build Alternative were escalated for the year 2017 to reflect a 5 percent increase for inflation compounded annually. Total estimated project costs for Phase 1, in 2017 dollars, are $46,950,000 (which includes $41,107,000 in capital costs and $5,811,300 in support costs) for the road widening improvements. Total estimated project costs for Phase 2, in 2017 dollars, are $19,750,000 (which includes $17,238,000 in capital costs and $2,490,600 in support costs) for the road widening improvements. Total estimated project costs for the combined Phase 1 and Phase 2, in 2017 dollars, are $64,300,000(which includes $55,911,000 in capital costs and $8,301,700 in support costs) for the road widening improvements. The project is listed in the 2007 Regional Transportation Plan (RTP), and the 2006 State Transportation Improvement Program (STIP).

2. FEATURES REQUIRING AN EXCEPTION:

A. Design Exception Feature #1

The design proposes raised center medians without median shoulders for the entire length of the project. The curbs of the medians will be immediately adjacent to the inside lanes from the All American Canal to Rockwood Avenue. (Sta 506+00 to Sta 531+00).

Standard for Which Exception is Requested**:**

Standard: HDM Index 302.1 "Shoulder widths given in table 302.1 shall be the minimum continuous usable width of paved shoulder." Table 302.1 gives the minimum inside shoulder width for urban areas with speeds less than or equal to 75km/hr and curbed medians to be 0.6 m.

Reason for Requesting Exception

Currently SR-98 is bordered on either side by residential and commercial developments for most of the project area. As the project is designed now, large amounts of right-of-way will be acquired to build the project. Increasing the width of the project even further by adding in median shoulders would result in greater right-of-way takes and possible home and business relocations. This section of roadway has and will have high volumes of pedestrian and bicycle users. A reduced inside shoulder will promote reduced speeds which will enhance pedestrian and bicyclists safety. Furthermore, the lane configuration matches the City of Calexico's designation for this facility.

Added Cost to Make Standard

The anticipated extra cost to add in standard median shoulders for the length of the project would result from additional right-of-way takes and possible relocations as well as additional construction costs. The estimated additional right-of-way cost would be $400,000. The additional construction cost would be $1,000,000.

3. TRAFFIC DATA:

Year 2035 (Design Year)

Segment	ADT	AM Peak Hour Volume	PM Peak Hour Volume
SR-98			
West of Dogwood Rd	9,300	700	410
East of Dogwood Rd	27,100	980	1,200
All American Canal and David Navarro Ave	29,000	1,030	840
David Navarro and Kloke Rd	32,800	2,110	2,150
Kloke Rd and Eady Ave	36,300	3,070	3,030
Eady Ave and V.V. Williams Ave	36,300	2,970	2,970
V.V. Williams and Cesar Chavez Blvd	37,900	3,370	3,280
Estrada Blvd and Ollie Ave	39,800	3,550	3,190
Ollie Ave ad SR-111	39,800	3,550	3,280
East of SR-111	47,100	1,950	2,070
SR-111			
North of SR-98	78,700	2,040	2,030
South of SR-98	65,900	1,360	2,340

All intersections are projected to operate at satisfactory levels of service (LOS D or better) under the 2035 build conditions. All intersections, except for the SR-98/Ollie Avenue intersection, will operate at LOS F for the “no build” condition.

4. ACCIDENT ANALYSIS:

The Traffic Accident Surveillance and Analysis System (TASAS) Selective Accident Retrieval (TSAR) for the project is summarized in the tables below. Accident rates exceed the statewide average accident rates for most segments of SR-98 within the project area.

Accident Rates[1]

Segment along SR-98	KP Limits	TOTAL No. of Accidents	ACTUAL RATES (per million vehicle miles)			STATEWIDE AVERAGE RATES (per million vehicle miles)		
			F*	F+I**	Total***	F*	F+I**	Total***
Eastbound and Westbound	48.2/52.3	89	0.00	0.42	2.05	0.025	0.73	1.59

[1] Data taken between December 1st, 2004 and November 30th, 2007
* Fatalities
** Fatalities plus Injuries
*** All reported accidents (includes PDO)

As shown below, most accidents occurred under normal conditions – clear weather during the daytime on dry pavement with no unusual roadway conditions.

Contribution of Climate/Roadway Conditions to Accidents[1]

Direction along SR-98	KP Limits	Total No. of Accidents	Weather					Lighting					Road Surface				Road Conditions			
			Clear	Cloudy	Rain	Not Stated	Other	Day	Dusk/Dawn	Dark – Street Light	Dark - No street Light	Other	Dry	Slippery	Not Stated	Other	No Unusual Conditions	Holes, Ruts	Not Stated	Other
Eastbound	48.2/52.3	56	54	2	0	0	0	45	2	8	1	0	56	0	0	0	52	1	2	1
Westbound	48.2/52.3	33	32	0	0	1	0	28	0	5	0	0	32	0	1	0	28	0	3	2

[1] Data taken between December 1st, 2004 and November 30th, 2007

As summarized in the table below, most collisions were caused by speeding, followed by other violations. Most collisions were rear ends, followed by broadsides and sideswipes.

Collision Factors and Types of Collisions[1]

Direction along SR-98	KP Limits	Total No. of Accidents	Primary Collision Factor									Type of Collision							
			Influence of Alcohol	Follow too Close	Failure to Yield	Improper Turn	Speeding	Other Violations	Other Than Driver	Unknown	Not Stated	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Auto-Pedestrian	Not Stated
Eastbound	48.2/52.3	56	0	0	7	2	30	14	2	1	0	2	7	31	10	3	1	2	0
Westbound	48.2/52.3	33	1	0	7	2	18	3	0	2	0	2	4	17	5	4	0	0	1

[1] Data taken between December 1st, 2004 and November 30th, 2007

5. INCREMENTAL IMPROVEMENTS:

There are no cost effective incremental improvements between those proposed and full standards that would not require removal with the proposed future project.

6. FUTURE CONSTRUCTION:

There are no long-term improvements or future construction planned beyond the scope of the project.

7. PROJECT REVIEWS:

Project Development Team (PDT) meetings were held monthly to discuss the SR-98 West widening project. Representatives from the California Department of Transportation (Caltrans), the City of Calexico, Dokken Engineering, developers, and the Imperial Irrigation District (IID) were present at these meetings. The PDT evaluated the design features of all the proposed alternatives and eliminated the infeasible designs.

The following Reviews were conducted for the 2000 PSR:

Reviewer	Title	Representing	Date Reviewed
James Douglas	Project Dev. Coordinator	D&LP	9/14/00
Jeffery Lewis	Senior Engineer	FHWA	8/30/00
Alex Kennedy	Traffic Reviewer	HQ Traffic Ops	6/21/00

8. RELEVANT ATTACHMENTS:

A. Vicinity Map

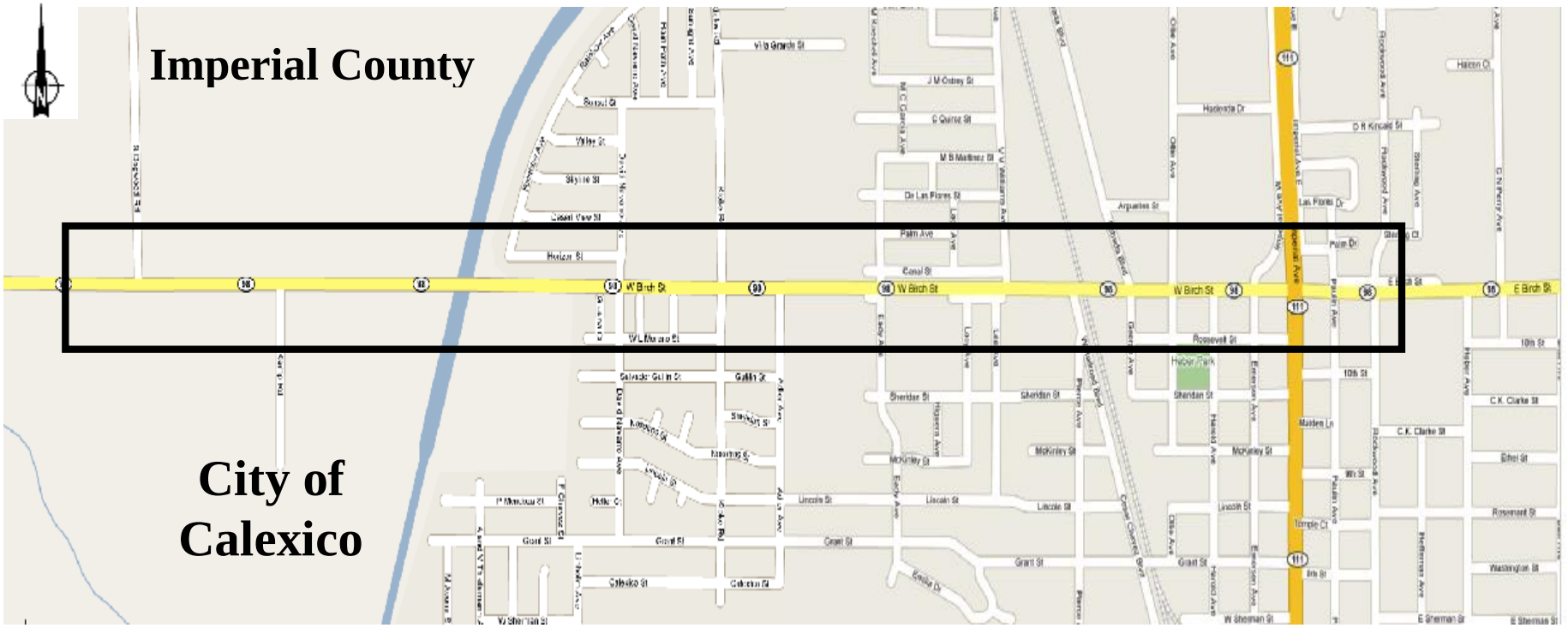

Figure 1
Project Location/Vicinity Map

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.52/52.23	1	12

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

PROFESSIONAL ENGINEER — REGISTERED — No. — Exp. — CIVIL — STATE OF CALIFORNIA

Dokken Engineering
5675 Ruffin Road
Suite 250
San Diego, CA 92123

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GNV
CULTIVATED FIELD

058-070-008

X123 POWER LINE
[IID]

PIPE
DIRT
STATE ROUTE 98
493
494
MATCH LINE SEE SHEET 2

059-100-06

6" STEEL (HIGH-PRESSURE)
[SC GAS]

LEGEND

-E-	EXISTING OH POWER LINE [IID]
-gs-	EXISTING ELECTRIC DISTRIBUTION (SAN DIEGO GAS AND ELECTRIC)
-t-	EXISTING TELEPHONE [SBC PACIFIC BELL]
-w-	EXISTING WATER PIPELINE [CITY OF CALEXICO]
	EXISTING WATER CASING [CITY OF CALEXICO]
-tv-	EXISTING OH CABLE TELEVISION [ADELPHIA]
-s-	EXISTING 8" SEWER PIPELINE [CITY OF CALEXICO]
-w-	EXISTING 8" IRRIGATION WATER PIPELINE [IID]
	EXISTING CANAL DRAIN [IID]

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.52/52.23	2	12

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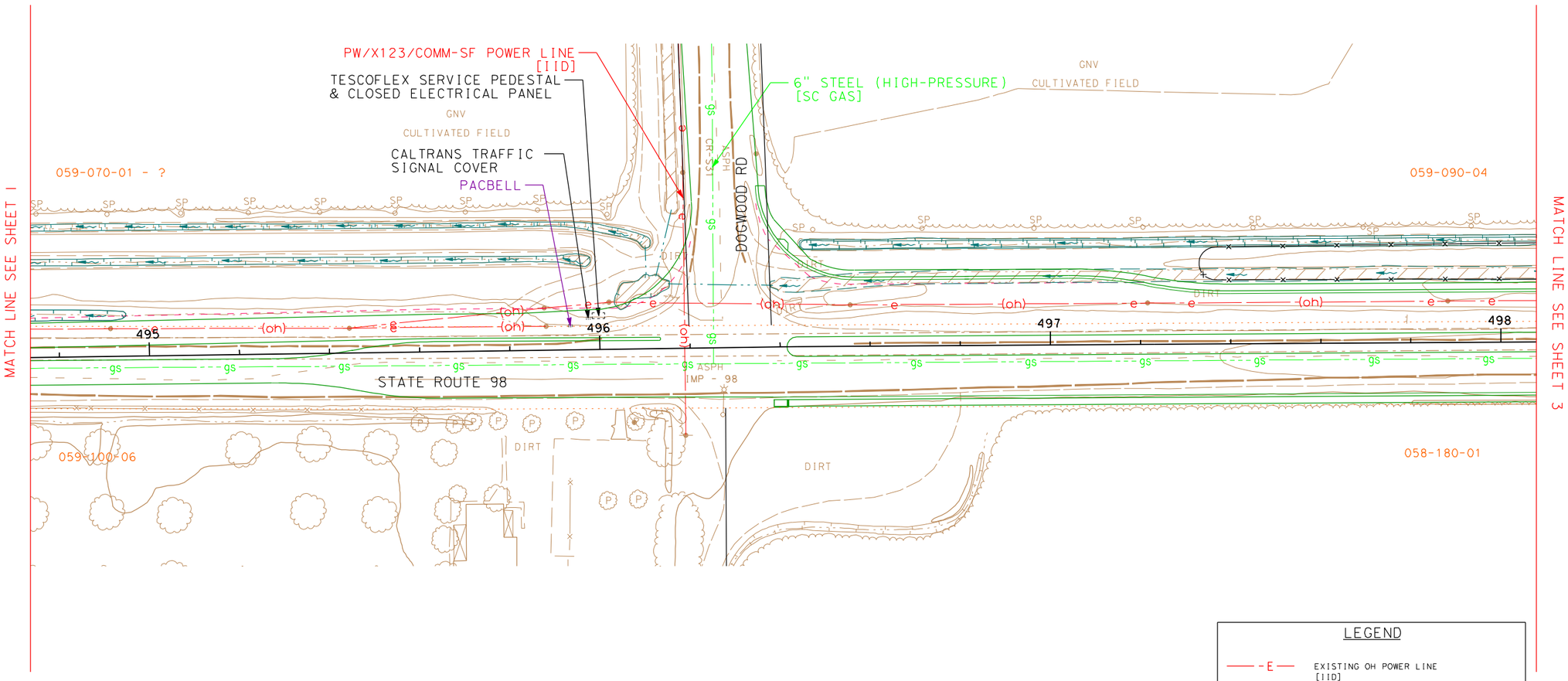

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8	IMP	98	48.52/52.23	3	12

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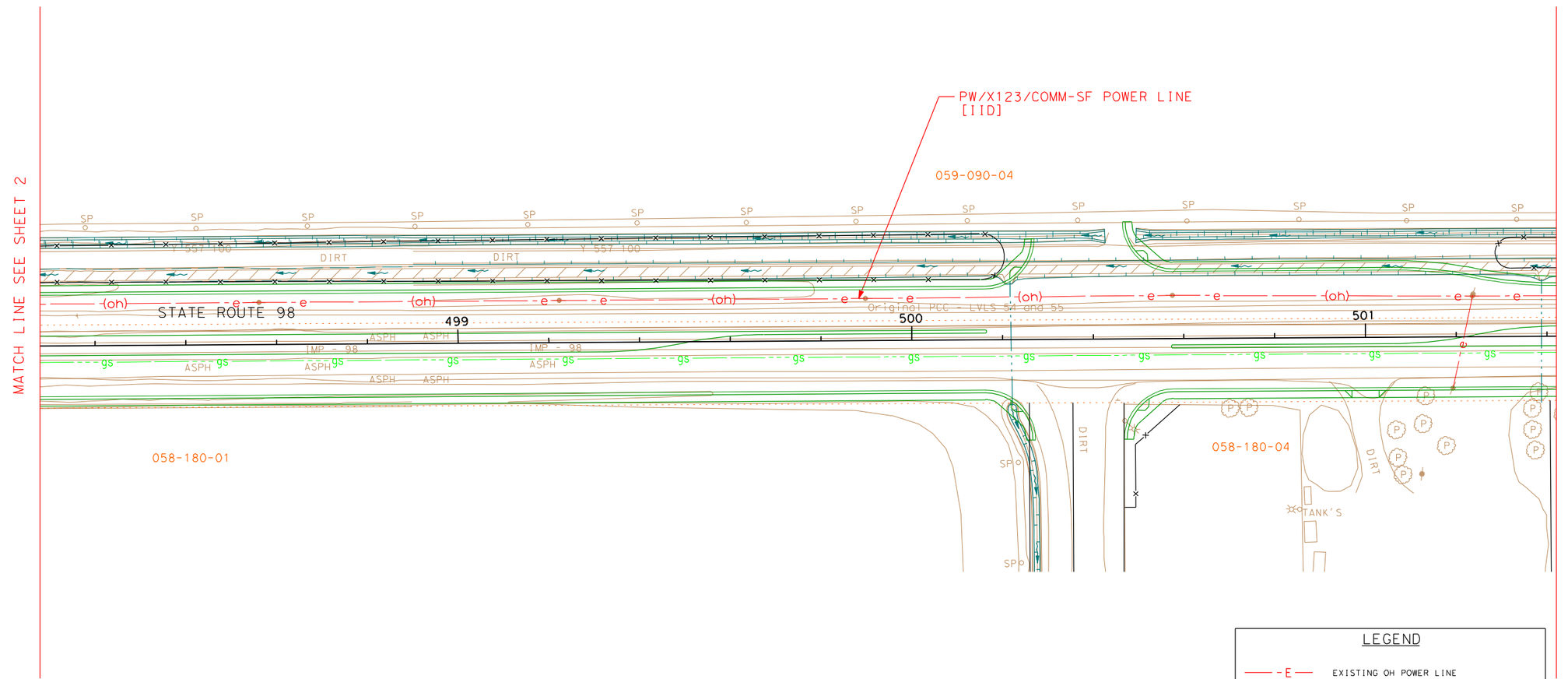

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8	IMP	98	48.52/52.23	4	12

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DATE	REVISED BY	DATE REVISED

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PROJECT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

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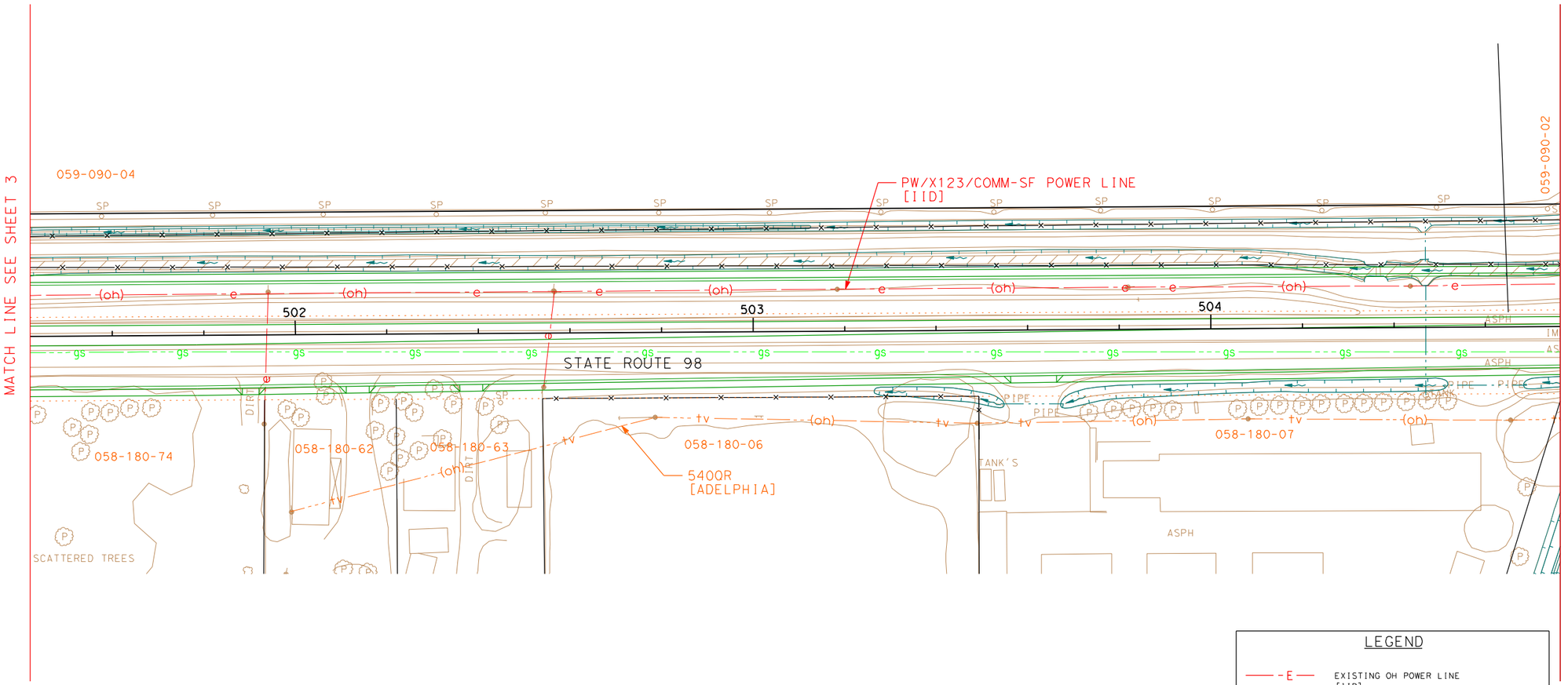

LEGEND

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.52/52.23	5	12

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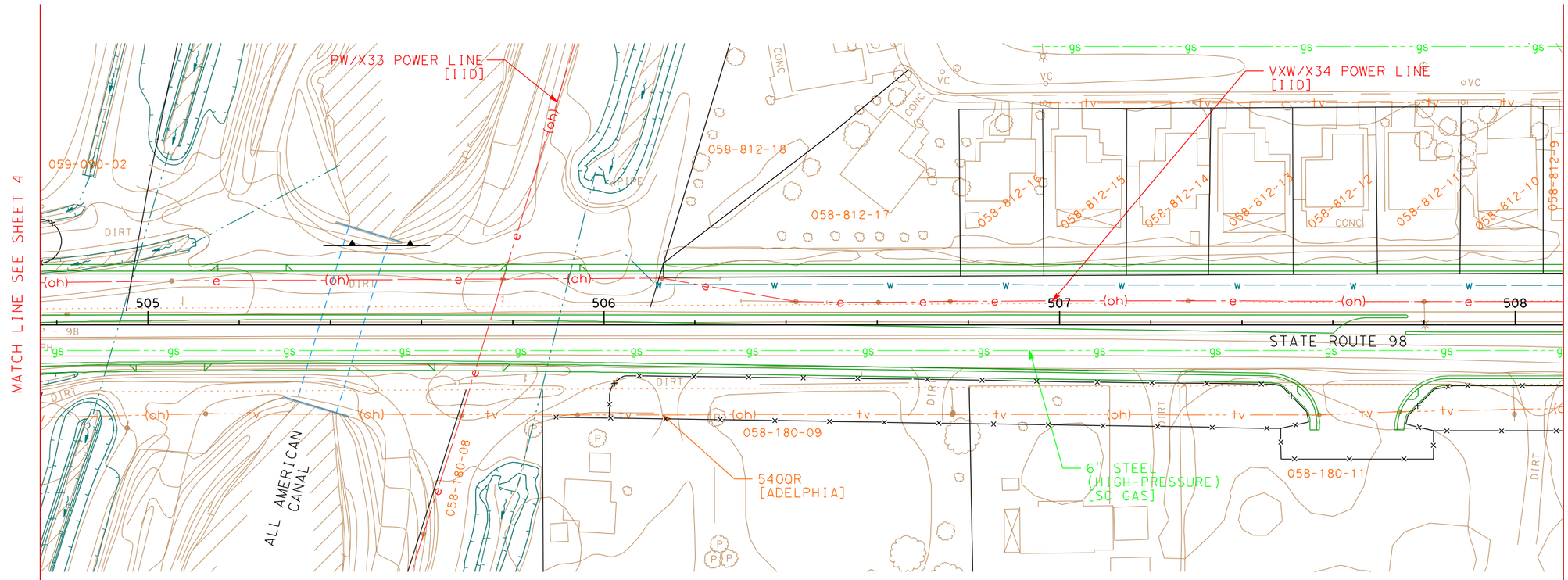

LEGEND

-E-	EXISTING OH POWER LINE [IID]
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-t-	EXISTING TELEPHONE [SBC PACIFIC BELL]
w	EXISTING WATER PIPELINE [CITY OF CALEXICO]
	EXISTING WATER CASING [CITY OF CALEXICO]
tv	EXISTING OH CABLE TELEVISION [ADELPHIA]
-s-	EXISTING 8" SEWER PIPELINE [CITY OF CALEXICO]
w	EXISTING 8" IRRIGATION WATER PIPELINE [IID]
	EXISTING CANAL DRAIN [IID]

DATE REVISED BY | DATE REVISED

CALCULATED/ DESIGNED BY

CHECKED BY

PROJECT ENGINEER

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

$REQUEST

LAST REVISION 02-21-06

DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => $USER
DGN FILE => $REQUEST

CU

EA

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.52/52.23	6	12

REGISTERED CIVIL ENGINEER DATE

PROFESSIONAL ENGINEER — REGISTERED — No. — Exp. — CIVIL — STATE OF CALIFORNIA

PLANS APPROVAL DATE

Dokken Engineering
5675 Ruffin Road
Suite 250
San Diego, CA 92123

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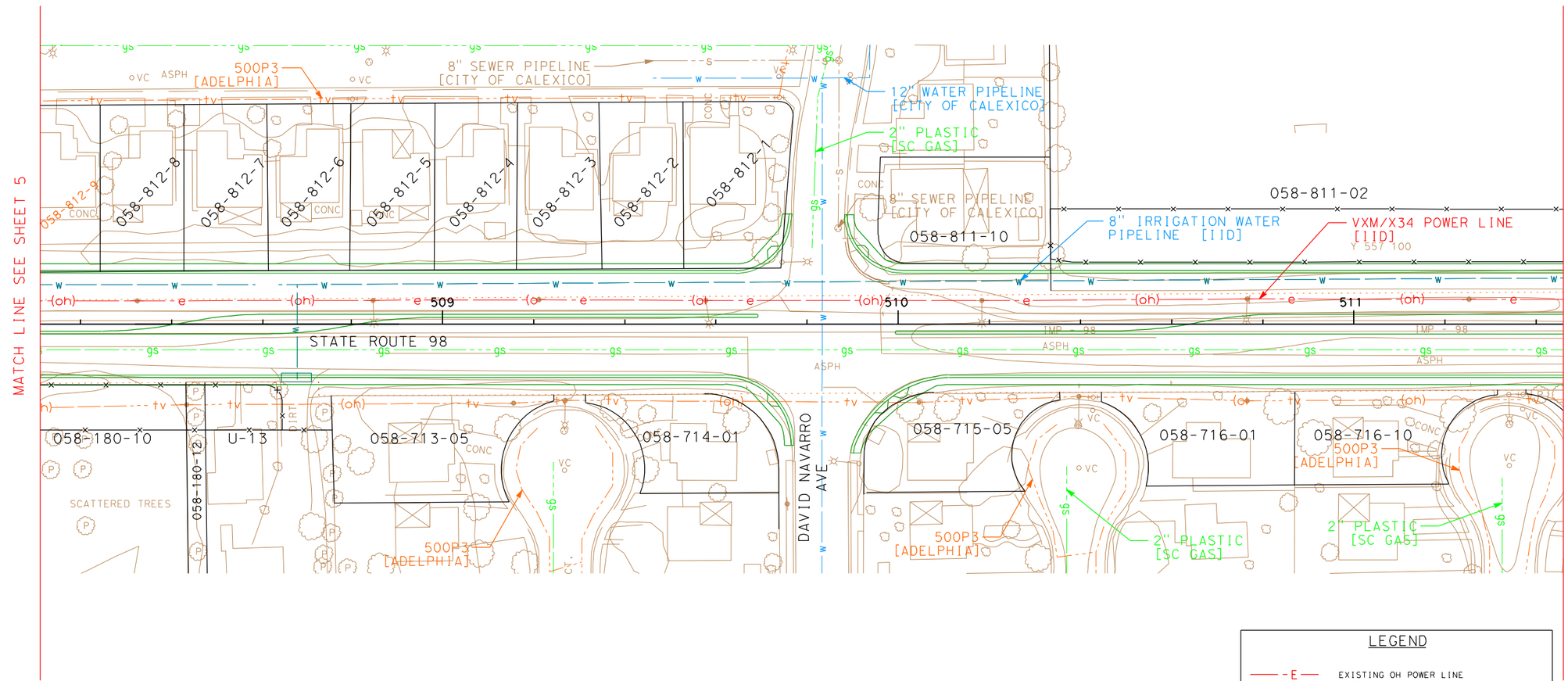

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8	IMP	98	48.52/52.23	7	12

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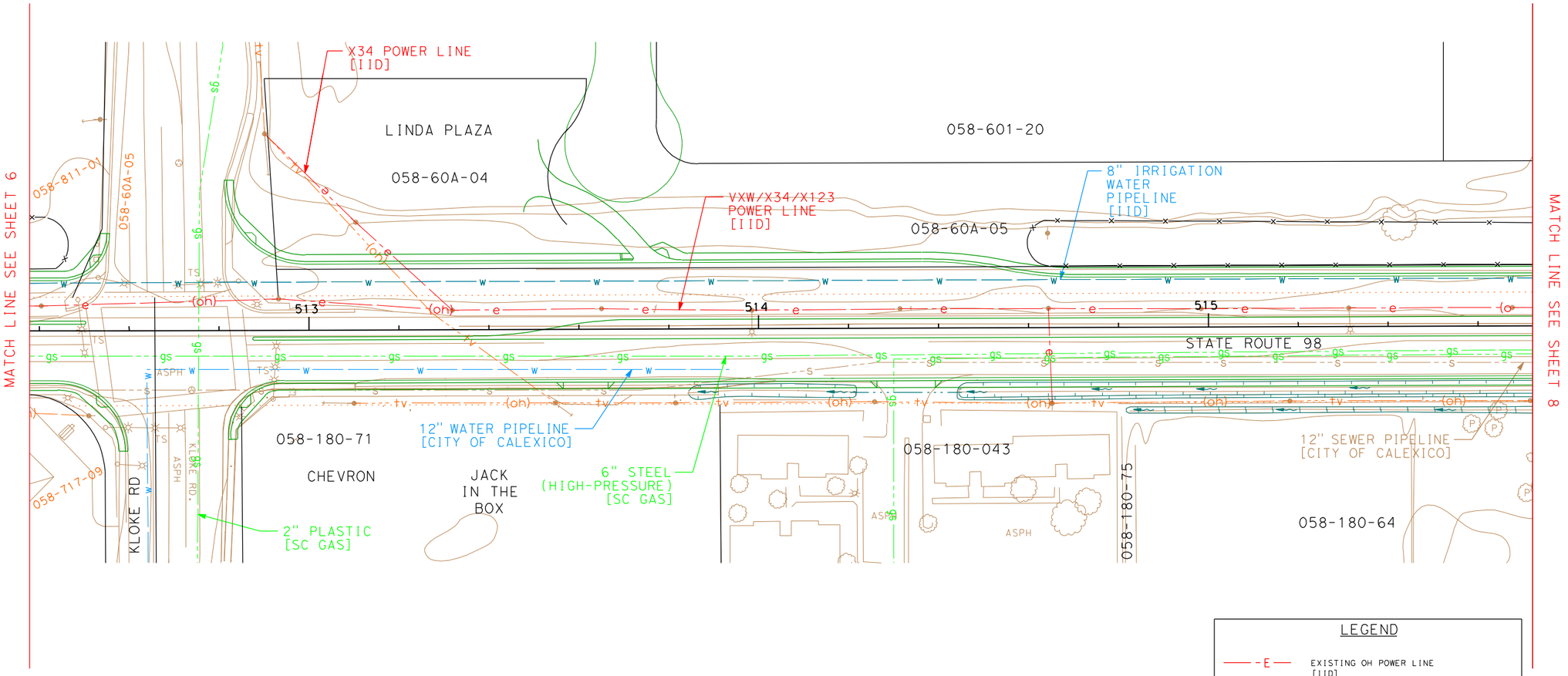

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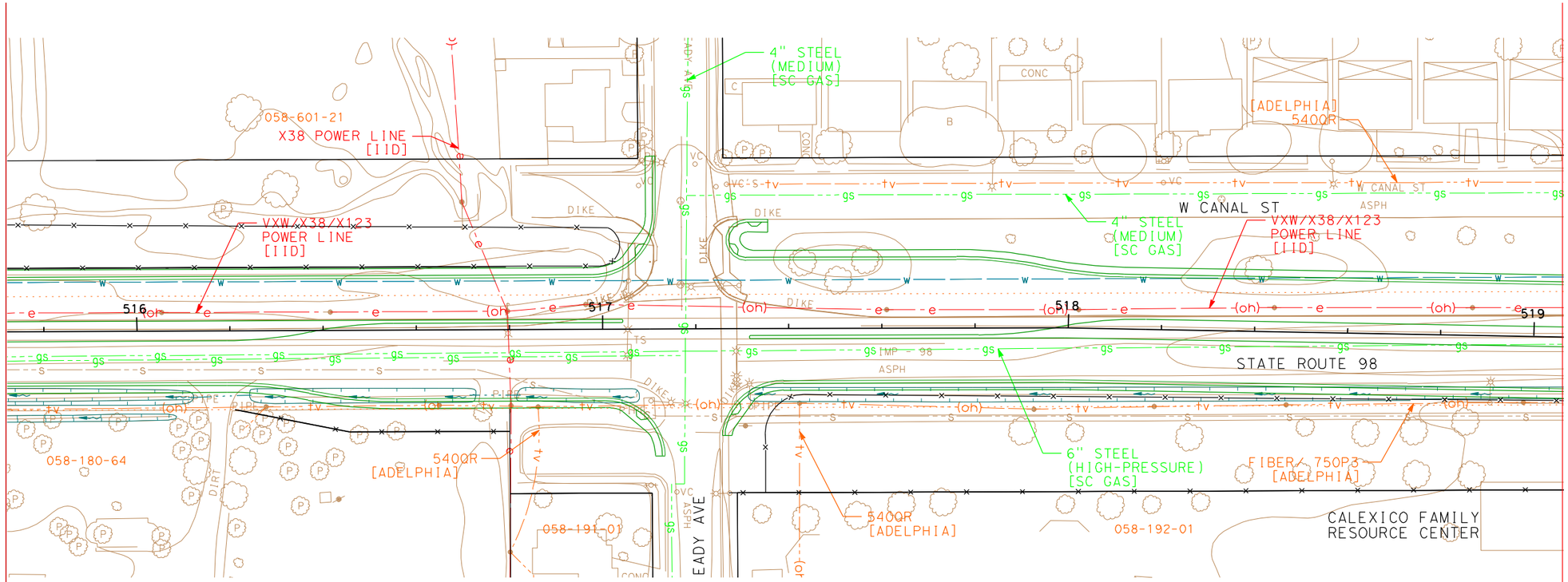

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8	IMP	98	48.52/52.23	9	12

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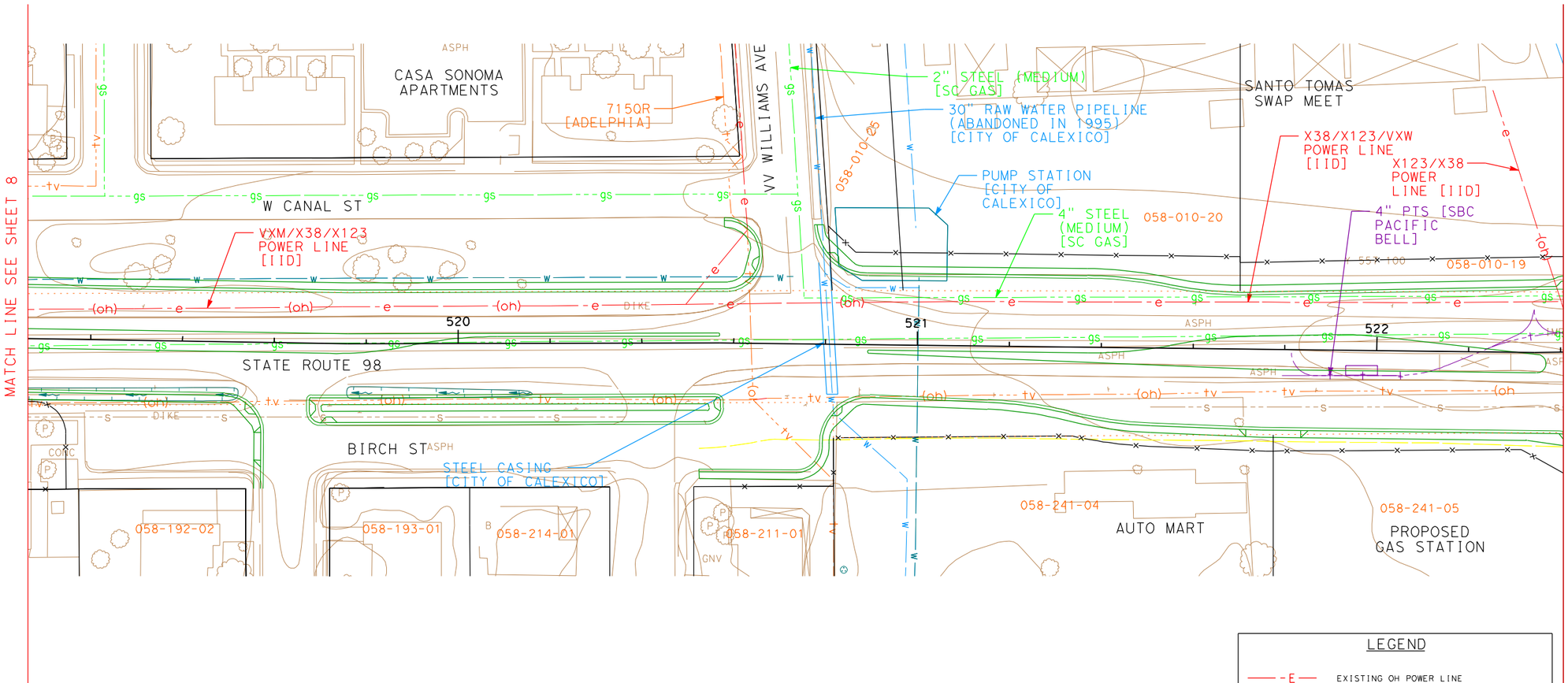

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8	IMP	98	48.52/52.23	10	12

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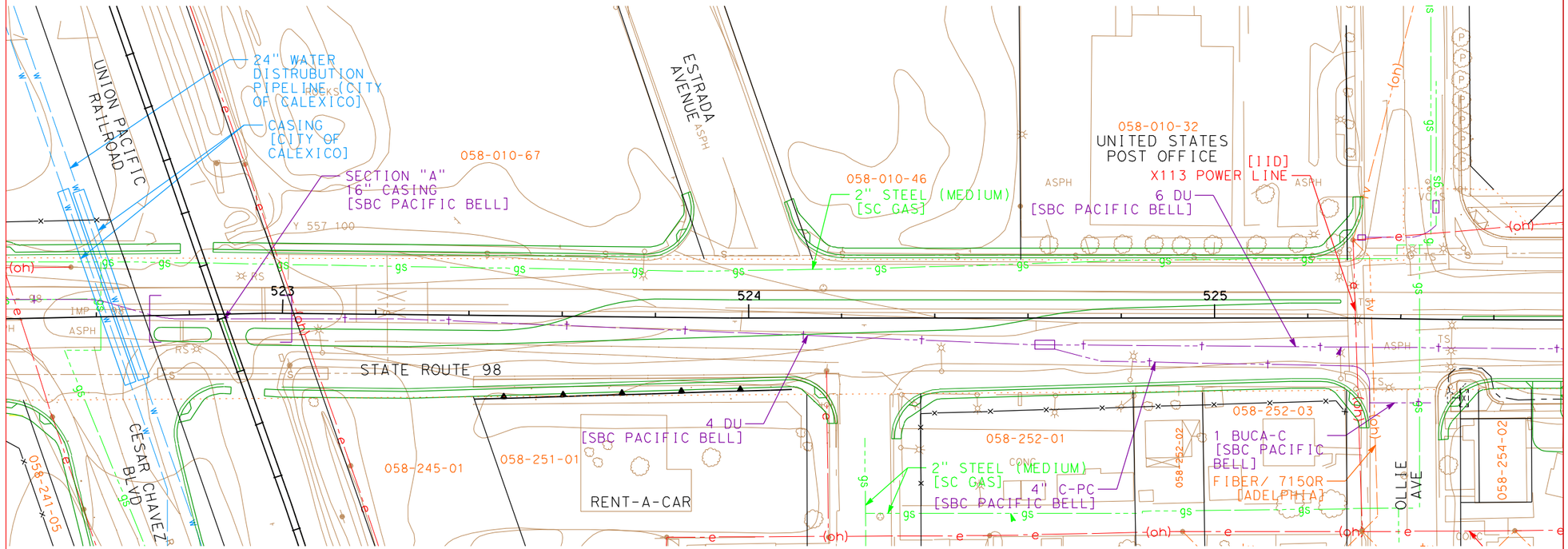

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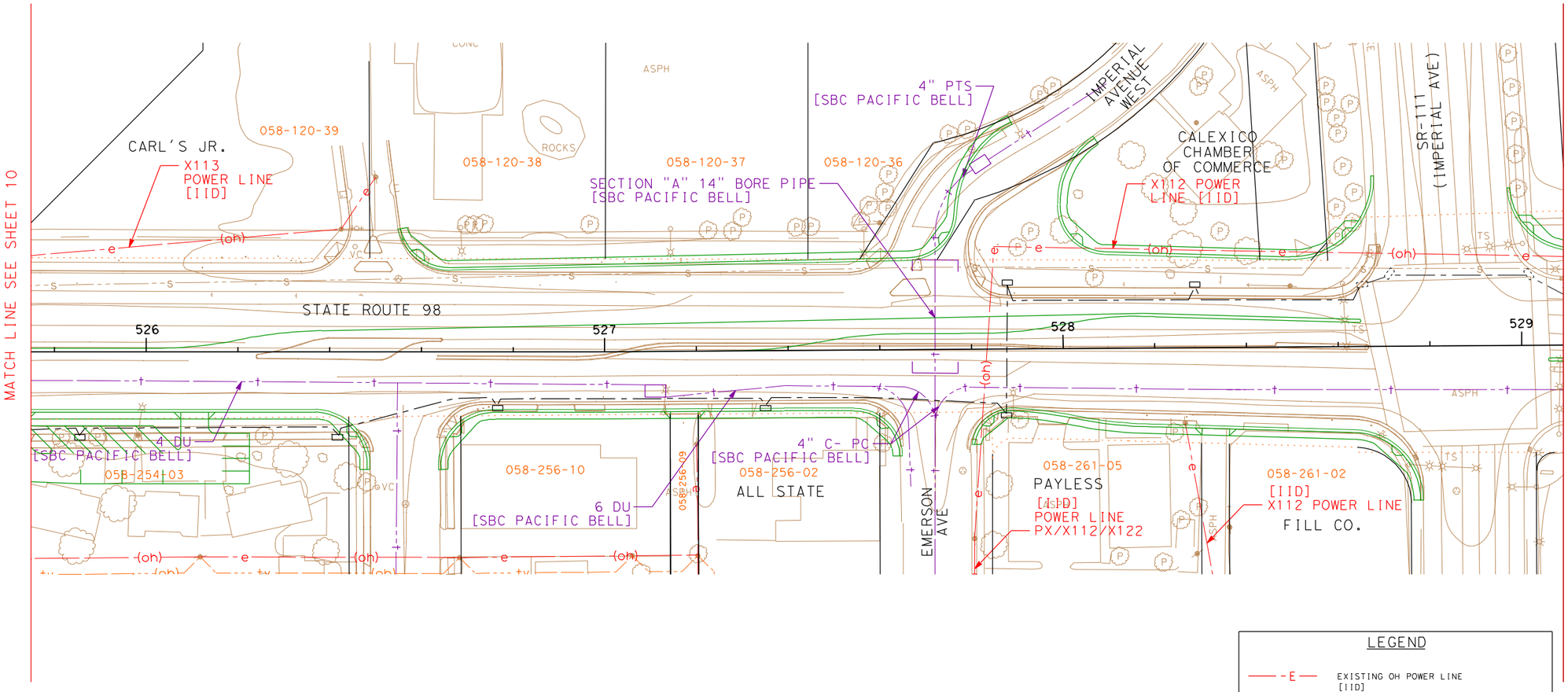

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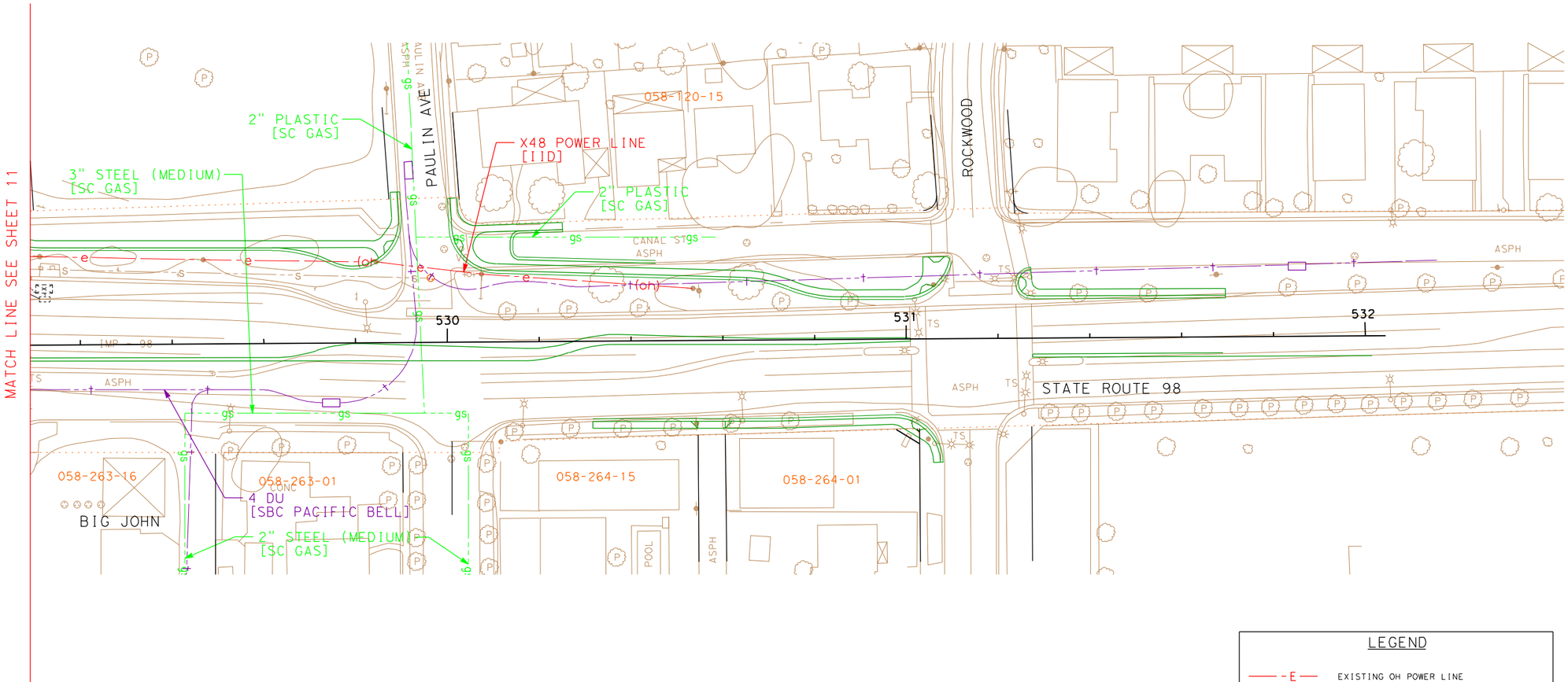

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DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

Utility Relocation Cost Estimate

Route: 11-SD-98

KP: 48.2/52.5, PM: 30.0/32.6

Description: Four and Six Lane Highway Widening

Project Engineer : Jason Lemons

Service Engineer:

R/W Utility Coordinator:

EA 080200 SR-98 West Project from West of Dogwood Road to East of Rockwood Avenue

I.D.	SHEET #	OWNER	FACILITY	LOCATION	Potential Utility Conflict	Pothole Required (Y/N)	Conflict Resolution	Quantity (M)	Unit	Unit Cost	TOTAL COST
1	--	IID	Distribution Power Poles	Sta. 501+20, 505+20 to 522+60, 525+30, 526+40, 527+80 to 531+00.	Widening	N	Relocate	60	each	$20,000	$1,200,000
2	--	IID	Transmission Power Poles	Sta. 494+00 to 505+20	Widening	N	Relocate	20	each	$30,000	$600,000
3	--	IID	Large Steel Transmission Pole	Sta. 528+00	Widening	N	Relocate	1	each	$150,000	$150,000
4	--	IID	Power Pole	Sta. 527+85	Widening	N	New	1	each	$30,000	$30,000
5	--	IID	Power Line	Sta. 494+00 to 522+60, 525+20 to 526+40	Widening	N	Relocate	3,425	meters	$130	$445,185
6	--	IID	Utility Pole	Sta. 507+60, 516+40 to 516+90, 519+20 to 520+70, 521+10 to 522+60, 525+30, 531+00	Widening	N	Relocate	21	each	$15,000	$315,000
7	--	IID	Utility Pole	Sta. 520+90	Widening	N	New	1	each	$20,000	$20,000
8	--	City of Calexico	Signals	--	Widening	N	Relocate	1	each	$50,000	$50,000
9	--	IID	8" Irrigation Water Pipeline	Sta. 506+00 to 520+80	Widening	Y	Relocate	48	each	Included in Traffic	--
10	--	IID	8" Irrigation Water Pipeline	Sta. 521+00	Widening	Y	Possible Relocate	1,465	meters	$500	$732,590
11	--	IID	Pump Station	Sta. 521+00	Widening	Y	Relocate	149	meters	$500	$74,335
12	--	City of Calexico	12" Water Pipe	Sta. 512+60 to 513+95	Widening	Y	Relocate	130	meters	$30	$3,886
13	--	City of Calexico	24" Water Distribution Pipeline	Sta. 522+60	Widening	Y	Relocate	254	meters	$30	$7,610
14	--	City of Calexico	36" Raw Water Pipeline	Sta. 522+60	Widening	Y	Relocate	310	meters	$40	$12,407
15	--	City of Calexico	Steel Casings	Sta. 522+60	Widening	Y	Relocate	87	meters	$30	$2,597
16	--	City of Calexico	Abandoned 30" Raw Water Pipe	Sta. 520+80	Widening	N	Remove	50	meters	$200	$10,000
17	--	City of Calexico	Abandoned Steel Casing	Sta. 520+80	Widening	N	Remove	30	meters	$100	$3,000
18	--	SBC Pacific Bell	4 DU	Sta. 521+80 to 531+70	Widening	Y	Relocate	938	meters	$30	$28,133
19	--	SBC Pacific Bell	6 DU	Sta. Look at sta 525+20	Widening	Y	Relocate	198	meters	$30	$5,931
20	--	SBC Pacific Bell	4" C-PC	Sta. 524+60 to 525+30, 527+70	Widening	Y	Relocate	76	meters	$30	$2,290
21	--	SBC Pacific Bell	14" Bore Pipe	Sta. 527+70	Widening	Y	Relocate	88	meters	$30	$2,632
22	--	SBC Pacific Bell	Control Box	Sta. 495+90	Widening	N	Relocate	1	each	$50,000	$50,000
23	--	SBC Pacific Bell	16" Casing	Sta. 522+90	Widening	Y	Relocate	30	meters	$30	$914
24	--	SC Gas	2" Plastic Pipe	Sta. 509+80, 512+75, 514+30,	Widening	Y	Relocate	564	meters	$40	$22,553
25	--	SC Gas	2" Steel Medium Pipe	Sta. 520+75, 524+00 to 525+45	Widening	Y	Relocate	741	meters	$40	$29,650
26	--	SC Gas	3" Steel Medium Pipe	Sta. 529+40 to 530+05	Widening	Y	Relocate	393	meters	$40	$15,735
27	--	SC Gas	4" Steel Medium Pipe	Sta. 517+20 to 522+60	Widening	Y	Relocate	713	meters	$50	$35,657
28	--	SC Gas	6" Steel Medium Pipe	Sta. 522+50	Widening	Y	Relocate	156	meters	$50	$7,787
29	--	SC Gas	6" Steel High Pressure Pipe	Sta. 492+80 to 525+40, 529+40 to 530+05	Widening	Y	Relocate	3,097	meters	$50	$154,841
										TOTAL COST:	$4,012,732

UNION PACIFIC RAILROAD COMPANY

Bob N. Prince
Manager Public Projects
909-879-6611
FAX 909-879-6289

19100 Slover Avenue
Bloomington,CA 92316

March 24,2000

File: Crossing, Public
CA: Calexico
State Route 98
707.8 Calexico Sub
DOT 760 900B

Mr. Raj Mangat
Division of Structures
California Dept of Transportation
1801 30th Street, MS 9-5/2F
Sacramento, CA 95816

FILE: 11 IMP-98-PM-31.32/32.32
State Route 98
Road Widening
11233-15785K

Dear Mr. Mangat:

Refer to previous correspondence in connection with the widening and intersection modifications on State Route 98 and Cesar Chavez Boulevard.

Attached is copy of esatimate in the amount of $285,951.00 to cover the installation of warning devices on State Route 98.

If you concur with said estimate please forward appropriate service contract to this office.

Sincerely

Bob N. Prince
Manager Industry & Public Projects

CC: Ms. Sandra Durbin – Caltrans

FILE : CROSSING PUBLIC

CA : CALEXICO

SR - 98

DOT#760 900 B

M E M O

BOB PRINCE

ATTACHED IS A MATERIAL AND FORCE ACCOUNT ESTIMATE AND FORM 30 DATED 03/16/00

COVERING THE INSTALLATION OF GRADE CROSSING WARNING DEVICES AT SR 98

IN CALEXICO CA. MP. 707.80 ON THE CALEXICO SUB.

This estimate is only valid for a period of 1 year and will expire on 03/16/01. If the date has expired, a new estimate should be requested prior to entering into an agreement with the State or Recollectable party.

BODIE JUILFS
TRACK PLANNER

DATE: 2000-03-16

ESTIMATE OF MATERIAL AND FORCE ACCOUNT WORK
BY THE
UNION PACIFIC RAILROAD

DESCRIPTION OF WORK:
INSTALL GATES & CANTILEVER XING SIGNALS. ALSO UNLOAD AND INSTALL 4 CARS OF BALLAST AT SR 98 IN CALEXICO CA. MP. 707.80 ON THE CALEXICO SUB.
SIGNAL PROJECT MANAGER:RODNEY PIPER 8-629-2237
RAILROAD TO PERFORM ALL WORK / COST DISTRIBUTED AS FOLLOWS:
SIGNAL - CAL TRANS - 100%

PID: 34380 AWO: 34208 MP,SUBDIV: 707.80, CALEXICO
SERVICE UNIT: 16 CITY: CALEXICO STATE: CA

DESCRIPTION	QTY	UNIT	LABOR	MATERIAL	RECOLL	UPRR	TOTAL
ENGINEERING WORK							
ENGINEERING			5110		5110		5110
LABOR ADDITIVE			4875		4875		4875
SIG-HWY XNG			1478		1478		1478
TOTAL ENGINEERING			11463		11463		11463
SIGNAL WORK							
BILL PREP			900		900		900
CONTRACT				19163	19163		19163
EARTH & ROCK				6500	6500		6500
EQUIPMENT RENTAL				15000	15000		15000
FOREIGN LINE FREIGHT				1832	1832		1832
LABOR ADDITIVE			29727		29727		29727
MATL STORE EXPENSE				4581	4581		4581
PERSONAL EXPENSES				22990	22990		22990
SALES TAX				3665	3665		3665
SIGNAL			40172	91630	131802		131802
TRANSPORTATION CHARGES				4709	4709		4709
USAGE EQUIPMENT				7740	7740		7740
WK ZONE TRAFFIC CONTROL				7500	7500		7500
TOTAL SIGNAL			70799	185310	256109		256109
TRACK & SURFACE WORK							
BALAST	4.00	CL	6086	2435	8521		8521
LABOR ADDITIVE			5029		5029		5029
SALES TAX				97	97		97
SIG-HWY XNG			1500		1500		1500
TRK-SURF,LIN			3232		3232		3232
TOTAL TRACK & SURFACE			15847	2532	18379		18379
LABOR/MATERIAL EXPENSE			98109	187842			
RECOLLECTIBLE/UPRR EXPENSE					285951	0	
ESTIMATED PROJECT COST							285951
EXISTING REUSEABLE MATERIAL CREDIT					0		
SALVAGE NONUSEABLE MATERIAL CREDIT					0		
RECOLLECTIBLE LESS CREDITS							

THE ABOVE FIGURES ARE ESTIMATES ONLY AND SUBJECT TO FLUCTUATION. IN THE EVENT OF AN INCREASE OR DECREASE IN THE COST OR QUANTITY OF MATERIAL OR LABOR REQUIRED, UPRR WILL BILL FOR ACTUAL CONSTRUCTION COSTS AT THE CURRENT EFFECTIVE RATE.

WORK ORDER AUTHORIZATION-DETAIL OF ESTIMATED EXPENDITURES

EST START: 01-01-00
EST COMP: 12-31-00

PROJ NO: 34380
A.W.O. NO: 34208
W.O. NO:
B.I. NO: 99EN10
STATE: CA
VAL SEC: 0418X

RAILROAD: UPRR CO.
LOCATION: CALEXICO CA ST HWY 98 CALEXICO SUB
DEPARTMENT: ENGINEERING SERVICES SERVICE UNIT: 16

INSTALL GATES & CANTILEVER XING SIGNALS. ALSO UNLOAD AND INSTALL 4 CARS
OF BALLAST AT SR 98 IN CALEXICO CA. MP. 707.80 ON THE CALEXICO SUB.
SIGNAL PROJECT MANAGER:RODNEY PIPER 8-629-2237
RAILROAD TO PERFORM ALL WORK / COST DISTRIBUTED AS FOLLOWS:
SIGNAL - CAL TRANS - 100%

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B.I. NO: 99EN10
STATE: CA
VAL SEC: 0418X

RAILROAD: UPRR CO.
LOCATION: CALEXICO CA ST HWY 98 CALEXICO SUB
DEPARTMENT: ENGINEERING SERVICES

SCOPE OF WORK

PROJECT NUMBER	VAL SEC	STATE	M.P. FROM	M.P. TO	SEGMENT	JOINT FACILITY
34380	0418X	CA	707.80	707.80	6697	

PROJECT NUMBER 34380

M.P. FROM	M.P. TO	TRACK TYPE	SEGMENT NUMBER	NUMBER OF XTIES	NUMBER OF SWTIES	TNS OF BALAST	TRACK FEET	LINE
707.80	707.80	SIMN	6697	0	0	380	0	0

WORK ORDER AUTHORIZATION-DETAIL OF ESTIMATED EXPENDITURES

EST START: 01-01-00
EST COMP: 12-31-00

PROJ NO: 34380
A.W.O. NO: 34208
W.O. NO:
B.I. NO: 99EN10
STATE: CA
VAL SEC: 0418X

RAILROAD: UPRR CO.
LOCATION: CALEXICO CA ST HWY 98 CALEXICO SUB
DEPARTMENT: ENGINEERING SERVICES

LABOR PLAN

GANG TYPE	GANG TYPE DESCRIPTION	GANG NBR	NUMBER IN GANG	WORK CODE	WORK CODE DESCRIPTION	GANG DAYS ALLOWED	DIRECT LABOR $
BAL008	8 PERSON BALLA	0	8	19003	BALLAST UNL	3.00	6086.88
SIG005	5 PERSON FOR S	0	5	34004	SIG GENERAL	48.58	38281.04
SIG005	5 PERSON FOR S	0	5	34007	SIG-GEN DIS	2.00	1576.00
SIG005	5 PERSON FOR S	0	5	34014	SIGNAL-GENE	2.40	1891.20
					SUB-TOTAL	52.98	41748.24
SRF003	3 MAN DIVISION	0	3	17009	TRK-SURF,LI	4.34	3232.70
					TOTAL		51,067.82

WORK ORDER AUTHORIZATION-DETAIL OF ESTIMATED EXPENDITURES

EST START: 01-01-00
EST COMP: 12-31-00

PROJ NO: 34380
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RAILROAD: UPRR CO.
LOCATION: CALEXICO CA ST HWY 98 CALEXICO SUB
DEPARTMENT: ENGINEERING SERVICES

STOCK MATERIAL PLAN

ITEM NUMBER	ITEM DESCRIPTION	UNIT COST	QTY	UM	DIRECT MATL $
02040420	BATTERY,GNB,75A9 OR 50A13	183.65	6	EA	1102
02040660	BATTERY,GNB, 75A23 OR 50A27	324.17	14	EA	4538
07810000	ASSEMBLY,JACK-4-WIRE SUTTLE	1.15	1	EA	1
07880400	WIRE, STATION	0.03	20	LF	1
09011240	CABLE TIE, NYLON 1 1/8" MAX. DIA	0.06	200	EA	12
09011980	CABLE TIE, NYLON 3 1/2" MAX. DIA	0.22	20	EA	4
09017210	CIRCUIT BREAKER, 30 AMP	7.49	1	EA	7
09040700	HEAT SHRINKABLE TUBING, .75" DIA.	1.03	8	EA	8
09041120	HEAT SHRINKABLE TUBING, 1.1" DIA.	1.60	4	EA	6
09054360	RELAY, GEN.PURPOSE 120V. TAB 856	12.96	2	EA	26
09057650	SOCKET,P-B 27E122 TAB 836A & 856	2.62	2	EA	5
09065700	TAPE, ELECTRICAL PLASTIC	2.42	2	RL	5
09066900	TERMINAL,SPADE,10-12 WIRE,#8 STUD	0.34	10	EA	3
09135650	2363 J,SLEEVE,4-6,REDUCING	0.84	8	EA	7
09136370	2367 J SLEEVE,SPLICING,4-4	0.84	8	EA	7
09137100	TERM.LUG 3/16 CABLE-1/4 POST 2412	0.83	50	EA	42
09215100	33466 TERMINAL, RING TONGUE AMP	0.23	24	EA	6
09261570	321527-1 TERMINAL, TEST	1.11	10	EA	11
09401140	ADAPTER, 4 INCH CARLON PLASTIC	2.25	2	EA	5
09409820	BUSHING, 4" PLASTIC,INSULATING	0.75	2	EA	2
09424920	CONDUIT, 4", PVC, TYPE 40	1.11	570	LF	633
09467930	LOCKNUT, 4 INCH, GALVANIZED	4.09	2	EA	8
09615550	LAMP,INCANDESCENT,10V.25W.	5.19	13	EA	67
09844170	GROUND ROD, 5/8 INCH X 8 FEET	5.19	13	EA	67
09846750	GRND.ROD CONN. 4WAY ONESHOT.	4.95	13	EA	64
09908640	WIRE,#6 AWG.1 COND.COPPER,SOLID	0.11	325	LF	36
09912120	WIRE,#6 AWG. 2 COND.(500' ROLL)	0.78	500	LF	390
09913120	WIRE,#6 AWG.5 COND. (500' ROLL)	1.46	1000	LF	1460
09915610	WIRE #6 AWG 1 COND COPPER, STRAN	0.37	150	LF	56
09930550	WIRE #10 AWG 1 COND COPPER, STRAN	0.14	3500	LF	490
09932310	WIRE #10 AWG 1 COND COPPER, TWIST	0.32	170	LF	54
09946050	WIRE #14 AWG 7 COND CC,(500' ROLL	0.67	500	LF	335
09960090	WIRE #16 AWG 1 COND COPPER, STRAN	0.07	250	LF	18
13060230	TOGGLE,SPRING WING 3/8	0.52	3	EA	2
13552450	SHEET METAL SCREW,#12 X 3/4"	2.00	2	BX	4
13553150	SHEET METAL SCREW #12 X 1"	2.96	1	BX	3
17061400	PADLOCK,SIGNAL,WITHOUT KEY,AMERIC	12.02	10	EA	120
19009970	HOSE,1 1/2 INCH,SIGNAL BOOTLEG	1.15	80	LF	92
28033210	CARTON, 39 1/8"L X 23 1/4"W X 17	3.36	1	EA	3
28033230	CARTON, 47 3/8"L X 39 1/2"W X 18"	7.34	1	EA	7
28041880	PALLET, 48 X 40 INCH 2/WAY	7.99	2	EA	16
35040010	PLASTER OF PARIS, DENTAL GRADE	0.81	25	LB	20

WORK ORDER AUTHORIZATION-DETAIL OF ESTIMATED EXPENDITURES

EST START: 01-01-00
EST COMP: 12-31-00

PROJ NO: 34380
A.W.O. NO: 34208
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LOCATION: CALEXICO CA ST HWY 98 CALEXICO SUB
DEPARTMENT: ENGINEERING SERVICES

39340220	SIGN, HIGHWAY CROSSING	50.00	2 EA	100
50401560	LUMBER, 2"X4"X 8 FEET	2.91	4 EA	12
52001370	SURGE PROTECTOR SP20-2A TAB 585	70.12	2 EA	140
52005690	BOND WIRE, 7 STRANDS	0.42	100 LF	42
52007040	WEB WELD BOND WIRE TK.CIRC.CONNEC	2.60	16 EA	42
52009780	BOOTLEG WIRE CLAMP, 5/8 INCH INSU	1.23	16 EA	20
52016830	WIRE DUCT, 2X3	9.03	15 EA	135
52016940	WIRE DUCT, 3X3	10.45	1 EA	10
52017510	WIRE DUCT COVER 2"X6'	2.11	15 EA	32
52017620	WIRE DUCT COVER 3"X6'	3.04	1 EA	3
52019530	ENCLOSURE,SHUNT,POLE MOUNTED.24X2	245.02	2 EA	490
52019560	EQUALIZER, H.D. TAB 583	9.22	5 EA	46
52019710	FOUNDATION, CANTILEVER LEAVE-IN-	775.22	2 EA	1550
52021550	FOUNDATION,4',STEEL,FOR FLSHR/GAT	203.96	4 EA	816
52025240	HOUSE, 6X6, SIGNAL XING	4061.35	1 EA	4061
52027350	CLIP BOARD - FOR SIGNAL PRINTS	6.47	1 EA	6
52027430	STEP BOX	12.69	1 EA	13
52027660	INTERFACE,DATA TRANSCEIVER #DTI-3	1248.01	1 EA	1248
52028420	LIGHTNING ARRESTOR,CLR-COMM TAB 3	7.02	12 EA	84
52029780	LIGHTNING ARR,HD TAB 582 W/O BASE	9.91	4 EA	40
52030010	LIGHTNING ARRESTOR CONN.STRIP	4.15	2 EA	8
52039210	RECTIFIER,20EC,12V.TAB575	381.98	1 EA	382
52039390	RECTIFIER, 40EC, 12V. TAB577	561.92	2 EA	1124
52040400	RESISTOR, ADJ.0.63 OHM TAB91	24.86	11 EA	273
52040460	RESISTER, ADJ. 5 OHM, TAB 90	12.76	1 EA	13
52042650	POST, MOUNTING, FOR SHUNT HOUSING	8.91	4 EA	36
52045700	SURGE SUPPRESSOR, PRIMARY,#2377-4	10.02	1 EA	10
52070010	TERMINAL,#12-10 WIRE,RING TONGUE	0.08	600 EA	48
52071600	TERMINAL,#20-16 WIRE,RING TONGUE	0.06	150 EA	9
52072280	TERMINAL BLOCK, SIGNAL 2 POST BAK	2.25	26 EA	59
52072510	TERMINAL BLOCK,SIGNAL 3 POST TEST	6.29	2 EA	13
52072740	TERMINAL BLOCK, SIGNAL 12 POST 6	8.60	4 EA	34
52074550	TEST LINK, INSULATED ASSEMBLY TAB	0.67	24 EA	16
52079550	WIRE TAG, PLASTIC - WHITE	0.08	100 EA	8
52079560	MARKING PEN(FOR WHITE TAG)	1.94	1 EA	2
52108160	LED FL/GATE ASSY.1W BACK ONLY	6426.00	2 EA	12852
52108300	LED-FL/GATE ASSY.1W FRONT REV.GAT	6426.00	2 EA	12852
52109370	GATE ARM, ADJ.16-32'	235.74	4 EA	943
52122140	HIGH WIND BRACKET 5"OR 4"	63.99	4 EA	256
52136470	SHEAR PIN, SK-1000-1	5.50	4 EA	22
52203400	DETECTOR, LIGHT OUT, LOD-1	472.44	2 EA	945
52205800	GCP111 NO ISLAND #81KB-80110-0B00	15157.88	1 EA	15158
52240000	IPI MODULE-GCP3000D2 #80211	1078.02	2 EA	2156
52246000	RESISTOR,47,000 (47K) OHM .5 WATT	0.20	4 EA	1
52258980	NBS, TAB 640, 62775-8621	491.01	2 EA	982
52263600	SURGE ARRESTOR,METER LOOP.	23.89	1 EA	24
52264040	SURGE PANEL - TAB 618	203.96	1 EA	204
52276050	CROSSING ANALYZER, HCA-1	1706.68	1 EA	1707

WORK ORDER AUTHORIZATION-DETAIL OF ESTIMATED EXPENDITURES

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DEPARTMENT: ENGINEERING SERVICES

52276550	CROSSING MODEM, EXM-1	365.28	1 EA	365
52726820	RELAY, FLASHER TAB 887	328.63	1 EA	329
52728800	RELAY, B1LC. TAB 911 A62-310	295.35	1 EA	295
52745830	RELAY,NEUTRAL, B1 TAB 884 & 884A	235.10	3 EA	705
52752390	RELAY,B1SR. 3 SEC. TAB 893	425.99	1 EA	426
52773760	RELAY BRACKET, HOLDS 14 B1 RELAYS	300.00	1 EA	300
52776370	RELAY PLUGBOARD,GRS B1,TAB 900	33.20	7 EA	232
52777970	FLAG TERMINAL, FOR GRS, 14-10	0.89	100 EA	89
52778110	FLAG TERMINAL, FOR GRS, 20-16	1.02	100 EA	102
52779280	RELAY TEST TERM,GRS B1 TAB770&864	6.90	7 EA	48
52907720	CANTILEVER - 24'-26' XING SIGNAL	7800.00	1 EA	7800
52907740	CANTILEVER - 30'-32' XING SIGNAL	9600.00	1 EA	9600
52959000	POWER TAP MATERIAL	2500.00	1 EA	2500
53311490	EXTRACTOR FOR "B"TERMINALS P3-308	9.89	1 EA	10
53311510	TEST NUT WRENCH. GRS #P3-320	15.64	1 EA	16
53648010	INSULATING CAP & SHIELD ASSY.	2.07	10 EA	21
53918230	BOND WIRE CLIP, SBA-248	1.42	16 EA	23
56207660	BALLAST, CLASS 1 "D"	6.41	380 TN	2436
	TOTAL			94,067

WORK ORDER AUTHORIZATION-DETAIL OF ESTIMATED EXPENDITURES

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LOCATION: CALEXICO CA ST HWY 98 CALEXICO SUB
DEPARTMENT: ENGINEERING SERVICES

JOB NO.	ACCT NO.	DESCRIPTION	QTY	UM	UNIT COST	LABOR	MATERIAL	TOTAL P.I.	CHRGABLE O.E.	TO OTHER
		VAL SEC: 0418X								
		** NON JOINT FACILITY **								
		** MAIN LINE **								
1	709	ENGINEERING				5110				
		SIG-HWY XNG W/C 34001				1478				
		LABOR ADDITIVE 74%				4875				
		JOB TOTAL				11463				709-0021-00010 11463
5	011	BALAST	4	CL			2435			
		TRK-SURF,LIN W/C 17009	13	MD		3232				
		BALLAST UNLD W/C 19003	24	MD		6086				
		SALES TAX					97			
		LABOR ADDITIVE 74%				3919				
		JOB TOTAL				13237	2532			709-0021-00010 15769
6	027	SIGNAL					91630			
		SIG-HWY XNG W/C 34004	242	MD		38281				
		SIG.-HWY.CRO W/C 34014	12	MD		1891				
		BILL PREP				900				
		EARTH & ROCK					6500			
		WK ZONE TRAFFIC CONTROL					7500			
		CONTRACT SRVS					10000			
		EQUIPMENT RENTAL					15000			
		PERSONAL EXPENSES					22990			
		FOREIGN LINE FREIGHT					1832			
		TRANSPORTATION CHARGES					4709			
		USAGE EQUIPMENT					7740			
		CONTRACT					9163			
		MATL STORE EXPENSE					4581			
		SALES TAX					3665			
		LABOR ADDITIVE 74				29727				
		JOB TOTAL				70799	185310			709-0021-00010 256109
8	709	CAL TRANS								
		SIGNAL								
		SIG-HWY XNG W/C 34007	10	MD		1500				

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LOCATION: CALEXICO CA ST HWY 98 CALEXICO SUB
DEPARTMENT: ENGINEERING SERVICES

JOB NO.	ACCT NO.	DESCRIPTION	QTY	UM	UNIT COST	LABOR	MATERIAL	TOTAL P.I.	CHRGABLE O.E.	TO OTHER
8	709	LABOR ADDITIVE 74				1110				
		JOB TOTAL				2610				709-0021-00010 2610
		PROJECT TOTALS 34380				98109	187842			285951

WORK ORDER AUTHORIZATION-DETAIL OF ESTIMATED EXPENDITURES

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RAILROAD: UPRR CO.
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DEPARTMENT: ENGINEERING SERVICES

JOB NO.	ACCT NO.	DESCRIPTION	QTY	UM	UNIT COST	LABOR	MATERIAL	TOTAL P.I.	CHRGABLE O.E.	TO OTHER
										ACCT 709 SUBTOTAL 285951
		ESTIMATE TOTALS				98109	187842			285951

ESTIMATED BY: ESRV312 CID#: 88001 00

TOTAL ESTIMATED EXPENITURES: $285,951

DATE: 03-16-2000 APPROVED BY:

APPROVED BY:

WORK ORDER AUTHORITY-DETAIL OF ESTIMATED CREDITS

EST START: 01-01-00
EST COMP: 12-31-00

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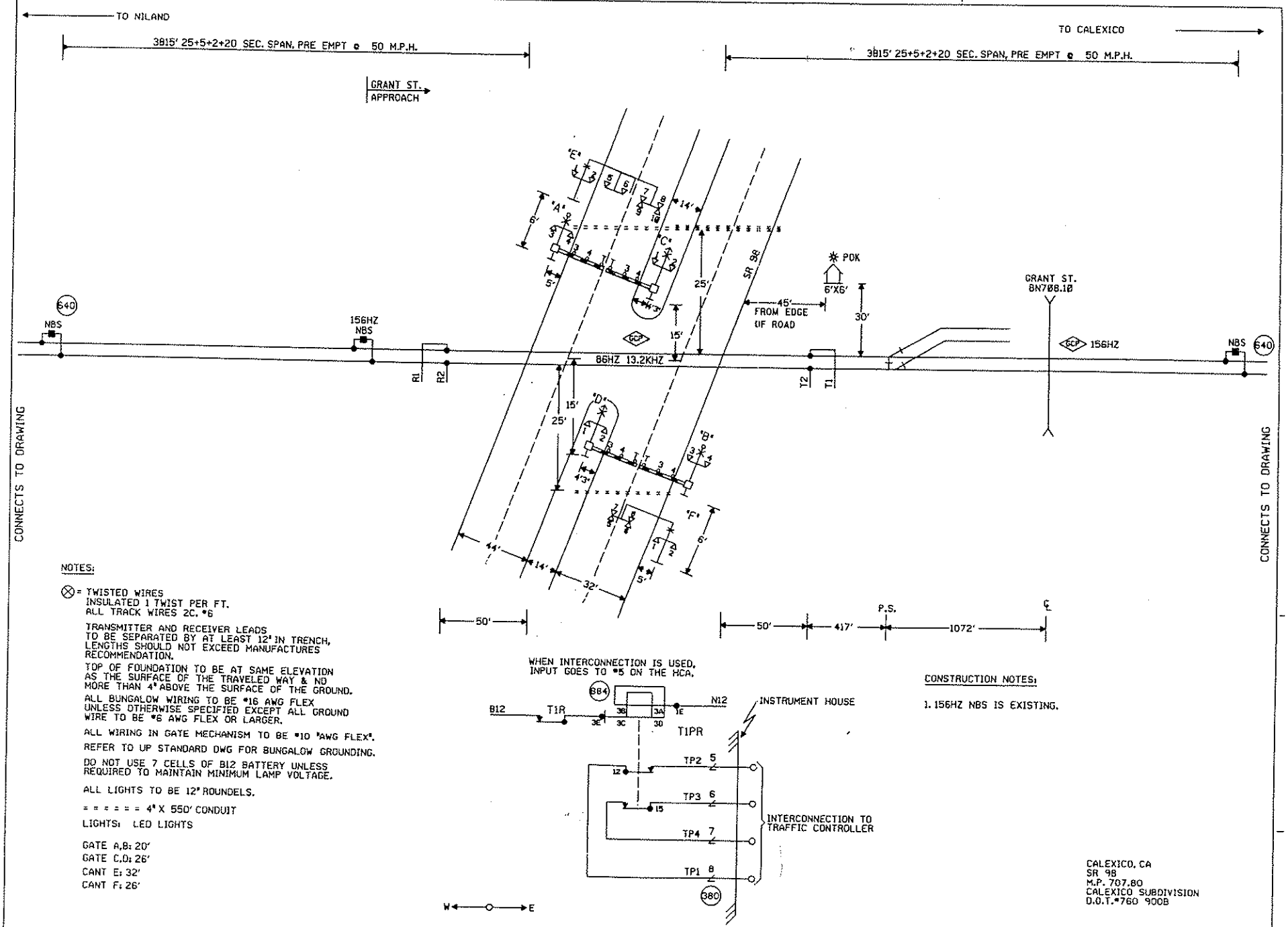
LOCATION: CALEXICO CA ST HWY 98 CALEXICO SUB
DEPARTMENT: ENGINEERING SERVICES

JOB NO.	ACCT NO.	DESCRIPTION				SALVAGE				LEDGER VALUE
		!VAL SEC: 0418X	!	!	!	!	!	!		
		! ** MAIN LINE **	!	!	!	!	!	!		
900		RET. BALAST								
901		RET. SIGNAL								

ESTIMATED CREDIT TO 'RESERVE FOR ROAD PROPERTY TO BE RETIRED AND REPLACED' ..... $ _____
ESTIMATED CREDIT TO 'RESERVE PROPERTY RETIRED AND NOT TO BE REPLACED' .... $ _____
ESTIMATED CREDIT TO 'EQUIPMENT RETIRED' ..... $ _____
ESTIMATED CREDIT TO ..... $ _____

ESTIMATED BY: ESRV312 CID#: 88001 000

DATE: 03-16-2000 APPROVED BY: APPROVED BY:



NOTES:

⊗ = TWISTED WIRES
INSULATED 1 TWIST PER FT.
ALL TRACK WIRES 2C. #6

TRANSMITTER AND RECEIVER LEADS TO BE SEPARATED BY AT LEAST 12" IN TRENCH, LENGTHS SHOULD NOT EXCEED MANUFACTURES RECOMMENDATION.

TOP OF FOUNDATION TO BE AT SAME ELEVATION AS THE SURFACE OF THE TRAVELED WAY & NO MORE THAN 4" ABOVE THE SURFACE OF THE GROUND.

ALL BUNGALOW WIRING TO BE #16 AWG FLEX UNLESS OTHERWISE SPECIFIED EXCEPT ALL GROUND WIRE TO BE #6 AWG FLEX OR LARGER.

ALL WIRING IN GATE MECHANISM TO BE #10 'AWG FLEX'.

REFER TO UP STANDARD DWG FOR BUNGALOW GROUNDING.

DO NOT USE 7 CELLS OF B12 BATTERY UNLESS REQUIRED TO MAINTAIN MINIMUM LAMP VOLTAGE.

ALL LIGHTS TO BE 12" ROUNDELS.

= = = = = = = 4" X 550' CONDUIT

LIGHTS: LED LIGHTS

GATE A,B: 20'
GATE C,D: 26'
CANT E: 32'
CANT F: 26'

WHEN INTERCONNECTION IS USED, INPUT GOES TO #5 ON THE HCA.

CONSTRUCTION NOTES:

1. 156HZ NBS IS EXISTING.

CALEXICO, CA
SR 98
M.P. 707.80
CALEXICO SUBDIVISION
D.O.T.#760 900B

MODIFICATION LEVEL	
D.A. LAST LEVEL CHK'D.	CQ
LAST LEVEL MOD. THIS TYP.	CP
LAST LEVEL BY DESIGNER.	CS
CHANGED FROM TYP.? Y/N	Y

UNION PACIFIC
SIGNAL DESIGN

DES: NASE	
DIG: NASE	
CHK: RCP	
A.F.E. 34208	
ID: BNC70780.1X	

UNION PACIFIC RAILROAD
CALEXICO, CALIFORNIA
HIGHWAY CROSSING SIGNALS
CONTROL CIRCUITS

OFFICE OF CHIEF ENG'R OMAHA NEBR.

DATE	11-10-99
SHEET	1
DWG	707.80
	RTE-BNC

S/C No. 11R065
Sheet 3 of 3

Union Pacific Railroad Company

Estimate for Install New Concrete Panels

Location: At various locations on State 98 and 111 in Imperial County, CA.

Project: Railroad Crossing Upgrade.

Length of Projects: 20 days

Estimate:

Install new concrete panels at three location Total of 22 panels @ $1088.00 each	= $23,936.00
Traffic Handling	=$40,000.00
4 Inch rigid pipe for SR-98 on either side of the roadway	=$ 500.00
Contingencies	=$ 5,564.00
Total	=$70,000.00

Note: This is an estimate only, railroad shall bill on an actual cost basis.

State agrees to reimburse Company for actual costs and expenses reasonably and necessarily incurred by Company in the performance of these items of work.

The estimated amount of cost and expense to be incurred by Company is summarized in estimate attached and made a part thereof. Any additional work incidental to that shown on attached estimate, but not specifically detailed thereon, may be included as part of this contract by written request or approval of State.

All work to be performed under this Service Contract shall be by Company employees and shall be done on a force account basis, the cost hereof to be paid to Company by State in the manner herein set forth.

The parties hereto agree the Company is a qualified self-insurer.

Conditions under which railroad flagmen are required in connection with this project shall be included in the contract Special Provisions for State's Contract No. 11-337805.

All applicable portions of Federal-Aid Policy Guide, Title 23, Code of Federal Regulations, Parts 646A, 646B and 140I are by reference incorporated herein and made a part hereof.

The records and accounts of the Company relating to the project shall be open for inspection and audit by State and/or Federal Government for a period of three years from the date final payment is received by the Company.

Under Federal Regulations there are no ascertainable net benefits to the Company and there shall be no required Company sharing of the costs.

All work under this contract is estimated to be completed by December 31, 2000, unless an extension of time is approved by the State in writing.

WHITE - COMPANY
YELLOW - CONTROLLER
GOLDEN ROD - AGREEMENTS
GREEN - ACCOUNTING
PINK - AGREEMENTS ENGINEER
BLUE - CONSTRUCTION

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 3

IMP CO. 98 &111 ROUTE VAR. P.M.

FEDERAL PARTICIPATION

SOURCE DIST.	SOURCE UNIT	CHARGE DIST.	CHARGE UNIT	EXP AUTH GEN. LED SUB-ACCT / WORK ORDER NO.	SPECIAL DESIGNATION PRE FIX	SUB-JOB NO. - R/W PARCEL NO. / LOCATION BRIDGE NO. ETC.	OBJECT	AMOUNT DEBIT OR CREDIT	FISCAL YEAR	ENC CODE	ENCUMBRANCE DOCUMENT NO.
11	232	11	232	337805			6040	$70,000.00	99	P	MC337805

ITEM 2660-301-042 | CHAPTER 324 | STATUTES 98 | FISCAL YEAR 1998/99

I HEREBY CERTIFY UPON MY OWN PERSONAL KNOWLEDGE THAT BUDGETED FUNDS ARE AVAILABLE FOR THE PERIOD AND PURPOSE OF THE EXPENDITURE STATED ABOVE.

SIGNATURE OF ACCOUNTING OFFICER: C C Cantin — DATE: 6/27/99

SERVICE CONTRACT NO. 11R065
THIS NUMBER IS TO BE PLACED ON ALL BILLS

Sacramento, CALIFORNA

MAY 18,1999

COMPANY UNION PACIFIC RAILROAD COMPANY PHONE (916)

ADDRESS 10031 FOOTHILLS BLVD., ROSEVILLE, CA 95747

The Company hereby agrees to do the work hereinafter set forth for the Department of Transportation in accordance with the provisions of this form and of the attached sheets if any and the Company agrees to receive and accept as full compensation therefore the payment provided herein.

Install new concrete panels at the following locations in Imperial County, as part of the the track upgrade by the Railroad. The State to pay for the concrete panels, traffic handling and 4" rigid pipe. The Railroad to install and provide for new rails and ties.

Lacation Crossing	PUC #	#Panels
SR-98 (Calexico)	BN-707.80	10
SR-111 (Calexico)	BN-708.80	8
SR-111 (Crossover)	BN-708.90	4

TOTAL ESTIMATED PROJECT COST $70,000 (see attached estimate)

It is expressly agreed that all persons engaged on this work are employees of the Company and that none are employees of the Department of Transportation of the State of California.
Further, the said Department of Transportation hereby agrees to the terms as above set forth, and hereby agrees to pay the same; provided, that by mutual consent this agreement may be modified or terminated at any time.

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hand the year and date first above written.

DEPARTMENT OF TRANSPORTATION

By Clem Ge Boman
MANAGER

Approved Thomas

Date 6/21/99

UNION PACIFIC RAILROAD COMPANY
COMPANY

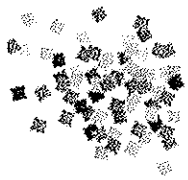
By D.T. Wedeart
CHIEF ENGINEER
TITLE OR POSITION

MAIL OCTUPLE BILL TO:

DEPARTMENT OF TRANSPORTATION
ENGINEERING SERVICE CENTER
DIVISION OF STRUCTURES
AGREEMENTS SECTION MS#9
P. O. BOX 942874
SACRAMENTO, CA 94274-0001

Approved as to Form and Procedure
Atty

DE-1384 (REV. 9/98)



10/31/2002 02:35 PM

Kaems/D11/Caltrans/CAGov, Matt
Mathews/D11/Caltrans/CAGov, Dale
Wilson/D11/Caltrans/CAGov, Raj
Mangat/HQ/Caltrans/CAGov, Tejpal
Bhatia/HQ/Caltrans/CAGov, Tom
Glover/HQ/Caltrans/CAGov, DLLUCAS@up.com,
FCCHEUNG@up.com
cc: loo@cpuc.ca.gov
Subject: Re: 11/20/02 Diagnostic CPUC Field Meeting@ Route 98,
M.P. BN - 707.80 DOT 760900M , Calexico, CA

There will be a Diagnostic Field Meeting with Danny Loo, from the CPUC on November 20, 2002 at 10 AM at the UPRR Route 98 RR crossing.

We will be discussing the 98 widening project and reviewing requirements for upgrades to the RR crossing.

Please advise if you are unable to attend, please advise me who will be attending in your place. The meeting date can not be changed, as it took me weeks to get this date.

Please bring any plans, questions, or other pertinent materials to this meeting. All railroad plans need to be in English. Please bring a copies of your most current plans for Danny and for others attending this meeting.

I tried to invite all interested parties, if there is someone else who should be in attendance, please advise me.

Contact me if you have any questions.

Thank you.

Sandra Durbin
DRC

LEGEND:

Accent Trees

Cercidium 'Desert Museum'	Museum Palo Verde	25x25'
Cercidium florida	Blue Palo Verde	30x30'
Yucca brevifolia	Joshua Tree	25'x25'

Small Trees

Acacia Stenophylla	Shoe-string Acacia	30x20'
Chilopsis linearis	Desert Willow	25x20'
Chitalpa tashkentensis	Chitalpa	25x25'
Lagerstroemia indica	Crape Myrtle	20x20'
Olneya tesota	Ironwood	25x25'
Olea europaea 'Fruitless'	Fruitless Olive	25x25'

Small Shade Trees

Acacia Stenophylla	Shoe-string Acacia	30x20'
Brahychiton populneus	Bottle tree	35x25'
Chitalpa tashkentensis	Chitalpa	25x25'
Dalbergia sissoo	Indian Rosewood	40x30'
Pistacia chinensis	Chinese pistache	40x35'
Prosopis chileensis	Chilean Mesquite	30x30'
Prosopis pubescens	Screw Bean	15x20'
Prosopis g. 'Maverick'	Maverick Honey Mesquite	30x30'
Prosopis g. 'Torreyana'	Honey Mesquite	30x30'
Quercus species	Live Oak	40x40'
Rhus lancea	African sumac	25'x25'

Palm Trees

Washingtonia Filifera	California Fan Palm	50x15'
Brahea armata	Mexican Blue Palm	15x8'
Chamaerops humilis	Mediterranean Fan Palm	12x16'

Existing Tree

Accent Shrubs

Agave vilmoriniana	Octopus Agave	4x5'
Agave parryi	Parry's Agave	2x3'
Agave geminiflora	Twin Flower Agave	3x3'
Agave desettiana	Smooth Agave	3x3'
Aloe dawei	Dawes Aloe	3x3'
Aloe vera	Medicinal Aloe	2x5'
Cereus Hildmannianus	Hildmann's Cereus	10x10'
Dasylirion wheeleri	Desert Spoon	4x4'
Hesperaloe parviflora	Red Hesperaloe	3x3'
Lophocereus Schottii	Senita	10x10'
Nolina microcarpa	Beargrass	3x4'
Opuntia robusta		10x10'
Pahycereus marginatus	Mexican Fence Post (cactus)	10x6'
Yucca baccata	Banana Yucca	3x5'
Yucca Pallida	Pale leaf Yucca	2x4'

Large Shrubs

Aloe ferox	Cape aloe	12x5'
Fouquieria splendens	Ocotillo	12x10'
Hesperaloe funifera	Giant hesperaloe	6x6'
Opuntia ficus Indica	Indian Fig	12x18'
Yucca Elata	Soap Tree	10x4'
Yucca rigida	Blue Yucca	12x6'
Yucca rostrata	Beaked Yucca	10x4'

Medium Shrubs

Calliandra californica	Baja Fairy Duster	5x5'
Calliandra eriophylla	Pink Flowering Duster	5x5'
Guaiacum coulteri	Guayacan	5x5'
Larrea tridentata	Creosote Bush	6x6'
Leucophyllum frutescens	Texas Sage	6x6'
Leucophyllum laevigatum	Chihuahua Sage	4x5'
Simondsia chinensis	Jojoba	6x6'

Small Shrubs

Callistemon c. 'littlejohn'	Compact Bottle Brush	3x3'
Dalea frutescens	Dalea	3x4'
Encelia farinosa	Brittle Brush	3x4'
Euphorbia rigida	Blue Euphorbia	2x3'
Euphorbia antisyphilitica	Candlilla	2x3'
Encelia farinosa	Brittle brush	3x3'
Leucophyllum candidum	Violet Silverleaf Sage	3x3'

NOTE:
The above legend list possible species. Final design is to select a limited number of species necessary for detailed design.

Groundcover

Oenothera stubbei	Saltillo primrose	0.5'x4'
Rosemarinus o.'Prostratus'	Prostrate Rosemary	1.5'x4'
Wedelia trilobata	Yellow Dot	0.5'x3'
Verbena Species	Sand Verbena	0.5x4'

Lawn (Bermuda Sod)

Inert Groundcover

Permeable Concrete at Bottom of Basin

River Rock / Cobble Stone Set In Concrete

Decomposed Granite (wide range of colors available)

Stamped Concrete for Areas less than 6' wide

5' Concrete Sidewalk

Basin Maintenance Trail

NOTE:

Landscape Concept:
SR-98 is the primary western approach to Calexico, connecting the City to the surrounding agricultural lands, and the desert beyond. The landscape design provides a transition from desert to the city, combining low water use planting with natural stone materials to provide an attractive combination of regionally appropriate elements. The goal of the design is to provide an attractive setting requiring minimum maintenance and water use.

Medians: The street medians will combine fan palms with flowering accent trees, thematic accent shrubs, rocks and set in concrete decomposed granite to provide a focal interest for the street. Median areas too narrow for planting will be paved with colored stamped concrete.

Right-of Way: Street trees will be planted on both sides of SR-98 to provide shade and visual relief. Due to the overhead power lines on both sides of the street, the street trees must be small in scale to avoid utility conflicts. Shrubs and accent plants will be planted only at key locations, including the intersections with SR-111, Cesar Chavez Boulevard, the All American Canal, Kloke Road, and Dogwood Road. The ground surface will be covered with decomposed granite to minimize wind erosion and provide an attractive appearance. At accent locations, and rocks set in concrete will add interest. A 5' wide sidewalk will be constructed adjacent to the street curbs. Where City maintained lawn exists, lawn will be installed in the adjacent project area to maintain consistency.

Storm Water Collection Basins: The linear basins along the right of way will hold storm run-off on a temporary basis. Caltrans requires that these basins should not be accessible to the public, and that a minimum 4' height perimeter fence surround each basin for safety. The bottom of the basins will be permeable concrete to allow maintenance and cleaning. The sides of the basin are typically 3:1 in steepness, and will be covered with decorative cobble or fractured rock. Occasional drifts of desert vegetation such as agave or yucca will be planted in the upper half of the basins to add interest.

Noise walls: Noise reduction walls are not proposed for the project.

Irrigation Concept:
The plant materials will be irrigated using a low volume, automatically controlled irrigation system consisting of bubblers, emitters or low volume spray at each shrub and tree location. Irrigation application will be controlled by a flexibly programmable irrigation controller with rain sensor, and flow sensor to detect excess flow and shut off the system master control valve in response to line breaks. The water source will be the City domestic water. The system will be designed to conserve water, while providing for plant health and growth.

Maintenance Concept:
The project will be maintained by the installation contractor for a two year plant establishment period after installation. The City of Calexico will assume responsibility for the long-term maintenance of the project under the guidance of a cooperative maintenance agreement between Caltrans and the City.

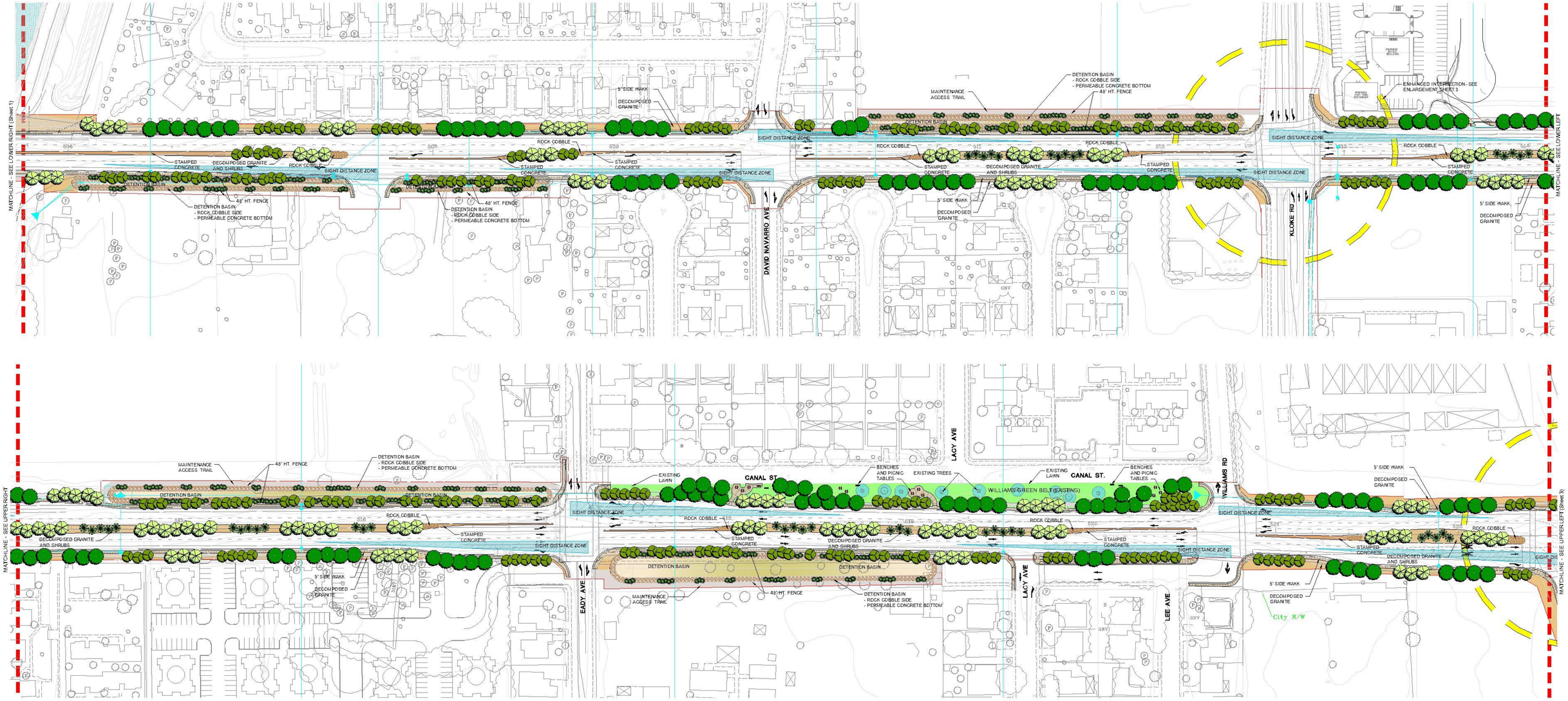
0 50 100
SCALE IN FEET

Landscape Concept Plan

SR98 West Widening Project

March 31, 2008

Estrada
Land Planning
Urban Design Landscape Architecture
Computer Imaging
619.238.0144
765 Broadway Circle, Suite 200
San Diego, California 92101
619.238.0578 Fax
ELP@EstradaLandPlan.com

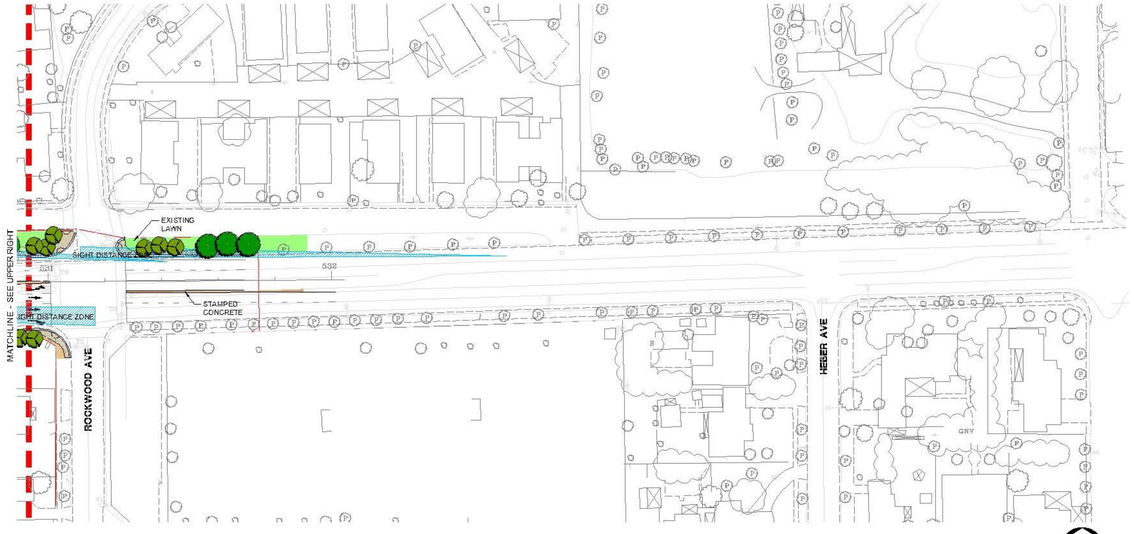


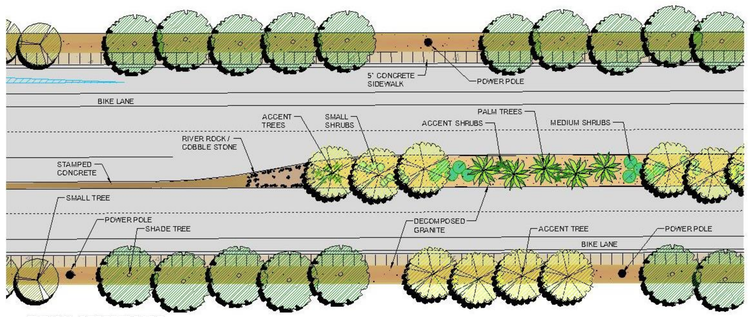
Landscape Concept Plan

SR98 West Widening Project

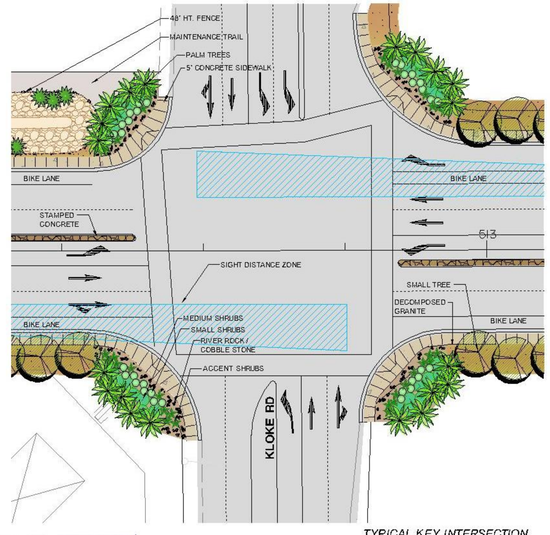
March 31, 2008

Estrada Land Planning
Urban Design Landscape Architecture Computer Imaging
619.239.0342
765 Broadway Circle, Suite 102
San Diego, California 92101-4641
619.239.0678 Fax
ELP@ESTRADALP.com



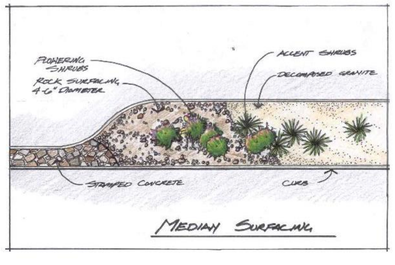


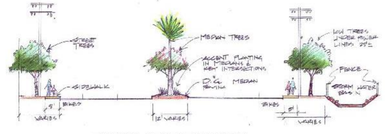
TYPICAL STREETSCAPE
SR-98 CALEXICO Scale: 1" = 20'



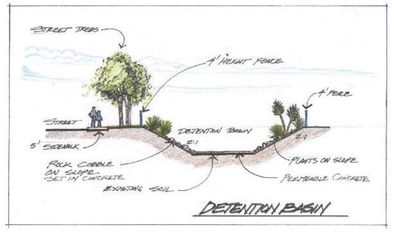
TYPICAL KEY INTERSECTION
SR-98 CALEXICO Scale: 1" = 20'

FENCE AT BASIN





TYPICAL STREET SECTION



DETENTION BASIN

Landscape Concept Plan

SR98 West Widening Project

March 31, 2008

Estrada Land Planning
Urban Design Landscape Architecture Construction Staging
619.224.0546
780 Broadway Circle, Suite 202
San Diego, California 92101-4641
619.224.0678 Fax
ELP@EstradaLandPlanning.com

APPENDIX E

State Route 98
Long Form - Storm Water Data Report

Dist-County-Route: 11-IMP-098

Kilometer Post (Post Mile) Limits: KP 48.5/ 52.2

Project Type: Highway Widening Project

EA: 080200

RU: 11-230

Program Identification:

Phase: ☐ **PID** ☒ **PA/ED** ☐ **PS&E**

Regional Water Quality Control Board(s): Colorado River Basin (Region 7)

Is the project required to consider incorporating Treatment BMPs? ☒ Yes ☐ No

If yes, can Treatment BMPs be incorporated into the project? ☒ Yes ☐ No

If No, a Technical Data Report must be submitted to the RWQCB at least 60 days prior to PS&E Submittal. List submittal date:

Total Disturbed Soil Area: 15 hectares

Estimated Construction Start Date: January 2017 Construction Completion Date: June 2018

Notification of Construction (NOC) Date to be submitted: December 2009

Notification of ADL reuse (if Yes, provide date) ☐ Yes Date: ☒ No

Separate Dewatering Permit (if Yes, permit number) ☐ Yes Permit #: ☒ No

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the data upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Glen Parker, *Registered Project Engineer/Landscape Architect* — Date: 10/29/08

I have reviewed the storm water quality design issues and find this report to be complete, current, and accurate:

Mario Orso, *Project Manager* — Date: 11/10/08

for Lanny Chronert, *Designated Maintenance Representative* — Date: 17 NOV 08

Jeff Bentz, *Designated Landscape Architect Representative* — Date: 11/5/08

STAMP
[Required for PS&E only]

Helene Bell, *District/Regional SW Coordinator or Designee* — Date: 11/04/08

STORM WATER DATA INFORMATION

1. Project Description

- Major Engineering Features

  This project is located within a municipal separate storm sewer systems (MS4) area, the City of Calexico. Improvements include widening the road from two to four lanes from Dogwood Road to just west of Ollie Avenue, and from four to six lanes from Ollie Avenue to Highway 111 (Hwy-111).

- The total disturbed project area will be approximately 15 hectares. This value is based on areas of exposed, erodible soil within the project limits that result from the construction of grading and roadways.

- This project will increase the total amount of impervious area located on the project site by approximately 5.9 hectares. The existing impervious area is approximately 9 hectares and the future impervious area will be approximately 15 hectares.

2. Define Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

- Receiving Water Bodies/Pollutants of Concern

  The project drains to the New River and the Imperial County Drains, which consequently drain to the Salton Sea. The receiving water bodies are impaired according to the 2006 Clean Water Act Section 303(d) list of Water Quality Limited Segments found at http://www.waterboards.ca.gov/coloradoriver/water_issues/programs/tmdl/docs/303d/usepa_final_r7_2006_303dlist.pdf.

  The Colorado River Basin Regional Water Quality Board's listed constituents of concern are the following:

Imperial Valley Drains

POLLUTANT/ STRESSOR	POLLUTANT SOURCES
DDT	Source Unknown
Dieldrin	Source Unknown
Endosulfan	Source Unknown
PCBs	Source Unknown
Selenium	Agricultural Return Flows
Tocaphene	Source Unknown

New River

POLLUTANT/ STRESSOR	POLLUTANT SOURCES
1,2,4-Trimethylbenzene	Industrial Point Source Out-of-state source
Chlordane	Source Unknown
Cloroform	Industrial Point Source Out-of-state source
Clorpyrifos	Source Unknown
Copper	Source Unknown
DDT	Source Unknown
Diazinon	Source Unknown
Dieldrin	Source Unknown
Mercury	Source Unknown
meta-para xylenes	Industrial Point Source Out-of-state source
Nutrients	Major Municipal Point Source-dry and/or wet weather discharge Agricultural Return Flows Out-of-state source
Organic Enritched/Low Dissolved Oxygen	Waste Water Inappropriate Waste Disposal/Wildcat Dumping Out-of-state source Unknown point source
o-Xylenes	Industrial Point Source Out-of-state source
PCBs	Source Unknown
p-Cymene	Industrial Point Source Out-of-state source
p-Dichlorobenzene/DCB	Industrial Point Source Out-of-state source
Pesticides	Agricultrial Return Flows Out-of-state source
Selenium	Source Unknown
Toluene	Industrial Point Source Out-of-state source
Toxaphene	Source Unknown
Toxicity	Source Unknown
Trash	Out-of-state source

- 401certification will not be necessary because the project does not involve discharges of dredged or fill material to waters of the United States, including wetlands and other water bodies, or involve construction of a hydroelectric facility.

- *Initial Site Assessment (ISA) Checklist*

  The project area does not have any High Risk Areas such as municipal or domestic supply reservoir or ground water percolation facilities. An *Initial Site Assessment (ISA) Checklist* for the proposed project has been prepared. A Memorandum on June 26, 2003, *Hazardous Waste Initial Site Investigation for: Imperial County - State Route 98 - Roadway Widening Project,* identified groundwater contamination coming from a former Fed Mart gasoline station, located on the north side of SR-98 between Ollie Avenue and Imperial Avenue West. Currently, the groundwater contamination is being remediated by MC Squared, Environmental Engineering Services for the property owners, the Birch Corporation.

  The groundwater contamination extends beneath the existing SR-98 and several other properties adjacent to the former Fed Mart; however, a site investigation performed for Caltrans by Geocon, Inc. at the NE corner of SR-98 and Ollie Avenue indicated that no groundwater or contaminated soil was present to 4.5 meters below the ground surface at this location. Therefore, contaminated soil or groundwater is not anticipated to be encountered during the course of construction activities given that the excavations for this project are less than that depth.

  The improvements of SR-98 will involve widening within current Union Pacific Railroad (UPRR) Right-of-Way. TASAS accident records did not indicate any accidents involving trains as having occurred at this crossing within the last 10 years. In addition, discussions with representatives of the UPRR by Caltrans indicated no record of releases of environmental or hazardous materials at this location.

- Regional Water Quality Control Board Special Requirements

  The Colorado River Basin Quality Control Board has jurisdiction within the project limits. The project discharges into the Colorado River Basin Quality Control Board hydrologic unit 723.10, known as Imperial.

  Pathogens were adopted as TMDL projects by the Colorado River Basin Quality Control Board on October 10, 2001 and approved by US EPA on August 14, 2002. The main sources of pathogens as indicated by fecal coliforms and E. coli bacteria in the New River are discharges of municipal wastes from the Mexicali Valley, Mexico and undisinfected but treated wastewater discharges from five domestic wastewater treatment plants in the Imperial Valley. The project is not anticipated to raise pathogens levels in the New River.

  Trash was adopted as TMDL projects by the Colorado River Basin Quality Control Board on June 21, 2006 and approved by US EPA on September 24, 2007. The trash impairment is due to the lack of a solid waste management plan to collect and properly dispose of municipal solid waste in Mexicali, resulting in littering of open lots, unpaved roads, the New River itself, and

the River's tributaries within and peripheral to the Mexicali metropolitan area. The project is not anticipated to raise trash levels in the New River.

Sedimentation/Siltation was adopted as TMDL projects by the Colorado River Basin Quality Control Board on June 26, 2002 and approved by US EPA on March 31, 2003. The source of pollutants is direct and indirect discharges of silt-laden agricultural tailwater into the river and drain maintenance operations. The silt carries insoluble pesticides such as DDT and its byproducts, which bioaccumulate in fish tissue. The project is not anticipated to raise sedimentation/siltation levels in the New River.

The Colorado River Basin Quality Control Board has recently established Dissolved Oxygen and volatile Organic Compounds as TMDL projects for the New River. No information has been published as of June 2008 regarding these TMDL projects.

The potential pollutant sources within the project right-of-way to be treated consist primarily of highway runoff. These items for the most part include Total Suspended Solids (TSS), specifically sediment resulting from erosion, but also include particulate and dissolved metals from the wearing of brake pads and the combustion products of fossil fuels as well as grease and oil from automobiles.

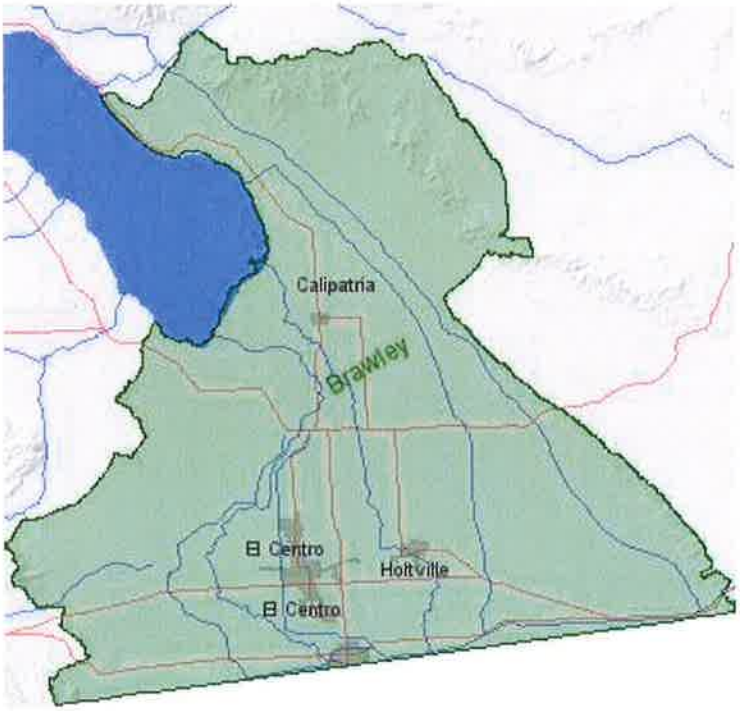


Figure 1: Brawley Watershed

The Colorado River Basin Regional Water Quality Control Board developed a Water Quality Control Plan for all of Imperial County, and portions of San Bernardino, Riverside, and San Diego Counties. The plan identifies the beneficial uses of all water bodies within the region in order to determine the water quality objectives necessary to protect those uses. The beneficial uses defined for the Imperial Valley are as follows:

New River

- Water Contact Recreation – Water for recreational activities involving body contact with water
- Non-contact Water Recreation – Water for recreational activities not involving body contact with water
- Warm Freshwater Habitats – Water that support warm water ecosystems
- Wildlife Habitat – Water that supports terrestrial ecosystems
- Preservation of Rare, Threatened, or Endangered Species – Water that supports habitats necessary for the survival of plant or animal species established as rare, threatened, or endangered
- Freshwater Replenishment – Water for natural or artificial maintenance of surface water quantity or quality
- Potential Industrial Service Supply – Uses of water for industrial activities that do not depend primarily on water quality including, but mot limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization.

Imperial Valley Drains

- Water Contact Recreation – Water for recreational activities involving body contact with water
- Non-contact Water Recreation – Water for recreational activities not involving body contact with water
- Warm Freshwater Habitats – Water that support warm water ecosystems
- Wildlife Habitat – Water that supports terrestrial ecosystems
- Preservation of Rare, Threatened, or Endangered Species – Water that supports habitats necessary for the survival of plant or animal species established as rare, threatened, or endangered
- Freshwater Replenishment – Water for natural or artificial maintenance of surface water quantity or quality

The beneficial uses defined for groundwater within Imperial Valley are as follows:

- Municipal and Domestic Supply – Water for community, military, or individual water supply systems
- Agricultural Supply – Water for farming, horticulture, or ranching
- Aquaculture – Water for aquaculture or mariculture operations
- Industrial Service Supply – Water for industrial activities that do not depend primarily on water quality
- Ground Water Recharge – Water for natural or artificial recharge of ground water purposes of future extraction, maintenance of water quality, or halting salt water intrusion into fresh water aquifers

- Seasonal Construction Restrictions

  The Caltrans March 2003 Construction Site Best Management Practices (BMPs) Manual, Figure 2-1 designates the rainy season dates for District 11 (Eastern California Areas) from August 1 through October 1, and November 1 through May 1. The RWQCB will be notified of the construction site within 30 days prior to the start of construction.

- Project Design Considerations

  The project is located in an area with temperate fall, winter, and spring and a harsh summer. The climate for Imperial is arid and dry desert area with little rainfall and temperatures between 4 and 42 degrees Celsius. Average annual rainfall within the project area is approximately 8 centimeters. Rainfall Intensity-Duration-Frequency (I-D-F) curves for 25-year and 100-year storm events are located in the attachments of this document.

  The geotechnical borings illustrate the soil is comprised of silt, silty sand, sandy clay, clay with sand, and clay. The groundwater level was found to be approximately 5 meters below the existing ground surface. Further investigation needs to be completed to determine the historic high groundwater level as well as the seasonal groundwater fluctuations.

  Total disturbed area for the widening construction will be approximately 15 hectares.

  Elevations within the project limits vary but are approximately sea level. Improvements within the project area will minimally impact the topographic and ground surface relief features.

  Right-of-way impacts for the project involve acquisitions for the widening of State Route 98 and the installation of detention basins near state right-of-way or on private property. As estimated, 3 HA would be needed for installation of detention basins outside of state right-of-way. The private land, where the majority of the detention basins are proposed, is owned by local developers. The City of Calexico proposes to negotiate with the developers for dedicated easements as a stipulation of developing these parcels. Coordination between the City and the developers continue to define land ownership and uses. There will be no additional right-of-way required for staging purposes, construction, and maintenance of Best Management Practices (BMPs). All permanent BMPs located outside of agency right-of-way will be maintained by the City of Calexico or the developers.

Land use adjacent to the improvements proposed for the widening consists primarily of commercial and residential development.

- Geology Information

The project vicinity is located in the Colorado Desert Geomorphic Province along the southern edge of the Imperial Valley, and is underlain by Quarternary-age lake deposits. The lake deposits are comprised of interbedded clays, silts and silty sand. The clays and silts have a stiff to very stiff consistency and the silty sand is medium dense.

Soil borings drilled up to 15 meters beneath the existing ground surface within the project area. Groundwater was encountered at a depth of approximately 5 meters below the ground surface, which can be expected to vary depending on local irrigation, rainfall, and runoff. Since the anticipated maximum excavation depth for the project is 2 meters, the proposed project is not expected to adversely affect groundwater, public water supply, or distribution networks.

A report entitled *Environmental Site Assessment for Aerially Deposited Lead: State Route 98, Calexico, Imperial County, California* was prepared by Southern California Soil & Testing, Inc. in March 2005. According to the study, no soil samples were reported to have total lead concentrations greater than 50mg/kg.

- Right-of-Way BMP Costs

The estimated unit cost for the acquisition of additional right-of-way to facilitate BMP implementation would be approximately $4,310,000 per hectare. In addition, the City of Calexico proposes to negotiate with the local developers for dedicated easements as a stipulation of developing parcels near the project location to facilitate BMP implementation. Coordination between the City and the developers will continue to define land ownership and uses.

- Measures for Avoiding or Reducing Potential Storm Water Impacts

For project areas exceeding 0.4 hectares, NPDES guidelines necessitate the development of a Storm Water Pollution Prevention Plan (SWPPP) by the contractor prior to construction to establish project-specific temporary BMPs. During the design phase, a Water Pollution Control Plan will be prepared and submitted as part of the bid documents to establish the minimum temporary construction BMPs required for the project.

Standard erosion control practices will be implemented to minimize soil erosion following construction activities. Typical measures utilized during construction include and are not limited to disturbing slopes only when necessary, minimizing cut and fill areas to reduces slope lengths, providing cut and fill slopes flat enough to allow re-vegetation, rounding and shaping slopes to reduce concentrated flows, collecting concentrated flows in stabilized drains, maintaning BMPs, phasing the construction to minimize soil disturbance during the rainy season, paved slopes, vegetated slopes, basins, and early construction of water conveyance systems. Permanent landscaping will be installed following the completion of the construction phase to prevent possible erosion.

3. Regional Water Quality Control Board Agreements

There are no negotiated understandings or agreements with the Colorado River Basin (Region 7) Water Quality Control Board pertaining to this project.

4. Describe Proposed Design Pollution Prevention BMPs to be used on the Project.

(Summarize responses to Checklist DPP-1, Parts 1-5)

Downstream Effects Related to Potentially Increased Flow, Parts 1 and 2

The volume of flow will increase within the project limits, but polluted waters from roadway surfaces will be conveyed into detention basins designed to store water during 100-year storm events. Culverts will be constructed with wingwalls to prevent scour.

Slope/Surface Protection Systems, Parts 1 and 3

Slopes throughout the project limits will be modified to accommodate the proposed construction. In general, the slopes adjacent to the widening will be constructed 1:4. However, some slopes will be constructed at 1:2 to facilitate right of way restrictions. Soil stabilization BMPs will be utilized to prevent soil particles from detaching and becoming suspended in storm water and non-storm water runoff. These BMPs may include the following:

1) The preservation of existing vegetation where required and when feasible.

2) The implementation of temporary soil stabilization measures at regular intervals throughout the rainy season.

3) The stabilization of non-active areas within 14 days of cessation of construction activities.

4) All remaining disturbed soil areas will be landscaped following the completion of the construction phase to prevent erosion. Permanent landscaping will include but is not limited to densely graded gravel, pervious paving, stamped concrete, trees and shrubs.

The aforementioned BMPs will be deployed in a sequence to follow the progress of grading and construction. As the locations of soil disturbance change, erosion controls will be adjusted accordingly to control storm water runoff at the downgrade perimeter.

Concentrated Flow Conveyance Systems, Parts 1 and 4

The following concentrated flow conveyance systems have been proposed within the project limits:

- 6 detention basins
- 23 concrete headwalls
- 2,900 meters of underground storm drains (various sizes)

Preservation of Existing Vegetation, Parts 1 and 5

At this phase, an estimated area of clearing and grubbing required for the project improvements has not been determined. The design process will select an alternative that will minimize disturbances to critical areas.

5. Describe Proposed Permanent Treatment BMPs to be used on the Project

The proposed widening improvements meet the criteria of a major reconstruction project. Since the existing drainage system will be altered, treatment BMPs must be analyzed.

Biofiltration Swales/Strips

Biofiltration swales/ strips will not be incorporated in this project due to the climate in the project location making them unfeasible.

Infiltration Basins

An infiltration basin allows temporary storage while the water infiltrates into the soil. The minimum acceptable infiltration rate for an infiltration device is 1.3 cm/hr, per Table B-3 of the Caltrans Storm Water Quality Handbook: Project Planning and Design Guide. Geotechnical investigation revealed that infiltration rates are too low within the project location. Infiltration basins have been considered for the proposed project improvements but have been rejected due to the low infiltration rates in the area.

Detention Basins

A detention basin is used to temporarily store or detain excess stormwater runoff and then release it at a regulated rate to downstream areas. They also provide water quality treatment for low flow events and during the detention of larger storm events.

The proposed drainage improvements include a series of six detention basins that would collect 66% of the project's roadway runoff and drain to either the All American Canal Drains #9 and #10 or be pumped to the existing 450 mm (18 inch) CMP at the intersection of Kloke Road and SR-98.

Since no major storm drainage system or discharge locations are available to tie in proposed storm drain improvements, detention basins should be installed along the project to facilitate collection and treatment of storm water. The basins have been sized to handle the water quality volume for a water quality storm event and have a drawdown time between 24 to 72 hours to meet the treatment requirements. The elongated basins have been positioned to meet right of way restrictions and fit into dedicated easements provided by local developments. In addition, the basins are designed with 1:2 side slopes, and bottom widths ranging from 2.5 meters (8 feet) to 10.2 meters (33 feet) wide. In addition, the inverts of the basins will be lined with permeable concrete.

Gross Solids Removal Devices (GSRDs)

Although trash is listed as a TMDL per the 303d list, NPDES is not a stakeholder in treatment of this TMDL since it is an "out-of-state" TMDL source.

Traction Sand Traps

Since traction sand will not be applied within the project limits, Traction Sand Traps have not been proposed for the project improvements.

Media Filters

Media Filters remove fine sediment, particulate-associated pollutants, and sometimes dissolved pollutants. Media Filters will not be incorporated in this project due to a larger right-of way footprint and maintenance concerns.

Multi-Chamber Treatment Trains (MCTT)

Multi-chamber treatment trains use three treatment mechanisms in three different chambers. These include a catch basin with a sump, a sedimentation chamber with tube settlers and sorbet pads, and a filtering chamber lined with media. MCTTs will not be incorporated in this project due to the maintenance concerns.

Wet Basins

Due to project location constraints and feasibility, wet basins will not be incorporated in this project.

6. Describe Proposed Temporary Construction Site BMPs to be used on Project

Construction BMPs should include: planning and scheduling to ensure the majority of the construction takes place during the non-rainy season (May through July and October), implementation of erosion control such as fiber matrices and hydraulic mulch to protect graded slopes, and the usage of sediment control devices such as silt fences and fiber rolls to prevent sediment pollution. These devices should remain in place until construction is complete and there is no potential for erosion and sediment transportation.

- Construction Site BMPs that have been designated as separate Bid Line Items include: Hydraulic Mulch; Fiber Rolls; Street Sweeping; Concrete Washout Facilities; Drainage Inlet Protection; and Silt Fences.

- Preliminary quantities and unit costs for each Construction Site BMP were determined based on the project length, steepness of slopes, disturbed soil areas, concrete quantities, proposed/existing drainage facilities, and temporary impact areas. The temporary construction site BMP costs are detailed in the table below:

	Item	Quantity	Unit Cost	Total Cost
Proposed Drainage Improvements	Excavation.	13,500 m^3	\$ 20/m^3	\$270,000
	Drain Rock	4,700 m^3	\$ 90/m^3	\$423,000
	Minor Drainage Structure (inlets, manholes, headwalls, etc)	75	\$ 6,000EA	\$450,000
	Proposed Storm Drain Pipe (various sizes)	1,200 m	\$ 600/m	\$720,000
	TOTAL COST: \$1,863,000			
Specialty Items	Fiber Rolls	16,600 m	\$ 15/m	\$249,000
	Prepare Storm Water Pollution Prevention Plan	LS	\$10,000	\$10,000
	Construction Site Management	LS	\$80,000	\$80,000
	Temporary Hydraulic Mulch (Polymer Stabilized Fiber Matrix)	32,400 m^2	\$ 1.00/m^2	\$32,400
	Temporary Construction Entrance/ Exit	10	\$ 4,000/EA	\$40,000
	Temporary Concrete Washout Facility	11	\$ 5,000/EA	\$55,000
	Temporary Drainage Inlet Protection	60	\$ 500/EA	\$30,000
	Temporary Fiber Roll	16,600 m	\$ 15/m	\$249,000
	Temporary Silt Fence	7,800 m	\$ 15/m	\$117,000
	Move in/Move Out (Temporary Erosion Control)	10	\$500/EA	\$5,000
	Street Sweeping	LS	\$50,000	\$50,000
	Water Pollution Control Maintenance Sharing	LS	\$30,000	\$30,000
	Additional Water Pollution Control	LS	\$50,000	\$50,000
	Storm Water Sampling and Analysis	LS	\$45,000	\$45,000
	TOTAL COST: \$ 1,042,400			
TOTAL : \$ 2,905,400				

- Construction of this project will take place near the All American Canal. No modifications will be made to this canal requiring temporary construction site BMPs.

7. Maintenance BMPs (Drain Inlet Stenciling)

All new inlets should be stenciled with painted messages warning citizens not to dump pollutants into the drains. The stenciling details and specifications will be included as part of the final plans and specifications.

ATTACHMENTS:

- ⇒ Vicinity Map
- ⇒ Evaluation Documentation Form
- ⇒ I-D-F Curves
- ⇒ Checklist SW-1, Site Data Sources
- ⇒ Checklists SW-2, Storm Water Quality Issues Summary
- ⇒ Checklist SW-3, Measures for Avoiding or Reducing Storm Water Impacts
- ⇒ Checklist DDP-1, Parts 1-5 (Design Pollution Prevention BMPs)
- ⇒ Checklist T-1, Parts 1 and 5 (Treatment BMPs)
- ⇒ BMP Summary Spreadsheet
- ⇒ Project Preliminary Drainage Exhibit

VICINITY MAP

IN IMPERIAL COUNTY IN CALEXICO

FROM 0.35 KILOMETERS WEST OF DOGWOOD ROAD TO ROCKWOOD AVENUE

DATE: 01.24.2007

See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPS EA: 080200

NO.	CRITERIA	YES	NO	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	☒		Go to 2
2.	Is this an emergency project?	☐	☒	If **Yes**, go to 11. If **No**, continue to 3.
3.	Have TMDLs OR OTHER Pollution Control Requirements been established for surface waters within the project limits?	☒	☐	If **Yes**, contact the District/Regional NPDES coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 10 or 4 (as determined by the NPDES Coordinator). _____ *(Dist./Reg. SW Coordinator initials)* If **No**, continue to 4.
4.	Is the project within an urban MS4?	☒	☐	If **Yes**, continue to 5. *(write the MS4 Area here)* If **No**, go to 11.
5.	Is the project directly or indirectly discharging to surface waters?	☒	☐	If **Yes**, continue to 6. If **No**, go to 11.
6.	Is this a new facility or major reconstruction?	☒	☐	If **Yes**, continue to 8. If **No**, go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?	☐	☐	If **Yes**, continue to 8. If **No**, go to 11.
8.	Is the Disturbed Soil Area (DSA) created by the project greater than or equal to 3.0 acres or does the project result in a net increase of one acre or more of new impervious surface?	☒	☐	If **Yes**, continue to 10. If **No**, go to 9. *15 hectares (total DSA quantity)*
9.	Is the project part of a Common Plan of Development?	☐	☐	If **Yes**, continue to 10. If **No**, go to 11.
10.	Project is required to consider approved Treatment BMPs.	☒	See Sections 2.4 and either Section 5.5 or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.	
11.	Project is not required to consider Treatment BMPs. JRB *(Dist./Reg. SW Coord. Initials)* *(Project Engineer Initials)* 10/31/08 *(Date)*	☒	Document for Project Files by completing this form, and attaching it to the SWDR.	

INTESITY-DURATION-FREQUENCY CURVES

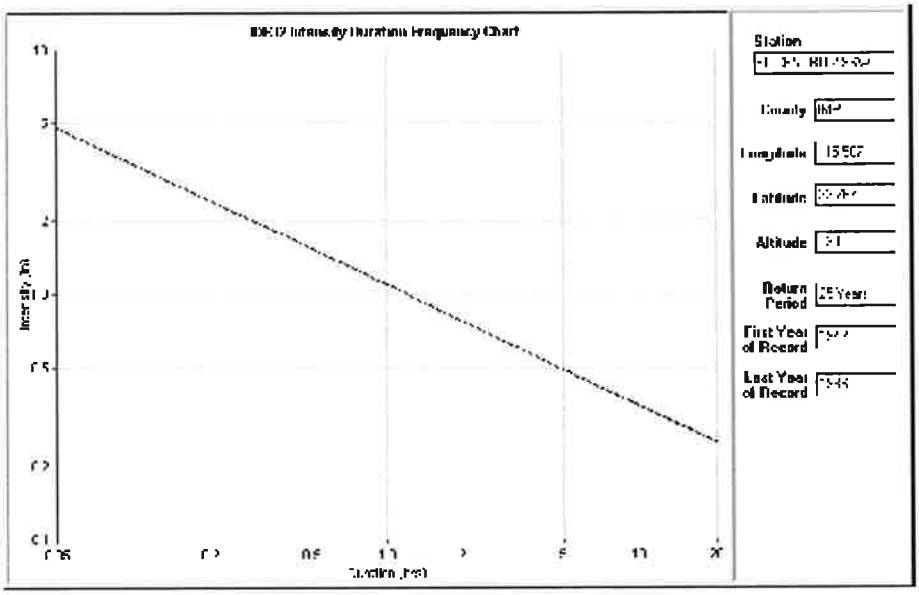


Figure A: 25-YEAR STORM IDF CURVE
$I_{(25)}$= 1.09(T_C /60)$^{-0.495}$= 2.7 in/hr = 67.2 mm/hr; where T_C = time of concentration

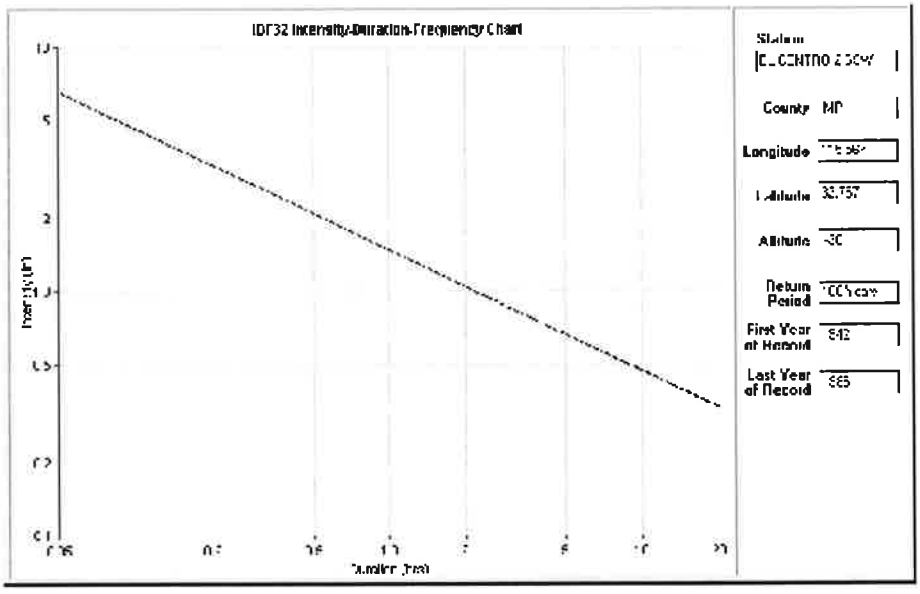


Figure B: 100-YEAR STORM IDF CURVE
$I_{(100)}$= 1.48(T_C /60)$^{-0.495}$= 3.6in/hr = 91.3mm/hr; where T_C = time of concentration

Checklist SW-1, Site Data Sources

Prepared by: G. Parker Date: 01.24.2007 District-Co-Route: 11-IMP-098

KP (PM): 48.5/ 52.2 EA: 080200

RWQCB: Colorado River Basin (Region 7)

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect any available documents pertaining to the category and list them and reference your data source. For specific examples of documents within these categories, refer to Section 5.5 of this document. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Topographic	
• Topographic Maps/USGS	
• Aerial Mapping	
•	
Hydraulic	
• Preliminary Hydrology Study/Dokken Engineering	August 2006
•	
•	
Soils	
• Aerially Deposited Lead Assessment/ SCST	March 23, 2005
• Geotechnical Design Report/ SCST	September 19, 2006
•	
Climatic	
• Storm Water Runoff Loads/OWP, CSU Sacramento	
• Imperial Irrigation District: Water Division, Web Site http://www.iid.com/Water_Index.php?pid=23	January 2007
•	
Water Quality	
• Colorado River Basin – Region 7 Control Plan	
Water Act Section 303(d) List/ Colorado River Basin Water Quality Control Board, Web Site http://www.swrcb.ca.gov/rwqcb7/	
•	
•	
Other Data Categories	
• IDF 32 Computer Program/Caltrans	September 1998
• Watershed Mapping /http://icemaps.des.ucdavis.edu/scripts/esrimap.dll	October 2004
• Basin Sizer v1.1c Beta/California State University	2001
•	
•	

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: G. Parker Date: 01.24.2007 District-Co-Route: 11-IMP-098
KP (PM): 48.5/ 52.2 EA: 080200
RWQCB: Colorado River Basin (Region 7)

The following questions provide a guide to collecting critical information relevant to project storm water quality issues. Complete responses to applicable questions, consulting other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional NPDES Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR.

1.	Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	☒Complete	☐NA
2.	For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	☒Complete	☐NA
3.	Determine if there are any High Risk Areas (municipal or domestic water supply reservoirs or groundwater percolation facilities) within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas.	☒Complete	☐NA
4.	Determine the RWQCB special requirements, including TMDLs, effluent limits, etc.	☒Complete	☐NA
5.	Determine regulatory agencies seasonal construction and construction exclusion dates or restrictions required by federal, state, or local agencies.	☒Complete	☐NA
6.	Determine if a 401 certification will be required.	☐Complete	☒NA
7.	List rainy season dates.	☒Complete	☐NA
8.	Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	☒Complete	☐NA
9.	If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	☒Complete	☐NA
10.	Determine contaminated or hazardous soils within the project area.	☒Complete	☐NA
11.	Determine the total disturbed soil area of the project.	☒Complete	☐NA
12.	Describe the topography of the project site.	☒Complete	☐NA
13.	List any areas outside of the Caltrans right-of-way that will be included in the project (e.g. contractor's staging yard, work from barges, easements for staging, etc.).	☒Complete	☐NA
14.	Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much?	☒Complete	☐NA
15.	Determine if a right-of-way certification is required.	☐Complete	☒NA
16.	Determine the estimated unit costs for right-of-way should it be needed for Treatment BMPs, stabilized conveyance systems, lay-back slopes, or interception ditches.	☒Complete	☐NA
17.	Determine if project area has any slope stabilization concerns.	☒Complete	☐NA
18.	Describe the local land use within the project area and adjacent areas.	☒Complete	☐NA
19.	Evaluate the presence of dry weather flow.	☐Complete	☒NA

Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts

Prepared by: G. Parker Date: 01.24.2007 District-Co-Route: 11-IMP-098
KP (PM): 48.5/ 52.2 EA: 080200
RWQCB: Colorado River Basin (Region 7)

The PE must confer with other functional units, such as Landscape Architecture, Hydraulics, Environmental, Materials, Construction and Maintenance, as needed to assess these issues. Summarize pertinent responses in Section 2 of the SWDR.

Options for avoiding or reducing potential impacts during project planning include the following:

1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?	☐Yes	☐No	☒NA
2.	Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	☐Yes	☐No	☒NA
3.	Can any of the following methods be utilized to minimize erosion from slopes:			
	a. Disturbing existing slopes only when necessary?	☒Yes	☐No	☐NA
	b. Minimizing cut and fill areas to reduce slope lengths?	☒Yes	☐No	☐NA
	c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?	☐Yes	☐No	☒NA
	d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes?	☐Yes	☐No	☒NA
	e. Avoiding soils or formations that will be particularly difficult to re-stabilize?	☐Yes	☐No	☒NA
	f. Providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates?	☒Yes	☐No	☐NA
	g. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?	☐Yes	☐No	☒NA
	h. Rounding and shaping slopes to reduce concentrated flow?	☒Yes	☐No	☐NA
	i. Collecting concentrated flows in stabilized drains and channels?	☒Yes	☐No	☐NA
4.	Does the project design allow for the ease of maintaining all BMPs?	☒Yes	☐No	
5.	Can the project be scheduled or phased to minimize soil-disturbing work during the rainy season?	☒Yes	☐No	
6.	Can permanent storm water pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction storm water impacts?	☒Yes	☐No	☐NA

Design Pollution Prevention BMPs
Checklist DPP-1, Part 1

Prepared by: G. Parker Date: 01.24.2007 District-Co-Route: 11-IMP-098
KP (PM): 48.5/ 52.2 EA: 080200
RWQCB: Colorado River Basin (Region 7)

Consideration of Design Pollution Prevention BMPs

1. Consideration of Downstream Effects Related to Potentially Increased Flow [to streams or channels]?

(a)	Will project increase velocity or volume of downstream flow?	☒Yes	☐No	☐NA
(b)	Will the project discharge to unlined channels?	☒Yes	☐No	☐NA
(c)	Will project increase potential sediment load of downstream flow?	☒Yes	☐No	☐NA
(d)	Will project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?	☐Yes	☒No	☐NA

If Yes was answered to any of the above questions, consider ***Downstream Effects Related to Potentially Increased Flow***, complete the DPP-1, Part 2 checklist.

2. Slope/Surface Protection Systems

(a)	Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA

If Yes was answered to the above question, consider ***Slope/Surface Protection Systems***, complete the DPP-1, Part 3 checklist.

3. Concentrated Flow Conveyance Systems

(a)	Will the project create or modify ditches, dikes, berms, or swales?	☒Yes	☐No	☐NA
(b)	Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA
(c)	Will it be necessary to direct or intercept surface runoff?	☒Yes	☐No	☐NA
(d)	Will cross drains be modified?	☒Yes	☐No	☐NA

If Yes was answered to any of the above questions, consider ***Concentrated Flow Conveyance Systems***; complete the DPP-1, Part 4 checklist.

4. Preservation of Existing Vegetation

a) It is the goal of the Storm Water Program to maximize the protection of desirable existing vegetation to provide erosion and sediment control benefits on all projects. ☒Complete

Consider ***Preservation of Existing Vegetation***, complete the DPP-1, Part 5 checklist.

Design Pollution Prevention BMPs
Checklist DPP-1, Part 2

Prepared by: G. Parker Date: 01.24.2007 District-Co-Route: 11-IMP-098
KP (PM): 48.5/ 52.2 EA: 080200
RWQCB: Colorado River Basin (Region 7)

Downstream Effects Related to Potentially Increased Flow

1. Review total paved area and reduce to the maximum extent possible.	☒Complete
2. Review channel lining materials and design for stream bank erosion control.	☒Complete
(a) See Chapters 860 and 870 of the HDM.	☒Complete
(b) Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.	☒Complete
3. Include, where appropriate, energy dissipation devices at culvert outlets.	☒Complete
4. Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.	☒Complete
5. Include, if appropriate, detention facilities to reduce peak discharges.	☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 3

Prepared by: G. Parker Date: 01.24.2007 District-Co-Route: 11-IMP-098
KP (PM): 48.5/ 52.2 EA: 080200
RWQCB: Colorado River Basin (Region 7)

Slope / Surface Protection Systems

1. What are the proposed areas of cut and fill? (attach plan or map) ☒Complete

2. Were benches or terraces provided on high cut and fill slopes to reduce concentration of flows? ☒Yes ☐No

3. Were slopes rounded and/or shaped to reduce concentrated flow? ☒Yes ☐No

4. Were concentrated flows collected in stabilized drains or channels? ☒Yes ☐No

5. Are slopes > 1:4 vertical:horizontal (V:H))? ☒Yes ☐No

   If Yes, an erosion control plan must be prepared or approved by the District Landscape Architect.

6. Are slopes > 1:2 (V:H)? ☐Yes ☒No

   If Yes, Geotechnical Services must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Storm Water Coordinator for slopes steeper than 1:2 (V:H).

7. Estimate the change to the impervious areas that will result from this project. 5.9 ha ☒Complete

VEGETATED SURFACES

1. Identify existing vegetation. ☒Complete
2. Evaluate site to determine soil types, appropriate vegetation and planting strategies. ☒Complete
3. How long will it take for permanent vegetation to establish? ☒Complete
4. Minimize overland and concentrated flow depths and velocities. ☒Complete

HARD SURFACES

1. Are hard surfaces required? ☒Yes ☐No

   If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations. ☒Complete

Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems. ☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 4

Prepared by: G. Parker Date: 01.24.2007 District-Co-Route: 11-IMP-098
KP (PM): 48.5/ 52.2 EA: 080200
RWQCB: Colorado River Basin (Region 7)

Concentrated Flow Conveyance Systems

Ditches, Berms, Dikes and Swales

1. Consider Ditches, Berms, Dikes, and Swales as per Chapters 813, 836, and 860 of the HDM. ☒Complete
2. Evaluate risks due to erosion, overtopping, flow backups or washout. ☒Complete
3. Consider outlet protection where localized scour is anticipated. ☒Complete
4. Examine the site for run-on from off-site sources. ☒Complete
5. Consider channel lining when velocities exceed scour velocity for soil. ☒Complete

Overside Drains

1. Consider downdrains, as per Index 834.4 of the HDM. ☒Complete
2. Consider paved spillways for side slopes flatter than 1:4 V:H. ☒Complete

Flared Culvert End Sections

1. Consider flared end sections on culvert inlets and outlets as per Chapter 827 of the HDM. ☒Complete

Outlet Protection/Velocity Dissipation Devices

1. Consider outlet protection/velocity dissipation devices at outlets, including cross drains, as per Chapters 827 and 870 of the HDM. ☒Complete

Review appropriate SSPs for Concentrated Flow Conveyance Systems. ☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 5

Prepared by: G. Parker Date: 01.24.2007 District-Co-Route: 11-IMP-098
KP (PM): 48.5/ 52.2 EA: 080200
RWQCB: Colorado River Basin (Region 7)

Preservation of Existing Vegetation

1.	Review Preservation of Property, Standard Specifications 16.1.01 and 16-1.02 (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation.	☒Complete
2.	Has all vegetation to be retained been coordinated with Environmental, and identified and defined in the contract plans?	☐Yes ☒No
3.	Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling?	☒Complete
4.	Have impacts to preserved vegetation been considered while work is occurring in disturbed areas?	☒Yes ☐No
5.	Are all areas to be preserved delineated on the plans?	☐Yes ☒No

Treatment BMPs

Checklist T-1, Part 1

Prepared by: G. Parker Date: 01.24.2007 District-Co-Route: 11-IMP-098

KP (PM): 48.5/ 52.2 EA: 080200

RWQCB: Colorado River Basin (Region 7)

Consideration of Treatment BMPs

This checklist is used for projects that require the consideration of Approved Treatment BMPs, as determined from the process described in Section 4 (Project Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each watershed and sub-watersheds within the project. Supplemental data will be needed to verify siting and design applicability for final incorporation into a project.

Complete this checklist for each phase of the project, when considering Treatment BMPs. Use the responses to the questions as the basis when developing the narrative in Section 5 of the Storm Water Data Report to document that Treatment BMPs have been appropriately considered.

Answer all questions, unless otherwise directed.

1. Dry Weather Flow Diversion

   (a) Are dry weather flows generated by Caltrans anticipated to be persistent? ☐Yes ☒No

   (b) Is a sanitary sewer located on or near the site? ☒Yes ☐No

   (c) Is the domestic wastewater treatment authority willing to accept flow? ☐Yes ☒No

   If Yes was answered to all of these questions consider Dry Weather Flow Diversion, complete and attach Part 3 of this checklist

2. Is the receiving water on the 303(d) list for litter/trash or has a TMDL been issued for litter/trash? ☒Yes ☐No

   If Yes, consider Gross Solids Removal Devices (GSRDs), complete and attach Part 6 of this checklist. Note: Biofiltration Systems, Infiltration Basins, Detention Devices, Media Filters, MCTTs, and Wet Basins also can capture litter – consult with District/Regional NPDES if these devices should be considered to meet litter/trash TMDL.

3. Is project located in an area (e.g., mountain regions) where traction sand is applied more than twice a year?
   If Yes, consider ***Traction Sand Traps***, complete and attach **Part 7** of this checklist. ☐Yes ☒No

4. (a) Are there local influent limits for infiltration or Basin Plan restrictions or other local agency prohibitions that would restrict the use of the infiltration devices? ☐Yes ☒No

   (b) Would infiltration pose a threat to local groundwater quality as determined by the District/Regional NPDES Storm Water Coordinator? ☐Yes ☒No

If the answer to either part of Question 4 is Yes, then Infiltration Devices are infeasible and the consideration of Infiltration Devices should not be made when completing Questions 5 through 17.

5. (a) Does the project discharge to any 303(d) listed water body? ☒Yes ☐No
   If No, go to Question 17, General Purpose Pollutant Removal

   (b) If Yes, is the identified pollutant(s) considered a Targeted Design Constituent (TDC) (check all that apply):

   __x__ phosphorus, __x__ nitrogen, __x__ total copper, __x__ dissolved copper,
   ___ total lead ___ dissolved lead, ___ total zinc, ___ dissolved zinc,
   __x__ sediments, ___ general metals [unspecified metals].

   (c) If only one TDC is checked above, continue to Question 6. ☐Complete

   (d) If more than one TDC is checked, contact your District/Regional NPDES Coordinator to determine priority before continuing with this checklist. ☒Complete

6. Consult with the District/Regional Storm Water Coordinator to determine whether Treatment BMP selection will be affected by any existing or future TMDL requirements. ☐Complete

The following questions show the approved Treatment BMPs in order of preference based on load reduction (performance) for the listed constituent and lifetime costs for the device, excluding right of way. Note that a line separates Treatment BMPs into groups of approximately equal effectiveness and within each grouping, any of the Treatment BMPs may be selected for placement if meeting site conditions. In the space provided next to the BMP, use Yes or a check mark to indicate a positive response.

For the SWDRs developed for the PID and PA/ED phases of a project: **Consider all approved Treatment BMPs listed that can be reasonably incorporated into the project for each TDC.**

For the SWDR developed for the PS&E phase: **Indicate (Yes or check mark) only those BMPs that will be incorporated into the project.**

7. Is phosphorus the TDC? [Use this constituent if "eutrophic" or "nutrients" is the TDC for the water body.] If Yes, consider: ☐Yes ☒No

   _____ Infiltration Devices
   _____ Austin Sand Filters

8. Is nitrogen the TDC? If Yes, consider: ☐Yes ☒No

   _____ Infiltration Devices
   _____ Austin Sand Filters
   _____ Delaware Filter
   _____ Detention Device
   _____ MCTT

9. Is copper (total) the TDC? If Yes for total Copper, consider: ☐Yes ☒No

_____ Infiltration Devices
_____ Wet Basins
_____ Biolfiltration Strips
_____ Detention Device
_____ Biofiltration Swales
_____ Austin Sand Filter
_____ Delaware Filter
_____ MCTT

10. Is copper (dissolved) the TDC? If Yes for dissolved Copper, consider: ☐Yes ☒No

_____ Infiltration Devices
_____ Biofiltration Strips
_____ Wet Basin
_____ Biofiltration Swale

11. Is lead (total) the TDC? If Yes for total Lead, consider: ☐Yes ☒No

_____ Infiltration Devices
_____ Wet Basin
_____ Biolfiltration Strips
_____ Austin Sand Filter
_____ **Delaware Filter**
_____ Detention Device
_____ Biofiltration Swales
_____ MCTT

12. Is lead (dissolved) the TDC? If Yes for dissolved Lead, consider: ☐Yes ☒No

_____ Infiltration Devices
_____ Biolfiltration Strips
_____ Wet Basin
_____ Detention Device
_____ Biofiltration Swales
_____ Austin Sand Filter

13. Is zinc (total) the TDC? If Yes for total Zinc, consider: ☐Yes ☒No

_____ Infiltration Devices
_____ Delaware Filter
_____ Wet Basin
_____ Biofiltration Strips
_____ Biofiltration Swales
_____ Austin Sand Filter
_____ MCTT
_____ Detention Devices

14. Is zinc (dissolved) the TDC? If Yes for dissolved Zinc, consider: ☐Yes ☒No

_____ Infiltration Devices
_____ Delaware Filter
_____ Biofiltration Strip
_____ Biofiltration Swale
_____ Austin Sand Filter
_____ MCTT

15. Is sediment (total suspended solids [TSS]) the TDC? If Yes for TSS, consider: ☒Yes ☐No

    ____ Infiltration Devices
    ____ Austin Sand Filter
    ____ Delaware Filter
    ____ Wet Basin
    X Detention Device
    ____ Biofiltration Strip
    ____ MCTT
    ____ Biofiltration Swale

16. Are "General Metals" or (unspecified) "Metals" the TDC? If Yes for General Metals, consider: ☐Yes ☒No

    ____ Infiltration Devices
    ____ Biofiltration Strips
    ____ Wet Basin
    ____ Biofiltration Swale
    ____ Austin Sand Filter
    ____ Delaware Filter
    ____ MCTT

17. General Purpose Pollutant Removal.: When it is determined that there are no TDCs, consider the Treatment BMPs in the order listed below. ☐Yes ☒No

    ____ Infiltration Devices
    ____ Biofiltration Strips
    ____ Wet Basin
    ____ Biofiltration Swale
    ____ Austin Sand Filter
    ____ Detention Device
    ____ Delaware Filter
    ____ MCTT

18. Biofiltration
    (a) Are site conditions and climate favorable to allow suitable vegetation to be established? ☐Yes ☒No

    (b) Have Biofiltration strips and swales been considered to the extent practicable? Note: Biofiltration BMPs should be considered for all projects, even if other Treatment BMPs are placed. ☐Yes ☒No

    If No to (a) or (b), document justification in Section 5 of the SWDR.

19. After completing the above, complete and attach the checklists shown below for every Treatment BMP under consideration ☒Complete

    ____ Biofiltration Strips and Biofiltration Swales: Checklist T-1, Part 2
    ____ Dry Weather Diversion: Checklist T-1, Part 3
    ____ Infiltration Devices: Checklist T-1, Part 4
    X Detention Devices: Checklist T-1, Part 5
    ____ GSRDs: Checklist T-1, Part 6
    ____ Traction Sand Traps: Checklist T-1, Part 7
    ____ Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8
    ____ Multi-Chambered Treatment Train: Checklist T-1, Part 9
    ____ Wet Basins: Checklist T-1, Part 10

20. (a) Estimate what percentage of WQV/WQF will be treated by the preferred Treatment BMP(s): 65 % ☒Complete

    (b) Have Treatment BMPs been considered for use in parallel or series to increase this percentage? ☒Yes ☐No

21. Prepare cost estimate, including right of way, for selected Treatment BMPs and include as supplemental information for SWDR approval. ☒Complete

Treatment BMPs
Checklist T-1, Part 5

Prepared by: G. Parker Date: 01.24.2007 District-Co-Route: 11-IMP-098
PM (KP): 48.5/52.2 EA: 080200
RWQCB: Colorado River Basin (Region 7)

Detention Devices

Feasibility

1. Is there sufficient head to prevent objectionable backwater conditions in the upstream drainage systems? ☒Yes ☐No

2. 2a) Is the volume of the Detention Device equal to at least the WQV? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) ☒Yes ☐No

   Only answer (b) if the Detention Device is being used also to capture traction sand.

   2b) Is the total volume of the Detention Device at least equal to the WQV and the anticipated volume of traction sand, while maintaining a minimum 12 inch freeboard (1 ft)? ☐Yes ☐No

3. Is basin invert ≥ 10 ft above seasonally high groundwater or can it be designed with an impermeable liner? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.) ☒Yes ☐No

If No to any question above, then Detention Devices are not feasible.

4. Does adequate area exist within the right-of-way to place Detention Device(s)?

   If Yes, continue to the Design Elements section. If No, continue to Question 5. ☐Yes ☒No

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Detention Device(s) and how much right-of way would be needed to treat WQV? 5.75 acres
   If Yes, continue to the Design Elements section. If No, continue to Question 6. ☒Yes ☐No

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Has the geotechnical integrity of the site been evaluated to determine potential impacts to surrounding slopes due to incidental infiltration? If incidental infiltration through the invert of an unlined detention device is a concern, consider using an impermeable liner. *	☒Yes ☐No
2.	Has the location of the Detention Device been evaluated for any effects to the adjacent roadway and subgrade? *	☒Yes ☐No
3.	Can a minimum freeboard of 12 inches be provided above the WQV? *	☒Yes ☐No
4.	Is an overflow outlet provided? *	☐Yes ☒No
5.	Is the drawdown time of the Detention Device within 24 to 72 hours? *	☒Yes ☐No
6.	Is the Detention Device outlet designed to minimize clogging (minimum outlet orifice diameter of 0.5 inches)? * - To be determined in PS&E phase.	☒Yes ☐No
7.	Are the inlet and outlet structures designed to prevent scour and re-suspension of settled materials, and to enhance quiescent conditions? * - To be determined in PS&E phase.	☒Yes ☐No
8.	Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? Note: Detention Basins may be lined, in which case no vegetation would be required for lined areas. *	☐Yes ☒No
9.	Has sufficient access for Maintenance been provided? *	☒Yes ☐No
10.	Is the side slope 1:4 (V:H) or flatter for interior slopes? ** (Note: Side slopes up to 1:3 (V:H) allowed with approval by District Maintenance.)	☐Yes ☒No
11.	If significant sediment is expected from nearby slopes, can the Detention Device be designed with additional volume equal to the expected annual loading? **	☒Yes ☐No
12.	Is flow path as long as possible (≥ 2:1 length to width ratio at WQV elevation is recommended)? **	☒Yes ☐No

Detention Basins

District-County-Route: 11-SD-098
EA: 80200

County	Route	Location Post Mile (PM)	Location KiloPost (KP)	Water Quality Volume (acre-ft)
IMP	98	30.4	48.9	1.11
IMP	98	30.7	49.3	1.19
IMP	98	31.0	49.8	0.88
IMP	98	31.0	50.0	0.77
IMP	98	31.4	50.6	0.98
IMP	98	31.6	50.8	1.49

LEGEND

- Existing Right of Way
- Existing Storm Water Facilities
- Proposed Storm Drain Lateral
- Proposed Headwall
- Proposed Manhole
- Proposed Curb Inlet
- Proposed Curb Outlet
- Proposed Basin Inlet
- PUMP Discharge Line
- Proposed Grading
- Existing Topography
- 100 Year Water Surface Elevation
- Proposed Watershed Label
- Proposed Watershed Boundary
- Existing Watershed Boundary

STATE ROUTE 98

DOGWOOD RD

Basin A (1:2 slope)
BASIN IE 98.7
WSE = 100.14 m

IE 98.70

0.3X

LOS LAGOS DEVELOPMENT

Basin B (1:2 slope)
BASIN IE 98.8
WSE = 100.14 m

IE 97.30

IE 96.85

AA DRAIN No. 9

ALL AMERICAN CANAL

SEE MATCH LINE BELOW

SEE MATCH LINE ABOVE

ALL AMERICAN CANAL

BRIDGE # 58-0180
(CONCRETE SIPHON)
BUILT IN 1938

BLANCHE CHARLES ELEMENTARY

WILLIAM MORENO JR. HIGH SCHOOL

LINDA PLAZA

Basin D (1:2 slope)
BASIN IE 98.95
WSE = 100.23

IE 98.95

Proposed StormWater Pump Station

IE 98.5

Basin E (1:2 slope)
BASIN IE 99.6
WSE = 100.77

0.3X

2.22

IE 97.54

IE 96.85

Basin C (1:2 slope)
BASIN IE 98.95
WSE = 100.23 m

AA DRAIN No. 10

RIVERVIEW DEVELOPMENT

DAVID NAVARRO AVE

ARCO

KLOKE RD

CHEVRON

JACK IN THE BOX

REMINGTON CONDOS

IE 99.50

Basin F (1:2 slope)
BASIN IE 99.5
WSE = 100.77

EADY AVE

MAINS ELEMENTARY SCHOOL

SEE MATCH LINE ABOVE

CASA SONOMA APARTMENTS

W CANAL ST

VV WILLIAMS AVE

SANTO TOMAS SWAP MEET

UNION PACIFIC RAILROAD

ESTRADA AVENUE

UNITED STATES POST OFFICE

FOOD FOR LESS

SHOPPING CENTER

CARL'S JR.

IMPERIAL AVENUE WEST

CALEXICO CHAMBER OF COMMERCE

SR-111 (IMPERIAL AVE)

PAULIN AVE

ROCKWOOD AVE

Basin F (1:2 slope)
BASIN IE 99.5
WSE = 100.77

IE 99.95

BIRCH ST

AUTO MART

PROPOSED GAS STATION

RENT-A-CAR

CESAR CHAVEZ BLVD

OLLIE AVE

HAROLD AVE

ALL STATE

EMERSON AVE

PAYLESS

FILL CO.

BIG JOHN

CALEXICO FAMILY RESOURCE CENTER

LACY AVE

LEE AVE

VINCENT MEMORIAL HIGH SCHOOL

ROOSEVELT STREET

SCALE 1":25m

DOKKEN ENGINEERING
7670 Opportunity Road
Suite 220
San Diego, CA 92123
(858) 514-8377

STATE ROUTE 98
PRELIMINARY
DRAINAGE DESIGN
EXHIBIT

JANUARY 2008

NOISE ABATEMENT DECISION REPORT
STATE ROUTE 98 WEST WIDENING PROJECT

11-IMP-98
KP 48.2/52.5
(PM 30.0/32.6)
EA 080200

Prepared for:

Caltrans – District 11
4050 Taylor Street
San Diego, CA 92110

Prepared by:

Dokken Engineering
5675 Ruffin Road
Suite 250
San Diego, CA 92123
(858) 514-8377

December 2007

It is understood that if pertinent parameters change substantially during the final project design, the noise abatement/mitigation design may be changed or eliminated from the final project design. A final decision on noise abatement/mitigation will be made upon completion of the project design.

PERSONNEL

Mario Orso	Caltrans, Project Manager
Kazim Mamdani	Caltrans, Project Engineer
Sai Win	Caltrans, Design Engineer
Olga Estrada	Caltrans, Environmental Generalist
Jayne Dowda	Caltrans, Environmental Engineering Branch Chief (Noise)
Chris Johnson	Dokken Engineering, Consultant Project Manager
Jason Lemons	Dokken Engineering, Consultant Project Engineer
Kimberly Beek	Dokken Engineering, Consultant Assistant Engineer

SIGNATURE SHEET
NOISE ABATEMENT DECISION REPORT
FOR PROPOSED STATE ROUTE 98 PROJECT
IN THE COUNTY OF IMPERIAL

This report documents the decision of the overall feasibility and reasonableness of providing the abatement measures. The purpose of this report is to determine which noise abatement measure(s) are proposed with this project for each location where a traffic noise impact has been identified.

Jason Lemons
Consultant Project Engineer
Dokken Engineering

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INTRODUCTION

This report evaluates the feasibility and reasonableness of measures to abate traffic noise impacts associated with the proposed State Route 98 West Widening Project. The requirements for noise abatement are based on Title 23, Code of Federal Regulations, Part 772 of the Federal Highway Administration (FHWA) standards, and the Caltrans Traffic Noise Analysis Protocol (Protocol). Under these regulations, noise abatement measures must be considered when future predicted noise levels with the project "approach or exceed" the Noise Abatement Criteria (NAC) or when the predicted noise levels with the project substantially exceed existing noise levels. One-decibel (1 dBA) L_{eq} (h) within the NAC is considered "approaching," and a 12-decibel (12 dBA) increase is considered "substantial." Primary considerations are given to outdoor areas of frequent human use. 23 CFR 772 requires that noise abatement measures that are reasonable and feasible and are likely to be incorporated into the project, be identified before adoption of the final environmental document.

The Protocol establishes a process for assessing the reasonableness and feasibility of noise abatement. Prior to publication of the draft environmental document a noise abatement decision is made. The noise abatement decision is based on the feasibility of evaluated abatement and the reasonableness determination. Noise abatement is considered to be acoustically feasible if it provides noise reduction of at least 5 dBA at receivers subject to noise impacts. Other non-acoustical factors relating to geometric standards (e.g. sight distances), safety, maintenance, and security can also affect feasibility.

The reasonableness determination is made by calculating an allowance that is considered to be a reasonable amount of money per benefited residence to spend on abatement. This reasonable allowance is then compared to the engineer's cost estimate of the abatement. If the engineer's cost estimate is less than the allowance, the determination is that the abatement is reasonable. If the cost estimate is greater than the allowance, the determination is that abatement is not reasonable.

The Noise Abatement Decision Report (NADR) presents the noise abatement decision based on acoustical and non-acoustical feasibility factors and the relationship between noise

abatement allowances and the engineer's cost estimate. The NADR does not present the final decision regarding noise abatement; rather it presents key information on abatement to be considered throughout the environmental review process based on the best available information at the time the draft environmental document is published. The final overall reasonableness decision will take this information into account along with other reasonableness factors identified during the environmental review process. These factors may include:

- impacts of abatement construction,
- public and local agency input,
- life cycle of abatement measures,
- views/opinions of impacted residents, and
- social, economic, environmental, legal, and technological factors.

At the end of the public review process for the environmental document, the final noise abatement decision is made and is indicated in the final environmental document. The noise abatement decision will become the final noise abatement decision unless compelling information received during the public review or the final design process indicates that it should be changed.

It is understood that if pertinent parameters change substantially during the final project design, the noise abatement/mitigation design may be changed or eliminated from the final project design. Another decision on noise abatement/mitigation will be made upon completion of the project design.

PURPOSE OF THE NOISE ABATEMENT DECISION REPORT

The purpose of the NADR is to:

- summarize the conclusions of the noise study report relating to acoustical feasibility and the reasonable allowances for abatement evaluated,
- present the engineer's cost estimate for evaluated abatement,
- present the engineer's evaluation of non-acoustical feasibility issues,
- present the noise abatement decision, and
- present information on secondary effects of abatement (impacts on cultural resources, scenic views, hazardous materials, biology, etc.).

PROJECT DESCRIPTION

The California Department of Transportation (Caltrans) in cooperation with the City of Calexico (City) proposes to improve traffic operations, enhance bicycle and pedestrian safety, and improve drainage performance on State Route 98 (SR-98). The project is located on SR-98 from .35 kilometers (0.22 miles) west of Dogwood Road to Rockwood Avenue, KP 48.2 to KP 52.5 (PM 30.0 to PM 32.6). The purpose of the SR-98 widening project is to achieve acceptable levels of service (LOS) on SR-98 from west of Dogwood Road to east of Hwy-111 through the project design year of 2035 as well as increase safety. The two alternatives for the project are the No Build Alternative and the Build Alternative. The No Build Alternative proposes no improvements to the project area. The Build Alternative proposes to widen the road from two to four lanes from Dogwood Road through just west of Ollie Avenue, and from four to six lanes from Ollie Avenue through Highway-111 (Hwy-111). In addition, the alternative will update the number of turning lanes according to traffic needs at each intersection within the project limits. The following intersections will be signalized as a result of this alternative: SR-98/David Navarro Avenue, SR-98/V.V Williams Avenue/Lee Avenue, and SR-98/Cesar Chavez Boulevard. This alternative will incorporate a new Class II bike lane, sidewalks and a standard drainage system. The project is listed in the 2007 Regional Transportation Plan (RTP), and the 2006 State Transportation Improvement Program (STIP). The portion of the project from David Navarro to SR-111 is listed in the 2006 Regional Transportation Improvement Program (RTIP).

NOISE IMPACT ANALYSIS

A Noise Study Report dated May 2007 by Parsons was prepared for this project. The Noise Study Report primarily analyzed traffic noise impacts in the project area and then analyzed the feasibility of noise abatement alternatives. The purpose of this report was to identify the sensitive noise receptors in the vicinity of the project, describe the traffic noise that occurs currently and the noise that is forecasted to occur upon implementation of the planned roadway improvements. Existing noise levels are currently below the Noise Abatement Criteria (NAC) at the majority of outdoor frequent human use area locations adjacent to SR-98. In the future, traffic noise levels will exceed the noise abatement criteria in many areas.

According to FHWA/Caltrans criteria, noise abatement must be considered at impacted receptors where areas of frequent human use occurs, such as a yard, patio, or deck, and a lowered noise level would be of benefit. Sound barriers ranging in height from approximately 1.8 to 3.7 meters (6 to 12 feet) would reduce the noise levels by at least 5 dBA at many of the residences. Nine proposed noise barriers, identified in relation to a nearby stationing on the SR-98 alignment, are preliminarily considered feasible in the Noise Study Report based on the FHWA/Caltrans Noise Abatement Criteria. All nine barriers are further evaluated in this Noise Abatement Decision Report.

NOISE ABATEMENT MEASURES CONSIDERED

The Noise Study Report prepared for this project evaluated traffic noise impacts to all sensitive receptor sites along the alignment and provided barrier recommendations to abate noise impacts. All noise barriers were analyzed as sound walls. A reasonableness analysis was completed and the cost breakdowns for each wall are included in the Noise Barrier Analysis section of this document. Worksheets "A", which calculate the reasonable cost allowance for each sound wall, are included in the Noise Study Report.

EXISTING LAND USE AND NOISE SENSITIVE LOCATIONS

Existing land uses adjacent to the project are characterized by the following: commercial, office, and industrial structures, schools, multi-family residences, single-family residences, and recreational areas. The terrain of the land surrounding the highway is relatively flat on either side of the roadway. For most of the land uses that surround the highway, the noise levels are below the NAC. Noise levels continue to increase in varying areas for the projected year of 2035 whether or not the project is built. Most of the noise comes from the traffic on the highway rather than from background or local traffic noise. The residential and recreational receptors are classified as Category "B" receptors with a Noise Abatement Criteria (NAC) of 67 dBA L_{eq} for the exterior; the commercial, office, and industrial receptors are category "C" with a NAC of 72 dBA L_{eq} for the exterior.

FEASIBILITY CRITERIA

The feasibility of a noise abatement measure is defined as an engineering consideration. A minimum 5 dBA noise reduction must be achieved at the affected receivers for the proposed noise abatement measure to be considered feasible. The ability to achieve an adequate noise reduction may be limited by topography, access requirements for driveways and ramps, the presence of local cross streets, other noise sources in the area, and safety considerations.

REASONABLENESS CRITERIA

The determination of reasonableness of noise abatement is considered more subjective than the feasibility criterion. This determination typically requires common sense and good judgment in arriving at a decision to construct noise abatement measures. Noise abatement is only considered when noise impacts are predicted and where frequent human use occurs and a lowered noise level would be of benefit. The overall reasonableness of noise abatement is determined by considering a multitude of factors including but not necessarily limited to the following:

a. Abatement cost
b. Absolute noise levels
c. Noise level changes
d. Noise abatement benefits
e. Date of development along the highway
f. Life cycle of abatement measures
g. Environmental impacts of abatement construction
h. Views/opinions of impacted residents
i. Public and local agency input
j. Social, economic, environmental, legal, and technological factors

A reasonableness decision is based on the above factors (a through f), and a reasonable dollar value is allowed per benefited residence. If the abatement can be constructed for a reasonable cost allowance, the reasonableness decision will be to provide abatement. The final decision on the reasonableness of abatement measures is determined after environmental impacts and public input, which includes the above factors (g through j), are considered.

Cost Analysis Methodology

Cost Allowance

A cost allowance per benefited residence is calculated using the standard methodology. A base allowance of $32,000 (Caltrans, 2006) per benefited residence is allotted. An additional allowance per benefited residence is added based on the following:

Absolute Noise Levels	Less than 69 dBA	Add $2,000
	70-74 dBA	Add $4,000
	75-78 dBA	Add $6,000
	More than 78 dBA	Add $8,000
Noise Level Increase	Less than 3 dBA	Add $0
	3-7 dBA	Add $2,000
	8-11 dBA	Add $4,000
	12 dBA or more	Add $6,000
Achievable Noise Reduction	Less than 6 dBA	Add $0
	6-8 dBA	Add $2,000
	9-11 dBA	Add $4,000
	12 dBA or more	Add $6,000

An additional allowance per benefited residence may be added if the project is new highway construction or more than 50% of the benefited residences' construction pre-date 1978:

No on both	Add $0
Yes on either one	Add $10,000

Table 1 below shows the reasonable allowance per benefited unit determination for this project.

Table 1 – Reasonable Allowance per Benefited Unit

Sound Wall	Base Allowance	Highest Predicted Future Noise Level	Absolute Noise Level Allowance	Highest Noise Level Increase	Build vs. Existing Noise Levels Allowance	Achievable Noise Reduction	Achievable Noise Reduction Allowance	Residences Predate 1978*	Predate 1978 Allowance	Total Allowance
S502	$32,000	68	$2000	3	$2000	7	$2000	YES	$10,000	$48,000
S511	$32,000	66	$2000	3	$2000	7	$2000	NO	$0	$38,000
S516A/B/C	$32,000	69	$2000	3	$2000	8	$2000	NO	$0	$38,000
S518	$32,000	69	$2000	4	$2000	11	$4000	NO	$0	$40,000
S520A	$32,000	66	$2000	4	$2000	9	$4000	YES	$10,000	$50,000
S520B	$32,000	66	$2000	4	$2000	10	$4000	YES	$10,000	$50,000
S526	$32,000	70	$4000	3	$2000	6	$2000	YES	$10,000	$50,000

All allowances are summed to determine a total allowance per benefited residence for each sound wall under consideration.

Construction Costs

Unit Price Derivation:

Since the size, type, and location can all affect the Estimated Cost to build a noise barrier, its cost analysis should be broken down into components. A unit price is assigned to each construction component of a wall based upon historical construction costs for each item of

work. The source used is the Caltrans 2006 Contract Cost Data (CCD) book which is published annually by Caltrans Division of Engineering Services – Office Engineer. The Office Engineer tracks standard contract item unit prices for bids opened in 2006 throughout the state of California. It is important to understand the inclusions of materials and related items of work specified to each cost item. To determine inclusions, the Measurement and Payment section of the Caltrans Standard Special Provisions (SSP) for each item of work should be consulted.

The total cost of a wall is dependent on several factors, itemized as follows:

1) Masonry Cost
2) Footing Cost
3) Structural Excavation and Backfill Costs
4) Demolition Costs
5) Clearing and Grubbing Costs
6) Landscaping Costs
7) Traffic Control Costs
8) Storm Water Pollution Prevention Program (SWPPP) implementation Costs
9) Easement Costs

These costs are described in the following sections.

Sound Wall Masonry Cost:

According to the measurement and payment section for sound wall masonry all reinforcing steel, cell fill material, scaffolding and other construction related costs to constructing the masonry portion of a sound wall are included in the Caltrans unit price. The CCD Item code is 518002 Sound Wall (Masonry Block) and the average price per m^2 is approximately $\$200/m^2$. A conservative **$\$275/m^2$** was used in this analysis.

Sound Wall Footing (Minor Concrete) Cost:

According to the Caltrans SSP, sound wall footing should include the cost of concrete reinforcing, as well as structural excavation and backfill. Item 510524 Minor Concrete in the CCD book gives an average unit price of $\$1,360m^3$ in 2006.

Demolition Costs:

The cost of the demolition of existing sound or property walls is found by using a derived unit price of **$\$40/m^2$**, which was found by combining costs of past projects for Item 150828 Remove Sound Wall in the CCD book. The demolition cost for wooden walls is found by using a unit cost of **$20/linear meter** which was derived from past projects in Item 150604 Remove Wood Fence in the CCD book.

Clearing and Grubbing, Landscaping, Traffic Control, and SWPPP Costs:

Additional costs for clearing and grubbing, landscaping, traffic control, and storm water pollution prevention program (SWPPP) must also be taken into account in the cost analysis. All of these costs are considered to be a percentage of the total construction cost of the wall and were determined by examining construction costs for similar jobs and quantities. Clearing and Grubbing is designated as 8% of the construction cost of the wall, landscaping is designated as 10%, and traffic control and SWPPP are both designated as 5% each.

Easement Costs:

Both temporary construction easements and footing easements may be required for construction of the sound walls under consideration. Easements are necessary for barriers constructed within or immediately adjacent to parcels not owned by the State. Easement costs are found by multiplying the required easement area by a designated unit cost. A unit cost of **$300/m^2$** is used for footing easements. The width of the footing is based on the height of the wall and is determined by using the spread footing table on p. 291 of Caltrans' Standard Plans, July 2004 edition. The purpose of a temporary construction easement is to provide enough space adjacent to the proposed wall alignment for typical construction equipment/methods to be applied to the wall. A typical temporary construction easement is linear and calculated by multiplying the length times 3 meters (measured from the edge of footing). Temporary construction easements costs are based upon a unit cost of **$45/m^2$.**

DETERMINATION OF RECOMMENDATIONS

Determination of Reasonableness:

During the NADR reasonableness is solely based on cost. Costs and allowances are compared on a "per benefited residence" basis. The total cost of the sound wall without easements, the total cost with construction easements only, and the total cost with all easements, are each divided by the number of benefited residences to obtain a cost per benefited residence. The cost per benefited residence is then compared to the allowance per benefited residence for each sound wall under consideration. If the estimated cost is higher than the allowance, the wall is determined to be not reasonable. If the wall is reasonable to construct but becomes not reasonable when either type of easement is added, it may be possible to construct the wall provided that the necessary easements are donated by the property owners. In this report, a wall is preliminarily recommended if the wall is found to be

reasonable with or without easements. Final recommendations will be determined after the negotiation of easements between the State and property owners is completed for those walls that are only reasonable without easements.

CONCLUSIONS AND RECOMMENDATIONS

This Noise Abatement Decision Report for the SR-98 West widening project eliminates, from further analysis, barriers that are clearly not reasonable. Since there are no severely impacted receptors along this corridor and none of the feasible walls are reasonable, there will be no further analysis of noise abatement on this project. Table 2 below summarizes the conclusions of this report.

Table 2 – Summary of Noise Abatement Decisions

Sound Wall	# of Benefited Residences	Reasonable w/o Easements	Reasonable w/ Construction Easements Only	Reasonable w/ all easements	Existence of Severely Impacted Receptors	Preliminarily Recommended
S502	1	NO	NO	NO	NO	NO
S511	4	NO	NO	NO	NO	NO
S516A/B/C	8	NO	NO	NO	NO	NO
S518	5	NO	NO	NO	NO	NO
S520A	1	NO	NO	NO	NO	NO
S520B	2	NO	NO	NO	NO	NO
S526	2	NO	NO	NO	NO	NO

REPORT FORMAT

The analysis of all proposed sound walls, which includes relevant data and a discussion on each wall along with exhibits and cost analysis, can be found in the following pages. A list of the locations of each sound wall with respect to their corresponding sheets is found below.

SHEET BREAKDOWN

SHEET 1
- NO NOISE BARRIER LOCATIONS

SHEET 2
- NOISE BARRIER S502

SHEET 3
- NOISE BARRIER S511
- NOISE BARRIER S516A/B/C

SHEET 4
- NOISE BARRIER S516A/B/C
- NOISE BARRIER S518
- NOISE BARRIER S520A
- NOISE BARRIER S520B

SHEET 5
- NOISE BARRIER S526

Noise Barrier Analysis

Noise Barrier S502

General

Type: Sound wall

SR-98 Station limits: 501+94 to 502+11

Receptor sites: R19

Severely Impacted Receptors: None

Height: 1.8 meters (6 feet) to 2.4 meters (8 feet)

Location: Sheet 2

Benefited units: 1 single family residence

Predicted Noise Levels if Project Built without Abatement

Year 2035: 68 dBA

Compared to existing (year 2007): 3 dBA increase

Feasibility

5-dBA reduction:	Yes
Noise reduction below NAC:	Yes
Feasible:	Yes

Reasonableness

Reasonable Total Cost Allowance:	$48,000
Estimated Total Cost without Easements:	$58,039
Estimated Total Cost with Construction Easements only:	$61,077
Estimated Total Cost with all Easements:	$61,863

Reasonable Cost Allowance/Benefited Unit:	$48,000
Estimated Cost/Benefited Unit without Easements:	$58,039
Estimated Cost/Benefited Unit with Construction Easements only:	$61,077
Estimated Cost/Benefited Unit with all Easements:	$61,863

Reasonable without Easements:	No
Reasonable with Construction Easements only:	No
Reasonable with all Easements:	No

Discussion

As shown in Sheet 2 of this NADR, noise barrier S502 would be located along the eastbound side of SR-98, east of the All American Canal. This area is represented by receiver site R19. The noise barrier would extend for approximately 26 meters (85 feet). The height of the barrier required to achieve a 5 dBA or more insertion loss at the critical design receiver would be 1.8 meters (6 feet) and 2.4 meters (8 feet). The wall would benefit one single family residence and is considered feasible. The estimated cost of S502, when all easements are assumed eliminated, would be 21% above the reasonable allowance. When only temporary construction easements are included, the estimated cost exceeds the reasonable allowance by 27%. The estimated cost of the wall including costs for both temporary construction easements and footing easements would be 29% above the reasonable allowance.

Noise Abatement Decision

Construction of noise barrier S502 is feasible, but not reasonable due to the estimated construction cost being higher than the total cost allowance. No severely impacted receptors exist for this wall that need to be abated for. Construction of S502 is not recommended.

Noise Barrier S511

General

Type: Sound wall

SR-98 Station limits: 510+32 to 511+66

Receptor sites: R11 and R11A

Severely Impacted Receptors: None

Height: 3.7 meters (12 feet)

Location: Sheet 3

Benefited units: 1 School (4 frontage units)

Predicted Noise Levels if Project Built without Abatement

Year 2035: 61 to 66 dBA

Compared to existing (year 2007): 2 to 3 dBA increase

Feasibility

5-dBA reduction:	Yes
Noise reduction below NAC:	Yes
Feasible:	Yes

Reasonableness

Reasonable Total Cost Allowance:	$152,000
Estimated Total Cost without Easements:	$556,561
Estimated Total Cost with Construction Easements only:	$561,448
Estimated Total Cost with all Easements:	$565,034

Reasonable Cost Allowance/Benefited Unit:	$38,000
Estimated Cost/Benefited Unit without Easements:	$139,140
Estimated Cost/Benefited Unit with Construction Easements only:	$140,362
Estimated Cost/Benefited Unit with all Easements:	$141,258

Reasonable without Easements:	No
Reasonable with Construction Easements only:	No
Reasonable with all Easements:	No

Discussion

As shown in Sheet 3 of this NADR, noise barrier S511 would be located along the westbound side of SR-98, east of David Navarro Avenue. This area is represented by receiver sites R11 and R11A. The noise barrier would extend for approximately 164 meters (538 feet). The height of the barrier required to achieve a 5 dBA or more insertion loss at the critical design receiver would be 3.7 meters (12 feet). The wall would benefit one school and is considered feasible. The estimated cost of S511, when all easements are assumed eliminated, would be 266% above the reasonable allowance. When only temporary construction easements are included, the estimated cost exceeds the reasonable allowance by 269%. The estimated cost of the wall including costs for both temporary construction easements and footing easements would be 272% above the reasonable allowance.

Noise Abatement Decision

Construction of noise barrier S511 is feasible but not reasonable due to the estimated construction cost being higher than the total cost allowance for noise barrier S511. No severely impacted receptors exist for this wall that need to be abated for. Construction of noise barrier S511 is not recommended.

Noise Barrier S516A/B/C

General

Type: Sound wall

SR-98 Station limits: 514+80 to 516+44

Receptor sites: R30A, R30 to R31

Severely Impacted Receptors: None

Height: 3.0 meters (10 feet)

Location: Sheets 3 and 4

Benefited units: 8 multi-family residences

Predicted Noise Levels if Project Built without Abatement

Year 2035: 69 dBA

Compared to existing (year 2007): 3 dBA increase

Feasibility

5-dBA reduction:	Yes
Noise reduction below NAC:	Yes
Feasible:	Yes

Reasonableness

Reasonable Total Cost Allowance:	$304,000
Estimated Total Cost without Easements:	$371,244
Estimated Total Cost with Construction Easements only:	$382,102
Estimated Total Cost with all Easements:	$383,754

Reasonable Cost Allowance/Benefited Unit:	$38,000
Estimated Cost/Benefited Unit without Easements:	$46,405
Estimated Cost/Benefited Unit with Construction Easements only:	$47,763
Estimated Cost/Benefited Unit with all Easements:	$47,969

Reasonable without Easements:	No
Reasonable with Construction Easements only:	No
Reasonable with all Easements:	No

Discussion

As shown in Sheets 3 and 4 of this NADR, noise barrier S516A, S516B, and S516C would be located along the eastbound side of SR-98, west of Eady Avenue. This area is represented by receiver sites R30, R30A, and R31. The noise barrier would extend for approximately 131 meters (430 feet). The height of the barrier required to achieve a 5 dBA or more insertion loss at the critical design receiver would be 3.0 meters (10 feet). The wall would benefit eight multi-family residences and is considered feasible. The estimated cost of S516/A/B/C, when all easements are assumed eliminated, would be 22% above the reasonable allowance. When only temporary construction easements are included, the estimated cost exceeds the reasonable allowance by 26%. The estimated cost of the wall including costs for both temporary construction easements and footing easements would be 26% above the reasonable allowance.

Noise Abatement Decision

Construction of noise barrier S516A/B/C is feasible, but not reasonable due to the estimated construction cost being higher than the total cost allowance. No severely impacted receptors exist for this wall that need to be abated for. Construction of S516A/B/C is not recommended.

Noise Barrier S518

General

Type: Sound wall

SR-98 Station limits: 517+28 to 519+17

Receptor sites: R33 to R35

Severely Impacted Receptors: None

Height: 3.7 meters (12 feet)

Location: Sheet 4

Benefited units: 1 School (5 frontage units)

Predicted Noise Levels if Project Built without Abatement

Year 2035: 65 to 69 dBA

Compared to existing (year 2007): 4 to 5 dBA increase

Feasibility

5-dBA reduction:	Yes
Noise reduction below NAC:	Yes
Feasible:	Yes

Reasonableness

Reasonable Total Cost Allowance:	$200,000
Estimated Total Cost without Easements:	$868,778
Estimated Total Cost with Construction Easements only:	$920,789
Estimated Total Cost with all Easements:	$971,477

Reasonable Cost Allowance/Benefited Unit:	$40,000
Estimated Cost/Benefited Unit without Easements:	$173,756
Estimated Cost/Benefited Unit with Construction Easements only:	$184,158
Estimated Cost/Benefited Unit with all Easements:	$194,295

Reasonable without Easements:	No
Reasonable with Construction Easements only:	No
Reasonable with all Easements:	No

Discussion

As shown in Sheet 4 of this NADR, noise barrier S518 would be located along the eastbound side of SR-98, east of Eady Avenue. This area is represented by receiver site R33 through R35. The noise barrier would extend for approximately 256 meters (840 feet). The height of the barrier required to achieve a 5 dBA or more insertion loss at the critical design receiver would be 3.7 meters (12 feet). The wall would benefit one school and is considered feasible. The estimated cost of S518, when all easements are assumed eliminated, would be 334% above the reasonable allowance. When only temporary construction easements are included, the estimated cost exceeds the reasonable allowance by 360%. The estimated cost of the wall including costs for both temporary construction easements and footing easements would be 386% above the reasonable allowance.

Noise Abatement Decision

Construction of noise barrier S518 is feasible but not reasonable due to the estimated construction cost being higher than the total cost allowance for noise barrier S518. No severely impacted receptors exist for this wall that need to be abated for. Construction of noise barrier S518 is not recommended.

Noise Barrier S520A

General

Type: Sound wall

SR-98 Station limits: 519+18 to 519+47

Receptor sites: R36

Severely Impacted Receptors: None

Height: 3.0 meters (10 feet)

Location: Sheet 4

Benefited units: 1 single family residence

Predicted Noise Levels if Project Built without Abatement

Year 2035: 66 dBA

Compared to existing (year 2007): 4 dBA increase

Feasibility

5-dBA reduction:	Yes
Noise reduction below NAC:	Yes
Feasible:	Yes

Reasonableness

Reasonable Total Cost Allowance:	$50,000
Estimated Total Cost without Easements:	$85,018
Estimated Total Cost with Construction Easements only:	$93,138
Estimated Total Cost with all Easements:	$98,088

Reasonable Cost Allowance/Benefited Unit:	$50,000
Estimated Cost/Benefited Unit without Easements:	$85,018
Estimated Cost/Benefited Unit with Construction Easements only:	$93,138
Estimated Cost/Benefited Unit with all Easements:	$98,088

Reasonable without Easements:	No
Reasonable with Construction Easements only:	No
Reasonable with all Easements:	No

Discussion

As shown in Sheet 4 of this NADR, noise barrier S520A would be located along the eastbound side of SR-98, west of Lacy Avenue. This area is represented by receiver site R36. The noise barrier would extend for approximately 30 meters (98 feet). The height of the barrier required to achieve a 5 dBA or more insertion loss at the critical design receiver would be 3.0 meters (10 feet). The wall would benefit one single family residence and is considered feasible. The estimated cost of S520A, when all easements are assumed eliminated, would be 70% above the reasonable allowance. When only temporary construction easements are included, the estimated cost exceeds the reasonable allowance by 86%. The estimated cost of the wall including costs for both temporary construction easements and footing easements would be 96% above the reasonable allowance.

Noise Abatement Decision

Construction of noise barrier S520A is feasible but not reasonable due to the estimated construction cost being higher than the total cost allowance for noise barrier S520A. No severely impacted receptors exist for this wall that need to be abated for. Construction of noise barrier S520A is not recommended.

Noise Barrier S520B

General

Type: Sound wall

SR-98 Station limits: 519+71 to 520+33

Receptor sites: R37

Severely Impacted Receptors: None

Height: 3.7 meters (12 feet)

Location: Sheet 4

Benefited units: 2 single family residences

Predicted Noise Levels if Project Built without Abatement

Year 2035: 66 dBA

Compared to existing (year 2007): 4 dBA increase

Feasibility

5-dBA reduction:	Yes
Noise reduction below NAC:	Yes
Feasible:	Yes

Reasonableness

Reasonable Total Cost Allowance:	$100,000
Estimated Total Cost without Easements:	$210,407
Estimated Total Cost with Construction Easements only:	$218,777
Estimated Total Cost with all Easements:	$231,053

Reasonable Cost Allowance/Benefited Unit:	$50,000
Estimated Cost/Benefited Unit without Easements:	$105,204
Estimated Cost/Benefited Unit with Construction Easements only:	$109,389
Estimated Cost/Benefited Unit with all Easements:	$115,527

Reasonable without Easements:	No
Reasonable with Construction Easements only:	No
Reasonable with all Easements:	No

Discussion

As shown in Sheet 4 of this NADR, noise barrier S520B would be located on along the eastbound side of SR-98, east of Lacy Avenue.. This area is represented by receiver site R37. The noise barrier would extend for approximately 62 meters (203 feet). The height of the barrier required to achieve a 5 dBA or more insertion loss at the critical design receiver would be 3.7 meters (12 feet). The wall would benefit two single family residences and is considered feasible. The estimated cost of S520B, when all easements are assumed eliminated, would be 110% above the reasonable allowance. When only temporary construction easements are included, the estimated cost exceeds the reasonable allowance by 119%. The estimated cost of the wall including costs for both temporary construction easements and footing easements would be 131% above the reasonable allowance.

Noise Abatement Decision

Construction of noise barrier S520B is feasible but not reasonable due to the estimated construction cost being higher than the total cost allowance for noise barrier S520B. No severely impacted receptors exist for this wall that need to be abated for. Construction of noise barrier S520B is not recommended.

Noise Barrier S526

General

Type: Sound wall

SR-98 Station limits: 524+82 to 525+22

Receptor sites: R40

Severely Impacted Receptors: None

Height: 3.0 meters (10 feet)

Location: Sheet 5

Benefited units: 2 single family residences

Predicted Noise Levels if Project Built without Abatement

Year 2035: 70 dBA

Compared to existing (year 2007): 3 dBA increase

Feasibility

5-dBA reduction:	Yes
Noise reduction below NAC:	Yes
Feasible:	Yes

Reasonableness

Reasonable Total Cost Allowance:	$100,000
Estimated Total Cost without Easements:	$113,357
Estimated Total Cost with Construction Easements only:	$114,810
Estimated Total Cost with all Easements:	$114,810

Reasonable Cost Allowance/Benefited Unit:	$50,000
Estimated Cost/Benefited Unit without Easements:	$56,678
Estimated Cost/Benefited Unit with Construction Easements only:	$57,405
Estimated Cost/Benefited Unit with all Easements:	$57,405

Reasonable without Easements:	No
Reasonable with Construction Easements only:	No
Reasonable with all Easements:	No

Discussion

As shown in Sheet 5 of this NADR, noise barrier S526 would be located along the eastbound side of SR-98, west of Ollie Avenue. This area is represented by receiver site R40. The noise barrier would extend for approximately 40 meters (131 feet). The height of the barrier required to achieve a 5 dBA or more insertion loss at the critical design receiver would be 3.0 meters (10 feet). The wall would benefit two single family residences and is considered feasible. The estimated cost of S526, when all easements are assumed eliminated, would be 13% above the reasonable allowance. When only temporary construction easements are included, the estimated cost exceeds the reasonable allowance by 15%. The estimated cost of the wall including costs for both temporary construction easements and footing easements would be 15% above the reasonable allowance.

Noise Abatement Decision

Construction of noise barrier S526 is feasible but not reasonable due to the estimated construction cost being higher than the total cost allowance for noise barrier S526. No severely impacted receptors exist for this wall that need to be abated for. Construction of noise barrier S526 is not recommended.

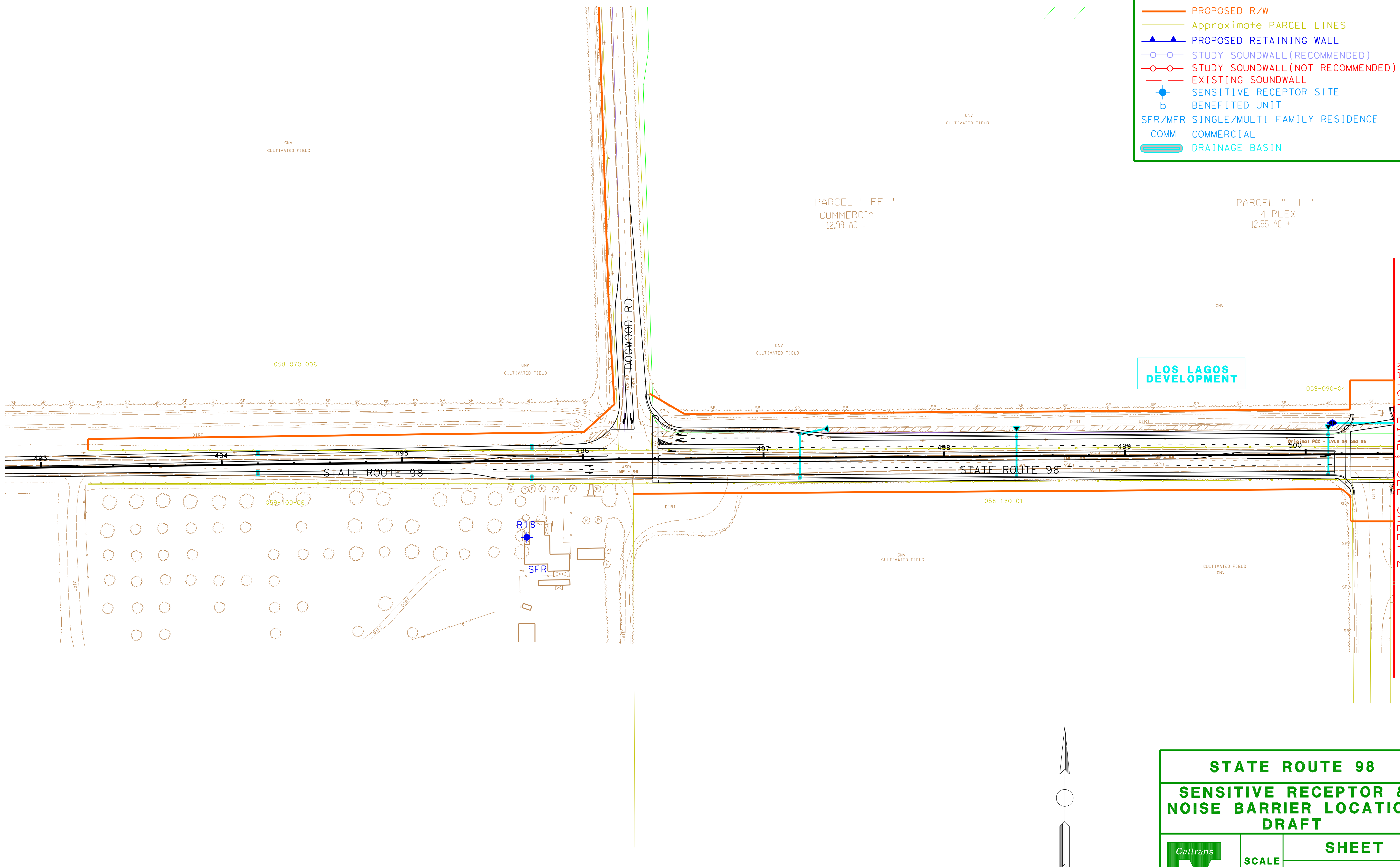
Cost Analysis

COST ANALYSIS

Sound Wall	# of Benefited Residences	WALL CHARACTERISTICS				QUANTITIES					EASEMENTS		
		Height	Length of Sound Wall	Length of Sound Wall on Retaining Wall	Length of Sound Wall Not on Retaining Wall	Excavation Depth	Excavation Width	Demolition of wood fence	Demolition of existing sound walls/property walls	Minor Concrete Sound Wall	Temporary Construction Easements	Footing Easements	Total Easements
		(m)	(m)	(m)	(m)	(m)	(m)	(m)	(cu m)	(cu m)	(sq m)	(sq m)	(sq m)
S502		2.4	17	0	17	1.22	1.9	0	0	13	22	0	22
		1.8	9	0	9	1.22	1.6	0	0	5	45	7	52
	1												
S511	4	3.7	164	0	164	1.22	2.4	0	0	177	109	33	141
S516A/B/C	8	3.0	131	0	131	1.22	2.1	0	0	118	241	15	256
S518	5	3.7	256	0	256	1.22	2.4	0	0	276	1,156	461	1,617
S520A	1	3.0	30	0	30	1.22	2.1	0	0	27	180	45	225
S520B	2	3.7	62	0	62	1.22	2.4	0	0	67	186	112	298
S526	2	3.0	40	0	40	1.22	2.1	0	0	36	32	0	32

Sound Wall	# of Benefited Residences	CONSTRUCTION COSTS				ADDITIONAL COSTS				EASEMENT COSTS		
		Sound Wall Masonry Cost	Minor Concrete Sound Wall Cost	Demolition Cost - wood fence	Demolition Cost - sound wall/property wall	Clearing & Grubbing	Landscaping Cost	Traffic Control Cost	SWPPP Cost	Construction Easements	Footing Easements	Total Easements
		($275/sq m)	($1360/cu m)	($20/m)	($40/cu m)	(8% of Wall Cost)	(10% of Wall Cost)	(5% of Wall Cost)	(5% of Wall Cost)	($45/sq m)	($110/sq m)	
S502		$14,025	$18,034	$0	$0	$2,565	$3,206	$1,603	$1,603	$1,008	$0	$1,008
		$5,940	$7,344	$0	$0	$1,063	$1,328	$664	$664	$2,030	$787	$2,817
	1											
S511	4	$193,930	$240,883	$0	$0	$34,785	$43,481	$21,741	$21,741	$4,887	$3,586	$8,473
S516A/B/C	8	$129,690	$160,344	$0	$0	$23,203	$29,003	$14,502	$14,502	$10,859	$1,652	$12,511
S518	5	$302,720	$376,013	$0	$0	$54,299	$67,873	$33,937	$33,937	$52,011	$50,688	$102,699
S520A	1	$29,700	$36,720	$0	$0	$5,314	$6,642	$3,321	$3,321	$8,120	$4,950	$13,070
S520B	2	$73,315	$91,066	$0	$0	$13,150	$16,438	$8,219	$8,219	$8,370	$12,276	$20,646
S526	2	$39,600	$48,960	$0	$0	$7,085	$8,856	$4,428	$4,428	$1,453	$0	$1,453

Sound Wall	# of Benefited Residences	TOTAL COSTS			COST PER BENEFITTED RESIDENCE			COST ALLOWANCE		REASONABLENESS		
		Estimated Total Cost (w/o Easements)	Estimated Total Cost (w/ Construction Easement Only)	Estimated Total Cost w/ Easements	Estimated Cost/Benefited Residence (w/o Easements)	Estimated Cost/Benefited Residence (w/ Construction Easement Only)	Estimated Cost Per Benefitted Residence w/ Easements	Reasonable Allowance Per Residence	Reasonable Total Allowance	Reasonable w/o Easements	Reasonable w/ Construction Easements Only	Reasonable w/ all easements
S502		$41,035	$42,043	$42,043								
		$17,004	$19,034	$19,820								
	1	**$58,039**	**$61,077**	**$61,863**	**$58,039**	**$61,077**	**$61,863**	**$48,000**	**$48,000**	**NO**	**NO**	**NO**
S511	4	**$556,561**	**$561,448**	**$565,034**	**$139,140**	**$140,362**	**$141,258**	**$38,000**	**$152,000**	**NO**	**NO**	**NO**
S516A/B/C	8	**$371,244**	**$382,102**	**$383,754**	**$46,405**	**$47,763**	**$47,969**	**$38,000**	**$304,000**	**NO**	**NO**	**NO**
S518	5	**$868,778**	**$920,789**	**$971,477**	**$173,756**	**$184,158**	**$194,295**	**$40,000**	**$200,000**	**NO**	**NO**	**NO**
S520A	1	**$85,018**	**$93,138**	**$98,088**	**$85,018**	**$93,138**	**$98,088**	**$50,000**	**$50,000**	**NO**	**NO**	**NO**
S520B	2	**$210,407**	**$218,777**	**$231,053**	**$105,204**	**$109,389**	**$115,527**	**$50,000**	**$100,000**	**NO**	**NO**	**NO**
S526	2	**$113,357**	**$114,810**	**$114,810**	**$56,678**	**$57,405**	**$57,405**	**$50,000**	**$100,000**	**NO**	**NO**	**NO**



LEGEND

- EXIST R/W
- PROPOSED R/W
- Approximate PARCEL LINES
- PROPOSED RETAINING WALL
- STUDY SOUNDWALL (RECOMMENDED)
- STUDY SOUNDWALL (NOT RECOMMENDED)
- EXISTING SOUNDWALL
- SENSITIVE RECEPTOR SITE
- b BENEFITED UNIT
- SFR/MFR SINGLE/MULTI FAMILY RESIDENCE
- COMM COMMERCIAL
- DRAINAGE BASIN

STATE ROUTE 98

SENSITIVE RECEPTOR & NOISE BARRIER LOCATION DRAFT

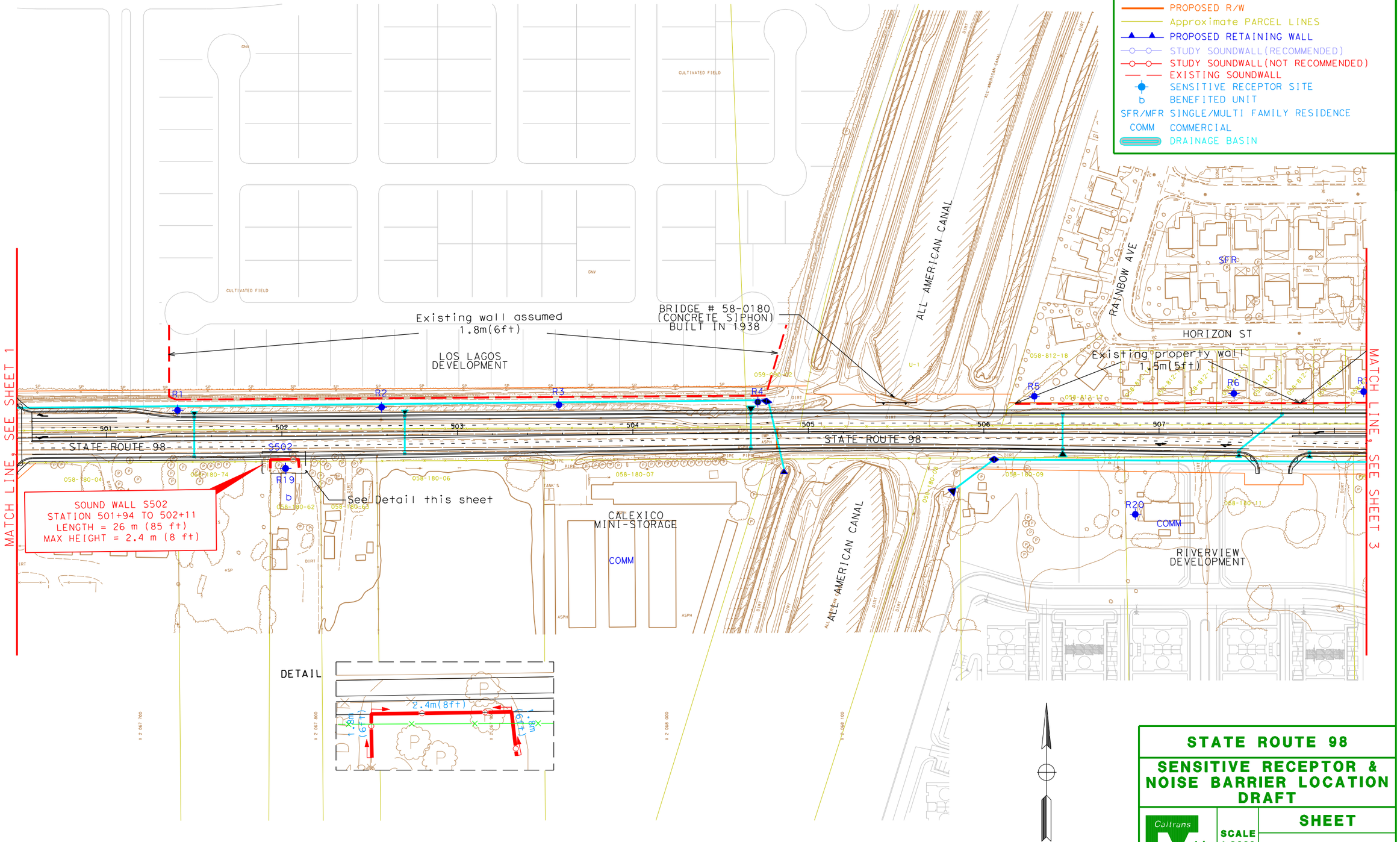
Caltrans Metric

SCALE 1:2000

SHEET 1

LEGEND

- EXIST R/W
- PROPOSED R/W
- Approximate PARCEL LINES
- PROPOSED RETAINING WALL
- STUDY SOUNDWALL(RECOMMENDED)
- STUDY SOUNDWALL(NOT RECOMMENDED)
- EXISTING SOUNDWALL
- SENSITIVE RECEPTOR SITE
- b BENEFITED UNIT
- SFR/MFR SINGLE/MULTI FAMILY RESIDENCE
- COMM COMMERCIAL
- DRAINAGE BASIN



STATE ROUTE 98

SENSITIVE RECEPTOR & NOISE BARRIER LOCATION DRAFT

Caltrans Metric

SCALE 1:2000

SHEET 2

LEGEND

- EXIST R/W
- PROPOSED R/W
- Approximate PARCEL LINES
- PROPOSED RETAINING WALL
- STUDY SOUNDWALL(RECOMMENDED)
- STUDY SOUNDWALL(NOT RECOMMENDED)
- EXISTING SOUNDWALL
- SENSITIVE RECEPTOR SITE
- b BENEFITED UNIT
- SFR/MFR SINGLE/MULTI FAMILY RESIDENCE
- COMM COMMERCIAL
- DRAINAGE BASIN

SKYLINE ST
DESERT VIEW ST
HORIZON ST
DAVID NAVARRO AVE
DE LAS FLORES
WILLIAM MORENO JR. HIGH SCHOOL
BLANCHE CHARLES ELEMENTARY
LINDA PLAZA
STATE ROUTE 98
LUNA CT
H FRITSCH ST
MERCADO ST
KLOKE RD
W MORENO ST.
E. MORENO ST.
CHEVRON
JACK IN THE BOX
ARCO
CASA IMPERIAL APARTMENTS
REMINGTON CONDOS

SOUND WALL S511
STATION 510+32 TO 511+66
LENGTH = 164 m (538 ft)
MAX HEIGHT = 3.7 m (12 ft)

SOUND WALL S516A
STATION 514+80 TO 515+10
LENGTH = 37 m (121 ft)
MAX HEIGHT = 3.0 m (10 ft)

SOUND WALL S516B
STATION 515+30 TO 515+83
LENGTH = 53 m (174 ft)
MAX HEIGHT = 3.0 m (10 ft)

Existing property wall 1.5m(5ft)
Existing property wall 1.8m(6ft)
Existing property wall 1.8m(6ft)

R8/LT1/CAL, R9, R10, R11 b (4 frontage units), R11A, R21, R22, R23, R24, CT-A, R25, R26/ST1/CAL, R27, CT-B, CT-C, R28, R29, R30

3.7m(12ft) 3.7m(12ft) 3.0m(10ft) 3.0m(10ft)

SEE SHEET 2
MATCH LINE, SEE SHEET 4

STATE ROUTE 98

SENSITIVE RECEPTOR & NOISE BARRIER LOCATION DRAFT

Caltrans Metric

SCALE 1:2000

SHEET 3

LEGEND

- EXIST R/W
- PROPOSED R/W
- Approximate PARCEL LINES
- PROPOSED RETAINING WALL
- STUDY SOUNDWALL(RECOMMENDED)
- STUDY SOUNDWALL(NOT RECOMMENDED)
- EXISTING SOUNDWALL
- SENSITIVE RECEPTOR SITE
- b BENEFITED UNIT
- SFR/MFR SINGLE/MULTI FAMILY RESIDENCE
- COMM COMMERCIAL
- DRAINAGE BASIN

DE LAS FLORES
BOWER
EADY AVE
LACY AVE
W PALMS
MFR
SFR
R13
R14
R15
R16
R17
CASA SONOMA APARTMENTS
VV-WILLIAMS AVE
SANTO TOMAS SWAP MEET
UNION PACIFIC RAILROAD
058-601-21
ST5/R12A/CAL
R12
CT-G
W CANAL ST
MATCH LINE, SEE SHEET 3
516
517
518
519
520
521
522
523
STATE ROUTE 98
3.0m(10ft)
S516C
CT-D
b R31
(2 units)
REMINGTON CONDOS
R32/ST2
LADY AVE
3.7m(12ft)
R33
S518
R35/ST3
3.7m(12ft)
R34
b
(5 frontage units)
CALEXICO FAMILY RESOURCE CENTER
3.0m(10ft)
S520A
R36
b
BIRCH ST
3.7m(12ft)
S520B
b
R37
b
R38A/ST3A/CAL
R38/LT2
AUTO MART
Existing property wall
City R/W 1.8m(6ft)
1.8m(6ft)
PROPOSED GAS STATION
058-241-05
058-241-04
058-241-01
LEE AVE
SFR
LACY AVE
CESAR CHAVEZ BLVD
RENT-
MAINS ELEMENTARY SCHOOL
VINCENT MEMORIAL HIGH SCHOOL

SOUND WALL S516C
STATION 516+03 TO 516+44
LENGTH = 41 m (135 ft)
MAX HEIGHT = 3.0 m (10 ft)

SOUND WALL S518
STATION 517+28 TO 519+17
LENGTH = 256 m (840 ft)
MAX HEIGHT = 3.7 m (12 ft)

SOUND WALL S520A
STATION 519+71 TO 519+47
LENGTH = 30 m (98 ft)
MAX HEIGHT = 3.7 m (12 ft)

SOUND WALL S520B
STATION 519+71 TO 520+02
LENGTH = 62 m (203 ft)
MAX HEIGHT = 3.7 m (12 ft)

STATE ROUTE 98

SENSITIVE RECEPTOR & NOISE BARRIER LOCATION DRAFT

Caltrans Metric

SCALE 1:2000

SHEET 4

LEGEND

- EXIST R/W
- PROPOSED R/W
- Approximate PARCEL LINES
- PROPOSED RETAINING WALL
- STUDY SOUNDWALL(RECOMMENDED)
- STUDY SOUNDWALL(NOT RECOMMENDED)
- EXISTING SOUNDWALL
- SENSITIVE RECEPTOR SITE
- b BENEFITED UNIT
- SFR/MFR SINGLE/MULTI FAMILY RESIDENCE
- COMM COMMERCIAL
- DRAINAGE BASIN

FLEA MARKET
OLLIE AVE
ESTRADA AVENUE
UNITED STATES POST OFFICE
058-010-46
058-010-32
CT-H
FOOD FOR LESS
SHOPPING CENTER
COMM
CONC
ASPH
058-120-40
CARL'S JR.
058-120-39
058-120-38
058-120-37
058-120-36
IMPERIAL AVENUE WEST
CALEXICO CHAMBER OF COMMERCE
U-106
CT-I
SR-111 (IMPERIAL AVE)
CANAL ST
058-261-005
PALM DR
PAULIN AVE
ROCKWOOD AVE
R43
R44
SFR
058-261-15
MATCH LINE, SEE SHEET 2
524
525
526
527
528
529
STATE ROUTE 98
3.0m(10ft)
S526
D
R40
b
CT-F
CT-E
058-252-01
058-252-02
A-CAR
R39
SFR
GEORGE AVE
OLLIE AVE
058-254-02
R41/ST4
MFR
058-254-03
058-256-10
058-256-09
058-256-02
ALL STATE
HAROLD AVE
EMERSON AVE
058-261-05
PAYLESS
058-261-02
FILL CO.
COMM
BIG JOHN
MILENIO AUTO SALES
BIRCH MANOR APARTMENTS
R42
MFR
058-264-01
SOUND WALL S526
STATION 524+82 TO 525+22
LENGTH = 40 m (131 ft)
MAX HEIGHT = 3.0 m (10 ft)
ROOSEVELT STREET

STATE ROUTE 98

SENSITIVE RECEPTOR & NOISE BARRIER LOCATION DRAFT

Caltrans Metric

SCALE 1:2000

SHEET 5

DOKKEN ENGINEERING
Transportation Solutions from Concept to Construction

Design Feasibility Study
Technical Memorandum

Date:	Consultant Firm (for structures):		Phone No:
6/26/06	Dokken Engineering		(916) 858-0642
Designed by:			Phone No:
John S. Bishop, SE			(916) 858-0642
EA:	County:	Rte:	KP(PM)
11-080200	Imperial	SR-98	48.52/52.23 (30.15/32.45)
Project Description:			
Widening of SR-98 through Calexico will require additional fill over the All American Canal and culvert.			

Background:

Engineering studies are being developed for the widening of State Route 98 through Calexico. The All American canal crosses State Route 98 through a culvert titled "Calexico-Seeley Highway Siphon" (Br. No. 58-0180). This study determines what if any limitations on loading exist for this culvert in the as-built condition.

Analysis:

The culvert was examined for varying depth of soil to be placed over the lid at depths of zero to ten feet in two foot increments. For each level of soil depth over the culvert, the culvert was analyzed for the appropriate dead, earth and live loads using the 2004 LRFD method.

Findings:

The Culvert is adequate to handle soil depths up to 4ft with full live loading. At soil depth six feet and greater the culvert deck flexure demand in the negative moment region was greater than capacity. Similarly the loads on the culvert walls exceeded the capacity based on the moment interaction diagram for soil depth six feet and greater. It should be noted that a site visit was not conducted for this report. It is recommended that a site investigation be performed before design begins to identify any as existing conditions that may materially alter the results of this analysis.

If you have any questions about the information contained in this study or wish to discuss this study in greater detail, please contact us at (916) 858-0642.

Respectfully submitted,

John S. Bishop, SE
Senior Engineer

2365 Iron Point Road, Suite 200, Folsom, CA 95630 ▪ Tele: 916.858.0642 ▪ Fax: 916.858.0643 ▪ www.dokkenengineering.com

SR-98 West Easements Spreadsheet

Construction			
APN	OWNER	AREA (sq m)	AREA (acres)
059-100-06	VELAZQUEZ VICENTE & ESTHER & MEDEROS A	392.704	0.097
058-180-01	B&D VENTURES LLC ETAL TC	23.589	0.006
058-180-04	RAMIREZ DANIEL C MARIA DE LOURDES	254.860	0.063
058-180-74		158.375	0.039
058-180-62	JAIME GARCIA JOSE & MATILDE	86.475	0.021
058-180-63	TARAZON JOSE RODRIGO	96.210	0.024
058-180-06	FERBER PROPERTIES LP	286.987	0.071
058-180-07	FERBER PROPERTIES LP	299.155	0.074
U-1		225.754	0.056
058-180-08	DAT U JOE REALTY INC	140.246	0.035
058-713-05	VALDEZ MARCELINO & IRENE	125.058	0.031
058-714-01	VALDEZ PORFIRIO & VIRGINIA	68.340	0.017
058-812-1	BOUOMAR OMAR	70.510	0.017
058-715-05	MARTINEZ JOSE B & SOCORRO J	156.369	0.039
058-811-10	TALAMANTES VICTOR M & JACQUELINE	213.853	0.053
058-716-01	PINEDA JOSE ERNESTO & BLANCA M	148.263	0.037
058-716-10	TORRES ALBERTO & CORPUS ARACELY	119.100	0.029
058-717-01	ALEJO HONORATO & RAMONA L	115.320	0.028
058-717-10	CALEXICO KOREAN CHURCH	60.745	0.015
058-717-09	BP WEST COAST PRODUCTS LLC	113.346	0.028
058-180-71	NO PARCEL OWNER INFORMATION	133.123	0.033
058-180-43?	NO PARCEL OWNER INFORMATION	35.330	0.009
058-180-043	CALEXICO INVESTORS I	84.054	0.021
058-180-075	DAT U JOE REALTY INC	7.574	0.002
058-601-21	NO PARCEL OWNER INFORMATION	4.941	0.001
058-211-01	CITY OF CALEXICO	43.458	0.011
058-010-20	C A MARTINEZ FAMILY LIMITED PARTNERSHIP	70.347	0.017
058-241-03	DIOCESE OF SAN DIEGO EDUC & WELFARE CORP	128.429	0.032
058-251-01	HERMOSILLO GUILLERMO G & ESPIE	199.464	0.049
058-010-67	NO PARCEL OWNER INFORMATION	14.830	0.004
058-010-46	ESTRADA ALICE & RAUL	42.044	0.010
058-252-01	GULUARTE JOSE JUAN	127.787	0.032
058-010-32	UNITED STATES POSTAL SERVICE	159.216	0.039
058-252-02	SALGADO ELIZABETH & HUBBARD ELIZBETH	39.957	0.010
058-252-03	TORRES FERNANDO JR	84.656	0.021
058-254-02	COTA LUIS A & LETICIA A	9.501	0.002
058-254-01	CITY OF CALEXICO	40.845	0.010
058-254-03	CITY OF CALEXICO HOUSING AUTHORITIES	228.255	0.056
058-256-10	CARVAJAL ARMANDO MARTELL	149.546	0.037
058-256-09	VELASQUEZ RICARDO & JOEL	20.917	0.005
058-256-02	ARELLANO SECUNDINO JR & MARIA ELENA	132.299	0.033
058-120-36	AMPS II LP & AMPS III LP	44.263	0.011
058-261-05	SAMBHI RAJINDER P & RAJ	54.354	0.013
058-261-02	STANLEY DOUGLAS S & CARYL L	152.685	0.038
U-10a		13.289	0.003
058-261-005	SAMBHI RAJINDER P & RAJ	15.516	0.004
058-120-15	NO PARCEL OWNER INFORMATION	87.594	0.022
058-264-15	LAMADRID JOE & ANA MARIA	26.162	0.006
058-264-01	PALETZ LAWRENCE RAYMOND MD & ROBYN	70.324	0.017
SUM:		5,376.018	1.328

Dedication from Developer			
APN	OWNER	AREA (sq m)	AREA (acres)
058-180-09	DAT U JOE REALTY INC	661.305	0.163
058-180-11	DAT U JOE REALTY INC	1,433.547	0.354
058-180-10	DAT U JOE REALTY INC	336.981	0.083
058-180-12	LPROP OSTRICH LLC	43.341	0.011
U-13		284.538	0.070
058-180-64	DAT U JOE REALTY INC	288.962	0.071
SUM:		3,048.675	0.753

10/31/2008

Permanent			
APN	OWNER	AREA (sq m)	AREA (acres)
~~059-070-01~~ 058-070-008	NO PARCEL OWNER INFORMATION	3,019.894	0.746
058-180-01	B&D VENTURES LLC ETAL TC	2,211.773	0.547
058-180-04	RAMIREZ DANIEL C MARIA DE LOURDES	107.011	0.026
059-090-02	NEC DOGWOOD & HIGHWAY LLC	775.806	0.192
U-1		2,007.628	0.496
058-812-18	CALLES RODOLFO V MARIA DEL CARMEN	7.533	0.002
058-812-17	CANCHOLA GERARDO J & ANA I	434.283	0.107
058-180-16	NO PARCEL OWNER INFORMATION	120.621	0.030
058-812-15	JIMENEZ JAVIER A & MARIA O	118.284	0.029
058-812-14	HERNANDEZ CARLOS E & FRANCISCA	115.434	0.029
058-812-13	GIL ELOISA	117.351	0.029
058-812-12	VARGAS RICARDO & TERESA	114.991	0.028
058-812-11	DIAZ NORMA C	111.449	0.028
058-812-10	LOPEZ JR JUAN M	110.013	0.027
058-812-9	CAMACHO JOSE LUIS & IRMA	108.176	0.027
058-812-8	ESCOBEDO ALEXANDER & OLGA	107.215	0.026
058-812-7	VIRAMONTES JOSE & GONZALEZ SLYVIA & RAFAEL ENRIQUE	106.738	0.026
058-812-6	VERDUGO EVARISTO T & MARIA	101.269	0.025
058-812-5	TUALLA EMILIA L	102.922	0.025
058-812-4	ANDERSON LUPITA ANN	99.002	0.024
058-812-3	FRANCO SOFIA ANA	100.538	0.025
058-812-2	FREDERICK ANABEL MALDONADO	95.113	0.024
058-812-1	BOUOMAR OMAR	130.735	0.032
058-715-05	MARTINEZ JOSE B & SOCORRO J	29.890	0.007
058-811-10	TALAMANTES VICTOR M & JACQUELINE	32.292	0.008
058-811-02	CALEXICO UNIFIED SCHOOL DISTRICT	2,460.127	0.608
058-811-01	YOURMAN A M JR & M M & C A INT EACH	1,506.011	0.372
058-010-25	NO PARCEL OWNER INFORMATION	144.647	0.036
058-010-20	C A MARTINEZ FAMILY LIMITED PARTNERSHIP	581.077	0.144
058-010-19	C A MARTINEZ FAMILY LIMITED PARTNERSHIP	681.875	0.168
058-241-04	RAMIREZ DANIEL C MARIA DE L	105.526	0.026
058-241-05	CALMEX INVESTMENTS INC	557.539	0.138
058-244-01	ARELLANO L N & M H & ZUNIGA E & C C	31.792	0.008
058-010-67	NO PARCEL OWNER INFORMATION	913.495	0.226
058-251-01	HERMOSILLO GUILLERMO G & ESPIE	317.757	0.079
058-010-46	ESTRADA ALICE & RAUL	372.272	0.092
058-252-01	GULUARTE JOSE JUAN	174.596	0.043
058-010-32	UNITED STATES POSTAL SERVICE	344.673	0.085
058-252-02	SALGADO ELIZABETH & HUBBARD ELIZBETH	46.611	0.012
058-252-03	TORRES FERNANDO JR	83.919	0.021
058-254-01	CITY OF CALEXICO	49.741	0.012
058-254-03	CITY OF CALEXICO HOUSING AUTHORITIES	250.984	0.062
058-120-39	THE BIRCH CORPORATION	111.407	0.028
058-120-38	THE BIRCH CORPORATION	273.596	0.068
058-256-10	CARVAJAL ARMANDO MARTELL	96.024	0.024
058-120-37	AMPS II LP & AMPS III LP	204.107	0.050
058-256-02	ARELLANO SECUNDINO JR & MARIA ELENA	88.433	0.022
058-120-36	AMPS II LP & AMPS III LP	68.997	0.017
U-10a		862.998	0.213
U-10b		99.346	0.025
058-264-01	PALETZ LAWRENCE RAYMOND MD & ROBYN!	8.079	0.002
SUM:		20,821.589	5.145

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

PHONE
(619) 280-4321
TOLL FREE
(877) 215-4321
FAX
(619) 280-4717

P.O. Box 600627
San Diego, CA 92160-0627
6280 Riverdale Street
San Diego, CA 92120
www.scst.com

REPORT OF ENVIRONMENTAL SITE ASSESSMENT FOR AERIALLY DEPOSITED LEAD STATE ROUTE 98 CALEXICO IMPERIAL COUNTY, CALIFORNIA

PREPARED FOR

MR. CHRIS JOHNSON
DOKKEN ENGINEERING
9665 CHESAPEAKE DRIVE, SUITE 435
SAN DIEGO, CALIFORNIA 92123

PREPARED BY

SOUTHERN CALIFORNIA SOIL & TESTING, INC.
6280 RIVERDALE STREET
SAN DIEGO, CALIFORNIA 92120

Providing Professional Engineering Services Since 1959

SOUTHERN CALIFORNIA SOIL & TESTING, INC

PHONE
(619) 280-4321
TOLL FREE
(877) 215-4321
FAX
(619) 280-4717

P.O. Box 600627
San Diego, CA 92160-0627
6280 Riverdale Street
San Diego, CA 92120
www.scst.com

March 23, 2005

SCS&T No. 0511121p
Report No. 1

Mr. Chris Johnson
Dokken Engineering
9665 Chesapeake Drive, Suite 435
San Diego, California 92123

Subject: REPORT OF ENVIRONMENTAL SITE ASSESSMENT
FOR AERIALLY DEPOSITED LEAD
STATE ROUTE 98
CALEXICO, CALIFORNIA

Dear Mr. Johnson:

Southern California Soil & Testing, Inc. (SCST) is pleased to present this report of the environmental site assessment for aerially deposited lead recently conducted at the referenced site. This report has been prepared pursuant to your request and in general accordance with conversation with personnel of the California State Department of Transportation (Caltrans).

If you have any questions regarding this report, please call us at (619) 280-4321.

Respectfully,
SOUTHERN CALIFORNIA SOIL & TESTING, INC.

Eddie Liang
Staff Engineer

Garrett B. Fountain, RCE 63885
Project Engineer

James J. Stone, RGE 000808
Principal Geotechnical Engineer

EL:GBF:JJS:kv

(6) Addressee

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ATTACHMENTS

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APPENDIX I

Laboratory Report

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

PHONE
(619) 280-4321
TOLL FREE
(877) 215-4321
FAX
(619) 280-4717

P.O. Box 600627
San Diego, CA 92160-0627
6280 Riverdale Street
San Diego, CA 92120
www.scst.com

1. PROJECT DESCRIPTION AND OBJECTIVES

Southern California Soil and Testing, Inc. (SCS&T) performed an assessment of aerially deposited lead at State Route 98 in Calexico in Imperial County California, Figure 1. The objectives of the investigation were to:

- Assess whether the near surface soil at the site has been impacted with lead due to the historical combustion of leaded fuels from freeway traffic; and
- Evaluate, based on the investigation results, the method of reuse of soil excavated during planned construction activities.

It is our understanding that the east- and west-travel lanes on SR-98 (Birch Street) from Dogwood Street crossing to SR-111 (Imperial Avenue) will be widened and the medians will be modified.

2. SCOPE OF WORK

2.1 SOIL SAMPLING

Samples were collected between August 15, 2005 and February 21, 2006, in accordance with U.S. Environmental Protection Agency (EPA) publication SW-846. Sample location and depth were selected using a random number generator within the project boundary. The approximate boring locations are shown on Figures 2 and 3. Soil samples were collected from the hand auger bucket, placed in laboratory-supplied glass jars, labeled, and stored in a secure container pending delivery to the laboratory. Chain-of-custody procedures were used for sample tracking. The hand auger was cleaned prior to drilling and between borings using a soap and water wash followed by a tap water rinse and a deionized water rinse. After completion, the borings were backfilled with cuttings.

2.2 SOIL SAMPLE ANALYSIS

Soil samples were submitted to a state-accredited laboratory and analyzed for total lead in general accordance with EPA Method 6010B. Soil samples with reported lead concentrations greater than or equal to 50 milligrams per kilogram (mg/kg) were to be analyzed for soluble lead in general accordance with WET/EPA Method 7420 using citric acid as the extractant. This second analysis was not done as none of the soil samples were reported to have lead concentrations greater than 50mg/kg.

3. FINDINGS

3.1 REGIONAL GEOLOGY

The SR-98 between the Dogwood Street and SR-111 (Imperial Avenue) is located in the Colorado Desert Geomorphic Province along the southern edge of the Imperial Valley, and is underlain by Quarternary-age lake deposits (Q_l).

The lake deposits are comprised of sandy clay and sandy silt. These deposits were found to be soft to medium stiff and extend to unknown depths below the existing ground surface. The lake deposits were deposited on a thick sequence marine and non-marine sedimentary deposits.

3.2 SOIL SAMPLE RESULTS

Reported total lead concentrations ranged from 6.13 mg/kg to 33.2 mg/kg. No soil samples were reported to have total lead concentrations greater than 50 mg/kg. Analytical results for total lead are presented on Figure 4 and Figure 5. Copies of laboratory reports are included in Appendix I.

3.3 DATA VALIDATION

Prior to submitting the soil samples to the laboratory, chain-of-custody documentation was reviewed for accuracy and completeness. The laboratory reports were reviewed for accuracy and consistency with the chain-of-custody documentation. Quality assurance/quality control (QA/QC) data were reviewed and were generally found to be within tolerance control limits. Based on this validation process, the data quality appears adequate for the purposes of this report.

4. STATISTICAL DATA EVALUATION

The analytical laboratory results from the investigation were evaluated statistically. The statistical results were then used to evaluate methods for on-site reuse or off-site disposal of the affected soil. The statistical methods were in general accordance with *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, U.S. Environmental Protection Agency (EPA) publication SW-846. Statistical methods were applied to the reported lead data set collected at the site to evaluate the following:

- Whether the total lead data are normally or log distributed (by comparison of the mean and variance);
- The upper one-sided confidence limits (UCLs) on the true means of the total lead concentrations; and
- On-site re-use options based on UCLs for both total and soluble lead concentrations.

Comparison of the mean and variance based on evaluation of all total lead data for the site indicated that the variance was far greater than the mean. Therefore, the data appeared to be log distributed. For this reason, UCLs were calculated for log-normally distributions.

The upper one-sided 80% and 95% confidence limits of the true mean are defined as the values that, when calculated repeatedly for randomly drawn data sets, equal or exceed the true mean 80% and 95% of the time, respectively. Statistical confidence limits are used to address uncertainties of a distribution mean arising from limited data available for evaluation. The UCLs of the true mean concentration are used as the mean concentrations because it is not possible to know the true mean of the original data set. The UCLs, therefore, will account for possible uncertainties due to limited sample data. It is our understanding that, according to Caltrans, an 80% UCL is acceptable if the soil is to be re-used on-site.

The true UCL, 13.1 mg/kg, is below 1000 mg/kg, the lower limit cutoff concentration for consideration as a possible hazardous waste.

Copies of the statistical analysis worksheets generated are shown on Figures 4 and 5.

5. CONCLUSIONS

Laboratory analytical results and statistical analysis of reported lead concentrations indicate that, based on the 80% log-normal UCLs for total and soluble lead concentrations, the soil excavated at the site would not be considered a hazardous waste with respect to lead according to Title 22 of the California Code of Regulations (CCR). Therefore, no restrictions are required on the use of excavated soils for new fills with respect to lead. The suitability of the near-surface soils for use as embankment fill and structure backfill based on geotechnical considerations are addressed in the geotechnical investigation report.

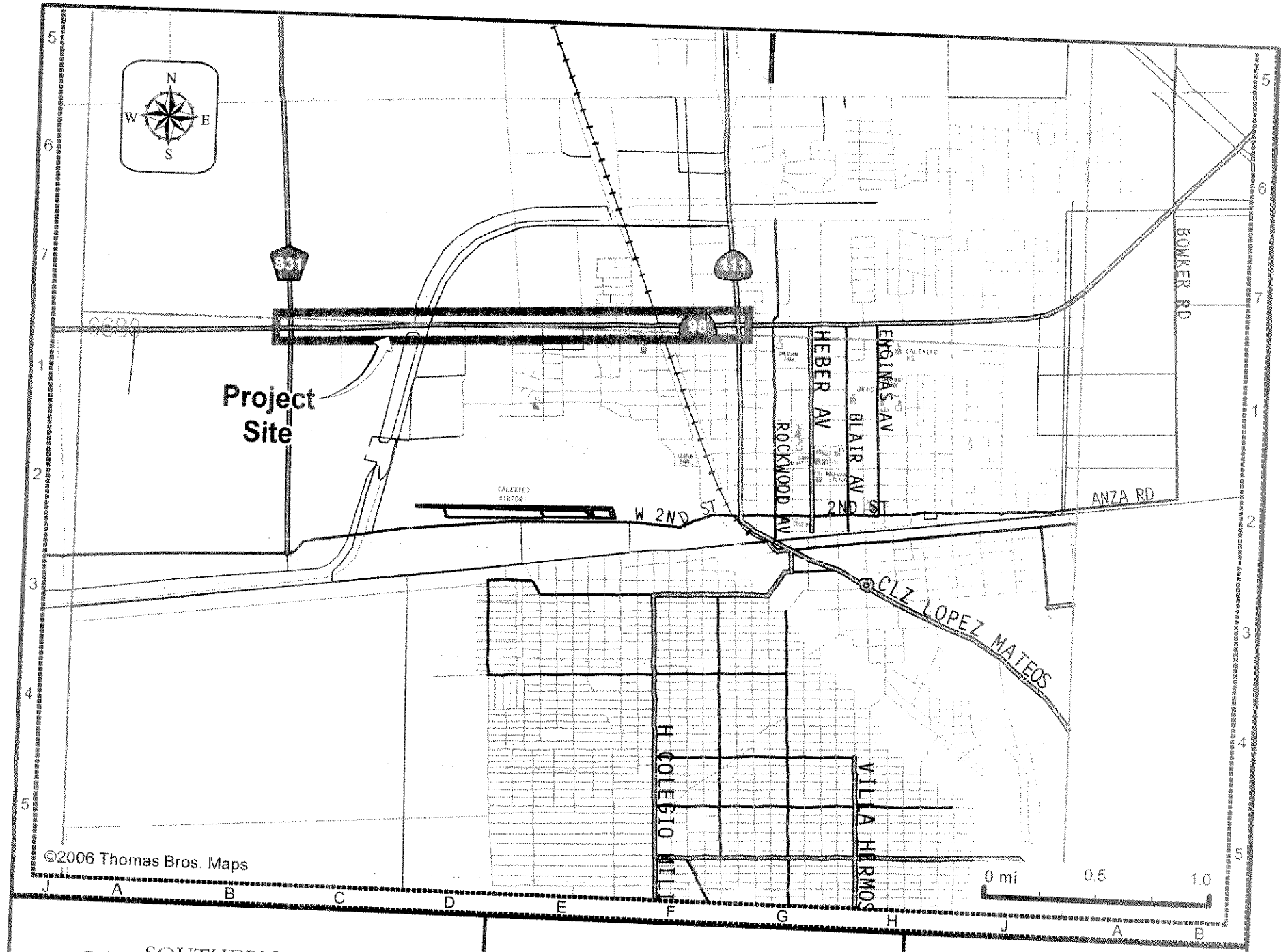
6. REPORT USAGE AND FUTURE SITE CONDITIONS

This report is intended for the sole usage of Dokken Engineering or their agents. Use of this report is subject to the provisions of the fully executed Contract between Dokken Engineering and Southern California Soil & Testing, Inc. Any third party usage of this report is subject to the provisions of the Contract and any unauthorized misuse of or reliance upon the report shall be without risk or liability to Southern California Soil & Testing, Inc.

The conclusions in this report are judged to be relevant at the time the work described in this report was conducted. Future conditions may differ and this report should not be relied upon to represent future site conditions unless a qualified consultant familiar with the practice of Phase II

environmental assessments and aerially deposited lead investigations in Southern California is consulted to assess the necessity of updating this report.

Although this assessment was undertaken to evaluate the soil conditions relative to aerially deposited lead, other potential sources of adverse environmental conditions may exist that were not detected because we relied upon inadequate or inaccurate information provided to us by third parties, such as public agencies and other outside sources, the scope of this assessment, and, undetected, unknown or unreported environmental releases are present that could not be detected within the scope of this study.



SOUTHERN CALIFORNIA SOIL & TESTING, INC.

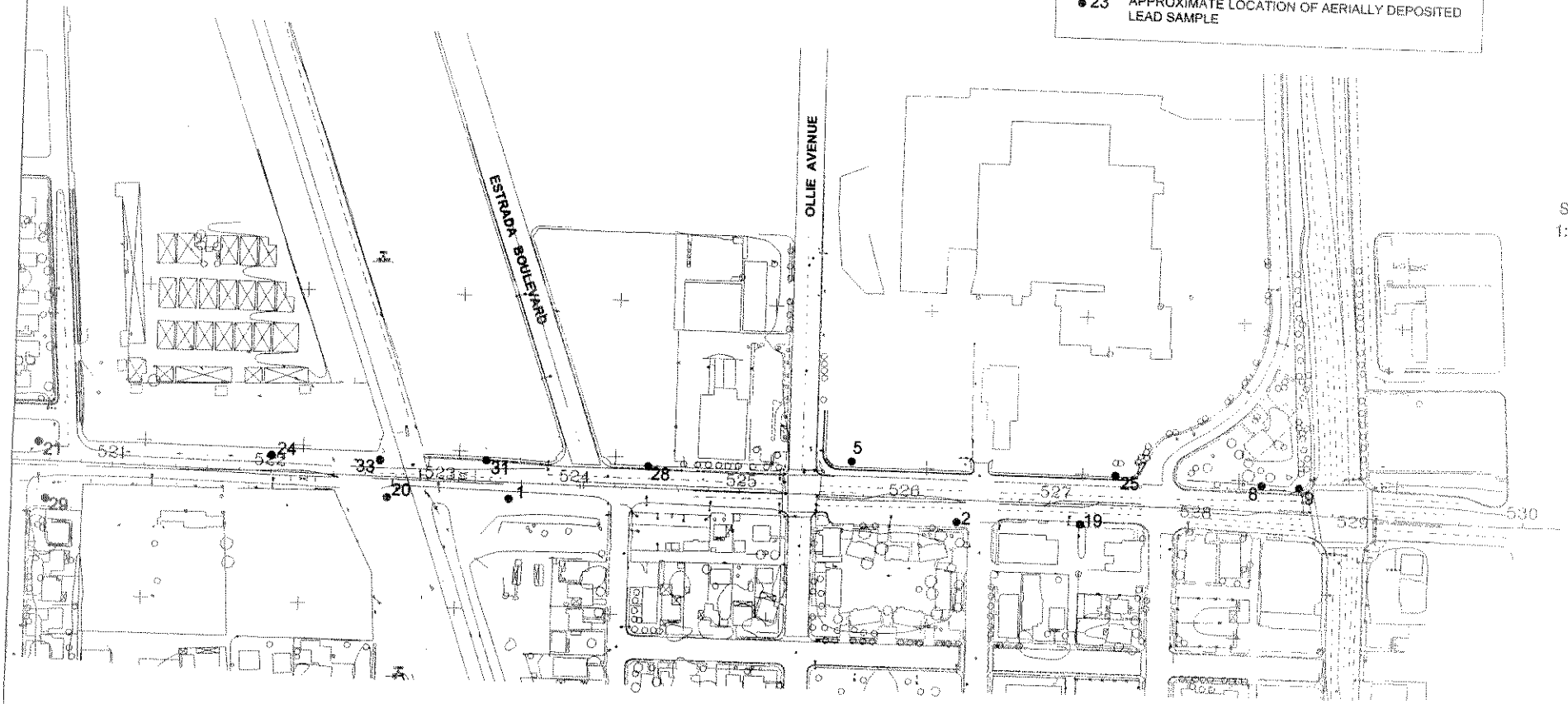
SITE LOCATION MAP
Calexico - SR98
Calexico, California

Job No. 0511121p-1

Figure: 1

AERIALLY DEPOSITED LEAD

● 23 APPROXIMATE LOCATION OF AERIALLY DEPOSITED LEAD SAMPLE



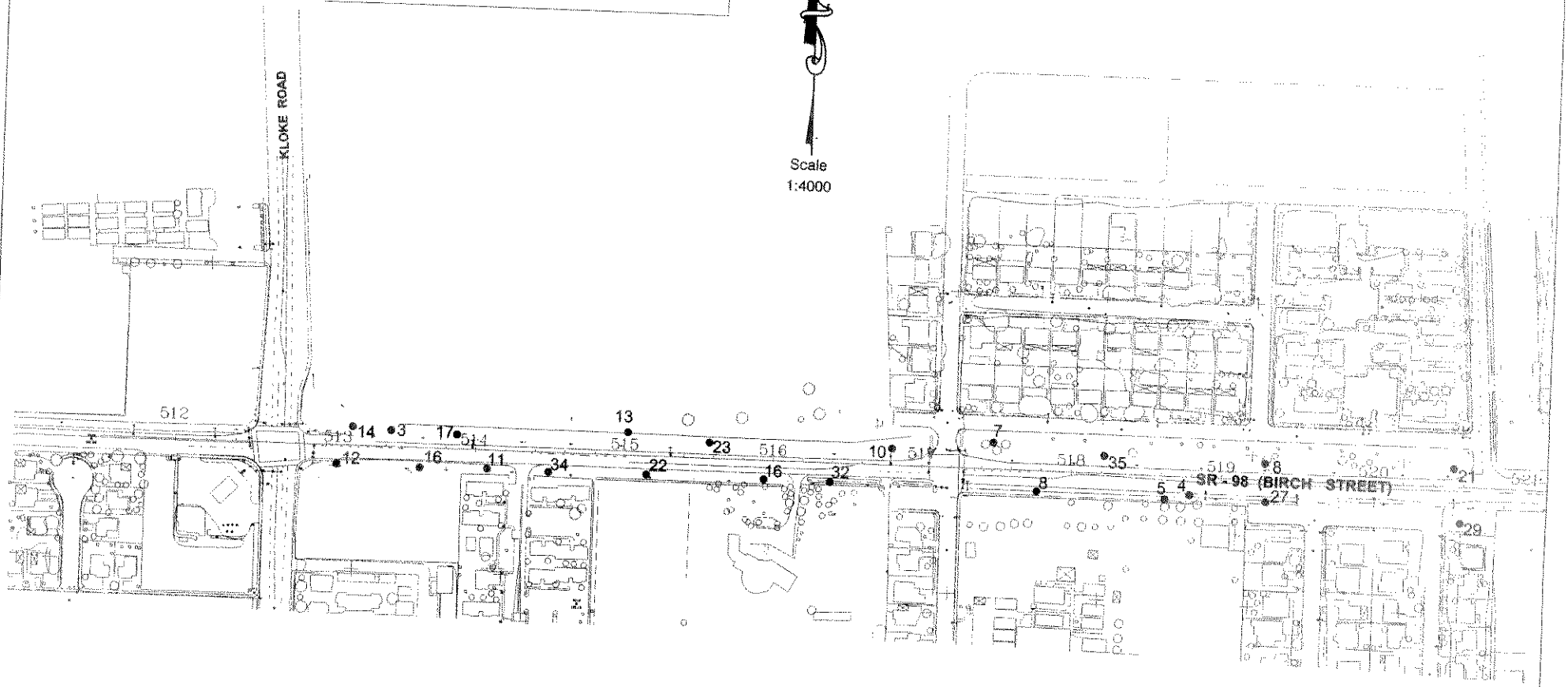
Scale 1:4000

SOUTHERN CALIFORNIA SOIL & TESTING, INC.		
SR-98 CALEXICO		
By: GF/DAS/DCD	Scale:	Date: 3/20/2006
JOB No.: 0511121P-1	Figure: 2	

AERIALLY DEPOSITED LEAD

● 23 APPROXIMATE LOCATION OF AERIALLY DEPOSITED LEAD SAMPLE

Scale
1:4000



SOUTHERN CALIFORNIA
SOIL & TESTING, INC.

SR-98 CALEXICO

By: GF/DAS/DCD	Scale:	Date: 3/20/2006
JOB No.: 0511121P-1	Figure: 3	

APPENDIX I

Calscience Environmental Laboratories, Inc.

August 30, 2005

Chris Bean
Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Subject: **Calscience Work Order No.:** **05-08-1511**
Client Reference: **SR98 Calexico / 0511121P**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 8/23/2005 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The original report of any subcontracted analysis is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Ranjit K. K. Clarke

Calscience Environmental
Laboratories, Inc.
Ranjit Clarke
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 08/23/05
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR98 Calexico / 0511121P

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#1	05-08-1511-1	08/17/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	19.1	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#2	05-08-1511-2	08/15/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	10.8	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#3	05-08-1511-3	08/19/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	11.5	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#4	05-08-1511-4	08/18/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	9.03	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#5	05-08-1511-5	08/18/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	6.13	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#6	05-08-1511-6	08/18/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	6.18	0.5	1		mg/kg

RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 08/23/05
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR98 Calexico / 0511121P

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#7	05-08-1511-7	08/18/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	26.3	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#8	05-08-1511-8	08/18/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	9.83	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#9	05-08-1511-9	08/18/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	10.5	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#10	05-08-1511-10	08/22/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	23.7	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#11	05-08-1511-11	08/19/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	9.91	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#12	05-08-1511-12	08/19/05	Solid	08/24/05	08/24/05	050824L07

Parameter	Result	RL	DF	Qual	Units
Lead	14.2	0.5	1		mg/kg

RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 08/23/05
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR98 Calexico / 0511121P

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#13	**05-08-1511-13**	**08/22/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L07**

Parameter	Result	RL	DF	Qual	Units
Lead	13.5	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#14	**05-08-1511-14**	**08/19/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L07**

Parameter	Result	RL	DF	Qual	Units
Lead	12.1	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#15	**05-08-1511-15**	**08/18/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L07**

Parameter	Result	RL	DF	Qual	Units
Lead	11.2	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#16	**05-08-1511-16**	**08/19/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L07**

Parameter	Result	RL	DF	Qual	Units
Lead	19.3	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#17	**05-08-1511-17**	**08/19/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L07**

Parameter	Result	RL	DF	Qual	Units
Lead	33.2	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#18	**05-08-1511-18**	**08/18/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L07**

Parameter	Result	RL	DF	Qual	Units
Lead	10.7	0.5	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 08/23/05
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR98 Calexico / 0511121P

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#19	**05-08-1511-19**	**08/17/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L07**

Parameter	Result	RL	DF	Qual	Units
Lead	15.6	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#20	**05-08-1511-20**	**08/19/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L07**

Parameter	Result	RL	DF	Qual	Units
Lead	19.7	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#21	**05-08-1511-21**	**08/18/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	16.4	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#22	**05-08-1511-22**	**08/22/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	11.0	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#23	**05-08-1511-23**	**08/22/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	9.73	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#24	**05-08-1511-24**	**08/19/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	15.4	0.5	1		mg/kg

RL - Reporting Limit . DF - Dilution Factor . Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 08/23/05
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR98 Calexico / 0511121P

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#25	**05-08-1511-25**	**08/18/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	9.86	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#26	**05-08-1511-26**	**08/22/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	9.47	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#27	**05-08-1511-27**	**08/18/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	16.9	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#28	**05-08-1511-28**	**08/17/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	9.53	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#29	**05-08-1511-29**	**08/18/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	9.51	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#30	**05-08-1511-30**	**08/18/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	12.6	0.5	1		mg/kg

RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 08/23/05
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR98 Calexico / 0511121P

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#31	**05-08-1511-31**	**08/17/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	14.5	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#32	**05-08-1511-32**	**08/22/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	8.29	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#33	**05-08-1511-33**	**08/18/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	10.3	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#34	**05-08-1511-34**	**08/22/05**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	14.8	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#35	**05-08-1511-35**	**08/18/05**	**Solid**	**08/24/05**	**08/25/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	9.76	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#36	**05-08-1511-36**	**08/17/05**	**Solid**	**08/24/05**	**08/25/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	24.7	0.5	1		mg/kg

RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 08/23/05
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR98 Calexico / 0511121P

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#37	**05-08-1511-37**	**08/18/05**	**Solid**	**08/24/05**	**08/25/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	10.9	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#38	**05-08-1511-38**	**08/17/05**	**Solid**	**08/24/05**	**08/25/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	11.2	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#39	**05-08-1511-39**	**08/17/05**	**Solid**	**08/24/05**	**08/25/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	13.3	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
#40	**05-08-1511-40**	**08/17/05**	**Solid**	**08/24/05**	**08/25/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	11.3	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**097-01-002-6,730**	**N/A**	**Solid**	**08/24/05**	**08/24/05**	**050824L07**

Parameter	Result	RL	DF	Qual	Units
Lead	ND	0.500	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**097-01-002-6,731**	**N/A**	**Solid**	**08/24/05**	**08/24/05**	**050824L08**

Parameter	Result	RL	DF	Qual	Units
Lead	ND	0.500	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 08/23/05
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project SR98 Calexico / 0511121P

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
#13	**Solid**	**ICP 3300**	**08/24/05**	**08/25/05**	**050824S07**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Lead	107	99	75-125	5	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 08/23/05
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project SR98 Calexico / 0511121P

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
#33	Solid	ICP 3300	08/24/05	08/25/05	050824S08

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Lead	97	101	75-125	3	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: N/A
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR98 Calexico / 0511121P

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
097-01-002-6,730	**Solid**	**ICP 3300**	**08/24/05**	**050824-I-07**	**050824L07**

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Lead	25.0	25.3	101	80-120	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: N/A
Work Order No: 05-08-1511
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR98 Calexico / 0511121P

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
097-01-002-6,731	**Solid**	**ICP 3300**	**08/24/05**	**050824-I-08**	**050824L08**

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Lead	25.0	25.0	100	80-120	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 05-08-1511

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Calscience Environmental Laboratories, Inc.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 . FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

DATE:

PAGE: 1 OF 4

LABORATORY CLIENT: Southern California Soil & Testing
ADDRESS: 10820 Riverdale Street
CITY: San Diego
TEL: 619-280-4321 FAX: 619-280-4717 E-MAIL: cbean@sCST.com

CLIENT PROJECT NAME / NUMBER: SR98 CALEXICO 05111218
PROJECT CONTACT: CHRIS BEAN GEO/GARRATT FOUNTAIN
SAMPLER(S): (SIGNATURE) Chris A. Bean
P.O. NO.:
QUOTE NO.:
LAB USE ONLY: 08-1511

TURNAROUND TIME
☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ☒ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS
Test Samples w/ >50 mg/kg Pb ~~Signals~~
Wet Method 7420

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	Please list tests required: Total Lead, EPA Method 6010B	Pb > 50mg/kg	Soluble Lead WET/EPA Method 7420 using Citric acid as the extractant
1	#1	Box 1	8/17/05	9:23		1	X	X	
2	#2		8/19/05	10:37		1			
3	#3		8/19/05	9:36		1			
4	#4		8/18/05	11:23		1			
5	#5		8/18/05	11:02		1			
6	#6		8/18/05	12:00		1			
7	#7		8/18/05	9:15		1			
8	#8		8/18/05	9:45		1			
9	#9		8/18/05	7:30		1			
10	#10		8/22/05	10:17		1			

Relinquished by: (Signature) Chris A. Bean — Received by: (Signature) CEL — Date: 8/22/05 — Time: 1215
Relinquished by: (Signature) — Received by: (Signature) — Date: — Time:
Relinquished by: (Signature) — Received by: (Signature) CEL — Date: 8/23/05 — Time: 1535

Environmental Laboratories, Inc.

GARDEN GROVE, CA 92841-1432

TEL: (714) 895-5494 . FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

DATE:

PAGE: 2 OF 4

LABORATORY CLIENT: Southern California Soil + Test

ADDRESS: 6820 Riverdale Street

CITY: San Diego CA 92120

TEL: 619-280-4321 FAX: E-MAIL:

CLIENT PROJECT NAME / NUMBER: SR98 Calexico 05112/P

PROJECT CONTACT: Chris Bem

SAMPLER(S) (SIGNATURE): Chris Bem

P.O. NO.:

QUOTE NO.:

LAB USE ONLY: 08-1511

TURNAROUND TIME

☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ☒ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)

☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	Please list tests required	Total Lead, EPA Method 6010B	If Pb > 50mg/kg	Soluble Lead WET/EPA Method 7420 using Citric acid as the extractant
11	#11	Box	8/19/05	11:37		1		X	X	
12	#12		8/19/05	8:40		1				
13	#13		8/22/05	8:23		1				
14	#14		8/19/05	9:00		1				
15	#15		8/18/05	8:50		1				
16	#16		8/19/05	9:53		1				
17	#17		8/19/05	10:33		1				
18	#18		8/18/05	8:00		1				
19	#19		8/17/05	10:00		1				
20	#20		8/19/05	8:00		1				

Relinquished by: (Signature) Chris Bem

Relinquished by: (Signature)

Relinquished by: (Signature)

Received by: (Signature) CEL

Received by: (Signature)

Received by: (Signature) CEL

Date: 8/23/5 Time: 1215

Date: Time:

Date: 8/23/5 Time: 1535

Environmental Laboratories, Inc.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 . FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

DATE:

PAGE: 3 OF 4

LABORATORY CLIENT: Southern California Soil & Gas

ADDRESS: 6820 Riverdale Street

CITY: San Diego CA

TEL: (619) 280-4321 FAX: E-MAIL

CLIENT PROJECT NAME / NUMBER: SR98 - Calexico

PROJECT CONTACT: Chris Beaw

SAMPLER(S): (SIGNATURE)

P.O. NO.:

QUOTE NO.:

LAB USE ONLY: 08-1511

TURNAROUND TIME

☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ☒ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)

☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS

See pg 1

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	Please list tests required	Total Lead, EPA Method 6010	If Pb > 50mg/kg	Soluble Lead WET/EPA Method 7420 using Citric acid as the extractant
21	~~#21~~ #21	Box	8/18/05	12:20		1		X	X	
22	~~#22~~ #22		8/22/05	7:45		1		X		
23	~~#23~~ #23		8/22/05	8:00		1		X		
24	~~#24~~ #24		8/19/05	6:30		1		X		
25	~~#25~~ #25	Box 2	8/18/05	8:30		1		X		
26	~~#26~~ #26	"	8/22/05	9:15		1		X		
27	~~#27~~ #27	"	8/18/05	11:45		1		X		
28	~~#28~~ #28	"	8/17/05	8:34		1		X		
29	~~#29~~ #29	"	8/18/05	12:44		1		X		
30	~~#30~~ #30	"	8/18/05	12:00		1		X		

Relinquished by: (Signature) Chris Beaw	Received by: (Signature) CRL	Date: 8/23/5	Time: 1515
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature) CRL	Date: 8/23/5	Time: 1535

aiscience Environmental Laboratories, Inc.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 . FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

DATE:

PAGE: 4 OF 4

LABORATORY CLIENT: Southern Cal Spec Sc. & Testing
ADDRESS: 6820 Riverdale
CITY: San Diego CA 92120
TEL: (619) 280-4321 FAX: E-MAIL:
CLIENT PROJECT NAME / NUMBER: SR98 CALEXICO 05111217P
PROJECT CONTACT: CHRIS BEAN
SAMPLER(S): (SIGNATURE)
P.O. NO.:
QUOTE NO.:
LAB USE ONLY: 0 8 - 1 5 1 1

TURNAROUND TIME
☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ☒ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS
Total Lead EPA Method 6010B →
IF Pb 50 mg/Kg Sol. Pb Wet/EPA 7420

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	Please list tests required	Total Lead, EPA Method 6010B	If Pb > 50mg/kg	Soluble Lead WET/EPA Method 7420 using Citric acid as the extractant
31	#31	Box 2	8/17/05	9:03 AM		1		X	→ X	
32	#32		8/22/05	10:37 AM		1		X	→ X	
33	#33		8/16/05	7:11 AM		1		X	→ X	
34	#34		8/16/05	7:00 AM		1		X	→ X	
35	#35		8/18/05	10:37 AM		1		X	→ X	
36	#36		8/17/05	11:40 AM		1		X	→ X	
37	#37		8/16/05	11:29		1		X	→ X	
38	#38		8/17/05	12:10		1		X	→ X	
39	#39		8/17/05	11:50		1		X	→ X	
40	#40		8/17/05	1:00 PM		1		X	→ X	

Relinquished by: (Signature)	Received by: (Signature)	Date: 8/23/5	Time: 1215
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date: 8/23/5	Time: 1535

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 05 - 08 - 1511

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: SCST DATE: 8/27/15

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
_____ Chilled and placed in cooler with wet ice.
✓ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.

3.9 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
_____ °C IR thermometer.
_____ Ambient temperature.

Initial: [signature]

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Applicable (N/A): ✓

Initial: [signature]

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			
Tedlar bag(s) free of condensation			✓

Initial: [signature]

COMMENTS:

Calscience
Environmental
Laboratories, Inc.

March 02, 2006

Garrett Fountain
Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Subject: **Calscience Work Order No.:** **06-02-1293**
Client Reference: **SR-98 Calexico / 0511121**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 2/23/2006 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of any subcontracted analysis is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Ranjit K. T. Clarke

Calscience Environmental
Laboratories, Inc.
Ranjit Clarke
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 02/23/06
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR-98 Calexico / 0511121

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #41	**06-02-1293-1**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	11.9	0.5	1		mg/kg

Sample #42	06-02-1293-2	02/21/06	Solid	02/24/06	02/27/06	060224L09

Parameter	Result	RL	DF	Qual	Units
Lead	10.6	0.5	1		mg/kg

Sample #43	06-02-1293-3	02/21/06	Solid	02/24/06	02/27/06	060224L09

Parameter	Result	RL	DF	Qual	Units
Lead	7.08	0.50	1		mg/kg

Sample #44	06-02-1293-4	02/20/06	Solid	02/24/06	02/27/06	060224L09

Parameter	Result	RL	DF	Qual	Units
Lead	10.1	0.5	1		mg/kg

Sample #45	06-02-1293-5	02/21/06	Solid	02/24/06	02/27/06	060224L09

Parameter	Result	RL	DF	Qual	Units
Lead	9.51	0.50	1		mg/kg

Sample #46	06-02-1293-6	02/20/06	Solid	02/24/06	02/27/06	060224L09

Parameter	Result	RL	DF	Qual	Units
Lead	22.7	0.5	1		mg/kg

RL - Reporting Limit . DF - Dilution Factor . Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 02/23/06
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR-98 Calexico / 0511121

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #47	**06-02-1293-7**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	15.1	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #48	**06-02-1293-8**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	15.4	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #49	**06-02-1293-9**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	12.6	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #50	**06-02-1293-10**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	11.6	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #51	**06-02-1293-11**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	9.74	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #52	**06-02-1293-12**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	11.4	0.5	1		mg/kg

RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 02/23/06
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR-98 Calexico / 0511121

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #53	**06-02-1293-13**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	10.4	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #54	**06-02-1293-14**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	9.89	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #55	**06-02-1293-15**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	12.5	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #56	**06-02-1293-16**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	9.90	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #57	**06-02-1293-17**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	10.8	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #58	**06-02-1293-18**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	8.87	0.50	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 02/23/06
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR-98 Calexico / 0511121

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #59	**06-02-1293-19**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	11.4	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #60	**06-02-1293-20**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	11.0	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #61	**06-02-1293-21**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	8.53	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #62	**06-02-1293-22**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	12.0	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #63	**06-02-1293-23**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	7.88	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #64	**06-02-1293-24**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	7.61	0.50	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 02/23/06
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR-98 Calexico / 0511121

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #65	**06-02-1293-25**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	11.6	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #66	**06-02-1293-26**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	7.50	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #67	**06-02-1293-27**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	14.4	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #68	**06-02-1293-28**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	10.8	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #69	**06-02-1293-29**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	12.6	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #70	**06-02-1293-30**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	7.62	0.50	1		mg/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.		Date Received:	02/23/06
P.O. Box 600627		Work Order No:	06-02-1293
6280 Riverdale Street		Preparation:	EPA 3050B
San Diego, CA 92120-3308		Method:	EPA 6010B

Project: SR-98 Calexico / 0511121

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #71	**06-02-1293-31**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	10.2	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #72	**06-02-1293-32**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	18.5	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #73	**06-02-1293-33**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	8.23	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #74	**06-02-1293-34**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	8.03	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #75	**06-02-1293-35**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	7.09	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #76	**06-02-1293-36**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	12.1	0.5	1		mg/kg

RL - Reporting Limit . DF - Dilution Factor . Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 02/23/06
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR-98 Calexico / 0511121

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #77	**06-02-1293-37**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	6.65	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #78	**06-02-1293-38**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	9.23	0.50	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #79	**06-02-1293-39**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	19.0	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #80	**06-02-1293-40**	**02/21/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	11.8	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Sample #81	**06-02-1293-41**	**02/20/06**	**Solid**	**02/24/06**	**02/27/06**	**060224L06**

Parameter	Result	RL	DF	Qual	Units
Lead	13.2	0.5	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**097-01-002-7,340**	**N/A**	**Solid**	**02/24/06**	**02/24/06**	**060224L06**

Parameter	Result	RL	DF	Qual	Units
Lead	ND	0.500	1		mg/kg

RL - Reporting Limit . DF - Dilution Factor . Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 02/23/06
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR-98 Calexico / 0511121

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**097-01-002-7,347**	**N/A**	**Solid**	**02/24/06**	**02/27/06**	**060224L09**

Parameter	Result	RL	DF	Qual	Units
Lead	ND	0.500	1		mg/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**097-01-002-7,348**	**N/A**	**Solid**	**02/24/06**	**02/27/06**	**060224L10**

Parameter	Result	RL	DF	Qual	Units
Lead	ND	0.500	1		mg/kg

RL - Reporting Limit . DF - Dilution Factor . Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 02/23/06
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project SR-98 Calexico / 0511121

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
06-02-1330-1	**Solid**	**ICP 3300**	**02/24/06**	**02/24/06**	**060224S06**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Lead	89	85	75-125	4	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 02/23/06
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project SR-98 Calexico / 0511121

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Sample #48	**Solid**	**ICP 3300**	**02/24/06**	**02/27/06**	**060224S09**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Lead	95	90	75-125	4	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: 02/23/06
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project SR-98 Calexico / 0511121

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
Sample #70	**Solid**	**ICP 3300**	**02/24/06**	**02/27/06**	**060224S10**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Lead	99	92	75-125	6	0-20	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: N/A
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR-98 Calexico / 0511121

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
097-01-002-7,340	**Solid**	**ICP 3300**	**02/24/06**	**060224-I-06**	**060224L06**

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Lead	25.0	25.8	103	80-120	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: N/A
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR-98 Calexico / 0511121

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
097-01-002-7,347	**Solid**	**ICP 3300**	**02/27/06**	**060224-I-09**	**060224L09**

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Lead	25.0	26.1	104	80-120	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

Southern California Soil & Testing, Inc.
P.O. Box 600627
6280 Riverdale Street
San Diego, CA 92120-3308

Date Received: N/A
Work Order No: 06-02-1293
Preparation: EPA 3050B
Method: EPA 6010B

Project: SR-98 Calexico / 0511121

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
097-01-002-7,348	**Solid**	**ICP 3300**	**02/27/06**	**060224-I-10**	**060224L10**

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Lead	25.0	26.2	105	80-120	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 06-02-1293

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Calscience Environmental Laboratories, Inc.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 . FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

DATE: 2-21-06

PAGE: 1 OF 15

LABORATORY CLIENT: Southern California Soil & Testing
ADDRESS: 6280 Riverdale St.
CITY: San Diego CA 92120
TEL: 619-280-4321 FAX: 619-280-4717 E-MAIL: eliang@SCST.com

CLIENT PROJECT NAME / NUMBER: SR-98 Calexico / 0511121
PROJECT CONTACT: Garrett Fountain
SAMPLER(S): (SIGNATURE)
P.O. NO.:
QUOTE NO.:
LAB USE ONLY: 02-1293

TURNAROUND TIME
☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS
if any samples are greater than or equal to 50 mg/kg for total lead by 6010B, analyse for soluble lead by wet citric by method 7420 (STLC)

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	Please list tests required	Total Lead, EPA Method 6010B	If Pb > 50mg/kg	Soluble Lead WET/EPA Method 7420 using Citric acid as the extractant
	sample # 41	495+86 @ -4'	2-20-06	1200	soil	1/40z		X		
	: 42	511+65 @ -2'	2-21-06	1500	:	:		X		
	: 43	506+41 @ -2'	2-21-06	1110	:	:		X		
	: 44	503+00 @ -2'	2-20-06	1650	:	:		X		
	: 45	495+10 @ -2.5'	2-21-06	0950	:	:		X		
	: 46	494+20 @ -2'	2-20-06	1740	:	:		X		
	: 47	505+80 @ -4'	2-20-06	1610	:	:		X		
	: 48	514+05 @ -1'	2-20-06	1335	:	:		X		
	: 49	509+41 @ -4'	2-20-06	1525	:	:		X		
	: 50	510+85 @ -2.5'	2-21-06	1415	:	:		X		

	Received by: (Signature)	Date	Time
Relinquished by: (Signature)		2/23/6	1325
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	2/23/6	1615

Calscience Environmental Laboratories, Inc.
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GARDEN GROVE, CA 92841-1432
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CHAIN OF CUSTODY RECORD

DATE: 2-21-06

PAGE: # 2 OF # 5

LABORATORY CLIENT: Southern California Soil & Testing

ADDRESS: 6280 Riverdale St.

CITY: San Diego CA 92120

TEL: 619-280-4321 FAX: 619-280-4717 E-MAIL: eliong@SCST.com

CLIENT PROJECT NAME / NUMBER: SR-98 Calexico / 0511121

PROJECT CONTACT: Garrett Fountain

SAMPLER(S): (SIGNATURE)

P.O. NO.:

QUOTE NO.:

LAB USE ONLY: 02-1293

TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY): ☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS: If any samples are greater than or equal to 50 mg/kg for total lead by 6010B, analyze for soluble lead by wet citric (STLC) by method 7420

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	Please list tests required	Total Lead, EPA Method 6010B	If Pb > 50mg/kg	Soluble Lead WET/EPA Method 7420 using Citric acid as the extractant
	sample # 51	499+27 @ -3'	2-20-06	0915	soil	1/4oz		X		
	" 52	509+30 @ -3'	2-21-06	1210	"	"		X		
	" 53	496+77 @ -3'	2-20-06	1055	"	"		X		
	" 54	495+25 @ -3'	2-20-06	1220	"	"		X		
	" 55	496+45 @ -4'	2-20-06	1130	"	"		X		
	" 56	497+61 @ -1'	2-20-06	0935	"	"		X		
	" 57	497+30 @ -2'	2-20-06	0950	"	"		X		
	" 58	504+19 @ -4'	2-20-06	1635	"	"		X		
	" 59	507+80 @ -2.5'	2-20-06	1550	"	"		X		
	" 60	510+25 @ -4'	2-21-06	1350	"	"		X		

Relinquished by: (Signature)	Received by: (Signature)	Date: 2/23/6	Time: 1925
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date: 2/23/6	Time: 1615

Calscience Environmental Laboratories, Inc.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 . FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

DATE: 2-21-06

LABORATORY CLIENT: Southern California Soil & Testing
ADDRESS: 6280 Riverdale St.
CITY: San Diego CA 92120
TEL: 619-280-4321 FAX: 619-280-4717 E-MAIL: eliang@SCST.com

CLIENT PROJECT NAME / NUMBER: SR-98 Calexico / 051121
PROJECT CONTACT: Garrett Fountain
SAMPLER(S): (SIGNATURE)
P.O. NO.:
QUOTE NO.:
LAB USE ONLY: D 2-12953

TURNAROUND TIME
☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS
If any samples are greater than or equal to 50 mg/kg for total lead by 6010B, analyze for soluble lead by wet citric (STLC) by method 7420

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	Please list tests required	Total Lead, EPA Method 6010B	If Pb > 50mg/kg	Soluble Lead WET/EPA Method 7420 using Citric acid as the extractant
	sample # 61	500+21 @ -4'	2-20-06	0850	Soil	1/402		X		X
	" 62	497+10 @ -4'	2-20-06	1035	"	"		X		X
	" 63	509+99 @ -3'	2-20-06	1500	"	"		X		X
	" 64	503+35 @ -1.5'	2-21-06	1010	"	"		X		X
	" 65	511+65 @ -2'	2-21-06	1430	"	"		X		X
	" 66	511+5 @ -4'	2-20-06	1415	"	"		X		X
	" 67	501+90 @ -3'	2-20-06	1710	"	"		X		X
	" 68	497+40 @ -3'	2-20-06	1005	"	"		X		X
	" 69	499+00 @ -3'	2-21-06	0945	"	"		X		X
	" 70	512+15 @ -2'	2-20-06	1355	"	"		X		X

Relinquished by: (Signature)	Received by: (Signature)	Date: 2/23/6	Time: 1325
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date: 2/23/6	Time: 1615

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CHAIN OF CUSTODY RECORD

DATE: 2-21-06

PAGE: 4 OF 5

LABORATORY CLIENT: Southern California Soil & Testing

ADDRESS: 6280 Riverdale St.

CITY: San Diego CA 92120

TEL: 619-280-4321 FAX: 619-280-4717 E-MAIL: eliang@SCST.com

CLIENT PROJECT NAME / NUMBER: SR-98 Calexico / 051121

PROJECT CONTACT: Garrett Fountain

SAMPLER(S): (SIGNATURE)

P.O. NO.:

QUOTE NO.:

LAB USE ONLY: 0 2 - 1 2 9 3

TURNAROUND TIME

☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)

☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS

If any samples are greater than or equal to 50 mg/kg for total lead by 6010B, analyze for soluble lead by wet citric (STLC) by method 7420

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	Please list tests required: Total Lead, EPA Method 6010B	If Pb > 50mg/kg: Soluble Lead WET/EPA Method 7420 using Citric acid as the extractant
	Sample # 71	508+70 @ -1'	2-21-06	1130	soil	1/402	X	X
	" 72	495+58 @ -1'	2-21-06	0815	"	"	X	X
	" 73	511+80 @ -1'	2-21-06	1445	"	"	X	X
	" 74	511+15 @ -4'	2-21-06	1545	"	"	X	X
	" 75	505+11 @ -4'	2-21-06	1045	"	"	X	X
	" 76	510+22 @ -3.5'	2-20-06	1445	"	"	X	X
	" 77	501+20 @ -3'	2-21-06	0915	"	"	X	X
	" 78	500+33 @ -1'	2-20-06	0830	"	"	X	X
	" 79	500+17 @ -1'	2-21-06	0855	"	"	X	X
	" 80	497+56 @ -3'	2-21-06	0835	"	"	X	X

Relinquished by: (Signature)	Received by: (Signature)	Date: 2/23/6	Time: 1325
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date: 2/23/6	Time: 1615

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GARDEN GROVE, CA 92841-1432
TEL: (714) 895-5494 . FAX: (714) 894-7501

CHAIN OF CUSTODY RECORD

DATE: 2-21-06

PAGE: 1 5 OF 0 5

LABORATORY CLIENT: Southern California Soil & Testing
ADDRESS: 6280 Riverdale St.
CITY: San Diego, CA 92120
TEL: 619-280-4321 FAX: 619-280-4717 E-MAIL: eliang@sost.com

CLIENT PROJECT NAME / NUMBER: SR-98 Calexico / 051121
PROJECT CONTACT: Garrett Fountain
SAMPLER(S): (SIGNATURE)
P.O. NO.:
QUOTE NO.:
LAB USE ONLY: 06-1293

TURNAROUND TIME
☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS
If any samples are greater than or equal to 50mg/kg for total lead by 6010B, analyze for soluble lead by wet citric (STLC) by method 7420

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	Matrix	#Cont	Please list tests required	Total Lead, EPA Method 6010B	If Pb > 50mg/kg	Soluble Lead WET/EPA Method 7420 using Citric acid as the extractant
	sample # 81	SB6+63@-1'	2-20-06	0810	Soil	1/402		X		

Relinquished by: (Signature)
Relinquished by: (Signature)
Relinquished by: (Signature)

Received by: (Signature)
Received by: (Signature)
Received by: (Signature) WCDatum CA

Date: 2/23/6 Time: 1535
Date: Time:
Date: 2/23/6 Time: 1615

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 06 - D2-1293

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: SCST DATE: 2/23/16

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
✓ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.
3.7 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
_____ °C IR thermometer.
_____ Ambient temperature.

Initial: [signature]

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Applicable (N/A): ✓

Initial: [signature]

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: [signature]

COMMENTS:

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

PHONE
(619) 280-4321
TOLL FREE
(877) 215-4321
FAX
(619) 280-4717

P.O. Box 600627
San Diego, CA 92160-0627
6280 Riverdale Street
San Diego, CA 92120
www.scst.com

REPORT OF ENVIRONMENTAL SITE ASSESSMENT FOR AERIALLY DEPOSITED LEAD STATE ROUTE 98 CALEXICO IMPERIAL COUNTY, CALIFORNIA

PREPARED FOR

MR. CHRIS JOHNSON
DOKKEN ENGINEERING
9665 CHESAPEAKE DRIVE, SUITE 435
SAN DIEGO, CALIFORNIA 92123

PREPARED BY

SOUTHERN CALIFORNIA SOIL & TESTING, INC.
6280 RIVERDALE STREET
SAN DIEGO, CALIFORNIA 92120

Providing Professional Engineering Services Since 1959

State of California

Memorandum

Business, Transportation and Housing Agency

To: **Rush Abrams**
Environmental Planner

From: **Diane Vermeulen**
Environmental Engineering

Date: August 23, 2006
File: IMP-98
KP: 48.52-52.23
PM: 30.15-32.45
EA: 080200

Subject: *Hazardous Waste Initial Site Investigation for Proposed Widening Project on State Route 9 in Calexico, Imperial County, California (Revised)*

A review of the potential for hazardous materials for the above referenced project has been completed. The project proposes to improve safety, widen SR 98 from 2 lanes to 4-6 lanes, improve drainage, pedestrian and bicycle facilities. The project will also include improvements to the intersections from Dogwood Road to Rockwood Ave. This project has increased in length since the last review back in 2003.

A previous Initial Site Assessment was completed in August 2003 for this project, which encompassed post miles 31.2 through 32.2. This study concluded that no significant ADL is present in concentrations of concern for this area.

There is a known plume of contamination coming from a former Fed Mart gas station located at approximate post mile 32.2 on the north side of SR 98. There are three monitoring wells located within Caltrans right of way on the eastbound shoulder and three monitoring wells on the westbound side just north of the Caltrans right of way. There was a site investigation performed, by Caltrans in 2003, at the intersection of SR 98 and Ollie Avenue where a new traffic signal is to be installed and the known plume of contamination from the Fed Mart gas station is near. The conclusion of that study was that no impacted ground water was present down to 15' below ground surface at this location. Since the maximum depth of excavation for the project is anticipated to be less than that, it is not expected that contaminated soil or ground water will be encountered during the course of construction activities.

Because of the three operating gas stations and the one closed gas station (Fed Mart Gas Station), within the project limits, the project does have potential hazardous waste involvement. However, because the proposed project would likely involve minimal grading, and due to the distance of the project site to hazardous waste sources, it is unlikely that hazardous material would be encountered during construction.

Encountering hazardous waste issues/materials on this project is not anticipated. If you have any questions or comments please feel free to contact me at 619-688-3148.

Diane M. Vermeulen

Diane Vermeulen, PE
Environmental Engineering

cc: Jayne Dowda

State of California **Business and Transportation Agency**

M E M O R A N D U M

To: Mario Orso, Project Manager

Attn: Kazim Mamdani, Design Manager

Updated

Date: August 8, 2008
File: 11-IMP-98
P.M.: 30.0 / 32.6
E.A.: 080200

From: DEPARTMENT OF TRANSPORTATION - District 11 Right of Way

Subject: Right of Way Data - Widen Highway – Stage 1 & 2

Programmed Amount: $-0-

1. **R/W Cost Estimate:**

		Current Value Future Use	Annual Escalation Rate	Escalated Value April 2015
A)	Acquisition including Excess Lands, Damages & Goodwill, Fees	$ 730,000	5%	$ 1,027,500
	SB-1210	$ 355,000		$ 355,000
B)	Acquisition of Railroad	$ 400,000	5%	$ 563,000
C)	Utility Relocation (State Share)	$ 4,000,000	5%	$ 5,628,000
	Potholing (Design Phase)	$ - 0 -		$ - 0 -
D)	Clearance / Demolition	$ - 0 -		$ - 0 -
E)	Relocation Assistance	$ - 0 -		$ - 0 -
F)	Title and Escrow	$ 78,000	5%	$ 109,500
	R/W Estimate	$ 5,563,000		$ 7,683,000
G)	Condemnation Settlements 10%	$ 148,500		$ 194,500
H)	Design Appreciation Factor 10%	$ 148,500		$ 194,500
	(Items G & H applied to items A + B)			
	Total R/W Estimate (Excluding Item #8 - Hazardous Waste)	**$ 5,860,000**	**Escalated**	**$ 8,072,000**

Current Date of Right of Way Certification April 2015

2. **Parcel Data:**

	Type	Du. App	G/W App
X			
A	50		
B	7		
C	13		
D	1		
Total	71	Excess Parcels	

Utilities	
U4-1-	2
-2-	
-3-	
-4-	4
U5-7-	7
-8-	
-9-	6

Railroad Involvements	
None	
C&M Agreements	
Service Contracts	1
Lic/Re/Clauses	1
Misc R/W Work	
Rap Displacements	
Clearance/Demolitions	
Construction Permits	

Areas: R/W Fee: 9.94 acres Excess:
R/W Easements: 1.95 acres

combined est. entered into PMCS. Stg 1+2.

Ent PMCS 1. EVENT RW SCREEN (All Data) 8/14/08 MK
2. AGRE SCREEN (Railroad Data Only) / /

REMARKS: The railroad costs covers the acquisition of the property rights for widening the current crossing. The safety equipment at the railroad crossing will need upgrading and those cost should come out of the construction budget. Some parcels impacted by the current design have reserved areas through the development process for the highway project widening. There is a dedication of 4.53 acres of the total fee area impacted at the Los Lagos Development. This dedicated area adds no Acquisition Costs but is accounted in the total fee take area. Drainage units could impact gas, water, and underground electric and telephone at additional cost. The total utility relocation cost of $4,000,000 is split between Stage 1 and Stage 2. SEE ATTACHED RAILROAD COMMENTS ON PAGE 4.

File: 11-IMP-98
P.M.: 30.0 / 32.6
E.A.: 080200

3. Are there major items of construction contract work?
Yes ____ No ____ Not determined at this time __X__ (If yes, explain.)

4. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, goodwill, etc.). **Fee acquisition of narrow strips off the front of parcels. Easements on parcels that project design has determined to be accomplished by limited property rights.**

5. Is there an effect on assessed valuation?
Yes __X__ No ____ (If yes, explain.) **Less than fee ownership reduces acquisition costs. Damages to some parcels have been identified for irrigation and drainage. Four businesses will have ingress / egress impeded by the temporary construction easements and changed in the after condition.**

6. Are utility facilities or rights of way affected?
Yes __X__ No ____ Not determined at this time ____ (If yes, explain.) **Water, sewer, electric, gas, telephone, and cable TV.**

7. Are railroad facilities or rights of way affected?
Yes __X__ No ____ (If yes, explain.)

Name(s) of railroad(s) **Union Pacific Railroad**

When branch lines or spurs are affected, would acquisition and/or payment of damages to businesses and/or industries served by the railroad facilities be more cost effective than construction of a facility to perpetuate the rail service? (See Procedural Handbook Vol. 4a, Chap. 440 for detail.)
Yes ____ No __X__ (If yes, explain.)

8. Were any previously unidentified sites with hazardous wastes and/or material found?
Yes ____ * None Evident __X__ (* If yes, attach memorandum per RWPH Vol. 1, Sec. 101.026).

9. Are RAP displacements required?
Yes ____ No __X__ (If yes, provide the following information.)

Number of single-family ____ Number of business/nonprofit ____
Number of multi-family ____ Number of farm ____

Based on Relocation Impact Statement/Study dated, it is anticipated that sufficient housing will be available without Last Resort Housing.

10. Are there material borrow and/or disposal sites required?
Yes ____ No __X__ Not determined at this time ____ (If yes, explain.)

11. Are there potential relinquishments and/or abandonment's?
Yes ____ No __X__ (If yes, explain.)

12. Are there existing and/or potential Airspace sites?
Yes ____ No __X__ (If yes, explain.) **All State property has the potential for Airspace involvement.**

13. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less than formula lead time and/or if significant pressures for project advancement are anticipated.)
PYPSCAN lead time 21 months. Minimum Right of Way lead time requested from receipt of final maps to certification 18 months. [ ] See attached.

14. Is it anticipated that all Right of Way work would be performed by Caltrans staff?
Yes__X__ No ____ (If no, explain.)

File: 11-IMP-98
P.M.: 30.0 / 32.6
E.A.: 080200

ASSUMPTIONS & LIMITING CONDITIONS

[ ] The mapping did not provide sufficient detail to determine the limits of the right of way required.

[ ] The transportation facilities have not been sufficiently designed so our estimator could determine the damages to any of the remainder parcels affected by the project.

[ ] Additional right of way requirements are anticipated, but are not defined due to preliminary nature of early design requirements.

[X] See attached

Evaluations prepared by:

1. R/W Signature _____ Joseph A. Quintero Date 8 / 12 / 2008

2. Railroad Signature _____ Laura Farah Date 8 / 13 / 08

3. Utilities Signature _____ Syndi Sutter Date 8 / 13 / 08

4. Proj.Coord. Signature _____ Debbie Fleming Date 8 / 13 / 08

I have personally reviewed the R/W Data Sheet and supporting information. I certify that the probable highest and best use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and I find this Data Sheet complete and current.

JANET SCHAFFER
Deputy District Director
Right of Way Division

By: _____

PAT KIPLING, CHIEF
Local Program / Project Coordination
& Estimating Branch
Right of Way Division

File: 11-IMP-98
P.M.: 30.0 / 32.6
E.A.: 080200

(Continued)

COMMENTS, ASSUMPTIONS & LIMITING CONDITIONS

- The construction within the railroad corridor will require long lead-time and should be the highway contractor's first order of business.
- The "construction-flagging" estimate should be based upon the total number of hours that the highway contractor would have to work within the Railroad's Right of Way 25' of centerline in order to complete the required construction.
- Construction-flagging costs should be estimated using $150/hour.
- Once the construction-flagging estimate is calculated, the estimate should be escalated by 25% for contingencies.
- We recommend that the highway contractor be held liable for *all* flagging costs in excess of the flagging estimate. If not all costs then set the liability at $150/hour and *not* at a specific dollar amount such as $500/day.

State of California **Business and Transportation Agency**

M E M O R A N D U M

To: Mario Orso, Project Manager

Attn: Kazim Mamdani, Design Manager

Updated

From: DEPARTMENT OF TRANSPORTATION - District 11 Right of Way

Date: August 8, 2008
File: 11-IMP-98
P.M.: 30.9 / 32.6
E.A.: 080200
Stage 1

Subject: Right of Way Data - Widen Highway – Stage 1

Programmed Amount: $-0-

1. **R/W Cost Estimate:**

		Current Value Future Use	Annual Escalation Rate	Escalated Value April 2015
A)	Acquisition including Excess Lands, Damages & Goodwill, Fees	$ 605,000	5%	$ 851,500
	SB-1210	$ 305,000		$ 305,000
B)	Acquisition of Railroad	$ 400,000	5%	$ 563,000
C)	Utility Relocation (State Share)	$ 2,400,000	5%	$ 3,377,000
	Potholing (Design Phase)	$ - 0 -		$ - 0 -
D)	Clearance / Demolition	$ - 0 -		$ - 0 -
E)	Relocation Assistance	$ - 0 -		$ - 0 -
F)	Title and Escrow	$ 65,000	5%	$ 91,500
	R/W Estimate	$ 3,775,000		$ 5,188,000
G)	Condemnation Settlements 10%	$ 131,000		$ 172,000
H)	Design Appreciation Factor 10% (Items G & H applied to items A + B)	$ 131,000		$ 172,000
	Total R/W Estimate (Excluding Item #8 - Hazardous Waste)	**$ 4,037,000**	**Escalated**	**$ 5,532,000**

Current Date of Right of Way Certification **April 2015**

2. **Parcel Data:**

Type	Du. App	G/W App
X		
A 43		
B 7		
C 10		
D 1		
Total 61	Excess Parcels	

Utilities
U4-1- 2
-2-
-3-
-4- 4
U5-7- 7
-8-
-9- 6

Railroad Involvements
None
C&M Agreements
Service Contracts 1
Lic/Re/Clauses 1
Misc R/W Work
Rap Displacements
Clearance/Demolitions
Construction Permits

Areas: R/W Fee: 3.90 acres Excess:
R/W Easements: 1.52 acres

not entered into PMCS yet

Ent PMCS
1. EVENT RW SCREEN (All Data) / /
2. AGRE SCREEN (Railroad Data Only) / /

REMARKS: The railroad costs covers the acquisition of the property rights for widening the current crossing. The safety equipment at the railroad crossing will need upgrading and those cost should come out of the construction budget. Some parcels impacted by the current design have reserved areas through the development process for the highway project widening. Drainage units could impact gas, water, and underground electric and telephone at additional cost. The total utility relocation cost of $4,000,000 is split between Stage 1 and Stage 2. SEE ATTACHED RAILROAD COMMENTS ON PAGE 4.

File: 11-IMP-98
P.M.: 30.9 / 32.6
E.A.: 080200

3. Are there major items of construction contract work?
Yes _____ No _____ Not determined at this time __X__ (If yes, explain.)

4. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, goodwill, etc.). **Fee acquisition of narrow strips off the front of parcels. Easements on parcels that project design has determined to be accomplished by limited property rights.**

5. Is there an effect on assessed valuation?
Yes __X__ No _____ (If yes, explain.) **Less than fee ownership reduces acquisition costs. Damages to some parcels have been identified for irrigation and drainage. Four businesses will have ingress / egress impeded by the temporary construction easements and changed in the after condition.**

6. Are utility facilities or rights of way affected?
Yes __X__ No _____ Not determined at this time _____ (If yes, explain.) **Water, sewer, electric, gas, telephone, and cable TV.**

7. Are railroad facilities or rights of way affected?
Yes __X__ No _____ (If yes, explain.)

Name(s) of railroad(s) **Union Pacific Railroad**

When branch lines or spurs are affected, would acquisition and/or payment of damages to businesses and/or industries served by the railroad facilities be more cost effective than construction of a facility to perpetuate the rail service? (See Procedural Handbook Vol. 4a, Chap. 440 for detail.)
Yes _____ No __X__ (If yes, explain.)

8. Were any previously unidentified sites with hazardous wastes and/or material found?
Yes _____ * None Evident __X__ (* If yes, attach memorandum per RWPH Vol. 1, Sec. 101.026).

9. Are RAP displacements required?
Yes _____ No __X__ (If yes, provide the following information.)

Number of single-family _____ Number of business/nonprofit _____
Number of multi-family _____ Number of farm _____

Based on Relocation Impact Statement/Study dated, it is anticipated that sufficient housing will be available without Last Resort Housing.

10. Are there material borrow and/or disposal sites required?
Yes _____ No __X__ Not determined at this time _____ (If yes, explain.)

11. Are there potential relinquishments and/or abandonment's?
Yes _____ No __X__ (If yes, explain.)

12. Are there existing and/or potential Airspace sites?
Yes _____ No __X__ (If yes, explain.) **All State property has the potential for Airspace involvement.**

13. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less than formula lead time and/or if significant pressures for project advancement are anticipated.)
PYPSCAN lead time _____. Minimum Right of Way lead time requested from receipt of final maps to certification _____. [ ] See attached.

14. Is it anticipated that all Right of Way work would be performed by Caltrans staff?
Yes__X__ No _____ (If no, explain.)

File: 11-IMP-98
P.M.: 30.9 / 32.6
E.A.: 080200

ASSUMPTIONS & LIMITING CONDITIONS

[ ] The mapping did not provide sufficient detail to determine the limits of the right of way required.

[ ] The transportation facilities have not been sufficiently designed so our estimator could determine the damages to any of the remainder parcels affected by the project.

[ ] Additional right of way requirements are anticipated, but are not defined due to preliminary nature of early design requirements.

[X] See attached

Evaluations prepared by:

1. R/W Signature _____ Joseph A. Quintero Date 8/12/2008

2. Railroad Signature _____ Laura Farah Date 8/13/2008

3. Utilities Signature S. Sutter Syndi Sutter Date 8/13/08

4. Proj.Coord. Signature _____ Debbie Fleming Date 8/13/08

I have personally reviewed the R/W Data Sheet and supporting information. I certify that the probable highest and best use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and I find this Data Sheet complete and current.

JANET SCHAFFER
Deputy District Director
Right of Way Division

By: Pat Kipling

PAT KIPLING, CHIEF
Local Program / Project Coordination
& Estimating Branch
Right of Way Division

File: 11-IMP-98
P.M.: 30.9 / 32.6
E.A.: 080200

(Continued)
COMMENTS, ASSUMPTIONS & LIMITING CONDITIONS

- The construction within the railroad corridor will require long lead-time and should be the highway contractor's first order of business.
- The "construction-flagging" estimate should be based upon the total number of hours that the highway contractor would have to work within the Railroad's Right of Way 25' of centerline in order to complete the required construction.
- Construction-flagging costs should be estimated using $150/hour.
- Once the construction-flagging estimate is calculated, the estimate should be escalated by 25% for contingencies.
- We recommend that the highway contractor be held liable for *all* flagging costs in excess of the flagging estimate. If not all costs then set the liability at $150/hour and *not* at a specific dollar amount such as $500/day.

State of California **Business and Transportation Agency**

M E M O R A N D U M

To: Mario Orso, Project Manager

Attn: Kazim Mamdani, Design Manager

Updated

Date: August 8, 2008
File: 11-IMP-98
P.M.: 30.0 / 30.9
E.A.: 080200
Stage 2

From: DEPARTMENT OF TRANSPORTATION - District 11 Right of Way

Subject: Right of Way Data - Widen Highway – Stage 2

Programmed Amount: $-0-

1. **R/W Cost Estimate:**

		Current Value Future Use	Annual Escalation Rate	Escalated Value April 2015
A)	Acquisition including Excess Lands, Damages & Goodwill, Fees	$ 125,000	5%	$ 176,000
	SB-1210	$ 50,000		$ 50,000
B)	Acquisition of Railroad	$ - 0 -		$ - 0 -
C)	Utility Relocation (State Share)	$ 1,600,000	5%	$ 2,251,000
	Potholing (Design Phase)	$ - 0 -		$ - 0 -
D)	Clearance / Demolition	$ - 0 -		$ - 0 -
E)	Relocation Assistance	$ - 0 -		$ - 0 -
F)	Title and Escrow	$ 13,000	5%	$ 18,000
	R/W Estimate	$ 1,788,000		$ 2,495,000
G)	Condemnation Settlements 10%	$ 17,500		$ 22,500
H)	Design Appreciation Factor 10% (Items G & H applied to items A + B)	$ 17,500		$ 22,500
	Total R/W Estimate (Excluding Item #8 - Hazardous Waste)	**$ 1,823,000**	**Escalated**	**$ 2,540,000**

Current Date of Right of Way Certification **April 2015**

2. **Parcel Data:**

	Type	Du. App	G/W App
X			
A	7		
B			
C	3		
D			
Total	10	Excess Parcels	

Utilities
U4-1- 2
-2-
-3-
-4- 4
U5-7- 7
-8-
-9- 6

Railroad Involvements
None X
C&M Agreements
Service Contracts
Lic/Re/Clauses
Misc R/W Work
Rap Displacements
Clearance/Demolitions
Construction Permits

Areas: R/W Fee: 6.04 acres Excess:
R/W Easements: 0.43 acres

not entered into PMCS ek

Ent PMCS 1. EVENT RW SCREEN (All Data) / /
2. AGRE SCREEN (Railroad Data Only) / /

REMARKS: There is a dedication of 4.53 acres of the total fee area impacted at the Los Lagos Development. This dedicated area adds no Acquisition Costs but is accounted in the total fee take area. Drainage units could impact gas, water, and underground electric and telephone at additional cost. The total utility relocation cost of $4,000,000 is split between Stage 1 and Stage 2.

File: 11-IMP-98
P.M.: 30.0 / 30.9
E.A.: 080200

3. Are there major items of construction contract work?
Yes _____ No _____ Not determined at this time __X__ (If yes, explain.)

4. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, goodwill, etc.). **Fee acquisition of narrow strips off the front of parcels. Easements on parcels that project design has determined to be accomplished by limited property rights.**

5. Is there an effect on assessed valuation?
Yes __X__ No _____ (If yes, explain.) **Less than fee ownership reduces acquisition costs. Damages to some parcels have been identified for irrigation and drainage.**

6. Are utility facilities or rights of way affected?
Yes __X__ No _____ Not determined at this time _____ (If yes, explain.) **Water, sewer, electric, gas, telephone, and cable TV.**

7. Are railroad facilities or rights of way affected?
Yes _____ No __X__ (If yes, explain.)

Name(s) of railroad(s)

When branch lines or spurs are affected, would acquisition and/or payment of damages to businesses and/or industries served by the railroad facilities be more cost effective than construction of a facility to perpetuate the rail service? (See Procedural Handbook Vol. 4a, Chap. 440 for detail.)
Yes _____ No __X__ (If yes, explain.)

8. Were any previously unidentified sites with hazardous wastes and/or material found?
Yes _____ * None Evident __X__ (* If yes, attach memorandum per RWPH Vol. 1, Sec. 101.026).

9. Are RAP displacements required?
Yes _____ No __X__ (If yes, provide the following information.)

Number of single-family _____ Number of business/nonprofit _____
Number of multi-family _____ Number of farm _____

Based on Relocation Impact Statement/Study dated, it is anticipated that sufficient housing will be available without Last Resort Housing.

10. Are there material borrow and/or disposal sites required?
Yes _____ No __X__ Not determined at this time _____ (If yes, explain.)

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Yes _____ No __X__ (If yes, explain.)

12. Are there existing and/or potential Airspace sites?
Yes _____ No __X__ (If yes, explain.) **All State property has the potential for Airspace involvement.**

13. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less than formula lead time and/or if significant pressures for project advancement are anticipated.)
PYPSCAN lead time _____. Minimum Right of Way lead time requested from receipt of final maps to certification _____. [ ] See attached.

14. Is it anticipated that all Right of Way work would be performed by Caltrans staff?
Yes__X__ No _____ (If no, explain.)

File: 11-IMP-98
P.M.: 30.0 / 30.9
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ASSUMPTIONS & LIMITING CONDITIONS

[ ] The mapping did not provide sufficient detail to determine the limits of the right of way required.

[ ] The transportation facilities have not been sufficiently designed so our estimator could determine the damages to any of the remainder parcels affected by the project.

[ ] Additional right of way requirements are anticipated, but are not defined due to preliminary nature of early design requirements.

[ ] See attached

Evaluations prepared by:

1. R/W Signature _____ Joseph A. Quintero Date 8 / 12 / 2008

2. Railroad Signature _____ Laura Farah Date 8 / 13 / 2008

3. Utilities Signature _____ Syndi Sutter Date 8 / 13 / 08

4. Proj.Coord. Signature _____ Debbie Fleming Date 8 / 13 / 08

I have personally reviewed the R/W Data Sheet and supporting information. I certify that the probable highest and best use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and I find this Data Sheet complete and current.

JANET SCHAFFER
Deputy District Director
Right of Way Division

By: _____

PAT KIPLING, CHIEF
Local Program / Project Coordination
& Estimating Branch
Right of Way Division

AIR QUALITY IMPACT ANALYSIS
SR 98 ROADWAY WIDENING PROJECT
CALEXICO, CALIFORNIA

Prepared for:

California Department of Transportation - District 11
4050 Taylor Street
San Diego, California 92110

Prepared by:

EDAW, Inc.
1420 Kettner Boulevard, Suite 500
San Diego, California 92101
Phone: (619) 233-1454
Fax: (619) 233-0952

December 4, 2007

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SECTION 1.0
INTRODUCTION

1.1 INTRODUCTION

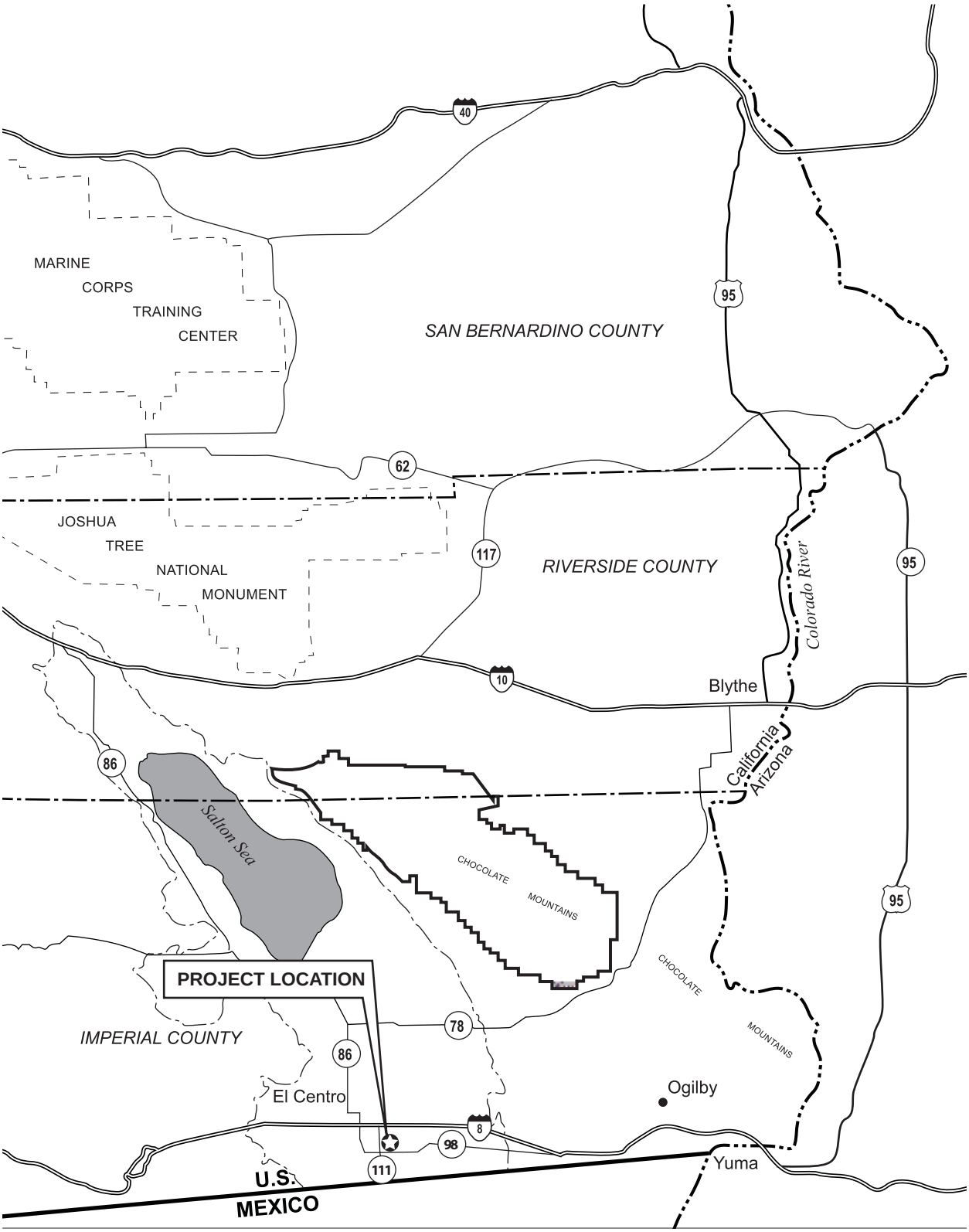
This Air Quality Impact Analysis has been prepared for the proposed State Route 98 (SR 98) roadway widening project. The California Department of Transportation (Caltrans) and the City of Calexico (City) are proposing to widen SR 98 between west of Dogwood Road and east of Rockwood Avenue (SR 111). The segment of SR 98 east of the All-American Canal is within the City of Calexico; the segment west of the canal is in the unincorporated area of Imperial County. Figures 1 and 2 show a regional map and a vicinity map, respectively.

This air quality study will describe the existing air quality; identify applicable rules and regulations; demonstrate conformity of the proposed project to the State Implementation Plan (SIP), as required by the Clean Air Act (CAA); discuss the potential impacts of toxic emissions; and identify measures to mitigate or minimize pollutant emissions associated with the proposed project.

1.2 PROJECT BACKGROUND

SR 98 is located in southern Imperial County and begins at the junction with Interstate 8 and continues east through Calexico. Caltrans, in cooperation with the City, has developed the proposed project to improve traffic operations, increase bicycle and pedestrian safety, and enhance drainage performance on SR 98. Figure 1 shows the proposed project's regional location.

SR 98 is a two-lane highway from Dogwood Road to just west of Ollie Avenue and a four-lane facility from Ollie Avenue to SR 111. Existing roadways and traffic signals within the proposed project along SR 98 are shown in Figure 3. Traffic signals are located at the following intersections: SR 98/Dogwood Road, SR 98/Kloke Road, SR 98/Eady Avenue, SR 98/Ollie Avenue, and SR 98/SR 111. The spacing between intersections is very close along SR 98 between David Navarro Avenue and Rockwood Avenue, and left-turn pockets are located at each full intersection. There are no bike lanes or bus stops along SR 98 and parking along the curb is prohibited.

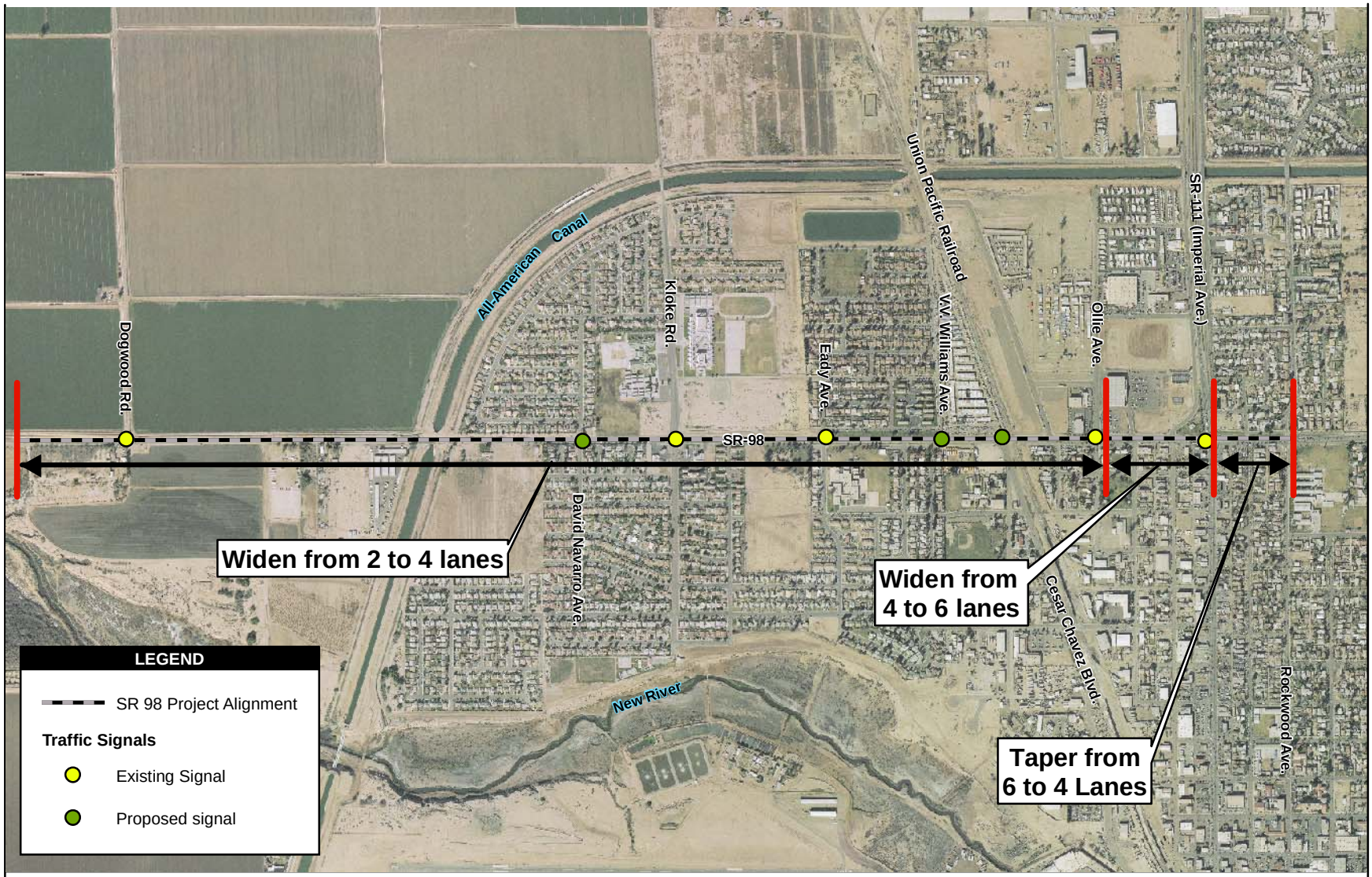


NORTH

No Scale

Figure 1
Regional Map

Figure 2
Existing Roadways and Traffic Signals



Source: AirPhotoUSA 2005

1,500 750 0 1,500 Feet

Scale: 1:18,000; 1 inch = 1,500 feet

Figure 3
Proposed Project

Caltrans and the City have considered various improvements on the portion of SR 98 extending from David Navarro Avenue to SR 111 since 1993. Improvements considered include widening SR 98 from four to six lanes, adding a left-turn median, constructing traffic signals or restricting turns at several intersections, upgrading the Union Pacific Railroad (UPRR) at-grade crossing, adding bike lanes, and constructing sidewalks.

A cooperatively funded project addressing safety concerns from Ollie Avenue to V.V. Williams Avenue was initiated in 1993 but was suspended in 1994 due to costs exceeding the funding limit. A downscaled safety project was completed in 1995, with approval conditioned on future upgrading of resulting nonstandard features. In 1996, Caltrans approved a Project Study Report for the portion of SR 98 from Kloke Road to SR 111, which proposed the following three alternatives:

- Alternative 1 - Full Four Lane Widening: proposed widening SR 98 to a full four lanes from Kloke Road to Ollie Avenue, signalizing the V.V. Williams Avenue intersection, channelization at Emerson Avenue, and upgrading the UPRR at-grade crossing.

- Alternative 2 - Partial Four Lane Widening: proposed widening SR 98 to a four lane facility from V.V. Williams Avenue to Ollie Avenue, signalizing the Ollie Avenue, V.V. Williams, and Eady Avenue intersections, channelization at Emerson Avenue, and upgrading the UPRR at-grade crossing.

- Alternative 3 - Miscellaneous Improvements: proposed signalizing the Ollie Avenue and Eady Avenue intersections, upgrading nonstandard shoulders and UPRR at-grade crossing, and channelization at Emerson Avenue.

The City selected Alternative 2 with the condition that sidewalks would be added along the south side of SR 98 from Kloke Road to Ollie Avenue. Due to time constraints related to the preparation and approval of a Project Report for the revised Alternative 2 and pressing safety concerns, Caltrans proposed the construction of traffic signals and curb ramps on SR 98 at the Eady Avenue and Ollie Avenue intersections. A Project Report for the signals was approved in November 1999 and construction of these traffic signals and curb ramps was completed in January 2001.

After remaining on hiatus for several years, planning for Alternative 2 recommenced in 2005, when the western terminus of Alternative 2 was extended to just west of Dogwood Road to accommodate an increase in residential development in the area. Additionally, sidewalks and Class II bike lanes were added to the east and westbound sides of SR 98 for the entire stretch of

the project.[1] Alternative 2 was also modified to include signalization of the following intersections: SR 98/David Navarro Avenue, SR 98/V.V. Williams Avenue/Lee Avenue, and SR 98/Cesar Chavez Boulevard. In 2006, the eastern terminus of Alternative 2 was extended to Rockwood Avenue based on increased traffic needs east of SR 111. This modified version of Alternative 2 is what is now identified as the proposed project.

1.3 PROJECT DESCRIPTION

The proposed project has two design alternatives under consideration: a Build Alternative and No Build Alternative. Each alternative is described below.

Build Alternative

The Build Alternative proposes to widen SR 98 from two to four lanes from approximately 0.5 kilometer west of Dogwood Road eastward to just west of Ollie Avenue, from four to six lanes from Ollie Avenue through SR 111, and tapering to match the existing four lanes at 0.3 kilometer east of Rockwood Avenue. The project will update the number of turning lanes according to traffic needs at each intersection within the project limits. The following intersections will become signalized: SR 98/David Navarro Avenue, SR 98/V.V. Williams Avenue/Lee Avenue, and SR 98/Cesar Chavez Boulevard. This alternative will incorporate a new Class II bike lane, sidewalks, and a standard drainage system. Project construction would start in December 2009 and be complete in September 2010, for a duration of less than 1 year.

No Build Alternative

No improvements to SR 98 would occur under the No Build Alternative. SR 98 would not be widened; Class II bike lanes, sidewalks, and a standard drainage system would not be built; and additional signalization along SR 98 would not occur. As a result, traffic congestion along SR 98 would worsen over time and pedestrian safety would decrease as SR 98 became a more heavily congested roadway.

[1] The City of Calexico General Plan Update calls for Class I bike lanes from David Navarro Avenue to SR 111. However, meetings between Caltrans and the City have confirmed that the City of Calexico General Plan Update will be updated to recommend Class II bike lanes for the full widening project.

1.4 SUMMARY

The project site is located in the Salton Sea Air Basin (SSAB). The SSAB is classified as a marginal nonattainment area for federal 8-hour ozone (O_3) standard and nonattainment for state 1-hour and 8-hour O_3 standards. For respirable particulate matter sized 10 microns or less in diameter (PM_{10}), the basin is currently classified as serious nonattainment for the federal standard and nonattainment for the state standard. The air basin currently meets the federal and state standards for carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), fine particulate matter sized 2.5 microns or less in diameter ($PM_{2.5}$), and lead (Pb) and is classified as an attainment area for these pollutants.

The CAA requires a demonstration that federal actions in nonattainment areas conform to the SIP and similar approved plans designed to achieve attainment. The project is located in an area that is not in attainment with some federal ambient air quality standards. The California SIP is based, in part, on plans developed by local Metropolitan Planning Organizations (MPOs). Transportation measures, such as the proposed action, are analyzed for conformity to the SIP as part of regional transportation plans (RTPs) and regional transportation improvement programs (RTIPs). In Imperial County, the Southern California Association of Governments (SCAG) is the MPO responsible for the preparation of RTPs and RTIPs, and the associated air quality analyses.

The current SCAG RTP and RTIP are the *Final Administrative Amendment (Gap Analysis) Destination 2030: 2004 Regional Transportation Plan (as amended in July 2006)* (2004 RTP) (SCAG 2007b) and the *Final Adopted 2006 Regional Transportation Program (RTIP) with Approved Amendments 1 through 8* (2006 RTIP) (SCAG 2007a). The 2004 RTP includes regional transportation needs from 2004 to 2030, and the 2006 RTIP is the implementation tool for the 2004 RTP. The Federal Highway Administration (FHWA) and the Federal Transportation Administration (FTA) approved the air quality conformity analysis and findings for the 2004 RTP on June 7, 2004, and for the 2006 RTIP through Amendment 8 on June 29, 2007.

The proposed project is listed in the SCAG's 2004 RTP (RTP ID 8020, page I-97) (SCAG 2004), and 2006 RTIP (Project ID 8020, page 1 of the Imperial County Listing of State Projects) (SCAG 2007a) as amended. The project description of the proposed project matches the project description in the 2004 RTP and 2006 RTIP. Therefore, the project is consistent with the assumptions contained in the SIP and thereby conforms to the SIP. A detailed discussion of the RTP and RTIP project descriptions is provided in Section 5.1 of this analysis.

Analysis of local CO and particulate impacts is also required to demonstrate conformity. Analysis of CO impacts in accordance with the *Transportation Project-Level Carbon Monoxide Protocol* shows that the project is satisfactory for local CO impacts. According to the March 2006 U.S. Environmental Protection Agency (EPA) rule relative to local PM_{10} and $PM_{2.5}$ analysis for transportation projects, particulate impacts are of concern only on projects defined as "projects of air quality concern." The SR 98 Widening project was determined to not be a project of air quality concern, and local particulate emissions would be acceptable.

SECTION 2.0
AIR POLLUTANTS

"Air pollution" is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants may adversely affect human or animal health, reduce visibility, damage property, and reduce the productivity or vigor of crops and natural vegetation.

Seven air pollutants have been identified by the EPA as being of concern nationwide: CO, O_3, NO_2, PM_{10} (also called respirable particulate and inhalable particulate), $PM_{2.5}$ (fine particulate matter), SO_2, and Pb. These pollutants are collectively referred to as criteria pollutants. A brief description of each of these pollutants is provided below.

2.1 CARBON MONOXIDE (CO)

CO is a colorless and odorless gas, which, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. Relatively high concentrations are typically found near crowded intersections and along heavily traveled roadways carrying slow-moving traffic. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Overall CO emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973. CO concentrations are typically higher in winter. As a result, California has required the use of oxygenated gasoline in the winter months to reduce CO emissions. CO interferes with the transfer of oxygen to the blood. It may cause dizziness and fatigue and can impair central nervous system functions.

2.2 OZONE (O_3)

O_3 is the principal component of smog and is formed in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_X), which are commonly referred to as precursors of O_3 and are both considered critical in O_3 formation. NO_X includes various combinations of nitrogen and oxygen, including nitrogen oxide (NO), nitrogen dioxide (NO_2), nitrogen trioxide (NO_3), etc. Significant O_3 production generally requires about 3 hours in a stable atmosphere with strong sunlight. O_3 is a regional air pollutant because it is transported and diffused by wind concurrent with the photochemical reaction

process. Motor vehicles are the major source of O_3 precursors in the air basin. During late spring, summer, and early fall, light winds, low mixing heights, and abundant sunshine combine to produce conditions favorable for maximum production of O_3. O_3 causes eye and respiratory irritation, reduces resistance to lung infection, and may aggravate pulmonary conditions in persons with lung disease. O_3 is also damaging to vegetation and untreated rubber. Control strategies for O_3 have focused on reducing emissions from vehicles, industrial processes using solvents and coatings, and consumer products (e.g., cleaning products and aerosol-propelled products).

2.3 NITROGEN DIOXIDE (NO_2)

There are two oxides of nitrogen that are important in air pollution: NO and NO_2. NO, along with some NO_2, is emitted from motor vehicle engines, power plants, refineries, industrial boilers, ships, aircraft, and railroads. NO_2 is primarily formed when NO reacts with atmospheric oxygen in the presence of ROG and sunlight; the other product of this reaction is O_3, as discussed above. NO_2 is the "whiskey brown"-colored gas readily observed during periods of greater smog. NO_2 increases damage from respiratory disease and irritation and may reduce resistance to certain infections.

2.4 PARTICULATE MATTER (PM_{10})

Particulate matter (PM) is a complex mixture of extremely small particles and liquid droplets. PM is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Natural sources of particulates include windblown dust and ocean spray.

The size of PM is directly linked to the potential for causing health problems. The EPA is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Health studies have shown a significant association between exposure to PM and premature death. Other important effects include aggravation of respiratory and cardiovascular disease, lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and irregular heartbeat (EPA 2007a). Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children. The EPA groups PM into two categories: PM_{10} and $PM_{2.5}$.

Inhalable particles (PM_{10}) include both fine and coarse dust particles. Coarse particles, such as those found near roadways and dusty industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter. Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads. Control of PM_{10} is achieved through the control of dust at construction sites, the cleaning of paved roads, and the wetting or paving of frequently used unpaved roads.

2.5 FINE PARTICULATE MATTER ($PM_{2.5}$)

Fine particles, such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller ($PM_{2.5}$). $PM_{2.5}$ is a subset of PM_{10}. Sources of fine particles include all types of combustion activities (motor vehicles, power plants, wood burning, etc.) and certain industrial processes. $PM_{2.5}$ is the major cause of reduced visibility (haze) in California. Control of $PM_{2.5}$ is primarily achieved through the regulation of emission sources, such as the EPA's Clean Air Interstate Rule and Clean Air Visibility Rule for stationary sources; the 2004 Clean Air Nonroad Diesel Rule, the Tier 2 Vehicle Emission Standards, and Gasoline Sulfur Program; or the California Air Resources Board (ARB) Goods Movement reduction plan. The health effects of $PM_{2.5}$ are similar to those of PM_{10}.

2.6 SULFUR DIOXIDE (SO_2)

SO_2 is a combustion product, with the primary source being power plants and heavy industry that use coal or oil as fuel. SO_2 is also a product of diesel engine combustion. The health effects of SO_2 include lung disease and breathing problems for asthmatics. SO_2 in the atmosphere contributes to the formation of acid rain. In the SSAB, there is relatively little use of coal and oil, and SO_2 is of lesser concern than in many other parts of the country.

2.7 LEAD (Pb)

Pb is a stable compound that persists and accumulates both in the environment and in animals. Historically, the Pb used in gasoline anti-knock additives represented a major source of Pb emissions to the atmosphere. The EPA began working to reduce lead emissions, issuing the first reduction standards in l973. In 1975, passenger cars and light trucks were manufactured with a more elaborate emission control system, which included a catalytic converter that required lead-free fuel. In l995, leaded fuel accounted for only 0.6 percent of total gasoline sales and effective January 1, 1996, the CAA banned the sale of the small amount of leaded fuel that was still available in some parts of the country for use in on-road vehicles. Therefore, Pb emissions have significantly decreased due to the near elimination of the use of leaded gasoline and are no

longer a concern except when considering lead smelters or other industrial applications where lead may be used.

The criteria pollutants that are most important for this air quality impact analysis are those that can be traced principally to motor vehicles and construction equipment. Of these pollutants, CO, ROG, NO_X, PM_{10}, and $PM_{2.5}$ are evaluated on a regional basis. CO is often analyzed on a localized or "microscale" basis in cases of congested traffic conditions. Although PM_{10} and $PM_{2.5}$ have very localized effects, there are no EPA-approved methodologies to evaluate microscale impacts of PM_{10} and $PM_{2.5}$. Methods for analysis of PM_{10} and $PM_{2.5}$ are anticipated within the next few years.

2.8 TOXIC AIR CONTAMINANTS – MOBILE SOURCE AIR TOXICS

In addition to the criteria air pollutants, the EPA also regulates toxic air contaminants (TACs) also known as hazardous air pollutants. Concentrations of TACs are also used as indicators of ambient-air-quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established (see Table 1 in Section 3.2). Most TACs originate from human-made sources, including on-road mobile sources, nonroad mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics

The CAA identified 188 TACs. The EPA has assessed this expansive list of toxics and identified a group of 21 as Mobile Source Air Toxics (MSATs). The MSATs are compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. The EPA also identified a subset of this list of 21 compounds that it now labels as the 6 priority MSATs. These are *benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene*. While these MSATs are considered the priority transportation

toxics, the EPA stresses that the lists are subject to change and may be adjusted in future rules (FHWA 2006a).

The EPA has issued a number of regulations that will dramatically decrease MSATs through cleaner fuels and cleaner engines. According to an FHWA analysis, even if the number of vehicle miles traveled increases by 64 percent, reductions of 57 percent to 87 percent in MSATs are projected from 2000 to 2020. Project MSAT impacts are discussed in Section 5.1 of this report.

According to the 2006 California Almanac of Emissions and Air Quality (ARB 2006a), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, the ARB has made preliminary concentration estimates based on a PM exposure method. This method uses ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, *para*-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient risk, for which data are available, in California.

Diesel PM poses the greatest health risk among these 10 TACs mentioned. Based on receptor modeling techniques, the ARB estimated the statewide diesel PM health risk in 2000 to be 540 excess cancer cases per million people. Since 1990, the diesel PM health risk in the state has been reduced by 40 percent. Overall, levels of most TACs have gone down since 1990 except for *para*-dichlorobenzene and formaldehyde (ARB 2006a).

2.9 ASBESTOS

The CAA requires the EPA to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with CAA Section 112, the EPA established National Emissions Standards for Hazardous Air Pollutants (NESHAP) to protect the public. Asbestos was one of the first hazardous air pollutants regulated under this section. On March 31, 1971, the EPA identified

asbestos as a hazardous pollutant, and on April 6, 1973, first promulgated the asbestos NESHAP in 40 CFR 61. In 1990, a revised NESHAP regulation was promulgated by the EPA.

The asbestos NESHAP regulations protect the public by minimizing the release of asbestos fibers during activities involving the processing, handling, and disposal of asbestos-containing material. Accordingly, the asbestos NESHAP specifies work practices to be followed during demolitions and renovations of all structures, installations, and buildings (excluding residential buildings that have four or fewer dwelling units). In addition, the regulations require the project applicant to notify applicable state and local agencies and/or EPA regional offices before all demolitions or before construction that contains a certain threshold amount of asbestos.

Naturally Occurring Asbestos-bearing Serpentine

Serpentine is a mineral commonly found in seismically active regions of California, usually in association with ultramafic rocks and along associated faults. Certain types of serpentine occur naturally in a fibrous form known generically as asbestos. Asbestos is a known carcinogen and inhalation of asbestos may result in the development of lung cancer or mesothelioma. The ARB has regulated the amount of asbestos in crushed serpentinite used in surfacing applications, such as for gravel on unpaved roads, since 1990. In 1998, new concerns were raised about health hazards from activities that disturb asbestos-bearing rocks and soil. In response, the ARB revised their asbestos limit for crushed serpentines and ultramafic rock in surfacing applications from 5 percent to less than 0.25 percent, and adopted a new rule requiring best practices dust control measures for activities that disturb rock and soil containing naturally occurring asbestos (NOA) (CDC 2000).

According to the report *A General Location Guide for Ultramafic Rocks in California-Areas More Likely to Contain Naturally Occurring Asbestos* (CDC 2000), NOA is not typically found in the geological formations in Imperial County. Thus, hazardous exposure to asbestos-containing serpentine materials would not be a concern with the proposed project.

SECTION 3.0
APPLICABLE STANDARDS

3.1 FEDERAL AND STATE STANDARDS

The federal CAA (42 U.S.C. §§ 7401-7671q) requires the adoption of national ambient air quality standards (NAAQS) to protect public health and welfare from the effects of air pollution. The NAAQS have been updated as needed. Current standards are set for SO_2, CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb. The ARB has established state standards, which are generally more stringent than the NAAQS and include standards for four additional pollutants. Federal and state standards are shown in Table 1.

Areas are classified under the federal CAA as either "attainment" or "nonattainment" for each criteria pollutant based on whether the NAAQS have been achieved.

The Imperial County portion of the air basin is currently classified as a federal or state nonattainment area, to some degree, for O_3 and PM_{10}. The air basin currently meets the federal and state standards for NO_2, CO, SO_2, $PM_{2.5}$, and Pb and is classified as an attainment area for these pollutants. A detailed listing of attainment designations is included in Section 4.2 of this report.

3.2 REGIONAL AUTHORITY

In Imperial County, the Imperial County Air Pollution Control District (ICAPCD) is the agency responsible for protecting the public health and welfare through the administration of federal and state air quality laws and policies. Included in the ICAPCD's tasks are monitoring air pollution, preparing the Imperial County portion of the SIP, and promulgating Rules and Regulations. The SIP includes strategies and tactics to be used to attain and maintain acceptable air quality in Imperial County.

The ICAPCD has established Rules and Regulations to govern emissions from activities within their jurisdiction that may negatively affect air quality and result in nonattainment with either local, state, or federal air quality standards (ICAPCD 2006). ICAPCD regulations and rules that would affect project construction include the following:

Table 1
California and National Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3]	Secondary[4]	Concentration[5]
Ozone (O_3)[6]	1-Hour	-	Same as Primary Standard	0.09 ppm (180 µg/m^3)
	8-Hour	0.08 ppm (157 µg/m^3)		0.070 ppm (137 µg/m^3)[9]
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	None	9.0 ppm (10 mg/m^3)
	1-Hour	35 ppm (40 mg/m^3)		20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.053 ppm (100 µg/m^3)	Same as Primary Standard	0.030 ppm (56 µg/m^3)[10]
	1-Hour	-		0.18 ppm (338µg/m^3)[10]
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.03 ppm (80 µg/m^3)	-	-
	24-Hour	0.14 ppm (365 µg/m^3)	-	0.04 ppm (105 µg/m^3)
	3-Hour	-	0.5 ppm (1300 µg/m^3)	-
	1-Hour	-	-	0.25 ppm (655 µg/m^3)
Suspended Particulate Matter (PM_{10})[7]	24-Hour	150 µg/m^3	Same as Primary Standard	50 µg/m^3
	Annual Arithmetic Mean	Revoked		20 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)[8]	24-Hour	35 µg/m^3	Same as Primary Standard	-
	Annual Arithmetic Mean	15 µg/m^3		12 µg/m^3
Lead (Pb)	30-Day Average	-	-	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	Same as Primary Standard	-
Hydrogen Sulfide (H_2S)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m^3)
Sulfates (SO_4)	24-Hour			25 µg/m^3
Visibility Reducing Particles	8-Hour (10 am to 6 pm, Pacific Standard Time)			In sufficient amount to produce an extinction coefficient of 0.23 per km due to particles when the relative humidity is less than 70 percent.
Vinyl chloride[9]	24 Hour			0.01 ppm (26 µg/m^3)

[1] NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the USEPA for further clarification and current federal policies.

[2] California Ambient Air Quality Standards for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM_{10}, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

[3] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[4] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[5] Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

[6] On June 15, 2005 the 1-hour ozone standard was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact Areas (those areas do not yet have an effective date for their 8-hour designations). Additional information on federal ozone standards is available at http://www.epa.gov/oar/oaqps/greenbk/index.html.

[7] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the USEPA revoked the annual PM_{10} standard on December 17, 2006.

[8] Effective, December 17, 2006, the USEPA lowered the $PM_{2.5}$ 24-hour standard from 65 µg/m^3 to 35 µg/m^3.

[9] The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[10] The Nitrogen Dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter
Source: USEPA 2007, CARB 2007.

- Regulation IV – Prohibitions:
  - Rule 401 – Opacity of Emissions, which regulates opacity of emissions;
  - Rule 407 – Nuisances, which prohibits the release of air contaminants that may cause injury, detriment, nuisance, or annoyance; and

- Regulation VIII – Fugitive Dust Rules:
  - Rule 800 – General Requirements for Control of Fine Particulate Matter (PM_{10}), which defines terms for the regulation and specifies, amongst other topics, soil stabilization and stabilization testing methods; and
  - Rule 801 – Construction and Earth Moving Activities, which contains EPA-required Best Available Control Measures (BACM) to be included in the ICAPCD Non-Attainment Area Plan for attaining NAAQS for PM_{10}. The BACM, construction phasing, paving unpaved haul and access roads, wetting unpaved roads and reduction of vehicle speeds and trips, are required to be implemented prior to and during, construction and earthmoving operations for development projects.

3.3 CONFORMITY OF FEDERAL ACTIONS

Background

The CAA Amendments of 1990 (Pub. L. 101-549, 104 Stat. 2399) require the EPA to promulgate rules to ensure that federal actions conform to the appropriate SIP. These rules, known together as the *General Conformity Rule* (40 CFR § 51.100 et seq. and § 93.100 et seq.), require any federal agency responsible for an action to determine if its action conforms to pertinent guidelines and regulations.

Section 176(c) of the CAA requires the following:

"No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan after it has been approved. …

Conformity to an implementation plan means:

(A) conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and

(B) that such activities will not

(i) cause or contribute to any new violation of any standard in any area;

(ii) increase the frequency or severity of any existing violation of any standard in any area; or

(iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area."

The determination of conformity shall be based on the most recent estimates of emissions, and such estimates shall be determined from the most recent population, employment, travel, and congestion estimates as determined by the metropolitan planning organization or other agency authorized to make such estimates.

In November 1993, the U.S. Department of Transportation (USDOT) and the EPA developed guidance for determining conformity of transportation plans, programs, and projects. This guidance is denoted as the Transportation Conformity Rule (40 CFR §§ 51.390 and 40 CFR §§ 93.100-129). On July 1, 2004, the EPA promulgated revisions to the transportation conformity rule to include criteria and procedures for the 8-hour O_3 and fine particulate matter ($PM_{2.5}$) NAAQS (Federal Register 2004). The action did not finalize new transportation conformity requirements for $PM_{2.5}$ precursors and $PM_{2.5}$ hot-spot analyses, or make changes to existing PM_{10} hot-spot analysis requirements. Subsequent rulemakings have developed current procedures for these particulate analyses. One of the more recent rules was promulgated in March 2006 and is discussed in the PM_{10} analysis section of this report.

Project Conformity

The metropolitan planning organization responsible for the preparation of RTPs and the associated air quality analyses is the SCAG. The most current regional plans are the 2004 RTP and the 2006 RTIP. The 2004 RTP includes regional transportation needs from 2004 to 2030; Amendment #3 was adopted on June 7, 2007. The 2006 RTIP is the implementation tool for the 2004 RTP. The FHWA and the FTA approved the air quality conformity analysis and findings

for the 2004 RTP on June 7, 2004, and for the 2006 RTIP through Amendment 8 on June 29, 2007. The subsequent amendments to the RTP were administrative and did not require new conformity analysis.

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SECTION 4.0
EXISTING CONDITIONS

4.1 ENVIRONMENTAL SETTING, CLIMATE, AND METEOROLOGY

Air quality is affected by both the rate and location of pollutant emissions and by meteorological conditions, which influence movement and dispersal of pollutants. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and air quality.

Regional Climate

The proposed project would be located in Imperial County and within the SSAB where the climate exhibits characteristics typical of a desert: low annual precipitation, very hot summers, mild winters, high evaporation rates, and strong inversions.

One of the main determinants of climatology in Imperial County is a semipermanent high-pressure area (the Pacific High) in the eastern Pacific Ocean. In the summer, this pressure center is located well to the north, directing storm tracks north of California. This high-pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, weakened low-pressure storms and the orographic barrier bring little rainfall. The combination of subsiding air, protective mountains, and distance from the ocean severely limits precipitation. In Imperial County, the mean monthly temperature ranges from 55-90 degrees Fahrenheit (ºF) and an annual rainfall averaging 2.61 inches.

The flat terrain of Imperial Valley and the strong temperature differentials created by intense solar heating produce moderate winds and deep thermal convection. The Imperial Valley region occasionally experiences periods of high winds. Predominant wind directions are westerly and west-southwesterly during all four seasons, and the average annual daily wind speed is 6.9 miles per hour.

A common atmospheric condition known as a temperature inversion affects air quality in Imperial County. During an inversion, air temperatures become warmer with increasing height rather than cooler. An inversion can be associated with little air movement and stagnant conditions. The inversion layer can persist for a day or more, causing air stagnation and

pollution buildup. Inversions are common between November and June but appear to be relatively absent between July and October.

4.2 REGIONAL AND LOCAL AIR QUALITY

Specific geographic areas are classified as either "attainment" or "nonattainment" areas for each pollutant based upon the comparison of measured data with federal and state standards. Table 2 lists the current attainment status of each criteria pollutant in the Imperial County portion of the SSAB.

Table 2
Attainment Status for the Imperial County Portion of the Salton Sea Air Basin

Pollutant	Attainment Status	
	Federal	State
O_3 – 1-Hour	--[a]	Nonattainment
O_3 – 8-hour	Nonattainment Marginal	
PM_{10}	Nonattainment Serious	Nonattainment
$PM_{2.5}$	Attainment	Unclassified/Attainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Pb	Attainment	Attainment

[a] - Repealed by law in June 2005.
Sources: EPA 2007b; ARB 2007b

Ambient air pollutant concentrations in Imperial County are measured at air quality monitoring stations operated by ICAPCD. The nearest air quality monitoring station to the project site is the Calexico-Ethel Street monitoring station located at 1029 Belcher Street. Among other information, this station monitors O_3, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$. Table 3 presents a summary of the highest pollutant values recorded at this station from 2004 to 2006 and the number of times that a state or federal standard was exceeded.

Table 3
Ambient Air Quality Summary – Calexico-Ethel Street

Pollutant Standards	2004	2005	2006
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)	10.33	8.98	9.76
Number of Days Standard Exceeded			
NAAQS 8-hour (≥9.0 ppm)	1	0	1
CAAQS 8-hour (≥9.0 ppm)	1	0	1
Nitrogen Dioxide (NO_2)			
Maximum 1-hour concentration (ppm)	0.11	0.13	0.10
Annual Average (ppm)	0.02	0.02	0.014
Number of Days Standard Exceeded			
CAAQS 1-hour	0	0	0
Ozone (O_3)			
Maximum 1-hour concentration (ppm)	0.106	0.116	0.111
Maximum 8-hour concentration (ppm)	0.077	0.093	0.087
Number of Days Standard Exceeded			
NAAQS 1-hour (>0.12 ppm)	0	0	0
CAAQS 1-hour (>0.09 ppm)	4	6	2
NAAQS 8-hour (>0.08 ppm)	0	1	1
Sulfur Dioxide (SO_2)			
Maximum 24-hour concentration (ppm)	0.003	0.002	0.041
Annual Average (ppm)	*	*	0.001
Number of Days Standard Exceeded			
NAAQS 24-hour (>0.14 ppm)	0	0	0
CAAQS 24-hour (>0.04 ppm)	0	0	0
Particulate Matter (PM_{10})[a]			
National maximum 24-hour concentration ($\mu g/m^3$)[b]	161	188	164
State maximum 24-hour concentration ($\mu g/m^3$)	155	195	158
National[a] annual average concentration ($\mu g/m^3$)	**60.8**	**53.2**	**56.1**
State[b] annual average concentration ($\mu g/m^3$)	**60.3**	**52.7**	*
Number of Days Standard Exceeded			
NAAQS 24-hour (>150 $\mu g/m^3$)	1	1	1
CAAQS 24-hour (>50 $\mu g/m^3$)	36	27	24
Particulate Matter ($PM_{2.5}$)			
National Maximum 24-hour concentration ($\mu g/m^3$)[b]	48.5	67.6	68.8
State maximum 24-hour concentration ($\mu g/m^3$)	59.0	85.2	80.8
National[b] annual average concentration ($\mu g/m^3$)	11.8	*	12.5
State[b] annual average concentration ($\mu g/m^3$)	**16.1**	**15.5**	**17.3**
Number of Days Standard Exceeded			
NAAQS 24-hour (>65 $\mu g/m^3$)[c]	0	1	1

Notes:

Bold – Exceedance of annual standard

* Data Unavailable

[a] Measurements usually collected every 6 days.

[b] State and national statistics may differ for the following reasons: State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. State statistics are based on *local* conditions. National statistics are based on *standard* conditions. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

[c] The NAAQS 24-hour $PM_{2.5}$ standard was reduced to 35 $\mu g/m^3$ in December 2006.

Source: ARB 2007c

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SECTION 5.0
FUTURE AIR QUALITY IMPACTS

An impact would be considered significant if the proposed project would not conform to the SIP. Conformity to an implementation plan as defined by the CAA means the activity would not (1) cause or contribute to new violation of federal, state, and local standards in the area; (2) interfere with provisions in the application of the SIP for maintenance or attainment of air quality standards; (3) increase the frequency or severity of an existing violation of any standard; or (4) delay timely attainment of any standard, any interim emission reduction, or other milestones included in the SIP for air quality.

5.1 OPERATIONAL EMISSIONS

Regional Air Quality

The CAA requires a demonstration that federal actions conform to the SIP and similar approved plans in areas that are designated as nonattainment. Transportation measures, such as the proposed action, are analyzed for conformity as part of the RTP and RTIP. The RTIP is the implementing document for the RTP. Both plans, and air quality analyses of the plans, were prepared by the SCAG. The proposed project is included in *Destination 2030: 2004 Regional Transportation Plan (RTP)* Appendix I, Project Lists, on page I-97, as "Caltrans project 8020, Post mile 30.8 to 32.3 - In Calexico From 0.5 Km West of Nararro *(sic)*Ave To SR 111 Widen Hwy from 1 to 2 Lanes in Each Direction with Turn Pockets at Major Intersections" (SCAG 2004). The RTP was approved by federal agencies on June 7, 2004, and the USDOT adopted a CAA conformity determination for the RTP on that date. Amendments to the 2004 RTP were adopted in February and July 2006, and June 2007. The scope of the 2006 amendments was limited to transit corridors, and they have no relationship to the SR 98 widening project. The 2007 amendment was administrative and no conformity analysis was required (SCAG 2007b).

The proposed project is included in *Final Adopted 2006 Regional Transportation Program (RTIP) with Approved Amendments 1-8* in the Imperial County State Projects Section, as "Caltrans project 8020, Post mile 30.8 to 32.3 - In Calexico From 0.5 Km West of Nararro *(sic)*Ave To SR 111 Widen Hwy from 1 to 2 Lanes in Each Direction with Turn Pockets at Major Intersections" (SCAG 2007a). The RTIP was approved by federal agencies on June 29, 2007, and the USDOT adopted a CAA conformity determination for the RTP and RTIP on that date (USDOT 2007). Volume I of the 2006 RTIP summarizes the air quality conformity

determinations made for the RTIP, including showing consistency with the 2004 RTP; satisfactory findings for emissions of $PM_{2.5}$, ozone precursors, NO_2, CO, and PM_{10} for the SSAB; and compliance with Transportation Control Measures, Financial Constraint, and Interagency Consultation and Public Involvement Tests. These are the requirements for a transportation program to demonstrate conformity with the SIP.

As described in Section 1.2 of this report, the proposed project was revised subsequent to publication of the RTP and RTIP. The boundaries of the project were extended west to 0.22 mile west of Dogwood Road, and east to Rockwell Avenue. These changes are small in the context of the Imperial County traffic and air quality conformity analyses. Therefore, the proposed project is consistent with the descriptions included in the current RTP and RTIP and conforms to the RTIP and RTP. Therefore, it may be concluded that the regional emissions of the proposed project conform to the Air Quality Management Plan and the SIP.

Local Air Quality

The Transportation Conformity Rules require a statement that:

Federal projects must not cause or contribute to any new localized CO or PM_{10} violations or increase the frequency or severity of any existing CO or PM_{10} violations in CO and PM_{10} nonattainment and maintenance areas.

As described in Section 4.2 above, the proposed project site is in a federal CO attainment area and PM_{10} nonattainment areas. The air quality conformity analyses of the RTP and RTIP are regional analyses and do not include the analyses of local CO or PM_{10} impacts; these must be addressed on a project level.

Carbon Monoxide

The *Transportation Project-Level Carbon Monoxide Protocol, UCD-ITS-97-21* (Protocol), (UCD ITS 1997), provides procedures and guidelines for use by agencies to evaluate the potential local level CO impacts of a transportation project. The Protocol provides decision flow charts designed to assist the lead agency in evaluating requirements that specifically apply to a proposed action. An examination of each flow chart inquiry as it pertains to the proposed project is provided below.

Requirement for New Project *(from Figure 1 of the Transportation Project-Level Carbon Monoxide Protocol, UCD-ITS-97-21)*:

3.1.1. Is the proposed project exempt from all emission analyses?

The proposed project is not exempt from all emission analyses as it does not meet the criteria for projects exempt from all emissions analyses listed in the Protocol. In addition, the air quality analyses of projects included in the RTP and RTIP do not include the analyses of local CO impacts, which therefore must be addressed on a project level.

3.1.2. Is the proposed project exempt from regional emission analyses?

The proposed project is not exempt from regional emission analyses as it does not meet the criteria for projects exempt from regional emission analyses listed in the Protocol.

3.1.3. Is the proposed project locally defined as regionally significant?

Yes. Regionally significant projects are defined in 40 CFR 93.101 as projects that would normally be included in the modeling of a metropolitan area's transportation network, which is the case for this project.

3.1.4 Is the project in a federal attainment area?

Yes.

3.1.4a Is the project in a California attainment area?

Yes.

With this response, one is required to Examine Local Impacts, per Section 4 of the Protocol. The question and answers below are from Figure 3, Local CO Analysis.

Level 1. Is the project in a CO nonattainment area?

No.

Was the area redesignated as "attainment" after the 1990 Clean Air Act?

No.

With this response, one proceeds to Level 7.

Level 7. Does the project worsen air quality?

The following criteria for worsening air quality are prescribed in Section 4.7.1 of the Protocol:

Would the project significantly increase the percentage of vehicles operating in the cold start mode? A threshold of 2 percent is considered potentially significant.

No. The purpose of the project is to relieve traffic congestion and improve bicycle and pedestrian safety, and drainage. The project would not increase the percentage of vehicles operating in cold start mode.

Would the project significantly increase traffic volumes? A threshold of more than 5 percent is considered potentially significant.

No. The purpose of the project is to relieve traffic congestion and improve bicycle and pedestrian safety, and drainage. The project would not significantly increase traffic volumes.

Would the project worsen traffic flow by either reducing average vehicle speeds or increasing delays at intersections?

No. When comparing the Build to the No Build scenario, the provision of additional lanes would increase average speeds and reduce intersection delays. All intersections along the corridor that were analyzed in the project traffic impact analysis would operate at level of service (LOS) D or better (LLG Engineers 2007).

With this response, the project is determined to be satisfactory for local CO impacts, and no further analysis is needed.

Particulate Matter - PM_{10}

On March 10, 2006, the EPA published a final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas. Based on that rule, the EPA and FHWA published *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (PM Guidance) (FHWA 2006b).

A hot-spot analysis is defined in 40 CFR 93.101 as an estimation of likely future localized $PM_{2.5}$ or PM_{10} pollutant concentrations and a comparison of those concentrations to the relevant air quality standards. A hot-spot analysis assesses the air quality impacts on a scale smaller than an entire nonattainment or maintenance area, including, for example, congested roadway intersections and highways or transit terminals. Such an analysis is a means of demonstrating that a transportation project meets CAA conformity requirements to support state and local air quality goals with respect to potential localized air quality impacts. When a hot-spot analysis is

required, it is included within the project-level conformity determination that is made by the FHWA or FTA.

For the SR 98 widening project, the application of the PM Guidance is limited to PM_{10}; Imperial County is an attainment area for $PM_{2.5}$.

The PM Guidance document describes qualitative hot-spot analyses. Quantitative PM_{10} hot-spot analyses will be required when appropriate methods and modeling guidance are available. Qualitative hot-spot analyses involve more streamlined reviews of local factors such as local monitoring data near a proposed project location.

Projects of Air Quality Concern

To meet statutory requirements, the March 10, 2006, final rule requires PM_{10} hot-spot analyses to be performed for "projects of air quality concern." Qualitative hot-spot analyses would be done for these projects. Projects not identified as projects of air quality concern have also met statutory requirements without any further hot-spot analyses.

Projects of air quality concern (POAQC) are projects within a PM_{10} nonattainment or maintenance area, funded or approved by the FHWA or FTA, and are one of the following types of projects:

- New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
- Projects affecting intersections that are LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F, because of increased traffic volumes from a significant number of diesel vehicles related to the project;
- New bus and rail terminals, and transfer points, that have a significant number of diesel vehicles congregating at a single location;
- Expanded bus and rail terminals, and transfer points, that significantly increase the number of diesel vehicles congregating at a single location; and
- Projects in, or affecting, locations, areas, or categories of sites that are identified in the PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The evaluation of a project as a potential POAQC is performed by an interagency consultation, a process described in the Transportation Conformity Rule. In the SSAB, the interagency consultation is performed by the Southern California Transportation Conformity Working Group (TCWG), organized by SCAG. Membership of the TCWG includes federal (EPA, EPA Region 9, FHWA, FTA), state (ARB, Caltrans), regional (Air Quality Management Districts, SCAG, etc.), and subregional (County Transportation Commissions) agencies and other stakeholders (SCAG 2007c).

The SR 98 widening project was submitted to the July 24, 2007, TCWG meeting and the project was determined to not be a POAQC, pending concurrence by the FHWA, which was not represented at the meeting (SCAG 2007d). On August 6, 2007, the FHWA concurred in the determination (FHWA 2007). The project PM_{10} interagency review forms submitted to the TCWG, the minutes of the July 24, 2007 TCWG meeting, and a copy of the concurring email from FHWA are included as Appendix A to this report.

Particulate Matter - $PM_{2.5}$

The SSAB is not a federally designated $PM_{2.5}$ nonattainment or maintenance area; thus, the project does not require a $PM_{2.5}$ hot-spot analysis.

Mobile Source Air Toxics

The following discussion is based on the FHWA Memorandum, Subject: Information: Interim Guidance on Air Toxic Analysis in NEPA Documents, dated February 3, 2006 (FHWA 2006a). The purpose of the guidance is to advise when and how to analyze MSATs in the National Environmental Policy Act (NEPA) process for highways. This guidance is interim, because MSAT science is still evolving. As the science progresses, the FHWA will update the guidance.

Introduction to MSATs

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, nonroad mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

MSATs are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in

fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead federal agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the CAA. In its rule, the EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent.

As a result, the EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary 6 MSATs.

Unavailable Information for Project-specific MSAT Impact Analysis

This air quality impact study includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with implementation of the proposed project. Due to these limitations, the following discussion is included in accordance with Council on Environmental Quality regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information Unavailable or Incomplete

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by

technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

- **Emissions.** The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a tripbased model — emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and it cannot adequately capture emissions effects of smaller projects.[2] For PM, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both PM and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, the EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

  These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

- **Dispersion.** The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of CO to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The National Cooperative Highway Research Program is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with

[2] For purposes of MSAT discussion, smaller projects are those with average daily traffic volumes of less than 140,000, as explained below.

these general limitations of dispersion models, the FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

- **Exposure Levels and Health Effects.** Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs.

Research into the health impacts of MSATs is ongoing. For different emission types, there are various studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that

may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from the IRIS database and represents the EPA's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.

- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.

- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.

- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.

- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

- **Diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel PM and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a nonprofit organization funded by the EPA, the FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes — particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that

would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based Upon Theoretical Approaches or Research Methods Generally Accepted in The Scientific Community.

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from the proposed project and MSAT concentrations or exposures created by the project emissions cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

The impact evaluation below provides a qualitative assessment of MSAT emissions and acknowledges that the proposed project may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

Evaluation of Project MSAT Potential

The FHWA has developed a tiered approach for analyzing MSATs in NEPA documents. Depending on the specific project circumstances, the FHWA has identified three levels of analysis:

- No analysis for projects with no potential for meaningful MSAT effects, Category (1);
- Qualitative analysis for projects with low potential MSAT effects, Category (2); or
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects, Category (3).

The proposed project is a Category (2) project, that is, the project would have a low potential for MSAT effects. This assessment is based on FHWA guidance that projects that do not meet the

criteria for Category (1) or Category (3) should be included in Category (2). Category (1) is limited to projects that

- qualify as a categorical exclusion under 23 CFR 771.117(c);
- are exempt under the CAA conformity rule under 40 CFR 93.126; or
- have no meaningful impacts on traffic volumes or vehicle mix.

The SR 98 widening project does not meet any of these requirements.

For a project to be of the magnitude to have a higher potential for MSAT effects, Category (3), a project must

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel PM in a single location; or

- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the annual average daily traffic (AADT) is projected to be in the range of 140,000 to 150,000, or greater, by the design year;

And also

- be proposed to be located in proximity to populated areas or in rural areas, in proximity to concentrations of vulnerable populations (i.e., schools, nursing homes, hospitals).

The SR 98 widening project would increase the capacity of the roadway. The forecast design year volumes in the project area would range from 9,300 to 47,100 average daily trips (ADT; LLG Engineers 2007). These volumes are less than the FHWA threshold value of 140,000 AADT as the minimum volume for higher potential MSAT effects (FHWA 2006a). Therefore, the project would be included in Category (2), projects with low potential for MSAT effects.

Evaluation of Project MSAT Impacts

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a

qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives* (FHWA 2006c).

The proposed project will significantly increase east-west SR-98 roadway capacity between Dogwood Road and SR 111, thereby providing relief to existing and forecast congested arterial roadways. The amount of MSATs emitted would be proportional to the VMT for the Build and No Build alternatives, assuming that other variables such as fleet mix are the same. The VMT have not been estimated for the two alternatives. With respect to through traffic, that is, traffic that does not originate or terminate in the project area, the VMT for the Build Alternative could be more or less than for the No Build Alternative depending on whether this widened roadway results in shorter or longer travel distance for the drivers attracted to this route in order to avoid other congested roadways. Overall, the VMT levels are anticipated to be greater because the SR 98 widening would attract traffic from the expected new development that would generate and attract trips that were not occurring in this area before. Without the widening, some traffic generated by the new development would likely choose alternate routes instead of the congested SR 98. This increase in VMT means MSATs under the Build Alternative would probably be higher than the No Build Alternative in the study area. There could also be localized differences in MSATs from indirect effects of the project such as associated access traffic, emissions of evaporative MSATs (e.g., benzene) from parked cars, and emissions of diesel PM from delivery trucks, depending on the type and extent of development.

Widening of this section of SR 98 could lead to higher MSAT emissions along the alignment, with a corresponding decrease in MSAT emissions along the roadways in the network that lose traffic to this route. Emissions along the new roadway in future years will likely be lower than initial levels as a result of the EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020 and ARB's statewide programs. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great, even after accounting for an average national annual VMT growth, that MSAT emissions in the study area are likely to decrease in the future in nearly all cases.

The widening of SR 98 would have the effect of moving some traffic closer to some homes, schools, and businesses; therefore, with the proposed project there may be localized areas where ambient concentrations of MSATs could be higher than with the No Build Alternative. However, as discussed above, the magnitude and the duration of these potential increases

compared to the No Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models. In summary, with the Build Alternative, the localized level of MSAT emissions near SR 98 could be higher relative to the No Build Alternative. If so, MSATs would likely be lower in other locations when traffic shifts away from them. On a regional basis, EPA vehicle and fuel regulations, coupled with fleet turnover, would over time cause substantial reductions that, in almost all cases, will cause regionwide MSAT levels to be significantly lower than currently observed (FHWA 2006a).

5.2 CONSTRUCTION EMISSIONS

The pollutants of most concern emitted during construction include PM_{10}, $PM_{2.5}$, and NO_X. The principal source of PM_{10} and $PM_{2.5}$ emissions would be fugitive dust from demolition and earth-moving activities, storage piles, and vehicle travel on unpaved and paved surfaces. The principal source of NO_X emissions would be the diesel engines of heavy construction equipment such as scrapers, graders, loaders, cranes, and heavy trucks.

Construction of the SR 98 widening is anticipated to require 10 months to complete. Federal conformity regulations require analysis of construction impacts for projects when construction activities will last for more than 5 years. The proposed project would last less than 5 years; therefore, no quantitative estimates of regional construction emissions have been made. However, it is recommended that specific measures to control dust and particulates be incorporated into project specifications. These measures are identified in Section 6.0.

SECTION 6.0
POLLUTION MITIGATION AND ABATEMENT MEASURES

In recognition of the nonattainment status of the project area for PM_{10} and O_3, the following measures are recommended.

Caltrans. Caltrans Standard Specifications 10-Dust Control, 17-Watering, and 18-Dust Palliative shall be incorporated into project specifications (Caltrans 2006).

ICPACD. It is assumed that the City of Calexico will comply with applicable ICAPCD Rules and Regulations. One Rule of importance is Rule VIII, Fugitive Dust, which specifies dust control requirements.

Idling Restrictions. Idling of diesel-powered vehicles and equipment shall not be permitted during periods of nonactive vehicle use. Diesel-powered engines shall not be allowed to idle for more than 5 consecutive minutes in a 60-minute period when the equipment is not in use, occupied by an operator, or otherwise in motion, except as follows:

- When equipment is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control;
- When it is necessary to operate auxiliary systems installed on the equipment, only when such system operation is necessary to accomplish the intended use of the equipment;
- To bring the equipment to the manufacturer's recommended operating temperature;
- When the ambient temperature is below 40°F or above 85°F; or
- When equipment is being repaired.

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SECTION 7.0
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APPENDIX A

TRANSPORTATION CONFORMITY WORKING GROUP DOCUMENTATION

This appendix includes the following:
Project Summary Form for Interagency Consultation
Figure 1 submitted with the Project Summary Form
Supplemental Traffic Tables and Figures
Minutes of the July 24, 2007 TCWG meeting
August 6, 2007 email from FHWA to TCWG

PM Conformity Hot Spot Analysis
Project Summary Form for Interagency Consultation

The purpose of this form is to provide sufficient information to allow the Transportation Conformity Working Group (TCWG) to determine if a project requires a project-level PM hot spot analysis pursuant to Federal Conformity Regulations.

The form is not required under the following circumstances:

1. The project sponsor determines that a project-level PM hot spot analysis is required or otherwise elects to perform the analysis; or
2. The project does not require a project-level PM hot spot analysis since it:
    a. Is exempt pursuant to 40 CFR 93.126; or
    b. Is a traffic signal synchronization project under 40 CFR 93.128; or
    c. Uses no Federal funds AND requires no Federal approval; or
    d. Is located in a Federal PM attainment area (note: PM10 and PM2.5 areas differ).

Projects other than those listed above may or may not need a project-level PM hot spot analysis depending on whether it is considered a "Project of Air Quality Concern" (POAQC), and should be brought before the TCWG for a determination.

It is the responsibility of the project sponsor to ensure that the form is filled out completely and provides a sufficient level of detail for the TCWG to make an informed decision on whether or not a project requires a project-level PM hot spot analysis. For example, the TCWG will be reviewing the effects of the project, and thus part of the required information includes build/no build traffic data. It is also the responsibility of the project sponsor to ensure a representative is available to discuss the project at the TCWG meeting if necessary.

Instructions:

1) Fill out form in its entirety. Enter information in gray input fields.

2) Be sure to include RTIP ID#. See http://scag.ca.gov/rtip/ if necessary.

3) Submit completed form to your local Transportation Commission who will submit it to the MPO. Caltrans projects can be submitted by Caltrans District representative.

The TCWG meets the fourth Tuesday of each month at SCAG Headquarters, 818 W. 7th Street, 12th Floor, Los Angeles, CA 90017. Participation is also available via teleconference. Call (213) 236-1800 prior to meeting to get the call-in number and pass-code.

Forms must be submitted by the second Tuesday of the month to be considered at that month's TCWG meeting.

REFERENCE

Criteria for Projects of Air Quality Concern (40 CFR 93.123(b)(1)) – PM_{10} and $PM_{2.5}$ Hot Spots

(i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;

(ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

(iii) New bus and rail terminals and transfer points than have a significant number of diesel vehicles congregating at a single location;

(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and

(v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM10 or PM2.5 applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

Links to more information:

http://www.fhwa.dot.gov/environment/conform.htm

http://www.epa.gov/otaq/stateresources/transconf/index.htm

TABLE 1
Type of Project

- New state highway
- Change to existing state highway
- New regionally significant street
- Change to existing regionally significant street
- New interchange
- Reconfigure existing interchange
- Intersection channelization
- Intersection signalization
- Roadway realignment
- Bus, rail, or inter-modal facility/terminal/transfer point
- Truck weight/inspection station
- At or affects location identified in the SIP as a site of actual or possible violation of NAAQS

RTIP ID# *(required)* 8020

Project Description *(clearly describe project)*
This project would improve traffic operations, enhance bicycle and pedestrian safety, and improve drainage performance on State Route 98 (SR 98) in Imperial County. The project would widen the road from two to four lanes from west of Dogwood Road to Ollie Avenue, and from four to six lanes from Ollie Avenue to SR 111 and east to Rockwood Avenue. Three intersections would be signalized. In addition, the project would update the number of turning lanes according to traffic needs at each intersection within the project limits. The project would incorporate a new Class II bike lane, sidewalks and a new drainage system. See attached Figures 1, 2, and 3.

Type of Project *(use Table 1 on instruction sheet)*
Change to existing state highway; includes intersection signalization.

County	**Narrative Location/Route & Postmiles**
Imperial	The project is located on SR-98 from 0.5 kilometers (km) (0.31 miles) west of Dogwood Road to 0.3 km (0.19 miles) east of Rockwood Avenue, KP 48.2 to KP 52.5 (PM 30.0 to PM 32.6). From the western terminus to the All-American Canal, the project alignment is in an unincorporated area of Imperial County. From the All-American Canal to the eastern terminus, the alignment is in the City of Calexico. **Caltrans Projects – EA#** 080200

Lead Agency: Caltrans

Contact Person	**Phone#**	**Fax#**	**Email**
Sandy Johnson	619-688-6460	619-688-3338	sandy_johnson@dot.ca.gov

Hot Spot Pollutant of Concern *(check one or both)* **PM2.5** **PM10 X**

Federal Action for which Project-Level PM Conformity is Needed *(check appropriate box)*

Categorical Exclusion (NEPA)	**X**	**EA or Draft EIS**	**FONSI or Final EIS**	**PS&E or Construction**	**Other**

Scheduled Date of Federal Action:

Current Programming Dates *as appropriate*

	PE/Environmental	**ENG**	**ROW**	**CON**
Start	In progress	In progress	8/2008	12/2009
End	7/2008	7/2008	12/2009	9/2010

Project Purpose and Need (Summary): *(attach additional sheets as necessary)*

This project proposes to improve traffic operations, enhance bicycle and pedestrian safety, and improve drainage performance on State Route 98 (SR 98). Currently two of the intersections along this corridor operate at a Level of Service F with a peak hour total delay of 22 minutes along this 2 mile segment. In the 2035 No-build condition every intersection along this corridor, except for SR 98/Ollie Ave., will operate at a Level of Service F in the year 2035 with a peak hour total delay of 49 minutes. In the 2035 Build condition three intersections along this corridor will operate at a Level of Service D the remainder will operate at C or better in the year 2035 with a peak hour total delay of 4 minutes. Currently there is not a continuous sidewalk or bicycle line along this corridor. The project is located in a heavily urbanized area with schools and residences abutting the highway. This project proposes a continuous sidewalk and Class II bike lane along its entire length. The sidewalk will include ADA compliant curb ramps. There is currently no organized drainage system along this corridor and the highway experiences localized flooding during heavy storms. This project proposes a drainage system that will contain a 100 year storm with no localized flooding.

Surrounding Land Use/Traffic Generators *(especially effect on diesel traffic)*
From the west end of the alignment to the All-American Canal, there is very little development; see Figure 3. East of the All-American Canal to the Southern Pacific Railroad/Cesar Chavez Blvd., there are single and multi- family residential developments, with also some commercial development along SR 98. Mixed residential and commercial continues east of Cesar Chavez Blvd, with a greater proportion of commercial use. For a more detailed description, see Attachment A.

Opening Year: Build and No Build LOS, AADT, % and # trucks, truck AADT of proposed facility
Opening year is projected to be 2015. Forecast traffic volumes range from 6,800 to 34,100 AADT. Build and No Build volumes would be the same. The existing percentage of trucks ranges from 6.6 to 15.0 for all trucks, including 2-axle trucks, and from less than 1 percent to 4.4 percent for trucks with 3 axles or more. It is assumed that the truck percentages in 2015 would be similar. The projected truck volumes for all trucks for 2015 would range from 1,893 to 5,125. The projected truck volumes for trucks with 3 axles or more for 2015 would range from 212 to 1,504. Under No Build conditions, 7 out of 9 intersections would operate at LOS E or F; under Build conditions, all intersections would operate at LOS D or better. Traffic data for 2015 are included in Attachment B.

RTP Horizon Year / Design Year: Build and No Build LOS, AADT, % and # trucks, truck AADT of proposed facility
Horizon year is 2035. Forecast traffic volumes range from 9,300 to 47,100 AADT. Build and No Build volumes would be the same. The existing percentage of trucks ranges from 6.6 to 15.0 for all trucks, including 2-axle trucks, and from less than 1 percent to 4.4 percent for trucks with 3 axles or more. It is assumed that the truck percentages in 2035 would be similar. . The projected truck volumes for all trucks for 2035 would range from 2,607 to 7,079. The projected truck volumes for trucks with 3 axles or more for 2035 would range from 293 to 2,077. Under No Build conditions, 8 out of 9 intersections would operate at LOS E or F; under Build conditions, all intersections would operate at LOS D or better. Traffic data for 2035 are included in Attachment B.

Opening Year: If facility is an interchange(s) or intersection(s), Build and No Build cross-street AADT, % and # trucks, truck AADT
Not applicable

RTP Horizon Year / Design Year: If facility is an interchange (s) or intersection(s), Build and No Build cross-street AADT, % and # trucks, truck AADT
Not applicable

Describe potential traffic redistribution effects of congestion relief *(impact on other facilities)*
The relief of congestion on SR-98 would also relieve congestion on intersecting roadways. There would be no adverse impact on other roadways. The widening of SR-98 will have a negligible, if slightly positive, impact to congestion on Interstate 8 (I-8).

Comments/Explanation/Details *(attach additional sheets as necessary)*

The project should be classified as **not a POAQC**. This conclusion is based on the following reasons:

Anticipated horizon year traffic volumes of 9,300 to 47,100 AADT are well below the 125,000 AADT threshold suggested in the Final PM Hotspot Document as an example of a highway where there might be a POAQC. Assuming all 3-axle trucks and 20% of 2-axle trucks would be diesel, the maximum percentage of diesel trucks would be approximately 6.5% and the maximum number of diesel trucks would be less than 3,100 AADT. These values are less than the 8% of 125,000 AADT, or 10,000 AADT suggested in the Final PM Hotspot document as a significant volume of diesel trucks.

The project does not cause a negative impact to congested intersections. Conversely, as described above, implementation of the project would improve the forecast intersection operations at 8 intersections from LOS E or F to LOS D or better.

Attachment A to SR 98 PM Conformity Hot Spot Analysis
Project Summary Form for Interagency Consultation

Land Use Patterns and Traffic Generators

Western Project Terminus to All-American Canal

Development immediately adjacent to the proposed project is relatively sparse and only includes four developed properties, all of which are located on the south side of SR 98. Two of these properties are residential developments with large areas of undeveloped land used for storage of a variety of items, including cars, buses, storage trailers, and other vehicular and storage-related items. Another property is a large undeveloped area used to store similar items but it does not have any residential development on the property. The fourth property is Calexico Mini-Storage, which rents secure spaces for the use of storage. The north side of SR 98 is currently in agricultural production.

Other land north of the proposed project, bounded by Jasper Road to the north, Dogwood Road to the west, SR 98 to the south, and the Calexico eastern city limits to the east, is predominately agricultural land with small amounts of residential development dispersed throughout. Additionally, a storage area with connex boxes and a large number of cars is bounded by W Cole Road to the south, Kloke Road to the west, and Calexico's eastern city limits to the northeast. This area has been designated as Industrial Specific Plan by the City of Calexico General Plan Update. Land bounded by W Cole Road to the north, Kloke Road to the west, Calexico's eastern city limits to the east, the All-American Canal to the south is predominantly undeveloped with the exception of another small storage area with connex boxes and a small amount of residential development.

All-American Canal to Cesar Chavez Boulevard

Land uses within this segment include residential, commercial, and school uses. Large areas of residential development exist on both sides of SR 98 near the All-American Canal that can be accessed by David Navarro Avenue. A residential development north of SR 98 that is accessed by David Navarro Avenue is known as Rainbow Park and is characterized by single-family residential homes.

Residential development south of SR 98 accessed by David Navarro Avenue is similar in type to the residential development within Rainbow. This area of residential development extends farther east along SR 98, crossing Kloke Road, until it abuts the Casa Imperial Apartments, a multi-family residential development.

Additional residential development exists along Eady Avenue. Single-family residential units line the western side of Eady Avenue south of SR 98, while residential development is also accessed by Eady Avenue north of SR 98 adjacent to the Casa Sonoma Apartments east of Lacy Avenue. Single-family residential development is also located along Lacy Avenue and Lee Avenue south of SR 98.

Commercial development includes an Arco gas station located at the southwest corner of the SR 98 and Kloke Road intersection, as well as a Chevron gas station located at the southeast corner of the SR 98 and Kloke Road intersection. The Chevron is located adjacent to a Jack in the Box restaurant and a small strip-commercial development occupied by several businesses, which are both located east of the Chevron along SR 98.

The largest commercial development within the segment is the Santo Tomas Swap Meet, located along the north side of SR 98 between V.V. Williams Avenue and the railroad tracks. The Santo Tomas Swap Meet is a large outdoor commercial shopping area with a large number of vendors selling a variety of products such as home furnishings, clothing, and other assorted items. Commercial development on the south side of SR 98 across from the Santo Tomas Swap Meet includes two businesses: San Diego BYA Bus and Auto Mart. From the field reconnaissance conducted for the proposed project, it is not clear whether these are two distinct businesses with clearly demarcated property lines or two jointly operated businesses. These two businesses are on an undeveloped dirt lot with cars, trucks, small buses, and school buses located on the property.

Additionally, there is a residential development along the southern side of SR 98 across from Rainbow Park that may also serve as a commercial enterprise as well. This residential development has a sign for a home loan office in the front yard indicating that this development may also serve as a commercial enterprise.

Several community resources are located within this segment. The properties of two schools are located adjacent to SR 98, while two other schools are located near SR 98. Portions of the open playing field and recess area for Blanche Charles Elementary School are located adjacent to SR 98 at the northwest corner of SR 98 and Kloke Road. Similarly, portions of the open playing field and recess area for Mains Elementary School are located adjacent to SR 98 at the southeast corner of SR 98 and Eady Avenue. Additionally, William Moreno Jr. High School abuts undeveloped properties in the northeast corner of the intersection of SR 98 and Kloke Road. Vincent Memorial Catholic High School is located south of the San Diego BYA Bus and Auto Mart. The Calexico Family Resource Center is located on the south side of SR 98 at the southwest corner of SR 98 and Lacy Avenue, with the parking lot of the properties occupying the entire corner of the intersection.

Cesar Chavez Boulevard to Eastern Project Terminus

Development immediately adjacent to SR 98 to the east of Cesar Chavez is similar to the development to the west, in that it is a mix of residential, commercial, and school uses. However, this segment has a greater concentration of commercial development.

Small amounts of residential development are located along the south side of SR 98. Development at the southwest corner of SR 98 and Ollie Avenue are single-family residences, while a multi-family apartment structure is located at the southeast corner of SR 98 and Paulin Avenue. Residential development on the north side of SR 98 is located between Paulin Avenue and the eastern terminus of the project. The residential development east of Paulin Avenue and west of Rockwood Avenue is characterized by single-family homes. Residential development east of Rockwood Avenue is predominantly multi-family.

Development along the southern portion of SR 98 between the railroad tracks and Rockwood Avenue is primarily commercial with a small amount of residential development. U-Save Car & Truck Rental and G&G Auto Sales are two commercial enterprises located along SR 98 between the railroad tracks and George Avenue. These two businesses appear to share the same commercial structure, parking lot, and display areas. Rios Auto Sales is located at the southeast corner of SR 98 and George Avenue. Additional commercial development between Ollie Avenue and Rockwood Avenue includes, but is not limited to, El Gaucho restaurant, a strip commercial development, El Soul Meat

Market, Fill Co. gas station, Big John gas station, Auto Fiesta Wholesale, and 24 Seven convenience store. Commercial development along the north side of SR 98 is concentrated between Ollie Avenue and SR 111. This commercial development includes a Carl's Jr., Food-4-Less grocery store, a Rite-Aid, and a strip mall with name brand chain-stores. Milenio Auto Sales is located at the corner of SR 98 and Paulin Avenue.

Several community resources are located within this segment. Portions of the open playing field and recess area for Rockwood Elementary School are located adjacent to SR 98 at the southeast corner of SR 98 and Rockwood Avenue. Additionally, the Calexico Chamber of Commerce is located at the northwest corner of SR 98 and SR 111, and a United States Post Office is located at the northwest corner of SR 98 and Ollie Avenue.

ATTACHMENT B
SR 98 PM CONFORMITY HOT SPOT ANALYSIS
PROJECT SUMMARY FORM FOR INTERAGENCY CONSULTATION

Traffic Data

SR 98 – EXISTING TRUCK TRAFFIC[a]

Segment	ADT	Truck Traffic	Percent Trucks
SR 98			
- West of David Navaro	9,200	787	8.55%
- David Navaro and Kloke Rd	11,200	856	7.64%
- Kloke Rd and Easy Ave	17,100	1,996	11.67%
- Eady Ave and V.V. Williams Ave	17,000	2,400	14.12%
- Estrada Blvd and Ollie Ave	22,400	2,617	11.68%
- Ollie Ave and SR 111	25,400	1,664	6.55%
- East of SR 111	26,400	3,967	15.03%
SR 111			
- North of SR 98	33,100	2,883	8.71%
- South of SR 98	36,200	2,507	6.93%

Source: Linscott, Law & Greenspan, Final Traffic Volumes/Traffic Operations Report, SR 98 Widening Update, City of Calexico, California, April 23, 2007

a – Includes 2-axle trucks

SR-98 YEAR 2015 TRAFFIC DATA

Intersection Operations	Year 2015 With Anza Road (No Improvements)				Year 2015 With Anza Road (With Improvements)		
	Control Type	Peak Hour	Delay	LOS	Control Type	Delay	LOS
SR 98/ Dogwood Road	Signal	AM PM	-[f] -[f]	- -	Signal	32.9 32.0	C C
SR 98/ David Navaro Avenue	AWSC[d]	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	40.4 27.0	D C
SR 98 / Kloke Road	Signal	AM PM	**56.7** **64.1**	**E** **E**	Signal	45.1 36.3	D D
SR 98/ Eady Avenue	Signal	AM PM	**>100.0** **78.7**	**F** **E**	Signal	22.7 20.9	C C
SR 98/ V.V. Williams Avenue / Lee Avenue	TWSC[c]	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	16.6 18.1	B B
SR 98/ Cesar Chavez Blvd	TWSC[c]	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	20.1 25.9	C C
SR 98/ Estrada Blvd	TWSC[c]	AM PM	**86.6** **37.8**	**F** **E**	TWSC[c]	12.6 11.9	B B
SR 98/ Ollie Avenue	Signal	AM PM	17.0 32.9	B C	Signal	13.2 28.1	B C
SR 98/ SR 111/ Imperial Avenue	Signal	AM PM	43.4 49.0	D D	Signal	32.9 35.5	C D
Grant Avenue/ Cesar Chavez Blvd	TWSC[c]	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	18.2 21.4	B C
2nd Street/ Cesar Chavez Blvd	AWSC[d]	AM PM	-[e] -[e]	- -	Signal	16.6 24.4	B C
2nd Street/ SR 111	Signal	AM PM	34.8 **>100.0**	C **F**	Signal	25.3 32.4	C C

Source: Linscott, Law & Greenspan, Final Traffic Volumes/Traffic Operations Report, SR 98 Widening Update, City of Calexico, California, April 23, 2007

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
d. AWSC – All-Way Stop Controlled Intersection. Delay not calculated because of too many lanes for unsignalized analysis.
e. The intersection cannot be calculated because the Trafficware Synchro software does not accept the existing lane geometrics for unsignalized intersections.
f. The intersection of SR 98 / Dogwood Road was not analyzed under existing conditions because the construction of the Anza Road extension requires intersection improvements at this intersection.

SR 98 – YEAR 2035 TRAFFIC DATA

Intersection Operations	Year 2035 With Anza Road (No Improvements)				Year 2035 With Anza Road (With Improvements)		
	Control Type	Peak Hour	Delay	LOS	Control Type	Delay	LOS
SR 98/ Dogwood Road	Signal	AM PM	**-**[f] -[f]	**-** -	Signal	37.5 41.1	D D
SR 98/ David Navaro Avenue	AWSC[d]	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	28.4 20.4	C C
SR 98 / Kloke Road	Signal	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	46.8 46.8	D D
SR 98/ Eady Avenue	Signal	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	20.5 14.8	C B
SR 98/ V.V. Williams Avenue / Lee Avenue	TWSC[c]	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	17.7 26.9	B C
SR 98/ Cesar Chavez Blvd	TWSC[c]	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	15.2 14.5	B B
SR 98/ Estrada Blvd	TWSC[c]	AM PM	**>100.0** **>100.0**	**F** **F**	TWSC[c]	13.9 13.5	B B
SR 98/ Ollie Avenue	Signal	AM PM	39.2 53.6	D D	Signal	21.1 34.7	C C
SR 98/ SR 111/ Imperial Avenue	Signal	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	39.2 48.2	D D
Grant Avenue/ Cesar Chavez Blvd	TWSC[c]	AM PM	**>100.0** **>100.0**	**F** **F**	Signal	20.4 27.2	C C
2nd Street/ Cesar Chavez Blvd	AWSC[d]	AM PM	-[e] **-**[e]	- -	Signal	18.7 30.5	B C
2nd Street/ SR 111	Signal	AM PM	**78.5** **>100.0**	**E** **F**	Signal	32.5 54.6	C D

Source: Linscott, Law & Greenspan, Final Traffic Volumes/Traffic Operations Report, SR 98 Widening Update, City of Calexico, California, April 23, 2007

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
d. AWSC – All-Way Stop Controlled Intersection. Delay not calculated because of too many lanes for unsignalized analysis.
e. The intersection cannot be calculated because the Trafficware Synchro software does not accept the existing lane geometrics for unsignalized intersections.
f. The intersection of SR 98 / Dogwood Road was not analyzed under existing conditions because the construction of the Anza Road extension requires intersection improvements at this intersection.

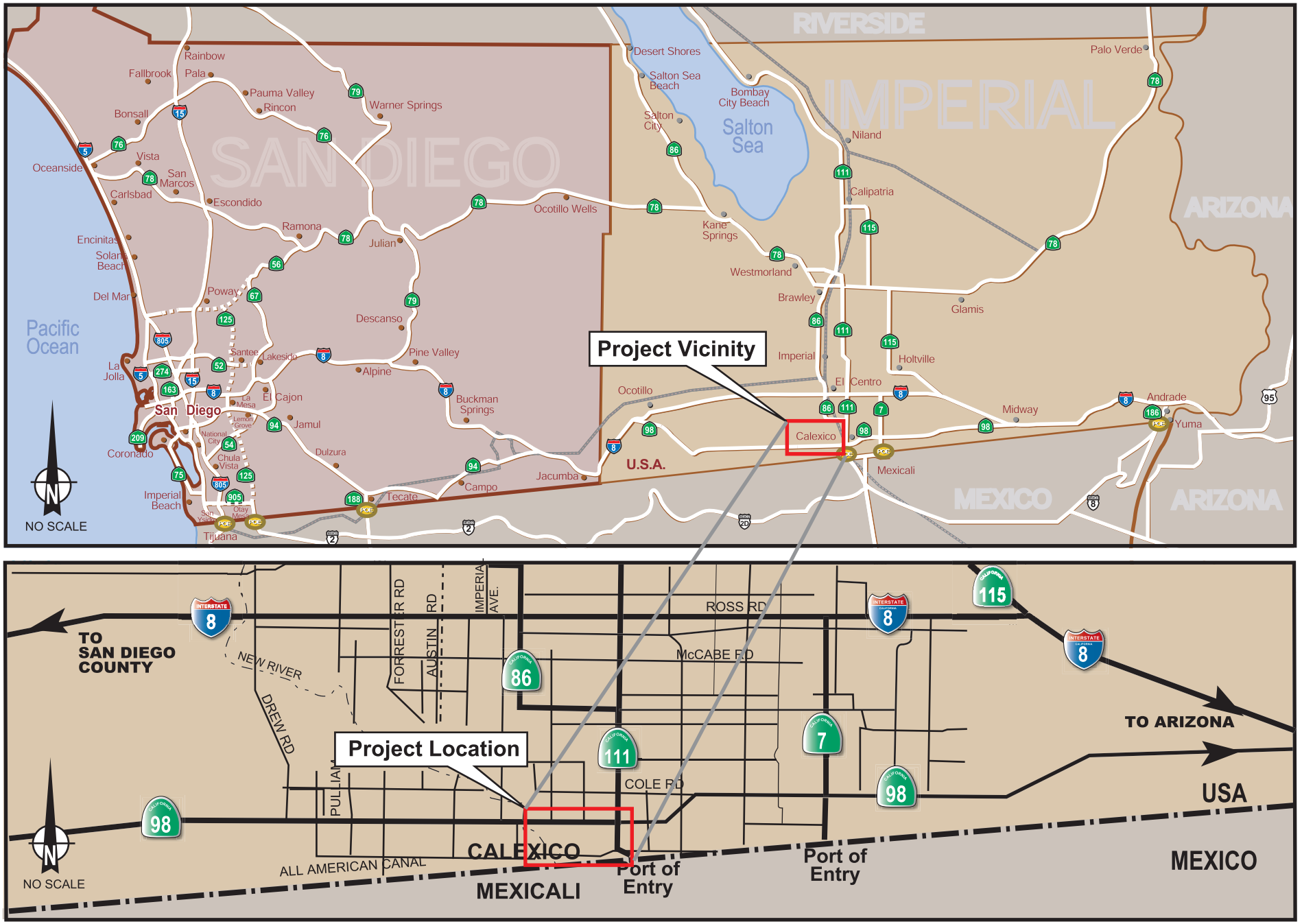


FIGURE 1

PROJECT LOCATION / VICINITY MAP

TABLE 5–5A
YEAR 2035 STREET SEGMENT OPERATIONS WITH ANZA ROAD
(SR 98 BUILT AS 4-LANE)

Street Segment	Future Classification	Future Capacity (LOS E)[a]	Year 2035 with Anza Road		
			ADT[b]	V/C[c]	LOS[d]
SR 98					
West of Dogwood Road	Major Arterial	37,000	9,300	0.25	A
Dogwood Road to All American Canal	Major Arterial	37,000	27,100	0.73	C
All American Canal to David Navaro Ave	Major Arterial	37,000	29,000	0.78	C
David Navaro Ave to Kloke Rd	Major Arterial	37,000	32,800	0.89	D
Kloke Road to Eady Ave	Major Arterial	37,000	36,300	0.98	**E**
Eady Ave to Lee Ave	Major Arterial	37,000	36,300	0.98	**E**
Lee Ave to Cesar Chavez Blvd	Major Arterial	37,000	37,900	1.02	**F**
Cesar Chavez Blvd to Ollie Ave	Major Arterial	37,000	39,800	1.08	**F**
Ollie Ave to SR 111	Prime Arterial	57,000	39,800	0.70	C
East of SR 111	Prime Arterial	57,000	47,100	0.83	D
2nd Street					
West of 2nd Street	Sec. Arterial	34,200	21,500	0.63	B
Cesar Chaved Blvd to SR 111	Major Arterial	37,000	35,300	0.95	**E**
East of SR 111	Sec. Arterial	34,200	14,500	0.42	B
Dogwood Road					
North of SR 98	Major Arterial	37,000	39,200	1.06	**F**
Cesar Chavez Blvd					
SR 98 to Grant Avenue	Major Arterial	37,000	32,900	0.89	D
Grant Avenue to 2nd Street	Major Arterial	37,000	15,600	0.42	B
SR 111					
North of SR 98	Prime Arterial	57,000	78,700	1.38	**F**
South of SR 98	Prime Arterial	57,000	65,900	1.16	**F**
North of 2nd Street	Prime Arterial	57,000	57,200	1.00	**F**
South of 2nd Street	Prime Arterial	57,000	100,300	1.76	**F**

Footnotes:

a. LOS E according to Imperial County Standard Street Classification

b. Average Daily Traffic Volumes.

c. V/C – Volume to Capacity ratio

d. LOS – Level of Service

TABLE 5–5B
YEAR 2035 STREET SEGMENT OPERATIONS WITHOUT ANZA ROAD
(SR 98 BUILT AS 4-LANE)

Street Segment	Future Classification	Future Capacity (LOS E)[a]	Year 2035 without Anza Road		
			ADT[b]	V/C[c]	LOS[d]
SR 98					
West of Dogwood Road	Major Arterial	37,000	10,500	0.28	A
Dogwood Road to All American Canal	Major Arterial	37,000	39,800	1.08	F
All American Canal to David Navaro Ave	Major Arterial	37,000	41,600	1.12	F
David Navaro Ave to Kloke Rd	Major Arterial	37,000	44,500	1.20	F
Kloke Road to Eady Ave	Major Arterial	37,000	47,700	1.29	**E**
Eady Ave to Lee Ave	Major Arterial	37,000	47,700	1.29	**E**
Lee Ave to Cesar Chavez Blvd	Major Arterial	37,000	49,100	1.33	**F**
Cesar Chavez Blvd to Ollie Ave	Major Arterial	37,000	46,000	1.24	**F**
Ollie Ave to SR 111	Prime Arterial	57,000	46,000	0.81	D
East of SR 111	Prime Arterial	57,000	48,800	0.86	D
2nd Street					
West of 2nd Street	Sec. Arterial	34,200	6500	0.19	A
Cesar Chaved Blvd to SR 111	Major Arterial	37,000	26,100	0.71	C
East of SR 111	Sec. Arterial	34,200	15,400	0.45	B
Dogwood Road					
North of SR 98	Major Arterial	37,000	33,800	0.91	**E**
Cesar Chavez Blvd					
SR 98 to Grant Avenue	Major Arterial	37,000	32,900	0.89	D
Grant Avenue to 2nd Street	Major Arterial	37,000	26,300	0.71	C
SR 111					
North of SR 98	Prime Arterial	57,000	80,100	1.41	**F**
South of SR 98	Prime Arterial	57,000	68,600	1.20	**F**
North of 2nd Street	Prime Arterial	57,000	66,600	1.17	**F**
South of 2nd Street	Prime Arterial	57,000	99,100	1.74	**F**

Footnotes:

a. LOS E according to Imperial County Standard Street Classification

b. Average Daily Traffic Volumes.

c. V/C – Volume to Capacity ratio

d. LOS – Level of Service

TABLE 5–5C
YEAR 2035 STREET SEGMENT OPERATIONS WITHOUT ANZA ROAD
(SR 98 AS 2 LANE – NO BUILD)

Street Segment	Future Classification	Future Capacity (LOS E)[a]	Year 2035 without Anza Road		
			ADT[b]	V/C[c]	LOS[d]
SR 98					
West of Dogwood Road	Collector St	16,200	10,500	0.65	D
Dogwood Road to All American Canal	Collector St	16,200	39,800	2.46	F
All American Canal to David Navaro Ave	Collector St	16,200	41,600	2.57	F
David Navaro Ave to Kloke Rd	Collector St	16,200	44,500	2.75	F
Kloke Road to Eady Ave	Collector St	16,200	47,700	2.94	**F**
Eady Ave to Lee Ave	Collector St	16,200	47,700	2.94	**F**
Lee Ave to Cesar Chavez Blvd	Collector St	16,200	49,100	3.03	**F**
Cesar Chavez Blvd to Ollie Ave	Collector St	16,200	46,000	2.84	**F**
Ollie Ave to SR 111	Collector St	16,200	46,000	2.84	F
East of SR 111	Collector St	16,200	48,800	3.01	F
2nd Street					
West of 2nd Street	Sec. Arterial	34,200	6500	0.19	A
Cesar Chaved Blvd to SR 111	Major Arterial	37,000	26,100	0.71	C
East of SR 111	Sec. Arterial	34,200	15,400	0.45	B
Dogwood Road					
North of SR 98	Major Arterial	37,000	33,800	0.91	**E**
Cesar Chavez Blvd					
SR 98 to Grant Avenue	Major Arterial	37,000	32,900	0.89	D
Grant Avenue to 2nd Street	Major Arterial	37,000	26,300	0.71	C
SR 111					
North of SR 98	Prime Arterial	57,000	80,100	1.41	**F**
South of SR 98	Prime Arterial	57,000	68,600	1.20	**F**
North of 2nd Street	Prime Arterial	57,000	66,600	1.17	**F**
South of 2nd Street	Prime Arterial	57,000	99,100	1.74	**F**

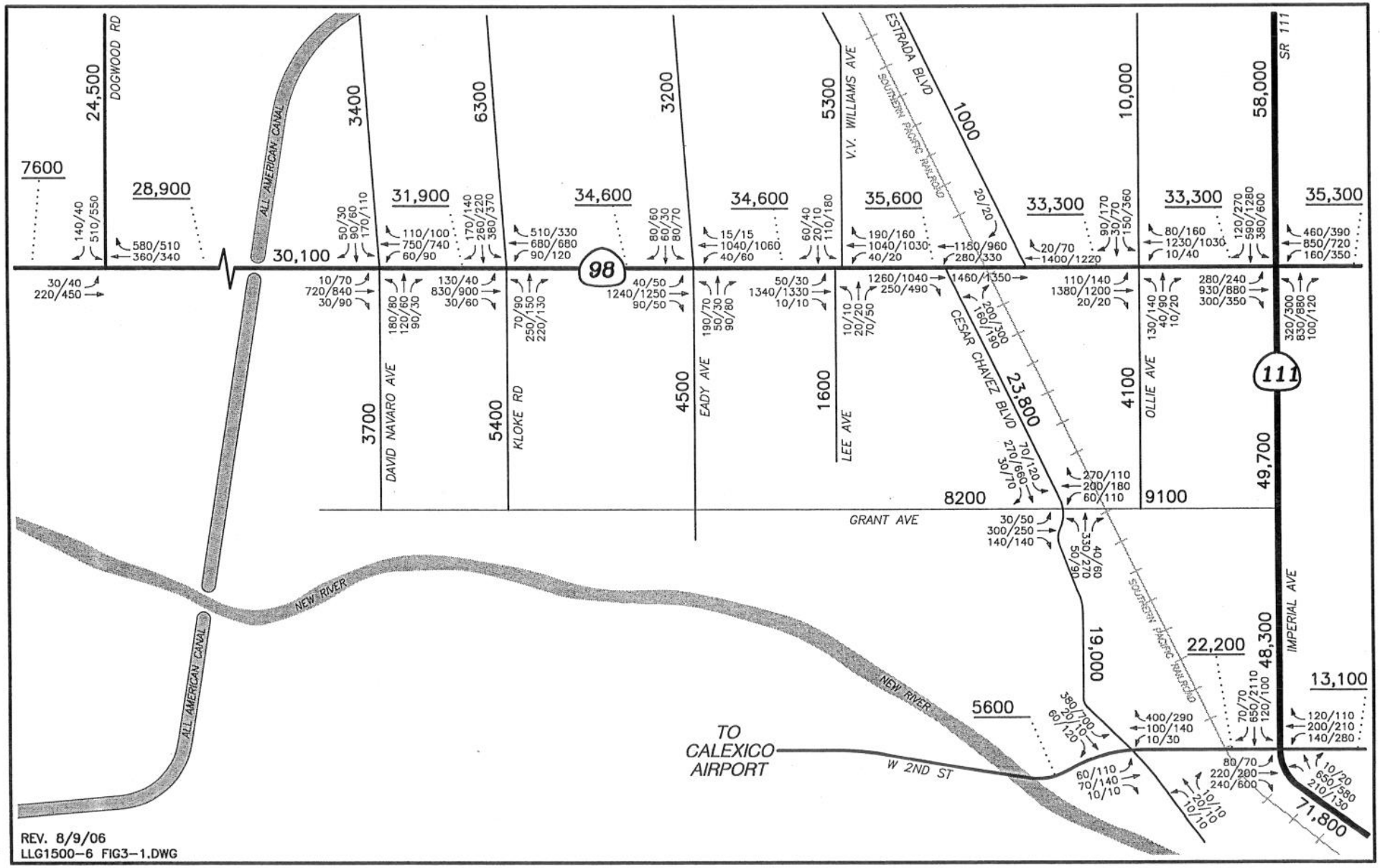
Footnotes:

a. LOS E according to Imperial County Standard Street Classification

b. Average Daily Traffic Volumes.

c. V/C – Volume to Capacity ratio

d. LOS – Level of Service



LINSCOTT LAW & GREENSPAN engineers

NORTH

NOT TO SCALE

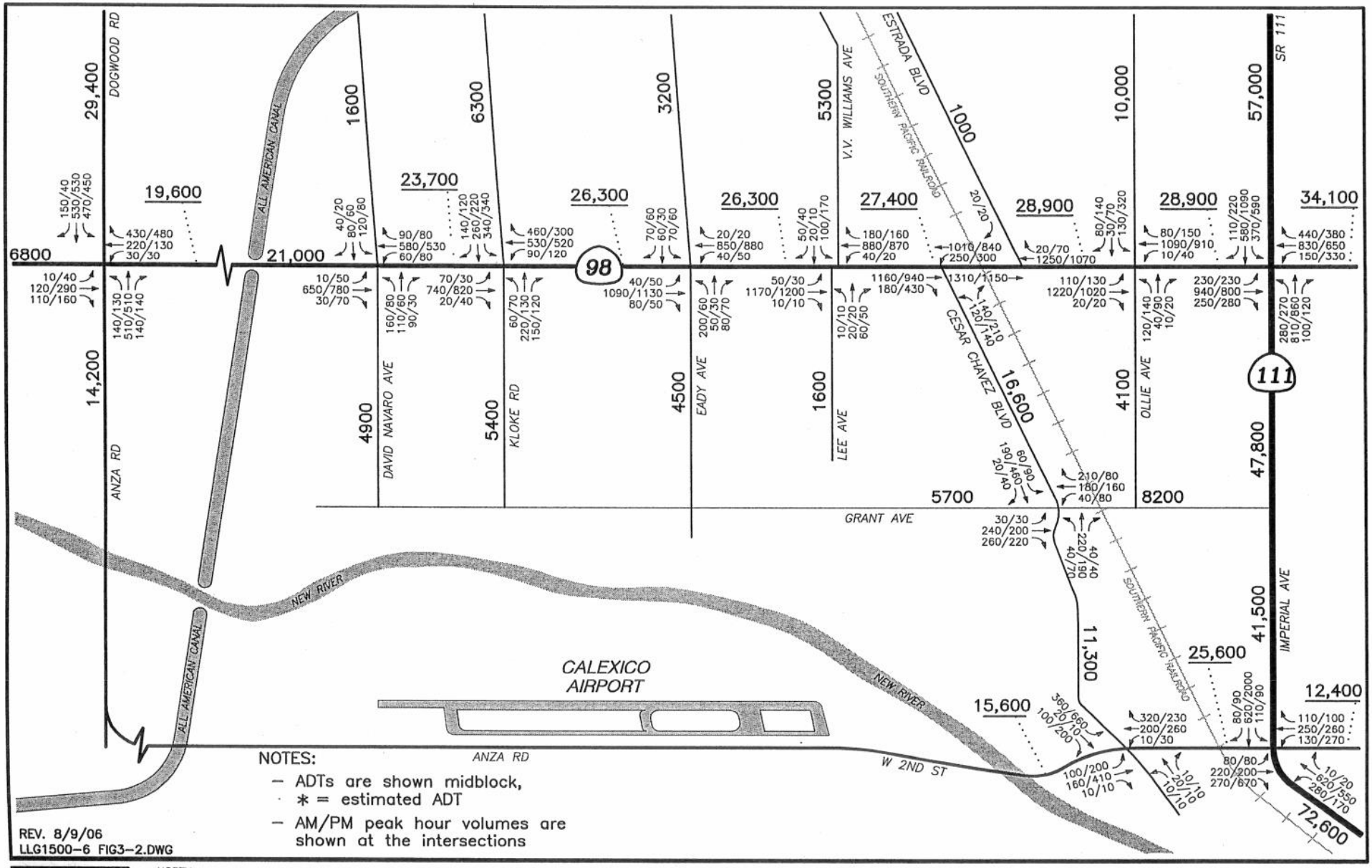
NOTES:

- ADTs are shown midblock, * = estimated ADT
- AM/PM peak hour volumes are shown at the intersections

Figure 3-1

2015 Traffic Volumes (without Anza Road Extension) AM/PM Peak Hours & ADT

SR 98 Widening Update



NOTES:

- ADTs are shown midblock, * = estimated ADT
- AM/PM peak hour volumes are shown at the intersections

REV. 8/9/06
LLG1500-6 FIG3-2.DWG

LINSCOTT LAW & GREENSPAN engineers

NORTH

NOT TO SCALE

Figure 3-2

2015 Traffic Volumes (with Anza Road Extension) AM/PM Peak Hours & ADT

SR 98 Widening Update

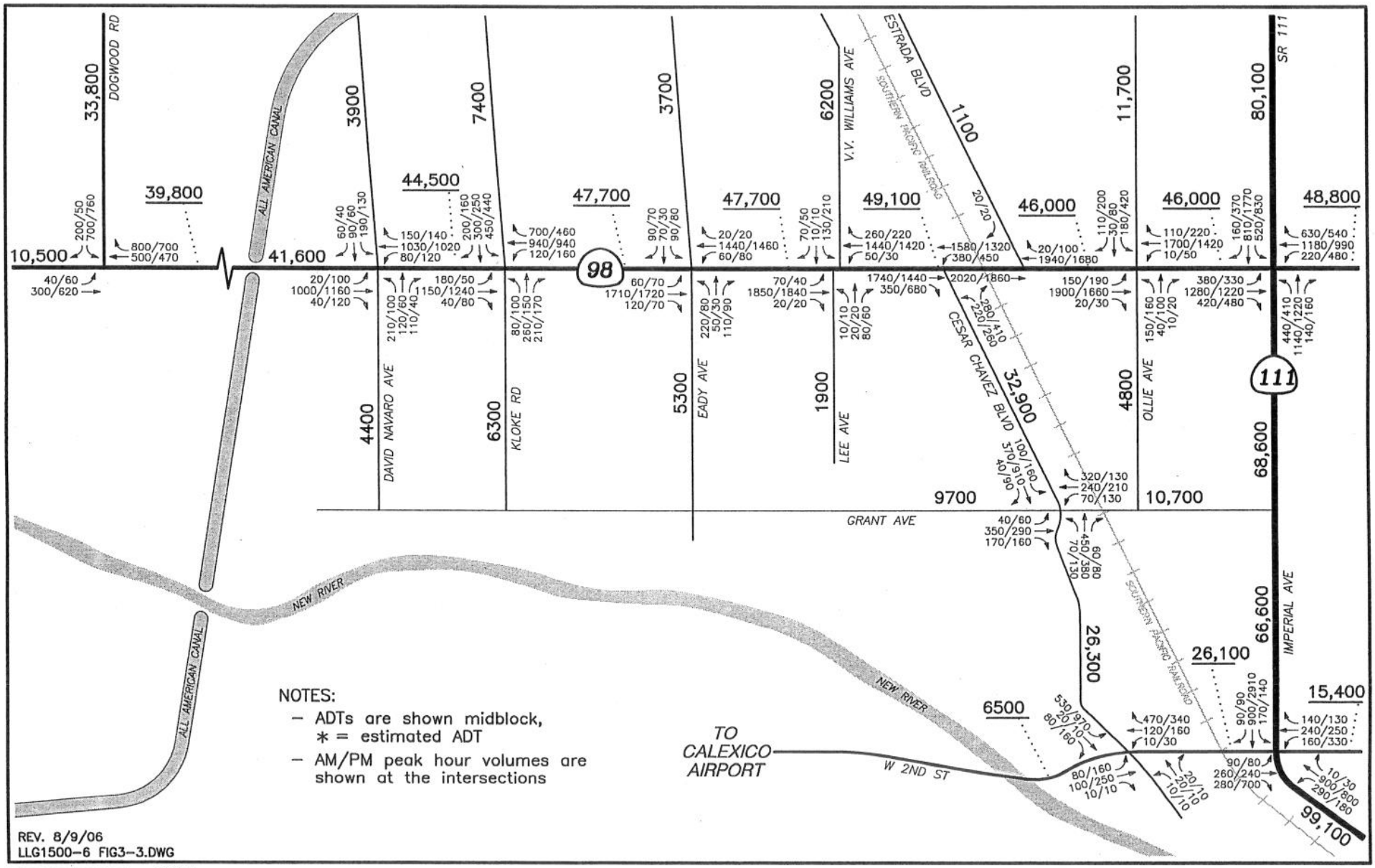
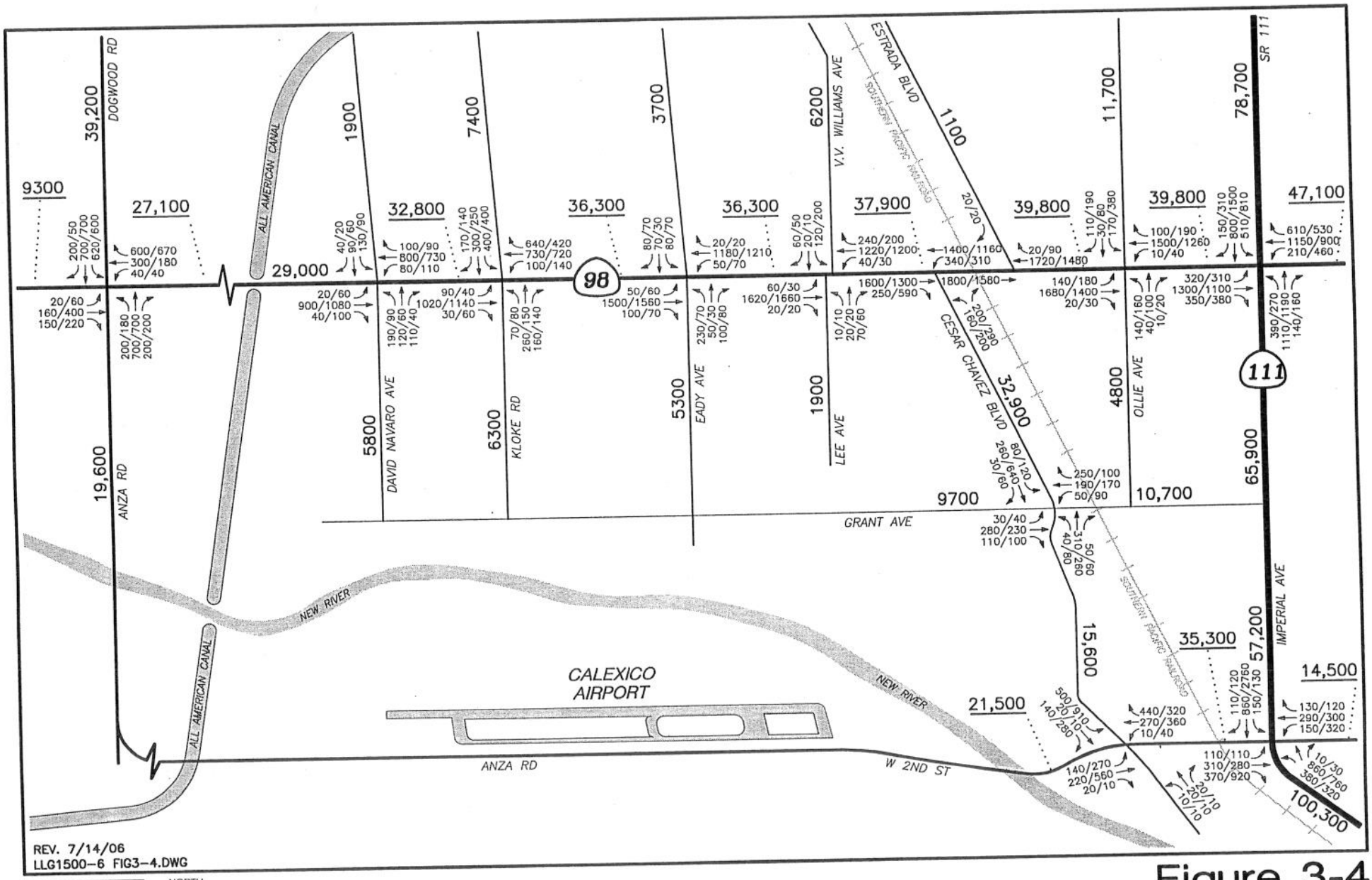


Figure 3-3

2035 Traffic Volumes (without Anza Road Extension) AM/PM Peak Hours & ADT

SR 98 Widening Update



REV. 7/14/06
LLG1500-6 FIG3-4.DWG

LINSCOTT LAW & GREENSPAN engineers

NORTH

NOT TO SCALE

NOTES:
- ADTs are shown midblock, * = estimated ADT
- AM/PM peak hour volumes are shown at the intersections

Figure 3-4

2035 Traffic Volumes (with Anza Road Extension) AM/PM Peak Hours & ADT

SR 98 Widening Update

TRANSPORTATION CONFORMITY WORKING GROUP
of the
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

July 24, 2007
Minutes

THE FOLLOWING MINUTES ARE A SUMMARY OF THE MEETING OF THE TRANSPORTATION CONFORMITY WORKING GROUP. AN AUDIOCASSETTE TAPE OF THE ACTUAL MEETING IS AVAILABLE FOR LISTENING IN SCAG'S OFFICE.

The Meeting of the Transportation Conformity Working Group was held at the SCAG office in Los Angeles.

In Attendance:

Huddleston, Lori	Metro
McAllester, Brad	Metro
Poe, Lisa	SANBAG
Walecka, Carla	Transportation Corridor Agency

SCAG Staff

Amatya, Naresh	SCAG
Asuncion, John	SCAG
Collier, Cheryl	SCAG
Del Rosario, Sheryll	SCAG
Gutierrez, Pablo	SCAG
Mann, Betty	SCAG
Nadler, Jonathan	SCAG
Sherwood, Arnie	SCAG, ITS UC Berkeley

Via Teleconference:

Brady, Mike	Caltrans Headquarters
Bergner, Jennifer	OCTA
Behtash, Arman	Caltrans District 12
Cacatian, Ben	Ventura County
Yoon, Andrew	Caltrans District 7
Fagan, Paul	Caltrans District 8
Gallo, Ilene	Caltrans Headquarters
Johnson, Sandy	Caltrans District 11
Kelly, John	U.S. EPA
Lobeck, Ken	RCTC
O'Connor, Karina	U.S. EPA
Shaw, Amad	Caltrans District 8

TRANSPORTATION CONFORMITY WORKING GROUP
of the
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

July 24, 2007
Minutes

Modrek, Laleh Caltrans District 8

1.0 CALL TO ORDER

Brad McAllester, Metro, called the meeting to order at 10:07 a.m.

2.0 PUBLIC COMMENT PERIOD

There were no comments.

3.0 CONSENT CALENDAR

3.1 Approval Item

3.1 TCWG June 26, 2007 Meeting Minutes

A MOTION was made to MOVE the minutes. The MOTION was SECONDED and UNAMIOUSLY approved.

4.0 INFORMATION ITEMS

4.1 Public Participation Plan: Draft Amendment No. 1

Cheryl Collier, SCAG, stated that SCAG's July 12th meeting of the Transportation and Communications Committee approved the release of SCAG's Public Participation Plan draft amendment No. 1 for 45-day review and public comment period which will close on August 28.

SCAG's Public Participation Plan serves as a guide for SCAG's public involvement process as well as the continuing, comprehensive and coordinated planning process among the stakeholders to ensure the ongoing opportunity for broad-based participation in the development and review of regional transportation plans and programs.

As a metropolitan planning organization (MPO), SCAG is responsible for preparing and utilizing a Plan which is developed in consultation with all interested parties and provides reasonable opportunities for interested parties to comment on the content of Regional Transportation Plan, the

Transportation Improvement Program, and overall work program pursuant SAFETEA-LU requirements.

SCAG made significant efforts to reach out to interested parties to encourage feedback, and involve interested parties in the development of the Plan's strategies and procedures and will continue these efforts in future updates to the Plan.

In March, the Regional Council (RC) adopted the Public Participation Plan. It was anticipated that future amendments may be needed as SCAG staff continued to work with FHWA and FTA on addressing the Department of Transportation's Statewide Transportation Planning; Metropolitan Transportation Planning; and Final Rule published in the Federal Register on February 14, 2007.

Any revisions to the original Plan adopted by the RC in March are highlighted in bold italics in the document that was handed out. The new Appendix "A", page 18, to the adopted Public Participation Plan is intended to provide more explicit details as to SCAG's strategies, procedures and techniques for public participation on the RTP, RTIP and Overall Work Program (OWP).

The five primary goals of the Plan are:

1) Implement an open and on-going participation process that ensures citizen, agency, and interested party participation in, and input into, regional transportation planning and programming.
2) Provide full public access and information to key decisions in the regional transportation planning process.
3) Disseminate clear, concise and timely information to citizens, affected agencies and interested parties.
4) Provide timely responses to issues, concerns, and comments raised by the public regarding the development and implementation of regional transportation plans, programs and projects. Ensure that the comments received are considered and incorporated into the deliberations regarding proposed plans and programs.
5) Enhance the participation process including reaching out to those communities that have been underrepresented and/or underserved.

As part of our continuing effort to engage interested parties in the development of our public participation activities, SCAG recently conducted an online survey of 3,600 individuals within SCAG's contact databases which asked several questions to help SCAG determine how to improve our public participation and outreach efforts. SCAG received 376 responses to the survey.

The Plan will go to the Transportation & Communications Committee (TCC) and RC at their August 30th meeting for consideration of adoption.

4.2 RTP Update

Naresh Amatya, SCAG, informed the Working Group that staff will present information on growth scenarios at the next TAC meeting (July 31, 2007). Analytical information will be shared with the TAC along with discussion of the baseline performance results. Staff will also report on the goods movement strategies being analyzed.

Mr. Amatya stated that SCAG's goal is to release the Draft RTP by the end of October or early November. Staff plans on presenting the Draft RTP to TCC at its November meeting with the recommendation that the draft be released for a public review and comment period. SCAG is then anticipating to adopt the Draft RTP in February 2008.

4.3 RTIP Update

John Asuncion, SCAG, informed the committee that staff had submitted Administrative Amendment No. 9 to Caltrans last week for their review and comments and are anticipating their approval.

Mr. Asuncion also stated that staff is currently finalizing the Draft 2008 RTIP guidelines, which is anticipated to be presented to the TCC at the August 30th meeting, with a recommendation that the draft be released for a 30-day public review. Last week SCAG staff met with the FHWA and EPA to discuss the modeling scenario questions for the 2008 RTIP guidelines. Staff is working on resolving the scenario questions and will bring back the resolutions to this item to the August meeting of the TCWG.

4.4 Review of PM Hot Spot Interagency Review Forms

Jonathan Nadler, SCAG, announced that because of the lack of representation by the FHWA at today's meeting, the PM Hot Spot reviews determined today will be tentative pending review and determination by FHWA:

IMP8020: Not a POAQC (pending FHWA concurrence)

ORA120316: Not a POAQC (pending FHWA concurrence)

SBD35556: Not a POAQC (pending FHWA concurrence)

Andrew Yoon, Caltrans District 7, stated the District had two projects pending from previous meetings that had not been resolved. The projects are LAOD399 (SR-60 at Lemon Avenue) and LAOD332 (I-405 La Tijera). Caltrans has provided additional information as required by the TCWG, but the projects have yet to be determined.

Additionally, Arman Behtash, Caltrans District 12, stated that he had one project pending determination. This project was ORA02011 (I-405 Magnolia and Beach Boulevard).

Jonathan Nadler responded that the projects would be considered not a POAQC pending FHWA concurrence. These projects will be tagged as time constrained.

4.5 AQMP Update

South Coast Air Quality Management District

Jonathan Nadler, SCAG, provided an AQMP update for the South Coast and Mojave Desert/Antelope Valley. On June 22, 2007, ARB held a hearing with members of the public, elected officials, as well as AQMD Board Members. AQMD staff had recommended more aggressive actions to reduce emissions from mobile sources, which contribute over 80 percent of the particulate matter pollution in our region, and are responsible for impacting our health. Based on public input received at the hearing, ARB

has delayed the adoption of its State Strategy. Instead, the ARB Board directed its staff to work closely with the AQMD to strengthen the plan to further reduce mobile source emissions. At the June meeting, ARB's staff did commit to 14 more tons of reductions. The ARB has rescheduled the consideration of the State Strategy and the SCAQMP, to their September meeting.

On July 13, 2007, the AQMD Board adopted 2007 Final AQMP Transportation Conformity Budgets and directed the Executive Officer to forward the adopted 2007 AQMP transportation conformity budgets to the ARB for its approval and subsequent submittal to the U.S. EPA. SCAG has since requested the removal of those measures at this time. SCAG expressed it still needed further time to work with its transportation partners and other stakeholders on the measures. Staff has been having ongoing discussions with its stakeholders about the two goods movement control measures, as well as looking at other alternatives.

Mojave Desert/ Antelope Valley Air Quality Management Districts

The Mojave Desert/Antelope Valley AQMDs have not released their AQMPs yet. These areas are reliant on the South Coast AQMD because a substantial portion of their air quality problem is related to transport of emissions from the South Coast Basin to the Mojave Desert and Antelope Valley Air Basins.

Ventura County Air Pollution Control District

Ben Cacatian, Ventura County APCD, discussed the air plan for Ventura County APCD. Ventura County is APCD planning to request a classification change from Moderate to Severe 15 for 8-hour ozone. Ventura County APCD staff will incorporate the photochemical modeling and attainment demonstration into the draft 2007 AQMP once available from ARB and South Coast AQMD. The anticipated adoption date has been moved from September to October. The attainment date under the Severe 15 is 2019 which means that Ventura must demonstrate attainment in 2018.

SCAG

Jonathan Nadler, SCAG, also discussed that staff is working on a new transportation model and is evaluating whether there needs to be modification to the emission budgets that would be set by using the default EMFAC2007. Staff is discussing its evaluation with ARB, Ventura, and MDAQMD/AVAQMD.

Mr. Nadler also informed the group that there will be a Goods Movement Control Measures Workshop on August 2, 9:00 – 12:00 p.m., at the SCAG office in downtown Los Angeles.

4.6 EPA Conformity Update

One-Hour Ozone Court Case

Karina O'Conner, EPA, provided an update on the Court case relating to the one-hour ozone standard. The Court has held that all the requirements for sub-part 2 areas are still in place, and that there are no new requirements in regard to one-hour ozone conformity.

There was previously some speculation that the Court ruling may affect the submittal date of the 8-hour ozone State Implementation Plans (SIPs) which were to be submitted to US EPA by June 2007. There are no changes to this requirement, and the EPA cannot change those deadlines. However, US EPA is not required to immediately make a finding of failure to submit.

8-hour Ozone Standard

John Kelly, EPA, discussed the potential modifications to the 8-hour Ozone standard, which consider new scientific evidence about ozone and its effects on people and public welfare.

EPA's proposal would revise both ozone standards: the primary standard, designed to protect human health; and the secondary standard, designed to protect welfare (such as vegetation and crops). EPA proposes to set the primary standard to a level within the range of 0.070-0.075 parts per million (ppm). The Agency also requested comments on alternative levels of the 8-

hour primary ozone standard, within a range from 0.060 ppm up to and including retention of the current standard (0.084 ppm). EPA also proposes to specify the level of the primary standard to the third decimal place, because today's monitors can detect ozone that accurately.

EPA is proposing two options for the secondary standard: One option would establish a new form of the standard designed specifically to protect sensitive plants from damage caused by repeated ozone exposure throughout the growing season. This cumulative standard would add daily ozone concentrations across a three-month period. EPA is proposing to set the level of the cumulative standard within the range of 7 to 21 ppm-hours. The other option would follow the current practice of making the secondary standard identical to the proposed primary 8-hour standard.

EPA will take public comment for 90 days following publication of the proposal in the Federal Register and will hold four public hearings. The meeting in Los Angeles will be held on August 30, 2007. EPA will issue final standards by March 12, 2008.

24-hour PM2.5 Standard

Mr. Kelly also discussed the new 24-hr PM2.5 standard. On October 17, 2006, EPA published a final rule that strengthened the 24-hour PM2.5 standard from the 1997 level of 65 micrograms per cubic meter ($\mu g/m^3$) to 35 $\mu g/m^3$, and retained the 1997 annual PM2.5 standard of 15.0 $\mu g/m^3$. This final rule was effective on December 18, 2006. The secondary standards for the 24-hour and annual standards are set at the same levels as the primary standards.

The new 24-hour PM2.5 Standard requires States to make recommendations by Nov. 2007 for areas to be designated attainment (meeting the standards) and nonattainment (violating the standards). Subsequently, EPA will make designations by November 2009; those designations will become effective in April 2010. SIPs will be due three years after designations, in April 2013. States must meet the standards by April 2015, with a possible extension to April 2020.

TRANSPORTATION CONFORMITY WORKING GROUP
of the
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

July 24, 2007
Minutes

5.0 CHAIR'S REPORT

No new items to report.

6.0 INFORMATION SHARING

Jonathan Nadler stated that the Federal Register released a notice on July 19th dealing with the Agency Information Collection Activity having to deal with conformity. Mr. Nadler inquired of Karina O'Conner, EPA, as to the importance of this item or whether it was more of a formality. Ms. O'Connor responded that she had submitted some preliminary input for the region a few months ago. Ms. O'Connor stated that if SCAG staff had the time to submit additional input, it would be welcomed.

7.0 ADJOURNMENT

Brad McAllester, Metro, adjourned the meeting at 11:25 a.m.

The next Transportation Conformity Working Group meeting will be held on Tuesday, August 28, 2007 at the SCAG office in Los Angeles.

The following is a copy of an email from Jean Mazur of the Federal Highway Administration (FHWA) to the Southern California Association of Governments Transportation Conformity Working Group (TCWG), sent August 6, 2007. The email provides FHWA concurrence to the TCWG decision on July 24, 2007, that the SR 98 Widening Project, identified as IMP8020, is not a Project of Air Quality Concern (POAQC).

"Mazur, Jean" <Jean.Mazur@fhwa.dot.gov>
08/06/2007 10:27 AM

To: "Sheryll Del Rosario" <delrosar@scag.ca.gov>
cc: "Jonathan Nadler" <nadler@scag.ca.gov>, <andrew.yoon@dot.ca.gov>, "Arman Behtash" <Arman_Behtash@dot.ca.gov>, "Sandy Johnson" <sandy_johnson@dot.ca.gov>, <oconnor.karina@epa.gov>, <mike.brady@dot.ca.gov>
Subject: RE: TCWG - Pending Determinations

Sheryll – Here is an update on my review for the projects. I have also included a few from the last TCWG meeting as well:

LAOD399 – I still have some outstanding questions that I have sent to Andrew.
LAOD73 and 10167 – We have signed the final document and Caltrans is working on the ROD. While our final approval is still outstanding, I believe that we are beyond the interagency consultation stage. I will coordinate any outstanding issues with EPA and Caltrans.
LAOD332 – This document is a CE. I am waiting to hear if it is being processed under the 6004 or 6005 MOU before I send any comments.
ORA02011 – I concur that the project is not a project of air quality concern.
IMP8020 - I concur that the project is not a project of air quality concern.

Thanks,
Jean

Attachment X

Landscaping concepts shown in this project are subject to an agreement from City of Calexico to maintain landscaping within the project limits. In case City of Calexico is unable to maintain the landscaping then the project during design phase will be modified to hardscape only.

DISTRICT TRAFFIC MANAGER BRANCH

CALTRANS- DISTRICT –11

SAN DIEGO, CALIFORNIA

TRANSPORTATION MANAGEMENT PLAN

EA: 11-080200

IN IMPERIAL COUNTY ON STATE ROUTE 98 FROM 0.5 KM WEST OF DOGWOOD ROAD TO 0.3 KM EAST OF ROCKWOOD AVENUE

11-IMP-98 KP 48.2 TO 52.5

July 1, 2008

REALIGNMENT AND WIDENING WITHIN IMPERIAL COUNTY ON STATE ROUTE 98 FROM 0.5 KILOMETERS WEST OF DOGWOOD ROAD TO 0.3 KILOMETERS EAST OF ROCKWOOD AVENUE

This Transportation Management Plan has been prepared under the direction of the following registered engineers. These registered Civil/Traffic Engineers attest to the technical information contained herein and have judged the qualifications of any technical specialists involved in the production of this report or in the providing of any engineering data upon which recommendations, conclusions and decisions were based.

Jason Lemons, P.E.
TMP Coordinator
Dokken Engineering

With the concurrence of:

Signature to be included at PS&E Phase
Allen H. Idan, P.E.
Caltrans TMP Manager

Signature to be included at PS&E Phase
Kasim Mandani, P.E.
Caltrans Project Manager

Approval Recommended By:

Signature to be included at PS&E Phase
Farood Khadem, P.E.
Caltrans, District Traffic Manager

Approved By:

Signature to be included at PS&E Phase
Joe Hull, P.E.
Caltrans, District Division Chief
Traffic Operations

PROJECT TEAM

Mario Orso
Caltrans, District 11
4050 Taylor Street
San Diego, CA 92110
(619) 688-2561

Kazim Mamdani
Caltrans, District 11
4050 Taylor Street
San Diego, CA 92110
(619) 718-7840

Sai Win
Caltrans, District 11
4050 Taylor Street
San Diego, CA 92110
(619) 688-3137

Chris Johnson
Dokken Engineering
5675 Ruffin Road, Suite 250
San Diego, CA 92110
(858)514-8377

Jason Lemons
Dokken Engineering
5675 Ruffin Road, Suite 250
San Diego, CA 92123
(858) 514-8377

Jeff Burdick
Dokken Engineering
5675 Ruffin Road, Suite 250
San Diego, CA 92123
(858) 514-8377

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EXECUTIVE SUMMARY

The Transportation Management Plan (TMP) is designed to minimize motorist delays when implementing projects on the State Freeways and Highways System. This should be accomplished without compromising public or worker safety, or the quality of the work being performed.

This report presents a TMP for the improvements proposed for State Route 98 (SR-98) in Imperial County, from west of Dogwood Road to east of Rockwood Avenue (see **Appendix A**).

Construction improvements for the Realignment Widening Project include the following modifications:

Develop a four to six-lane conventional highway and a two to six lane highway
Grading, planting and irrigation of slopes adjacent to the proposed highway
Intersection improvements for local roads along SR-98
Implementation of drainage facilities along SR-98

Lane closure charts, given in **Appendix C,** will be developed by Caltrans District Traffic Manager (DTM) Branch during the PS&E Phase of the project.

A joint effort between the District Traffic Manager's Branch and Construction with support from the Public Information office will ensure that all the TMP elements are put in place correctly. The TMP is a living document, which shall be monitored by the DTM branch through the course of construction.

If any elements of this TMP do not perform as expected, adjustments shall be made accordingly. Additional TMP elements may become necessary should the scope of work change, or there is a drastic change in traffic volumes or any other unforeseen circumstances.

The TMP strategies recommended in this report are:

Public Information
Motorist Information Strategies
Incident Management
Construction Strategies
Demand Management
Alternate Route Strategies

The goals and objectives of the TMP can be effectively achieved by implementing the recommendations of this report.

PROJECT DESCRIPTION

The California Department of Transportation (Caltrans) in cooperation with the City of Calexico (City), proposes to improve traffic operations, enhance bicycle and pedestrian safety, and improve drainage performance on State Route 98 (SR-98). The project is located on SR-98 from .35 kilometers (0.22 miles) west of Dogwood Road to Rockwood Avenue, KP 48.2 to KP 52.5 (PM 30.0 to PM 32.6).

The following describes the proposed alternatives:

(1) No Build Alternative: The No Build Alternative proposes no improvements to the project area.

(2) Build Alternative: The Build Alternative proposes to widen the road from two to four lanes from Dogwood Road through just west of Ollie Avenue, and from four to six lanes from Ollie Avenue through Highway-111 (Hwy-111). In addition, the alternative will update the number of turning lanes according to traffic needs at each intersection within the project limits. The following intersections will be signalized as a result of this alternative: SR-98/David Navarro Avenue, SR-98/V.V.Williams Avenue/Lee Avenue, and SR-98/Cesar Chavez Boulevard. This alternative will incorporate a new Class II bike lane, sidewalks and a standard drainage system.

Cost estimations for the Build Alternative were escalated for the year 2017 to reflect a 5 percent increase for inflation compounded annually. Total estimated project costs for Phase 1, in 2017 dollars, are $46,950,000 (which includes $41,107,000 in capital costs and $5,811,300 in support costs) for the road widening improvements. Total estimated project costs for Phase 2, in 2017 dollars, are $19,750,000 (which includes $17,238,000 in capital costs and $2,490,600 in support costs) for the road widening improvements. Total estimated project costs for the combined Phase 1 and Phase 2, in 2017 dollars, are $64,300,000(which includes $55,911,000 in capital costs and $8,301,700 in support costs) for the road widening improvements. The project is listed in the 2007 Regional Transportation Plan (RTP), and the 2006 State Transportation Improvement Program (STIP). Additional funding sources include City, State, Federal, and local funds.

TRANSPORTATION MANAGEMENT PLAN (TMP)

Goals & Objectives

The policy for creating the Transportation Management Plan (TMP) according to Caltrans Deputy Directive 60 (DD-60) is to minimize motorist delays when implementing projects or performing other activities on the State highway and freeway systems. This is accomplished without compromising public or worker safety, or the quality of the work being performed. Deputy Directive 60 is included as **Appendix D**.

This TMP will address the closure requirements to complete the project in a cost efficient and timely manner with minimal interference to the traveling public. A successful TMP results in minimized project-related traffic delay and accidents by the effective application of traditional traffic mitigation strategies and innovative combinations of other strategies. These additional methods to reduce delay include timely dissemination of information to the public and motorists regarding construction operations; strategies centered on demand, incident, and system management; and use of alternative routes.

Various transportation management techniques will be utilized with this project. The lessons learned from this project and others will be used in future project TMPs. An evaluation follow-up report will be prepared to analyze and evaluate the effectiveness of these TMP elements.

In summary the goals and objectives of this TMP are:

- Reducing traffic demand or time spent in the queue to less than 30 minutes above normal recurring traffic delay.
- Maintaining traffic flow throughout the corridor and the surrounding areas.
- Providing a safe environment for the work force and motoring public.
- Minimizing impacts to local businesses.

EXISTING FACILITIES

SR-98 is a two-lane highway from David Navarro Avenue to Ollie Avenue and four-lane facility from Ollie Avenue to SR-111. There are traffic signals at the SR-98/Kloke Road and SR-98/SR-111 intersections and left-turn pockets at each intersection except V.V. Williams Avenue.

On the north side of SR-98, there is an asphalt concrete sidewalk from Kloke Avenue to Eady Avenue and from V.V. Williams Avenue to Ollie Avenue, there is also a Portland cement concrete (PCC) sidewalk on the north side of SR-98 from Emerson Avenue to SR-111. On the south side of SR-98, there is a PCC sidewalk from Ollie Avenue to SR-111.

A 1995 Minor B safety project restriped SR-98 at Cesar Chavez Boulevard for a left-turn pocket. The restriping reduced the standard 2.4 m shoulder widths to a nonstandard 0.6 m shoulder widths. All geometrics are standard except at this location.

The SR-98/V.V. Williams intersection is a perpendicular T-intersection with stop signs on all approaches. All geometric widths are standard. There is an existing frontage street (Canal Street) on the north side in the northwest quadrant, approximately 24 m from SR-98. Approximately 30 m West of V.V. Williams on the south side, in the southwest quadrant, Lee Road forms a T-intersection perpendicular with SR-98. There is an existing asphalt concrete sidewalk on the northeast corner extending easterly from V.V. Williams.

Existing traffic LOS from Dogwood to SR-111 ranges from "D" to "F." The majority of this portion of SR-98 is currently at LOS F

TMP ELEMENTS

An Overview

The following TMP elements are considered the most important with respect to reducing traveler delay and enhancing traveler safety:

1- Public Awareness Campaign (PAC)

2- **Motorist Information Strategies**

- Portable changeable message signs (PCMS).

3- Incident Management

4- Construction Strategies

5- Demand Management

6- Contingency Plans

- Traffic Contingency Plan.
- Contractor Contingency Plan.

The cost estimates for the above TMP elements are listed in the Transportation Management Plan Data Sheet (**Appendix B**). These TMP elements are discussed in the following sections:

1. Public Awareness Campaign

The primary goal of a Public Awareness Campaign (PAC) is to educate motorists, merchants, residents, elected officials and government agencies about the construction process and the associated impacts and to outline the steps that can be taken to minimize these impacts. The PAC is an important tool for building partnerships between agencies and the community, reaching target audiences with important construction project information, project status and informing motorists about the benefits of the improved facility. With an effective PAC, public acceptance, tolerance and cooperation will be enhanced.

Specific elements that may be used to accomplish these objectives include:

- Public Information Officer- By assigning a dedicated person to this position public concern can be professionally addressed.
- Open House- Schedule an open house before the project starts to provide information to interested parties.
- Brochures and Mailer - Delivered throughout local communities to residents and businesses by a walking delivery service and U.S. Postal service. Brochures will also be available at the City Hall, Chamber of Commerce, and local legislators.
- Media Releases/Special Alerts - News outlets and traffic reporters will be sent detailed information before significant project events so that proper coverage of the construction activities can be given.
- Paid Advertising – Ads may be placed in pertinent newspapers/radio stations within the Calexico area.
- Notifications to major business centers – i.e. local malls and business center property managers. Affected businesses and venues will be notified in advance of construction activities to help disseminate information about the subject project.
- Telephone Hotline - services via an 800 number.
- Internet - Caltrans District 11 website will be regularly updated with project information and links providing the traveling public with current project status, so they can make informed travel decisions. The Caltrans District 11 website can be found at http://www.dot.ca.gov/dist11/projectinfo/index.htm.

The PAC is designed to meet the following objectives:

- Identify all target audiences who will be impacted by construction activities.
- Disseminate project information to the public and proactively answer project-related questions regarding construction activities, property acquisition concerns, road closures, noise, dust, and other construction related activities.
- Inform the public about the construction process and how the project will affect their travel on SR-98.
- Promote alternate modes of transportation and alternate routes.
- Promote partnerships between Caltrans, elected officials, merchants and businesses, residents and the traveling public.

2. Motorist Information Strategies

Providing motorists with current road conditions and routes is the objective of the Motorist Information Strategy program. The elements described below are designed to allow the Contractor and Resident Engineer (R.E.) a means of communicating with the traveling public. Depending on the communication medium, the information passed to the public may pertain to the upcoming week's detour routes or an immediate traffic issue requiring an alternate route or a long delay.

Specific elements that may be used to accomplish these objectives include:

- Portable Changeable Message Signs (PCMS) – Provide up to the minute traffic and road conditions, allowing the motorist to make alternate travel plans or to anticipate delays. It is important to utilize message signs at the following locations during construction:

  - Ø On the highway approximately ½ mile in advance of any lane closure.
  - Ø On the highway approximately ½ mile in advance of the alternate routes.

  Suitable messages for the Portable Electronic Message Signs should be developed jointly by Caltrans representatives from Traffic Management and Construction. During construction, all Portable Electronic Message Signs should be checked daily to ensure that they are in proper working condition and that their visibility is not compromised and then repaired or replaced as needed.
- Ground Mounted Signs – Inform motorist of future closures, detour routes and construction status to increase safety and driver certainty.
- Commercial Traffic Radio – Information may be released to radio stations for inclusion in there traffic reports.
- Caltrans Highway Information Network (CHIN) – Provides advanced information to motorists regarding planned lanes, ramps, and other type of freeway closures through an information telephone line, 1-800-427-7623, and through Caltrans website at http://www.dot.ca.gov/hq/roadinfo/ .

3. Incident Management

The previous two strategies, Public Information and Motorist Information, are measures designed to prevent traffic congestion and accidents. However it is inevitable that incidents will occur which will negatively affect traffic. The following elements are designed to identify these incidents as rapidly as possible and provided the appropriate corrective action.

- Call Boxes – When call boxes or access to them is affected the District 11 callbox coordinator should be contacted at (858) 268-8260. Notes should also be included to the R.E. that in spot locations where call boxes will be re-installed, the shoulder work should be completed as soon a practicable to allow the re-installation of the call box.
- Construction Zone Enhanced Enforcement Plan (COZEEP) - Implementation of a COZEEP to provide California Highway Patrol assistance and surveillance within construction areas. The officers can enforce speed reductions within work zones and provide emergency response support.
- Traffic Surveillance Stations – Installation of a closed circuit television (CCTV) system that would provide immediate notification of a traffic incident. CCTV has been considered for this project however due to the high cost with marginal benefit, it is not appropriate for this project.

- 911 Cellular Calls – Real time emergency information on road conditions can be relayed to the Transportation Management Center (TMC) by the public using cellular phones.

4. Construction Strategies

There are several transportation elements that fall under Construction Strategies designed to improve traffic congestion within construction zones. These elements generally impose limitation and guidelines on the contractor during construction. The goal of these Construction Strategies is to ensure that the owner's goals for traffic flow (Caltrans, Local Agency, etc.) are also the contractor's goals.

- Incentive/Disincentive Clauses – A late pickup of a planned lane closure will be detrimental to the level of service in this facility and have severe economic consequences for the motorists involved in the resulting congestion. As a result, a "delay clause" is incorporated into the contract's Special Provisions to help ensure that the contractor complies with the hours shown in the lane closure charts, a monetary penalty of $3,100.00 will be imposed on the contractor for each ten-minute increment if the closure extends beyond the specified time for reopening. It is the responsibility of the Resident Engineer to impose this penalty on the contractor when circumstances warrant. This strategy creates a huge incentive for the contractor to plan his work well along with adequate contingency plans, thus insuring an on time opening of lane closures. A second, more extreme method is for the state representative to suspend the contract work.
- Late Opening Damage Clauses – Encourages the contractor to complete the work on time and avoid further traffic delays due to construction.
- Off peak/ Weekend Work – Limits the effects on commuter traffic while still allowing access to complete the work.
- Planned Lane Closures – Allowing motorist to plan and curtail their commutes or choose an alternative means of transportation. Lane closure charts (found in **Appendix C**) will be included in the final design. Full roadway closures of SR-98 are not anticipated for the construction of this project.
- Sign Structures are to be placed under California Highway Patrol (CHP) traffic breaks.

5. Demand Management

The underlying principle of Demand Management is to lower loading on the highway by promoting alternate modes of transportation and altering the peak traffic times. Demand Management techniques include:

- Variable Work Hours – This very important strategy may be an economical way to decrease the volume of traffic in large numbers during the peak hours. By encouraging employers in the surrounding areas to implement 9/80 schedules or similar flexible shifts and working hours, peak traffic volumes can be reduced.

6. Contingency Plans

Contract Special Provisions require the contractor to provide a Contingency Plan to the Resident Engineer. This plan should be submitted by the contractor and reviewed by the R.E. The Contractor Contingency Plan should detail back up equipment and material that will be on site for critical operations. A critical operation is any operation where an unforeseen mishap could impede motorist or cause lane closure to run past its allotted time window.

In addition to the Contractor's Contingency Plan a contingency plan should be developed by the agency overseeing the construction project. This plan should be activated whenever the contractor's contingency plan is anticipated to fail and opening of lanes on time is deemed unachievable by R.E./field inspectors. Depending on the time and location of the unplanned event, there may be the potential for redirecting traffic via city street detours. Therefore, in an effort to enhance contingency efforts, the DTM Branch should be made available on an as needed basis to aid in providing assistance if redirecting traffic volumes is required. Such efforts may require additional cooperation on the part of Caltrans Public Affairs, CHP COZEEP units, TMP coordinator, TMC personal, Traffic Management Team (TMT) units, and/or maintenance personnel. Early notification to the following is recommended:

- 5/24 TMC personnel at (858) 467-4332
- Public Information officer
- District Traffic Manager Branch
- CHP
- TMT
- Maintenance

The TMC personnel have access to contact numbers of all branches listed above and can assist in communications if required by field personnel. It is recommended that the Contractor Contingency plan be reviewed prior to any lane closure activity.

TMP COORDINATION AND REVIEW

During the course of construction, TMP staff and the construction Traffic Manager Branch will observe traffic conditions and make recommendations to the Resident Engineer concerning any changes that need to be made with respect to Traffic Management. The TMP coordinator will work closely with the construction personnel to develop timely recommendations regarding: changing messages on the fixed signs and the signing along detour/alternate routes. Should the collection of relevant traffic data be required, such as the amount of traffic flowing past the work area and the actual traffic

delay that occurs during construction, data may be collected and given to the TMP Manager and field personnel.

Traffic control issues will be relayed to workers by performing a job hazard analysis prior to starting work and used for toolbox/tailgate safety meetings. A tailgate safety meeting shall be held immediately prior to any activity involving a lane closure on the highway or ramp.

After the project is completed, a follow-up report will be prepared by the TMP Coordinator that discusses the effectiveness of the TMP elements that were used and provides "lessons learned" from this project. Estimates will be given concerning how much traffic was diverted away from the construction area, along with the volume of traffic that was able to flow past the work area, queue lengths, and traffic delays that were caused by the construction. This information should be valuable during the preparation of future TMPs for similar projects.

APPENDX (A)
Vicinity Map

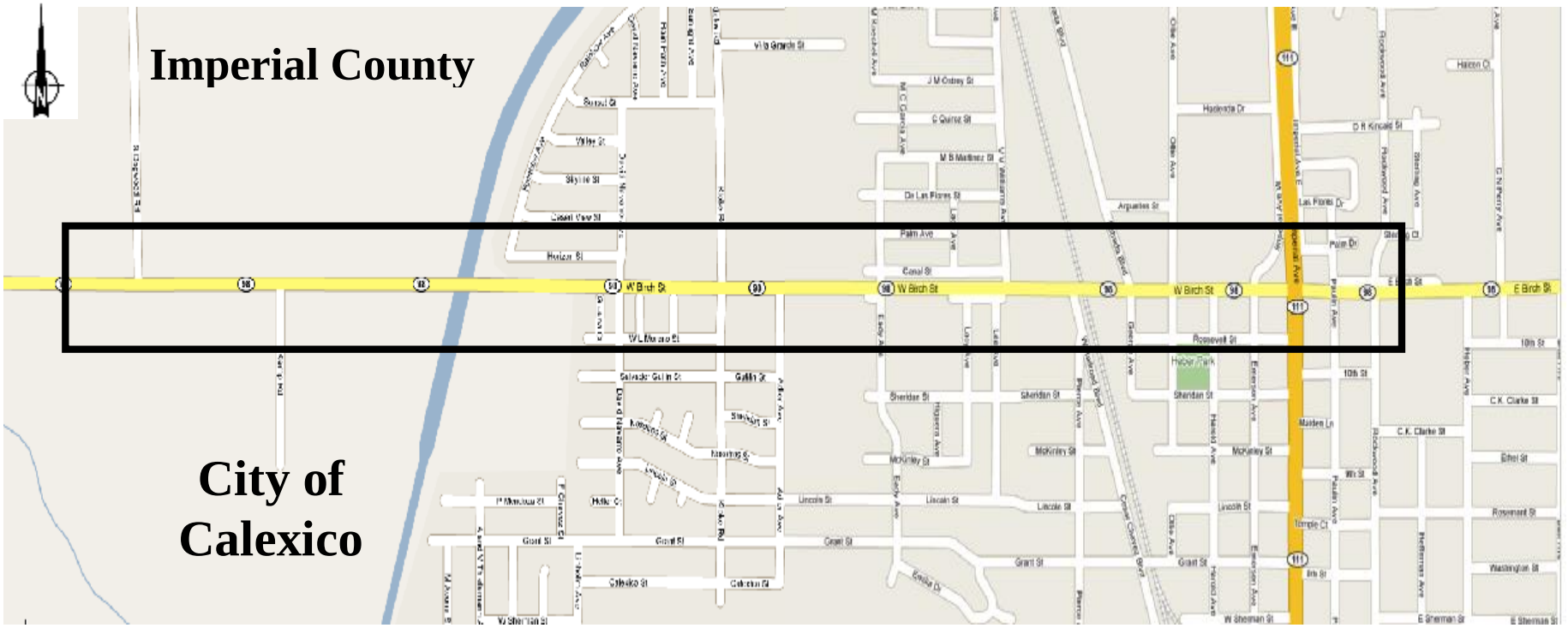

Figure 1
Project Location/Vicinity Map

APPENDX (B)
TMP Data Sheet

TRANSPORTATION MANAGEMENT PLAN DATA SHEET
(Preliminary TMP Elements and Costs)

Co/Rte/PM 11-IMP-98 EA 11-08020 Alternative No. _____

Project Limit PM 30.0/32.6

Project Description SR-98 Widening

1) Public Information

- [x] a. Brochures and Mailers — $65
- [ ] b. Press Release
- [x] c. Paid Advertising — $5,000
- [ ] d. Public Information Center/Kiosk
- [ ] e. Public Meeting/Speakers Bureau
- [ ] f. Telephone Hotline
- [ ] g. Internet
- [x] h. Others Local Business Coordination — $5,000

2) Motorists Information Strategies

- [ ] a. Changeable Message Signs (Fixed)
- [x] b. Changeable Message Signs (Portable) — $40,000
- [x] c. Ground Mounted Signs — $19,500
- [ ] d. Highway Advisory Radio
- [ ] e. Caltrans Highway Information Network (CHIN)
- [ ] f. Others _____

3) Incident Management

- [x] a. Construction Zone Enhanced Enforcement Program (COZEEP) — $10,000
- [ ] b. Freeway Service Patrol
- [ ] c. Traffic Management Team
- [ ] d. Helicopter Surveillance
- [ ] e. Traffic Surveillance Stations (Loop Detector and CCTV)
- [ ] f. Others _____

4) Construction Strategies

- [x] a. Lane Closure Chart — $50,000
- [ ] b. Reversible Lanes
- [ ] c. Total Facility Closure
- [ ] d. Contra Flow
- [ ] e. Truck Traffic Restrictions
- [ ] f. Reduced Speed Zone
- [ ] g. Connector and Ramp Closures
- [ ] h. Incentive and Disincentive
- [ ] i. Moveable Barrier
- [ ] j. Others _____

5) Demand Management

- [ ] a. HOV Lanes/Ramps (New or Convert)
- [ ] b. Park and Ride Lots
- [ ] c. Rideshare Incentives
- [ ] d. Variable Work Hours
- [ ] e. Telecommute
- [ ] f. Ramp Metering (Temporary Installation)
- [ ] g. Ramp Metering (Modify Existing)
- [ ] h. Others _____

6) Alternative Route Strategies

- [ ] a. Add Capacity to Freeway Connector
- [ ] b. Street Improvement (widening, traffic signal... etc)
- [ ] c. Traffic Control Officers
- [ ] d. Parking Restrictions
- [ ] e. Others _____

7) Other Strategies

- [ ] a. Application of New Technology
- [ ] e. Others _____

TOTAL ESTIMATED COST OF TMP ELEMENTS = $131,000

Project Notes:

Assumptions/ Comments:
1. Entire project will take approximately XX working days to construct.
2. Current dollar values used. Inflation was not factored into the estimate.
3. Traffic Control/Maintain Traffic costs were not provided. Please consult with the OE or Construction office for this estimate.
4. Portable CMS specified for this project by this estimate are designated for congestion relief as outlined by DD-60. Portable CMS required for other purposes should be included under other specifications.
5. The COZEEP specified for this project by this estimate is designated for congestion relief as outlined by DD-60. The COZEEP required for other purposes should be included under other specifications.
Note 1: All projects should be evaluated for applicability of A+B Bidding. Consult the Lane Closure Charts Coordinator for the analysis.
Note 2: As outlined in Deputy Directive 60, this TMP is a living document, subject to change as required by changing circumstances. If there is material change to the project scope which will affect the function or adequacy of the TMP, then changes to the TMP must be addressed. If traffic conditions at the project site demonstrate that TMP elements need to be adjusted to adequately address congestion, then the TMP shall be altered accordingly.
Note 3: Hospitals with emergency services and fire stations that may require access through work zones at all hours should be accommodated. Schools, major venues, shopping malls, and other heavily utilized areas should also be notified of construction activities that may impact their services.

PREPARED BY Jason Lemons (858) 514-8377 DATE

APPROVED BY To be approved at PS&E Phase Allen Holden DATE

APPENDIX (C)
Lane Closure Requirements

To be included at PS&E Phase

APPENDIX (D)
Deputy Directive 60

DEPUTY DIRECTIVE

Number: DD-60

Refer to Director's Policy: 03-Safety and Health

05-Multimodal Alternatives Analysis

08-Freeway System Management

Effective Date: 6-15- 2000

Supersedes: P&P 89-04

Title: Transportation Management Plans

POLICY

Caltrans minimizes motorist delays when implementing projects or performing other activities on the State highway system. This is accomplished without compromising public or worker safety, or the quality of the work being performed.

Transportation Management Plans (TMPs), including contingency plans, are required for all construction, maintenance, encroachment permit, planned emergency restoration, locally or specially-funded, or other activities on the State highway system. Where several consecutive or linking projects or activities within a region or corridor create a cumulative need for a TMP, Caltrans coordinates individual TMPs or develops a single interregional TMP.

TMPs are considered early, during the project initiation or planning stage.

Major Lane Closures require District Lane Closure Review Committee approval.

DEFINITION/
BACKGROUND

A *TMP*, when implemented, results in minimized project-related traffic delay and accidents by the effective application of traditional traffic mitigation strategies and an innovative combination of public and motorist information, demand management, incident management, system management, alternate route strategies, construction strategies, or other strategies.

Major Lane Closures are those that are expected to result in ***significant traffic impacts*** despite the implementation of TMPs.

Significant traffic impact is 30 minutes above normal recurring traffic delay on the existing facility or the delay threshold set by the District Traffic Manager, whichever is less.

Contingency Plans address specific actions that will be taken to restore or minimize effects on traffic when congestion or delays exceed original estimates due to unforeseen events such as work-zone accidents, higher than predicted traffic demand, or delayed lane closures.

RESPONSIBILITIES

District Directors:

- Ensure TMPs are considered early for all projects and activities performed on the State highway system.

- Enforce and advocate TMPs and lane closure policies to ensure compliance with established procedures, guidelines, and policies.

- Consider the cumulative impact of multiple projects. Recognize the need for and oversee implementation and coordination of interregional TMPs between corridors, districts, neighboring states, and Mexico.

- Ensure that TMP planning and implementation is coordinated with the California Highway Patrol (CHP).

- Ensure capital outlay support resources for TMP activities are provided in District workplans.

District Traffic Manager:

- Act as the single focal point for all traffic impact decisions resulting from planned activities on the State highway system.

- Determine the need for and extent of a TMP.

- Facilitate review, approval, modification, or disapproval of all TMP measures and planned lane closure requests on the highway system.

- Direct the termination or modification of active planned lane closure operations without compromising the safety of the public or workers, when traffic impact becomes significant.

TMP Manager

- Act as single focal point for development and implementation of TMPs.

District Encroachment Permit, Design, Maintenance, and Project Engineers:

- Ensure TMPs are fully incorporated in the development of project plans, specifications and estimates.

District Project Manager:

- Designate project resources for all TMP measures and activities.

- Inform the DTM of all projects that may require a TMP in any phase of their development and coordinates scheduling of projects to minimize or eliminate conflicting construction activities.

- Recognize and advocate TMP development, implementation and conflict resolution from project initiation through construction.

District Construction Engineers, Resident Engineers, Encroachment Permit Inspectors, Oversight Engineers, and Maintenance Supervisors/Superintendents:

- Work to insure necessary TMP measures are planned for and implemented.

- Work with the District Traffic Manager (DTM) to insure that project activities conform to the TMP, contingency plans are implemented if necessary, and traffic delay is minimized and does not exceed allowable limits.

- Ensure Contractor is prepared to comply with TMPs as related to its performance of work.

- Notify District communication centers or District Transportation Management Center (TMC) of significant traffic impact due to a planned lane closure.

- Coordinate work activities with CHP.

APPLICABILITY

- All Caltrans employees involved in development and implementation of TMPs.

ORIGINAL SIGNED BY:

_____

TONY HARRIS
Chief Deputy Director

APPENDIX (E)
SSPs

To be included at PS&E Phase

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.52/52.23	1	5

REGISTERED ENGINEER — 02/21/06 DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

Dokken Engineering
5675 Ruffin Road
Suite 250
San Diego, CA 92123

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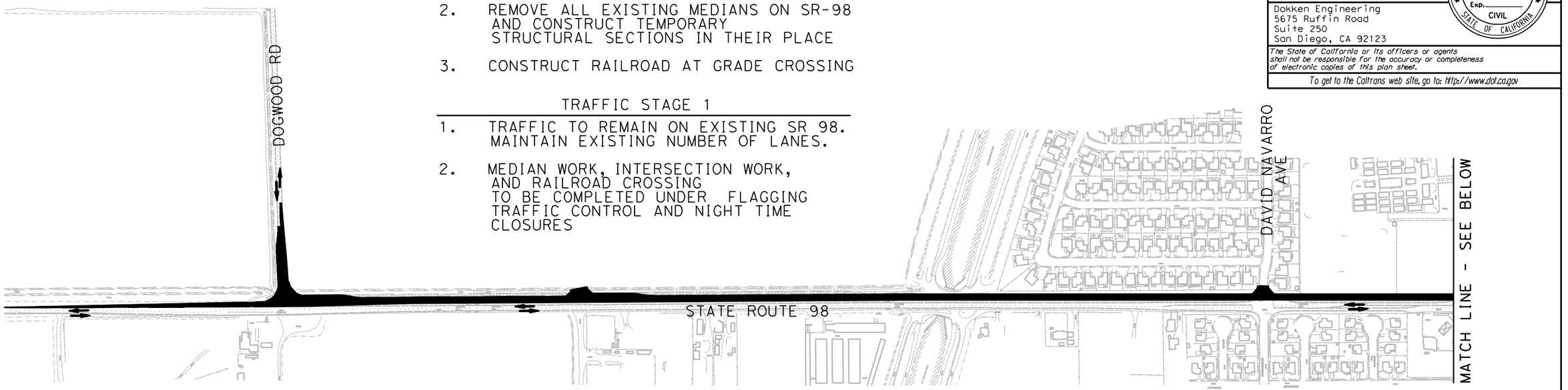
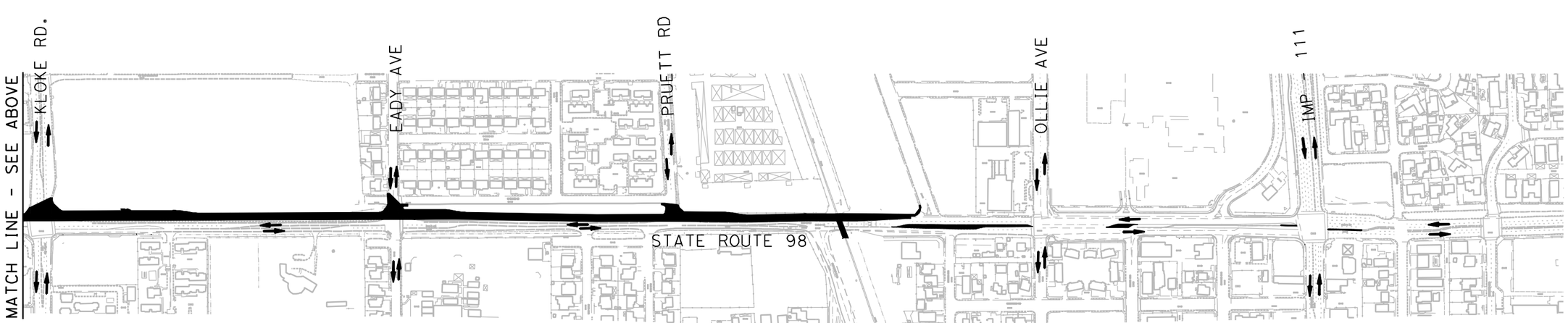
STAGE 1

1. WIDEN PORTIONS OF NORTHSIDE OF SR-98 FROM STA 493+00 TO 524+00
2. REMOVE ALL EXISTING MEDIANS ON SR-98 AND CONSTRUCT TEMPORARY STRUCTURAL SECTIONS IN THEIR PLACE
3. CONSTRUCT RAILROAD AT GRADE CROSSING

TRAFFIC STAGE 1

1. TRAFFIC TO REMAIN ON EXISTING SR 98. MAINTAIN EXISTING NUMBER OF LANES.
2. MEDIAN WORK, INTERSECTION WORK, AND RAILROAD CROSSING TO BE COMPLETED UNDER FLAGGING TRAFFIC CONTROL AND NIGHT TIME CLOSURES





LEGEND:

DIRECTION OF TRAFFIC

STAGE CONSTRUCTION

STAGE 1

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

STAGE CONSTRUCTION

NO SCALE

SC-01

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

OVERSIGHT ENGINEER: K. MAMDANI

CALCULATED/DESIGNED BY

CHECKED BY

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LAST REVISION 02-11-08

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.52/52.23	1	5

REGISTERED ENGINEER — 02/21/06 DATE

PLANS APPROVAL DATE

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Dokken Engineering
5675 Ruffin Road
Suite 250
San Diego, CA 92123

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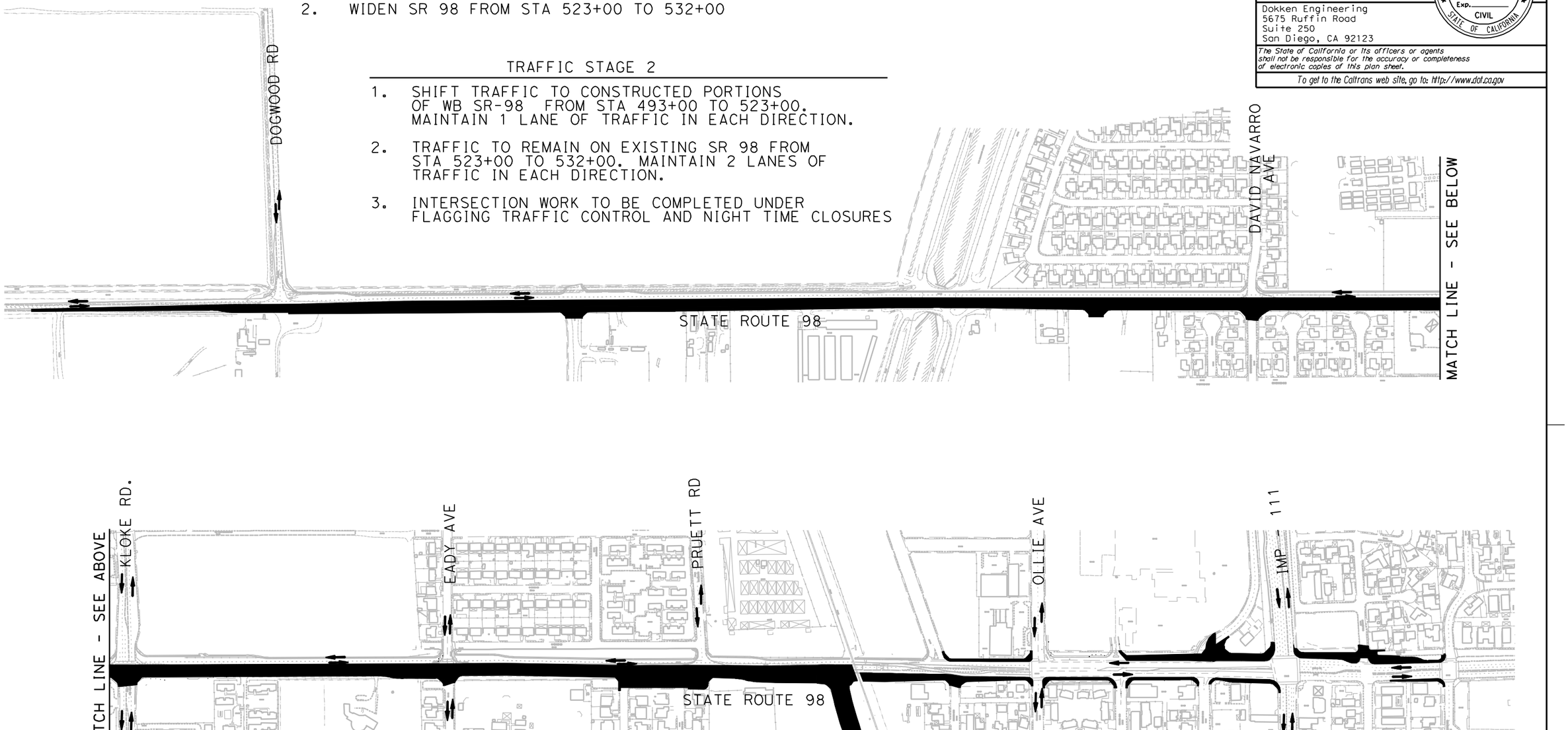
STAGE 2

1. CONSTRUCT REMAINING PORTIONS OF SR 98 FROM STA 493+00 TO 523+00
2. WIDEN SR 98 FROM STA 523+00 TO 532+00

TRAFFIC STAGE 2

1. SHIFT TRAFFIC TO CONSTRUCTED PORTIONS OF WB SR-98 FROM STA 493+00 TO 523+00. MAINTAIN 1 LANE OF TRAFFIC IN EACH DIRECTION.
2. TRAFFIC TO REMAIN ON EXISTING SR 98 FROM STA 523+00 TO 532+00. MAINTAIN 2 LANES OF TRAFFIC IN EACH DIRECTION.
3. INTERSECTION WORK TO BE COMPLETED UNDER FLAGGING TRAFFIC CONTROL AND NIGHT TIME CLOSURES



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STAGE CONSTRUCTION

STAGE 2

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STAGE CONSTRUCTION

NO SCALE

SC-02

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K. MAMDANI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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8	IMP	98	48.52/52.23	1	5

REGISTERED ENGINEER — 02/21/06 DATE

PLANS APPROVAL DATE

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San Diego, CA 92123

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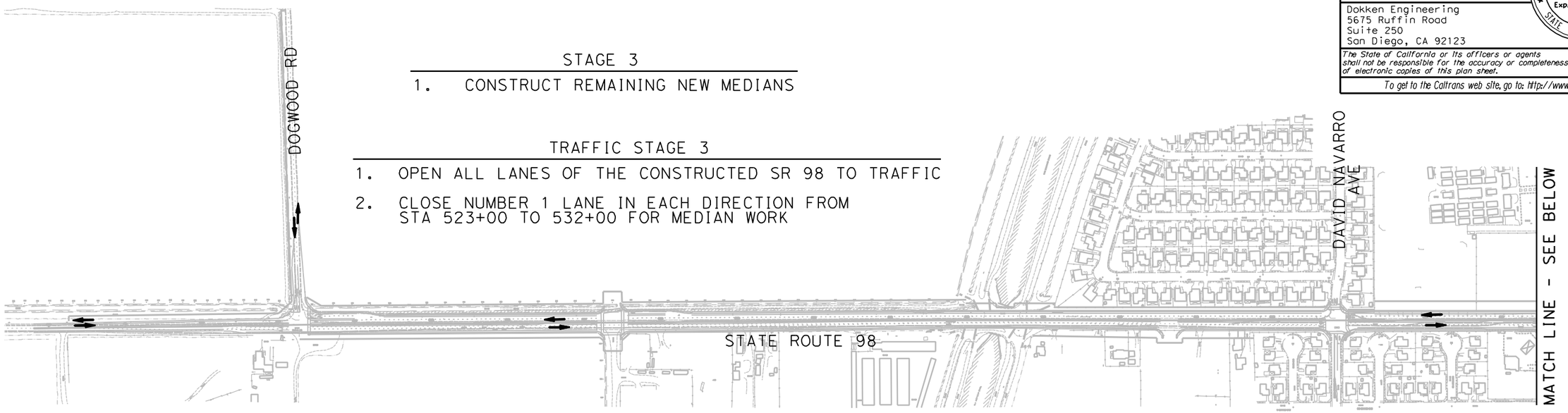
STAGE 3

1. CONSTRUCT REMAINING NEW MEDIANS

TRAFFIC STAGE 3

1. OPEN ALL LANES OF THE CONSTRUCTED SR 98 TO TRAFFIC
2. CLOSE NUMBER 1 LANE IN EACH DIRECTION FROM STA 523+00 TO 532+00 FOR MEDIAN WORK



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STAGE CONSTRUCTION

STAGE 3

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8	IMP	98	48.52/52.23	1	5

REGISTERED ENGINEER — DATE: 02/21/06

PLANS APPROVAL DATE

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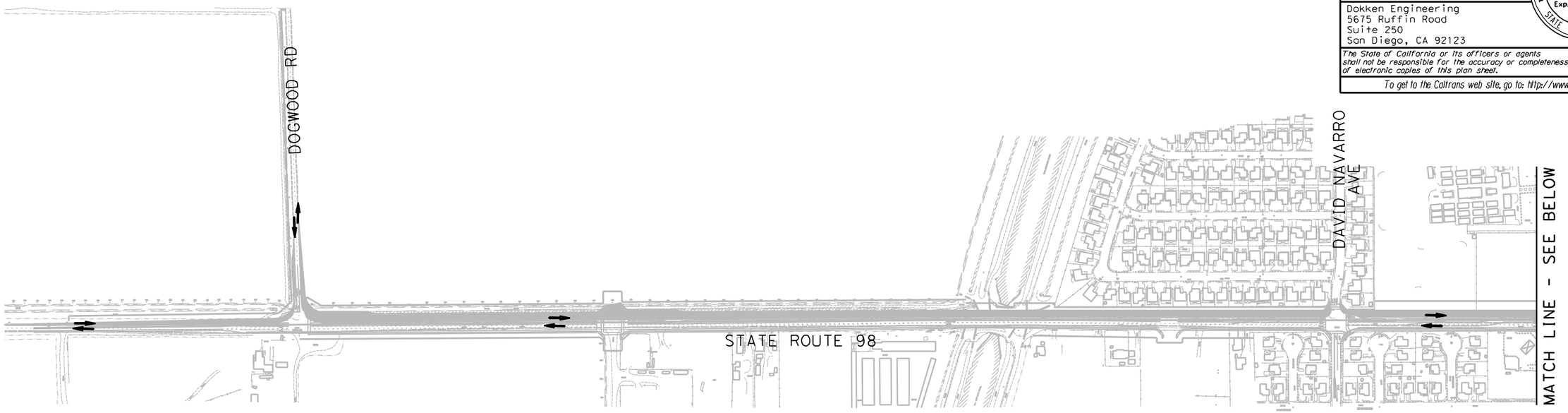
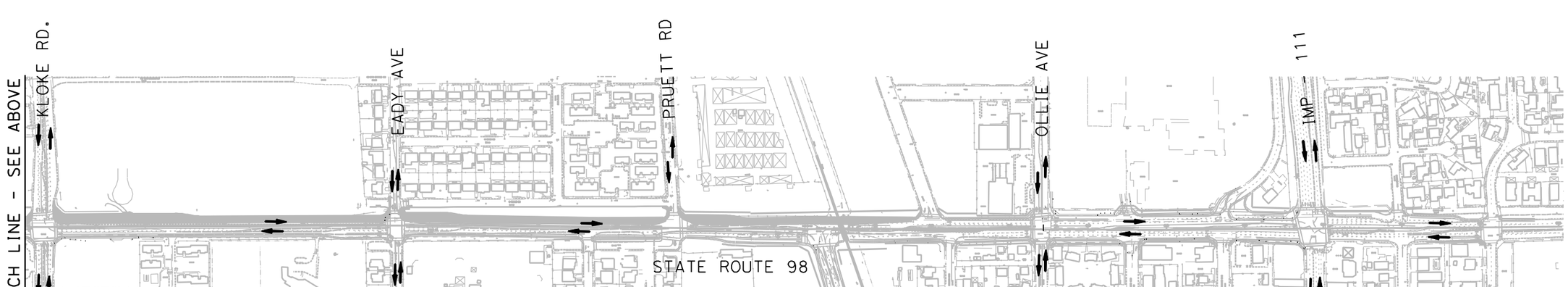
TRAFFIC STAGE 3a

1 NIGHT WORK, FLAGGING TRAFFIC CONTROL

STAGE 3a

1 AC OVERLAY SR-98





LEGEND:

DIRECTION OF TRAFFIC

STAGE CONSTRUCTION

STAGE 3a

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STAGE CONSTRUCTION

NO SCALE

SC-04

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
8	IMP	98	48.52/52.23	1	5

REGISTERED ENGINEER — 02/21/06 DATE

PLANS APPROVAL DATE

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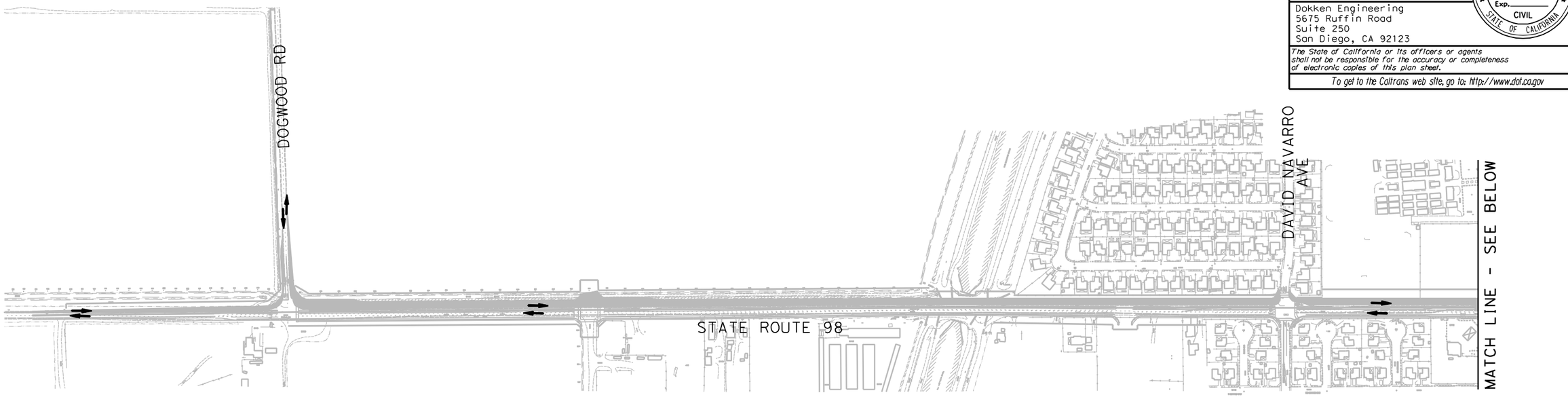
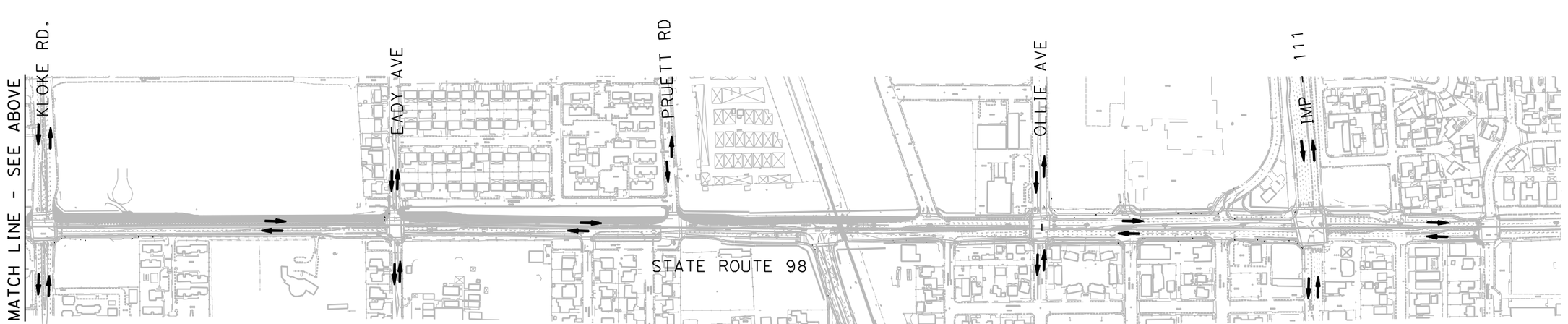
TRAFFIC STAGE 3b

1 CLOSE NUMBER 1 LANE IN EACH DIRECTION

STAGE 3b

1 CONSTRUCT NEW MEDIANS





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DIRECTION OF TRAFFIC

STAGE CONSTRUCTION

STAGE 3b

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STAGE CONSTRUCTION

NO SCALE

SC-05

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

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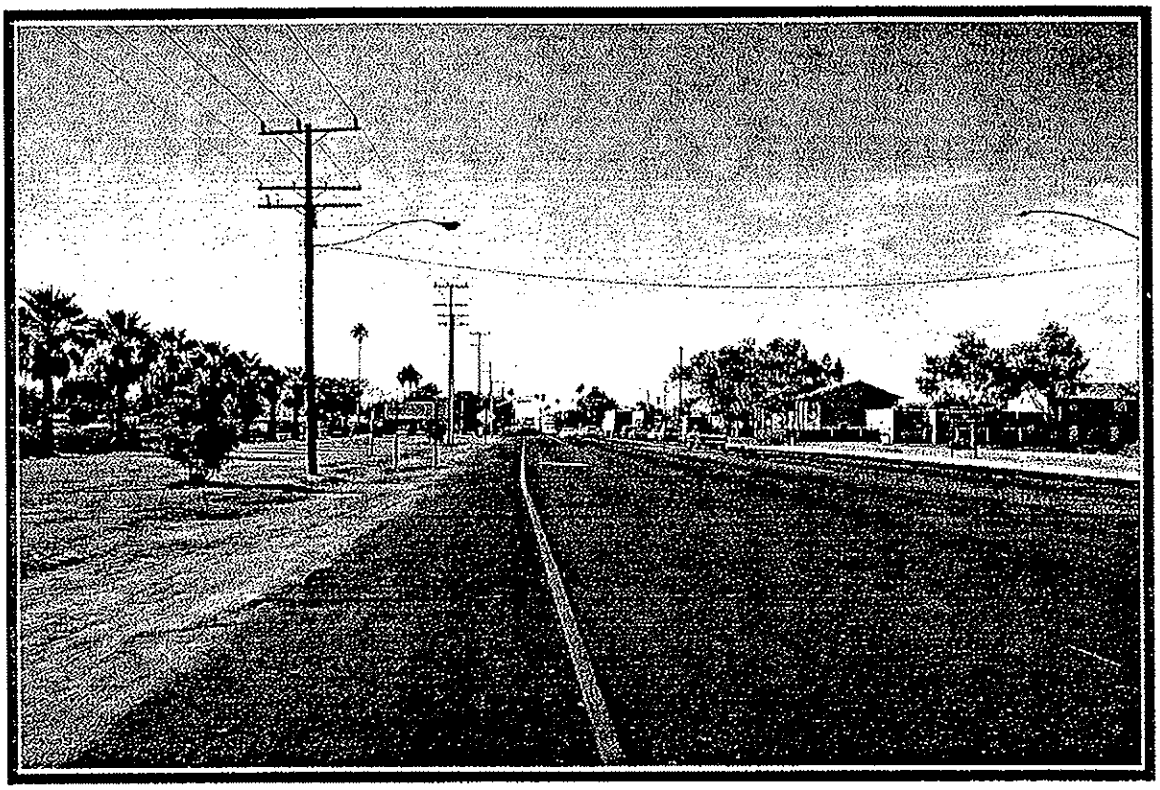
Value Analysis Report



SR 98 Corridor

EA 175200 Special Designation: 6Calexi98

Contract No. 53A0020

Task Order No. 138

April 2000

Prepared by

Value Management Strategies, Inc.

VMS

Value Management Strategies, Inc.
"Value Leadership"

R. Terry Hays, CVS
President

April 30, 2001

Ms. Chili Cilch
Value Analysis Coordinator
California Department of Transportation - District 11
2829 Juan Street
San Diego, CA 92110

Reference: Value Analysis Study—Caltrans Task Order No. 138
SR 98 Corridor

Dear Chili:

Value Management Strategies, Inc., is pleased to transmit 40 copies of our Final Value Analysis Study Report for the referenced project. Please distribute them as indicated on the following distribution list. We have distributed an additional copy to the Headquarters Branch.

This report updates the Preliminary Value Analysis Study Report based on our April 4, 2001 Implementation Meeting with the City and community representatives in Calexico.

We enjoyed working with you and are looking forward to continuing our efforts to assist Caltrans in its value analysis efforts.

Sincerely,

Value Management Strategies, Inc.

R. Terry Hays

R, Terry Hays, CVS

3520 Monte Real, Escondido, CA 92029-7910
phone (760) 741-1155 ◆ fax (760) 489-6765

2080 Mountain Blvd., Suite 203, Oakland, CA 94611-2829
phone (510) 338-1160 ◆ fax (510) 338-1160

VA Study Report
SR 98 Corridor
Distribution List

Project Sponsors and Decision Makers (6 Copies)

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2. Rick Hopkins
3. Pedro Orso Delgado
4. Muggs Stoll
5. Gene Pound
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Project Stakeholders (14 Copies)

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2. Gilbert Grijalva	Council person	City of Calexico
3. Timothy B. Jones	Director	Imperial County Public Works
4. Kenneth G. Skillman, III	Director of Development Services	City of El Centro
5. Ralph Fernandez	Sergeant	C.H.P. – El Centro
6. Joe M. Rivera	Assistant Patrol Agent-In-Charge	U.S. Border Patrol, Calexico
7. Carlos Escalante	Fire Chief	Calexico Fire Department
8. Yoli G. Cordero	Director	Calexico Chamber of Commerce
9. Ben Aguirre	Power Superintendent	Imperial Irrigation District
10. Cesar Velandia	Urban Planning Office, Chief	Municipality of Mexicali
11. Alfredo Hernandez	Department Chief	S.C.T. – Mexico
12. Exie Mascorro		S.C.T. – Mexico
13. Ismael Angulo		S.C.T. – Mexico
14. Oscar Hernandez		S.C.T. – Mexico

Caltrans Functional Units (7 Copies)

VA Team (11 Copies)

1. Mark Baza	Caltrans, Planning
2. Robert Peterson	Caltrans
3. Hildy Carrillo Rivera	Calexico Chamber of Commerce
4. Mariano Martinez	City of Calexico
5. Luis Pelayo	Caltrans
6. Everett Townsend	Caltrans
7. Frank Fiorenza	County of Imperial, Public Works
8. Paul Solosky	Caltrans, Right-of-Way
9. Artoro Selwick	Calexico Planning Commission
10. Ted Lyon	City of Calexico
11. Clint Harris	Caltrans, Environmental

VA Coordinator (2 Copies)

1. Chili Cilch

Headquarters VA Branch (1 Copy)

1. Earl Burgess *

*Distributed by Value Management Strategies, Inc.

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EXECUTIVE SUMMARY

ABSTRACT

FINAL

The purpose of the VA Study is to address the needs of State Route 98 (SR 98) in support of Imperial Valley's long-term regional traffic plans. SR 98 will not accommodate current and future traffic demands. The existing SR 98 corridor currently transports auto/truck local, regional, and international traffic. The purpose of this project is to improve safety and reduce traffic congestion by increasing the capacity of SR 98 and reducing local and regional traffic conflicts in Calexico's residential and school areas.

The VA team identified four alternatives to widening along the existing corridor. Alternative 1.4 is considered to best meet the purpose and need for the project and has strong community support. This alignment follows existing SR98 from SR7 to Bowker Road where it turns north to Jasper, continue on Jasper to Dogwood, and turn south on Dogwood to existing SR 98. It needs to be determined if SR 98 should be grade separated at SR 111. It should be grade separated at the railroad. The route between existing SR98 and Jasper Road near Bowker Road will be refined in design. Currently there are several options to be evaluated.

The Calexico City Council has voiced their support for this alignment. The cost along this alignment is considered comparable to widening along existing SR98. The performance of this alternative is ~ 265% improved over widening the current alignment. This performance improvement is largely due to greatly improved local and regional traffic operations; community support for this alignment, and possible reduced environmental impact.

INTRODUCTION

This Value Analysis (VA) Report summarizes the events of the VA study conducted for Caltrans District 11 by Value Management Strategies, Inc. The subject of the study is the future configuration of SR 98 in San Diego, California:

- 11-175200-IMP-98-KP 11.6/25.3

Gary Gallegos, District Director, requested this VA Study to address the needs of SR 98 in support of Imperial Valley's long-term regional traffic plans. The documents provided to the VA team included the Imperial Valley Regional Traffic Plan and other technical data prepared by Caltrans. The VA Study was facilitated by Terry Hays, CVS.

PROJECT DESCRIPTION

SR 98 is currently a two-lane conventional highway in the county from SR 7 to the start of Cole Road where it angles to the southwest for approximately one mile. At that point, SR 98 heads west and widens to a four-lane conventional highway west of Meadows. It continues as a four-lane highway to just west of SR 111, where it reduces back to two lanes to the city limits and beyond. There is a current project to widen the segment of SR 98 west of SR 111 to the western city limits to a four-lane conventional highway. This will improve current local traffic issues in the area, but it will not solve all of the current or long-term traffic issues.

There has been continuing growth in cross-border traffic and trade between the cities of Calexico, California, and Mexicali, Baja California, Mexico. This growth is largely due to the North America Free Trade Agreement (NAFTA) and the continuing growth of Calexico and Mexicali. Truck traffic through Calexico/Mexicali East Port of Entry (POE) serves interregional, interstate, and international trade goods and movement.

As a result of these factors, SR 98 will not accommodate current and future traffic demands. The existing SR 98 corridor currently transports auto/truck local, regional, and international traffic.

The purpose of this project is to improve safety and reduce traffic congestion by increasing capacity of SR 98 and reducing the truck and auto conflicts in residential areas. Another goal is to reduce the impact of the state highway on the residential areas along existing SR 98. The current alignment impacts the Calexico community, as it forces a significant amount of truck traffic through residential areas and near schools.

Even with the completion of the SR 7 highway project and new commercial developments near the POE, a large volume of trucks will continue to the center of Calexico due to the location of the existing truck terminals in the city.

PROJECT ISSUES

Key issues facing the long-term use of existing SR 98 include:

1. The Calexico sphere of influence is increasing as the city continues to grow and develop. The new limits of Calexico's sphere of influence are:
   a. East and south of SR 98 to Port of Entry
   b. East and north of SR 98 to Barbara Worth Road
   c. North to Jasper Road
   d. West to Dogwood Road
2. Local traffic demands
3. Border traffic – north (AM), south (PM)
4. Truck traffic is forced through residential areas
5. Children need to cross both existing SR 98 and Cole Road to attend schools
6. Border-related businesses are key economic contributors in Calexico
7. Westbound SR 98 to SB 111 to Mexico traffic

PROJECT ANALYSIS

The VA tools were used by the VA team to analyze the project. The results of these analyses clarified the functional requirements of the project. *Accommodate NAFTA Traffic, Accommodate Cross Border Traffic,* and *Accommodate Calexico Growth* were identified as the higher order functions for this project. *Increase State Route Capacity* was determined to be the basic function.

The following performance criteria were identified by the team and stakeholders as being essential to the project:

- Community Support
- Compatibility with Mexico's Plans
- Calexico's Traffic Operations
- Environmental Impact
- Construction Schedule Impact
- Impact on Gateway Infrastructure Improvements
- Regional Traffic Impacts
- Impact on Growth and Land Use

VA ALTERNATIVES

Detailed documentation of the alternatives is provided in the VA Alternatives section of this report. The VA team developed four alternative alignments for the project, descriptions of which are provided below:

Alt. No.	Description	Potential Cost	Performance
1.1	**Widen Existing SR 98 to Four and/or Six Lanes from SR 7 to Dogwood.**	$90,000,000 to $120,000,000	Baseline

Widen existing SR 98 to four and/or six lanes from SR 7 to Dogwood and add an interchange at SR 111. Mitigation may be needed to resolve traffic congestion with this alternative—the widening of SR 111 between SR 98 and Cole Road and a second interchange at SR 111 and Cole Road.

As this is the current alignment for SR98, widening to improve operations will be carried forwards into the Environmental Process and studied further. The schools and parks along this alignment create 4(f) issues and it does not solve the increased concern for the mixing of local and regional traffic, which has increased since the NAFTA was implemented.

1.2	**Widen SR 98 from SR 7 to Cole Road and Realign SR 98 Along Cole Road to Dogwood.**	$90,000,000	+45%

Realign SR 98 on Cole to Dogwood. East of the SR 98/Cole Road intersection, the alignment would remain on the existing SR 98 and be widened to a four- and/or six-lane expressway. This alignment will have a six-lane ultimate capacity and 200 feet of right-of-way. The alignment would start at the existing SR 98/SR 7 intersection, maintain the existing alignment to the start of Cole, continue on Cole to Dogwood, and turn south on Dogwood to existing SR 98. SR 98 would also be grade separated at SR 111 and possibly at the railroad.

This alignment was shown in the Regional Long Rand Plan as the route for the new SR98. However, due to the added growth and traffic created by NAFTA, Cole Road is not desired by the City or County as the new alignment. While this is a viable alternative, and better than retaining the alignment along the existing SR98 unless a decision is made now the development that is currently occurring and planned, would either limit right-of-way or greatly increase project cost. Due to the added growth, development and traffic created by NAFTA This alignment The City Counsel will issue a statement against the Cole Road alignment and the long range plan will be updated to remove Cole Road as an option for the future SR98. This alternative is to be dropped from further consideration.

1.3	**Realign SR 98 to a Six-Lane Expressway from SR 7, Along Jasper Road to Dogwood.**	$125,000,000	+80%

This alignment will have a six-lane ultimate capacity and 200 feet of right-of-way, and be designed to current expressway standards. The new alignment would start in the vicinity of the SR 98/SR 7 intersection, which would be converted to an interchange, traverse northwest to Jasper, continue on Jasper to Dogwood, and turn south on Dogwood to existing SR 98. SR 98 would also be grade separated at SR 111 and possibly at the railroad. Existing SR 98 will be relinquished to the city and county. This is strongly opposed by local residents due to the impact on farming both sides of the road and the impact to a historical school in the area.

This alternative will be dropped due to purpose and need concerns. There are traffic operation concerns along SR7 at the connection to the east end of SR98 due to trucks operations going to and coming from the Gateway development. This alignment also has the greatest potential impact on environmental issues and farming. The community in this area is strongly against this alignment.

1.4 **Widen SR 98 from SR 7 to Bowker Road and Realign SR 98 Along Jasper to Dogwood.** . These are factored into the cost estimate. $100,000,000 +265%

This alignment would be designed to current expressway standards. This alignment will have a six-lane ultimate capacity and 200 feet of right-of-way. The existing alignment would be maintained from SR 7 to Bowker Road, where it will turn north to Jasper, continue on Jasper to Dogwood, and turn south on Dogwood to existing SR 98. It needs to be determined if SR 98 should be grade separated at SR 111 and possibly at the railroad

This alternative has strong support from the City of Calexico and local residents. The Calexico City Council has voiced their support for this alignment. The cost along this alignment is considered comparable to widening along existing SR98. The performance of this alternative is greatly improved over widening the current alignment. This performance improvement is largely due to greatly improved local and regional traffic operations; community support for this alignment, and possible reduced environmental impact. The route between existing SR98 and Jasper Road near Bowker Road will be refined in design. Currently there are several options to be evaluated.

1.5 **Widen SR 98 from SR 7 to Barbara Worth Road and Realign SR 98 Along Jasper to Dogwood.** $100,000,000 +114%

This alignment would be designed to current expressway standards. This alignment will have a six-lane ultimate capacity and 200 feet of right-of-way. The existing alignment would be maintained from SR 7 to Barbara Worth Road, where it will turn north to Jasper, continue on Jasper to Dogwood, and turn south on Dogwood to existing SR 98. It needs to be determined if SR 98 should be grade separated at SR 111 and possibly at the railroad. These are factored into the cost estimate. This is strongly opposed by local residents due to the impact on farming both sides of the road and the impact to a historical school in the area.

This alternative is to be dropped. Concerns for increased impact to farming and a historical school house in the area. There is no support for this alignment and it provides no advantage over Alternative 1.4.

Detailed documentation of these alternatives is provided in the VA Alternatives section of this report.

PERFORMANCE AND VALUE IMPROVEMENTS

The VA team evaluated the performance of each alternative to determine its effect on the performance criteria identified by Caltrans and the project stakeholders. The VA team evaluated the four alternative alignments on a relative 1-10 scale for each criterion. Alternative 1.1—Widen Along the Current Alignment—is used as a baseline to compare the other alternatives against, as this is typically the standard solution. The 1 to 10 rating for each criterion is multiplied by the relative weight of the criteria. The aggregate project performance, therefore, produces a numerical value between 100 and 1,000, with 1,000 being the optimal result. This performance rating is then divided by the total cost of the concept (whether it is the current concept or VA Alternative concept) to establish a relative performance/cost index. The difference between the VA Alternative concepts and the original baseline concept is expressed as a net percent change in value.

PERFORMANCE RATING MATRIX

SR98 Corridor

Caltrans

Criteria	Unit of Measurement	Criteria Weight	Concept	Performance Rating 1 2 3 4 5 6 7 8 9 10	Total Performance
Community Support	Degree	24	Alternative 1.1		24
			Alternative 1.2		24
			Alternative 1.3		24
			Alternative 1.4		240
			Alternative 1.5		24
Compatibility with Mexico's Plans	Degree	18	Alternative 1.1		90
			Alternative 1.2		144
			Alternative 1.3		144
			Alternative 1.4		144
			Alternative 1.5		144
Calexico Traffic Operations	Degree	20	Alternative 1.1		20
			Alternative 1.2		60
			Alternative 1.3		120
			Alternative 1.4		200
			Alternative 1.5		160
Environmental Impact	Degree	10	Alternative 1.1		10
			Alternative 1.2		20
			Alternative 1.3		20
			Alternative 1.4		80
			Alternative 1.5		20
Construction Schedule Impact	Degree	4	Alternative 1.1		24
			Alternative 1.2		24
			Alternative 1.3		28
			Alternative 1.4		24
			Alternative 1.5		24
Impact on Gateway Infrastructure Improvements	Degree	2	Alternative 1.1		18
			Alternative 1.2		18
			Alternative 1.3		10
			Alternative 1.4		18
			Alternative 1.5		18
Regional Traffic Impact	Degree	4	Alternative 1.1		8
			Alternative 1.2		16
			Alternative 1.3		28
			Alternative 1.4		36
			Alternative 1.5		32
Impact on Growth and Land Use	Degree	18	Alternative 1.1		54
			Alternative 1.2		54
			Alternative 1.3		72
			Alternative 1.4		162
			Alternative 1.5		128

Overall Performance Criteria	Total Performance	% Performance Improvement	Total Cost	Value Index (P/C)	% Value Improvement
Alternative 1.1	248	Baseline	90	2.8	Baseline
Alternative 1.2	360	45%	90	4.0	45%
Alternative 1.3	446	80%	125	3.6	29%
Alternative 1.4	904	265%	100	9.0	228%
Alternative 1.5	530	114%	100	5.3	92%

BASIS FOR CHANGE IN PERFORMANCE AND VALUE

VA Alternatives 1.1 and 1.2 are similar in terms of cost and performance and would provide no real benefit to the community, as they maintain regional traffic conflicts with local traffic, neighborhoods and schools. Even though Alternative 1.2 is slightly better for performance, it does not meet the long-term purpose and need for the project. VA Alternatives 1.3 and 1.5 would meet the project's purpose and need and significantly improve the project's performance. However, their impact to the historical school east of Jasper and the impact to farming both sides of the road east of Jasper, make these alternatives highly undesirable to the local community. Alternative 1.4 appears to have strong support from the local community and would meet the project's need and purpose. The following table summarizes the VA team's logic in support of the change in the performance ratings.

Basis For Change In Performance

Performance Criteria	VA Alternative 1.2	VA Alternative 1.3	VA Alternative 1.4	VA Alternative 1.5
Community Support	No change.	General support to move the State Route off the current alignment within Calexico, but strong local opposition to placing the State Route on Jasper east of Bowker.	Greatly improves community support. No opposition stated to date.	General support to move the State Route off the current alignment within Calexico, but strong local opposition to placing the State Route on Jasper east of Bowker.
Compatibility with Mexico's Plans	Significantly improves compatibility with current and potential future border crossings.	Significantly improves compatibility with current and potential future border crossings.	Significantly improves compatibility with current and potential future border crossings.	Significantly improves compatibility with current and potential future border crossings.
Calexico Traffic Operations	More direct route for trucks to local truck terminals.	Some improvement to local traffic, as some border truck traffic will use new route, however some will remain on old SR98	Greatly improves local traffic, as border truck traffic is separated from local city traffic, and it effectively increases local capacity.	Improves local traffic, as most border truck traffic will be separated from local city traffic.

Environmental Impacts	Slightly reduced Section 4(f) issues at schools.	Significantly reduces impacts to homes and schools 4(f), right-of-way, and noise). But there are significant impacts to farms, a historic school as well as other environmental sites along the alignment.	Significantly reduces impacts to homes and schools 4(f), right-of-way, and noise).	Significantly reduces impacts to homes and schools 4(f), right-of-way, and noise). But may impact historical school on Jasper. Also impact to farmland concern
Construction Schedule Impact	No change.	Slight improvement due to reduced utility relocation, impact during construction, construction phases, and traffic operations.	No significant change.	No significant change.
Impact on Gateway Infrastructure Improvements	No change.	May significantly impact traffic patterns in/out of the Gateway development.	No change.	No change.
Regional Traffic Impact	No change.	Improves regional traffic operations; regional and local traffic operations conflicts are reduced. Some regional traffic is expected to continue to use current route.	Greatly improves regional traffic operations; regional and local traffic operations conflicts are reduced.	Improves regional traffic operations; regional and local traffic operations conflicts are reduced.
Impact on Growth and Land Use	No change.	Compatible with land use Master Plan. May encourage some added growth in new areas. Significant impacts land used for farming.	Compatible with land use Master Plan. No significant added growth is projected from this alignment.	Compatible with land use Master Plan. Impacts land used for farming.

IMPLEMENTATION MEETING

On Wednesday, April 4, 2001, the VA team discussed the alternatives with the project stakeholders, including representatives from the City of Calexico, local landowners, developers, County of Imperial and Caltrans District 11. The dispositions of the VA alternatives were also determined at this meeting. Key comments relating to the disposition of each alternative are noted in the discussion of the VA Alternatives above and in the Implementation Section. Added general comments are summarized below.

- Substantial local and regional support for Alternative 1.4 to be considered the PA&ED Phase. The alignment from SR98 to Jasper in the vicinity of Bowker Road will be refined during the PA&ED Phase.
- Agreement that Alternatives 1.2, 1.3, and 1.5 be dropped from further consideration, as they do not satisfy the project's need and purpose and have significant impact on either farming or planned development along these alignments.
- City Counsel will issue a statement in support of dropping the Cole Road alignment and initiate action to remove it from the Regional Long Range Plan. Action may also be taken when the new alignment is constructed to restrict truck access to Cole Road between SR98 and SR111.
- Action will be taken to ensure property owners are invited to Public Hearings. Also, the rejected alternative alignments will be shown and noted that no further consideration for these alignments will be made.

VA TEAM AND PROCESS

The three-day study was performed during the period of November 15-17 in Calexico, California. The VA study was led by Terry Hays, CVS, from Value Management Strategies, Inc. The VA team members are listed below:

Terry Hays	Team Leader	Value Management Strategies, Inc.
Mark Baza	Special Studies	Caltrans, Planning
Robert Peterson	Traffic	Caltrans
Hildy Carrillo Rivera	Executive Director	Calexico Chamber of Commerce
Mariano Martinez	Public Works Director	City of Calexico
Luis Pelayo	Project Engineer	Caltrans
Everett Townsend	Design Manager	Caltrans
Frank Fiorenza	Deputy Director, Engineering	County of Imperial, Public Works Department
Paul Solosky	Acquisitions	Caltrans, Right-of-Way
Artoro Selwick		Calexico Planning Commission
Ted Lyon	City Engineer	City of Calexico
Clint Harris	Environmental Analyst	Caltrans, Environmental

Throughout the VA session the VA team was supported by numerous stakeholders and Caltrans representatives. These participants included:

Javier Alatorre	Mayor	City of Calexico
Gilbert Grijalva	Council Person	City of Calexico
Timothy B. Jones	Director	Imperial County Public Works
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Ismael Angulo		S.C.T. – Mexico
Oscar Hernandez		S.C.T. – Mexico
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Cesar Velandia	Chief, Urban Planning Office	Municipality of Mexicali
Ralph Fernandez	Sergeant	C.H.P. – El Centro
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Shawn Rizzutto	Senior Resident Engineer	Caltrans
Chili Cilch	VA Program Manager	Caltrans
Carlos Escalante	Fire Chief	Calexico Fire Department
Yoli G. Cordero	Director	Calexico Chamber of Commerce
Gene Pound	Division Chief, Planning	Caltrans, Planning
Rick Hopkins	Division Chief, Design	Caltrans, Design
Ben Aguirre	Power Superintendent	Imperial Irrigation District
Barry Garman	Area Developer	Barry S. Garman – Real Estate Service

The VA Job Plan, as outlined by the Caltrans VA Activity Chart, was followed to analyze the functions of the project, create and evaluate ideas for change, and develop and present alternatives to the project team. Further details are provided in the VA Process section of the Final VA Report.

Environmental Impacts	Slightly reduced Section 4(f) issues at schools.	Significantly reduces impacts to homes and schools 4(f), right-of-way, and noise). But there are significant impacts to farms, a historic school as well as other environmental sites along the alignment.	Significantly reduces impacts to homes and schools 4(f), right-of-way, and noise).	Significantly reduces impacts to homes and schools 4(f), right-of-way, and noise). But may impact historical school on Jasper. Also impact to farmland concern
Construction Schedule Impact	No change.	Slight improvement due to reduced utility relocation, impact during construction, construction phases, and traffic operations.	No significant change.	No significant change.
Impact on Gateway Infrastructure Improvements	No change.	May significantly impact traffic patterns in/out of the Gateway development.	No change.	No change.
Regional Traffic Impact	No change.	Improves regional traffic operations; regional and local traffic operations conflicts are reduced. Some regional traffic is expected to continue to use current route.	Greatly improves regional traffic operations; regional and local traffic operations conflicts are reduced.	Improves regional traffic operations; regional and local traffic operations conflicts are reduced.
Impact on Growth and Land Use	No change.	Compatible with land use Master Plan. May encourage some added growth in new areas. Significant impacts land used for farming.	Compatible with land use Master Plan. No significant added growth is projected from this alignment.	Compatible with land use Master Plan. Impacts land used for farming.

IMPLEMENTATION MEETING

On Wednesday, April 4, 2001, the VA team discussed the alternatives with the project stakeholders, including representatives from the City of Calexico, local landowners, developers, County of Imperial and Caltrans District 11. The dispositions of the VA alternatives were also determined at this meeting. Key comments relating to the disposition of each alternative are noted in the discussion of the VA Alternatives above and in the Implementation Section.

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Exie Mascorro		S.C.T. – Mexico
Ismael Angulo		S.C.T. – Mexico
Oscar Hernandez		S.C.T. – Mexico
Kenneth G. Skillman, III	Director of Development Services	City of El Centro
Cesar Velandia	Chief, Urban Planning Office	Municipality of Mexicali
Ralph Fernandez	Sergeant	C.H.P. – El Centro
Joe M. Rivera	Assistant Patrol Agent-In-Charge	U.S. Border Patrol, Calexico
Shawn Rizzutto	Senior Resident Engineer	Caltrans
Chili Cilch	VA Program Manager	Caltrans
Carlos Escalante	Fire Chief	Calexico Fire Department
Yoli G. Cordero	Director	Calexico Chamber of Commerce
Gene Pound	Division Chief, Planning	Caltrans, Planning
Rick Hopkins	Division Chief, Design	Caltrans, Design
Ben Aguirre	Power Superintendent	Imperial Irrigation District
Barry Garman	Area Developer	Barry S. Garman – Real Estate Service

The VA Job Plan, as outlined by the Caltrans VA Activity Chart, was followed to analyze the functions of the project, create and evaluate ideas for change, and develop and present alternatives to the project team. Further details are provided in the VA Process section of the Final VA Report.

IMPLEMENTATION ACTION

IMPLEMENTATION ACTION

FINAL

INTRODUCTION

The results of the VA study contained in the final VA report were reviewed for implementation by the stakeholders and design team. The following Summary Disposition Sheet lists all of the VA alternatives and design suggestions developed by the VA team. The disposition of each item is noted and the implemented savings are recorded.

IMPLEMENTATION MEETING

On Wednesday, April 4, 2001, the VA team discussed the alternatives with the project stakeholders, including representatives from the City of Calexico, local landowners, developers, County of Imperial and Caltrans District 11. The dispositions of the VA alternatives were also determined at this meeting. Key comments relating to the disposition of each alternative are noted in the discussion of the VA Alternatives and in the Implementation Section. Added general comments are summarized below.

- Substantial local and regional support for Alternative 1.4 to be considered the PA&ED Phase. The alignment from SR98 to Jasper in the vicinity of Bowker Road will be refined during the PA&ED Phase.

- Agreement that Alternatives 1.2, 1.3, and 1.5 be dropped from further consideration, as they do not satisfy the project's need and purpose and have significant impact on either farming or planned development along these alignments.

- City Counsel will issue a statement in support of dropping the Cole Road alignment and initiate action to remove it from the Regional Long Range Plan. Action may also be taken when the new alignment is constructed to restrict truck access to Cole Road between SR98 and SR111.

- Action will be taken to ensure property owners are invited to Public Hearings. Also, the rejected alternative alignments will be shown and noted that no further consideration for these alignments will be made.

IMPLEMENTATION ACTION

Of the four alternatives to widening along the existing SR98 corridor, Alternative 1.4 has been accepted for further consideration in the PA&ED Phase of Project Development. This alternative is considered by the stakeholders and community to best meet the purpose and need for the project and has strong community support. This alignment follows existing SR98 from SR7 to Bowker Road where it turns north to Jasper, continue on Jasper to Dogwood, and turn south on Dogwood to existing SR 98. It needs to be determined if SR 98 should be grade separated at SR 111. It should be grade separated at the railroad. The route between existing SR98 and Jasper Road near Bowker Road will be refined in design. Currently there are several options to be evaluated.

The Calexico City Council has voiced their support for this alignment. The cost along this alignment is considered comparable to widening along existing SR98. The performance of this alternative is ~ 265% improved over widening the current alignment. This performance improvement is largely due to greatly improved local and regional traffic operations; community support for this alignment, and possible reduced environmental impact when compared to the other alignment possibilities.

SUMMARY OF VA ALTERNATIVES *SR 98 Corridor*				Caltrans			
No.	Title	VA Team Estimate		Validated Savings		Disposition	Technical Reviews
		Initial / *LCC*	Performance Changes (%)	Initial / *LCC*	Performance Changes (%)		
1.1	Widen Existing SR 98 to Four and/or Six Lanes from SR 7 to Dogwood	$90,000,000	Baseline		Baseline		
1.2	Widen SR 98 from SR 7 to Cole Road and Realign SR 98 Along Cole Road to Dogwood	$90,000,000	+45%			R	
1.3	Realign SR 98 to a Six-Lane Expressway from SR 7, Along Jasper Road to Dogwood	$125,000,000	+80%			R	
1.4	Widen SR 98 from SR 7 to Bowker Road and Realign SR 98 Along Jasper to Dogwood	$100,000,000	+265%			A	
1.5	Widen SR 98 from SR 7 to Barbara Worth Road and Realign SR 98 Along Jasper to Dogwood	$100,000,000	+114%			R	

A = Accepted	CA = Conditionally Accepted	R = Rejected
VA Sets		Comments

VA ALTERNATIVES

INTRODUCTION

The results of this study are presented as individual alternatives to the current situation.

VA ALTERNATIVES

Each alternative consists of a summary of the original concept, a description of the suggested change, a cost, a listing of its advantages and disadvantages, sketches, and a brief narrative discussing the rationale for the alternative. Performance measures are also presented with discussion of how each performance measure is impacted by the alternative. A numerical 1 to 10 rating is provided for each performance measure. This is multiplied by the weighting for that performance measure, and a Total Performance value is determined for each alternative. These performance values are compared to the baseline alternative, and a net change in performance is determined for each alternative.

A summary of VA alternatives and detailed descriptions of the alternatives are on the following pages.

The alternatives are numbered sequentially (1.1, 1.2, 1.3, 1.4 and 1.5). This numbering sequence indicates the alternatives are competing items and cannot be combined. Only one of these five alternatives may be implemented.

EVALUATION OF ALTERNATIVES

The VA team performs an initial evaluation of the alternatives in preparation for their presentation to the project stakeholders. The alternatives the team identifies as having the highest likelihood of improving the project are highlighted on the Summary of Alternatives list. The project stakeholders are, however, encouraged to evaluate all VA alternatives on their individual merit, selecting the ones, in whole or in part, to be implemented.

SUMMARY OF VA ALTERNATIVES *SR98 Corridor*		Caltrans	
Number	**Title**	**Potential Savings Initial/*LCC***	**Performance**
1.1	Widen Existing SR 98 to Four and/or Six Lanes from SR 7 to Dogwood	$90,000,000	Baseline
1.2	Widen SR 98 from SR 7 to Cole Road and Realign SR 98 Along Cole Road to Dogwood	$90,000,000	+45%
1.3	Realign SR 98 to a Six-Lane Expressway from SR 7, Along Jasper Road to Dogwood	$125,000,000	+80%
1.4	Widen SR 98 from SR 7 to Bowker Road and Realign SR 98 Along Jasper to Dogwood	$100,000,000	+265%
1.5	Widen SR 98 from SR 7 to Barbara Worth Road and Realign SR 98 Along Jasper to Dogwood	$100,000,000	+114%

VALUE ANALYSIS ALTERNATIVE *SR 98 Corridor*	**Caltrans**	
FUNCTION: Increase Capacity	**IDEA NO.** 4	**ALTERNATIVE NO.** 1.1
TITLE: Widen Existing SR 98 to Four and/or Six Lanes from SR 7 to Dogwood		**PAGE NO.** 1 of 4

ORIGINAL CONCEPT:

SR 98 is currently a two-lane conventional highway in the county from SR 7 to the start of Cole Road, where it angles to the southwest for approximately one mile. At that point, SR 98 heads west and widens to a four-lane conventional highway west of Meadows. It continues as a four-lane highway to just west of SR 111, where it reduces back to two lanes to the city limits and beyond. There is a current project to widen the segment of SR 98 west of SR 111 to the western city limits to a four-lane conventional highway. This will improve current local traffic issues in the area, but it will not solve all of the current or long-term traffic issues created largely as a by-product of NAFTA.

ALTERNATIVE CONCEPT:

Widen Existing SR 98 to four and/or six lanes from SR 7 to Dogwood and add an interchange at SR 111. Mitigation may be needed to resolve traffic congestion with this alternative, the widening of SR 111 between SR 98 and Cole Road, and a second interchange at SR 111 and Cole Road.

ADVANTAGES:

- Converts less agricultural land

DISADVANTAGES:

- Eight schools in the vicinity of SR 98; students need to cross current SR 98 alignment
- Extensive residential fronting SR 98 in the city
- Current alignment is fully developed in the city
- Mixes local and regional traffic through residential areas
- Does not support existing land use plans
- Residential takes could delay the project
- Major intersection or interchange is required at SR 111
- Would require gas station take – hazardous material likely to be encountered
- Noise impact – mitigation would be significant
- Requires significant improvements to SR 111 and other roads in the area
- Very strong city/community opposition
- High potential for section 4(f) issues

COST SUMMARY	Initial Cost	Present Value Subsequent Cost	Present Value Highway User Cost	Net Present Value
Original Concept	$	$	$	$
Alternative Concept	$ 90,000,000 to 120,000,000	$	$	$ 90,000,000 to 120,000,000
Savings	$	$	$	$

Team Member:	**Discipline:**	**PERFORMANCE:** **Base Condition**

VALUE ANALYSIS ALTERNATIVE *SR 98 Corridor*		Caltrans	
TITLE:	Widen Existing SR 98 to Four and/or Six Lanes from SR 7 to Dogwood	**ALTERNATIVE NO.** 1.1	**PAGE NO** 2 of 4

DISCUSSION / JUSTIFICATION:

This alternative does not meet the project's purpose and need. In fact, it complicates the current situation by increasing the regional and local traffic conflicts. The added traffic would also increase traffic conflicts on SR 111 between SR 98 and Cole Road and may require an interchange at both roads on SR 111.

The widening of existing SR 98 in the city limits would serve to divide the community and increase the noise and pollution from the State Route on the local community. Right-of-way impacts, utility relocations, and noise mitigation add significantly to the project cost and construction complexity. Traffic impact during construction will not only affect the community along this alignment, but it will also divert traffic through parallel neighborhoods, further spreading the impact on the community.

While an initial review indicates that this might be a lower cost alternative than a new alignment, added cost to address traffic operational issues on SR 111 could add $30,000,000 to $50,000,000 to the project.

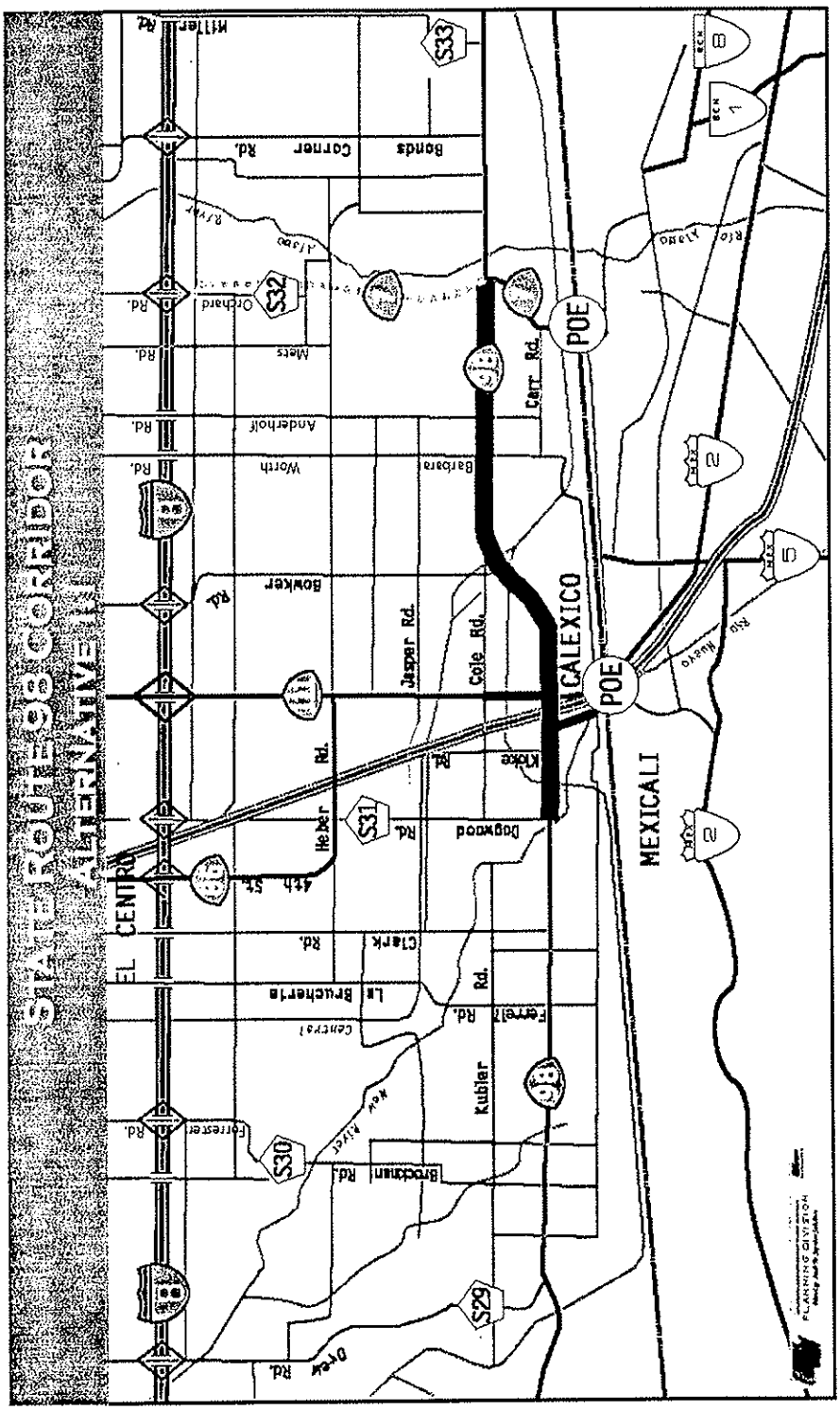
This alignment is not recommended, but it is documented, as widening the existing alignment is often the first consideration in a project.

TECHNICAL REVIEWER COMMENTS:

IMPLEMENTATION CONSIDERATIONS:

- Analysis of the impact to local and regional traffic operations is needed to verify the impact on other area roads.
- Special considerations for schools and residential need to be considered.
- Requires early coordination with resource agencies to agree upon viable alternatives that meet the purpose and need.

SKETCHES *SR 98 Corridor*		Caltrans	
TITLE:	Widen SR 98 from SR 7 to Barbara Worth Road and Realign SR 98 Along Jasper to Dogwood	**NUMBER** 1.1	**PAGE NO.** 3 of 4



PERFORMANCE MEASURES *SR 98 Corridor*		Caltrans	
TITLE:	Widen Existing SR 98 to Four and/or Six Lanes from SR 7 to Dogwood	**NUMBER** 1.1	**PAGE NO.** 4 of 4

CRITERIA	Performance	Original	Alternative
Community Support The community is very strongly against maintaining the existing SR 98 route. The community wants regional traffic away from residences and schools and away from their local traffic patterns.	Measure	Degree	Degree
	Rating		1
	Weight		24
	Contribution		24
Compatibility with Mexico's Plans Adds nothing special for proposed west border crossings.	Measure	Degree	Degree
	Rating		5
	Weight		18
	Contribution		90
Calexico Traffic Operations Keeps regional traffic traveling through the heart of key residential areas and in the vicinity of eight schools. Heavy pedestrian crossings to access schools impacts traffic operations.	Measure	Degree	Degree
	Rating		1
	Weight		20
	Contribution		20
Environmental Impact Significant impact to residences for both right-of-way takes and noise impacts. Takes may include gas stations. May have an impact on historic properties. The environmental approval process could take longer.	Measure	Degree	Degree
	Rating		1
	Weight		10
	Contribution		10
Construction Schedule Impact Construction phasing, detours, and restricted work windows could impact the construction schedule.	Measure	Degree	Degree
	Rating		6
	Weight		4
	Contribution		24
Impact on Gateway Infrastructure Improvements Compatible with the Gateway development. This could improve their access to SR 98.	Measure	Degree	Degree
	Rating		9
	Weight		2
	Contribution		18
Regional Traffic Impact Forces regional traffic to mix with local traffic, and reduces operational effectiveness. Forces regional traffic through residential areas.	Measure	Degree	Degree
	Rating		2
	Weight		4
	Contribution		8
Impact on Growth and Lands Use Does not support community land use plans. In fact, it adversely impacts land use plans.	Measure	Degree	Degree
	Rating		3
	Weight		18
	Contribution		54
Total Performance:			**248**
Net Change in Performance:			

VALUE ANALYSIS ALTERNATIVE *SR 98 Corridor*		Caltrans	
FUNCTION:	Increase Capacity	**IDEA NO.** 3	**ALTERNATIVE NO.** 1.2
TITLE:	Widen SR 98 from SR 7 to Cole Road and Realign SR 98 Along Cole Road to Dogwood		**PAGE NO.** 1 of 4

ORIGINAL CONCEPT:

SR 98 is currently a two-lane road in the county from SR 7 to the start of Cole Road, where it angles to the southwest for approximately one mile. At that point, SR 7 heads west and widens to five lanes at Magnolia. It continues as a five-lane road to just west of SR 111, where it reduces back to two lanes to the city limits and beyond. There is a project to widen the segment of SR 98 west of SR 111 to the western city limits to five lanes. This will improve current local traffic issues in the area, but it will not solve the long-term traffic issues created largely as a by-product of NAFTA.

ALTERNATIVE CONCEPT:

Realign SR 98 on Cole to Dogwood. East of the SR 98/Cole Road intersection, the alignment would remain on the existing SR 98 and be widened to a four- and/or six-lane expressway. This alignment will have a six-lane ultimate capacity and 200 feet of right-of-way. The alignment would start at the existing SR 98/SR 7 intersection, maintain the existing alignment to the start of Cole, continue on Cole to Dogwood, and turn south on Dogwood to existing SR 98. SR 98 would also be grade separated at SR 111 and possibly at the railroad.

ADVANTAGES:

- More direct route to truck terminals
- Could represent the lowest cost alternative
- Compatible with the Gateway project plans

DISADVANTAGES:

- Too much existing development on Cole
- Impact on two new schools planned for Cole Road
- 3,200 new homes going in off Cole Road
- New commercial projects in progress
- Shifts SR 98 problem to another location – solves little
- Canal impact—parallel to Cole—restricts alignment options
- Increases regional/local traffic conflicts
- Very strong city/community opposition
- May require some utility relocations and drainage canals on existing SR 98 near SR 7
- Possible need for a frontage road for the existing residences west of the Cole Road intersection
- May need to either realign two canals or incorporate one structure to cross them

COST SUMMARY	Initial Cost	Present Value Subsequent Cost	Present Value Highway User Cost	Net Present Value
Original Concept	$	$	$	$
Alternative Concept	$ 90,000,000	$	$	$ 90,000,000
Savings	$	$	$	$

Team Member:	Discipline:	PERFORMANCE: +45%

VALUE ANALYSIS ALTERNATIVE *SR 98 Corridor*		Caltrans	
TITLE:	Widen SR 98 from SR 7 to Cole Road and Realign SR 98 Along Cole Road to Dogwood	**ALTERNATIVE NO.** 1.2	**PAGE NO** 2 of 4

DISCUSSION / JUSTIFICATION:

This is the most direct alignment to the truck terminals and industrial areas west of SR 111 and is potentially least costly. This is currently shown in the Regional Long Range Plan as the ultimate alignment for SR98. However, due to recent growth, development and traffic created by NAFTA, this alternative does not meet the project's purpose and need. With this alignment there will continue to be regional traffic in residential areas and local/regional traffic conflicts. This also does not support the City of Calexico's current land use plan. The local community does not support this alignment for a State Route.

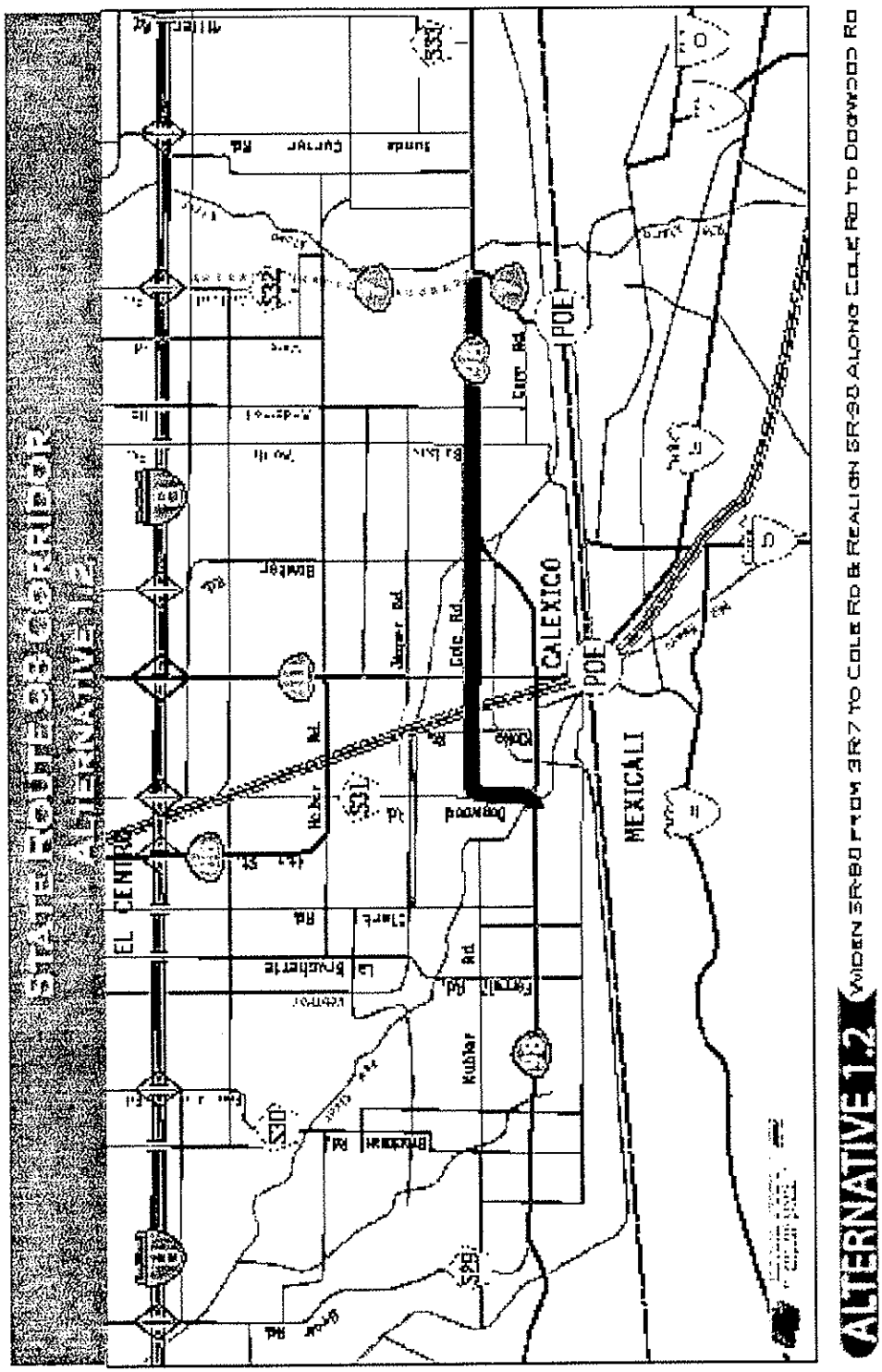
The City no longer supports this alignment. The Calexico City Counsel will issue a statement against the Cole Road alignment and the long range plan will be updated to remove Cole Road as an option for the future SR98. This alternative is to be dropped from further consideration.

TECHNICAL REVIEWER COMMENTS:

IMPLEMENTATION CONSIDERATIONS:

- Analysis of the impact to local and regional traffic operations is needed to verify the impact on other area roads.
- Special considerations for schools, businesses, residential need to be considered.
- Requires early coordination with resource agencies to agree upon viable alternatives that meet the purpose and need.

SKETCHES *SR 98 Corridor*		Caltrans	
TITLE:	Widen SR 98 from SR 7 to Barbara Worth Road and Realign SR 98 Along Jasper to Dogwood	**NUMBER** 1.2	**PAGE NO.** 3 of 4



PERFORMANCE MEASURES *SR 98 Corridor*		Caltrans	
TITLE:	Widen SR 98 from SR 7 to Cole Road and Realign SR 98 Along Cole Road to Dogwood	NUMBER 1.2	PAGE NO. 4 of 4

CRITERIA	Performance	Original	Alternative
Community Support The community is very strongly against shifting the SR 98 route to Cole Road due to new residential and schools being constructed. The local community wants truck traffic away from residential and school areas and away from their local traffic patterns.	Measure	Degree	Degree
	Rating	1	1
	Weight	24	24
	Contribution	24	24
Compatibility with Mexico's Plans Good cross border connections with current border crossings and a potential future western crossing.	Measure	Degree	Degree
	Rating	5	8
	Weight	18	18
	Contribution	90	144
Calexico Traffic Operations Keeps regional traffic traveling through the heart of key residential areas and past two schools.	Measure	Degree	Degree
	Rating	1	3
	Weight	20	20
	Contribution	20	60
Environmental Impact Significant impact to residences, both right-of-way takes, and noise impacts. Takes may include gas stations. May need to relocate a new 24" water line. Need to avoid a canal that parallels Cole Road.	Measure	Degree	Degree
	Rating	1	2
	Weight	10	10
	Contribution	10	20
Construction Schedule Impact Construction phasing, detours, and restricted work windows could impact the construction schedule.	Measure	Degree	Degree
	Rating	6	6
	Weight	4	4
	Contribution	24	24
Impact on Gateway Infrastructure Improvements Compatible with Gateway and could improve their access to SR 98.	Measure	Degree	Degree
	Rating	9	9
	Weight	2	2
	Contribution	18	18
Regional Traffic Impact Forces regional traffic to mix with local traffic and reduce operational effectiveness. However, it provides the most direct route to the truck terminals.	Measure	Degree	Degree
	Rating	2	4
	Weight	4	4
	Contribution	8	16
Impact on Growth and Lands Use Does not support community land use plans. In fact, it adversely impacts land use plans.	Measure	Degree	Degree
	Rating	3	3
	Weight	18	18
	Contribution	54	54
Total Performance:		**248**	**360**
Net Change in Performance:			**+45%**

VALUE ANALYSIS ALTERNATIVE *SR 98 Corridor*		Caltrans	
FUNCTION:	Increase Capacity	**IDEA NO.** 1	**ALTERNATIVE NO.** 1.3
TITLE:	Realign SR 98 to a Six-Lane Expressway from SR 7, Along Jasper Road to Dogwood		**PAGE NO.** 1 of 4

ORIGINAL CONCEPT:

SR 98 is currently a two-lane conventional highway in the county from SR 7 to the start of Cole Road, where it angles to the southwest for approximately one mile. At that point, SR 98 heads west and widens to a four-lane conventional highway west of Meadows. It continues as a four-lane highway to just west of SR 111, where it reduces back to two lanes to the city limits and beyond. There is a current project to widen the segment of SR 98 west of SR 111 to the western city limits to a four-lane conventional highway. This will improve current local traffic issues in the area, but it will not solve all of the current or long-term traffic issues created largely as a by-product of NAFTA.

ALTERNATIVE CONCEPT:

Realign SR 98 from SR 7 along Jasper to Dogwood. This alignment will have a six-lane ultimate capacity and 200' of right-of-way, and it will be designed to current expressway standards. The new alignment would start in the vicinity of the SR 98/SR 7 intersection, which would be converted to an interchange, traverse northwest to Jasper, continue on Jasper to Dogwood, and turn south on Dogwood to existing SR 98. SR 98 would also be grade separated at SR 111 and possibly at the railroad. Existing SR 98 will be relinquished to the city and county.

ADVANTAGES:

- No loss of business from truckers
- Moves truck traffic away from schools
- Consistent with plans south of the border
- Separates truck traffic from local traffic
- Supports and enhances existing land use plans
- In concert with Calexico sphere of influence
- Can prevent new SR 98 from becoming predominantly residential again
- Minimal traffic impact during construction
- Increases Gateway Development area potential
- Could support a proposed new county airport location
- May further enhance county development

DISADVANTAGES:

- Unknown impacts to Gateway project as unknown, unplanned development could occur along the new SR 98
- Need to avoid Heber Dunes –4(f) issue
- Truck traffic operations at connection to SR 7
- Conversion of farmland for right-of-way
- Possible increased environmental impact
- Increases conversion of agricultural land
- Community opposition to SR on Jasper East of Bowker Road – historical school along the alignment
- More difficult to farm both sides of Jasper if it becomes the new SR – large/long farm equipment is difficult to cross a busy state route.

COST SUMMARY	Initial Cost	Present Value Subsequent Cost	Present Value Highway User Cost	Net Present Value
Original Concept	$	$	$	$
Alternative Concept	$ 125,000,000	$	$	$ 125,000,000
Savings	$	$	$	$

Team Member:	Discipline:	PERFORMANCE: +80%

VALUE ANALYSIS ALTERNATIVE *SR 98 Corridor*		Caltrans	
TITLE:	Realign SR 98 to a Six-Lane Expressway from SR 7, Along Jasper Road to Dogwood	**ALTERNATIVE NO.** 1.3	**PAGE NO** 2 of 4

DISCUSSION / JUSTIFICATION:

With this alignment Existing SR 98 from SR7 to Dogwood will be relinquished to the city and county. However, traffic on this will be lower than on other alignments as many truckers going into Calexico will continue to use the old route as the new one may be considered as longer, due to out of direction travel. In addition, there are traffic operation concerns along SR7 at the connection to the east end of SR98 due to trucks operations going to and coming from the Gateway development.

This alignment is also strongly opposed by local residents and the community due to the impact on farming both sides of the road and the impact to a historical school in the area. Preliminary review of the alternatives indicates that this alignment may have the most significant environmental impact.

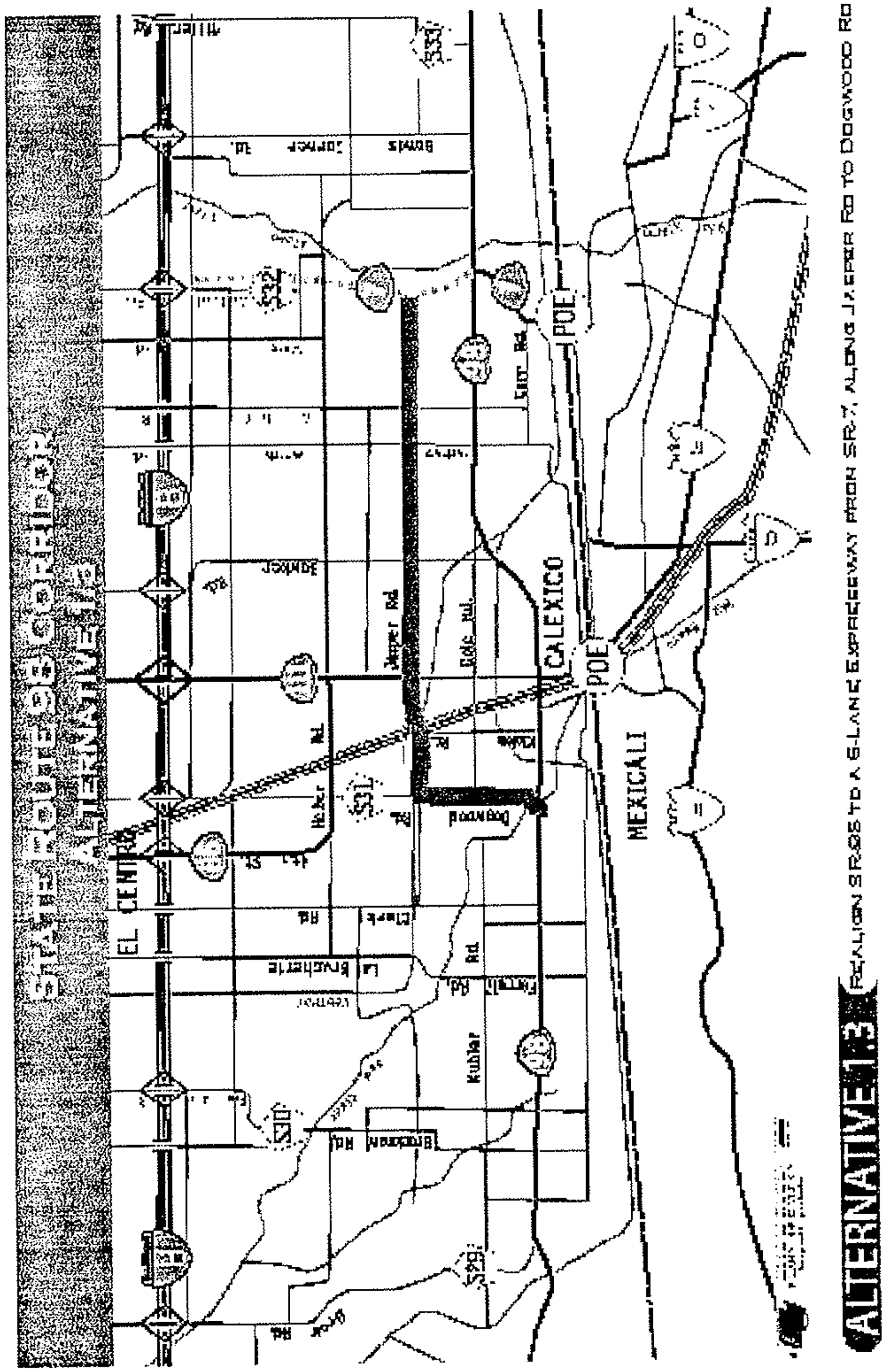
This alternative will be dropped due to purpose and need concerns and strong local opposition.

TECHNICAL REVIEWER COMMENTS:

IMPLEMENTATION CONSIDERATIONS:

- Need to determine the best way to tie the new alignment of SR 98 into SR 7.
- Need to ensure the alignment misses Heber Dunes to avoid Section 4(f) issues.
- Need to identify right-of-way needs on Jasper, so that the planned new gas line can be aligned to miss the potential right-of-way.

SKETCHES *SR 98 Corridor*		**Caltrans**	
TITLE:	Widen SR 98 from SR 7 to Barbara Worth Road and Realign SR 98 Along Jasper to Dogwood	**NUMBER** 1.3	**PAGE NO.** 3 of 4



PERFORMANCE MEASURES *SR 98 Corridor*		Caltrans	
TITLE: Realign SR 98 to a Six-Lane Expressway from SR 7, Along Jasper Road to Dogwood		NUMBER 1.3	PAGE NO. 4 of 4
CRITERIA	**Performance**	**Original**	**Alternative**
Community Support There is strong local opposition to relocating SR 98 to Jasper east of Bowker Road due to impact on farming and a historic school house in the area	Measure	Degree	Degree
	Rating	1	1
	Weight	24	24
	Contribution	24	24
Compatibility with Mexico's Plans Good cross border connections with current border crossings and potential future western crossings.	Measure	Degree	Degree
	Rating	5	8
	Weight	18	18
	Contribution	90	144
Calexico Traffic Operations Due to perceived out of direction travel by some truckers, there would continue to be some conflict with local traffic and regional truck operations.	Measure	Degree	Degree
	Rating	1	6
	Weight	20	20
	Contribution	20	120
Environmental Impact Probable impact to the historical school along this alignment, and increased impact to farmland.	Measure	Degree	Degree
	Rating	1	2
	Weight	10	10
	Contribution	10	20
Construction Schedule Impact Construction should be greatly reduced, as most construction can be done without impacting traffic operations and construction phasing to maintain local traffic operations. Minimal utilities to relocate.	Measure	Degree	Degree
	Rating	6	7
	Weight	4	4
	Contribution	24	28
Impact on Gateway Infrastructure Improvements May impact planned traffic patterns for the Gateway area west of SR 7. Direct access to SR 98 will not occur for east-west travel.	Measure	Degree	Degree
	Rating	9	5
	Weight	2	2
	Contribution	18	10
Regional Traffic Impact Improves regional traffic, as it reduces local traffic and regional traffic conflicts, but there will continue to be some conflict with local traffic and regional truck operations.	Measure	Degree	Degree
	Rating	2	7
	Weight	4	4
	Contribution	8	28
Impact on Growth and Land Use Improves access to industrial area west of SR 111. Improves developable potential for county land north and east of Calexico.	Measure	Degree	Degree
	Rating	3	5
	Weight	18	18
	Contribution	54	90
Total Performance:		**248**	**446**
Net Change in Performance:			**+80%**

VALUE ANALYSIS ALTERNATIVE *SR 98 Corridor*		Caltrans	
FUNCTION:	Increase Capacity	**IDEA NO.** 2	**ALTERNATIVE NO.** 1.4
TITLE:	Widen SR 98 from SR 7 to Bowker Road and Realign SR 98 Along Jasper to Dogwood		**PAGE NO.** 1 of 4

ORIGINAL CONCEPT:

SR 98 is currently a two-lane conventional highway in the county from SR 7 to the start of Cole Road, where it angles to the southwest for approximately one mile. At that point, SR 98 heads west and widens to a four-lane conventional highway west of Meadows. It continues as a four-lane highway to just west of SR 111, where it reduces back to two lanes to the city limits and beyond. There is a current project to widen the segment of SR 98, west of SR 111 to the western city limits, to a four-lane conventional highway. This will improve current local traffic issues in the area, but it will not solve all the current or long-term traffic issues created largely as a by-product of NAFTA.

ALTERNATIVE CONCEPT:

Widen SR 98 from SR 7 to Bowker Road and realign SR 98 along Jasper to Dogwood. This would be designed to current expressway standards. This alignment will have a six-lane ultimate capacity and 200 feet of right-of-way. The existing alignment would be maintained from SR 7 to Bowker Road, where it will turn north to Jasper, continue on Jasper to Dogwood, and turn south on Dogwood to existing SR 98. It needs to be determined if SR 98 should be grade separated at SR 111 and possibly at the railroad. These are factored into the cost estimate.

ADVANTAGES:

- No loss of business from truckers
- Moves truck traffic away from schools
- Consistent with plans south of the border
- Separates truck traffic from local traffic
- Supports and enhances existing land use plans
- In concert with Calexico sphere of influence
- Can prevent new SR 98 from becoming predominantly residential again
- Should have a minimal environmental impact
- Minimal traffic impact during construction
- Increases Gateway Development area potential
- Caltrans owns right-of-way from SR 7 to Cole
- Less conversion of agricultural land
- Compatible with Gateway development plans

DISADVANTAGES:

- May require some utility relocations and drainage canals on existing SR 98 near SR 7
- Possible need for a frontage road for existing residences west of the Cole Road intersection

COST SUMMARY	Initial Cost	Present Value Subsequent Cost	Present Value Highway User Cost	Net Present Value
Original Concept	$	$	$	$
Alternative Concept	$ 100,000,000	$	$	$ 100,000,000
Savings	$	$	$	$

Team Member:	Discipline:	PERFORMANCE: +265%

VALUE ANALYSIS ALTERNATIVE *SR 98 Corridor*		Caltrans	
TITLE:	Widen SR 98 from SR 7 to Bowker Road and Realign SR 98 Along Jasper to Dogwood	**ALTERNATIVE NO.** 1.4	**PAGE NO** 2 of 4

DISCUSSION / JUSTIFICATION:

This alignment satisfies all elements of the project's purpose and need, and it is very strongly supported by all community representatives that participated in the study. The alignment is also compatible with both the land use plan implemented by the City of Calexico and the long-term regional traffic plan. It will provide part of the a third north-south link that will be necessary if the proposed new border crossing west of the city is opened.

The majority of the land required for this alignment would be purchased from farmland. It is anticipated that this land will be converted to other uses in the next 10-20 years. Realigning SR 98 to this area can help to define area land use and minimize the potential of future regional traffic conflicts with local traffic, schools, and residential developments.

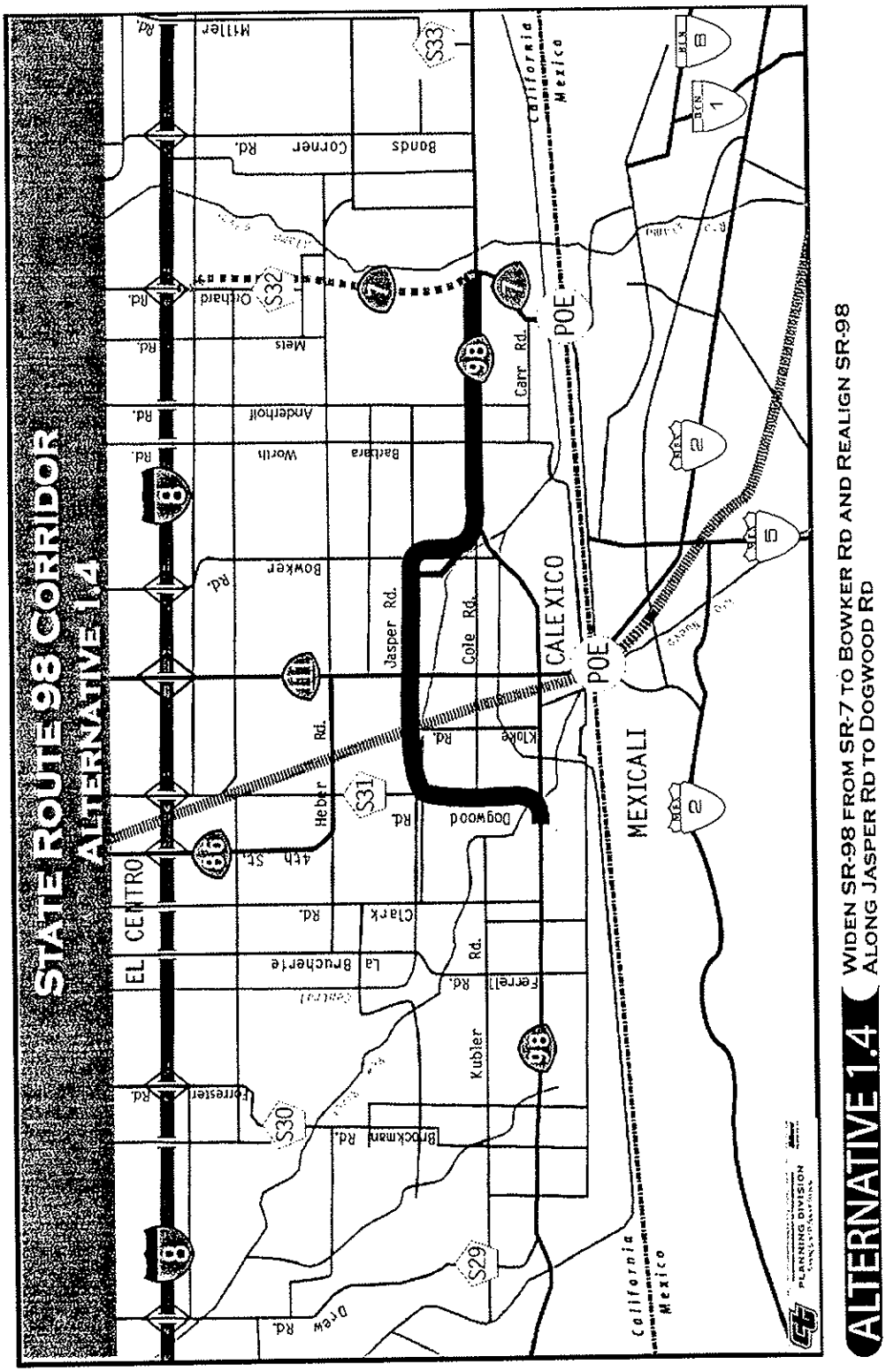
This alternative has strong support from the City of Calexico and local residents. The Calexico City Council has voiced their support for this alignment. The cost along this alignment is considered comparable to widening along existing SR98. The performance of this alternative is greatly improved over widening the current alignment. This performance improvement is largely due to greatly improved local and regional traffic operations; community support for this alignment, and possible reduced environmental impact. The route between existing SR98 and Jasper Road near Bowker Road will be refined in design. Currently there are several options to be evaluated.

TECHNICAL REVIEWER COMMENTS:

IMPLEMENTATION CONSIDERATIONS:

- Need to determine the best location near the Bowker Road intersection to transition the road from the current SR 98 alignment to Jasper Road.
- How to widen existing portion of SR 98, which is being reused, to the north, south, or bilateral.
- Need to identify right-of-way needs on Jasper so the new planned gas line can be aligned to miss potential right-of-way.

SKETCHES *SR 98 Corridor*		Caltrans	
TITLE:	Widen SR 98 from SR 7 to Bowker Road and Realign SR 98 Along Jasper to Dogwood	NUMBER 1.4	PAGE NO. 3 of 4



PERFORMANCE MEASURES *SR 98 Corridor*		Caltrans	
TITLE:	Widen SR 98 from SR 7 to Bowker Road and Realign SR 98 Along Jasper to Dogwood	**NUMBER** 1.4	**PAGE NO.** 4 of 4

CRITERIA	Performance	Original	Alternative
Community Support Strong community support for shifting SR 98 and the truck traffic away from community residential, school, and commercial areas, and to minimize local and regional traffic conflicts.	Measure	Degree	Degree
	Rating	1	10
	Weight	24	24
	Contribution	24	240
Compatibility with Mexico's Plans Good cross border connections with current border crossings and potential future western crossings.	Measure	Degree	Degree
	Rating	5	8
	Weight	18	18
	Contribution	90	144
Calexico Traffic Operations Greatly improved local traffic, as border truck traffic is separated from local city traffic and effectively increases local capacity.	Measure	Degree	Degree
	Rating	1	10
	Weight	20	20
	Contribution	20	200
Environmental Impact Minimal environmental impact, as community noise impact will be reduced and right-of-way takes from private homes and impacts to schools will be greatly reduced. Farmland impacts are reduced. Reduced right-of-way requirements east of Calexico.	Measure	Degree	Degree
	Rating	1	8
	Weight	10	10
	Contribution	10	80
Construction Schedule Impact Construction should be greatly reduced, as most construction can be done without impacting traffic options. Reduced construction phasing is needed to maintain local traffic operations. Minimal utilities to relocate.	Measure	Degree	Degree
	Rating	6	6
	Weight	4	4
	Contribution	24	24
Impact on Gateway Infrastructure Improvements Compatible with Gateway and could improve their access to SR 98.	Measure	Degree	Degree
	Rating	9	9
	Weight	2	2
	Contribution	18	18
Regional Traffic Impact Improves regional traffic, as it reduces local traffic and regional traffic conflicts.	Measure	Degree	Degree
	Rating	2	9
	Weight	4	4
	Contribution	8	36
Impact on Growth and Lands Use Improves access to the industrial area west of SR 111. Maintains SR 98 within the sphere of influence of the City of Calexico	Measure	Degree	Degree
	Rating	3	9
	Weight	18	18
	Contribution	54	162
Total Performance:		**248**	**904**
Net Change in Performance:			**+265%**

VALUE ANALYSIS ALTERNATIVE *SR 98 Corridor*		Caltrans	
FUNCTION:	Increase Capacity	**IDEA NO.** 2	**ALTERNATIVE NO.** 1.4
TITLE:	Widen SR 98 from SR 7 to Barbara Worth Road and Realign SR 98 Along Jasper to Dogwood		**PAGE NO.** 1 of 4

ORIGINAL CONCEPT:

SR 98 is currently a two-lane conventional highway in the county from SR 7 to the start of Cole Road, where it angles to the southwest for approximately one mile. At that point, SR 98 heads west and widens to a four-lane conventional highway west of Meadows. It continues as a four-lane highway to just west of SR 111, where it reduces back to two lanes to the city limits and beyond. There is a current project to widen the segment of SR 98, west of SR 111 to the western city limits, to a four-lane conventional highway. This will improve current local traffic issues in the area, but it will not solve all the current or long-term traffic issues created largely as a by-product of NAFTA.

ALTERNATIVE CONCEPT:

Widen SR 98 from SR 7 to Barbara Worth Road and realign SR 98 along Jasper to Dogwood. This would be designed to current expressway standards. This alignment will have a six-lane ultimate capacity and 200 feet of right-of-way. The existing alignment would be maintained from SR 7 to Barbara Worth Road, where it will turn north to Jasper, continue on Jasper to Dogwood, and turn south on Dogwood to existing SR 98. It needs to be determined if SR 98 should be grade separated at SR 111 and possibly at the railroad. These are factored into the cost estimate.

ADVANTAGES:

- No loss of business from truckers
- Moves truck traffic away from schools
- Consistent with plans south of the border
- Separates truck traffic from local traffic
- Supports and enhances existing land use plans
- In concert with Calexico sphere of influence
- Can prevent new SR 98 from becoming predominantly residential again
- Minimal traffic impact during construction
- Increases Gateway Development area potential
- Caltrans owns right-of-way from SR 7 to Cole
- Compatible with Gateway development plans

DISADVANTAGES:

- May require some utility relocations and drainage canals on existing SR 98 near SR 7
- Possible need for a frontage road for existing residences west of the Cole Road intersection
- Increases conversion of agricultural land
- Community opposition to SR on Jasper East of Bowker Road – historical school along the alignment
- More difficult to farm both sides of Jasper if it becomes the new SR – large/long farm equipment is difficult to cross a busy state route.

COST SUMMARY	Initial Cost	Present Value Subsequent Cost	Present Value Highway User Cost	Net Present Value
Original Concept	$	$	$	$
Alternative Concept	$ 100,000,000	$	$	$ 100,000,000
Savings	$	$	$	$

Team Member:	Discipline:	PERFORMANCE: +114%

VALUE ANALYSIS ALTERNATIVE *SR 98 Corridor*		Caltrans	
TITLE:	Widen SR 98 from SR 7 to Barbara Worth Road and Realign SR 98 Along Jasper to Dogwood	**ALTERNATIVE NO.** 1.5	**PAGE NO** 2 of 4

DISCUSSION / JUSTIFICATION:

While this alignment would satisfy the project's purpose and need, it is very strongly opposed by local residents, as it has greater impact on historical properties and local farming east of Bowker.

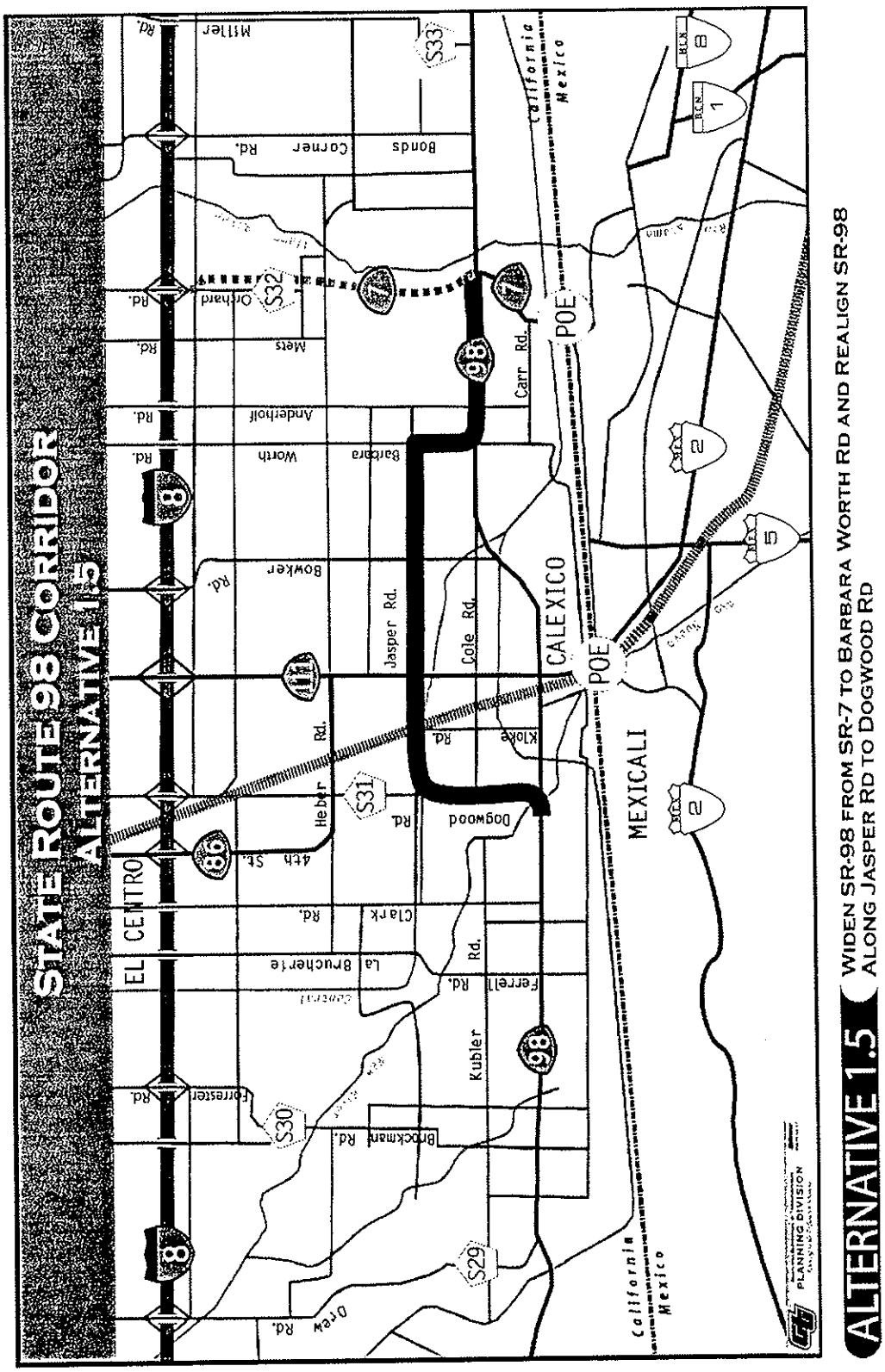
This alternative is to be dropped. There is no support for this alignment and it provides no advantage over Alternative 1.4.

TECHNICAL REVIEWER COMMENTS:

IMPLEMENTATION CONSIDERATIONS:

- Need to avoid historical property and maintain local farming operations for this to be considered.
- How to widen existing portion of SR 98, which is being reused, to the north, south, or bilateral.
- Need to identify right-of-way needs on Jasper so the new planned gas line can be aligned to miss potential right-of-way.

SKETCHES *SR 98 Corridor*		Caltrans	
TITLE:	Widen SR 98 from SR 7 to Barbara Worth Road and Realign SR 98 Along Jasper to Dogwood	NUMBER 1.5	PAGE NO. 3 of 4



PERFORMANCE MEASURES *SR 98 Corridor*		Caltrans		
TITLE:	Widen SR 98 from SR 7 to Barbara Worth Road and Realign SR 98 Along Jasper to Dogwood	NUMBER 1.5		PAGE NO. 4 of 4
CRITERIA		**Performance**	**Original**	**Alternative**
Community Support While there is strong community and local opposition to relocating SR 98 to Jasper east of Bowker Road due to the impact on farming and a historical school house in the area.		Measure	Degree	Degree
		Rating	1	1
		Weight	24	24
		Contribution	24	24
Compatibility with Mexico's Plans Good cross border connections with current border crossings and potential future western crossings.		Measure	Degree	Degree
		Rating	5	8
		Weight	18	18
		Contribution	90	144
Calexico Traffic Operations Improves local traffic, as some regional border truck traffic is separated from local city traffic, but there would continue to be some conflict with local traffic and regional truck operations.		Measure	Degree	Degree
		Rating	1	8
		Weight	20	20
		Contribution	20	160
Environmental Impact Probable impact to historical school along this alignment and increased impact to farmland.		Measure	Degree	Degree
		Rating	1	2
		Weight	10	10
		Contribution	10	20
Construction Schedule Impact Construction should be greatly reduced, as most construction can be done without impacting traffic options. Reduced construction phasing is needed to maintain local traffic operations. Minimal utilities to relocate.		Measure	Degree	Degree
		Rating	6	6
		Weight	4	4
		Contribution	24	24
Impact on Gateway Infrastructure Improvements Compatible with Gateway and could improve their access to SR 98.		Measure	Degree	Degree
		Rating	9	9
		Weight	2	2
		Contribution	18	18
Regional Traffic Impact Improves regional traffic, as it reduces local traffic and regional traffic conflicts, but there would continue to be some conflict with local traffic and regional truck operations.		Measure	Degree	Degree
		Rating	2	9
		Weight	4	4
		Contribution	8	36
Impact on Growth and Lands Use Improves access to the industrial area west of SR 111. Maintains SR 98 within the sphere of influence of the City of Calexico		Measure	Degree	Degree
		Rating	3	6
		Weight	18	18
		Contribution	54	128
Total Performance:			**248**	**530**
Net Change in Performance:				**+114%**