ROAD REPAIR AND ACCOUNTABILITY ACT OF 2017
PROJECT BASELINE AGREEMENT

Project Name: Fix 5 Cascade Gateway/ I-5 Improvements Shasta

Resolution TCEP-P-2021-07B
(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 Fix 5 Cascade Gateway / I-5 Improvements Shasta, effective on, June 23, 2021 (will be completed by CTC), is made by and between the California Transportation Commission (Commission), the California Department of Transportation (Caltrans), the Project Applicant, *Shasta Regional Transportation Agency (SRTA)*, and the Implementing Agency, *Caltrans*, sometimes collectively referred to as the "Parties".

3. RECITAL

3.2 Whereas at its December 2, 2020 meeting the Commission approved the Trade Corridor Enhancement Program, and included in this program of projects the Fix 5 Cascade Gateway/ I-5 Improvements Shasta, 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 , "Adoption of Program of Projects for the State Highway Operation and Protection Program", March 2022
- ☒ Resolution G-20-77, "Adoption of Program of Projects for the Trade Corridor Enhancement Program", dated December 2, 2020

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 SRTA and Caltrans (for non-SHOPP funded) and Caltrans (for SHOPP funded work) agree to secure funds for any additional costs of the project. Caltrans will support SRTA, to the extent possible, to secure additional funds for non-SHOPP.

4.6 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 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

a) In the event of a cost overrun the state will cover a share proportionate to the state contribution of the TCEP funding identified in the Project Programming Request (PPR) submitted with this baseline agreement. (For example, if the state/regional TCEP funding share was a 40/60 ratio, the state may fund no more than 40% of the cost overrun.)

b) In the event of a cost overrun in SHOPP, the state will cover 100% of the overrun.

Attachments:

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

SIGNATURE PAGE
TO
PROJECT BASELINE AGREEMENT
Fix 5 Cascade Gateway/I-5 Improvements Shasta

Resolution TCEP-P-2021-07B

Dan Little — 5.24.2021
Dan Little — Date

Executive Director, Shasta Regional Transportation Agency

Project Co-Applicant

Dave Moore — 5/24/2021
Dave Moore — Date

District Director

Implementing Agency and Project Co-Applicant

Dave Moore — 5/24/2021
Dave Moore — Date

District Director

California Department of Transportation

Michael D. Keever for — 6/22/21
Toks Omishakin — Date

Director

California Department of Transportation

Mitchell Weiss — 07/16/21
Mitchell Weiss — Date

Executive Director

California Transportation Commission

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST (PPR)

PRG-0010 (REV 08/2020)

PPR ID
ePPR-D02-2020-0001 v4

Amendment (Existing Project) ☒ YES ☐ NO				Date	06/08/2021 13:12:08
Programs ☐ LPP-C ☐ LPP-F ☐ SCCP ☐ **X** TCEP ☐ STIP ☐ Other					
District	EA	Project ID	PPNO	Nominating Agency	
02	0H920	0215000083	3597	Shasta Regional Transportation Agency	
County	Route	PM Back	PM Ahead	Co-Nominating Agency	
Shasta	5	R 14.800	R 20.000		
				MPO	Element
				[redacted]	Capital Outlay
Project Manager/Contact			Phone	Email Address	
Eric Orr			530-225-3466	eric.orr@dot.ca.gov	

Project Title

Fix 5 Cascade Gateway / I-5 Improvements Shasta

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

In Shasta County in Redding from 0.3 mile north of Cypress Avenue Undercrossing to 0.6 mile north of Oasis Road Overcrossing. Description: Provide standard vertical clearance over I-5 at the NB 273/NB 5 connector ramp. Provide improved vertical clearance under four structures at I-5 at Twin View Blvd and SR 299 crossings. Add a third mixed-flow through lane. Install high tension cable barrier and concrete barrier in the median as determined by the median width. Construct four auxiliary lanes. Widen seven bridges. Upgrade bridge rails on both sides. Place overhead signs, guide signs and warning signs as recommended by Traffic Operations. Remove and replace existing guardrail and end treatments.

Component	Implementing Agency
PA&ED	Caltrans District 2
PS&E	Caltrans District 2
Right of Way	Caltrans District 2
Construction	Caltrans District 2

Legislative Districts

Assembly:	1	Senate:	1	Congressional:	1

Project Milestone	Existing	Proposed
Project Study Report Approved	02/14/2017	
Begin Environmental (PA&ED) Phase	01/07/2019	01/07/2019
Circulate Draft Environmental Document Document Type (ND/MND)/CE	04/30/2020	04/30/2020
Draft Project Report	04/30/2020	04/30/2020
End Environmental Phase (PA&ED Milestone)	08/04/2020	08/04/2020
Begin Design (PS&E) Phase	07/01/2022	07/01/2022
End Design Phase (Ready to List for Advertisement Milestone)	08/29/2024	08/29/2024
Begin Right of Way Phase	07/01/2022	07/01/2022
End Right of Way Phase (Right of Way Certification Milestone)	08/08/2024	08/08/2024
Begin Construction Phase (Contract Award Milestone)	02/04/2025	02/04/2025
End Construction Phase (Construction Contract Acceptance Milestone)	12/28/2026	12/28/2026
Begin Closeout Phase	12/28/2028	12/28/2028
End Closeout Phase (Closeout Report)	09/30/2030	09/30/2030

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST (PPR)

PRG-0010 (REV 08/2020)

PPR ID
ePPR-D02-2020-0001 v4

Date 06/08/2021 13:12:08

Purpose and Need

Purpose: Improve operations on I-5 by reducing merging conflicts and congestions, upgrading signing and lighting, providing new ITS elements to improve safety and reduce collision concentrations; improve primary evacuation route for high fire severity zones; reduce adverse impacts of closures during winter storms; enhance reliability of the interstate and interregional goods movement; improve pavement quality to increase smoothness, reduce maintenance efforts, and minimize field maintenance exposure to traffic

Need: Existing facility has aged beyond its design life and no longer adequately meets transportation demands within the project limits. The existing pavement needs to be preserved and the existing lighting, signing and median barrier are non-standard. Additional Transportation Management System elements are needed to improve freeway operations during emergency events. The mainline flow of traffic is degraded by a speed differential resulting from an increase in merging trucks and other vehicles at several consecutive ramps. Recent fires and winter storms developed long backups, delays, and major detours through and around the project area, demonstrating the current lack of system resiliency. This four-lane section of freeway is the last remaining bottleneck on I-5 in Shasta County from the Tehama County line to Shasta Lake City, restricting freeway operations and inter-regional goods movement. All these factors reduce the safety and operational effectiveness of the facility.

NHS Improvements	YES ☐ NO	Roadway Class 1	Reversible Lane Analysis	YES ☐ NO

Inc. Sustainable Communities Strategy Goals ☒ YES ☐ NO Reduce Greenhouse Gas Emissions ☐ YES ☒ NO

Project Outputs

Category	Outputs	Unit	Total
Pavement (lane-miles)	Roadway lane miles	Miles	7.6
Bridge / Tunnel	Modified/Reconstructed bridges/tunnels	SQFT	119,522
Operational Improvement	Auxiliary lanes	Miles	5
TMS (Traffic Management Systems)	Closed circuit television cameras	EA	1
Pavement (lane-miles)	Mainline Shoulders construction	Miles	15.2
TMS (Traffic Management Systems)	Communications (fiber optics)	Miles	1.2

Date 06/08/2021 13:12:08

Additional Information

Performance Indicators and Measures: Economic Development: Jobs Created (Indirect): With Build = 1040, Without Build = 0, Change = 0

The SHOPP funds identified as part of this project are associated with PPNO 3790, Asset Management ID # 22190, EA 02-1J380, and Project Identification # 0220000064. The Project Initiation Report (PIR) will be signed by the district on or before June 30, 2021, and will be submitted by the district to be programmed as part of the 2022 SHOPP, in March of 2022.

The cost increase in the SHOPP section is to correct a clerical error.

Performance Indicators and Measures						
Measure	**Required For**	**Indicator/Measure**	**Unit**	**Build**	**Future No Build**	**Change**
Congestion Reduction	TCEP	Daily Vehicle Hours of Travel Time Reduction	Hours	0	0	0
	TCEP	Daily Truck Trips	# of Trips	0	0	0
	TCEP	Daily Truck Miles Traveled	Miles	0	0	0
Throughput	TCEP	Change in Truck Volume That Can Be Accommodated	# of Trucks	7,293	6,875	418
	TCEP	Change in Rail Volume That Can Be Accommodated	# of Trailers	0	0	0
			# of Containers	0	0	0
	TCEP	Change in Cargo Volume That Can Be Accommodated	# of Tons	0	0	0
			# of Containers	0	0	0
System Reliability	TCEP	Truck Travel Time Reliability Index	Index	1.67	1.69	-0.02
	TCEP	Daily Vehicle Hours of Travel Time Reduction	Hours	0	0	0
Velocity	TCEP	Travel Time or Total Cargo Transport Time	Hours	0	0	0
Air Quality & GHG	LPPF, LPPC, SCCP, TCEP	Particulate Matter	PM 2.5 Tons	0.02	0.015	0.005
			PM 10 Tons	0.079	0.058	0.021
	LPPF, LPPC, SCCP, TCEP	Carbon Dioxide (CO2)	Tons	147.86	105.903	41.957
	LPPF, LPPC, SCCP, TCEP	Volatile Organic Compounds (VOC)	Tons	0	0	0
	LPPF, LPPC, SCCP, TCEP	Sulphur Dioxides (SOx)	Tons	0	0	0
	LPPF, LPPC, SCCP, TCEP	Carbon Monoxide (CO)	Tons	0.17	0.126	0.044
	LPPF, LPPC, SCCP, TCEP	Nitrogen Oxides (NOx)	Tons	0.084	0.058	0.026
Safety	LPPF, LPPC, SCCP, TCEP	Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries	Number	0	0	0
	LPPF, LPPC, SCCP, TCEP	Number of Fatalities	Number	0.4	0.6	-0.2
	LPPF, LPPC, SCCP, TCEP	Fatalities per 100 Million VMT	Number	0.312	0.359	-0.047
	LPPF, LPPC, SCCP, TCEP	Number of Serious Injuries	Number	97	129	-32
	LPPF, LPPC, SCCP, TCEP	Number of Serious Injuries per 100 Million VMT	Number	14.8	15	-0.2
Economic Development	LPPF, LPPC, SCCP, TCEP	Jobs Created (Direct and Indirect)	Number	82.5	0	82.5
Cost Effectiveness	LPPF, LPPC, SCCP, TCEP	Cost Benefit Ratio	Ratio	3.3	0	3.3

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST (PPR)

PRG-0010 (REV 08/2020)

PPR ID
ePPR-D02-2020-0001 v4

District	County	Route	EA	Project ID	PPNO
02	Shasta	5	0H920	0215000083	3597

Project Title

Fix 5 Cascade Gateway / I-5 Improvements Shasta

Existing Total Project Cost ($1,000s)									
Component	Prior	21-22	22-23	23-24	24-25	25-26	26-27+	Total	Implementing Agency
E&P (PA&ED)	1,600							1,600	Caltrans District 2
PS&E			5,162					5,162	Caltrans District 2
R/W SUP (CT)			77					77	Caltrans District 2
CON SUP (CT)					8,014			8,014	Caltrans District 2
R/W			742					742	Caltrans District 2
CON					64,640			64,640	Caltrans District 2
TOTAL	1,600		5,981		72,654			80,235	
Proposed Total Project Cost ($1,000s)									Notes
E&P (PA&ED)	1,600							1,600	
PS&E			5,849					5,849	
R/W SUP (CT)			77					77	
CON SUP (CT)					8,254			8,254	
R/W			742					742	
CON					66,790			66,790	
TOTAL	1,600		6,668		75,044			83,312	

Fund #1:	RIP - National Hwy System (Committed)								Program Code
Existing Funding ($1,000s)									20.XX.075.600
Component	Prior	21-22	22-23	23-24	24-25	25-26	26-27+	Total	Funding Agency
E&P (PA&ED)	1,600							1,600	Shasta Regional Transportation Age
PS&E			2,227					2,227	
R/W SUP (CT)			50					50	
CON SUP (CT)									
R/W			631					631	
CON									
TOTAL	1,600		2,908					4,508	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)	1,600							1,600	
PS&E			2,227					2,227	
R/W SUP (CT)			50					50	
CON SUP (CT)									
R/W			631					631	
CON									
TOTAL	1,600		2,908					4,508	

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST (PPR)

PRG-0010 (REV 08/2020)

PPR ID
ePPR-D02-2020-0001 v4

Fund #2:	State SB1 TCEP - Trade Corridors Enhancement Account (Committed)								Program Code
	Existing Funding ($1,000s)								20.XX.723.100
Component	Prior	21-22	22-23	23-24	24-25	25-26	26-27+	Total	Funding Agency
E&P (PA&ED)									Caltrans HQ
PS&E			1,071					1,071	State Share
R/W SUP (CT)			27					27	
CON SUP (CT)									
R/W			111					111	
CON									
TOTAL			1,209					1,209	
	Proposed Funding ($1,000s)								Notes
E&P (PA&ED)									
PS&E			1,071					1,071	
R/W SUP (CT)			27					27	
CON SUP (CT)									
R/W			111					111	
CON									
TOTAL			1,209					1,209	

Fund #3:	State SB1 TCEP - Trade Corridors Enhancement Account (Committed)								Program Code
	Existing Funding ($1,000s)								20.XX.723.200
Component	Prior	21-22	22-23	23-24	24-25	25-26	26-27+	Total	Funding Agency
E&P (PA&ED)									Caltrans HQ
PS&E			664					664	TCEP - Regional Share
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL			664					664	
	Proposed Funding ($1,000s)								Notes
E&P (PA&ED)									
PS&E			664					664	
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL			664					664	

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST (PPR)

PRG-0010 (REV 08/2020)

PPR ID
ePPR-D02-2020-0001 v4

Fund #4:	Future Need - Future Funds (Uncommitted)								Program Code
Existing Funding ($1,000s)									FUTURE
Component	Prior	21-22	22-23	23-24	24-25	25-26	26-27+	Total	Funding Agency
E&P (PA&ED)									
PS&E			1,200					1,200	
R/W SUP (CT)									
CON SUP (CT)					8,014			8,014	
R/W									
CON					64,640			64,640	
TOTAL			1,200		72,654			73,854	
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									Caltrans and SRTA are applying for various alternative fund sources to fund the construction component.
PS&E									
R/W SUP (CT)									
CON SUP (CT)					8,254			8,254	
R/W									
CON					66,790			66,790	
TOTAL					75,044			75,044	

Fund #5:	SHOPP - Future Funds (Uncommitted)								Program Code
Existing Funding ($1,000s)									
Component	Prior	21-22	22-23	23-24	24-25	25-26	26-27+	Total	Funding Agency
E&P (PA&ED)									Caltrans District 2
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									
Proposed Funding ($1,000s)									Notes
E&P (PA&ED)									PS&E programming will be added to the project with the adoption of the Cascade SHOPP project in the 2022 SHOPP in March 2022.
PS&E			1,887					1,887	
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL			1,887					1,887	

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST (PPR)

PRG-0010 (REV 08/2020)

PPR ID
ePPR-D02-2020-0001 v4

Complete this page for amendments only

Date 06/08/2021 13:12:08

District	County	Route	EA	Project ID	PPNO
02	Shasta	5	0H920	0215000083	3597

SECTION 1 - All Projects

Project Background

There are no changes tot he project background at this time.

Programming Change Requested

Reason for Proposed Change

Updated funding plan and additional information page to match the Project Report.

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

Other Significant Information

SECTION 2 - For SB1 Project Only

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

ePPR now matches the PR as required by the SB1 program.

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

SECTION 3 - All Projects

Attachments

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

FIX 5 CASCADE GATEWAY

Project Report

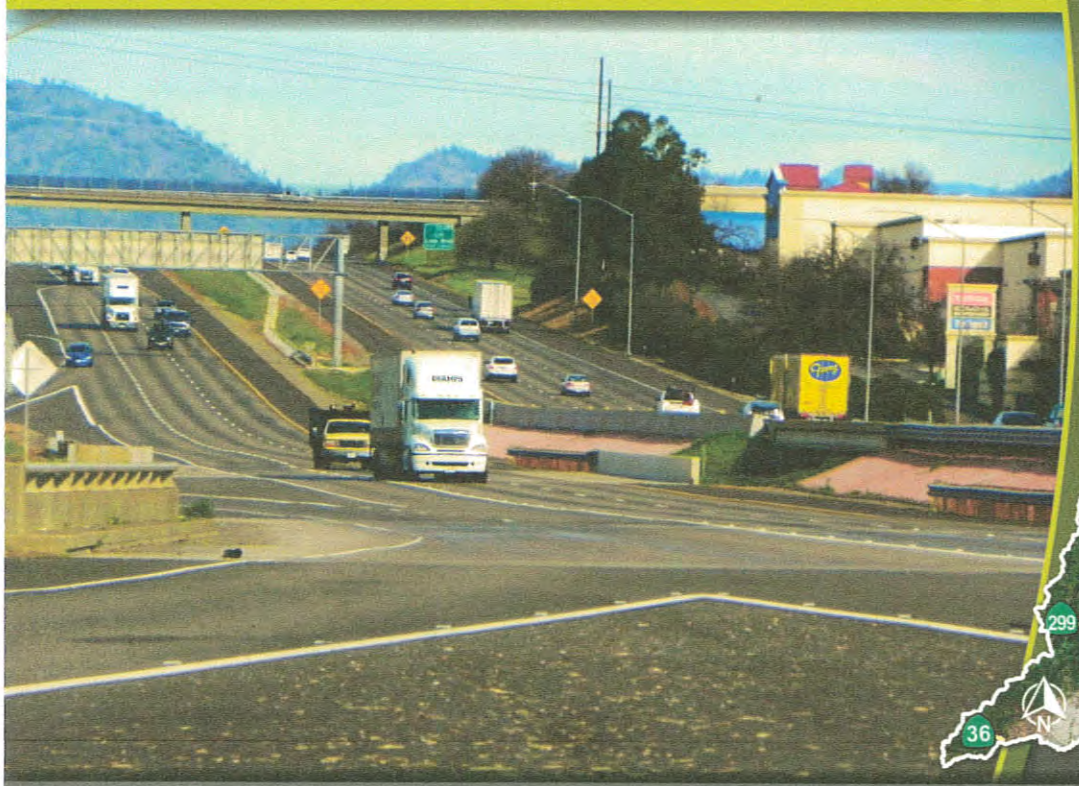
02-SHA-5 PM R14.8/R20.0

STIP EA: 02-0H920

EFIS ID: 02-1500-0083

PPNO 3597

STIP-RIP: 20.XX.075.600



PROJECT LOCATION

In Shasta County in Redding from 0.3 mile north of Cypress Avenue Undercrossing to 0.6 mile north of Oasis Road Overcrossing

"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 has judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions and decisions are based."

REGISTERED PROFESSIONAL ENGINEER
TRAVIS A. GURNEY
No. 77417
CIVIL
STATE OF CALIFORNIA

TRAVIS A. GURNEY, P.E. — 7/20/2020 Date

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:

Karen E Hawkins — 7/24/2020 Date
KAREN E. HAWKINS
Assistant Division Chief, North Region ROW

Approval Recommended:

Sean Shepard — 7/24/2020 Date
SEAN E. SHEPARD, P.E.
Project Manager, District 2

KAK — 08/04/2020 Date
KRISTEN A. KINGSLEY, P.E.
Deputy District Director, PPM/AM, District 2

8.4.20 Date
TOM BALKOW
Deputy District Director, PLA, District 2

7/24/2020 Date
DAN LITTLE
Executive Director, SRTA

Project Approved:

8/4/2020 Date
DAVE MOORE, P.E.
District Director, District 2

CALIFORNIA DEPARTMENT OF TRANSPORTATION • DISTRICT 2

TABLE OF CONTENTS

1. INTRODUCTION

The Fix 5 Cascade Gateway (F5CG) Project will widen Interstate 5 (I-5) from four to six lanes in Redding from 0.3 mile north of Cypress Avenue Overcrossing to 0.6 mile north of Oasis Road Undercrossing. Roadway widening will typically be in the median with limited outside widening as needed to add a 12-ft lane and 10-ft median shoulder in each direction. In addition to the proposed through-lanes, the project will widen the roadway to add four new auxiliary lanes. The work will require widening seven bridges and adding stormwater treatment and drainage features to account for the new impervious area. This project will improve a primary evacuation route, enhance reliability of I-5 and interregional goods movement, and provide merging and operational improvements. A location map is included as Attachment A. The current (non-escalated) capital construction cost is estimated at $57,000,000, which includes $14,280,000 for structures improvements. The design, right of way, and construction costs will be funded from the State Transportation Improvement Program (STIP) (20.XX.075.600), with significant potential contributions anticipated from the State Highway Operation and Protection Program (SHOPP) and other programs and grants. This project falls under a Project Development Processing Category 4A, “widening of existing freeway without requiring a revised freeway agreement.”

Table 1: Project Report Summary

Project Limits	02-Shasta-05-R14.8/R20.0	
Number of Alternatives	2, including the "No Build" Alternative	
	Current Cost Estimate (2020):	**Escalated Cost Estimate (2026):**
Capital Outlay Support	$13,991,000	$15,780,000
Capital Outlay Construction	$57,000,000	$66,709,000
Capital Outlay Right-of-Way	$740,000	$744,000
Funding Sources / Codes	20.XX.075.600 STIP - Regional Improvement Program Contributions anticipated from other funding sources	
Delivery Year	Fiscal Year 2025/2026	
Construction Year	2026	
Working Days	240	
Type of Facility	four-lane and six-lane interstate freeway	
Number of Structures	7	
Anticipated Environmental Determination or Document	CEQA - Initial Study/Mitigated Negative Declaration NEPA - Categorical Exclusion	
Legal Description	In Shasta County in Redding from 0.3 mile north of Cypress Avenue Undercrossing to 0.6 mile north of Oasis Road Overcrossing.	
Project Development Category	Category 4A – Widening of existing freeway without requiring a revised freeway agreement	

2. RECOMMENDATION

It is recommended the project be approved using the preferred alternative and that the project proceed to the design phase.

3. BACKGROUND

Project History

A Project Study Report-Project Development Support (PSR-PDS) was completed in February of 2017 that evaluated adding a lane on I-5 in each direction to connect the existing six-lane section of freeway in central Redding to the six-lane section in Shasta Lake City. The I-5 corridor in Shasta County has the highest traffic volumes in California north of Sacramento. Recent projects on the I-5 corridor from the Tehama/Shasta County line to the Redding area have added a third lane in each direction. The Redding

to Anderson Six-Lane (RASL) project is expected to complete construction activities in 2021. Shasta Regional Transportation Agency (SRTA) and other local officials are eager to connect these segments and create a continuous 22-mile plus section of 6-lane freeway extending from Cottonwood to Shasta Lake City.

Three different alternatives were identified for the project development phase. Two build alternatives would add an additional lane and widened shoulder in both directions; the alternatives varied by where the widening occurs – to the outside, to the inside, and a combination of inside and outside widening. The third alternative considered was a no-build alternative. A Value Analysis (VA) study was conducted in December 2019 to evaluate the project scope and propose value enhancing ideas. The VA team concluded that widening to the median provided the best assured value for the project. During the preliminary design phase, it was determined one of the alternatives (Build Alternative, described in the PSR-PDS) was not feasible, consistent with the recommendation provided by the VA team. Therefore, no further evaluation of this alternative is necessary.

Local Involvement in Developing the Project

- SRTA, City of Redding, and Caltrans together developed the purpose and need for this project.
- The top priority of SRTA is the I-5 corridor from the Tehama/Shasta County line north to Mountain Gate near Shasta Lake.

Project Proponents Include

- SRTA
- City of Redding
- Caltrans

Route History

This section of I-5 was initially constructed in 1963; the original route was designated State Route (SR) 3.

I-5 is the primary north-south route in the western United States. In addition, I-5 is a high emphasis route and part of the National Highway System (NHS) and the Interregional Road System (IRRS).

Existing Facility

Existing Facility Adjacent to the Project Limits

I-5 north and south of the project location is a six-lane freeway with 12-ft lanes, 10-ft inside shoulders and 10-ft outside shoulders. The terrain is level with grades up to 3 percent. The median is typically paved and 36-ft wide with a concrete barrier.

Existing Facility within the Project Limits

The existing facility within the project limits is typically a four-lane freeway with 12-ft lanes, 10-ft outside shoulders and varying inside shoulder widths. Traffic is separated by a concrete barrier and paved median approximately 36-ft in width, or an 84-ft unpaved median separated by a berm or high-tension cable barrier. The terrain is level with grades up to 3 percent. The horizontal alignment is curvilinear with a design speed of 70 mph and a posted speed of 65 mph.

Table 2 below includes the important freeway features for the nearly 22-mile-long segment of I-5 from Cottonwood through Anderson and Redding to Shasta Lake City.

Table 2: Existing Freeway Features

			Begin Post Mile (SHA-5)	End Post Mile (SHA-5)	Length (miles)	Median Width* (feet)	Segment	Comments
Total length of 21.8 miles	6-Lane freeway		0.30	R4.30	4.00	36 - 60	Cottonwood Hills EA 02-37100	6-lane completed in 2011
	6-Lane freeway		R4.30	R11.20	6.90	60 - 84	Redding to Anderson Six-Lane (RASL) EA 02-4C40V	6-lane to be completed in 2021
	6-Lane freeway (NB lanes only)		R11.20	R16.50	5.30	36-60	South Redding 6-Lane EA 02-4C401	6-lane completed in 2012
	6-Lane freeway (SB lanes only)		R11.20	R14.90	3.70	36-60	South Redding 6-Lane EA 02-4C401	
	4-lane freeway (NB lanes only)	3.6 miles of 4-lane freeway	R16.50	R18.50	2.00	84	Proposed Fix 5 Cascade Gateway Project EA 02-0H920	Proposed project connects the 6-lane freeway segments on each end
	4-Lane freeway (SB lanes only)		R14.90	R18.50	3.60	84		Proposed project connects the 6-lane freeway segments at both ends
	Existing 6-Lane freeway		R18.50	R22.10	3.60	36		
	Total Miles				**21.8**		*Median width is the distance between inside edges of traveled way and includes the inside shoulders.	

SB = southbound, NB = northbound

There are four full interchanges within the project limits and one terminal interchange. The following table includes all the interchanges within the limits of this project.

Table 3: Freeway Interchanges

Exit Number	Road Served	Ramp Movements Provided	Post Mile (PM)	Local government jurisdiction and comments
678	44	• NB Off • NB On • SB Off • SB On	15.45	State Facility Weaving concerns SB 5 and EB 44
680	299	• NB Off • NB On • SB Off • SB On	17.32	State Facility
681	Twin View Boulevard	• NB Off • NB On	18.07	City of Redding
681A	Twin View Boulevard	• SB Off • SB On	18.07	
681B	273	• NB On • SB Off	18.48	State Facility
682	Oasis Road	• NB Off • NB On • SB Off • SB On	19.40	City of Redding

SB = southbound, NB = northbound

4. PURPOSE AND NEED

The purpose of the proposed project is to improve operations on I-5 by reducing merging conflicts and congestion, upgrading signing and lighting consistent with adjacent segments of the corridor, and providing new ITS elements; to improve safety and reduce collision concentrations; to improve this primary evacuation route for high fire severity zones; to reduce adverse impacts of closures during winter storms; enhance reliability of interstate and interregional goods movement; and improve the pavement quality to enhance smoothness, reduce maintenance efforts, and minimize Field Maintenance exposure to traffic.

The proposed project is needed because the existing facility has aged beyond its design life and no longer adequately meets transportation demands within the project limits. The existing pavement needs to be preserved and the existing lighting, signing and median barrier are non-standard. Additional Transportation Management System elements are needed to improve freeway operations during emergency events. The

mainline flow of traffic is degraded by a speed differential resulting from an increase in merging trucks and other vehicles at several consecutive ramps. Recent fires and winter storms developed long backups, delays, and major detours through and around the project area, demonstrating the current lack of system resiliency. This four-lane section of freeway is the last remaining bottleneck on I-5 in Shasta County from the Tehama County line to Shasta Lake City, restricting freeway operations and inter-regional goods movement. All these factors reduce the safety and operational effectiveness of the facility.

4A. REGIONAL AND SYSTEM PLANNING

Interstate 5 links most of the metropolitan areas in California, Oregon, and Washington. This section is a high emphasis route and principal arterial and is included in the following national networks: Strategic Highway and the Surface Transportation Assistance Act (STAA), as well as, the National Highway System (NHS). In 2007, federal legislation added I-5 as a "Corridor of the Future." This freeway is a key backbone route in District 2 and identified in the Interregional Transportation Strategic Plan as a Strategic Interregional Corridor of Economic Significance (the Sacramento Valley – Oregon Corridor). The corridor supports trade between Mexico and Canada, interregional goods movement, and is important to the regional economy.

Interstate 5 serves a mix of interregional traffic, as well as regional, local traffic, and transit on this portion of the route. This route passes through the Redding area, including interchanges for connections to west-east Route 44 and Route 299.

Operational improvements to enhance interregional connectivity for motorized travel on I-5 is consistent with the corridor vision described in the I-5 Transportation Concept Report (2008) and is shared with the Shasta Regional Transportation Agency. Pedestrians and bicyclists are not allowed for the majority of I-5 within the project limits because alternative routes are available, however bicyclists are allowed in both directions from the 273 Separation to the Oasis Overcrossing. Non-motorized travel is supported by city streets and paths that run in comparable alignments near I-5.

Interstate 5 is recognized as a priority route for the region. This proposed six-lane project is included in the District System Management Plan. Also, the North State Transportation for Economic Development Study for the 16-county Super Region encourages operational and bridge improvements on I-5. In addition, facilitation of goods movement for economic productivity is supported in the California Freight Mobility Plan (2014).

4B. TRAFFIC

Current and Forecasted Traffic

The current and forecasted traffic data is shown in the Table 4 Traffic Data below. The data was provided by the District 2 Traffic Branch.

Table 4: Traffic Data

	Average Daily Traffic (ADT)	Design Hourly Volume (DHV)	Traffic Index (TI)
Base year (2017)	60,000	5400	
Construction Year (2026)	66,300	5600	
10-year (2036)	74,800	6300	13.5
20-year (2046)	85,600	7200	14.5
30-year (2056)	94,600	7800	15.5
40-year ADT (2066)	102,600	8300	16
Directional Split %	55%		
2017 Truck %	11%		

Accident Analysis

The following accident information was obtained for I-5 in Shasta County from PM R14.8 to PM R20.0. The data is from Transportation System Network (TSN) for the 36-month period between 01/01/15 and 12/31/17.

Table 5: Accident Data

Sha-5 PM R14.8/R20.0

Accident Rates (accidents per million vehicle miles)	**Actual**	**Average**
Total Accident Rate	0.49	0.51
F+I Accident Rate	0.19	0.16
Fatal Accident Rate	0.00	0.002

F+I = Fatal + Injury

There were 141 reported crashes on this freeway segment of which there were 56 Injury crashes and 85 property damage only (PDO) crashes. According to the Type of Collision code, there were 4 Head-Ons, 34 Sideswipes, 37 Rear Ends, 6 Broadsides, 51 Hit Objects, and 9 Overturns.

There were 5 accident concentrations of note:

(1) PM R15.36-R15.59 (27 crashes): The southbound (SB) segment of I-5 within these PM limits includes the SB off-ramp to eastbound (EB) SR 44 off-ramp at PM R15.391 and the 5/44 Separator (bridge number 6-126 R/L). In the northbound (NB) direction, there were 13 reported crashes of which there were six Hit Objects, five Sideswipes, one Broadside, and one Head-On. Nine of the 13 NB crashes happened in wet conditions. In the SB direction, of the 14 reported crashes, there were six Hit Objects, two Broadsides, three Sideswipes, two Head-Ons, and one Rear End. Twelve of the 14 SB crashes happened in wet conditions.

(2) PM R15.95-R16.30 (18 crashes): Nine of the crashes involved SB drivers and there were three Hit Objects, three Sideswipes, and three Rear Ends. Five of the nine SB crashes occurred on wet pavement. Nine of the crashes involved NB drivers and there were four Hit Objects, one Sideswipe, and four Rear Ends. All of the NB crashes happened on dry pavement.

(3) PM R16.55-R16.84 (16 crashes): Fourteen of the crashes involved SB drivers and there were six Hit Objects, two Sideswipes, one Broadside, three Overturns, and two Rear Ends. One of the 14 SB crashes occurred on wet pavement. Two of the crashes involved NB drivers and both were Hit Objects. One of the NB crashes happened on wet pavement.

(4) PM R17.06-R17.23 (11 crashes): Ten of the crashes involved SB drivers. The SB crashes were two Hit Objects, three Sideswipes, one Broadside, and four Rear Ends. Two of the 10 SB crashes occurred on wet pavement. The one crash that involved a NB driver was a Sideswipe that happened on wet pavement.

(5) PM R17.58-R17.87 (15 crashes): Nine of the crashes involved SB drivers and there were four Hit Objects, two Sideswipes, one Broadside, and two Rear Ends. One of the nine SB crashes occurred on wet pavement. Six crashes involved NB drivers of which there were two Rear Ends, three Hit Objects and one Sideswipe. None of the NB crashes happened on wet pavement.

The accident concentrations that happened on mainline near ramp gore points are primarily due to merging/lane changes, unsafe speed and driving under the influence (DUI). Traffic Investigations determined the addition of a third lane will help reduce accidents because fewer lane changes will occur due to traffic not having to move over for merging traffic.

5. ALTERNATIVES

No Build Alternative

The no build alternative proposes no improvements to I-5, other than routine maintenance over the design life. Without the proposed improvements, assets in fair to poor condition would continue to deteriorate. Traffic operations would not improve and there would not be a reduction in merging conflicts and congestion. There would be no improvement in resiliency during emergency events. This alternative does not meet the need and purpose of the project.

Build Alternative 1 (Preferred Alternative)

This alternative proposes to add a third mixed-flow through lane. Features on mainline I-5 include:

- A six-lane freeway with three through lanes in the NB and SB directions with 10-ft inside and outside shoulders:
  - SB widening in the median from PM R15.4 to R18.6.
  - NB widening in the median from PM R16.5 to R18.6.
  - NB widening to the outside from PM R18.6 to R19.2.
- Four-strand high tension cable barrier will be placed in the unpaved median sections, when the median width is greater than 36-ft
- Concrete barrier will be placed in the paved median sections, when the median width is 36-ft or less.
- Four auxiliary lanes will be constructed in the following locations:
  - SB PM 15.8/R17.0 – From I-5/SR 44 WB off-ramp terminating at the I-5/SR 299 on-ramp. Widening will be within the median.
  - NB PM R15.5/R17.0 – From I-5/SR 44 WB on-ramp terminating at the I-5/SR 299 off-ramp. Widening will be in the median, while utilizing existing pavement and reconfiguring existing pavement delineation. In addition, it will include a two-lane off ramp at SR 299.
  - SB PM 18.7/R19.4 – From I-5/SR 273 SB off-ramp terminating at the Oasis on-ramp. The paved median will be reconstructed, the existing concrete barrier will be upgraded and relocated approximately 5-ft to the east, existing pavement delineation will be reconfigured, and the remaining median pavement will be utilized where feasible.
  - NB PM R18.7/R19.3 – From I-5/SR 273 NB on-ramp terminating at the Oasis off-ramp. Widening will be to the outside. The paved median will be reconstructed, existing pavement delineation will be reconfigured, and the remaining median pavement will be utilized where feasible.
- Seven bridges will be widened, six of which will include a ¾-inch minimum polyester concrete overlay:

- Six bridges will be widened in the median and each will include the polyester overlay on the existing portions of the structures.
- One bridge will be widened to the outside and does not require the polyester overlay across the existing structure.

Table 6: Structures Within The Project Limits

PM	Bridge (Official Bridge Name)	Bridge Number	Upper Facility	Lower Facility	Polyester Concrete Overlay on Existing Structure	Widening Towards (Median/Outside)	Vertical Clearance Work
R15.43	East Redding (5/44) Separation	06-0126L	I-5	Route 44 (freeway)	Yes	Median	No
R15.43	East Redding (5/44) Separation	06-0126R			N/A	N/A	No
R15.56	NB I-5 to WB SR 44 Connector Undercrossing (UC)	06-0127L	I-5	Route 44 (freeway)	Yes	Median	No
R16.15	Hilltop Drive Overcrossing (OC)	06-0101	Hilltop Drive	I-5	N/A	N/A	No
R17.13	Boulder Creek	06-0167	I-5	Boulder Creek	N/A	N/A	N/A
R17.3	Route (5/299) Separation	06-0129L	I-5	Route 299	Yes	Median	No
R17.3	Route (5/299) Separation	06-0129R			Yes	Median	Yes
R18.07	Twin View Boulevard UC	06-0143L	I-5	Twin View Boulevard	Yes	Median	Yes
R18.07	Twin View Boulevard UC	06-0143R			Yes	Median	Yes
R18.48	NB SR 273-NB I-5 Connector Overcrossing (OC)	06-0137G	Route 273	I-5	N/A	N/A	Yes
R19.0	Churn Creek	06-0107	I-5	Churn Creek	No	Outside	NA
R19.4	Oasis Road OC	06-0155	Oasis Road	I-5	N/A	N/A	No

- Widened bridges will include upgraded bridge rail on both sides.
- Vertical clearance under I-5 will be improved by lowering the roadway under four structures at Twin View Blvd and SR 299.
- Vertical clearance on I-5 will be improved to standard under the NB SR 273/NB I-5 Connector OC by reconstructing a portion of the southbound profile of I-5.
- The existing pavement will be cold planed 0.10-ft and a 0.10-ft Rubberized Hot Mix Asphalt (Open Graded) (RHMA-OG) friction course will be placed from edge of pavement (EP) to EP as a final wearing course for mainline, shoulders, and ramps. The RHMA-OG will reduce the possibility of hydroplaning and provide attenuation of traffic noise.
- Dig-outs will be utilized to repair locations of failed pavement.
- Excess material is anticipated to be approximately 70,000 cubic yards. The project will reuse as much material on-site as possible, however an optional disposal site will be provided.
- Placement of overhead signs, guide signs and warning signs will be added or replaced as recommended by Traffic Operations.
- Existing ramp configurations will be maintained or improved when feasible.
- Existing ITS Elements and other improvements will be maintained or modified as needed.
- Existing guardrail and end treatments will be removed and replaced with new Midwest Guardrail System (MGS), including Transition railing (Type WB-31) and Terminals Systems (TL-2).

Drainage

The proposed 10-ft inside shoulder will be sloped towards the median for most of the project limits. The number 1 lane (inside lane closest to the median) will typically be sloped towards the median as well except when conforming to the existing six-lane facilities adjacent to the project where the number 1 lanes are sloped to the outside. Several factors were considered in determining the number 1 lane cross slope, including: conforming to existing structures, conforming to existing six-lane sections, paved medians, profile grades paired with geometric configurations, and width of pavement. All the controlling factors will directly or indirectly affect the drainage characteristics.

The existing median drainage will be adjusted, replaced or expanded as needed. Median inlets attached to cross-culverts will be maintained or adjusted to perpetuate the existing connectivity. Additional drainage facilities will be added to meet drainage needs. From the information provided in the culvert inventory assessment, there are 18 culverts in poor to critical condition requiring some type of repair or replacement. An additional seven culverts are in fair condition and need maintenance or repair.

Detention basins, infiltration trenches, and underground detention vaults will be utilized as necessary to attenuate or retain peak flows during storm events. A portion of the project is located adjacent to a flood plain, which is associated with Boulder Creek and Churn Creek. When required, increased stormwater runoff from the additional impervious area will be metered to maintain pre-construction out-flows.

Railroad Involvement

There is no railroad within the project limits, therefore this project requires no railroad involvement.

Transportation Management Systems

There are 34 existing Traffic Census Station locations with 64 loops and six piezoelectric axle sensors (piezos) within the project limits; the six piezos and 45 loops will be replaced, 19 loops will be protected in place, and three new loops will be added.

There are seven existing ITS field elements within the project limits that must be protected in place or replaced if damaged during construction. The existing fiber optic vaults will be adjusted to grade to account for the change in elevation due to the roadway widening in the median.

Two new ITS elements are anticipated as part of this project: A Closed-Circuit Television (CCTV) camera near Hilltop Overcrossing at PM R16.15 and placement of fiber optic system from PM R18.6 to R20.0. Additional ITS elements may be considered and included as part of grant applications for additional funding; the ITS element commitments made during the application process will be incorporated into the project scope. As funding sources become available, grant requirements evolve, and technologies advance the items of work for ITS elements could expand or be reduced.

Utilities

Existing utilities within the project limits will be identified and potholed as outlined in the Caltrans utility policy. It was determined that the potholing and the utility conflict mapping for this project will be delayed into the design phase due to the extended time between the Project Approval and Environmental Documentation (PA&ED) and Ready to List (RTL) dates. There is a low risk to the project schedule and costs by delaying utility verification and potholing to the design phase.

At the Twin View Boulevard UC and the Churn Creek Bridge there are utilities in potential conflict including a 4-inch gas line, 8-inch water line, and 18-inch sewer line. Any utilities that conflict with the proposed improvements will be relocated prior to construction. Several existing utilities cross the roadway where construction activities are expected; however, no conflicts are anticipated, and these utilities will be protected in place.

Borrow Site, Disposal Site, and Material Storage

No borrow sites will be utilized on this project.

Approximately 70,000 cubic yards of asphalt grindings and other materials will be generated from roadway excavation and cold planing. Grindings and other construction debris will become property of the contractor. Some excavated materials may be reused onsite as embankment and/or disposed of at an optional disposal site located at one of the Shasta County Road Department's disposal yards; the actual location is still to be determined.

Highway Planting and Erosion Control

Disturbed slopes in the median and new embankment slopes will be stabilized with erosion control measures as recommended by the landscape architect. Gore areas at interchanges will have a contrast treatment applied between the ramps and mainline. Additional roadway planting and irrigation will be required to adjust, modify, or replace any highway planting disturbed during construction, which is anticipated near the northbound Oasis off-ramp.

Storm Water

This project will have a total disturbed soil area (DSA) of 32.0 acres. The DSA was calculated as all roadway excavation, widening, embankment areas, and staging areas. This project will be constructed under a Storm Water Pollution Prevention Program (SWPPP) Risk Level 2. The total project area is estimated at 260 acres. The existing impervious area is 53.1 acres. The impervious area after the project is completed is estimated at 69.8 acres. The net new impervious area is estimated at 16.6 acres. The replaced impervious area is estimated at 9.3 acres. The new impervious surface subject to MS4 threshold criteria is estimated at 25.9 acres (including 9.3 acres of replacement area). This project is within the boundary of the City of Redding Phase II Urban MS4 Permit Area.

Treatment best management practices (BMP) will be used within the project limits when feasible and are anticipated to utilize existing and proposed bio-strips, bio-swales, detention basins, and infiltration basins. Areas within the project where treatment BMPs are not feasible are anticipated to use alternative compliance credits established during the development and construction of the Redding to Anderson Six-Lane Project (RASL EA: 02-4C40V). The RASL Project's Storm Water Data Report stated, "The new and existing treatment BMPs will treat 87 acres of pavement area. The additional 43 treatment BMP acres will be documented and used as an Alternative Compliance credit source for the 02-0H920 North Redding 6 Lane and other future projects in this corridor/watershed, subject to RWQCB concurrence."

Project Capital Cost

An estimate for capital costs associated with the Build Alternative has been prepared. The cost estimate, $57,000,000 in current day dollars, is included as Attachment D.

Nonstandard Mandatory and Advisory Design Features

Nonstandard features in this project include superelevation rates and curve radius, on-ramp taper lengths, side slopes, median widths, interchange merging lengths, and interchange spacing. A Design Standard Decision Document (DSDD) will be approved during the next phase of the project when additional geometric data is available. Michael Webb, Acting Headquarters Project Delivery Coordinator, John Martin, Office Chief for Design Redding, and Robert Nixon, District 2 Design Liaison, agreed that the probability of approving these nonstandard features is high during a consultation meeting conducted on January 8, 2020, and they agreed to defer approval of the nonstandard features until the next phase of the project.

Table 7: Design Standards Risk Assessment

Non-standard Design Feature	Design Standard from Highway Design Manual (HDM)	Probability of Nonstandard Design Feature Approval	Justification for Probability Rating
1	**Index 202.2 Standards for Superelevation:** "Based on the above emax, superelevation rates from Tables 202.2A through 202.2E shall be used with the minimum curve radii and design speed (Vd)"	High	For all curves the proposed superelevation does provide a maximum comfortable speed of 80+ mph, exceeding the design speed of 70 mph. An open-graded rubberized HMA overlay will also be placed from Edge of Shoulder (ES) to ES, improving cross drainage and reducing hydro-planing. There is no history of collisions related to superelevation rate at any of the curves identified within the project limits.
2	**304.1 Side Slope Standards:** "For new construction, widening, or where slopes are otherwise being modified, embankment (fill) slopes should be 4:1 or flatter."	High	The proposed slopes are approximately 2:1 or flatter, and are consistent with existing slopes in the area, 4:1 or flatter slopes would require additional Right of Way causing impacts to local businesses.
3	**Index 305.1(b) Median Standards of the HDM states:** "Rural Areas. The minimum median width for freeways and expressways in rural areas should be 62 feet."	High	A minimum 36' median will still provide 10' shoulders and a barrier will be placed in the median to mitigate crossover accidents. Existing drainage will be upgraded to accommodate additional flows due to the reduction in the median width and the additional pavement.
4	**Spacing Index 501.3** The minimum interchange spacing shall be one mile in urban areas, two miles in rural areas, and two miles between freeway to freeway interchanges and local street interchanges	High	The interchange spacing is perpetuated from the existing condition, the proposed additional lane will improve operations. No new interchanges are proposed on this project. The existing condition will be maintained or improved.
5	**Weaving Section 504.7** On main freeway lanes the weaving length measured as shown in Figure 504.2A should not be less than 1,600 feet except where excessive cost or severe environmental constraints would require consideration of a shorter length.	High	The weaving length is perpetuated from the existing condition, the additional lane will improve spacing between thru traffic, providing improved weaving operations.

Rejected Alternatives

Several alternatives and design options were considered and rejected during the development of the draft project report and preliminary design phase. With the concurrence of the Project Development Team, the alternatives and design options have been set aside from further study. The primary rejected alternative can be summarized in the following summary.

Alternative 2 (Widen to the Outside, as described in the PSR dated February 2017)

This alternative proposes to add a third mixed flow through lane with widening to the outside in the southbound direction near the 44 Interchange. Features on mainline I-5 include:

- A 6-lane freeway with 3-through lanes in the northbound and southbound directions with 10-ft inside and outside shoulders.
  - SB widening in the median, PM R14.8/R15.2 and PM R15.8/R18.5.
  - SB widening to the outside, PM R15.2/R15.8.
  - NB widening in the median, PM R16.5/R19.5.
- Six bridges would be widened plus overlaid with polyester concrete.
  - Four bridges would be widened in the median.
  - Two bridges would be widened on the outside.
- Sound walls would likely be required near residential areas to accommodate the outside widening of the SB lanes.
- Ramps at the I-5/SR 44 Interchange would be adjusted as needed.

During the preliminary design phase Alternative 2 was found infeasible for the following reasons:

- Widening to the outside near the 44 Interchange would require reconfiguration of both the southbound I-5 to eastbound 44 connector ramp and the westbound 44 to southbound 5 connector ramp. This reconfiguration would generate extensive work and require several nonstandard geometric features.
- Widening to the outside north of the 44 Interchange would negatively affect the environmentally sensitive park area west of I-5, which is part of the U.S. Department of Transportation Act of 1966 Section 4(F) for consideration of park and recreation lands.
- Widening to the outside would generally not allow a consistent transition when conforming to the existing mainline configuration, forcing a non-desirable shift prior to conforming into the existing roadway.

6. CONSIDERATIONS REQUIRING DISCUSSION

Hazardous Waste

An Initial Site Assessment was done for this project location. This route should not have hazardous levels of aerially deposited lead (ADL). This project may have asbestos containing material (ACM) at the structure locations. Removal of existing striping and pavement markings will require a lead compliance plan as a contract bid item. A task order for a site investigation may be required during the design phase to sample and test for ACM and ADL concentration.

Treated wood is present within the project limits in the form of guard rail posts and existing sign posts. Treated wood waste (TWW) may not be relinquished to the contractor and must be disposed of at an appropriately permitted disposal facility or reused in an appropriate manner on the project. In addition to disposal, State regulations specify the way TWW must be stored prior to disposal.

A geologic evaluation regarding naturally occurring asbestos (NOA) was conducted within the project limits. The evaluation does not indicate the presence of rock commonly associated with NOA.

There are no Cortese List locations within the project limits.

Value Analysis

A value analysis (VA) was completed to comply with the requirements set forth by the Federal Highway Administration for projects greater than $50 million. The VA study conducted in December 2019 evaluated and proposed several design alternatives. District 2 Management has been briefed on the VA alternatives and has decided to accept all seven that were proposed. The information developed during the VA study was instrumental in the development of the project scope for this project.

Concepts derived from the VA study include:

- Eliminate ramp work at the Central Redding Interchange by instead widening to the median.
- Construct a soft barrier (pavement delineation or markings) between the mainline and the on/off weave lane at southbound I-5 at the Central Interchange.
- Construct a total of four auxiliary lanes (two in the northbound direction and two in the southbound direction).

Right of Way

All work will be done within the existing Right of Way (R/W) limits, which is owned in fee. Additional R/W is not required to complete the proposed work. There are three utilities in potential conflict that may require relocation prior to construction. Several existing utilities are within the project limits; however no conflicts are anticipated and these utilities will be protected in place.

Environmental Compliance

An Initial Study (Mitigated Negative Declaration) has been prepared pursuant to the California Environmental Quality Act (CEQA). A Categorical Exclusion (CE) has been prepared pursuant to the National Environmental Policy Act (NEPA). The Environmental Documents are included as Attachment E.

Impacts to Waters of the State, Waters of the U.S., and riparian vegetation have been identified which will require mitigation through the regulatory permit process. The project will require mitigation under CEQA for impacts to migratory wildlife species and a migratory wildlife corridor. Mitigation of these unavoidable impacts are proposed to occur either on-site or off-site and are estimated to cost $650,000. Impacts will be minimized to the extent feasible in the design plans. The project will require 401, 404, and 1600 permits as described below in Section 7: OTHER CONSIDERATIONS. A Letter of Concurrence has been received from the US Fish and Wildlife Service for impacts related to widening the Churn Creek Bridge.

Noise Abatement Decision Report

The potential traffic noise impacts to the local receptors within the project limits were studied. A detailed noise study (Noise Study Report – North Redding, I-5 Six-Lane Widening Project, March 2020) and a Noise Abatement Decision Report (Noise Abatement Decision Report, 02-SHASTA-5 PM R14.8/R20.0, 02-0H920, April 2020) were written and are available upon request.

All sound walls studied were for abatement as required by federal protocols, not mitigation for CEQA impacts. Sound wall locations identified in the project noise study report (NSR) were considered for economic effectiveness. All sound walls studied were acoustically feasible and would provide a minimum of 5-dBA attenuation. The estimated construction cost of the qualifying sound walls ranged from $1.28-million to $6.50-million. The most effective sound walls were those positioned approximately between Route 5/299 Separation and Twin View Blvd Undercrossing. These areas have the highest concentration of residential receptors adjacent to I-5.

All sound wall options were deferred based on construction cost and impact to project scope. The walls were determined to not be reasonable since they exceed the reasonable construction costs set by FHWA. Further, the potential sound wall construction would have significant impact to the mature landscaping along the State right of way. Construction of two wall locations near the R/W would require the removal of numerous large trees. The adjacent landowners may find this aspect of future sound wall construction objectionable.

Green House Gas (GHG) Emissions

Operation and construction of the project is expected to result in a slight increase in greenhouse gas emissions. However, any greenhouse gas emissions resulting from operation of the project or construction of the project would have a less than significant effect on the environment. Various measures will be implemented during construction to minimize greenhouse gas emissions.

Air Quality

Once built, the project will not conflict with or obstruct implementation of an applicable air quality management plan, result in a cumulatively considerable net increase in ozone for which the project vicinity is currently in non-attainment, expose sensitive receptors to substantial pollutant concentrations, or result in other emissions (such as those leading to objectionable odors) that could adversely affect a substantial number of people. During construction, the project could result in short-term elevated levels of dust, criteria pollutants, and odors. However, with implementation of avoidance/minimization measures for dust and pollutant control during construction and rapid dissipation of any odors, the project will have a less than significant impact on air quality.

7. OTHER CONSIDERATIONS

Route Matters

There are no freeway agreements, new connections, route adoptions, or relinquishments required with this project.

Permits

This project will require the following permits for widening the Churn Creek Bridge and drainage upgrades.

- Clean Water Act Section 401, Water Quality Certification is required from the Central Valley Regional Water Quality Control Board for filling in Waters of the State/Waters of the U.S.
- Clean Water Act Section 404 Nationwide Permit is required from the U.S. Army Corps of Engineers for impacts to wetlands and Waters of the U.S.
- A Section 1600 permit is required from the California Department of Fish and Wildlife for impacts to streams and riparian areas.

Mitigation will be used to satisfy conditions for all three permits.

Cooperative Agreements

Proposed improvements to the vertical clearance under the I-5 structures at the Twin View Undercrossing requires a Cooperative Agreement between Caltrans and the City of Redding.

Transportation Management Plan

A Transportation Management Plan (TMP) will be prepared for this project. The TMP will include lane and ramp closure charts, provisions for construction zone enhanced enforcement patrol (COZEEP), changeable message signs and highway advisory radio.

This project will require a work zone speed limit reduction; it is anticipated the work zone speed limit will be 55 mph for the duration of the project.

A TMP Data Sheet has been prepared and is included as Attachment G.

Stage Construction

Two construction stages are anticipated for adding the third lane in each direction on mainline I-5. The stage one work will consist of rebuilding the outside shoulder and modifying the shoulder cross slope to accommodate temporary traffic as needed. Stage 2 will require placing temporary railing (Type K) (k-rail) 2-ft inside the existing median edge of travelled way (ETW), shifting both lanes of traffic 6-ft to the outside and using the existing outside shoulder to accommodate the temporary second lane for the

duration of construction. Additional staging is needed for the outside widening at Churn Creek as well as the lowering the profile of SB I-5 at the SR 273 OC.

Construction staging for Twin View UC and Route (5/299) Separation requires multiple stages, detouring, and coordination with the traffic operation requirements for the City of Redding. Bridge construction will be staged to avoid daytime road closures on Twin View Blvd and Lake Blvd. Construction sequencing will accommodate pedestrians and bicycles throughout the construction phase. Twin View Blvd and Lake Blvd will require full closures in both directions for short (6-hour) night-time windows to place the new bridge girders. Detours are available for Twin View Blvd and Lake Blvd via local roads.

Construction staging for the NB I-5 to WB SR 44 Connector UC requires multiple stages and detours. Bridge construction will be staged to allow at least one lane of the 44 Connector traffic to be in operation during daytime hours. Construction sequencing will allow a continuous pedestrian and bicycle detour throughout the construction phase, except for intermittent nighttime closures for placement of girders. The WB 44 Connector will be closed and will utilize a detour to place the new bridge girders.

Construction staging for the East Redding (5/44) Separation requires multiple stages and detours. Bridge construction will be staged to maintain the existing roadway lanes and ramps but will require reconfiguring the ramps and lanes while reducing the width of the existing shoulders to provide space for construction activities during daytime hours. The construction area will be shielded by k-rail. This work will likely require lane and ramp closures, and possibly a full closure of SR-44 using detours at night during certain construction activities.

Construction staging for Churn Creek Bridge requires one stage which shifts traffic toward the median and places k-rail on the existing outside shoulder to shield the work area. During certain construction operations a lane or ramp closure will be required.

The City of Redding traffic operations engineer has tentatively reviewed and approved the closure windows and the construction staging requirements.

Title VI Considerations

Provisions for low mobility and minority groups have been considered during the development of this project. No ADA improvements are needed.

Complete Streets

Complete streets elements have been considered pursuant to Caltrans complete street policies and directives. The project is located on Interstate 5 where pedestrians are prohibited unless there has been an emergency or a vehicle issue that makes walking necessary. In this case there are 10-ft shoulders for a pedestrian to use within the project limits. Bicyclists are allowed in both directions between PM 18.75 and PM 19.22 and are to use the existing 10-ft shoulders to travel on. There is also a local road system that can be used for those bicycling within the project limits and if desired during construction the detour for bicyclists can be on this local road system. This Local system connects to additional surface streets that have bike and pedestrian infrastructure in place and often connects to a much larger existing multi-use path network. In areas where this project may have impacts to any local road system, accommodations and considerations will be made in the TMP for those traveling by bike or walking.

8. PROGRAMMING AND FUNDING

Programming

A programming sheet has been prepared that identifies proposed capital and support costs. The programming sheet is included as Attachment I.

Funding

This project is proposed to be funded in part through the STIP Regional Improvement Program (20.XX.075.600) for delivery in the 2025/26 fiscal year. The STIP has fully funded the PA&ED phase and partially funded future support phases. Additional funding sources are now sought for the continued development and construction of this project in 2026. It is anticipated that SHOPP-eligible work identified in this Draft Project Report may ultimately be funded by a future 2022 SHOPP project shown in District 2's Ten Year Plan. The anticipated SHOPP Performance Measures are shown in Attachment K. This project is eligible for Federal Funding.

The current (non-escalated) construction capital cost estimate is $57,000,000. For a detailed cost estimate, see Attachment D.

9. SCHEDULE

The schedule for this project is as follows:

Proposed PROJECT SCHEDULE					
M000	ID Need	1/6/2015	M377	P & E to R.O.E.	7/17/2025
M010	Approve PID/PIF	2/14/2017	M378	Draft Struct. PS&E	5/8/2025
M015	Program Project	3/22/2018	M380	Final Struct. PS&E	9/4/2025
M020	Begin Envir	4/30/2019	M410	Right of Way Cert.	8/25/2025
M030	NOP	-	M430	Draft Contract Ready	9/11/2025
M035	NOI	-	M460	Ready to List	9/25/2025
M040	Begin Project	1/7/2019	M470	Allocate	12/11/2025
M120	Circ. Draft ED	4/30/2020	M480	Advertise	12/29/2025
M200	PA & ED	8/17/2020	M490	Bid Opening	2/17/2026
M221	Bridge Site Submit	11/13/2023	M495	Award	3/17/2026
M224	Right of Way Maps	7/25/2023	M500	Approve Contract	4/14/2026
M225	Reg. Right of Way	10/25/2023	M600	Accept Contract	12/8/2027
M275	General Plans	3/11/2024	M800	End Project	12/10/2029
M300	Draft P&E	5/22/2025	M900	Final Project Closeout	9/10/2031

10. RISKS

A Risk Management Plan (RMP) has been completed for this project and is included in this report as Attachment H. Summaries of the most pertinent project-related risks are as follows:

Funding

- This project is fully funded through PA&ED. Partial funding has been identified for future support phases. Difficulty securing complete future support and capital funding will halt progress during the design and construction phases.

Performance Measures

- New information from surveys and other data sources may lead to alterations in the number and types of assets improved by the project, which could potentially result in a project change request (PCR) if the project performance measures listed at PS&E and RTL do not match the project's performance measures listed at PA&ED.

Environmental

- The scope of the project could evolve as funding becomes available, causing additional work not currently anticipated in the environmental document. These scope changes could require a higher-level document or a re-validation.

Structures/Geotechnical

- The scope of the project requires the widening of multiple structures. Due to limited resources, paired with the extended time frame provided during the design phase, it was determined to perform geotechnical drilling/studies in the design phase. If grant funding becomes available on an accelerated schedule, the structure design schedule could become the critical path.

11. PROJECT REVIEWS

Headquarters personnel, District 2 Design Liaison, and SRTA have reviewed the project during the development of the proposed features of the project. They concur with the proposed improvements.

The following individuals were involved in the reviews:

- Dan Little, Executive Director of SRTA
- Michael Webb, Acting HQ Project Delivery Coordinator
- Tim Sobelman, HQ Project Delivery Coordinator
- Robert Nixon, District 2 Design Liaison

12. EXTERNAL AGENCY COORDINATION

External Agencies

Coordination has been initiated with the following agencies:

Central Valley Water Quality Control Board
Waiver for Waste Discharge Requirements (WDRs)
Water Quality Certification

City of Redding
Public Works Department, City Management, and City Council

Shasta Regional Transportation Agency
Partnering and project scope development

Shasta County Roads Department
Utilizing the county disposal sites

13. PROJECT PERSONNEL

Sean Shepard	Project Manager	(530) 225-3530
Toby Crawford	Design Branch Chief	(530) 225-3365
Travis Gurney	Design Project Engineer	(530) 225-3533
Joe Downing	Structure Branch Chief	(916) 227-8430
Joey Aquino	Structure Project Engineer	(916) 227-8098
Carolyn Sullivan	Environmental Branch Chief	(530) 225-2234
Cabe Cornelius	Environmental Coordinator	(530) 225-3514
Eric Rulison	Biologist	(530) 225-2917
Russell Adamson	Archeologist	(530) 225-2743
Joe Baltazar	Traffic Management Chief	(530) 225-3245
Carol Sloan	Right of Way Senior	(530) 225-3411
Karen Hawkins	Right of Way Manager	(530) 225-3022
Martin Wimer	Maintenance Area Superintendent	(530) 225-3417
Rick Kuykendall	Maintenance Liaison	(530) 229-0566
Jeremiah Pearce	ITS Engineering Senior	(530) 225-3320

14. ATTACHMENTS

Attachment A	Location Map
Attachment B	Preliminary Project Plans
Attachment C	Structures General Plans (GP)
Attachment D	Cost Estimate
Attachment E	Environmental Document
Attachment F	R/W Data Sheet
Attachment G	TMP Data Sheet
Attachment H	Risk Management Plan
Attachment I	Programming Sheet
Attachment J	Stormwater Data Report PA&ED
Attachment K	SHOPP Performance Measures
Attachment L	Culvert Inventory Assessment

Attachment A
Location Map

INDEX OF PLANS

SHEET No.	DESCRIPTION
1	TITLE AND LOCATION MAP
X-X	TYPICAL CROSS SECTIONS
X	KEY MAP AND LINE INDEX
XX-XX	LAYOUTS
XX-XX	PROFILES AND SUPERELEVATION DIAGRAMS
XX-XX	CONSTRUCTION DETAILS
XX-XX	TEMPORARY WATER POLLUTION CONTROL PLANS
XX-XX	CONTOUR GRADING PLANS
XX-XX	DRAINAGE PLANS, PROFILES, DETAILS AND QUANTITIES
XX-XX	UTILITY PLANS
XX	CONSTRUCTION AREA SIGNS
XX-XX	MOTORIST INFORMATION PLANS
XX-XX	STAGE CONSTRUCTION PLANS
XX-XX	TRAFFIC HANDLING PLANS AND QUANTITIES
XX-XX	PAVEMENT DELINEATION PLANS, DETAILS AND QUANTITIES
XX-XX	SIGN PLANS, DETAILS AND QUANTITIES
XX-XX	SUMMARY OF QUANTITIES
XX-XX	REVISED STANDARD PLANS
XX-XX	VENDOR DRAWINGS

STRUCTURES

XX-XXX	NAME OF BRIDGE, Br No. XX-XXXX
XXX-XXX	NAME OF BRIDGE, BR No. XX-XXXXX

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON

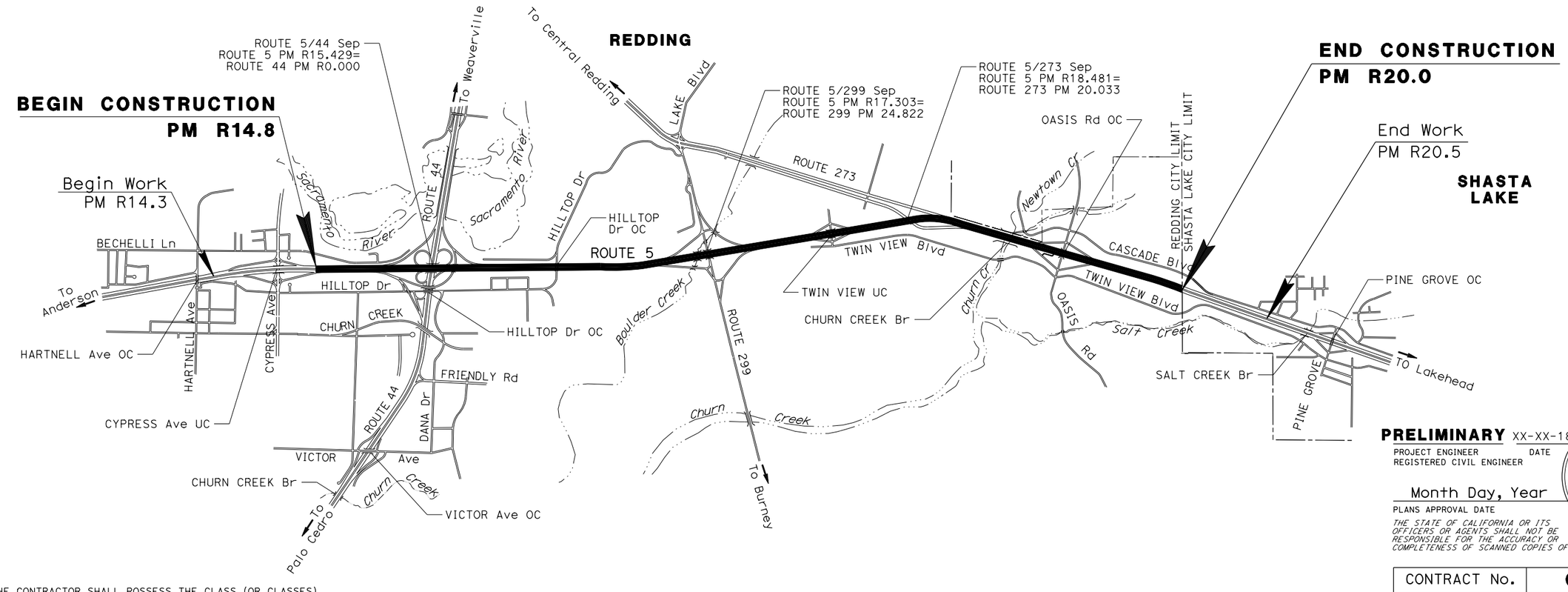
STATE HIGHWAY

IN SHASTA COUNTY IN REDDING FROM 0.3 MILE NORTH OF CYPRESS AVENUE UNDERCROSSING TO 0.6 MILE NORTH OF OASIS ROAD OVERCROSSING

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2018

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	005	R14.8/R20.0	1	1

LOCATION MAP



THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

PRELIMINARY XX-XX-18

PROJECT ENGINEER DATE
REGISTERED CIVIL ENGINEER

TRAVIS A. GURNEY
No. C77417
Exp. 06-30-21
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

Month Day, Year
PLANS APPROVAL DATE

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CONTRACT No.	02-0H9204
PROJECT ID	0215000083

PROJECT MANAGER: SEAN SHEPARD
DESIGN MANAGER: TOBY CRAWFORD

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LAST REVISION 12-19-18
DATE PLOTTED => 14-APR-2020
TIME PLOTTED => 08:58

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Attachment B
Preliminary Project Plans

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02	Sha	5	R14.8/R20.0		?

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REGISTERED PROFESSIONAL ENGINEER
TRAVIS A. GURNEY
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Exp. 6-30-21
CIVIL
STATE OF CALIFORNIA

NOTE:

1. DIMENSIONS OF THE PAVEMENT (STRUCTURAL SECTIONS) ARE SUBJECT TO THE TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
2. SUPERELEVATIONS AS SHOWN ON THE SUPERELEVATION DIAGRAMS, OR AS DIRECTED BY THE ENGINEER.
3. SHOULDER RUMBLE STRIP CONSTRUCTION SUBSEQUENT TO COMPLETION OF LANE CONSTRUCTION AND FINAL TRAFFIC STRIPING OPERATIONS.
4. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

LEGEND

** CRACK AND SEATED

\# HIGH TENSION CABLE BARRIER (4-STRAND)
STA "CL1" 1044+45 TO 1070+95, 6' LT TO 5' RT
STA "CL1" 1070+65 TO 1120+90, 16' LT TO 16' RT
STA "CL1" 1126+28 TO 1163+20, 16' RT TO 16' RT
STA "CL1" 1165+85 TO 1193+43, 16' RT TO 9' RT
SEE SHEET C-XX

DESIGN DESIGNATION (ROUTE 5)

ADT (2017) = 60,000
ADT (2026) = 66,300
ADT (2036) = 74,800
ADT (2046) = 85,600
DHV (2026) = 5600
DHV (2036) = 6300
DHV (2046) = 7200

D = 55%
T = 11%
V = 70 MPH

ABBREVIATIONS

BBA	BEGIN BRIDGE APPROACH SLAB
BBAR	BOTTOM OF BARRIER
CL2	CLASS 2
DFL	DESIGN FLOWLINE
EBA	END BRIDGE APPROACH SLAB
HTCB	HIGH TENSION CABLE BARRIER
OGAC	OPEN GRADED ASPHALT CONCRETE
RAC	RUBBERIZED HOT MIX ASPHALT
REM	REMOVE
RHMA	RUBBERIZED ASPHALT CONCRETE
RHMA (OG)	RUBBERIZED HOT MIX ASPHALT (OPEN GRADED FRICTION COURSE) (PG 64-16)
RHMA (GAP GRADED)	RUBBERIZED HOT MIX ASPHALT (GAP GRADED) (PG 64-16) WITH LIME TREATMENT
RS	12" RUMBLE STRIPE (ASPHALT CONCETE PAVEMENT)
SB	SHOULDER BACKING
SEG	SUBGRADE ENHANCEMENT GEOTEXTILE
SHT	SHEET
SUPER	SUPERELEVATION
TOB	TOP OF BARRIER
TYP	TYPICAL
TYPE 60MC (MOD)	CONCRETE BARRIER (TYPE 60 MC, MODIFIED)
TYPE 60C	CONCRETE BARRIER (TYPE 60C)
VC	VEGETATION CONTROL (MINOR CONCRETE)

PLANNED STRUCTURAL SECTIONS

P-1: 0.10' RHMA (OG)

P-2: 0.20' RHMA (GAP GRADED)
0.45' HMA (TYPE A)
1.80' CL2 AB
SEG

P-3: 0.50' HMA (TYPE A)
0.50' CL2 AB

EXISTING STRUCTURAL SECTIONS

E-1: 0.10' RAC (OGAC)
0.15' TO 0.50' AC
0.17' TO 0.42' AB
VAR AS

E-2: 0.10' RAC (OGAC)
0.43' TO 0.55' AC
0.67' PCC**
0.33' TO 0.35' CTB
VAR AS

E-3: 0.10' RAC (OGAC)
0.65' TO 0.74' AC
1.82' TO 1.85 CL2 AB
SEG

E-4: 0.10' RAC (OG)
0.35' TO 0.80' AC
0.42' TO 0.47' AB
0.35 CTB (1' BEYOND (E) ETW)
VAR AS

E-5: 0.10' AC (OG)
0.75' AC
2.25' CL 2 AB
SEG

E-6: 0.10' AC (OG)
0.75' AC

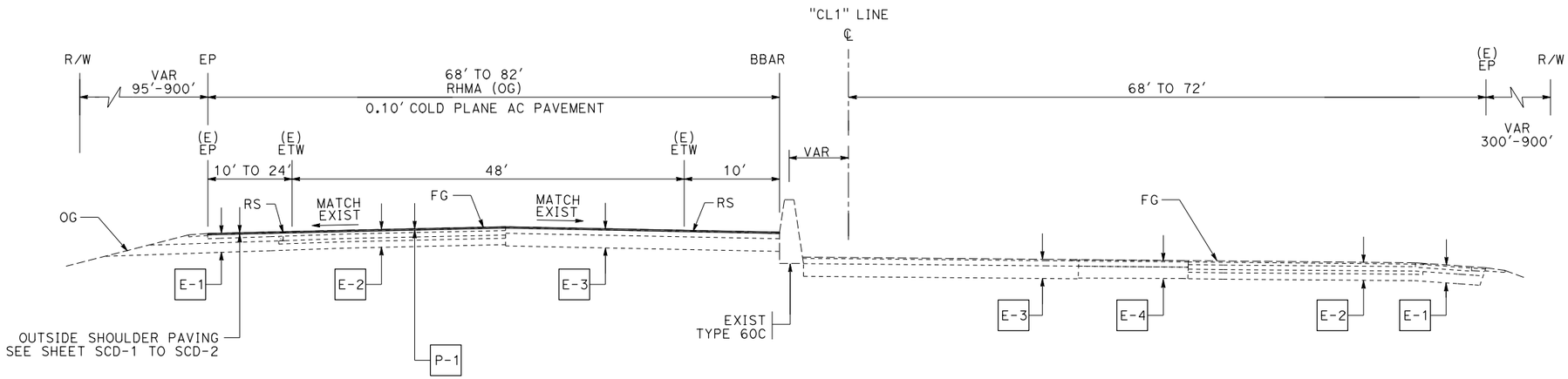
E-7: 0.10' AC (OG)
0.50' AC
0.70' PCC**
0.50 CTB
0.80' TO 1.30' AS

E-8: 0.10' RAC (OG)
0.75' AC
0.47' AB

E-9: 0.10' RAC (OG)
0.20' TO 0.55' AC
0.67' CTB
VAR AS

E-10: 0.10' RAC (OG)
0.55' AC
0.60' AB
PRIME COAT
0.80 TO 1.00' AS

E-11: 0.20' AC (TYPE A)
0.35' CL2 AB



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ROUTE 5

TYPICAL CROSS SECTION

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X-1

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TIME PLOTTED => 10:24

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CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR: TOBY CRAWFORD

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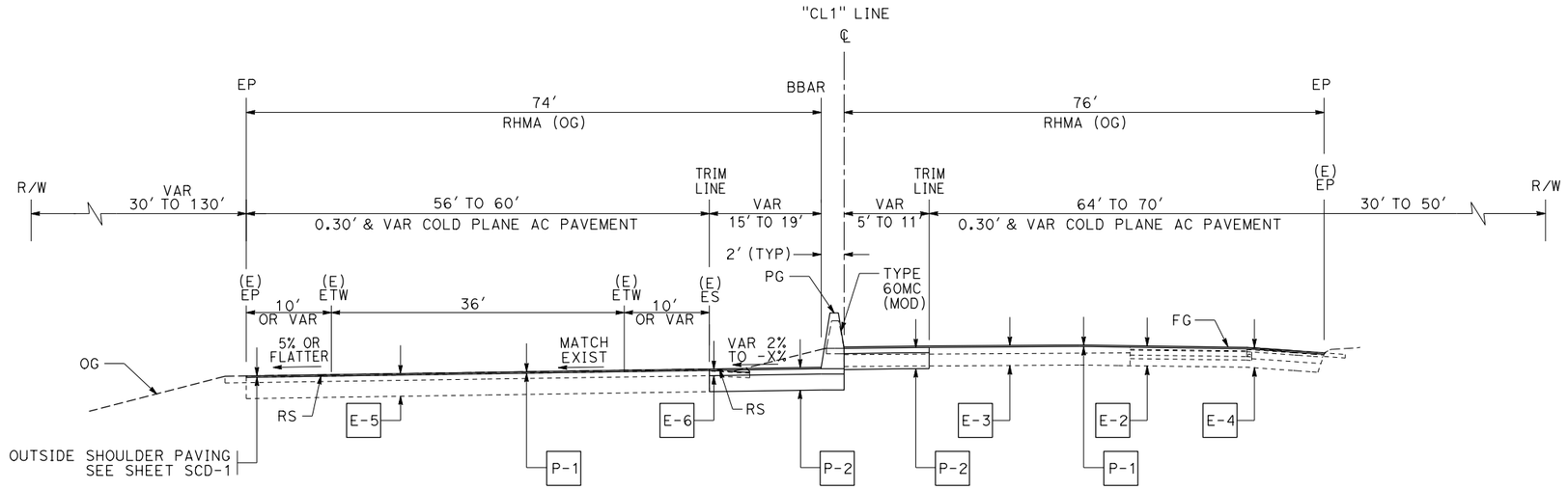

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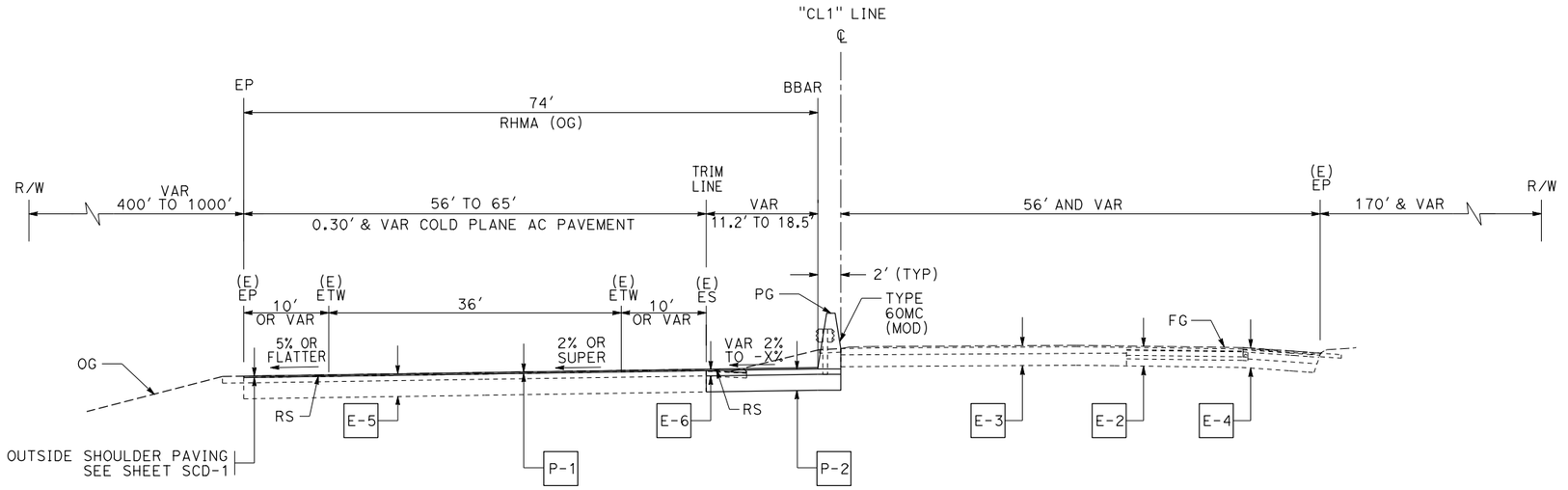
ROUTE 5



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ROUTE 5

TYPICAL CROSS SECTION

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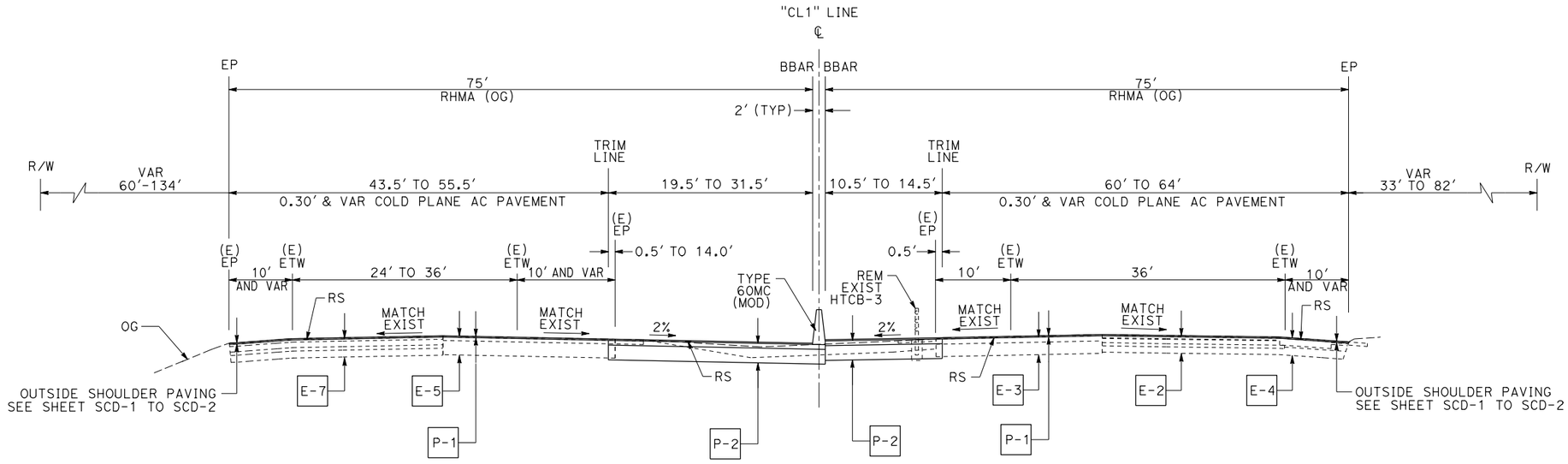

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ROUTE 5

TYPICAL CROSS SECTION

NO SCALE

X-3

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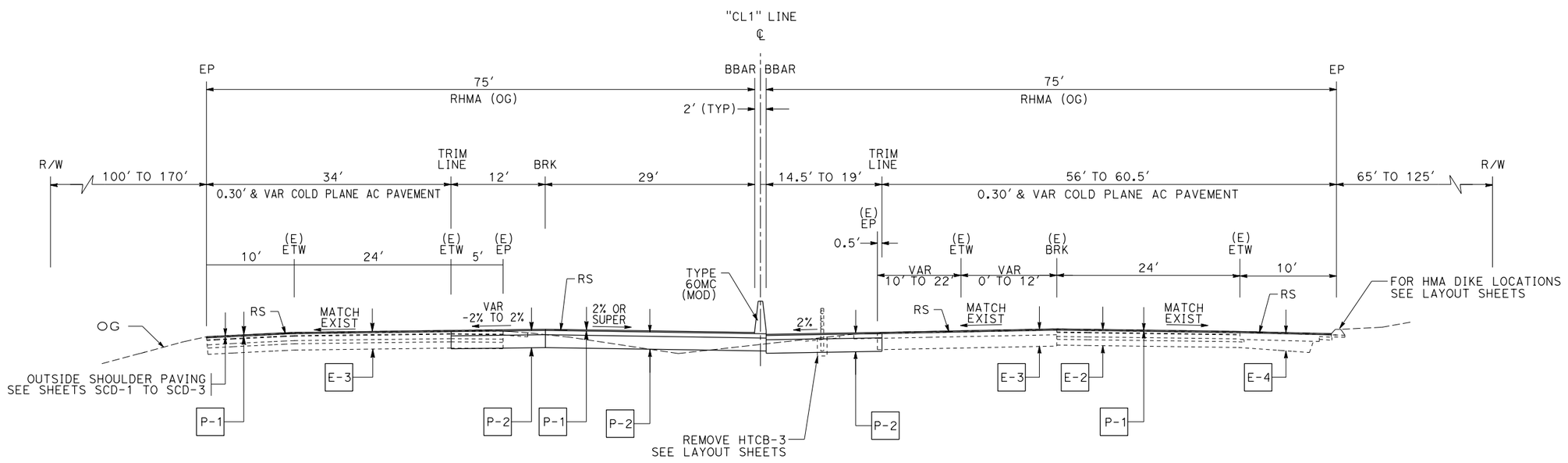

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REGISTERED PROFESSIONAL ENGINEER
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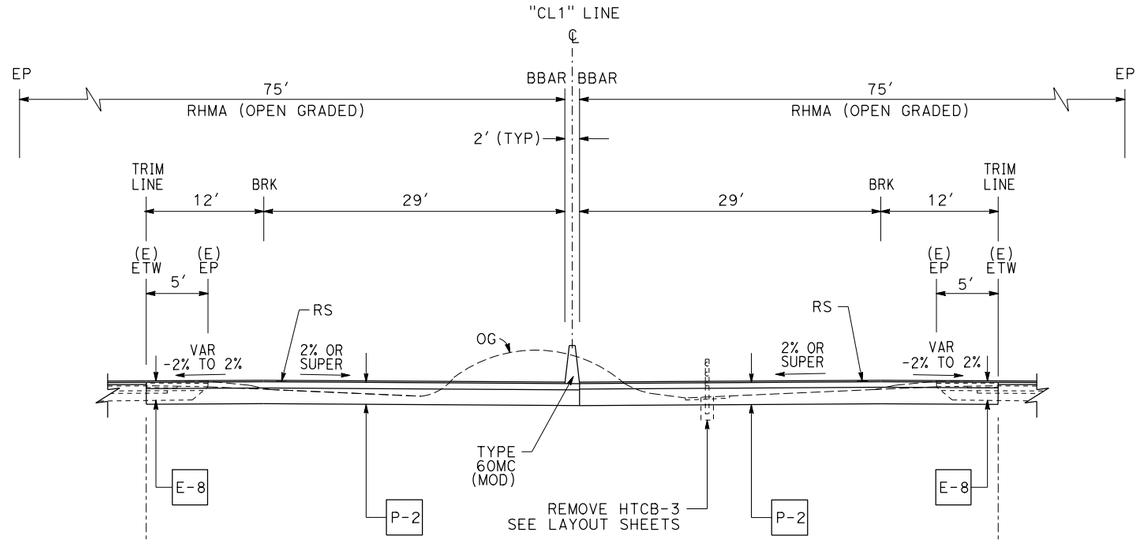
No. C77417
Exp. 6-30-21
CIVIL
STATE OF CALIFORNIA



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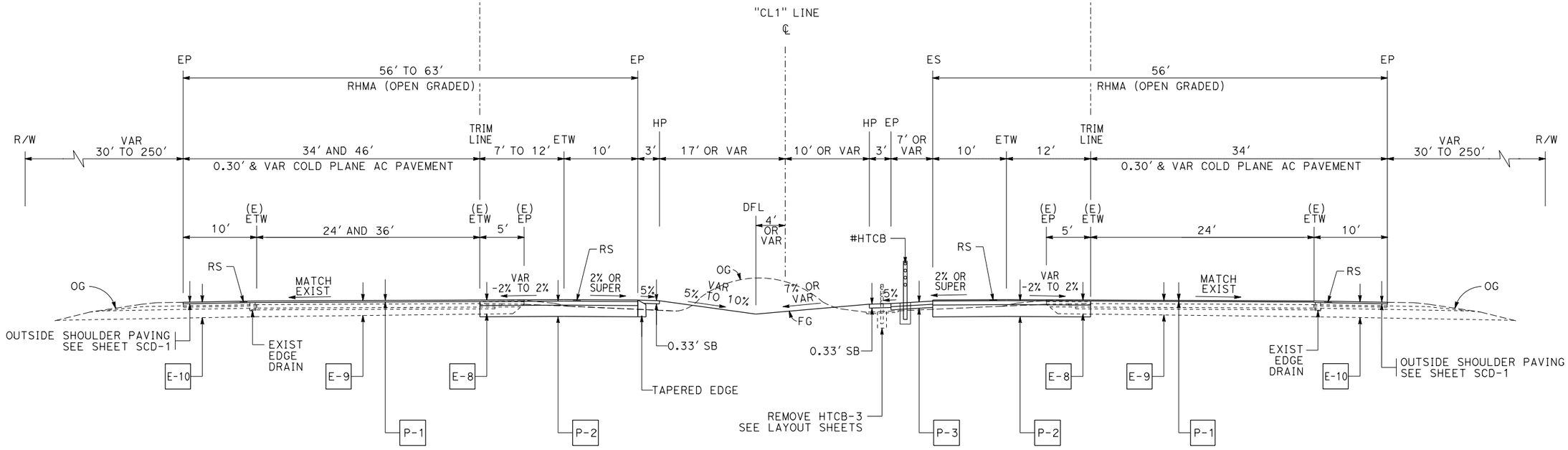

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"CL1" 1164+84 EBA TO "CL1" 1181+00
"CL1" 1189+00 TO "CL1" 1192+24.97
ROUTE 5

TYPICAL CROSS SECTION

NO SCALE

X-5

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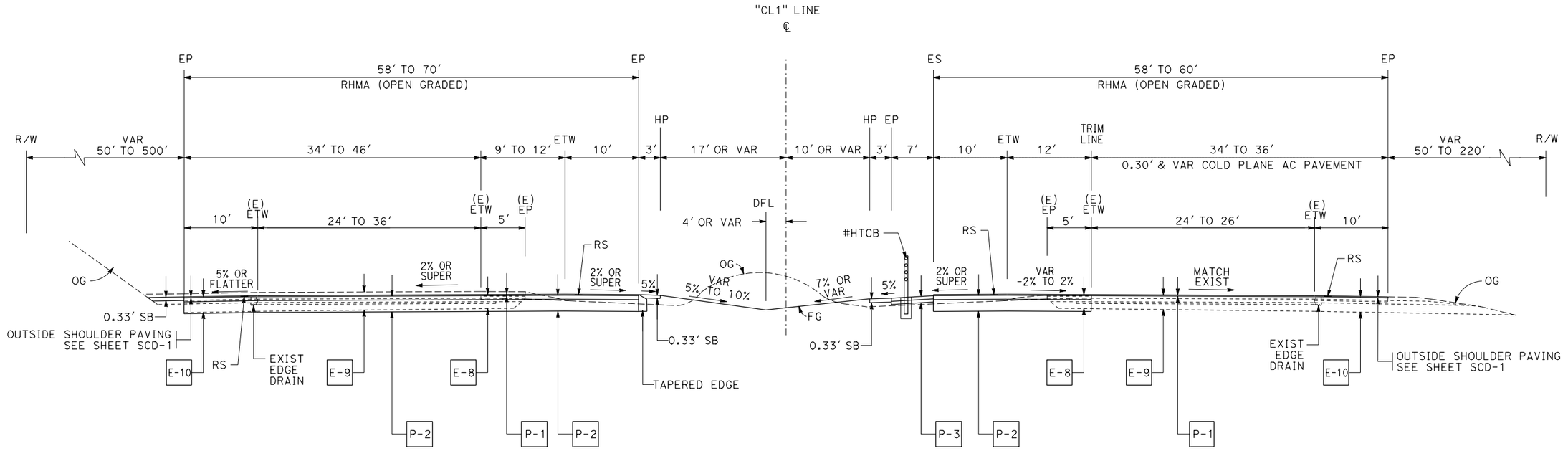

"CL1" 1181+00 TO "CL1" 1189+00

ROUTE 5

TYPICAL CROSS SECTION

NO SCALE

X-6

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	5	R14.8/R20.0		?

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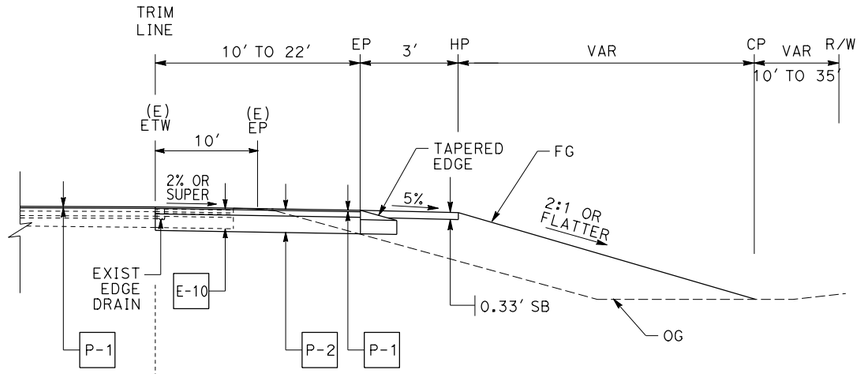
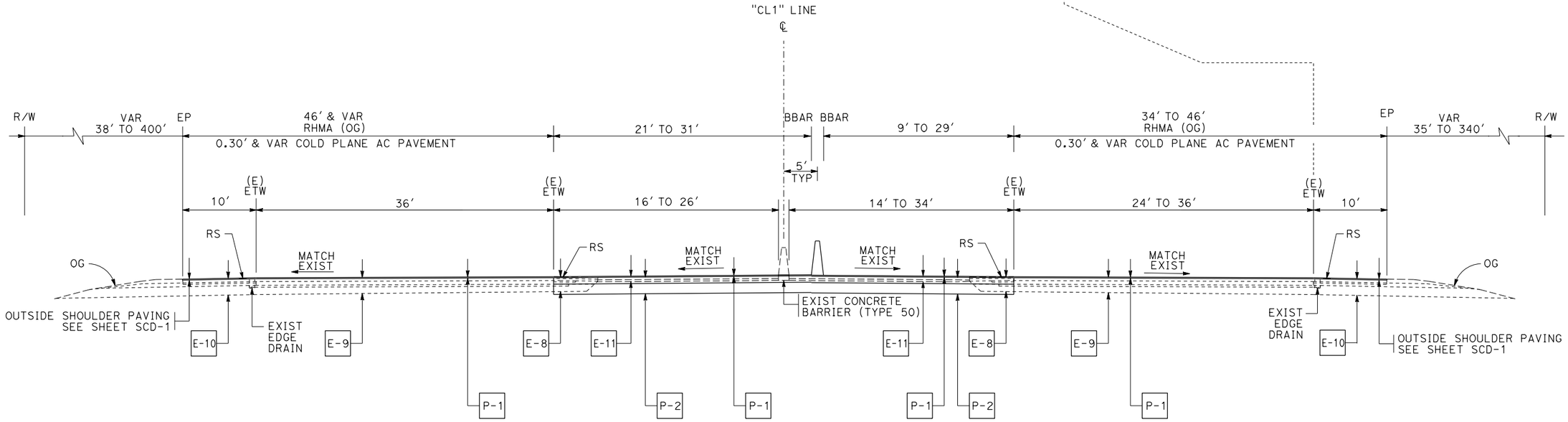


"CL1" 1199+69 TO "CL1" 1212+37 BBA
"CL1" 1213+65 EBA TO "CL1" 1224+21



"CL1" 1192+25 TO "CL1" 1238+00

ROUTE 5

TYPICAL CROSS SECTION

NO SCALE

X-7

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02	Sha	5	R14.8/R20.0		?

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Exp. 6-30-21
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NOTES:

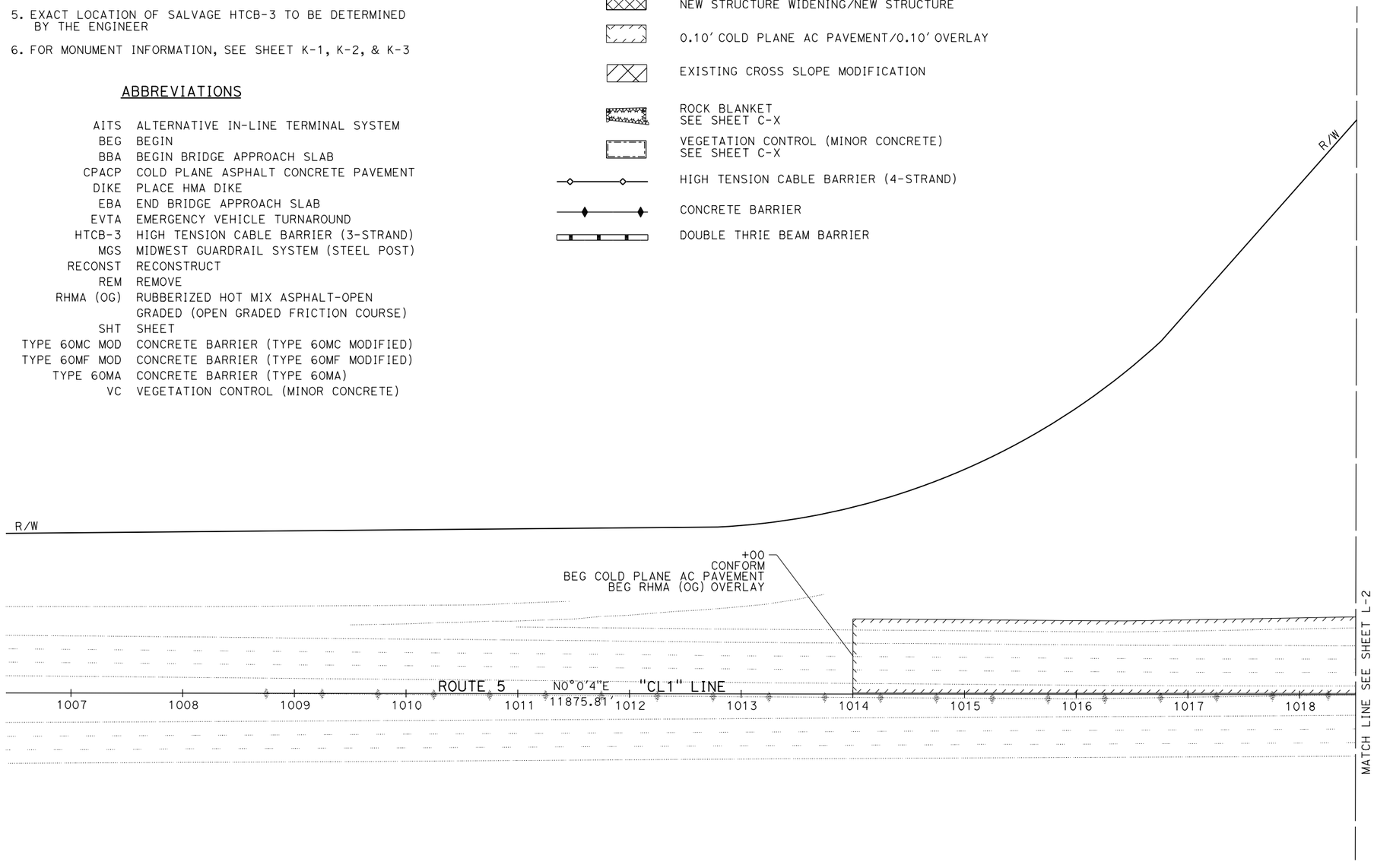
1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. ALL LOCATIONS SHOWN AS CONFORM ARE RHMA (OG) OVERLAY UNLESS STATED OTHERWISE.
3. ROADWAY WIDENING CONSTRUCTION SUBSEQUENT TO OUTSIDE SHOULDER PAVING.
4. EXACT LOCATION OF RAMP CONFORMS TO BE DETERMINED BY THE ENGINEER.
5. EXACT LOCATION OF SALVAGE HTCB-3 TO BE DETERMINED BY THE ENGINEER
6. FOR MONUMENT INFORMATION, SEE SHEET K-1, K-2, & K-3

ABBREVIATIONS

AITS	ALTERNATIVE IN-LINE TERMINAL SYSTEM
BEG	BEGIN
BBA	BEGIN BRIDGE APPROACH SLAB
CPACP	COLD PLANE ASPHALT CONCRETE PAVEMENT
DIKE	PLACE HMA DIKE
EBA	END BRIDGE APPROACH SLAB
EVTA	EMERGENCY VEHICLE TURNAROUND
HTCB-3	HIGH TENSION CABLE BARRIER (3-STRAND)
MGS	MIDWEST GUARDRAIL SYSTEM (STEEL POST)
RECONST	RECONSTRUCT
REM	REMOVE
RHMA (OG)	RUBBERIZED HOT MIX ASPHALT-OPEN GRADED (OPEN GRADED FRICTION COURSE)
SHT	SHEET
TYPE 60MC MOD	CONCRETE BARRIER (TYPE 60MC MODIFIED)
TYPE 60MF MOD	CONCRETE BARRIER (TYPE 60MF MODIFIED)
TYPE 60MA	CONCRETE BARRIER (TYPE 60MA)
VC	VEGETATION CONTROL (MINOR CONCRETE)

LEGEND

- (1) CURVE NUMBER
- NEW STRUCTURAL SECTION
- MAINLINE RECONSTRUCTION
- NEW MEDIAN PAVING
- NEW STRUCTURE WIDENING/NEW STRUCTURE
- 0.10′ COLD PLANE AC PAVEMENT/0.10′ OVERLAY
- EXISTING CROSS SLOPE MODIFICATION
- ROCK BLANKET SEE SHEET C-X
- VEGETATION CONTROL (MINOR CONCRETE) SEE SHEET C-X
- HIGH TENSION CABLE BARRIER (4-STRAND)
- CONCRETE BARRIER
- DOUBLE THRIE BEAM BARRIER



LAYOUT
SCALE: 1" = 50′

L-1

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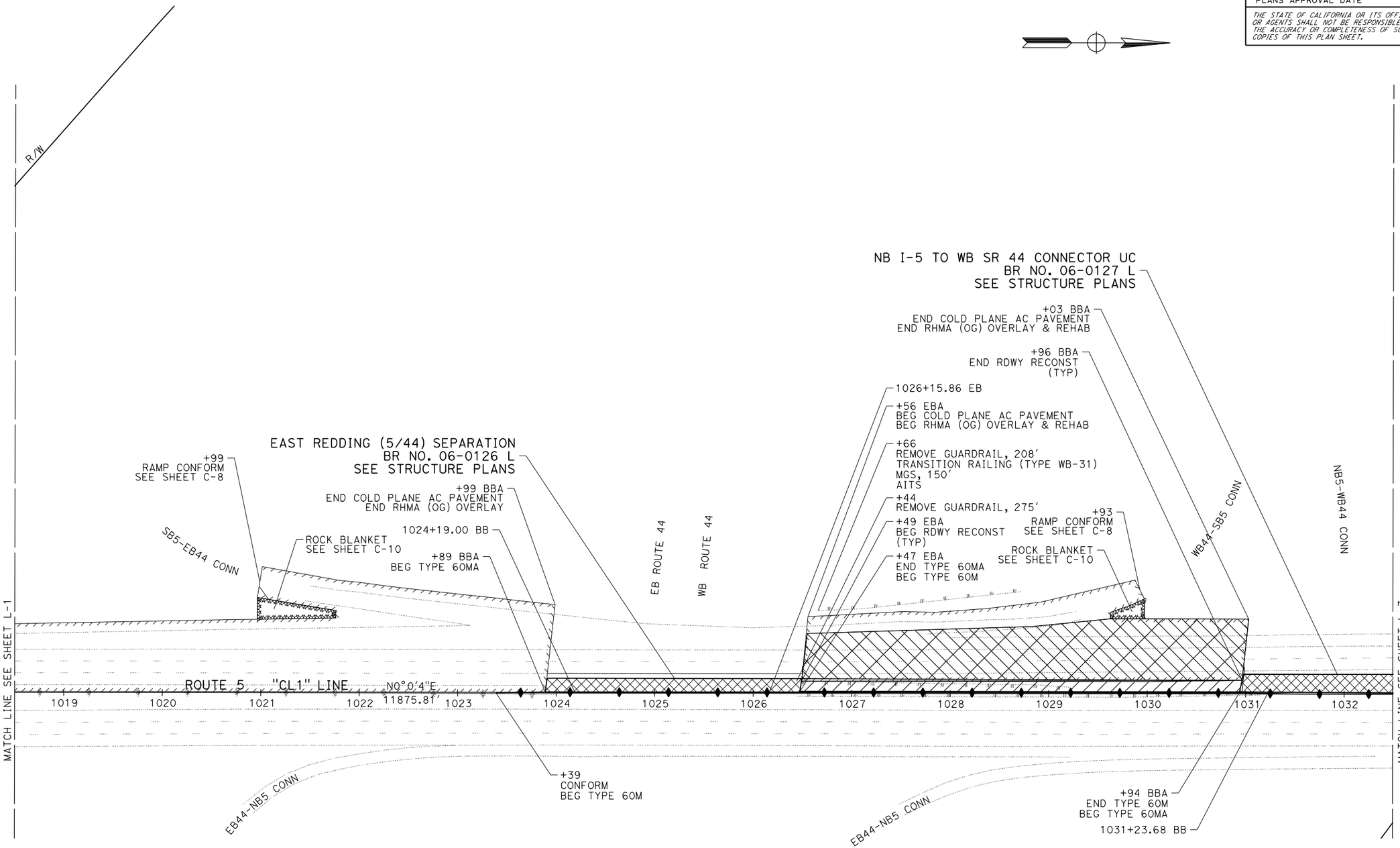

LAYOUT
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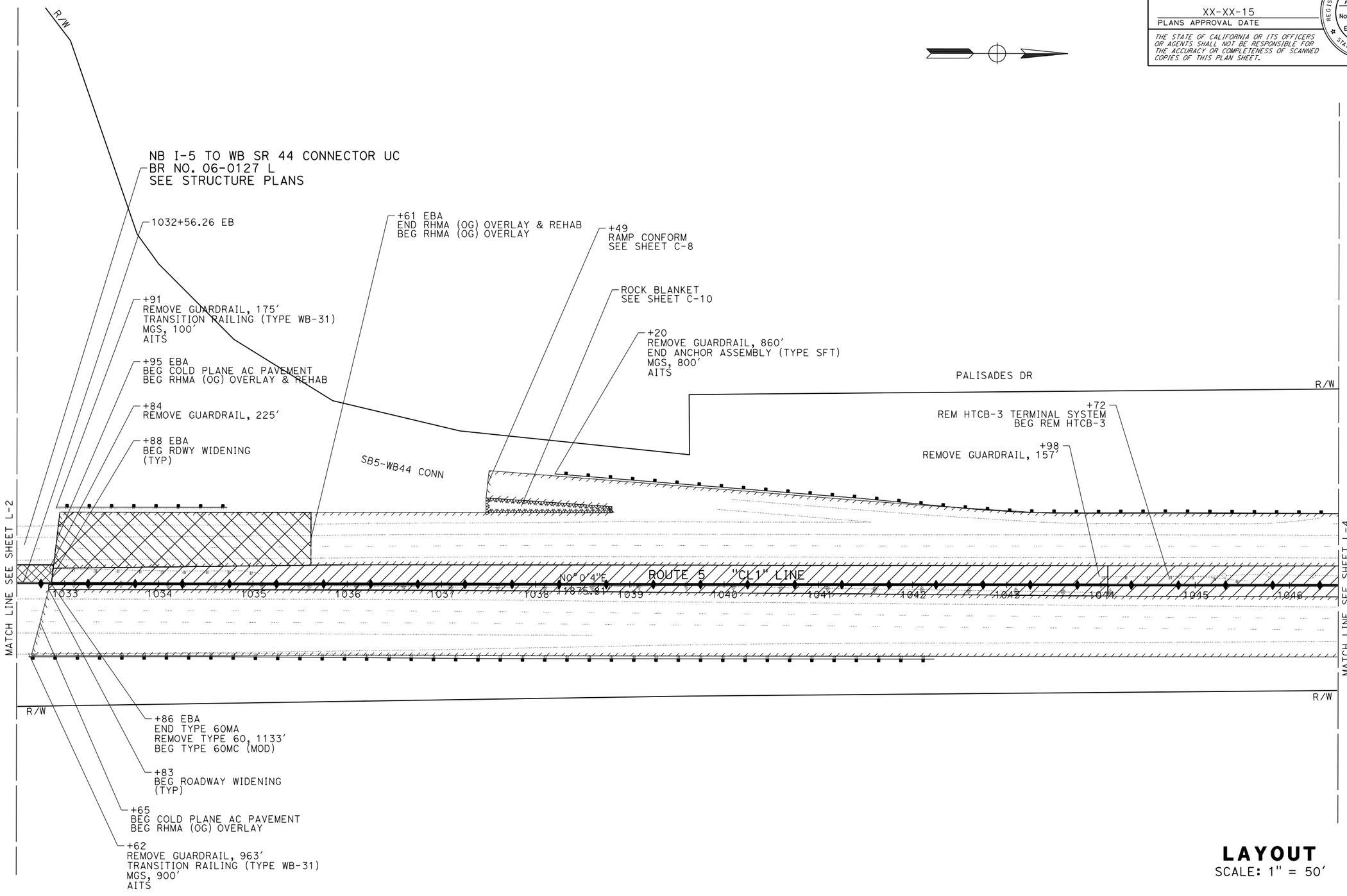

LAYOUT
SCALE: 1" = 50'

L-3

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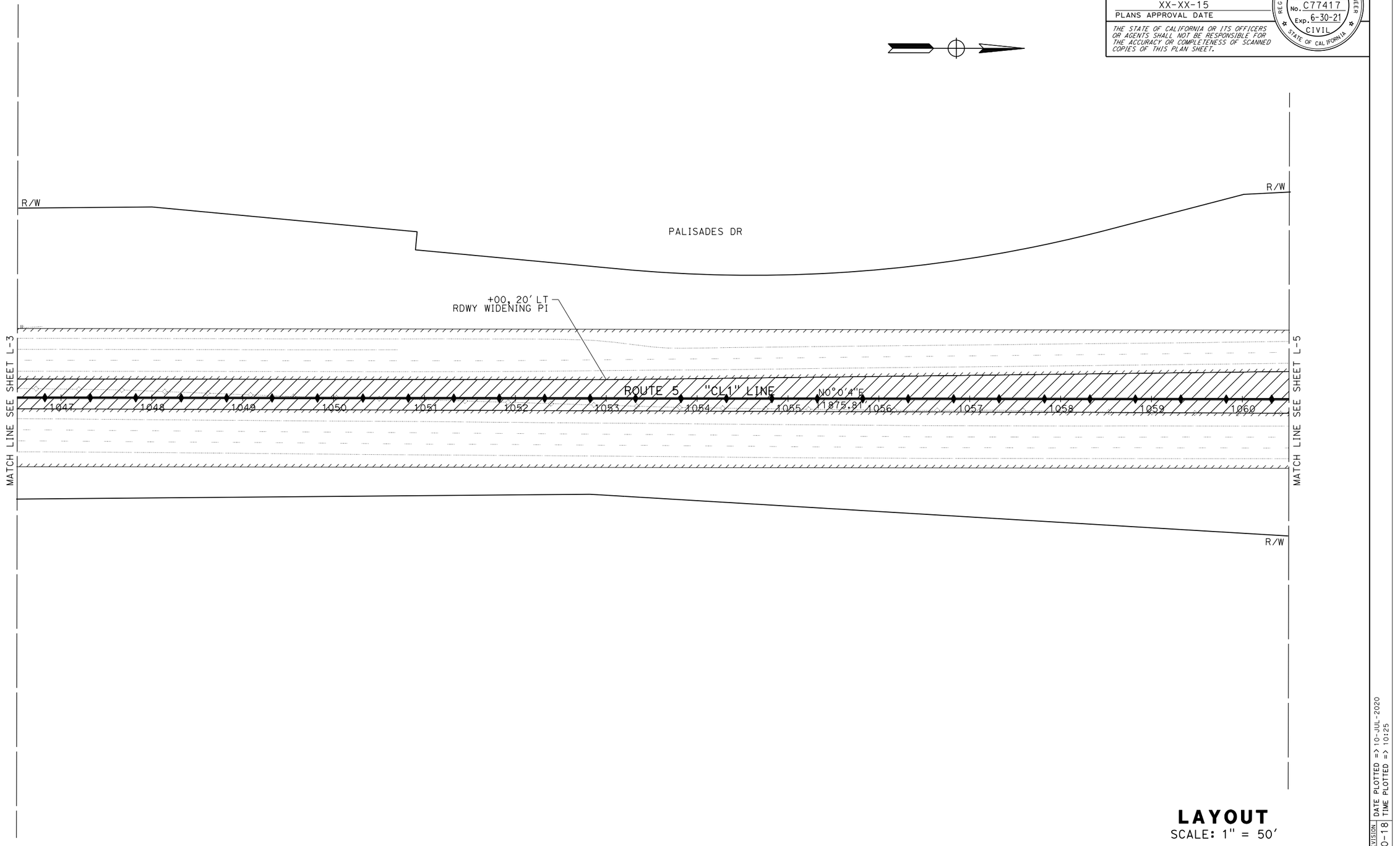

LAYOUT
SCALE: 1" = 50'

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	5	R14.8/R20.0		?

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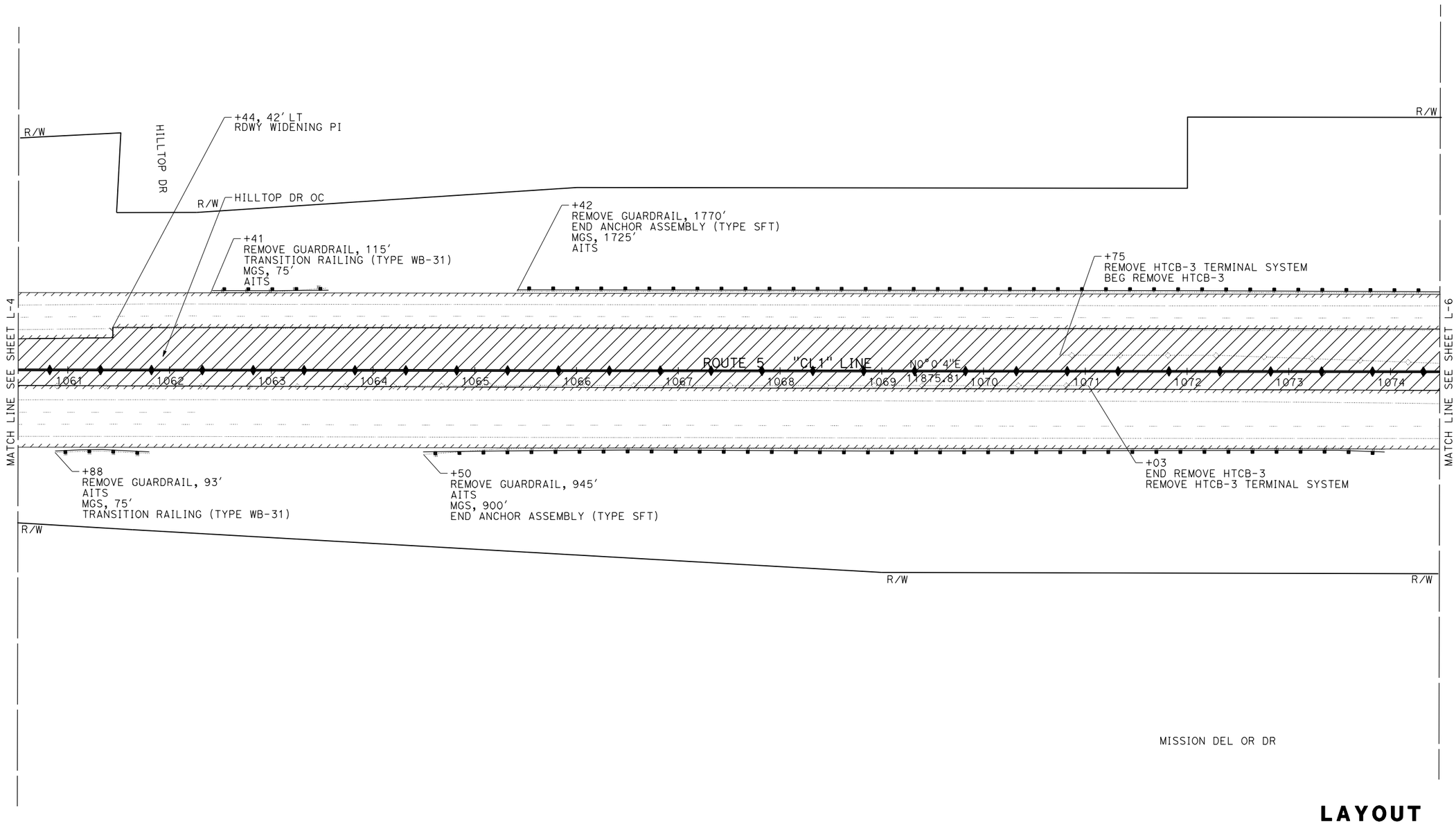

LAYOUT
SCALE: 1" = 50'

L-5

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USERNAME => s132331
DGN FILE => 0215000083ea005.dgn
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UNIT 0316
PROJECT NUMBER & PHASE 0215000083 1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	5	R14.8/R20.0		?

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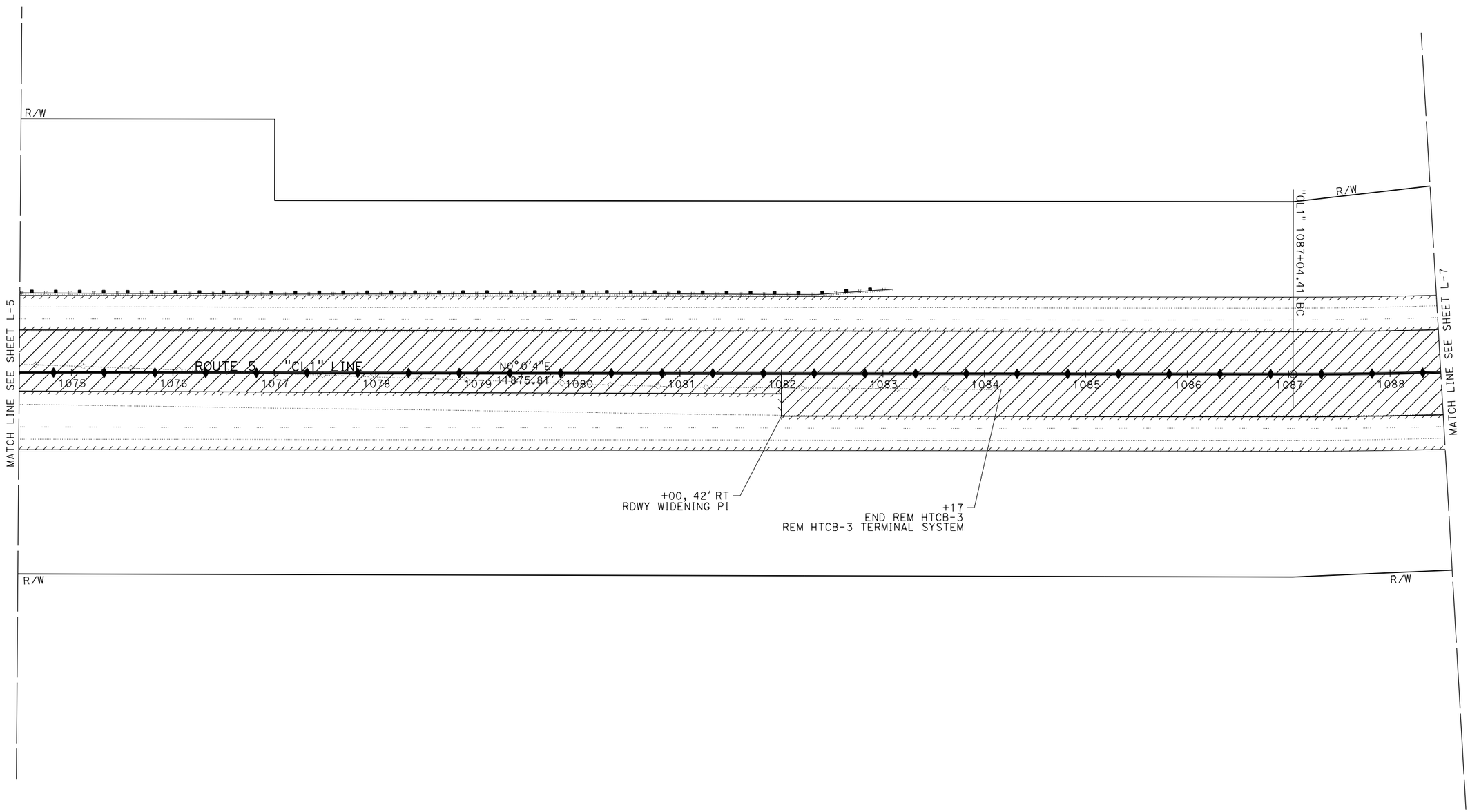

LAYOUT
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L-6

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UNIT 0316
PROJECT NUMBER & PHASE 0215000083 1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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CURVE DATA

No. ⊙	R	Δ	T	L
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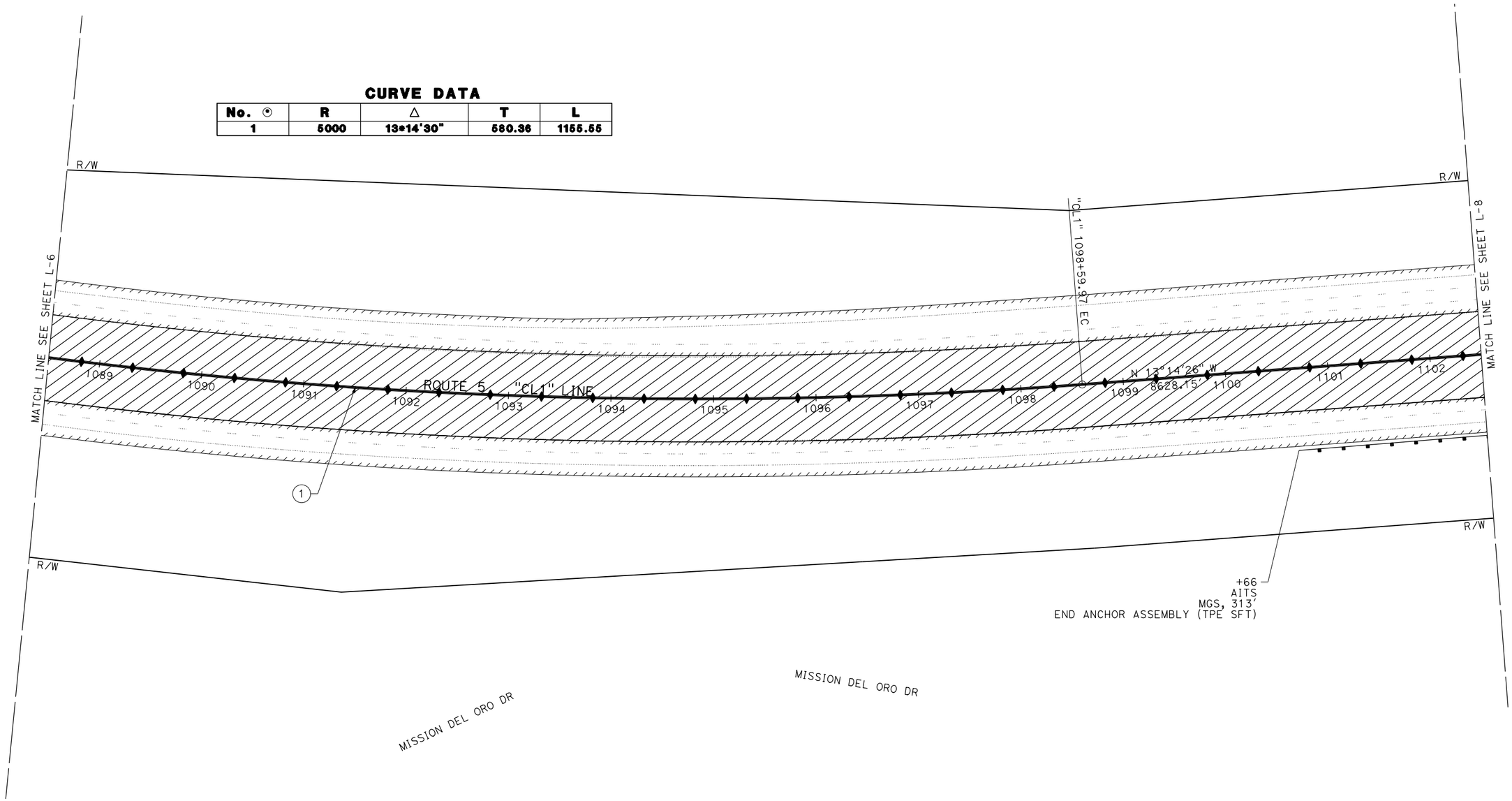

LAYOUT
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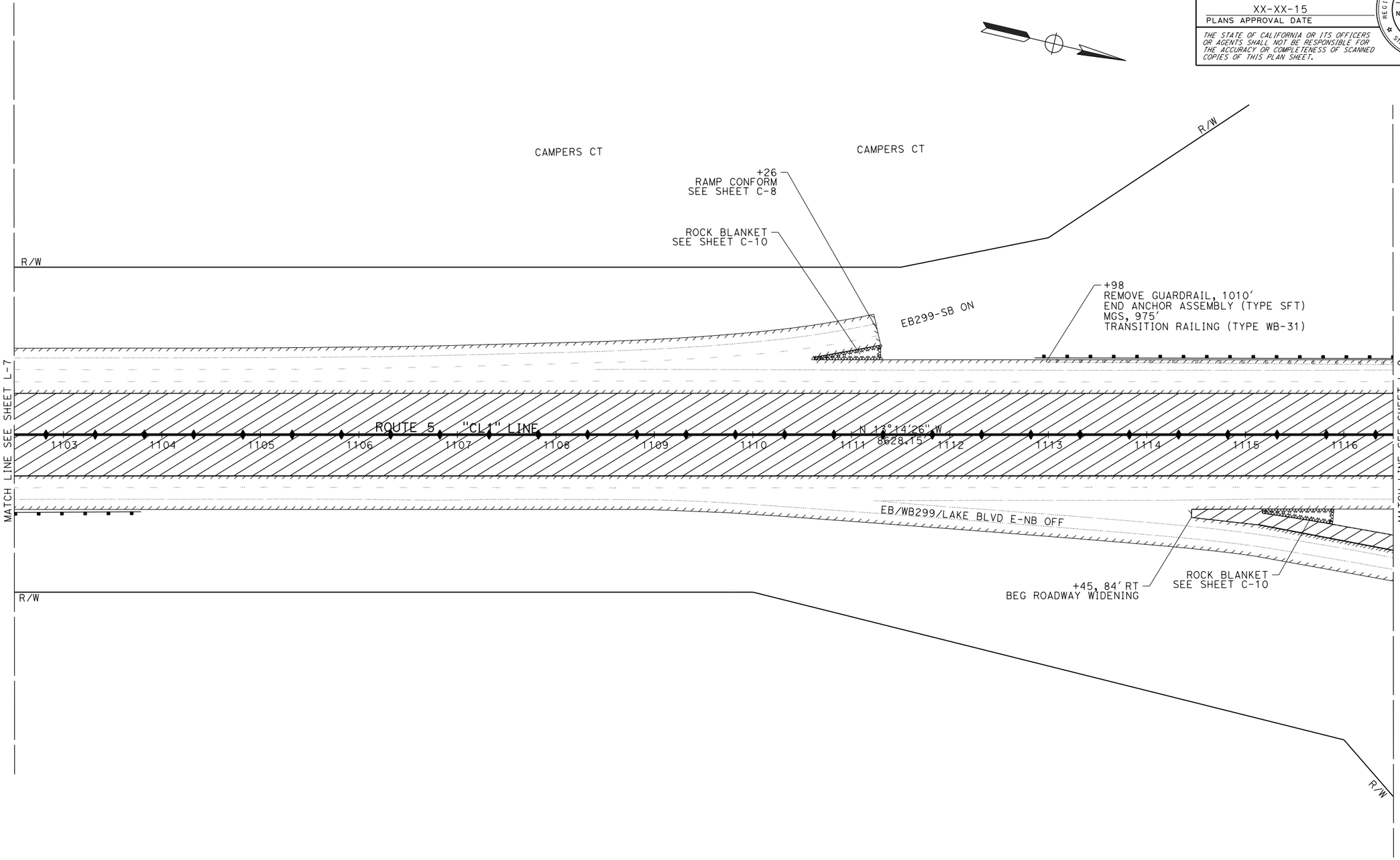

LAYOUT
SCALE: 1" = 50'

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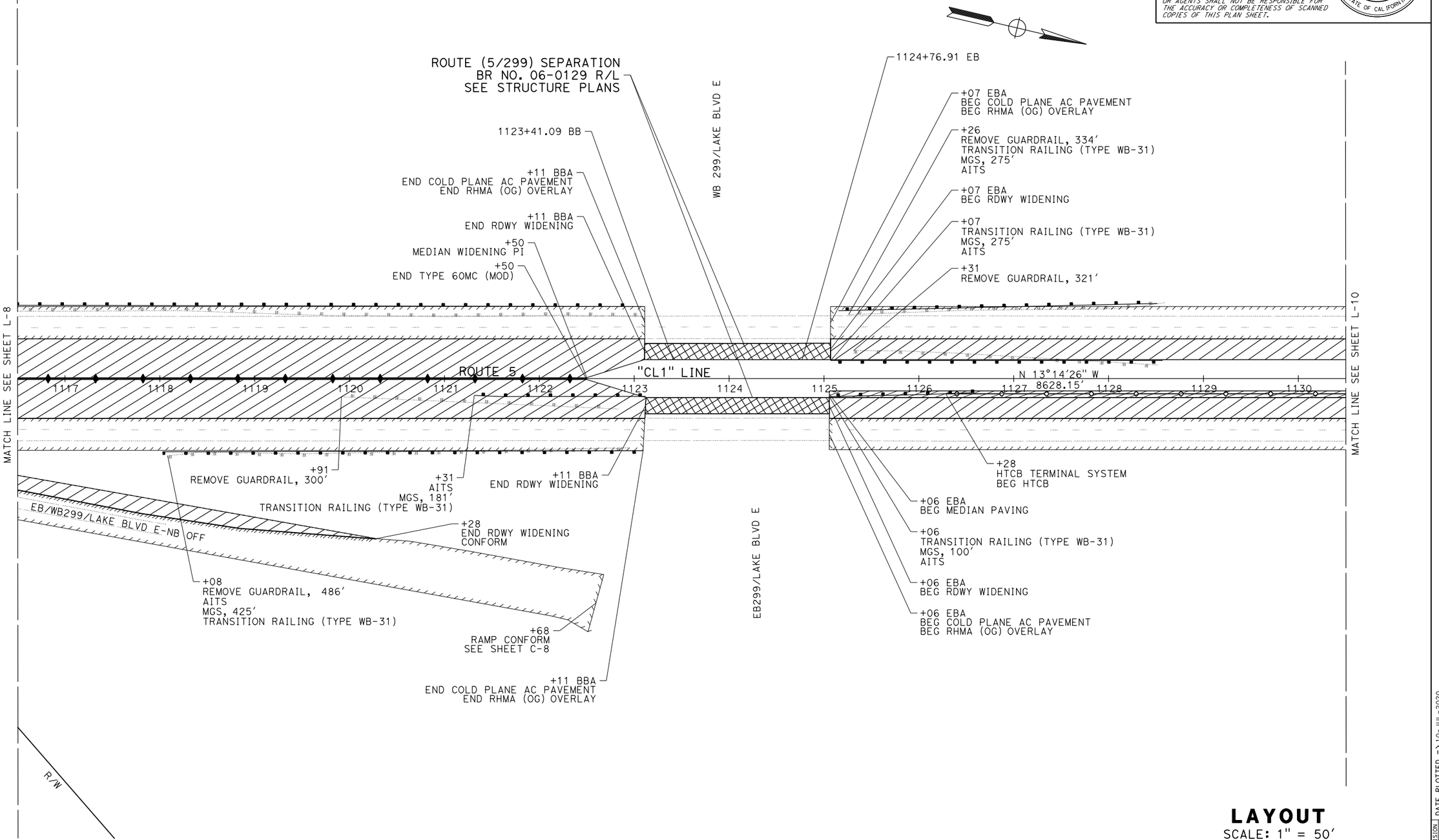

LAYOUT
SCALE: 1" = 50'

L-9

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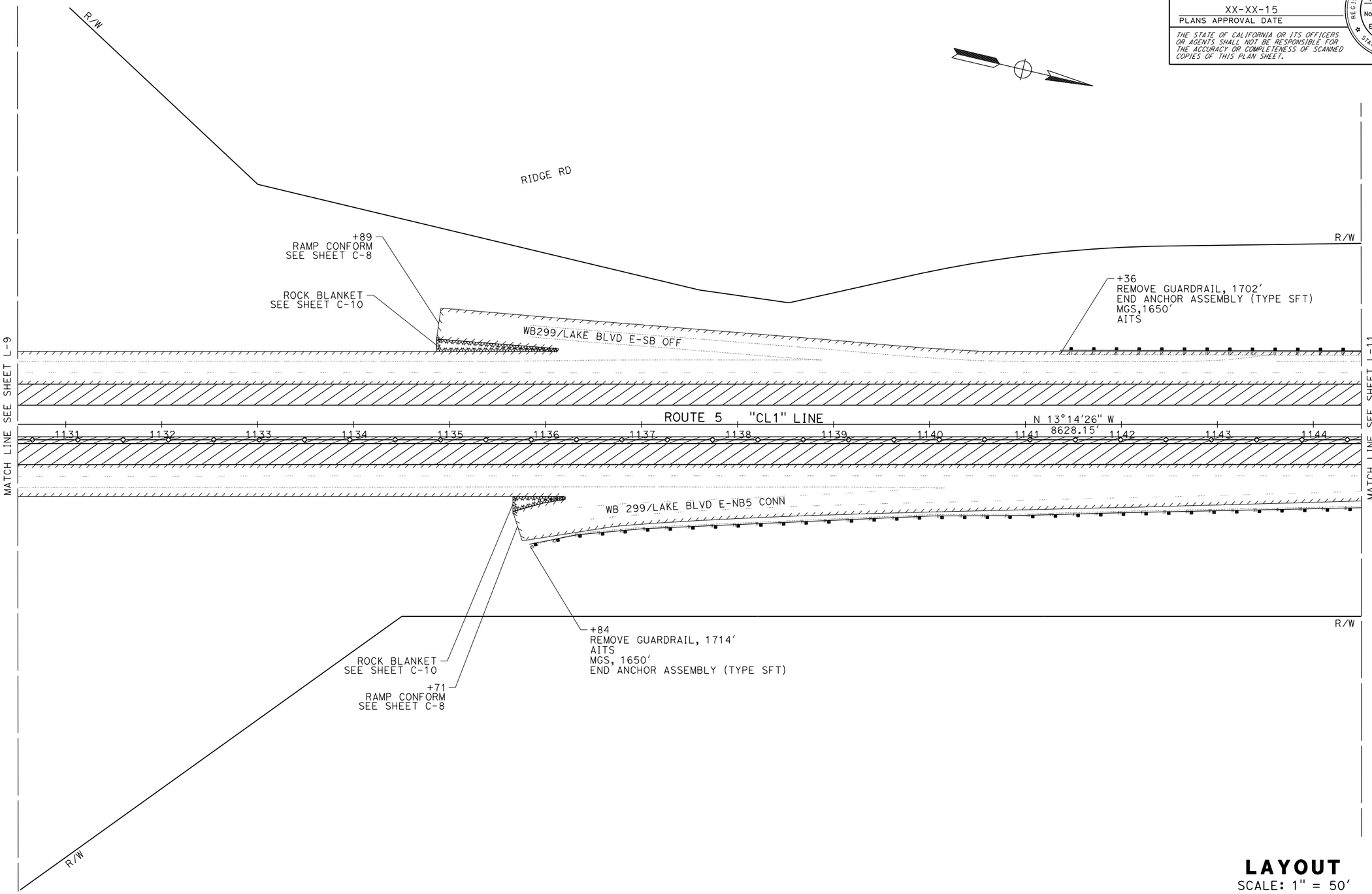

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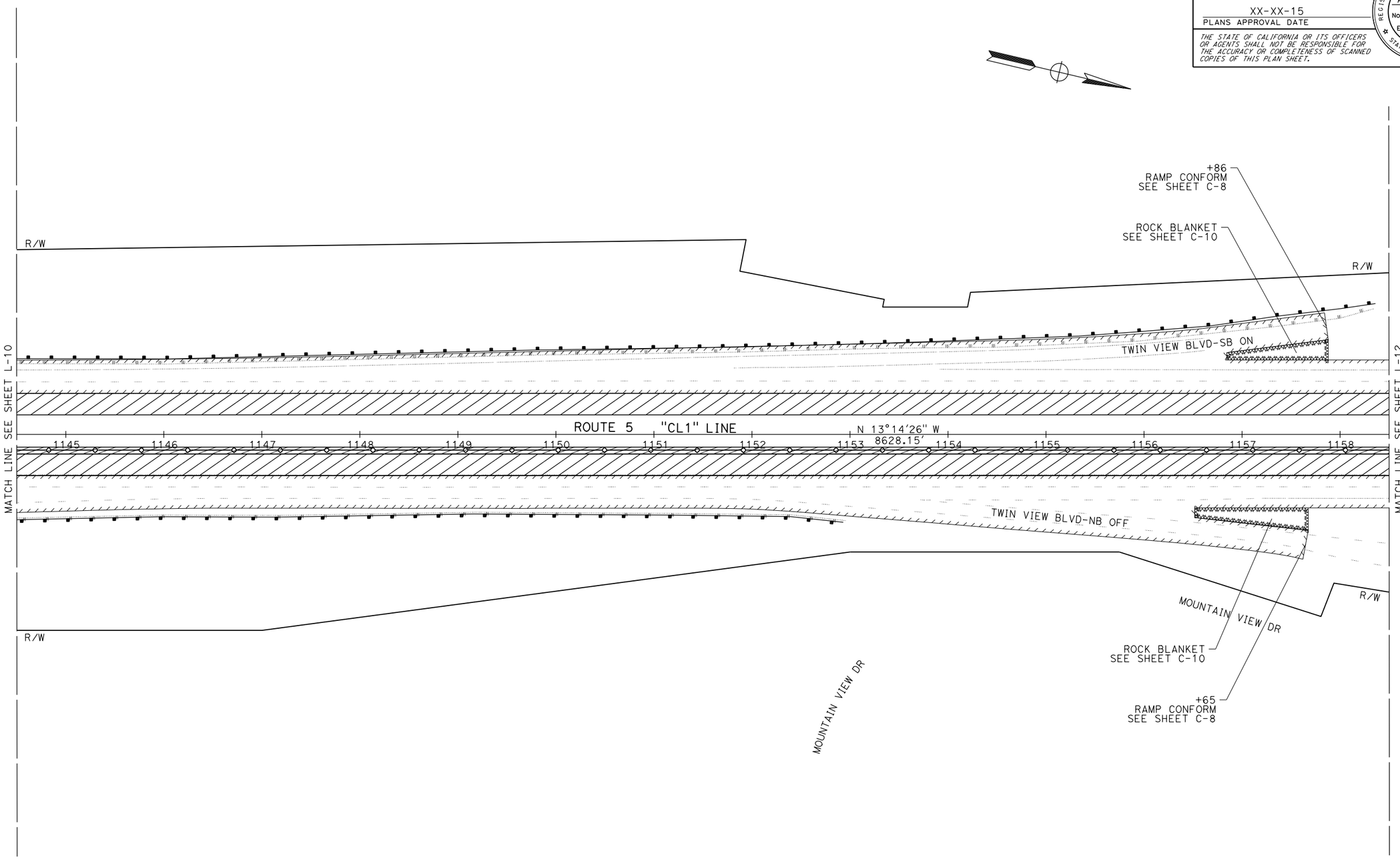

LAYOUT
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TRAVIS A. GURNEY
No. C77417
Exp. 6-30-21
CIVIL
STATE OF CALIFORNIA

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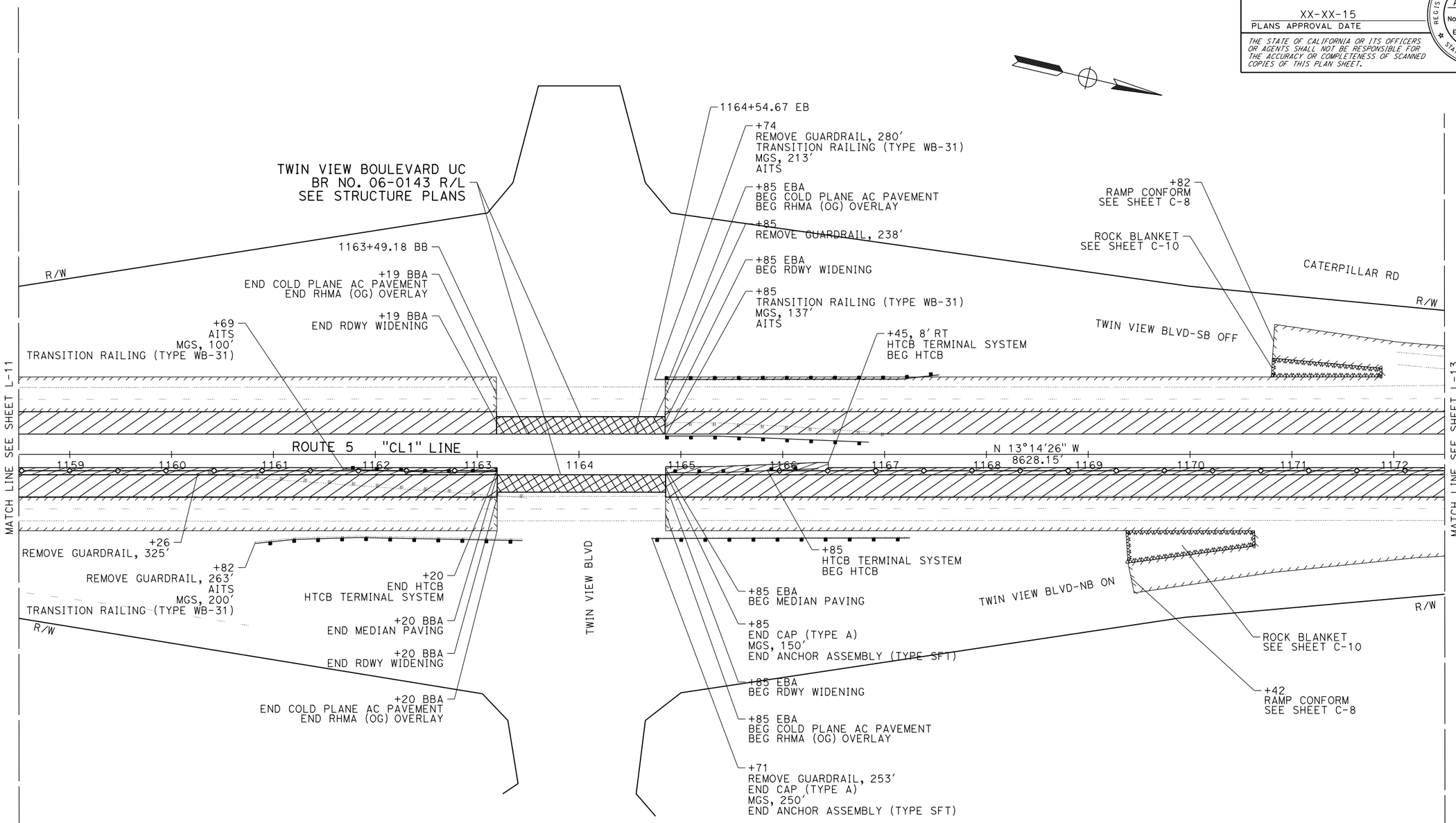

LAYOUT
SCALE: 1" = 50'

L-12

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY
TRAVIS A. GURNEY

CHECKED BY

FUNCTIONAL SUPERVISOR
TOBY CRAWFORD

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans®
DESIGN

P:\proj3\02\0h920\design\P&E\0215000083ea012.dgn

LAST REVISION
DATE PLOTTED => 10-JUL-2020
TIME PLOTTED => 10:26
12-20-18

BORDER LAST REVISED 7/2/2010

USERNAME => s132331
DGN FILE => 0215000083ea012.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0316

PROJECT NUMBER & PHASE 0215000083 1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	5	R14.8/R20.0		?

XX-XX-15
REGISTERED CIVIL ENGINEER DATE

XX-XX-15
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER
TRAVIS A. GURNEY
No. C77417
Exp. 6-30-21
CIVIL
STATE OF CALIFORNIA

NOTE:

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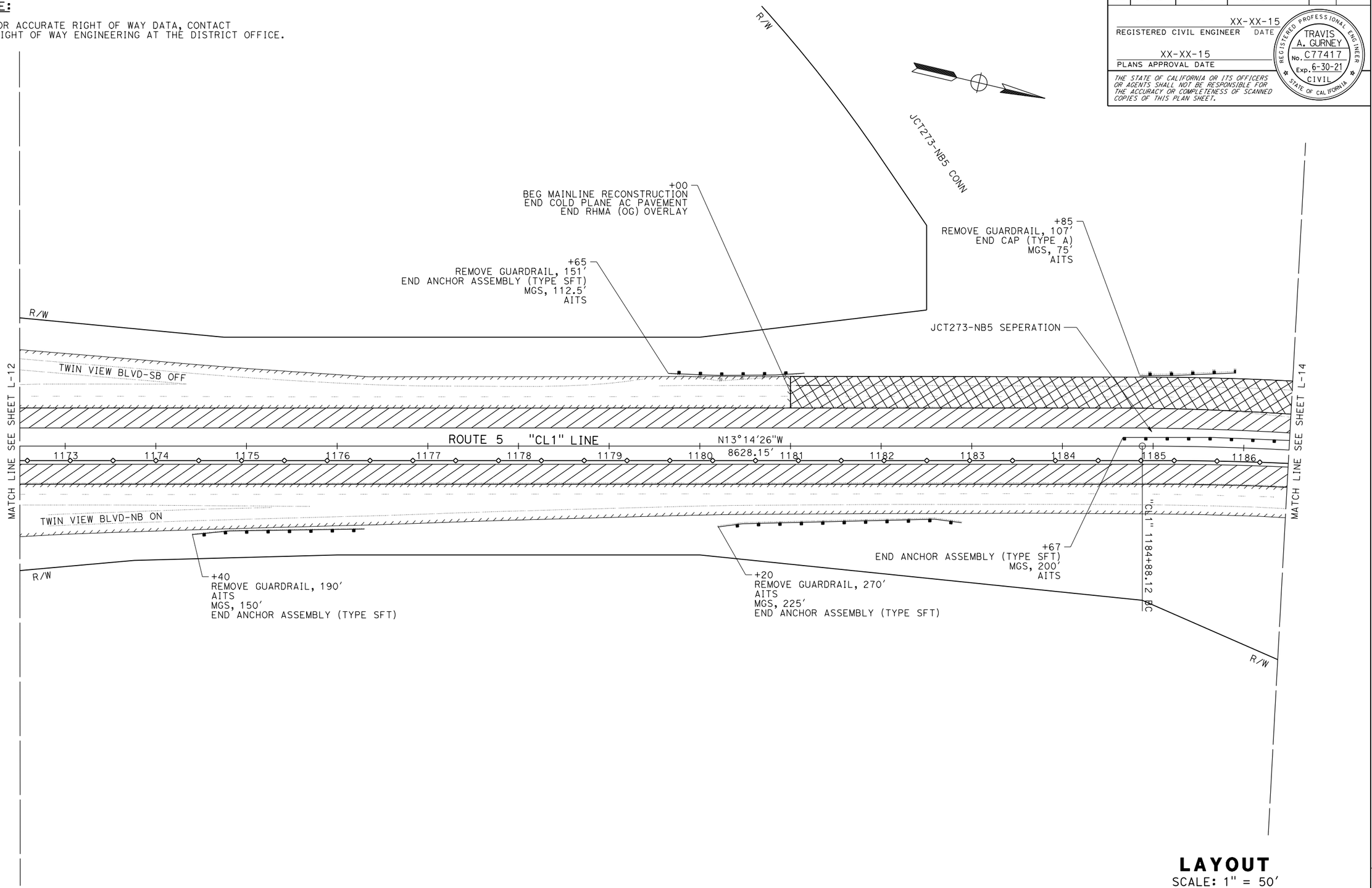

LAYOUT
SCALE: 1" = 50'

L-13

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY
CHECKED BY TRAVIS A. GURNEY

FUNCTIONAL SUPERVISOR TOBY CRAWFORD

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® **DESIGN**

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LAST REVISION 12-20-18
DATE PLOTTED => 10-JUL-2020
TIME PLOTTED => 10:26

BORDER LAST REVISED 7/2/2010 | USERNAME => s132331 | DGN FILE => 0215000083ea013.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0316 | PROJECT NUMBER & PHASE 0215000083 1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	5	R14.8/R20.0		?

XX-XX-15
REGISTERED CIVIL ENGINEER DATE

XX-XX-15
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER
TRAVIS A. GURNEY
No. C77417
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CIVIL
STATE OF CALIFORNIA

NOTE:

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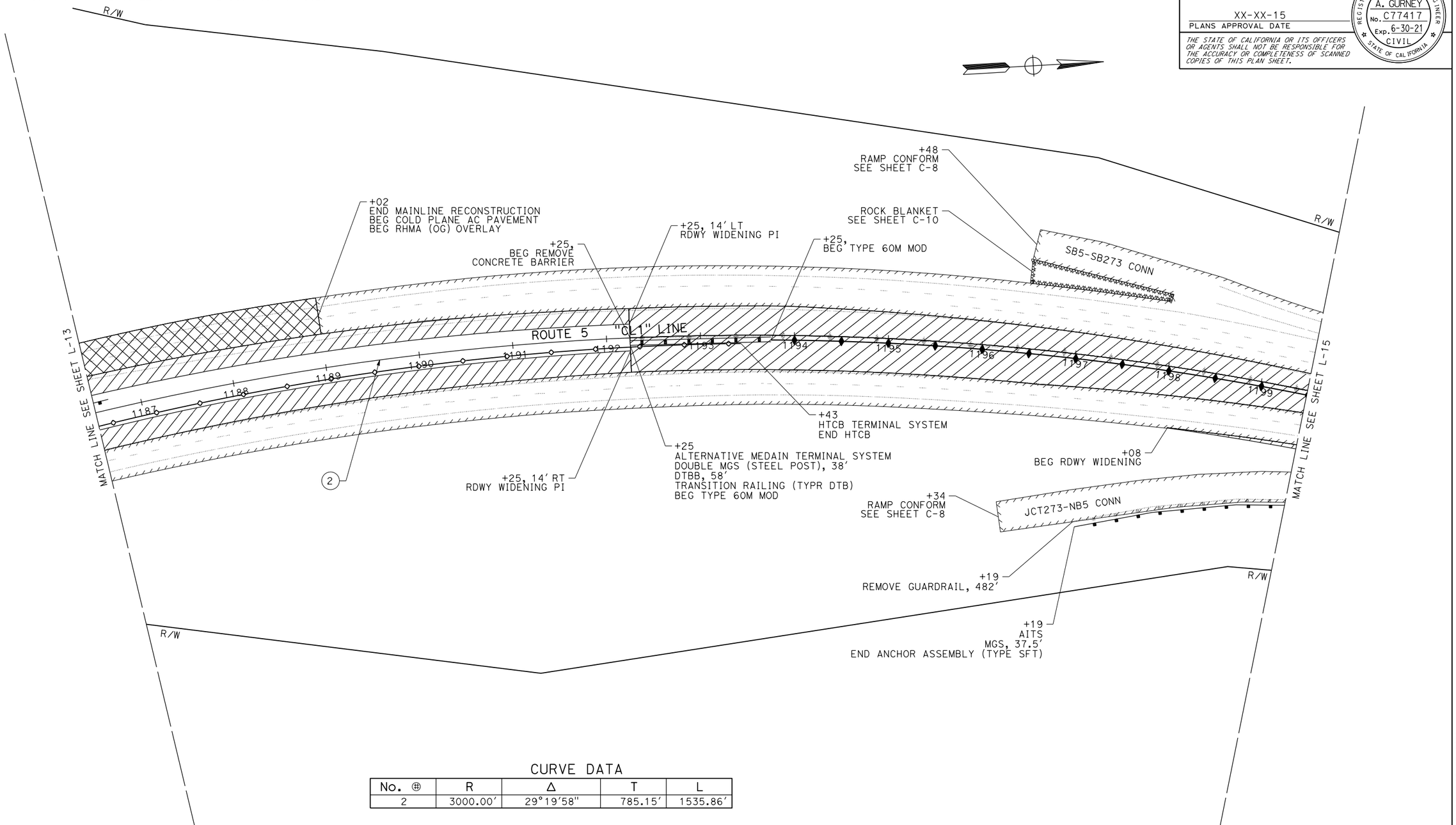

CURVE DATA

No. ⊕	R	Δ	T	L
2	3000.00'	29°19'58"	785.15'	1535.86'

LAYOUT
SCALE: 1" = 50'

L-14

REVISED BY | DATE REVISED
CALCULATED-DESIGNED BY | CHECKED BY: TRAVIS A. GURNEY
FUNCTIONAL SUPERVISOR: TOBY CRAWFORD

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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LAST REVISION 12-20-18 | DATE PLOTTED => 10-JUL-2020 | TIME PLOTTED => 10:26

BORDER LAST REVISED 7/2/2010 | USERNAME => s132331 | DGN FILE => 0215000083ea014.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0316 | PROJECT NUMBER & PHASE 0215000083 1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	5	R14.8/R20.0		?

XX-XX-15
REGISTERED CIVIL ENGINEER DATE

XX-XX-15
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
TRAVIS A. GURNEY
No. C77417
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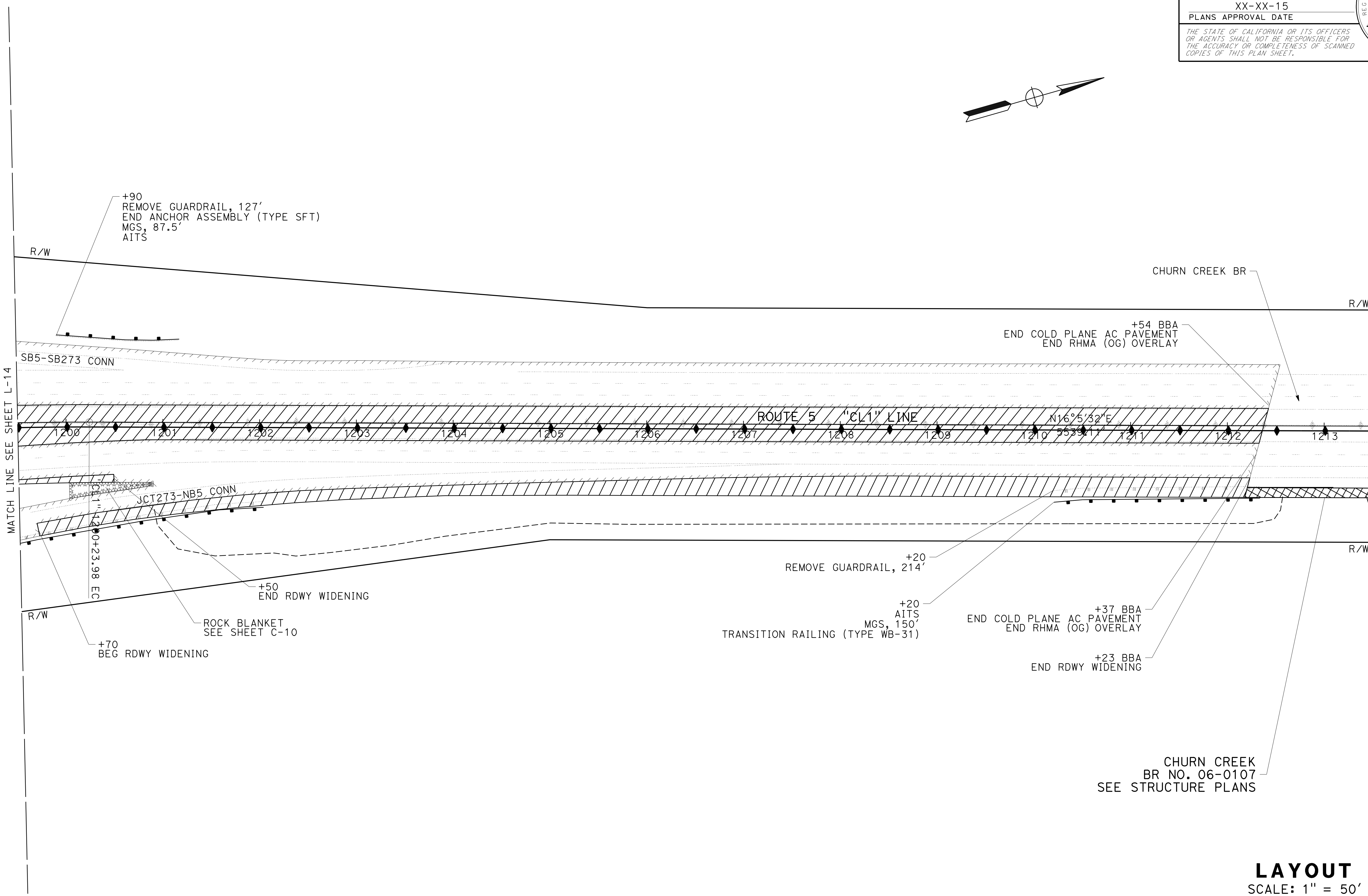

LAYOUT
SCALE: 1" = 50′

L-15

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY: TRAVIS A. GURNEY
CHECKED BY
FUNCTIONAL SUPERVISOR: TOBY CRAWFORD

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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P:\proj3\02\0h920\design\P&E\0215000083ea015.dgn

LAST REVISION 12-20-18
DATE PLOTTED => 10-JUL-2020
TIME PLOTTED => 10:26

BORDER LAST REVISED 7/2/2010
USERNAME => s132331
DGN FILE => 0215000083ea015.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0316
PROJECT NUMBER & PHASE 0215000083 1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	5	R14.8/R20.0		?

XX-XX-15
REGISTERED CIVIL ENGINEER DATE

XX-XX-15
PLANS APPROVAL DATE

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TRAVIS A. GURNEY
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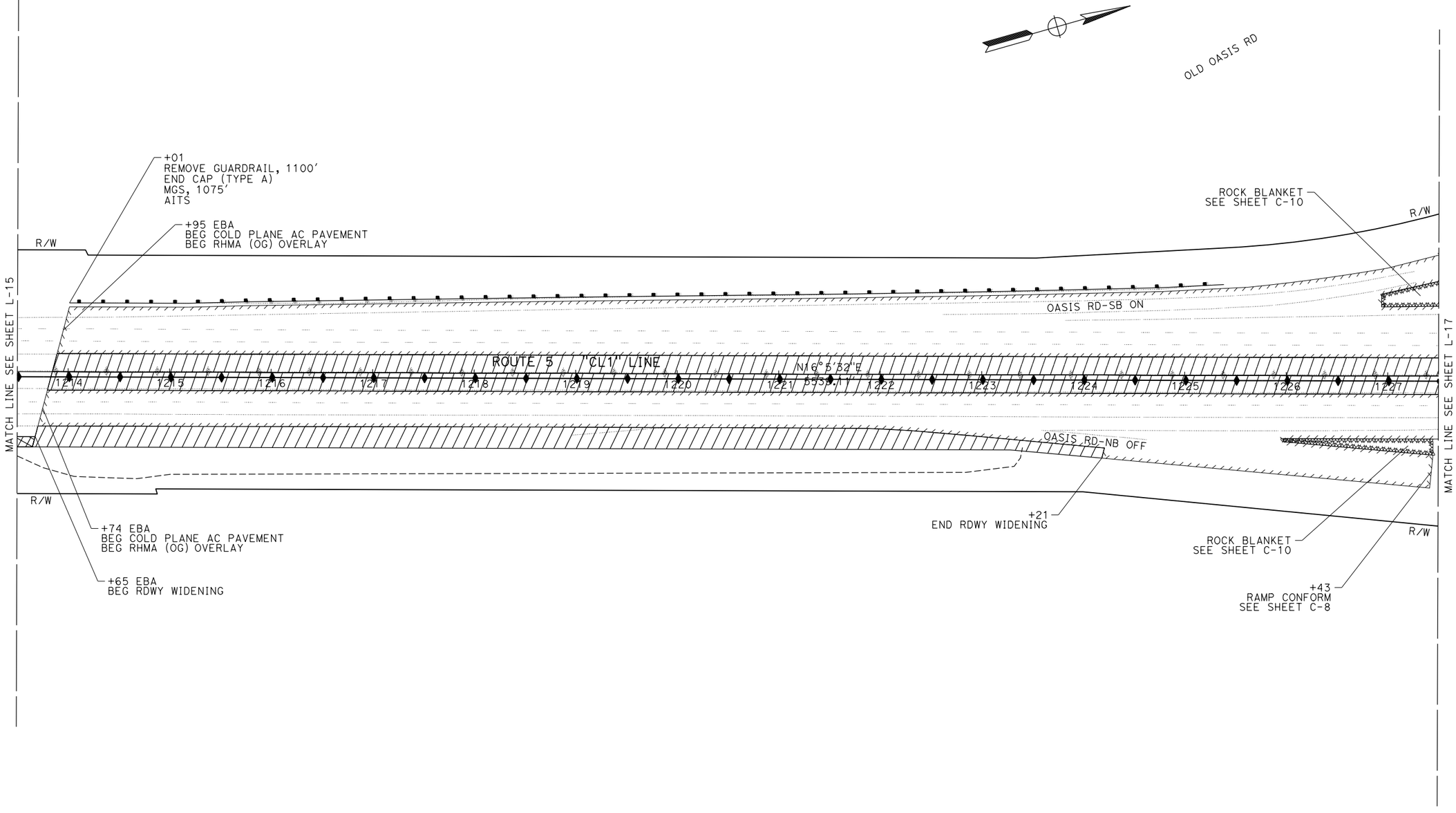

LAYOUT
SCALE: 1" = 50'

L-16

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY
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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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LAST REVISION 12-20-18
DATE PLOTTED => 10-JUL-2020
TIME PLOTTED => 10:26

BORDER LAST REVISED 7/2/2010
USERNAME => s132331
DGN FILE => 0215000083ea016.dgn
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0316
PROJECT NUMBER & PHASE 0215000083 1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	5	R14.8/R20.0		?

XX-XX-15
REGISTERED CIVIL ENGINEER DATE

XX-XX-15
PLANS APPROVAL DATE

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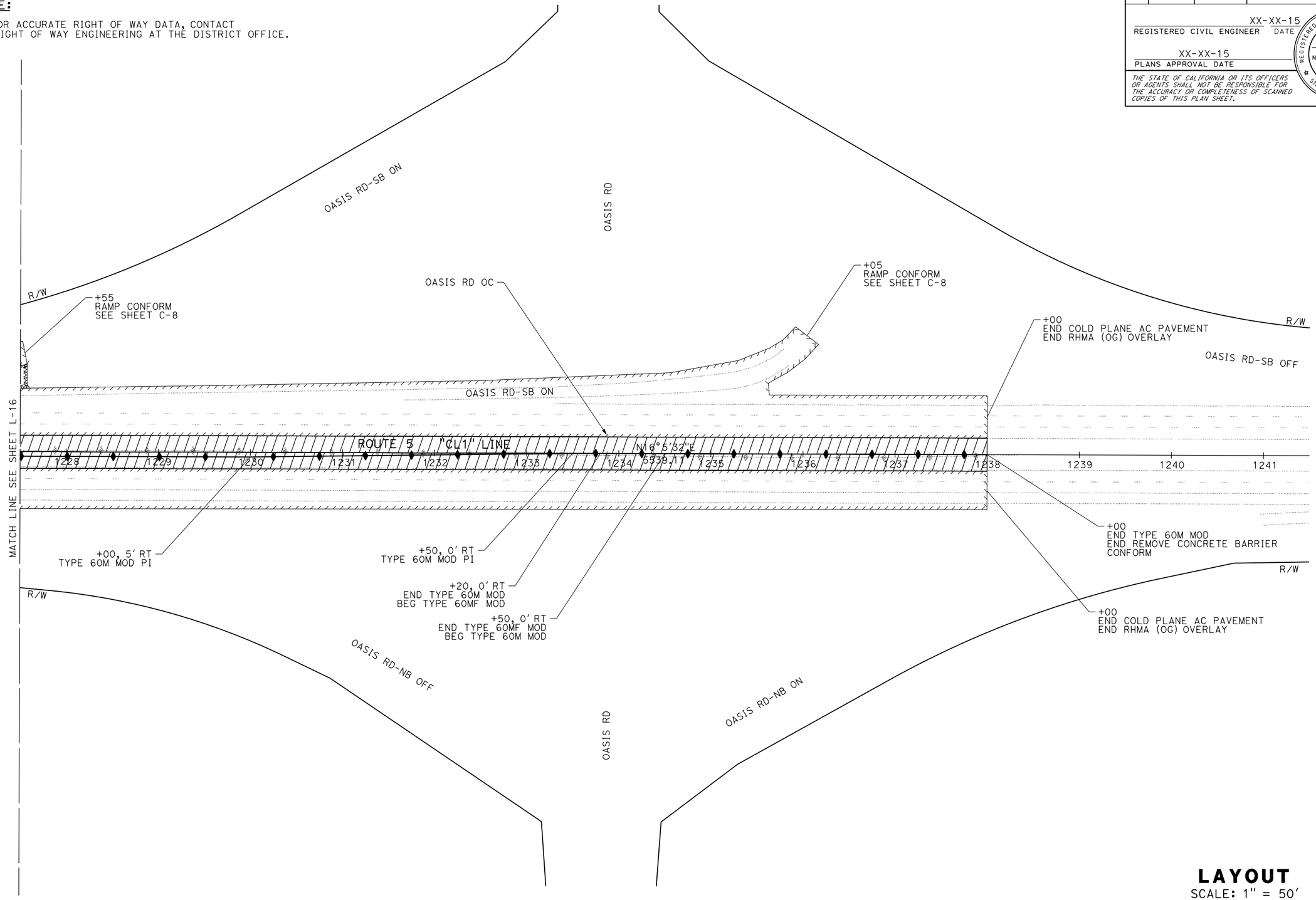

LAYOUT
SCALE: 1" = 50'

L-17

CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
TRAVIS A. GURNEY			

FUNCTIONAL SUPERVISOR: TOBY CRAWFORD

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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DESIGN

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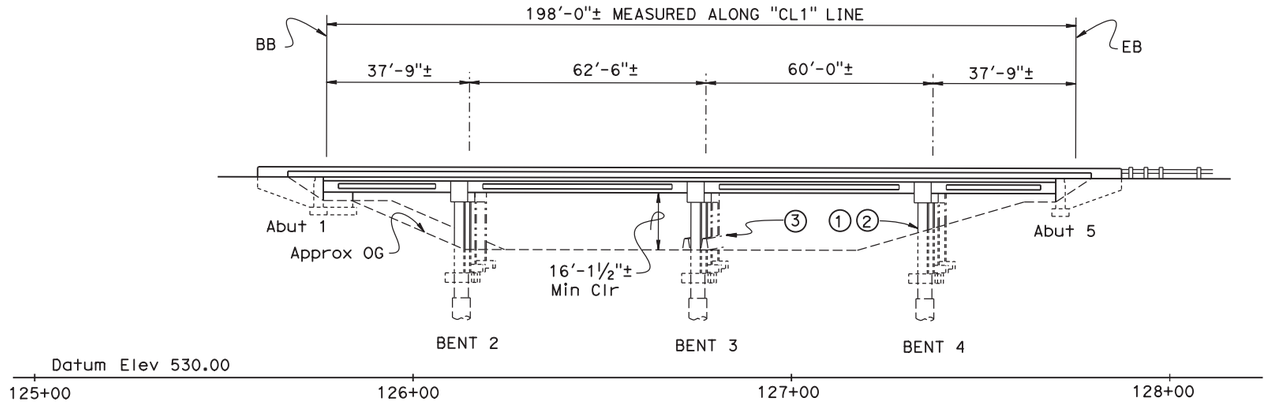
LAST REVISION 12-20-18
DATE PLOTTED => 10-JUL-2020
TIME PLOTTED => 10:26

BORDER LAST REVISED 7/2/2010 | USERNAME => s132331 | DGN FILE => 0215000083ea017.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0316 | PROJECT NUMBER & PHASE 0215000083 1

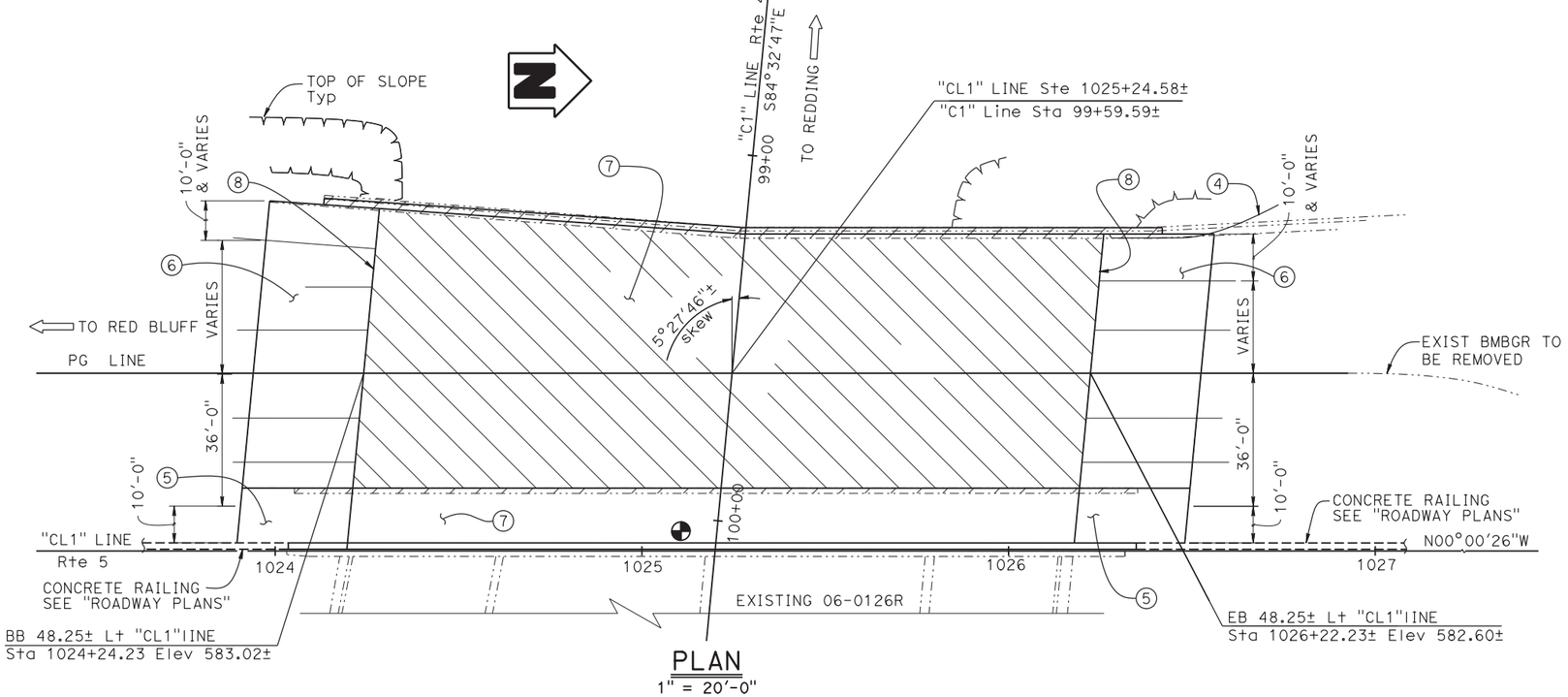
Attachment C
Structures General Plans (GP)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF ENGINEERING SERVICES

Dist	COUNTY	ROUTE	POST MILE
02	Sha	5	R14.8/R20



ELEVATION
1" = 20'-0"



PLAN
1" = 20'-0"

LEGEND:

- New structure
- Existing structure
- Limits of Existing overlay removal
- Existing Concrete and Barrier Rail Removal
- Point of minimum vertical clearance

NOTES:

1. Paint "EAST REDDING SEPARATION"
2. Paint "BR. NO. 06-0126L"
3. Concrete Barrier Type 60E, see "ROADWAY PLANS"
4. MGS, see "ROADWAY PLANS"
5. Structure Approach Type N(30D)
6. Structure Approach Type R(30D)
7. ¾"± Minimum Polyester Concrete Overlay
8. Joint Seal (MR = 1")

DATE OF ESTIMATE	06/20/19
BRIDGE REMOVAL	
STRUCTURE DEPTH	
LENGTH	198
WIDTH	15
AREA	3,020
COST/SQFT INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	$853
TOTAL COST	$2,576,000

ALTERNATIVE A
EAST REDDING (5/44) SEPARATION

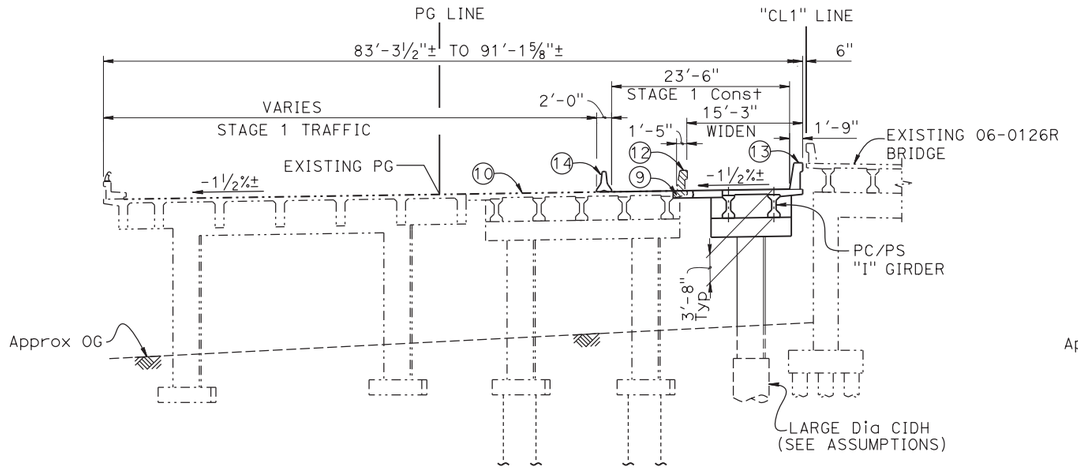
DESIGNED BY: Joey Aquino	DATE: 2-22-19	STRUCTURE DESIGN	PLANNING STUDY NO. 1
DRAWN BY: Liang Ma	DATE: 2-28-19	DESIGN BRANCH 3	SEPARATION (WIDEN)
CHECKED BY: Joe Downing	DATE: X		UNIT: 3578 / BRIDGE No.: 06-0126L
APPROVED: X	DATE: X		PROJECT EA: 02-0H920 / PROJECT No. & PHASE: 0215000083

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 1/11/2019)

DATE PLOTTED => 01-MAY-2019 TIME PLOTTED => 10:38
FILE => 06-0126l-aps-alternative_a-1of1.dgn USERNAME => s131147

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF ENGINEERING SERVICES

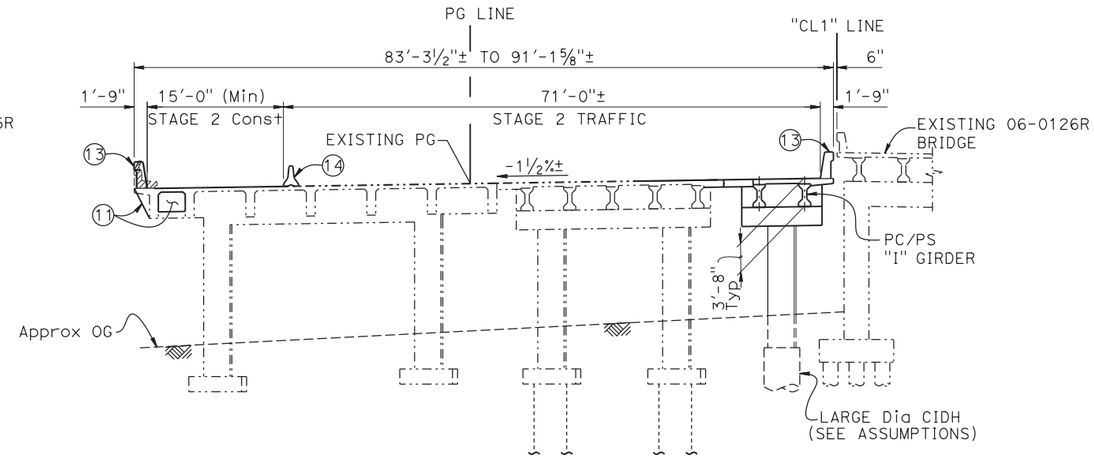
Dist	COUNTY	ROUTE	POST MILE
02	Sha	5	R14.8/R20



STAGE 1

TYPICAL SECTION

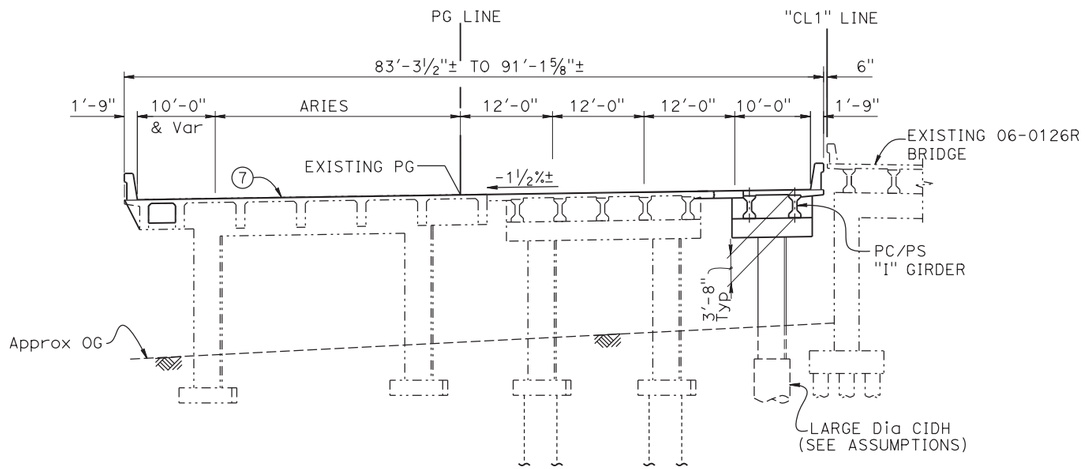
1" = 10'-0"



STAGE 2

TYPICAL SECTION

1" = 10'-0"



FINAL

TYPICAL SECTION

1" = 10'-0"

LEGEND:

- New structure
- Existing structure
- Limits of Existing overlay removal
- Existing Concrete and Barrier Rail Removal
- Point of minimum vertical clearance

NOTES:

(7) ¾"± Minimum Polyester Concrete Overlay
(9) Closure Pour
(10) Remove Existing Overlay (First order of work before stage 1 K-Railing placement)
(11) Concrete Strut and Diaphragm (Overhang refrofit for new Barrier)
(12) Salvage Existing Metal Railing
(13) Concrete Barrier Type 842
(14) Temporary Railing (Type K),see "ROADWAY PLANS"

ASSUMPTIONS:

1. Large Diameter CIDH Pile is assumed due to space limitation between left and right Bridge Foundation

2. Deep Foundation is assumed to match Right Bridge's Foundation

ALTERNATIVE A
EAST REDDING (5/44) SEPARATION

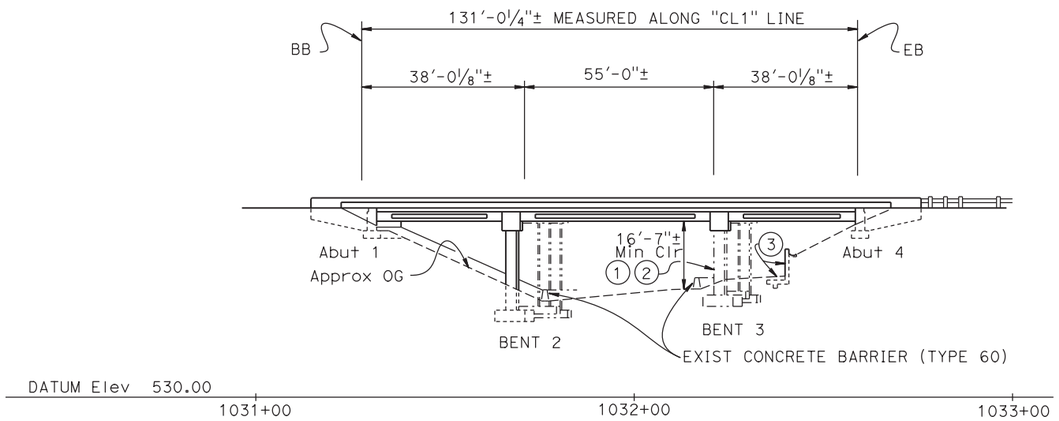
DESIGNED BY Joey Aquino	DATE 2-22-19	STRUCTURE DESIGN	PLANNING STUDY NO. 2
DRAWN BY Liang Ma	DATE 2-28-19	DESIGN BRANCH 3	SEPARATION (WIDEN)
CHECKED BY Joe Downing	DATE X		UNIT: 3578 / BRIDGE No.: 06-0126L
APPROVED X	DATE X		PROJECT EA: 02-0H920 / PROJECT No. & PHASE: 0215000083

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 1/11/2019)

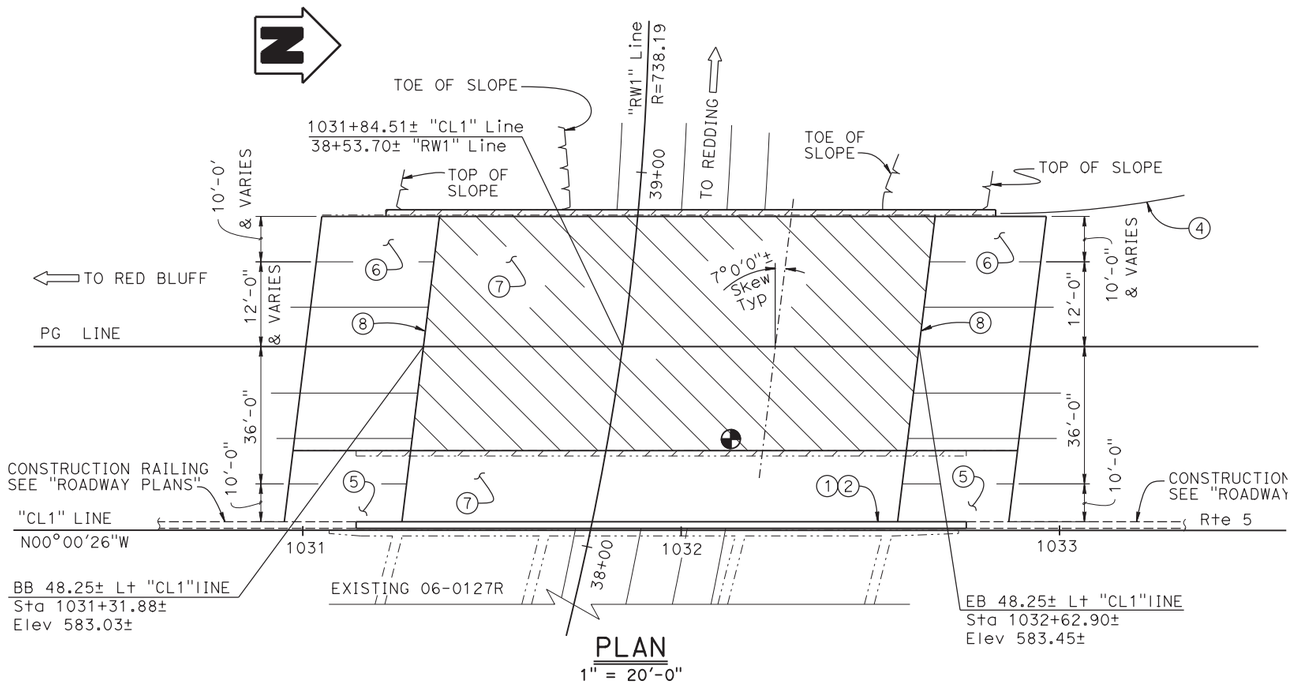
DATE PLOTTED => 01-MAY-2019 TIME PLOTTED => 10:38
FILE => 06-0126l-aps-alternative_a-2019 USERNAME => s131147

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF ENGINEERING SERVICES

Dist	COUNTY	ROUTE	POST MILE
02	Sha	5	R14.8/R20



ELEVATION
1" = 20'-0"



PLAN
1" = 20'-0"

LEGEND:
- New structure
- Existing structure
- Limits of Existing overlay removal
- Existing Concrete and Barrier Rail Removal
- Point of minimum vertical clearance

NOTES:
1. Paint "CONNECTOR UC"
2. Paint "BR. NO. 06-0127L"
3. Existing Bike Path and Retaining Wall
4. MGS, see "ROADWAY PLANS"
5. Structure Approach Type N(30D)
6. Structure Approach Type R(30D)
7. ¾"± Minimum Polyester Concrete Overlay
8. Joint Seal (MR = 1")

DATE OF ESTIMATE	06/20/19
BRIDGE REMOVAL	
STRUCTURE DEPTH	
LENGTH	131
WIDTH	19
AREA	2,552
COST/SQFT INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	$936
TOTAL COST	$2,388,000

ALTERNATIVE A
NB I-5 TO WB SR 44 CONNECTOR

DESIGNED BY: Joey Aquino	DATE: 3-10-19	STRUCTURE DESIGN	PLANNING STUDY NO. 1
DRAWN BY: Liang Ma	DATE:	DESIGN BRANCH 3	CONNECTOR UC
CHECKED BY: Joe Downing	DATE: X		UNIT: 3578 / BRIDGE No.: 06-0127L
APPROVED: X	DATE: X		PROJECT EA: 02-0H920 / PROJECT No. & PHASE: 0215000083

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 1/11/2019)

DATE PLOTTED => 01-MAY-2019 TIME PLOTTED => 10:58
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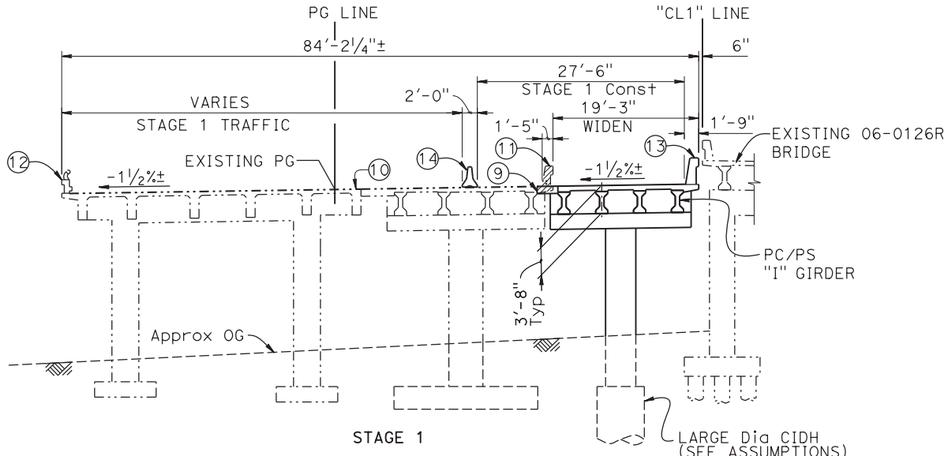
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF ENGINEERING SERVICES

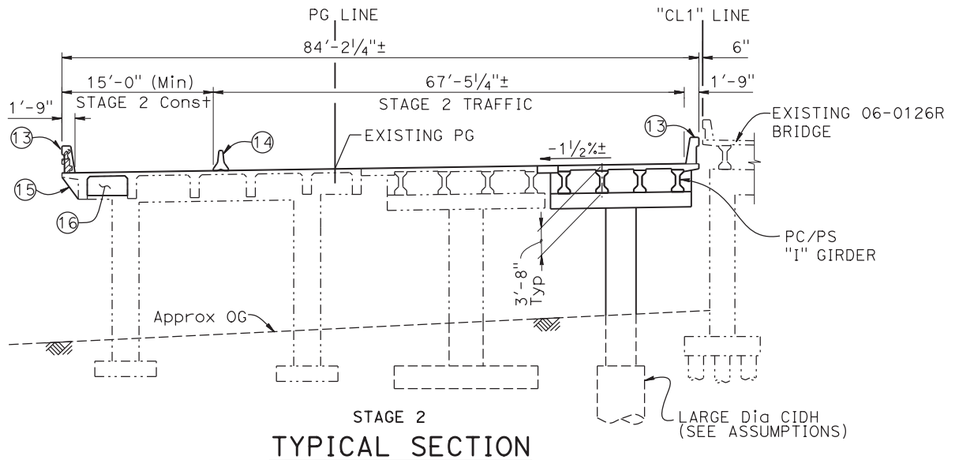
Dist	COUNTY	ROUTE	POST MILE
02	Sha	5	R14.8/R20



STAGE 1

TYPICAL SECTION

1" = 10'-0"



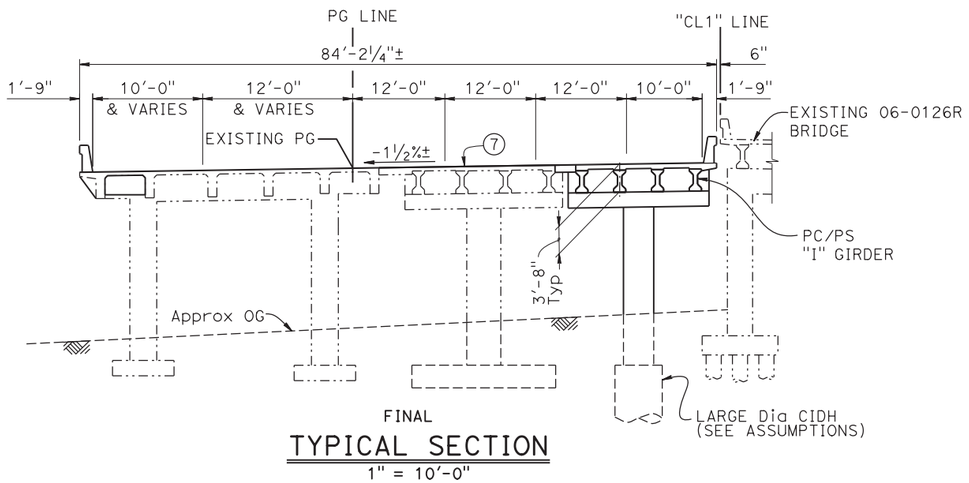
STAGE 2

TYPICAL SECTION

1" = 10'-0"

LEGEND:

- New structure
- Existing structure
- Limits of Existing overlay removal
- Existing Concrete and Barrier Rail Removal
- Point of minimum vertical clearance



FINAL

TYPICAL SECTION

1" = 10'-0"

NOTES:

7. ¾"± Minimum Polyester Concrete Overlay
9. Closure Pour
10. Remove Existing Overlay
11. Existing Concrete Barrier Type 732 to be removed
12. Salvage Existing Metal Railing
13. Concrete Barrier Type 842
14. Temporary Railing (Type K), see "ROADWAY PLANS"
15. Contruct Concrete Struts
16. Contruct Intermediate Diaphragm

ASSUMPTIONS:

1. Large Diameter CIDH Pile Foundation is assumed due to space limitation between left and right Bridge Foundation
2. Deep Foundation is assumed in view of shallow Foundation dueb to close proximity of Right Bridge Pile Foundation

ALTERNATIVE A
NB I-5 TO WB SR 44 CONNECTOR

DESIGNED BY: Joey Aquino	DATE: 3-10-19	STRUCTURE DESIGN	PLANNING STUDY NO. 2
DRAWN BY: Liang Ma	DATE:	DESIGN BRANCH 3	CONNECTOR UC
CHECKED BY: Joe Downing	DATE: X		UNIT: 3578 / BRIDGE No.: 06-0127L
APPROVED: X	DATE: X		PROJECT EA: 02-0H920 / PROJECT No. & PHASE: 0215000083

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 1/11/2019)

DATE PLOTTED => 01-MAY-2019 TIME PLOTTED => 10:59
FILE => 06-0127l-aps-alternative_a-2sheet USERNAME => s131147

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF ENGINEERING SERVICES

Dist	COUNTY	ROUTE	POST MILE
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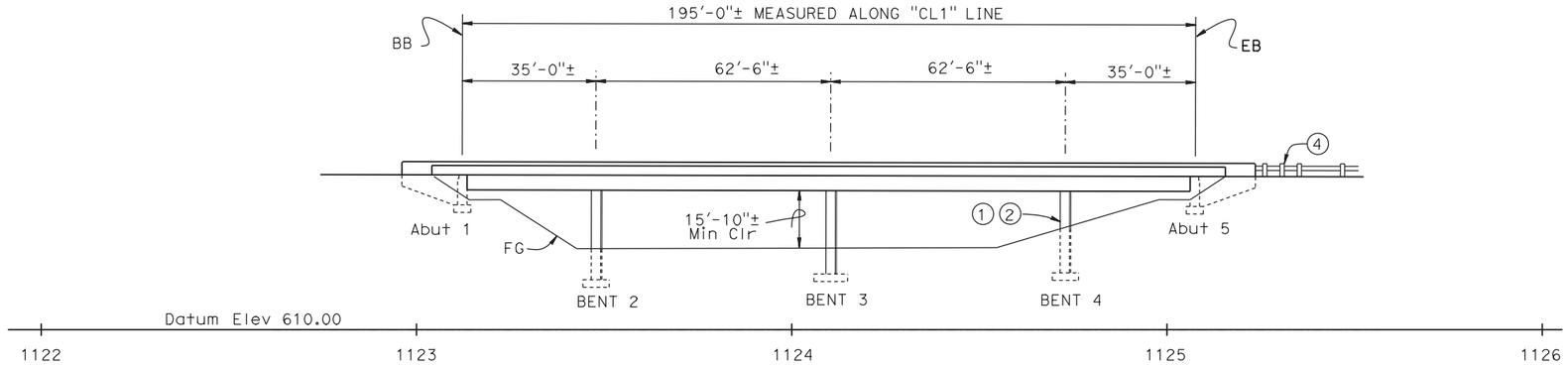
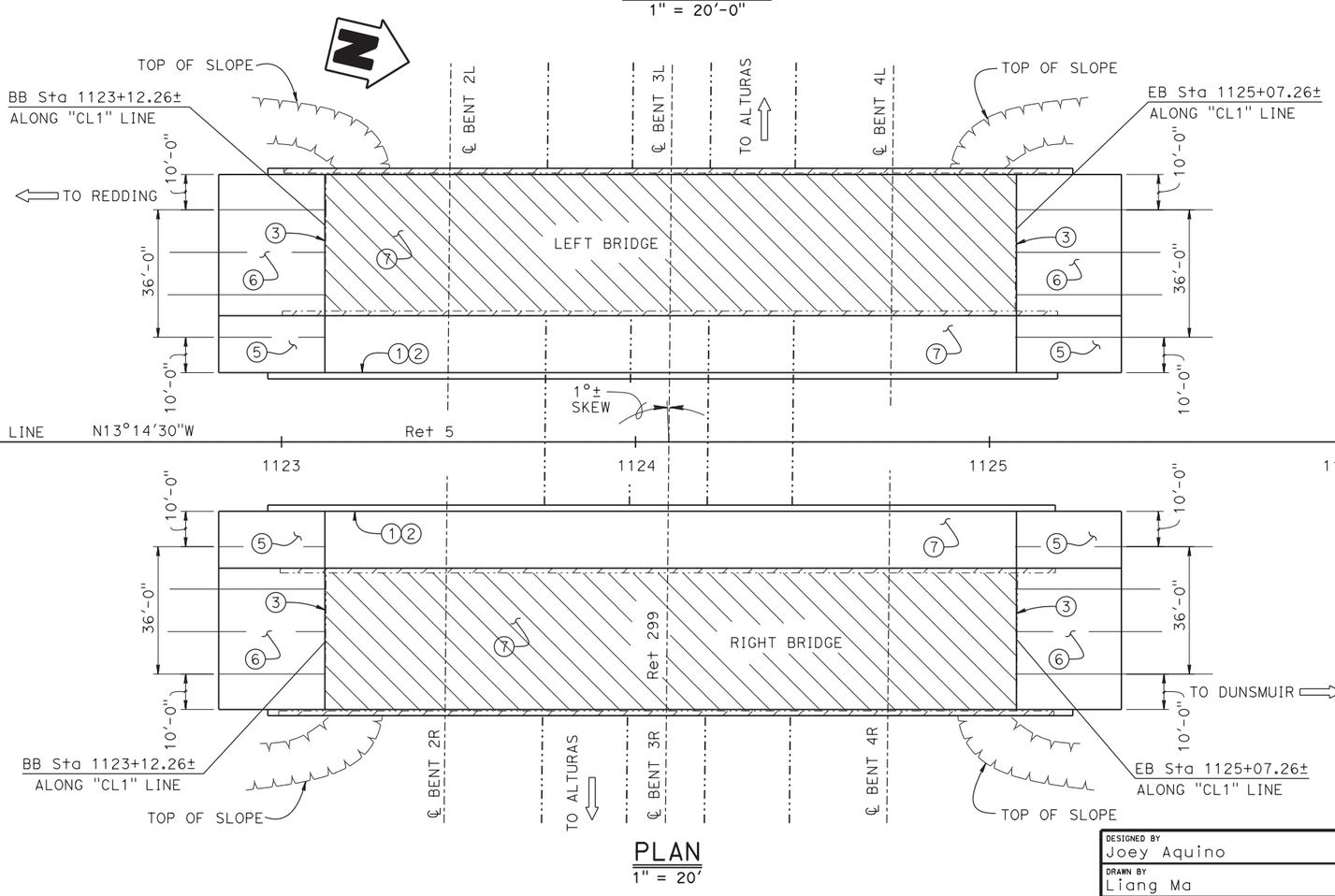


ELEVATION
1" = 20'-0"



PLAN
1" = 20'

LEGEND:

- New structure
- Existing structure
- Limits of Existing overlay removal
- Existing Concrete and Barrier Rail Removal

NOTES:

1. Paint "CHURN CREEK BRIDGE"
2. Paint "BR. NO. 06-0107R"
3. Joint Seal (MR = 1")
4. MGS, see "ROADWAY PLANS"
5. Structure Approach Type N(30D)
6. Structure Approach Type R(30D)
7. ¾"± Minimum Polyester Concrete Overlay

LEFT BRIDGE:	
DATE OF ESTIMATE	06/28/19
BRIDGE REMOVAL	
STRUCTURE DEPTH	
LENGTH	195
WIDTH	18
AREA	3,477
COST/SQFT INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	$680
TOTAL COST	$2,363,000

RIGHT BRIDGE:	
DATE OF ESTIMATE	06/28/19
BRIDGE REMOVAL	
STRUCTURE DEPTH	
LENGTH	195
WIDTH	18
AREA	3,477
COST/SQFT INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	$680
TOTAL COST	$2,363,000

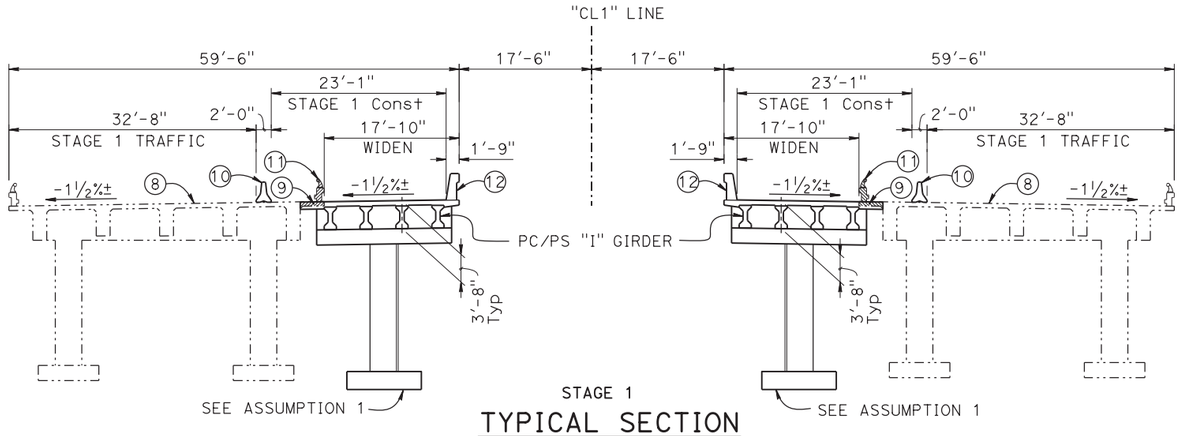
DESIGNED BY: Joey Aquino	DATE: 4-02-19	STRUCTURE DESIGN	ROUTE 5/299 SEPARATION (WIDEN)
DRAWN BY: Liang Ma	DATE: 4-02-19	DESIGN BRANCH 3	PLANNING STUDY NO. 1
CHECKED BY: Joe Downing	DATE: X		UNIT: 3578 / BRIDGE No.: 06-0129L/R
APPROVED: X	DATE: X		PROJECT EA: 02-0H920 / PROJECT No. & PHASE: 0215000083

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 1/11/2019)

DATE PLOTTED => 01-MAY-2019 TIME PLOTTED => 10:43
FILE => 06-0129r1-aps-a-gp01.dgn USERNAME => s131147

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF ENGINEERING SERVICES

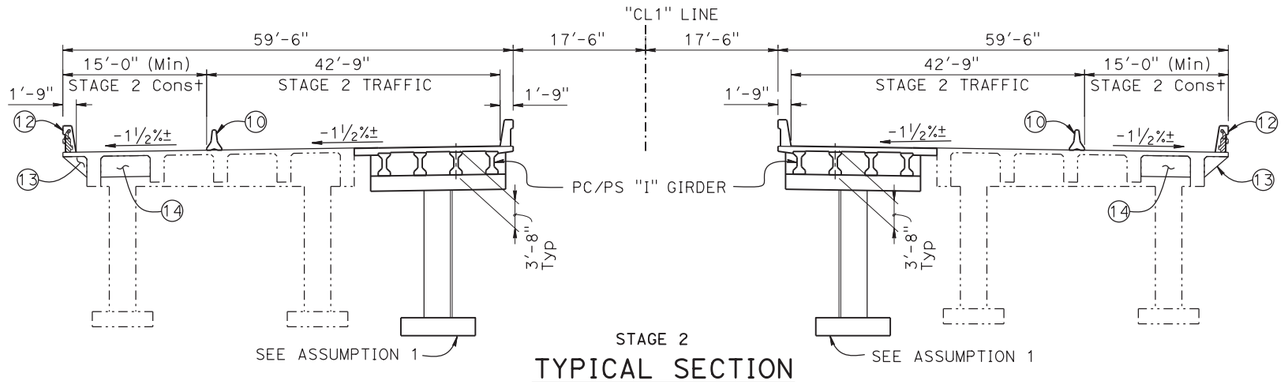
Dist	COUNTY	ROUTE	POST MILE
02	Sha	5	R14.8/R20



STAGE 1

TYPICAL SECTION

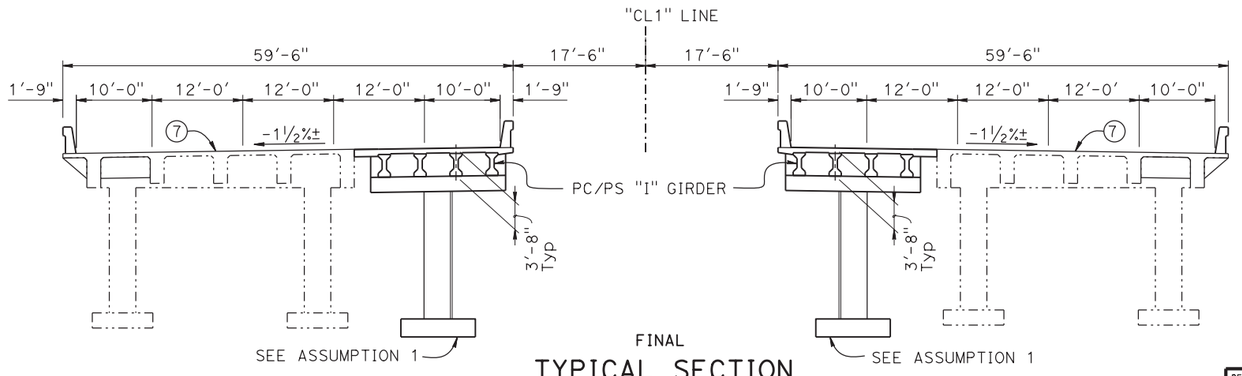
1" = 10'-0"



STAGE 2

TYPICAL SECTION

1" = 10'-0"



FINAL

TYPICAL SECTION

1" = 10'-0"

LEGEND:

- New structure
- Existing structure
- Limits of Existing overlay removal
- Existing Concrete and Barrier Rail Removal

NOTES:

(7) ¾"± Minimum Polyester Concrete Overlay
(8) Remove Existing Overlay
(9) Closure Pour
(10) Temporary Railing (Type K),see "ROADWAY PLANS"
(11) Existing Concrete Barrier to be removed
(12) Concrete Barrier Type 842
(13) Construct Concrete Struts
(14) Construct Intermediate Diaphragms

ASSUMPTIONS:

1. Shallow Foundation assumed to match existing Bridge Foundation
2. Shoring will be required for Footing excavation

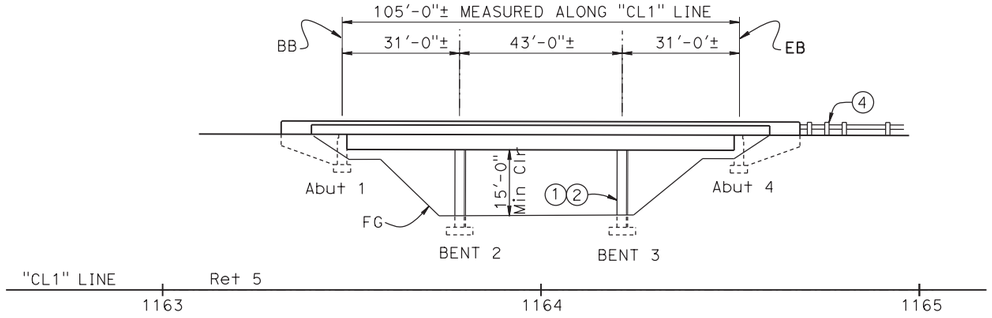
DESIGNED BY: Joey Aquino	DATE: 4-02-19	STRUCTURE DESIGN	ROUTE 5/299 SEPARATION (WIDEN)
DRAWN BY: Liang Ma	DATE: 4-02-19	DESIGN BRANCH 3	PLANNING STUDY NO. 2
CHECKED BY: Joe Downing	DATE: X		UNIT: 3578 / BRIDGE No.: 06-0129L/R
APPROVED: X	DATE: X		PROJECT EA: 02-0H920 / PROJECT No. & PHASE: 0215000083

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 1/11/2019)

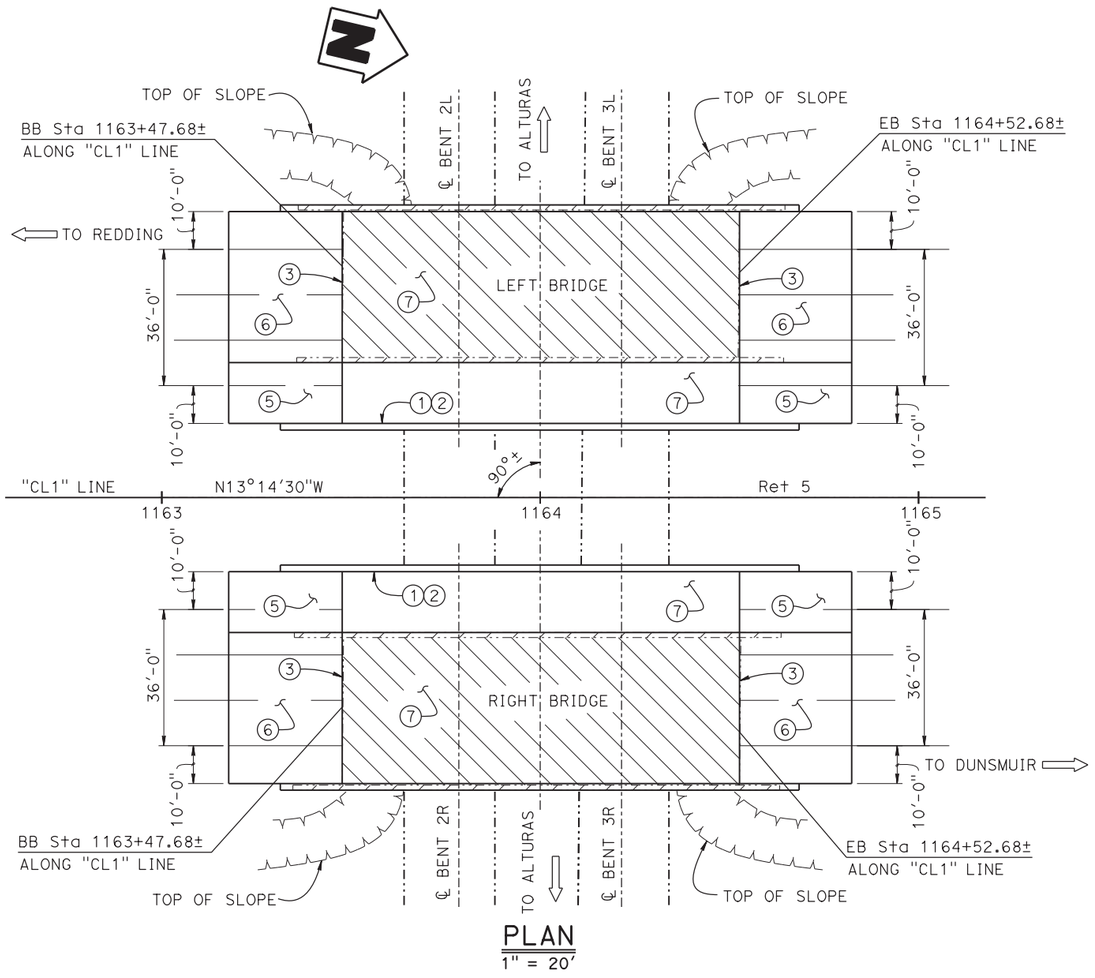
DATE PLOTTED => 01-MAY-2019 TIME PLOTTED => 10:43
FILE => 06-0129r1-aps-a-gp02.dgn USERNAME => s131147

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF ENGINEERING SERVICES

Dist	COUNTY	ROUTE	POST MILE
02	Sha	5	R14.8-R20



ELEVATION
1" = 20'-0"



PLAN
1" = 20'

LEGEND:

- New structure
- Existing structure
- Limits of Existing overlay removal
- Existing Concrete and Barrier Rail Removal

NOTES:

1. Paint "CHURN CREEK BRIDGE"
2. Paint "BR. NO. 06-0107R"
3. Joint Seal (MR = 1")
4. MGS, see "ROADWAY PLANS"
5. Structure Approach Type N(30D)
6. Structure Approach Type R(30D)
7. ¾"± Minimum Polyester Concrete Overlay

LEFT BRIDGE:	
DATE OF ESTIMATE	06/28/19
BRIDGE REMOVAL	
STRUCTURE DEPTH	
LENGTH	105
WIDTH	18
AREA	1,872
COST/SQFT INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	$809
TOTAL COST	$1,515,000

RIGHT BRIDGE:	
DATE OF ESTIMATE	06/28/19
BRIDGE REMOVAL	
STRUCTURE DEPTH	
LENGTH	105
WIDTH	18
AREA	1,872
COST/SQFT INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	$810
TOTAL COST	$1,516,000

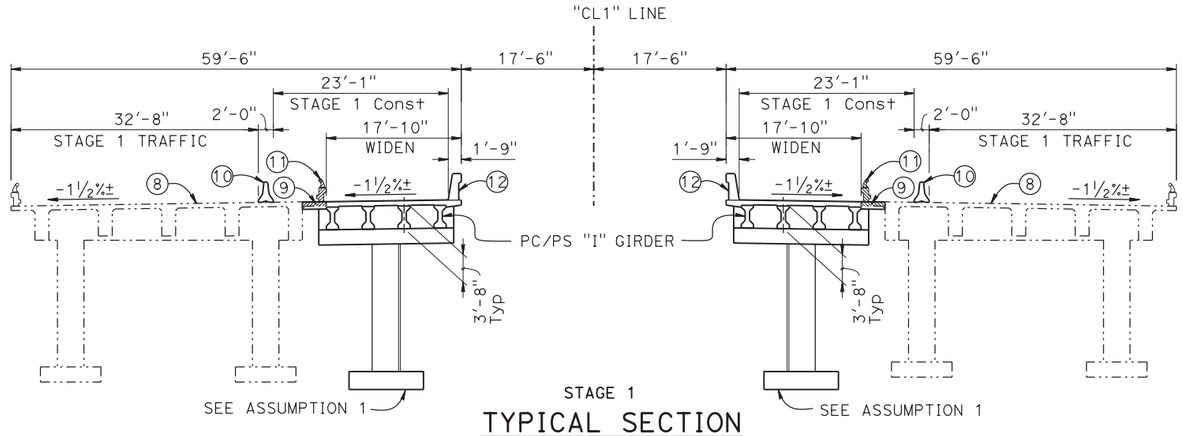
DESIGNED BY: Joey Aquino	DATE: 4-05-19	STRUCTURE DESIGN	TWIN VIEW BLVD UC (WIDEN)
DRAWN BY: Liang Ma	DATE: 4-05-19	DESIGN BRANCH 3	PLANNING STUDY NO. 1
CHECKED BY: Joe Downing	DATE: X		UNIT: 3578 / BRIDGE No.: 06-0143L/R
APPROVED: X	DATE: X		PROJECT EA: 02-0H920 / PROJECT No. & PHASE: 0215000083

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 1/11/2019)

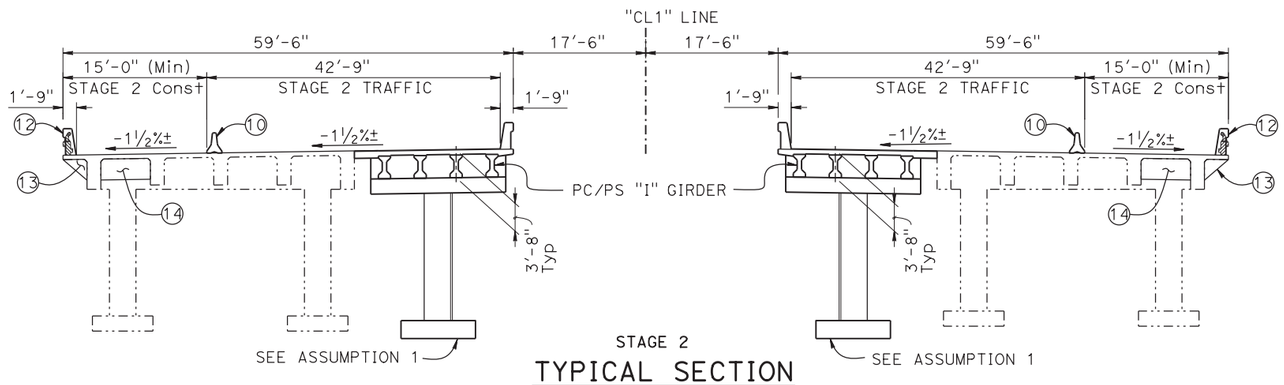
DATE PLOTTED => 01-MAY-2019 TIME PLOTTED => 10:45
FILE => 06-0143r1-aps-a-gp01.dgn USERNAME => s131147

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF ENGINEERING SERVICES

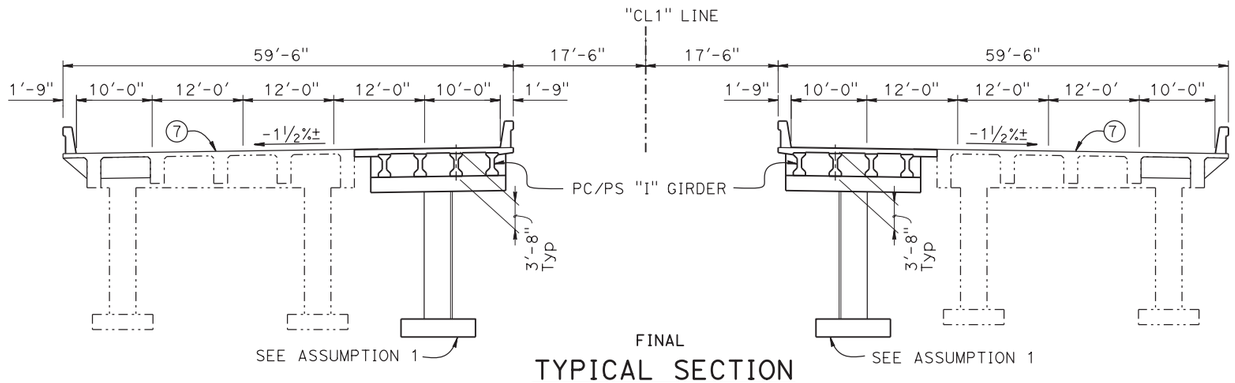
Dist	COUNTY	ROUTE	POST MILE
02	Sha	5	R14.8/R20



STAGE 1
TYPICAL SECTION
1" = 10'-0"



STAGE 2
TYPICAL SECTION
1" = 10'-0"



FINAL
TYPICAL SECTION
1" = 10'-0"

LEGEND:

- New structure
- Existing structure
- Limits of Existing overlay removal
- Existing Concrete and Barrier Rail Removal

NOTES:

NOTES:

(7) ¾"± Minimum Polyester Concrete Overlay
(8) Remove Existing Overlay
(9) Closure Pour
(10) Temporary Railing (Type K),see "ROADWAY PLANS"
(11) Existing Concrete Barrier to be removed
(12) Concrete Barrier Type 842
(13) Construct Concrete Struts
(14) Construct Intermediate Diaphragms

ASSUMPTIONS:

1. Shallow Foundation assumed to match existing Bridge Foundation
2. Shoring will be required for Footing excavation

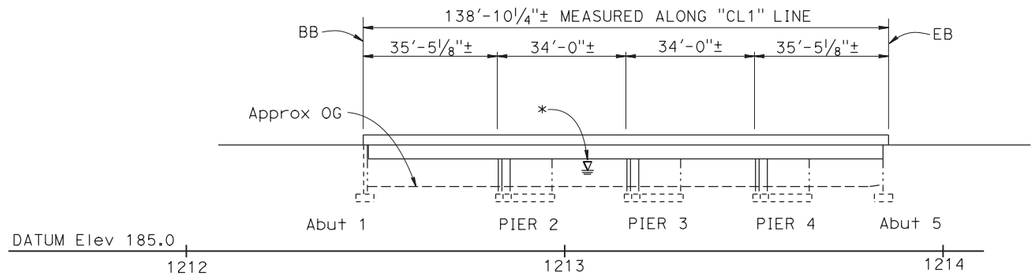
DESIGNED BY: Joey Aquino	DATE: 4-05-19	STRUCTURE DESIGN	TWIN VIEW BLVD UC (WIDEN)
DRAWN BY: Liang Ma	DATE: 4-05-19	DESIGN BRANCH 3	PLANNING STUDY NO. 2
CHECKED BY: Joe Downing	DATE: X		UNIT: 3578 / BRIDGE No.: 06-0143L/R
APPROVED: X	DATE: X		PROJECT EA: 02-0H920 / PROJECT No. & PHASE: 0215000083

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 1/11/2019)

DATE PLOTTED => 01-MAY-2019 TIME PLOTTED => 10:45
FILE => 06-0143r1-aps-a-gp02.dgn USERNAME => s131147

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF ENGINEERING SERVICES

Dist	COUNTY	ROUTE	POST MILE
02	Sha	5	R14.8/R20



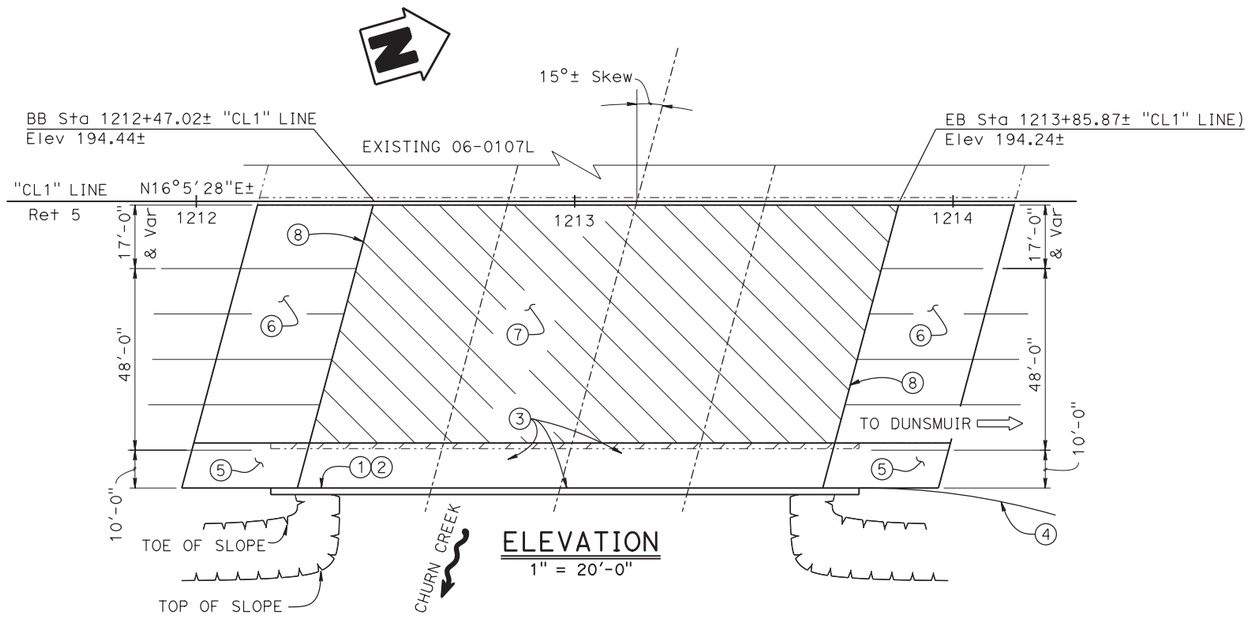
PLAN
1" = 20'-0"

LEGEND:

- New structure
- Existing structure
- Limits of Existing overlay removal
- Existing Concrete and Barrier Rail Removal

NOTES:

1. Paint "CHURN CREEK BRIDGE"
2. Paint "BR. NO. 06-0107R"
3. Paint Pier Number
4. MGS, see "ROADWAY PLANS"
5. Structure Approach Type N(30D)
6. Structure Approach Type R(30D)
7. ¾"± Minimum Polyester Concrete Overlay
8. Joint Seal (MR = 1")



ELEVATION
1" = 20'-0"

DATE OF ESTIMATE	06/20/19
BRIDGE REMOVAL	
STRUCTURE DEPTH	
LENGTH	139
WIDTH	12
AREA	1,712
COST/SQFT INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	$904
TOTAL COST	$1,548,000

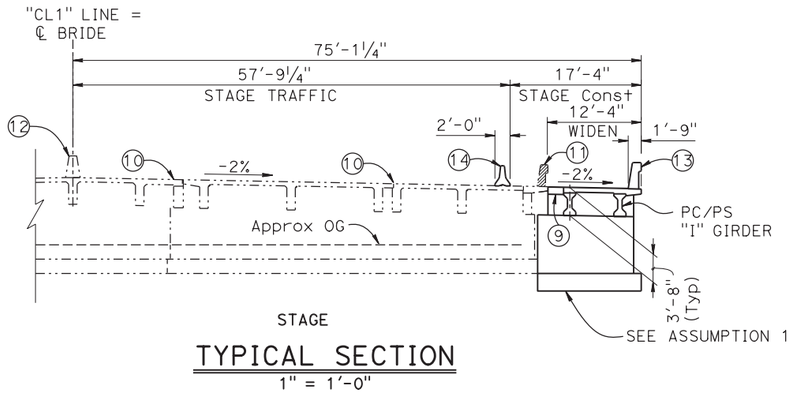
DESIGNED BY: Joey Aquino	DATE: 3-28-19	STRUCTURE DESIGN	CHURN CREEK BRIDGE (WIDEN)
DRAWN BY: Liang Ma	DATE:	DESIGN BRANCH 3	PLANNING STUDY NO. 1
CHECKED BY: Joe Downing	DATE: X		UNIT: 3578 / BRIDGE No.: 06-0107R
APPROVED: X	DATE: X		PROJECT EA: 02-0H920 / PROJECT No. & PHASE: 0215000083

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 1/11/2019)

DATE PLOTTED => 01-MAY-2019 TIME PLOTTED => 10:35
FILE => 06-0107r-aps-a-gp01.dgn USERNAME => s131147

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - DIVISION OF ENGINEERING SERVICES

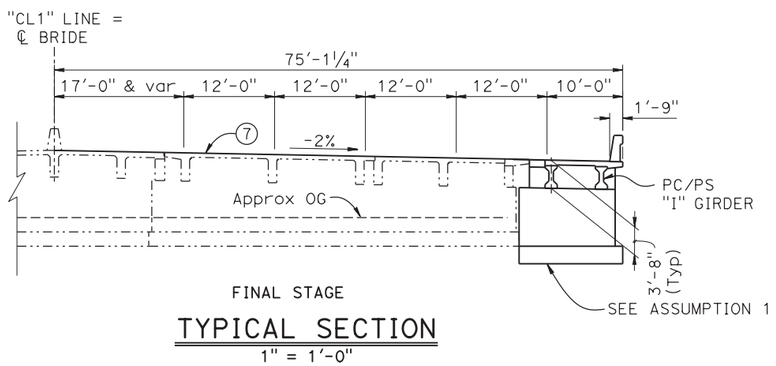
Dist	COUNTY	ROUTE	POST MILE
02	Sha	5	R14.8/R20



STAGE

TYPICAL SECTION

1" = 1'-0"



FINAL STAGE

TYPICAL SECTION

1" = 1'-0"

LEGEND:

- New structure
- Existing structure
- Limits of Existing overlay removal
- Existing Concrete and Barrier Rail Removal

NOTES:

(7) ¾"± Minimum Polyester Concrete Overlay
(9) Closure Pour
(10) Remove Existing Overlay (First order of work before stage 1 K-Railing placement)
(11) Existing Concrete Barrier Type 736 to be removed
(12) Existing Concrete Barrier
(13) Concrete Barrier Type 842
(14) Temporary Railing (Type K),see "ROADWAY PLANS"

ASSUMPTIONS:

1. Shallow Foundation assumed to match existing Bridge Foundation

2. Shoring will be required for Footing excavation

DESIGNED BY: Joey Aquino	DATE: 3-28-19	STRUCTURE DESIGN	CHURN CREEK BRIDGE (WIDEN)
DRAWN BY: Liang Ma	DATE:	DESIGN BRANCH 3	PLANNING STUDY NO. 2
CHECKED BY: Joe Downing	DATE: X		UNIT: 3578 / BRIDGE No.: 06-0107R
APPROVED: X	DATE: X		PROJECT EA: 02-0H920 / PROJECT No. & PHASE: 0215000083

STRUCTURES DESIGN ADVANCE PLANNING STUDY SHEET (ENGLISH) (REVISION 1/11/2019)

DATE PLOTTED => 01-MAY-2019 TIME PLOTTED => 10:36
FILE => 06-0107r-aps-a-gp02.dgn USERNAME => s131147

Attachment D
Cost Estimate

PROJECT
COST ESTIMATE

EA: 02-0H920

Fix 5 Cascade Gateway

EFIS: 02 1500 0083

Type of Estimate : PA&ED

Program Code : 20.XX.075.600 STIP

Project Limits : SHA 5 R14.8/R20.0

Project Description: Widen to Six-Lanes

SUMMARY OF PROJECT COST ESTIMATE

		Current Year Cost
TOTAL ROADWAY COST	**$**	**42,707,696**
TOTAL STRUCTURES COST	**$**	**14,280,000**
SUBTOTAL CONSTRUCTION COST	**$**	**57,000,000**
TOTAL RIGHT OF WAY COST	**$**	**740,000**

Estimate By:	Travis Gurney	**7/10/2020**
		Date
Checked By:	Toby Crawford	**7/10/2020**
		Date

PROJECT COST ESTIMATE SUMMARY

DIST-CO-RTE PM: 02-SHA-5, PM R14.8/R20.0
EA: 02-0H920

ROADWAY ESTIMATE

ITEM NUM	ITEM CODE	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	TOTAL
	070030	LEAD COMPLIANCE PLAN	LS	1	5,000.00	$5,000
	080050	PROGRESS SCHEDULE (CRITICAL PATH METHOD)	LS	1	20,000.00	$20,000
	090105	TIME-RELATED OVERHEAD (LS)	LS	1	2,400,000.00	$2,400,000
	090205	DISPUTE RESOLUTION BOARD ON-SITE MTG	EA	4	6,000.00	$24,000
	090210	HOURLY OFF-SITE DISPUTE-RESOLUTION-BOARD-RELATE	HR	80	200.00	$16,000
	100100	DEVELOP WATER SUPPLY	LS	1	80,000.00	$80,000
	120090	CONSTRUCTION AREA SIGNS	LS	1	50,000.00	$50,000
	120100	TRAFFIC CONTROL SYSTEM	LS	1	830,000.00	$830,000
	120149	TEMPORARY PAVEMENT MARKING (PAINT)	SQFT	500	10.00	$5,000
	120159	TEMPORARY TRAFFIC STRIPE (PAINT)	LF	160,000	0.50	$80,000
	120165	CHANNELIZER (SURFACE MOUNTED)	EA	500	40.00	$20,000
	120300	TEMPORARY PAVEMENT MARKER	EA	3,000	6.00	$18,000
	124000	TEMPORARY PEDESTRIAN ACCESS ROUTE	LS	1	50,000.00	$50,000
	128652	PORTABLE CHANGEABLE MESSAGE SIGN (LS)	LS	1	50,000.00	$50,000
	128653A	PORTABLE SPEED FEEDBACK SIGN	LS	1	40,000.00	$40,000
	129000	TEMPORARY RAILING (TYPE K)	LF	60,000	30.00	$1,800,000
	129091A	ALTERNATIVE TEMPORARY CRASH CUSHION SYSTEM	EA	20	3,000.00	$60,000
	129100	TEMPORARY CRASH CUSHION MODULE	EA	200	250.00	$50,000
	130100	JOB SITE MANAGEMENT	LS	1	100,000.00	$100,000
	130300	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	1	22,000.00	$22,000
	130310	RAIN EVENT ACTION PLAN	EA	50	500.00	$25,000
	130320	STORM WATER SAMPLING AND ANALYSIS DAY	EA	90	500.00	$45,000
	130330	STORM WATER ANNUAL REPORT	EA	2	2,000.00	$4,000
	131201	TEMPORARY CREEK DIVERSION SYSTEM	EA	1	20,000.00	$20,000

130505	MOVE-IN/MOVE-OUT (TEMPORARY EROSION CONTROL)	EA	4	500.00	$2,000
130520	TEMPORARY HYDRAULIC MULCH	SQYD	30,000	0.50	$15,000
130560	TEMPORARY SOIL BINDER	SQYD	30000	1.00	$30,000
130610	TEMPORARY CHECK DAM	LF	1000	8.00	$8,000
130620	TEMPORARY DRAINAGE INLET PROTECTION	EA	40	300.00	$12,000
130640	TEMPORARY FIBER ROLL	LF	2,500	5.00	$12,500
130650	TEMPORARY GRAVEL BAG BERM	LF	2500	12.00	$30,000
130680	TEMPORARY SILT FENCE	LF	500	8.00	$4,000
130710	TEMPORARY CONSTRUCTION ENTRANCE	EA	9	4,000.00	$36,000
130730	STREET SWEEPING	LS	1	94,000.00	$94,000
130900	TEMPORARY CONCRETE WASHOUT	LS	1	50,000.00	$50,000
131103	WATER QUALITY ANNUAL REPORT	EA	2	500.00	$1,000
131104	WATER QUALITY MONITORING REPORT	EA	2	500.00	$1,000
131105	WATER QUALITY SAMPLING AND ANALYSIS DAY	EA	12	1,000.00	$12,000
140003	ASBESTOS COMPLIANCE PLAN	LS	1	5,000.00	$5,000
141120	TREATED WOOD WASTE	LB	150,000	0.25	$37,500
146002	CONTRACTOR-SUPPLIED BIOLOGIST (LS)	LS	1	50,000.00	$50,000
146005A	INVASIVE SPECIES PREVENTION	LS	1	30,000.00	$30,000
146007A	BAT AND BIRD EXCULSION DEVICE	LS	1	100,000.00	$100,000
153121	REMOVE CONCRETE (CY)	CY	100	75.00	$7,500
160110	TEMPORARY HIGH-VISIBILITY FENCE	LF	500	10.00	$5,000
170103	CLEARING AND GRUBBING (LS)	LS	1	100,000.00	$100,000
180106	DUST PALLIATIVE	LS	1	10,000.00	$10,000
190101	ROADWAY EXCAVATION	CY	70,000	33.00	$2,310,000
190185	SHOULDER BACKING	TON	1,500	40.00	$60,000
194001	DITCH EXCAVATION	CY	500	55.00	$27,500
198206	SUBGRADE ENHANCEMENT GEOTEXTILE, CLASS A1	SQYD	121,100	5.00	$605,500
200114	ROCK BLANKET	SQFT	20,900	25.00	$522,500
200002	ROADSIDE CLEARING	LS	1	10000.00	$10,000
200123	CULTIVATION	SQYD	500	3.00	$1,500

202006	SOIL AMENDMENT	CY	6	70.00	$420
202039	SLOW RELEASE FERTILIZER	LB	50	7.00	$350
202038	PACKET FERTILIZER	EA	120	1.00	$120
204035	PLANT (GROUP A)	EA	110	33.00	$3,630
204036	PLANT (GROUP B)	EA	15	120.00	$1,800
204045	SOD	SQYD	500	15.00	$7,500
204096	MAINTAIN EXISTING PLANTED AREAS	LS	1	15000.00	$15,000
204099	PLANT ESTABLISHMENT WORK	LS	1	2,500.00	$2,500
205035	WOOD MULCH	CY	380	45.00	$17,100
206005	EDGING	LF	600	7.00	$4,200
206400	CHECK AND TEST EXISTING IRRIGATION FACILITIES	LS	1	10000.00	$10,000
206402	OPERATE EXISTING IRRIGATION FACILITIES	LS	1	10,000.00	$10,000
206405	REMOVE IRRIGATION FACILITY	LS	1	10440.00	$10,440
206560	CONTROL AND NEUTRAL CONDUCTORS	LS	1	15000.00	$15,000
206562	1" REMOTE CONTROL VALVE	EA	2	585.00	$1,170
206563	1 1/4" REMOTE CONTROL VALVE	EA	3	626.00	$1,878
206564	1 1/2" REMOTE CONTROL VALVE	EA	2	669.00	$1,338
206634	2" WYE STRAINER ASSEMBLY	EA	2	605.00	$1,210
208444	GARDEN ASSEMBLY VALVE	EA	2	297.00	$594
208447	POP-UP SPRINKLER ASSEMBLY (GEAR DRIVEN)	EA	15	192.00	$2,880
208448	RISER SPRINKLER ASSEMBLY	EA	130	35.00	$4,550
208575	2" GATE VALVE	EA	2	433.00	$866
208576	2-1/2" GATE VALVE	EA	2	475.00	$950
208594	3/4" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	1600	5.00	$8,000
208595	1" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	300	6.00	$1,800
208596	1 1/4" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	1600	6.00	$9,600
208597	1 1/2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	500	6.00	$3,000
208598	2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	500	7.00	$3,500
208599	2 1/2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	100	9.00	$900
208602	6" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	80	13.00	$1,040

208603	8" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	60	22.00	$1,320
208738	8" CORRUGATED HIGH DENSITY POLYETHYLENE PIPE CO	LF	60	65.00	$3,900
210300	HYDROMULCH	SQFT	270,000	0.15	$40,500
210301A	HYDROMULCH (FRM)	SQFT	270,000	0.15	$40,500
210430	HYDROSEED	SQFT	270,000	0.20	$54,000
210431A	HYDROSEED (HBGM)	SQFT	270,000	0.25	$67,500
210610	COMPOST (CY)	CY	2,500	40.00	$100,000
210630	INCORPORATE MATERIALS	SQFT	270,000	0.15	$40,500
220101	FINISHING ROADWAY	LS	1	100,000.00	$100,000
260203	CLASS 2 AGGREGATE BASE (CY)	CY	73,505	36.00	$2,646,180
390021A	FULL WIDTH SEGMENT CORRECTION	EA	25	3,500.00	$87,500
390025A	PARTIAL WIDTH SEGMENT CORRECTION	EA	15	2,500.00	$37,500
390095	REPLACE ASPHALT CONCRETE SURFACING	CY	500	400.00	$200,000
390132	HOT MIX ASPHALT (TYPE A)	TON	41,100	79.00	$3,246,900
390137	RUBBERIZED HOT MIX ASPHALT (GAP GRADED)	TON	17000	110.00	$1,870,000
390401	HOT MIX ASPHALT-OPEN GRADED (OPEN GRADED FRICTION COURSE)	TON	1,600	131.00	$209,600
390402	RUBBERIZED HOT MIX ASPHALT-OPEN GRADED (OPEN GRADED FRICTION COURSE)	TON	23,100	98.00	$2,263,800
394060	DATA CORE	LS	1	12,500.00	$12,500
394074	PLACE HOT MIX ASPHALT DIKE (TYPE C)	LF	1620	3.00	$4,860
394076	PLACE HOT MIX ASPHALT DIKE (TYPE E)	LF	4200	3.00	$12,600
394077	PLACE HOT MIX ASPHALT DIKE (TYPE F)	LF	13600	3.00	$40,800
394090	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	SQYD	40	90.00	$3,600
397005	TACK COAT	TON	300	600.00	$180,000
398100	REMOVE ASPHALT CONCRETE DIKE	LF	3000	5.00	$15,000
398200	COLD PLANE ASPHALT CONCRETE PAVEMENT	SQYD	200000	5.00	$1,000,000
498052	60" CAST-IN-DRILLED-HOLE CONCRETE PILE (SIGN FOUNDATION)	LF	300	1,200.00	$360,000
510092F	STRUCTURAL CONCRETE, HEADWALL	CY	50	1,300.00	$65,000
510094F	STRUCTURAL CONCRETE, DRAINAGE INLET	CY	300	2,200.00	$660,000
510502F	MINOR CONCRETE (MINOR STRUCTURE)	CY	30	3,500.00	$105,000

520104AF	BAR REINFORCING STEEL (HEADWALL)	LB	10,000	2.00	$20,000
560203F	FURNISH SIGN STRUCTURE (BRIDGE MOUNTED WITH WALKWAY)	LB	4,654	8.00	$37,232
560204F	INSTALL SIGN STRUCTURE (BRIDGE MOUNTED WITH WALKWAY)	LB	4,654	4.00	$18,616
560208F	FURNISH SIGN STRUCTURE (TUBULAR)	LB	150,000	6.00	$900,000
560209F	INSTALL SIGN STRUCTURE (TUBULAR)	LB	150,000	0.50	$75,000
560218F	FURNISH SIGN STRUCTURE (TRUSS)	LB	25,000	5.00	$125,000
560219F	INSTALL SIGN STRUCTURE (TRUSS)	LB	25,000	0.30	$7,500
568046	REMOVE SIGN STRUCTURE (EA)	EA	1	10,450.00	$10,450
641126A	36" PERFORATED PLASTIC PIPE	LF	100	109.00	$10,900
641132A	48" PERFORATED PLASTIC PIPE	LF	290	120.00	$34,800
641133A	60" PERFORATED PLASTIC PIPE	LF	120	172.00	$20,640
650014	18" REINFORCED CONCRETE PIPE	LF	1,500	160.00	$240,000
650018	24" REINFORCED CONCRETE PIPE	LF	1,500	170.00	$255,000
665100A	18" POLYMERIC SHEET COATED CORRUGATED STEEL PIPE (.109" THICK)	LF	120	175.00	$21,000
665101A	24" POLYMERIC SHEET COATED CORRUGATED STEEL PIPE (.138" THICK)	LF	230	180.00	$41,400
682050A	CLASS 6 PERMEABLE MATERIAL	CY	4,000	40.00	$160,000
682051A	CLASS D FILTER FABRIC	SQYD	12,000	1.00	$12,000
690119A	18" POLYMERIC SHEET COATED CORRUGATED STEEL PIPE DOWNDRAIN (.109" THICK)	LF	120	160.00	$19,200
690126A	24" POLYMERIC SHEET COATED CORRUGATED STEEL PIPE DOWNDRAIN (.138" THICK)	LF	200	240.00	$48,000
691900	FLUME DOWNDRAIN	LF	360	50.00	$18,000
692101	TAPERED INLET	EA	10	150.00	$1,500
692301	ANCHOR ASSEMBLY	EA	22	730.00	$16,060
692361	FLUME ANCHOR ASSEMBLY	EA	40	400.00	$16,000
700617	DRAINAGE INLET MARKER	EA	5	75.00	$375
703233	GRATED LINE DRAIN	LF	80	400.00	$32,000
705206	24" CONCRETE FLARED END SECTION	EA	4	1,000.00	$4,000

707117	36" PRECAST CONCRETE PIPE INLET	LF	60	1,600.00	$96,000
710102	ABANDON CULVERT (LF)	LF	1,000	50.00	$50,000
710110	ABANDON INLET	EA	2	1,000.00	$2,000
710132	REMOVE CULVERT (LF)	LF	380	120.00	$45,600
710138	REMOVE DOWNDRAIN (EA)	EA	50	3,000.00	$150,000
710150	REMOVE INLET	EA	25	1,800.00	$45,000
710167	REMOVE FLARED END SECTION (EA)	EA	4	700.00	$2,800
710196	ADJUST INLET	EA	5	1,500.00	$7,500
710212	ADJUST MANHOLE TO GRADE	EA	2	3,500.00	$7,000
710370	SAND BACKFILL	CY	300	75.00	$22,500
723080	ROCK SLOPE PROTECTION (60 LB, CLASS II, METHOD B) (CY)	CY	40	160.00	$6,400
723040	ROCK SLOPE PROTECTION (3/8 T, CLASS VI, METHOD B) (CY)	CY	50	220.00	$11,000
729011	ROCK SLOPE PROTECTION FABRIC (CLASS 8)	SQYD	50	2.00	$100
731504	MINOR CONCRETE (CURB AND GUTTER)	CY	25	1,000.00	$25,000
731521	MINOR CONCRETE (SIDEWALK)	CY	50	1,000.00	$50,000
750001 F	MISCELLANEOUS IRON AND STEEL	LB	60,000	2.00	$120,000
810120	REMOVE PAVEMENT MARKER	EA	1500	3.00	$4,500
810170	DELINEATOR (CLASS 1)	EA	400	60.00	$24,000
810230	PAVEMENT MARKER (RETROREFLECTIVE)	EA	4800	6.00	$28,800
820110	MILEPOST MARKER	EA	16	80.00	$1,280
820112	MARKER (CULVERT)	EA	50	80.00	$4,000
820113A	CULVERT MARKER (BARRIER MOUNTED)	EA	20	50.00	$1,000
820132	OBJECT MARKER (TYPE L)	EA	10	50.00	$500
820220	REMOVE MARKER	EA	90	10.00	$900
820270	REMOVE ROADSIDE SIGN (WOOD POST)	EA	40	150.00	$6,000
820280	REMOVE ROADSIDE SIGN (METAL POST)	EA	20	150.00	$3,000
820750	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-UNFRAMED)	SQFT	100	10.00	$1,000
820780	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-FRAMED)	SQFT	44	30.00	$1,320

820840	ROADSIDE SIGN - ONE POST	EA	40	300.00	$12,000
820850	ROADSIDE SIGN - TWO POST	EA	10	1,000.00	$10,000
820710	FURNISH LAMINATED PANEL SIGN (1"-TYPE A)	SQFT	2780	25.00	$69,500
820720	FURNISH LAMINATED PANEL SIGN (1"-TYPE B)	SQFT	710	25.00	$17,750
820730	FURNISH LAMINATED PANEL SIGN (21/2"-TYPE B)	SQFT	380	28.00	$10,640
820750	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-UNFRAMED)	SQFT	190	6.00	$1,140
820760	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-UNFRAMED)	SQFT	560	7.00	$3,920
820780	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-FRAMED)	SQFT	27	13.00	$351
820790	FURNISH SINGLE SHEET ALUMINUM SIGN (0.080"-FRAMED)	SQFT	460	14.00	$6,440
832006	MIDWEST GUARDRAIL SYSTEM (STEEL POST)	LF	13,000	35.00	$455,000
832070	VEGETATION CONTROL (MINOR CONCRETE)	SQYD	5,400	40.00	$216,000
839791A	SALVAGE HIGH TENSION CABLE BARRIER (3-STRAND)	LF	4000	4.00	$16,000
839792A	SALVAGE HIGH TENSION CABLE BARRIER (3-STRAND) TERMINAL SYSTEM	EA	4	1,000.00	$4,000
839793A	HIGH TENSION CABLE BARRIER (4-STRAND)	LF	6,500	30.00	$195,000
839794A	HIGH TENSION CABLE BARRIER (4-STRAND) TERMINAL SYSTEM	EA	6	4,000.00	$24,000
839543	TRANSITION RAILING (TYPE WB-31)	EA	16	4,000.00	$64,000
839576	END CAP (TYPE A)	EA	4	300.00	$1,200
839581	END ANCHOR ASSEMBLY (TYPE SFT)	EA	14	800.00	$11,200
839584	ALTERNATIVE IN-LINE TERMINAL SYSTEM	EA	28	3,500.00	$98,000
839586A	ALTERNATIVE MEDIAN TERMINAL SYSTEM	EA	1	5,000.00	$5,000
839722A	CONCRETE BARRIER (TYPE 60MC MOD)	LF	1,600	400.00	$640,000
839685	CONCRETE BARRIER (TYPE 60M MOD)	LF	12500	90.00	$1,125,000
839724A	CONCRETE BARRIER (TYPE 60MF MOD)	LF	100	260.00	$26,000
839752	REMOVE GUARDRAIL	LF	15000	5.00	$75,000
839774	REMOVE CONCRETE BARRIER	LF	6100	70.00	$427,000
839729A	RECONSTRUCT CONCRETE ANCHOR BLOCK	EA	4	2,500.00	$10,000

840501	THERMOPLASTIC TRAFFIC STRIPE	LF	3000	2.00	$6,000
840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	180	10.00	$1,800
840516	THERMOPLASTIC PAVEMENT MARKING (ENHANCED WET NIGHT VISIBILITY)	SQFT	180	11.00	$1,980
840623	6" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NI	LF	92000	1.50	$138,000
846007	6" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NI	LF	92,000	1.00	$92,000
846010	8" THERMOPLASTIC TRAFFIC STRIPE (ENHANCED WET NI	LF	2200	2.00	$4,400
846030	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	75,000	1.00	$75,000
846035	REMOVE THERMOPLASTIC PAVEMENT MARKING	SQFT	440	10.00	$4,400
846051	12" RUMBLE STRIP (ASHALT CONCRETE PAVEMENT)	STA	920	60.00	$55,200
870009	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	1	25,000.00	$25,000
870500A	CLOSED CIRCUIT TELEVISION SYSTEM	LS	1	100,000.00	$100,000
872130	MODIFYING EXISTING ELECTRICAL SYSTEM	LS	1	1,600,000.00	$1,600,000
870200	LIGHTING SYSTEM	LS	1	175,000.00	$175,000
999990	MOBILIZATION 10.0%	LS	1	4,100,000.00	$4,100,000
		ROADWAY SUBTOTAL			**$36,378,690**

SUPPLEMENTAL WORK

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
066015	FEDERAL TRAINEE PROGRAM	LS	1	28,800.00	$28,800
066070	MAINTAIN TRAFFIC	LS	1	45,000.00	$45,000
066094	VALUE ANALYSIS	LS	1	9,600.00	$9,600
066393	HOT MIX ASPHALT SMOOTHNESS INCENTIVE	LS	1	40,000.00	$40,000
066595	WATER POLLUTION CONTROL MAINTENANCE SHARING	LS	1	23,300.00	$23,300
066596	ADDITIONAL WATER POLLUTION CONTROL	LS	1	6,000.00	$6,000
066597	STORM WATER SAMPLING AND ANALYSIS	LS	1	6,000.00	$6,000
066610	PARTNERING	LS	1	90,000.00	$90,000
066670	PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS	LS	1	1,600,000.00	$1,600,000
		SW SUBTOTAL			**$1,848,700**

STATE FURNISHED MATERIALS AND EXPENSES

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
066062	COZEEP CONTRACT	LS	1	257,000.00	$257,000
066063	TRAFFIC MANAGEMENT PLAN - PUBLIC INFORMATION	LS	1	50,000.00	$50,000
066105	RESIDENT ENGINEERS OFFICE	LS	1	240,000.00	$240,000
066854A	ELECTRONICS AND COMMUNICATION EQUIPMENT	LS	1	20,000.00	$20,000
066857A	BATTERY BACKUP SYSTEM	LS	1	10,000.00	$10,000
066858A	FIBER OPTIC DISTRIBUTION UNIT	LS	1	2,500.00	$2,500
066871	ELECTRICAL SERVICE CONNECTIONS	LS	1	7,000.00	$7,000
066909A	TELEPHONE SERVICE CONNECTIONS	LS	1	2,000.00	$2,000
066915	BOE TREATED WOOD WASTE GENERATION FEE	LS	1	5,000.00	$5,000
066916	ANNUAL CONSTRUCTION GENERAL PERMIT FEE	LS	1	4,288.00	$4,288

SF SUBTOTAL		$597,788
PROJECT SUBTOTAL		$38,825,178
CONTINGENCIES	10%	$3,882,518
TOTAL ROADWAY COST=		**$42,707,696**

STRUCTURES ESTIMATE

44 SEPARATION	$2,580,000
44 CONNECTOR	$2,390,000
299 SEPARATION	$4,720,000
TWIN VIEW OC	$3,040,000
CHURN CREEK BRIDGE	$1,550,000
MOBLIZATION/CONTENGENCY 25% - INCLUDED	$0

TOTAL STRUCTURE COST =	**$14,280,000**

PROJECT TOTAL =	**$56,987,696**

Attachment E
Environmental Document

Fix 5 Cascade Gateway

Shasta County, CA
02–SHA–5–PM R14.8/R20.0
EA 02-0H920
EFIS 0215000083

Initial Study with Mitigated Negative Declaration

Prepared by the
State of California, Department of Transportation

July 10, 2020

SCH No. 2020029051
02-SHA-5-PM R14.8/R20.0
EA 02-0H920
EFIS 0215000083

Fix 5 Cascade Gateway

Initial Study with Mitigated Negative Declaration

Submitted Pursuant to: (State) Division 13, California Public Resources Code

STATE OF CALIFORNIA
Department of Transportation

SCH No. 2020029051
02-SHA-5-PM R14.8/R20.0
EA 02-0H920
EFIS 0215000083

MITIGATED NEGATIVE DECLARATION

Pursuant to: Division 13, Public Resources Code

Project Description

The California Department of Transportation (Caltrans) proposes to reconstruct and widen mainline Interstate 5 (I-5) from 4 lanes to 6 lanes from post miles (PM) R14.8 to R20.0 in Shasta County, including widening to the median with 12 feet lanes and 10 feet inside shoulders and the following structures: East Redding (5/44) Separation (06-0126L), N5W44 Connector Undercrossing (UC) (06-0127L), Route 5/299 Separation (06-01239 L&R), Twin View Blvd UC (06-0143 L&R), and Churn Creek bridge (06-0107).

Determination

Caltrans has prepared an Initial Study for this project, and following public review, has determined that the proposed project would not have a significant effect on the environment for the following reasons:

The proposed project would have no effect on agriculture and forest resources, cultural resources, Tribal cultural resources, land use and planning, mineral resources, population and housing, and recreation.

The proposed project would have less than significant impacts on aesthetics, air quality, energy, geology and soils, hazards and hazardous materials, hydrology and water quality, greenhouse gas emissions, noise, transportation, public services, utilities and service systems, wildfire, and mandatory findings of significance.

With incorporated mitigation measures to mitigate for impacts to the movement of native resident wildlife species within migratory wildlife corridors, the project would not have significant impacts to biological resources

Individual impacts would not have a cumulatively significant impact on the environment.

Approved By: Wesley Stroud Date: 7/16/20

Wesley Stroud, Office Chief
North Region Office of Environmental Management
California Department of Transportation
(530) 225-3510

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List of Abbreviated Terms

AB	Assembly Bill
ARB	(California) Air Resources Board
BAU	Business-as-usual
BMPs	Best management practices
CAFE	Corporate Average Fuel Economy
Caltrans	California Department of Transportation
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	Methane
CNDDB	California National Diversity Database
CO_2	Carbon dioxide
CO	Carbon monoxide
CO-CAT	Coastal and Ocean Working Group of the California Climate Action Team
CTP	California Transportation Plan
CVRWQCB	Central Valley Regional Water Quality Control Board
DOT	Department of Transportation
EO	Executive Order
EPACT92	Energy Policy Act of 1992
ESA	Environmentally sensitive area
FCAA	Federal Clean Air Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
GHG	Greenhouse gas
HFC-134a	1,1,1,2-tetrafluoroethane
HFC-152a	Difluoroethane
HFC-23	Fluoroform
H_2S	Hydrogen sulfide
IPCC	Intergovernmental Panel on Climate Change
LCFS	Low Carbon Fuel Standard
$MMTCO_2e$	Metric tons of carbon dioxide
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
NOAA	National Oceanic and Atmospheric Administration
NO_x	Nitrogen oxides
N_2O	Nitrous oxide
OPR	Office of Planning Research
OSTP	Office of Science and Technology Policy
O_3	Ozone
Pb	Lead
PPM	Parts per million
PM	Post mile or particulate matter (air quality)
ROG	Reactive organic gas
RTP	Regional Transportation Plan

SB	Senate Bill
SCS	Sustainable Communities Strategy
SF_6	Sulfur hexafluoride
SIP	State Implementation Plan
SLR	Sea-level rise
SO_2	Sulfur dioxide
SO_x	Sulfur oxides
SR	State Route
TCAPCD	Tehama County Air Pollution Control District
USDOT	United States Department of Transportation
U.S. EPA	United States Environmental protection Agency
VOCs	Volatile organic compounds
VMT	Vehicle miles traveled

Chapter 1. Proposed Project

Project Title
Fix 5 Cascade Gateway

Lead Agency Name and Address
California Department of Transportation, District 2
Office of Environmental Management, MS-30
1657 Riverside Drive
Redding, CA 96001

Contact Person and Phone Number
Carolyn Sullivan
Caltrans Environmental Branch Chief, R2
Phone: (530) 225-2928
Email: carolyn.sullivan@dot.ca.gov

Project Location
The proposed project is located on Interstate 5 (I-5) Shasta County from PM R14.8 to R20.0. The project is approximately 5.2 miles in Northern Redding. The project is on the United States Geological Survey's Enterprise and Project City 7.5-minute quadrangles. A project location map showing work locations and associated post miles is provided in Figure 1.

Purpose and Need

The purpose of the proposed project is to improve operations on I-5 by reducing merging conflicts and congestion, upgrading signing and lighting consistent with adjacent segments of the corridor, and providing new ITS elements; to improve safety and reduce collision concentrations; to improve this primary evacuation route for high fire severity zones; to reduce adverse impacts of closures during winter storms; enhance reliability of interstate and interregional goods movement; and improve the pavement thus providing higher quality rideability, reducing maintenance efforts, and minimizing Field Maintenance exposure to traffic.

The need for the proposed project is that the existing facility has aged beyond its design life and no longer adequately meets transportation demands within the project limits. The existing pavement is in need of preservation. The existing lighting, signing and median barrier are non-standard and should be brought to current standards. Additional Intelligent Transportation System (ITS) elements are needed to improve freeway operations during emergency events. The mainline flow of traffic is degraded by an increase in merging trucks and other vehicles at several close consecutive ramps. Recent fires and winter storms developed long backups, delays, and major detours through and around the project area, demonstrating the current lack of system resiliency. This four-lane section of freeway is the only bottleneck on I-5 in Shasta County from the Tehama County line to Shasta Lake City, restricting freeway operations and interregional goods movement. These factors reduce the operational effectiveness and safety of the facility.

Project Description (Build Alternative)

This alternative proposes to add a third mixed-flow through lane. Features on mainline I-5 include:

- A 6-lane freeway with 3-through lanes in the northbound (NB) and southbound (SB) directions with 10-ft. inside and outside shoulders;
    - SB widen in the median PM R15.4/R18.6
    - NB widen in the median PM R16.5/R18.6
    - NB widen to the outside PM R18.6/R19.2
- Four auxiliary lanes would be constructed.
    - SB widen in the median PM 15.8/R17.0, from I-5/SR WB 44 off-ramp, terminating at the I-5/SR 299 on-ramp
    - NB widen in the median, while utilizing existing pavement and re-configuring existing pavement delineation PM R15.5/R17.0, from I-5/SR WB 44 on-ramp terminating, at the I-5/SR 299 off-ramp
    - SB reconstruct median paving, relocation and upgrade existing concrete barrier approximately 5-ft to the east, while utilizing existing pavement and re-configuring existing pavement delineation PM 18.7/R19.4, from I-5/SR SB 273 off-ramp, terminating at the Oasis on-ramp
    - NB reconstruct median paving, while utilizing existing pavement and re-configuring existing pavement delineation PM R18.7/R19.3, from I-5/SR NB 273 on-ramp, terminating at the Oasis off-ramp
- Seven bridges would be widened, including 6 requiring 3/4” minimum polyester concrete overlay.
    - six bridges would be widened in the median including the polyester overlay on the existing structures.
    - One bridge would be widened on the outside and does not require the polyester overlay across the existing structure.
- Replace ground signage with overhead and on-pavement signage near the Route 299 West/Route 44 Interchange;
- Pavement edge-to-edge overlay of open graded rubber asphalt surface course;
- Replace/repair or install culverts and drainage retention/detention facilities;
- Install a cable barrier in unpaved depressed areas where the median width is greater than 36 foot;
- Install a concrete barrier in the paved median sections when the median width is 36-ft or less;
- Existing guardrail and end treatments would be removed and replaced with new Midwest Guardrail System (MGS) railing, including WB31 transitions and TL-2 terminals; and
- Add traffic controls and ITS elements, including census loops on ramps, traffic monitoring stations, and the installation of new fiber optic lines would be replaced or added for enhanced traffic management.

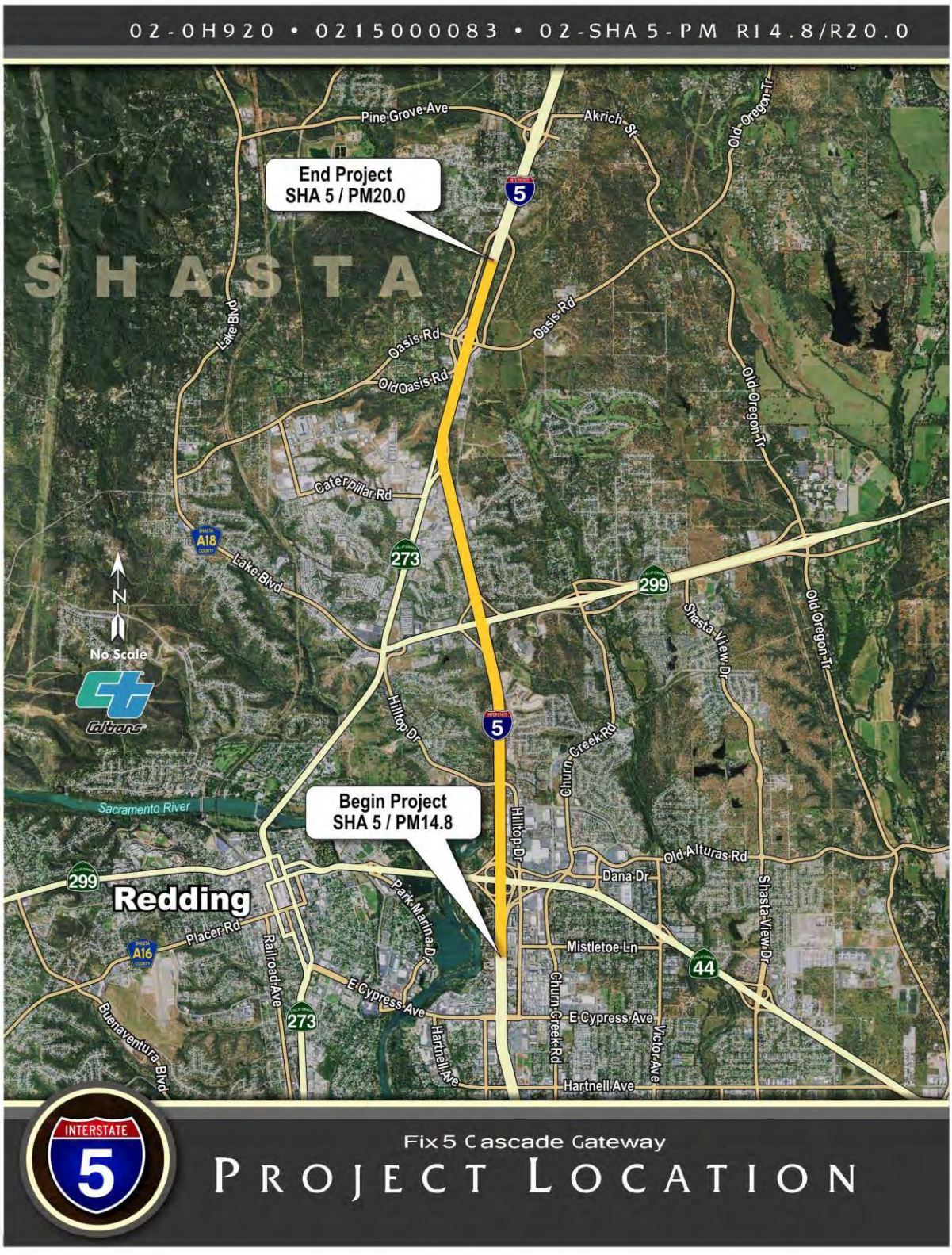

Figure 1. Project Location

Construction Access
The work would be accessed from mainline I-5, interchange ramps, or local streets. Temporary access would be necessary for work conducted east of Churn Creek Bridge. Improvements (e.g., excavation and grading) on these access roads and trails would be needed before and after work.

In-Water Work
Work within Churn Creek would take place June 1 to October 15, during the dry/low flow season. In-water work includes activities to construct the bridge widening such as removal of vegetation, construction of temporary access roads, placement of temporary crossing, and gravel work pad.

Disposal/Borrow Sites
No borrow sites would be utilized on this project.

Approximately 70,000 cubic yards of asphalt grindings and other materials would be generated from roadway excavation. Grindings and other construction debris would become property of the contractor. Some excavated materials may be reused onsite as embankment and/or disposed of at an optional disposal site located at one of the Shasta County Road Department's disposal yards; the actual location is still to be determined.

Staging/Stockpiling
Staging/stockpiling of materials and equipment would occur in the median of I-5 within the project limits.

Right-of-Way
Most of the proposed work would be conducted within Caltrans' existing right-of-way. No right-of-way would be permanently acquired. No work would occur on federal lands.

Utilities
Existing utilities within the project limits would be identified and positively located as outlined in the Caltrans' utility policy. At the Twin View Boulevard UC and the Churn Creek Br there are utilities in potential conflict including a 4" gas line, 8" water line and 18" sewer line. Any utilities that come in conflict with the proposed improvements would be relocated prior to construction. Several existing utilities cross the roadway where construction activities are expected, however no conflicts are anticipated and a construction method of protecting the existing utilities in place would be pursued.

Drainage
The proposed 10-foot, inside shoulder would be sloped toward the median for most of the project limits. The inside lane (closest to the median) would be sloped towards the median from PM R15.6 to R16.8. The inside lane would be sloped towards the outside, in-plane with the existing lanes, from PM R15.4 to R15.6 and R16.8 to R18.6. This would conform to the existing six-lane facilities adjacent to the project's median widening. The existing median drainage would be adjusted, replaced, or expanded as needed. Median inlets attached to cross-culverts would be maintained or adjusted to perpetuate the existing connectivity. Additional drainage facilities would be added to meet drainage needs. Culverts within the project limits could be repaired or replaced as needed.

Detention basins, infiltration trenches, and underground detention vaults would be utilized as necessary to retain peak flows during storm events. Stormwater from the additional impervious area out-letting from the R/W, when required, would l be metered to maintain pre-construction out-flows.

Stormwater

Treatment BMPs would be used within the project limits when feasible. It is anticipated BMPs would include utilization of existing and proposed bio-strips, bio-swales, detention basins, and infiltration basins. Alternative Compliance credits established during the development and construction of the Redding to Anderson 6-Lane (RASL) Project would be used as additional treatment BMP credit (subject to RWQCB concurrence).

Plantings

Disturbed slopes in the median and new embankment slopes would be stabilized in accordance with erosion control plans. Gore areas at interchanges would have a contrast treatment applied between the ramps and mainline. Additional roadway planting and irrigation would be required to adjust, modify, or replace any highway planting disturbed during construction, which is anticipated in the gore area and near the northbound Oasis Off-Ramp.

Stage Construction

Two construction stages are anticipated for mainline I-5. The stage one work would consist of rebuilding the outside shoulder and modifying the shoulder cross slope to accommodate temporary traffic as needed. Stage 2 would require placing temporary railing (Type K) 2-ft inside the existing median edge of travelled way (ETW), shifting both lanes of traffic 6-ft to the outside and using the existing outside shoulder to accommodate the temporary second lane for the duration of construction.

Construction staging for the Twin View UC and Route (5/299) Separation requires multiple stages, detouring and coordination with the traffic operations requirement for the City of Redding. Bridge construction would be staged to avoid daytime lane closure on Twin View and Lake Blvd. New bridge column construction would require closure of sidewalks. Construction sequencing would allow continuous pedestrian and bicycle detours throughout the construction phase. Twin View and Lake Blvd would require full closure in both directions for short, 6-hr night-time windows to place the new bridge girders.

Construction staging for NB I-5 to WB SR 44 Connector UC requires multiple stages and detouring. Bridge construction would be staged to allow at least one lane of the 44 Connector traffic to be in operation during daytime hours. Construction sequencing would allow continuous pedestrian and bicycle detours throughout the construction phase, except for intermittent night time closures for placement of girders. The WB 44 Connector would be closed and would utilize a detour to place the new bridge girders.

Construction staging for the East Redding (5/44) Separation requires multiple stages and detouring. Bridge construction would be staged to maintain the existing roadway lanes and ramps however would require reconfiguring the ramps and lanes while reducing the width of the existing shoulders to provide space for the construction activities during daytime hours, the construction area would be shielded by K-rail. Closures of lanes, ramps or the entire SR-44 using detours at night during certain construction activities is anticipated.

Construction staging for the Churn Creek bridge requires one stage which shifts traffic towards the median and placing k-rail on the existing outside shoulder to shield the work area. During certain construction operations a lane or ramp closure would be required.

Schedule

The entire project is scheduled as a two-season project, anticipated to take place between April 2026 and October 2027. Construction would span approximately 240 working days. The bridge widening is scheduled as a one-season project, anticipated to take place between April and October of 2026. Construction would last approximately 7 calendar months and span approximately 150 working days.

Project Alternatives

The Project Study Report (PSR) dated February 2017 identified two alternatives: A build alternative (Alternative 2 – widen to the outside) and a No-build alternative. During the preliminary design phase preceding the Draft Project Report, a third alternative was developed.

Alternative 1 (Preferred Alternative) adds an additional lane and shoulder in both directions using a combination of inside (to the median) and outside widening.

Alternative 2 (From PSR) added an additional lane and shoulder on I-5 in both directions. The concept of this alternative was to widen primarily to the outside on the south end of the project limits. A Value Analysis (VA) study conducted in December 2019 evaluated each of the three alternatives. The VA team concluded that widening to the median provided the best assured value for the project. During the preliminary design phase Alternative 2 was found unfeasible for the following reasons:

- Widening to the outside near the 44 Interchange would require reconfiguration of both the Southbound I-5 to Eastbound 44 connector ramp and the Westbound 44 to Southbound 5 connector ramp. This reconfiguration would generate extensive work and require several non-standard geometric features.
- Widening to the outside North of the 44 Interchange would negatively affect the environmentally sensitive park and trail area west of I-5, which is protected through the U.S. Department of Transportation Act of 1966 Section 4(F).
- Widening to the outside would generally not allow a consistent transition when conforming to the existing mainline configuration, forcing a non-desirable shift prior to conforming into the existing roadway.

Alternative 3 (No Build) proposes no improvements to I-5, other than routine maintenance over the design life. Without the proposed improvements, assets in fair to poor condition would continue to deteriorate. Traffic operation would not improve and there would not be a reduction in merging conflicts and congestion. There would be no improvement in resiliency during emergency events. This alternative does not meet the need and purpose of the project.

Permits and Approvals Needed

Work would require permits from the California Department of Fish and Wildlife, Army Corps of Engineers, and the Central Valley Regional Water Quality Control Board (CVRWQCB). In addition, a Notice of Intent would need to be filed with the State Water Resources Control Board to obtain coverage under the NPDES General Construction Permit (the permit regulates the discharge of storm water runoff from construction sites). Permits required for the project are summarized in Table 1.

Table 1. Permit and Approvals

Agency/Landowner	Permit Type
CDFW	Lake or Streambed Alteration Agreement
CVRWQCB	Clean Water Act Section 401 Water Quality Certification
NOAA Fisheries	Letter of Concurrence – Informal Section 7 Consultation
State Water Resources Control Board	A Notice of Intent would be filed to obtain coverage under the NPDES General Construction Permit. Because more than one acre of ground disturbance would occur, a Storm Water Pollution Prevention Plan (SWPPP) would need to be prepared in accordance with Caltrans standard specifications for water pollution control (California Department of Transportation 2018).
US Army Corps of Engineers	Nationwide Permit 14 (linear transportation projects)

Chapter 2. CEQA Environmental Checklist

This checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects would indicate that there are no impacts to a particular resource. A NO IMPACT answer in the last column reflects this determination. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

See Section 3.1: Aesthetics

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

a) Land adjacent to I-5 is classified as Otherland and Urban and Built-Up Land (California Department of Conservation 2020a). The project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use. Therefore, there would be no impact.

b) No properties within the project limits are enrolled in a Williamson Act contract (California Department of Conservation 2020b). Therefore, the would be no impact.

c) No forest land or timberland is present within the project limits. As such, the project would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)). Therefore, there would be no impact.

d) No forest land is present within the project limits. The project would not result in the loss of forest land or convert forest land to non-forest use. Therefore, there would be no impact.

e) The project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use. Therefore, there would be no impact.

Given the above findings, the proposed project would have no impact on agriculture and forest resources.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

See Section 3.2: Air Quality

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, or NOAA Fisheries?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

See Section 3.3: Biological Resources

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☐	☒

a - c) The cultural resources study included a pre-field record search with the California Historical Resources Information System and the Caltrans Cultural Resource Database, Native American consultation, and archaeological fieldwork of the project area. This cultural resource study was conducted to satisfy requirements of the National Environmental Policy Act (NEPA) of 1969, Section 106 of the National Historic Preservation Act of 1966 (36 CFR 800, as amended in 1992), and the California Environmental Quality Act (CEQA) of 1970. More specifically, its purpose was to identify and evaluate historic properties found within the Area of Potential Effects (APE) and to assess effects to the properties that may result from the proposed project.

No archaeological resources were noted within or adjacent to the project area (California Department of Transportation 2020a). The existing bridges were evaluated as part of the 2014 Bridge Survey and all structures meet the criteria of a Category 5 structure and is not eligible for the National Register of Historic Places. The Native American Heritage Commission was contacted and provided a list of interested individuals and tribes. Listed tribes were contacted and the Cultural Resources Director of the Wintu Tribe of Northern requested additional information about the project. She would also like to be consulted, review the Cultural Report, and requested the possibility of a monitor during construction.

If previously unidentified cultural resources are encountered during construction, i.e., “late discoveries,” it is Caltrans’ policy that work in that area must stop immediately and not resume until a qualified archaeologist can assess the finds and determine an appropriate course of action in consultation with the State Historic Preservation Officer (Environmental Handbook 2006, Vol. 2, Chapter 2-4.4).

No indicators of human remains were observed within the project limits. If human remains are identified during construction, they would be treated in accordance with the requirements of California Health and Safety Code section 7050.5 and Public Resources Code section 5097.98. If, pursuant to §7050.5(c) of the California Health and Safety Code, the county coroner/medical examiner determines that the human remains are or may be of Native American origin, then the discovery shall be treated in accordance with the provisions of §5097.98 (a)-(d) of the California Public Resources Code. Caltrans shall ensure that, to the extent permitted by applicable law and regulation, the views of the Tribes and the Most Likely Descendent(s) are taken into consideration when decisions are made about the sensitive and dignified treatment and disposition of the Native American human remains and associated burial items. It is the intent of Caltrans that human remains would not be unnecessarily disturbed and would not be disinterred unless necessary to protect them from damage or destruction. Tribal consultation is ongoing throughout all phases of the project.

Given the above findings, the proposed project would have no impact on cultural resources.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VI. ENERGY: Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

See section 3.4 Energy.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VII. GEOLOGY AND SOILS: Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

See Section 3.5: Geology and Soils

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VIII. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

See Section 3.6: Greenhouse Gas Emissions

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IX. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

See Section 3.7: Hazards and Hazardous Materials

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
X. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
(i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
(iv) impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

See Section 3.8: Hydrology and Water Quality

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XI. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

a) The proposed project is in the City of Redding on I-5 the major North-South travel corridor in the State. The proposed project is within the *City of Redding General Plan 2000-2020* (City of Redding 2000). Land use in the project vicinity varies but is primarily single and multiple family homes. Other land use consists of commercial, industrial, office, open space, and public. Because there is an existing travel corridor, construction of the project would not physically divide an established community. Therefore, there would be no impact.

b) The proposed project would not affect existing and/or future land uses nor would the project cause a significant environmental impact due to a conflict with any applicable land use plan, policy, and/or regulation adopted for avoiding or mitigating an environmental effect. Therefore, there would be no impact.

Given the above findings, the proposed project would have no impact on land use and planning.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XII. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

a-b) No mineral resources occur within the project limits nor would any be affected by the proposed project. Therefore, there would be no impact.

Given the above findings, the proposed project would have no impact on mineral resources.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIII. NOISE: Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

See Section 3.9: Noise

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIV. POPULATION AND HOUSING: Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

a) The proposed project would not induce population growth, either directly or indirectly. The project adds lanes in a segment where there is a gap between three lane segments to the north and south. Therefore, there would be no impact.

b) The proposed project would not displace any existing housing or people, necessitating the construction of replacement housing elsewhere. Therefore, there would be no impact.

Given the above findings, the proposed project would have no impact on population and housing.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact

XV. PUBLIC SERVICES:

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

a) Existing traffic has two lanes in both directions. Impacts to schools, parks and other public facilities would be negligible. However, limited periods during construction may require traffic be limited to one lane, in each direction or one direction. Some construction activities may need roadway closure to be conducted. These limited closures and lane reductions would mostly come at night, but fire and police response times could be delayed because of these closures.

Given the above findings, the proposed project would have less than significant impacts to public services.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVI. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

a-b) The proposed project would not increase the use of existing parks or other recreational facilities. In addition, the proposed project does not include recreational facilities or require the construction and/or expansion of recreational facilities. Therefore, there would be no impact.

Given the above findings, the proposed project would have no impact on recreation.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVII. TRANSPORTATION: Would the project:				
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☒	☐

See Section 3.10: Transportation

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVIII. TRIBAL CULTURAL RESOURCES: Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

a-b) a-b) Assembly Bill (AB) 52 (Chapter 532, California Statutes of 2014) establishes a formal consultation process for California tribes as part of the CEQA review process and equates significant impacts on "tribal cultural resources" with significant environmental impacts (Public Resources Code 21084.2). Caltrans contacted the following tribes to inform them of the project and request their participation: Winnenem Wintu, Redding Rancheria, and Wintu Tribe of Northern California. Currently, there are no tribal cultural resources that are listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources, or determined to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1 within the project area.

Given the above findings, the proposed project would have no impact on tribal cultural resources.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

See Section 3.11: Utilities and Service Systems

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XX. WILDFIRE: If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

See Section 3.12: Wildfire

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XXI. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Chapter 3. Discussion of Environmental Impacts

3.1 Aesthetics

Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and aesthetically (emphasis added) and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

The California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities" (CA Public Resources Code [PRC] Section 21001[b]).

California Streets and Highways Code Section 92.3 directs Caltrans to use drought resistant landscaping and recycled water when feasible and incorporate native wildflowers and native and climate-appropriate vegetation into the planting design when appropriate.

Affected Environment

The proposed project is in an urban part of Shasta County. Interstate 5 within the project area is not designated as a scenic highway (California Department of Transportation 2011). Within the project area, the most notable potentially scenic resources are Boulder and Churn Creek and adjacent riparian vegetation.

Environmental Consequences

The proposed work would require the removal of vegetated berms within the median of I-5 and widening the Churn Creek Bridge. The current extent of the earth berm is limited, most of the median is a grass or concrete area with a high-tension cable barrier. From that sense the visual impacts of adding another lane is minimal as currently much is gently sloped open area. The addition of the lanes, in areas with the earth berm would increase range-of-view. Currently, traveling with the 6-foot earthen berm, can feel restrictive. Once removed, while vehicles from the opposite direction would be visible, the entire interstate corridor would be visible, potentially reducing the feeling of constriction for small vehicles traveling next to commercial vehicles.

To widen the bridge some vegetation would need to be removed including some cottonwood and honey locust trees. Removal of the vegetated berm and these trees would have a negligible impact on the visual character of the project area because other mature trees and landscaping line the Interstate.

CEQA Determination

The proposed project would not have a substantial adverse effect on any scenic vistas, would not substantially damage scenic resources within a state scenic highway, and would not create a new source of substantial light or glare which would adversely affect day and/or nighttime views in the area. Because the project would only negligibly degrade the existing visual character of the site and its surroundings, the project would have a less than significant impact on aesthetics.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance/minimization measures are included in the project.

3.2 Air Quality

Regulatory Setting

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act (CCAA) is its companion state law. These laws, and related regulations by the United States Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM) —which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), Lead (Pb), and sulfur dioxide (SO_2). In addition, state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel “Conformity” requirement under the FCAA also applies.

Conformity
The conformity requirement is based on FCAA Section 176(c), which prohibits the U.S. Department of Transportation (USDOT) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. “Transportation Conformity” applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 Code of Federal Regulations (CFR) 93 govern the conformity process.

Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not in California), sulfur dioxide (SO_2). California has nonattainment or maintenance areas for all these transportation-related "criteria pollutants" except SO_2 and has a nonattainment area for lead (Pb); however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept and scope and the "open-to-traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and TIP; the project has a design concept and scope[1] that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and EPA-approved emissions models; and in PM areas, the project complies with any control measures in the SIP. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in CO and PM nonattainment or maintenance areas to examine localized air quality impacts.

Affected Environment

The project is in the northern Sacramento Valley. The climate in the project vicinity is Mediterranean, which is characterized by hot summers and wet winters with occasional snowfall. The average annual precipitation recorded at nearby Redding Municipal Airport between 1986 and 2016 is 33.68 inches (Western Regional Climate Center 2019). Wind direction and strength varies seasonally in the project vicinity. In spring, prevailing winds are generally from the northwest. In summer, a weak Delta breeze is occasionally evident as cool air from the Bay Area moves north into the Sacramento Valley. In winter, Pacific storms moving westward across northern California bring strong south winds. Inversion layers, which are common in winter, occur when a layer of warm air overlies a layer of dense cold air and prevents atmospheric mixing. If the trapped cold air contains large quantities of pollutants, air quality can be substantially impaired.

The project is in the Sacramento Valley Air Basin and is within the jurisdiction of the Shasta County Air Quality Management District (SCAQMD) and the California Air Resources Board. The SCAQMD is the primary agency responsible for preparing the Air Quality Management Plan

[1] "Design concept" means the type of facility that is proposed, such as a freeway or arterial highway. "Design scope" refers to those aspects of the project that would clearly affect capacity and thus any regional emissions analysis, such as the number of lanes and the length of the project.

(AQMP) in cooperation with local governments and the private sector. The AQMP provides the framework for meeting state and federal ambient air quality standards.

The project is in an attainment/unclassified area for all current NAAQS. Therefore, conformity requirements do not apply. Construction activities would not last for more than 5 years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analysis (40 CFR 93.123(c)(5)). Regarding state air quality standards, the project is in a nonattainment area for one criteria pollutant—ozone. The project area attainment status of state and federal criterial air pollutants is shown in Table 2.

Table 2. State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State[1] Standard	Federal[2] Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
Ozone (O_3)[3]	1 hour	0.09 ppm[4]	---	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NOx) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes.	Nonattainment	---
	8 hours	0.070 ppm	0.070 ppm (4^{th} highest in 3 years)			Nonattainment	Unclassified/ Attainment
Carbon Monoxide (CO)[5]	1 hour	20 ppm	35 ppm	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone. Colorless, odorless.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Unclassified	Unclassified/ Attainment
	8 hours	9.0 ppm	9 ppm			Unclassified	Unclassified/ Attainment
	8 hours (Lake Tahoe)	6 ppm	---			Unclassified	---
Respirable Particulate Matter (PM10)[6]	24 hours	50 µg/m^3 [7]	150 µg/m^3 (expected number of days above standard < or equal to 1)	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic & other aerosol and solid	Dust- and fume-producing industrial and agricultural operations; combustion smoke & vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained	Attainment	Unclassified
	Annual	20 µg/m^3	--- [7]			Attainment	---

				compounds are part of PM10.	paved road dust; natural sources.		
Fine Particulate Matter (PM2.5)[8]	24 hours	---	35 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the PM2.5 size range. Many toxic & other aerosol and solid compounds are part of PM2.5.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.	---	
	Annual	12 µg/m^3	12.0 µg/m^3			Attainment	Unclassified/ Attainment
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	0.100 ppm[9]	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain & nitrate contamination of stormwater. Part of the "NOx" group of ozone precursors.	Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations.	Attainment	Unclassified/ Attainment
	Annual	0.030 ppm	0.053 ppm			Attainment	Unclassified/ Attainment
Sulfur Dioxide (SO_2)[10]	1 hour	0.25 ppm	0.075 ppm (99th percentile over 3 years)	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Attainment	Unclassified/ Attainment
	3 hours	---	0.5 ppm[11]			---	Unclassified/ Attainment
	24 hours	0.04 ppm	0.14 ppm (for certain areas)			Attainment	Unclassified/ Attainment
	Annual	---	0.030 ppm (for certain areas)			---	Unclassified/ Attainment
Lead (Pb)[12]	Monthly	1.5 µg/m^3	---	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from older gasoline use may exist in soils along major roads.	Attainment	---
	Calendar Quarter	---	1.5 µg/m^3 (for certain areas)			---	Unclassified/ Attainment
	Rolling 3-month average	---	0.15 µg/m^3 [13]			---	Unclassified/ Attainment
Sulfates	24 hours	25 µg/m^3	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	Attainment	N/A

Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea. Strong odor.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	Unclassified	N/A
Visibility Reducing Particles (VRP)[14]	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70%	---	Reduces visibility. Produces haze. NOTE: not directly related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas. However, some issues and measurement methods are similar.	See particulate matter above. May be related more to aerosols than to solid particles.	Unclassified	N/A
Vinyl Chloride[12]	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	Not indicated on the California Air Resources Board website	N/A

[1] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations

[2] Federal standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S.EPA for further clarification and current national policies.

[3] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. Transportation conformity applies in newly designated nonattainment areas for the 2015 national 8-hour ozone primary and secondary standards on and after August 4th, 2019 (see Transportation Conformity Guidance for 2015 Ozone NAAQS Nonattainment Areas).

[4] ppm = parts per million

[5] Transportation conformity requirements for CO no longer apply after June 1, 2018 for the following California Carbon Monoxide Maintenance Areas (see U.S. EPA CO Maintenance Letter).

[6] On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[7] $\mu g/m^3$ = micrograms per cubic meter

[8] The 65 $\mu g/m^3$ PM2.5 (24-hr) NAAQS was not revoked when the 35 $\mu g/m^3$ NAAQS was promulgated in 2006. The 15 $\mu g/m^3$ annual PM2.5 standard was not revoked when the 12 $\mu g/m^3$ standard was promulgated in 2012. Therefore, for areas designated nonattainment or nonattainment/maintenance for the 1997 and or 2006 PM2.5 NAAQS, conformity requirements still apply until the NAAQS are fully revoked.

[9] Final 1-hour NO_2 NAAQS published in the Federal Register on 2/9/2010, effective 3/9/2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause re-designation to nonattainment in some areas after 2016.

[10] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[11] Secondary standard, the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant rather than health. Conformity and environmental analysis address both primary and secondary NAAQS.

[12] The ARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM10 and, in larger proportion, PM2.5. Both the ARB and U.S. EPA have identified lead and various organic compounds that are precursors to ozone and PM2.5 as toxic air contaminants. There are no exposure criteria for adverse health effect due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.

[13] Lead NAAQS are not considered in Transportation Conformity analysis.

[14] In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Sensitive receptors are hospitals, schools, homes, hotels, daycare facilities, elderly housing, and convalescent facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants. No sensitive receptors are present within the project area. However, sensitive receptors present within a 1/4-mile radius of the project area include numerous homes, several hotels, Boulder Creek Elementary School, and Bethel School.

Environmental Consequences

The Air Quality Report completed for the project concluded that construction impacts to air quality are temporary in duration and therefore would not result in long-term adverse conditions (California Department of Transportation 2020b). During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other construction-related activities. Emissions from construction equipment also are expected and would include carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOCs), directly-emitted particulate matter (PM10 and PM2.5), and toxic air contaminants such as diesel exhaust particulate matter. Ozone is a regional pollutant that is derived from NOx and VOCs in the presence of sunlight and heat. Site preparation and roadway construction typically involves clearing, cut-and-fill activities, grading, removing or improving existing roadways, building bridges, and paving roadway surfaces. Construction-related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. These activities could temporarily generate enough PM10, PM2.5, and small amounts of CO, SO_2, NOx, and VOCs to be of concern. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site could deposit mud on local streets, which could be an added source of airborne dust after it dries. PM10 emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM10 emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the United States Environmental Protection Agency (U.S. EPA) to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent. The Department's Standard Specifications (Section 14) on dust minimization require use of water or dust palliative compounds and would reduce potential fugitive dust emissions during construction.

In addition to dust-related PM10 emissions, heavy-duty trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NOx, VOCs and some soot particulate (PM10 and PM2.5) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel (not more than 15 ppm sulfur), so SO_2-related issues due to diesel exhaust would be minimal.

Some phases of construction, particularly asphalt paving, may result in short-term odors in the immediate area of each paving site(s). Such odors would quickly disperse to below detectable levels as distance from the site(s) increases.

Long-term operation of the project would result in an overall improvement in local air quality because fewer pollutants would be released from vehicles because of reduced traffic congestion and more efficient traffic flow.

CEQA Determination

Once constructed, the project would not conflict with or obstruct implementation of an applicable air quality management plan, result in a cumulatively considerable net increase in ozone for which the project vicinity is currently in non-attainment, expose sensitive receptors to substantial pollutant concentrations, or result in other emissions (such as those leading to objectionable odors) that could adversely affect a substantial number of people. During construction, the project could result in short-term elevated levels of dust, criteria pollutants, and odors. However, with implementation of avoidance/minimization measures for dust and pollutant control during construction and rapid dissipation of any odors, the project would have a less than significant impact on air quality.

Avoidance, Minimization, and/or Mitigation Measures

As described in the Air Quality Report (California Department of Transportation 2020b), the construction contractor shall comply with Section 10-5 "Dust Control", Section 14-9 "Air Quality", and Section 18 "Dust Palliatives" in the *2018 Caltrans Standard Specifications* (California Department of Transportation 2018). Compliance with these standard specifications would include implementing the following dust and pollutant reduction/control measures to minimize any air quality impacts resulting from construction activities:

- A dust control plan shall be developed documenting sprinkling, temporary paving, speed limits, and timely revegetation of disturbed slopes as needed to minimize construction impacts.

- Water or a dust palliative shall be applied to the site and equipment as often as necessary to control fugitive dust emissions.

- Soil binder shall be spread on any unpaved roads used for construction purposes and on all project construction parking areas.

- Construction equipment and vehicles shall be properly tuned and maintained. All construction equipment shall use low sulfur fuel as required by California Code of Regulations Title 17, Section 93114.

- Track-out reduction measures, such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic, shall be used.

- All transported loads of soils and wet materials shall be covered before transport, or adequate freeboard (space from the top of the material to the top of the truck) shall be provided to minimize emission of dust during transportation.

- Dust and mud that are deposited on paved, public roads due to construction activity and traffic shall be promptly and regularly removed to reduce PM emissions.

- Trucks shall be washed as they leave the right-of-way as necessary to control fugitive dust emissions.

- Equipment and materials storage sites shall be located as far away from residential and park uses as practicable; construction areas shall be kept clean and orderly.

3.3 Biological Resources

Regulatory Setting

Wetlands and Other Waters

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. The lateral limits of jurisdiction over non-tidal water bodies extend to the ordinary high water mark (OHWM), in the absence of adjacent wetlands. When adjacent wetlands are present, CWA jurisdiction extends beyond the OHWM to the limits of the adjacent wetlands. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be

present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (40 Code of Federal Regulations [CFR] 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a "least environmentally damaging practicable alternative" (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, EO 11990 states that a federal agency, such as FHWA and/or the Department, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: (1) that there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm. A Wetlands Only Practicable Alternative Finding must be made.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Boards (RWQCBs) and the California Department of Fish and Wildlife (CDFW). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that would substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement would be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge

Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see the Water Quality section for more details.

Plant Species

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) have regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA).

This section of the document discusses all other special-status plant species, including CDFW species of special concern, USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at California Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act (CEQA), found at California Public Resources Code, Sections 21000-21177.

Animal Species

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries), and the California Department of Fish and Wildlife (CDFW) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in the Threatened and Endangered Species Section [##] below. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.
Federal laws and regulations relevant to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the California Fish and Game Code

- Sections 4150 and 4152 of the California Fish and Game Code

Threatened and Endangered Species

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration (FHWA) (and the Department, as assigned), are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take Statement or a Letter of Concurrence. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct." California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The California Department of Fish and Wildlife (CDFW) is the agency responsible for implementing CESA. Section 2080 of the California Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

Invasive Species

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State's invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project.

Affected Environment

Biological resources-related literature and record searches addressing the project area included review of numerous databases, lists, and maps, as well as visits to and/or contacts with relevant agencies (California Department of Transportation 2020c). Biological field surveys were conducted in 2019 to evaluate the existing environment, gather information on the presence of special-status species, and determine project level impacts regarding biological resources. Results and findings based on the above literature searches, surveys, and analyses are presented below.

Habitats and Natural Communities of Concern

Habitats within the project area include riverine habitat (Churn Creek). The remainder of the project area consists of paved surfaces (e.g., roadway and shoulders). Riverine and riparian habitats are considered habitats of special concern and regulated under federal and state laws. A description of the onsite aquatic and riparian habitats is provided below, along with estimated impacts to the habitat, and identification of avoidance/minimization measures and compensatory mitigation that may be warranted.

Riverine Habitat

Churn Creek (watershed is about 35 square miles) is the only waterway that would be affected. West of I-5, prior to Churn Creek flowing under the interstate, Buckeye Creek and Churn Creek merge. Both Buckeye and Churn Creek are shown as intermittent streams on the USGS topographical map (Project City quad). East of the Churn Creek bridge widening, about 0.6 mile downstream, Salt Creek flows into Churn Creek. Churn Creek flows south under SR 299, then SR 44, under local roadways, through the City of Redding until it flows into the Sacramento River in North Anderson about 15 miles south.

Other water ways in the Fix 5 Shasta Gateway project include an unnamed water way and Boulder Creek, both of which eventually flow into Churn Creek.

About 74 ft² (0.002 acres) of permanent stream bed and bank alteration would occur for the construction of piers associated with the Churn Creek bridge widening. About 2,825 ft² (0.065 acres) of temporary impacts to stream bed and bank would occur for placement a work pad needed to widen churn creek bridge. The work pad would be clean, spawning-sized gravel and would be removed once construction has been completed. Additionally, small amounts of RSP are anticipated at potential jurisdictional aquatic features to dissipate energy. At many of these locations RSP previously exists but needs supplemental RSP to function properly. In addition, the drainage ditch that flows north to south from Oasis road NB offramp to Churn Creek would be filled and replaced within the project limits further to the east near the right-of-way fence.

- Work in Churn Creek shall be completed during the period between June 1 and October 15, or as otherwise specified in resource-agency permits. Upon completion of work, the contractor shall restore temporarily disturbed streambed to near pre-construction conditions.

- Potential direct and indirect effects on water quality and the aquatic environment shall be avoided by implementing standard construction best management practices for erosion control and spill prevention.

Riparian Habitat
Riparian habitat occurs at multiple locations within the ESL including adjacent to the four water ways. Riparian vegetation is mostly cottonwood and willow species mixed with invasive Himalayan blackberry, spearmint, and nutsedges.

261ft² (0.006 acres) of permanent and 653 ft² (0.007 acres) of temporary impacts to riparian habitat would occur associated with the widening of Churn Creek Bridge (Table 6). Other permanent impacts to riparian areas are not anticipated. Temporary impacts that include trimming riparian vegetation may occur to replace drainage features.

- Removal of existing vegetation shall not exceed the minimum necessary to complete operations.
- Upon completion of work, the contractor shall restore the topography of temporarily disturbed riparian areas to preconstruction conditions and stabilize soils with appropriate erosion control methods.

Wetlands
Wetland features are located within the ESL. Most of the features delineated are connected to larger features inside the BSA. The ESL wetlands are emergent wetlands consisting soft and poverty rush with poverty rush being the more dominant of the two. Cat-tails and water pepper occur in the lower, inundated locations.

Implementation of this project is not anticipated to cause any temporary or permanent impacts to wetlands with the current scope. This would be achieved through the implementation of Avoidance and Minimization Efforts, which are listed below.

- All wetland areas not required for construction shall be protected by establishing environmentally sensitive area fencing as a first order of work to ensure construction activities do not impact the areas.

Permits
Waters and riparian habitat identified within the project area are protected by state laws and regulations and Sections 401 and 404 of the federal Clean Water Act. Work within the bed and bank of Churn Creek would require a Nationwide Permit 14 from the Army Corps of Engineers, Water Quality Certification from the CVRWQCB, and a Lake or Stream bed Alteration Agreement from the California Department of Fish and Wildlife. Impacts to riparian vegetation would be addressed in the Lake or Stream bed Alteration Agreement. In addition, a Notice of Intent would need to be filed with the State Water Resources Control Board to obtain coverage under the NPDES General Construction Permit.

Special-Status Plant Species
No special-status plant species were observed within and/or adjacent to the project area during the field survey nor are any special-status plant species expected to be present. Therefore, there would be no impact to special-status plant species.

Special-Status Animal Species
Although no special-status animal species were observed within and/or adjacent to the project area during the field survey, the following special-status animal species have the potential to occur within and/or adjacent to the project area: western pond turtle (state Species of Concern), Central Valley steelhead DPS (federal Threatened), Central Valley spring-run Chinook salmon ESU (federal and state Threatened), and Central Valley winter-run Chinook salmon ESU

(federal and state Endangered). The following discussion addresses special-status animal potentially present within and/or adjacent to the project area, as determined by the literature review and completion of field surveys, and includes a detailed description of the species' life history and habitat requirements, an evaluation of the potential for the species to be affected by the proposed work, and identification of avoidance/minimization measures that may be warranted.

Western Pond Turtle
Western pond turtles associate with permanent or nearly permanent water in a wide variety of habitat types, including lakes, ponds, rivers, streams, and irrigation ditches. The species is reported from near sea level to 4,690 feet in elevation. Individuals are active all year where climate is warm; elsewhere, individuals may hibernate in response to the onset of winter conditions. Western pond turtles require basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks. Egg laying occurs from March to August. Along large, slow-moving streams, eggs are deposited in nests constructed in sandy banks. Along foothill streams, females may climb hillsides, sometimes moving up to 325 feet to find a suitable nest site. Nests must have a relatively high internal humidity for eggs to develop and hatch properly.

Churn Creek provides potentially suitable habitat for the western pond turtle. Although no western pond turtles were observed during the field survey, western pond turtles could be directly affected if present during in-channel work and harmed by construction equipment. Potential indirect effects on western pond turtles could occur if sediments or pollutants were to enter drainages and degrade habitat for the species. With implementation of the following avoidance/minimization measure, project implementation would have no direct or indirect effects on western pond turtles:

- Potential direct effects on western pond turtles shall be avoided by having a contractor-supplied biologist conduct a pre-construction survey of in-water work areas each day that in-water work would occur until a water diversion is established. If present, turtles shall be relocated to suitable habitat outside of work areas.

- Potential indirect effects on turtles shall be avoided by implementing standard construction best management practices for erosion control and spill prevention.

Salmonids

Central Valley Spring-Run Chinook Salmon ESU
Adult spring-run leave the ocean to begin their upstream migration in late-January to early February. Spring-run adults generally enter rivers as sexually immature fish and must hold in deep, freshwater pools with cold water for up to several months before spawning. Spawning normally occurs between mid-August and early October. Adults spawn in clean, loose gravel, in swift, relatively shallow riffles, or along the margins of deeper river reaches where suitable water temperatures, depths, and velocities favor red construction and oxygenation of incubating eggs. Spring-run spawn and rear in the clear, cool water. Fry emergence occurs from November through March and seek streamside habitats containing beneficial aspects such as riparian vegetation and associated structures that provide invertebrates for food, predator avoidance cover, and slower water velocities for resting. Juveniles may reside in freshwater for 12 to 16 months, but some migrate downstream to the ocean as young-of-the-year in the winter or spring

months within 8 months of hatching. Most downstream migration occurs at night. Juveniles enter the ocean where they would reside for several years before returning as adults to freshwater rivers and streams to spawn.

Central Valley Winter-Run Chinook Salmon ESU
Adult winter-run begin spawning migrations from December through July. Adults are sexually immature when upstream migration begins, and they must hold for several months in suitable habitat prior to spawning. Spawning occurs between late-April and mid-August. Adults spawn in clean, loose gravel, in swift, shallow riffles, or along the margins of deeper river reaches where suitable water temperatures, depths, and velocities favor red construction and oxygenation of incubating eggs. Fry emerge from mid-June through mid-October and seek streamside habitats containing beneficial aspects such as riparian vegetation and associated structures that provide invertebrates for food, predator avoidance cover, and slower water velocities for resting. Downstream migration of juveniles may begin after almost 1 year in the river. Most of the downstream migration activity occur at night. Juveniles enter the ocean where they would reside for several years before returning as adults to freshwater rivers and streams to spawn.

Central Valley Steelhead Trout DPS
Steelhead are the anadromous form of rainbow trout. In the Sacramento River basin, steelhead enter freshwater from August to April. They hold in the main-stem Sacramento River until flows are high enough in its tributaries to enter for spawning. Steelhead adults typically spawn from December to April, with peak spawning from January to March, in small streams and tributaries where cool, well-oxygenated water is available year-round. Juvenile steelhead generally migrate to the ocean in spring and early summer at 1 to 3 years of age. Juvenile steelhead would reside in the ocean for several years before returning as adults to freshwater rivers and streams to spawn.

Although not observed during the field survey, the onsite reach of Churn Creek provides potentially suitable rearing habitat for Central Valley spring-run Chinook salmon, Central Valley winter-run Chinook salmon, and Central Valley steelhead during winter and spring when water temperatures are suitable for salmonids. By June 15, water temperatures in Churn Creek are expected to exceed 25 °C (77 °F), which is lethal to salmonids. The presence of warm water during the summer months would preclude the presence of salmonids. Implementation of the following avoidance/minimization measures would ensure that salmonids would not be directly or indirectly affected by the proposed work:

- Work in Churn Creek shall be limited to the period between June 1 and October 15, or as otherwise specified in resource-agency permits. Upon completion of work, the contractor shall restore temporarily disturbed streambed to pre-construction conditions.

- Potential indirect effects on salmonids shall be avoided by implementing standard construction best management practices for erosion control and spill prevention.

Critical Habitat
No designated critical habitat exists in the project limits.

Essential Fish Habitat
Review of the NMFS EFH mapper confirmed that the project area is within a watershed designated as EFH for Chinook salmon. The proposed work would be a temporarily and localized disturbance of EFH for Chinook salmon. With the additional implementation of conservation measures it is expected that the project would not adversely affect EFH.

Nesting Migratory Birds

A variety of migratory bird species could potentially nest in vegetation within and/or adjacent to the project area. If present, nesting birds could be directly and indirectly affected by the proposed work. Potential direct effects on nesting birds could include mortality resulting from destruction of nests during vegetation removal. Potential indirect effects on nesting birds could include disruption of feeding patterns or nest abandonment due to construction related noise. With implementation of the following measure, vegetation removal and construction activities would have no direct or indirect effects on nesting birds.

- To avoid disturbing nesting birds, tree and shrub removal shall be restricted to the period between October 1 and January 31. If this is not practicable, a contractor-supplied biologist shall conduct a preconstruction survey for nesting birds within 3 days prior to removing trees and shrubs. If an active nest is discovered, the resident engineer shall be notified immediately and all work within 100 feet of the nest shall cease.

- Prior to construction, the contractor shall install bird exclusionary material on the Churn Creek Bridge outside the nesting season to prevent birds from nesting on the structure.

Invasive Species

The project area contains ruderal species that include non-native, invasive, and noxious weeds. Noxious weeds are considered widespread in California and subject to regulations to stop their spread. Implementation of the following avoidance/minimization measures would prevent the introduction/spread of invasive and/or noxious weed species and reduce any impacts on native plant communities to levels less than significant.

- In accordance with Caltrans' non-standard specification 14-6.05, prior to beginning work, the contractor shall prepare an invasive species control plan that identifies measures to be implemented to prevent the introduction and/or spread of invasive species (e.g., noxious weeds). The invasive species control plan shall be approved by Caltrans environmental staff and implemented prior to beginning work.

Wildlife Corridors and Nursery Sites

Under current conditions, while difficult, medium to large wildlife such as deer, raccoons, and fox can cross the interstate. The median barrier is either an earth berm or a high-tension cable barrier , both simple for an adult deer, fawn or medium mammal to navigate. Additionally, existing conditions only have wildlife crossing two lanes of traffic at a time. The median is wide enough for wildlife to pause without being harmed before either turning around or proceeding across the next two lanes. With the addition of an additional lane, that is another 12 feet of active roadway wildlife would have to navigate. Reducing the medium width also would reduce the area wildlife have to recuperate and prepare to cross another three to four lanes of active traffic. Moreover, the reduction in median width is exacerbated with the addition of standard concrete barriers. The addition of the barrier would eliminate all wildlife but adult deer from being able to cross the interstate. Medium to small wildlife would attempt to cross, be stopped by the concrete barrier, and would have to turn around. While adult deer would be able to cross the concrete median and additional lane, the median may affect their line of sight and the additional lane would require deer to continue across the entire Interstate instead of being able to stop in the median. With a sprint across the interstate wildlife may cross one side safely only to jump into oncoming traffic, making the travel way dangerous for wildlife and drivers alike. Therefore, with the increase of 48 feet of additional active lanes, reduction in median size, and construction of high concrete median barrier, a total widening of 84 feet at the widest segment,

impact to wildlife movement across I-5 would be substantial. The proposed project would interfere with the movement of native resident or migratory wildlife species, but not fishes (a water diversion would be installed to allow aquatic organisms to move freely around the in-channel work area). The proposed project would not impede any established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

Habitat Conservation Plans and Natural Community Conservation Plans

The United States Fish and Wildlife Service has approved two habitat conservation plans in Shasta County (United States Fish and Wildlife Service 2020). One to the Fruit Growers Supply Company (Corporation) for Northern spotted owl, Yreka phlox and coho salmon – Southern Oregon- Northern California Coast ESU and one to Ox Yoke Road (private Individual) for valley elderberry beetle. These landowners are not adjacent to the project. No natural community conservation plans have been designated in Shasta County (California Department of Fish and Wildlife 2020). Given the above findings, there would be no impact on habitat conservation plans or natural community conservation plans.

CEQA Determination

The proposed project would have no impacts to on special status plants, local policies or ordinance, or adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved conservation plan.

The project would have a less than significant impact to habitats and natural communities of concern, species protection (including nesting migratory birds), and animal species of special concern.

Without mitigation, the addition of two new active travel lanes, two auxiliary lanes, reduction in median, and addition of sections of high concrete median barriers, the proposed project would substantially interfere with the movement of wildlife species which would be a significant impact. However, the project would include mitigation for impacts to the movement of wildlife species which would mitigate impacts below the level of significance

Avoidance, Minimization, and/or Mitigation Measures

Two options, or a combination of the two, are proposed. First, the fifth worst hot spot for mule deer collisions in the entire state would be remedied. This section of roadway, also along Interstate 5 is in Tehama county is about 1.5 miles from Dibble Creek to the Antelope Boulevard intersection (Post miles R28.2 – R26.5). Caltrans proposes to attach outriggers to the top of the existing 4 -foot tall fence to discourage wildlife from jumping the fence, or in some areas replacing the existing fence with a six-foot-tall fence. Wildlife would be channeled to multiple existing waterway bridge locations to cross underneath the Interstate.

A second alternative to mitigate for impacts would be to fund a Department of Fish and Wildlife program to purchase collars for use on deer herds around the City of Redding. This would help understand the ecology and movement of urban deer so that treatments can be properly implemented in the future.

The final alternative would be a combination of the two above scenarios. Collars on a small number of individuals would have a large impact in understanding the movement of urban deer in the City of Redding. This option would be based on CDFW staff availability to conduct the research. Because the collars auto-drop and can be refurbished, a combination of the two

alternatives would lead to multiple years of important data, while addressing the existing known critical vehicle-wildlife incident hotspot.

It is anticipated that the 401 Water Quality Certification, 404 Army Corps of Engineers permit, and 1602 Streambed Alteration agreement would require compensatory mitigation which would be determined in the next phase of the project.

Additionally, avoidance/minimization measures for habitats and natural communities of concern, species protection (including nesting migratory birds), animal species of special concern, and invasive species control, would be implemented.

3.4 Energy

Regulatory Setting

National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

Energy Policy Act

The federal Energy Policy Act (EPA) addresses energy production in the United States, including: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Tribal energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology. For example, the Act provides loan guarantees for entities that develop or use innovative technologies that avoid the by-production of greenhouse gases. Another provision of the Act increases the amount of biofuel that must be mixed with gasoline sold in the United States.

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) Guidelines section 15126.2(b) and Appendix F, Energy Conservation, require an analysis of a project's energy use to determine if the project may result in significant environmental effects due to wasteful, inefficient, or unnecessary use of energy, or wasteful use of energy resources.

CEQA applies to most California transportation projects (certain projects are statutorily exempt). For CEQA analyses, estimation data were compared from the future year Build scenarios to energy consumption from the Baseline (existing conditions). The following analysis and determinations are for CEQA only.

Affected Environment

The topography of a region can substantially impact air flow and resulting pollutant concentrations. California is divided into 15 air basins with similar topography and meteorology to better manage air quality throughout the state. Each air basin has a local air district that is

responsible for identifying and implementing air quality strategies to comply with ambient air quality standards.

The North Redding 6 Lanes project site is located at City of Redding in Shasta County, an area within the Sacramento Valley Air Basin (SVAB), which includes Sacramento, Shasta, Tehama, Butte, Glenn, Colusa, Sutter, Yuba, Yolo, and parts of Solano and Placer Counties. Air quality regulation in this project location is administered by Shasta County Air Quality Management District. Current and forecasted population for Shasta County is 180,040 as of July 1, 2018 U.S. Census, and the county's economy is largely driven by City of Redding.

Existing Roadway Conditions

The existing roadway segment of I-5 was planned, designed, and built in the 1960's. The existing freeway median narrows between SR 273 and Oasis Road, and at the same time, it expands from 4lanes to 6-lanes. The 4-lane segment has an 84-foot median while the existing 6-lane segment has a 36-foot median. The existing third northbound lane was added to the outside of the original 4-lanes and begins at the on-ramp from SR 273 and continues to SR 151 at Exit 685.

Environmental Consequences

Direct Energy Consumption (Construction)

Site preparation and roadway construction would land clearing/grubbing, roadway excavation/ removal, structural excavation/removal, base/subbase/imported borrow, structure concrete, paving, drainage/environment/landscaping, and traffic signalization/signage/stripping/painting. During construction, short-term fuel consumption is expected by various operation. Fuels for construction equipment would be largely powered by gasoline and diesel. Construction activities are expected to increase traffic congestion in the area, resulting in increases in fuel consumption from traffic during the delays. This consumption would be temporary and limited to the immediate area surrounding the construction site.

The basic procedure for analyzing direct energy consumption from construction activities is to obtain fuel consumption projections in gallons from the Caltrans Construction Emission Tool (CAL-CET). Construction energy consumption was estimated using the Caltrans' Model, CAL-CET2018 (version 1.3). Construction-related fuel consumption by operation and annual for the proposed project were calculated in an Energy Analysis Report (Caltrans 2020) completed for the project. The energy consumption presented is based on the best information available at the time of calculations. The energy represents the construction fuel consumption.

The proposed project construction would primarily consume diesel and gasoline through operation of heavy-duty construction equipment, material deliveries, and debris hauling. Energy use associated with proposed project construction is estimated to result in the short-term consumption of 120,414 gallons for the build alternative from diesel-powered equipment and 72,271 gallons for the build alternative from gasoline-powered equipment. These represent small demands (approximately diesel: 0.5%; gasoline: 0.08%) on Shasta County's gasoline and diesel sales estimates (i.e. 24 million of diesel gallons and 87 million of gasoline gallons in 2018) that would be easily accommodated, and this demand would cease once construction is complete.

Direct Energy Consumption (Mobile Sources)

The basic procedure for analyzing direct energy consumption from mobile sources was conducted by calculating fuel consumption using CT-EMFAC2017. Operational energy considers long-term changes in fuel consumption due to the project that would increase capacity (excluding the construction phase). The operational fuel consumption analysis compares forecasted consumption for baseline, no-build, and build alternatives during existing, opening, and design years.

The added lanes on both directions of the freeway proposed as an alternative would affect traffic operations and increase vehicle capacity along I-5 in the project area. Although the annual diesel fuel consumption under the alternatives for opening and design year is higher than that under the existing condition due to increases in truck AADT volumes, the annual gasoline consumption for future build scenario would decrease in comparison with the baseline condition due to the improvement of emission factors by zero-emission vehicles as well as increases in carsharing programs and development of mass transit. No substantial differences between the build and the no build alternatives during the opening and design years would be anticipated due to no appreciable changes in traffic volumes.

Indirect Energy

The proposed project does not include additional maintenance activities which would result in long-term indirect energy consumption by equipment required to operate and maintain in the roadway. It would reconstruct and widen mainline I-5 from 4 lanes to 6 lanes, including widening to the median with 12 feet lanes and 10 feet inside shoulders and structures. As such, it is unlikely to increase indirect energy consumption though increased fuel usage above baseline fuel usage.

CEQA Determination

Once constructed, the project may contribute to roadway improvement that would improve the fuel economy of vehicles. Construction-related energy consumption would be temporary and is unlikely to substantially increase direct energy consumption through increased fuel usage. Therefore, the proposed project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.

The proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, there would be no impact.

Given the above findings, the proposed project would have a less than significant impact on energy resources

Avoidance, Minimization, and/or Mitigation Measures

Energy Saving Measures (Construction)

The guidance in section 15126.2(b) and Appendix F of the CEQA Guidelines, Energy Conservation provide feasible conservation measures during construction. While construction would result in a short-term increase in energy use, construction design features would help conserve energy. The following measures shall be implemented when practical:

- Reduce grades and curvatures in construction of the project.

- Use recycled and energy-efficient building materials, energy-efficient tools and construction equipment, and renewable energy sources in construction and operation of the project.
- Improve operations and maintenance practices by regularly checking and maintaining equipment to ensure its functioning efficiently.
- Optimize start-up time, power-down time, and equipment sequencing.
- Educate employees about how their behaviors affect energy use.
- Ensure that team members are trained in the importance of energy management and basic energy-saving practices. Hold staff meetings on energy use, costs, objectives, and employee responsibilities.

3.5 Geology and Soils

Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under the California Environmental Quality Act (CEQA).

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Structures are designed using the Department's Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification would determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see the Department's Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

Affected Environment

The proposed project is located within the northern portion of the Central Valley, which is generally characterized relatively flat topography. Landslides are uncommon on the valley floor. Review of aerial photographs found no evidence of large landslides within or adjacent to the project limits. Given that that the topography within the project area is relatively level and there is no history of highway repairs due to landslides or subsidence within the project area, the soils are presumed to be relatively stable. Most of the underlying geology in the project area consists of nonmarine sedimentary rocks from the Pliocene-Pleistocene with insertions of marine sedimentary and metasedimentary rocks (California Department of Conservation 2020c). The northern limits consist of Metavolcanic rocks (California Department of Conservation 2020c). The proposed project is not located in an area that has a known active earthquake fault, as delineated on the most recent Alquist-Priolo earthquake fault zoning map (California Department of Conservation 2020d). The project location is subject to moderate seismic ground shaking from earthquakes (California Department of Conservation 2020e). The project area is not in an area characterized by seismic-related ground failure and/or liquefaction (California Department of Conservation 2020f).

Predominant soil types throughout the project area include Redding, Clough, Churn, Gaviota, and Newtown (Natural Resources Conservation Service 2020). All these soils have low infiltration rates. Potential for erosion does occur.

Expansive soils present hazards for development because they expand and shrink depending on water content. A hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The Natural Resource Conservation Service recognizes four hydrologic soil groups (A through D). Group D soils have a high shrink-swell potential due to their high clay content. All fall in the Hydrologic Group D except Newton, which falls in Group C. However, the current roadway is on fill from soil groups outside of Group D.

Environmental Consequences

Although the new structures and roadway could be subjected to moderate seismic ground shaking in the event of a strong earthquake, any such limitations can be overcome through proper planning, design, and/or construction. The proposed work includes grading and excavation, which would disturb approximately 26.8 acres of ground surface. The widening of Churn Creek bridge and the activities associated with it have the potential to cause soil erosion and may result in the loss of a small amounts of soil until the slopes, banks, and temporary access roads are fully stabilized.

CEQA Determination

The proposed project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, seismic-related ground failure (including liquefaction), and landslides. The proposed project is not located on a soil that is unstable or that would become unstable because of the project and potentially result in onsite/offsite landslide, lateral spreading, subsidence, liquefaction, or collapse. There are expansive soils present within the project area, however, the proposed project would not create substantial direct or indirect risks to life and/or property. The proposed project does not include the use of septic tanks and/or alternative waste water disposal systems and would not directly or indirectly destroy a unique paleontological resource/site or unique geologic feature. The project may result in the loss of a very small amount of soil, but this quantity would not constitute a substantial loss of soil. By designing the additional lanes in accordance with current seismic safety standards and implementation of standard BMPs for erosion control during construction, the proposed project would have a less than significant impact on geology and soils.

Avoidance, Minimization, and/or Mitigation Measures

The following measures shall be implemented to overcome the effects of strong seismic ground shaking and to minimize the potential for erosion:

- The new roadway lanes and bridge widening shall be designed in accordance with current seismic safety standards.

- Standard construction best management practices for erosion control and spill prevention shall be implemented.

3.6 Greenhouse Gas Emissions

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research

attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF6), and various hydrofluorocarbons (HFCs). CO_2 is the most abundant GHG; while it is a naturally occurring component of Earth's atmosphere, fossil-fuel combustion is the main source of additional, human-generated CO_2.

Two terms are typically used when discussing how we address the impacts of climate change: "greenhouse gas mitigation" and "adaptation." Greenhouse gas mitigation covers the activities and policies aimed at reducing GHG emissions to limit or "mitigate" the impacts of climate change. Adaptation, on the other hand, is concerned with planning for and responding to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels). This analysis includes a discussion of both.

Regulatory Setting

This section outlines federal and state efforts to comprehensively reduce GHG emissions from transportation sources.

Federal

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to deciding on the action or project.

The Federal Highway Administration (FHWA) recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices (FHWA 2019). This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—"the triple bottom line of sustainability" (FHWA n.d.). Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects. The most important of these was the Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Economy (CAFE) Standards. This act establishes fuel economy standards for on-

road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the CAFE program based on each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States.

Energy Policy Act of 2005, 109th Congress H.R.6 (2005–2006): This act sets forth an energy research and development program covering: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) the establishment of the Office of Indian Energy Policy and Programs within the Department of Energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

The U.S. EPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) is responsible for setting GHG emission standards for new cars and light-duty vehicles to significantly increase the fuel economy of all new passenger cars and light trucks sold in the United States. Fuel efficiency standards directly influence GHG emissions.

State

California has been innovative and proactive in addressing GHG emissions and climate change by passing multiple Senate and Assembly bills and executive orders (EOs) including, but not limited to, the following:

EO S-3-05 (June 1, 2005): The goal of this EO is to reduce California's GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below year 1990 levels by 2050. This goal was further reinforced with the passage of Assembly Bill (AB) 32 in 2006 and Senate Bill (SB) 32 in 2016.

Assembly Bill (AB) 32, Chapter 488, 2006, Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals outlined in EO S-3-05, while further mandating that the California Air Resources Board (ARB) create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code [H&SC] Section 38551(b)). The law requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

EO S-01-07 (January 18, 2007): This order sets forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020. ARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.

Senate Bill (SB) 375, Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires ARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan how it achieves the emissions target for its region.

SB 391, Chapter 585, 2009, California Transportation Plan: This bill requires the State's long-range transportation plan to identify strategies to address California's climate change goals under AB 32.

EO B-16-12 (March 2012) orders State entities under the direction of the Governor, including ARB, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

EO B-30-15 (April 2015) establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent ($MMTCO_2e$).[2] Finally, it requires the Natural Resources Agency to update the state's climate adaptation strategy, Safeguarding California, every 3 years, and to ensure that its provisions are fully implemented.

SB 32, Chapter 249, 2016, codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

SB 1386, Chapter 545, 2016, declared "it to be the policy of the state that the protection and management of natural and working lands … is an important strategy in meeting the state's greenhouse gas reduction goals, and would require all state agencies, departments, boards, and commissions to consider this policy when revising, adopting, or establishing policies, regulations, expenditures, or grant criteria relating to the protection and management of natural and working lands."

AB 134, Chapter 254, 2017, allocates Greenhouse Gas Reduction Funds and other sources to various clean vehicle programs, demonstration/pilot projects, clean vehicle rebates and projects, and other emissions-reduction programs statewide.

SB 743, Chapter 386 (September 2013): This bill changes the metric of consideration for transportation impacts pursuant to CEQA from a focus on automobile delay to alternative methods focused on vehicle miles travelled, to promote the state's goals of reducing greenhouse gas emissions and traffic related air pollution and promoting multimodal transportation while balancing the needs of congestion management and safety.

SB 150, Chapter 150, 2017, Regional Transportation Plans: This bill requires ARB to prepare a report that assesses progress made by each metropolitan planning organization in meeting their established regional greenhouse gas emission reduction targets.

[2] GHGs differ in how much heat each trap in the atmosphere (global warming potential, or GWP). CO_2 is the most important GHG, so amounts of other gases are expressed relative to CO_2, using a metric called "carbon dioxide equivalent" (CO_2e). The global warming potential of CO_2 is assigned a value of 1, and the GWP of other gases is assessed as multiples of CO_2.

EO B-55-18 (September 2018) sets a new statewide goal to achieve and maintain carbon neutrality no later than 2045. This goal is in addition to existing statewide targets of reducing GHG emissions.

EO N-19-19 (September 2019) advances California's climate goals in part by directing the California State Transportation Agency to leverage annual transportation spending to reverse the trend of increased fuel consumption and reduce GHG emissions from the transportation sector. It orders a focus on transportation investments near housing, managing congestion, and encouraging alternatives to driving. This EO also directs ARB to encourage automakers to produce more clean vehicles, formulate ways to help Californians purchase them, and propose strategies to increase demand for zero-emission vehicles.

Environmental Setting

The proposed project is in a rural area, with a primarily natural resources-based agricultural and tourism economy. Interstate 5 is the main transportation route to and through the area for both passenger and commercial vehicles. There are no alternative northbound/southbound routes, other than local roads. Traffic counts for this section of I-5 are high. The proposed project is within the jurisdiction of the Shasta Regional Transportation Agency (SRTA), which is the federally designated metropolitan planning organization (MPO) and state-designated Regional Transportation Planning Agency (RTPA) for Shasta County, and guides transportation development within the County.

A GHG emissions inventory estimates the amount of GHGs discharged into the atmosphere by specific sources over a period, such as a calendar year. Tracking annual GHG emissions allows countries, states, and smaller jurisdictions to understand how emissions are changing and what actions may be needed to attain emission reduction goals. U.S. EPA is responsible for documenting GHG emissions nationwide, and the ARB does so for the state, as required by H&SC Section 39607.4.

National GHG Inventory

The U.S. EPA prepares a national GHG inventory every year and submits it to the United Nations in accordance with the Framework Convention on Climate Change. The inventory provides a comprehensive accounting of all human-produced sources of GHGs in the United States, reporting emissions of CO_2, CH_4, N_2O, HFCs, perfluorocarbons, SF6, and nitrogen trifluoride. It also accounts for emissions of CO_2 that are removed from the atmosphere by "sinks" such as forests, vegetation, and soils that uptake and store CO2 (carbon sequestration). The 1990–2016 inventory found that of 6,511 MMTCO2e GHG emissions in 2016, 81% consist of CO_2, 10% are CH_4, and 6% are N_2O; the balance consists of fluorinated gases (EPA 2018a). In 2016, GHG emissions from the transportation sector accounted for nearly 28.5% of U.S. GHG emissions.

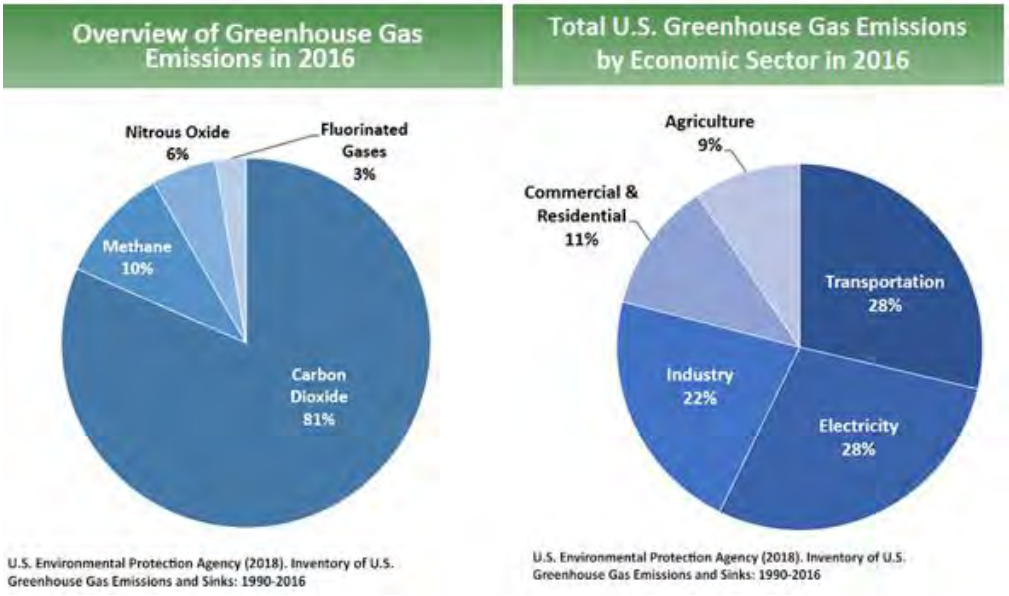

Figure 2. U.S. 2016 Greenhouse Gas Emissions

State GHG Inventory

ARB collects GHG emissions data for transportation, electricity, commercial/residential, industrial, agricultural, and waste management sectors each year. It then summarizes and highlights major annual changes and trends to demonstrate the state's progress in meeting its GHG reduction goals. The 2019 edition of the GHG emissions inventory found total California emissions of 424.1 $MMTCO_2e$ for 2017, with the transportation sector responsible for 41% of total GHGs. It also found that overall statewide GHG emissions declined from 2000 to 2017 despite growth in population and state economic output (ARB 2019a).

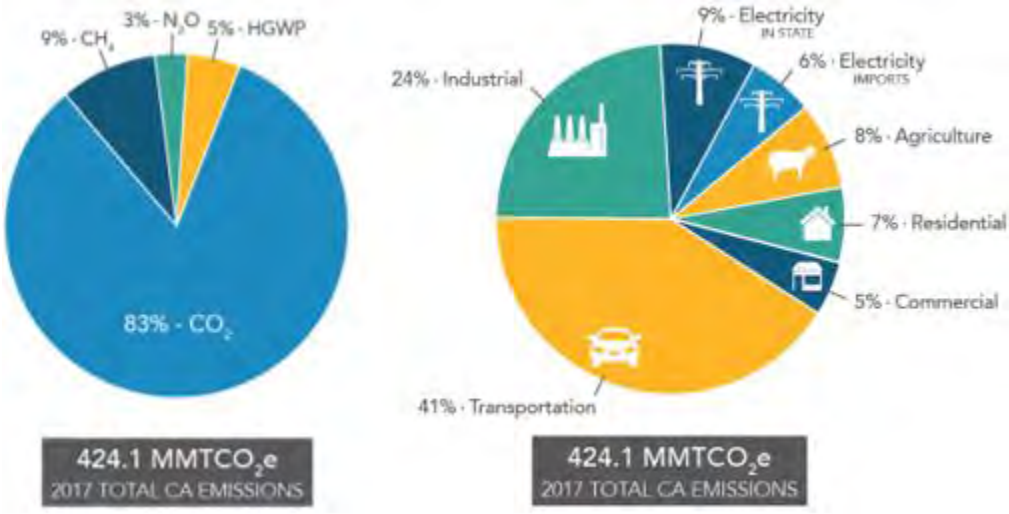

Figure 3. California 2017 Greenhouse Gas Emissions

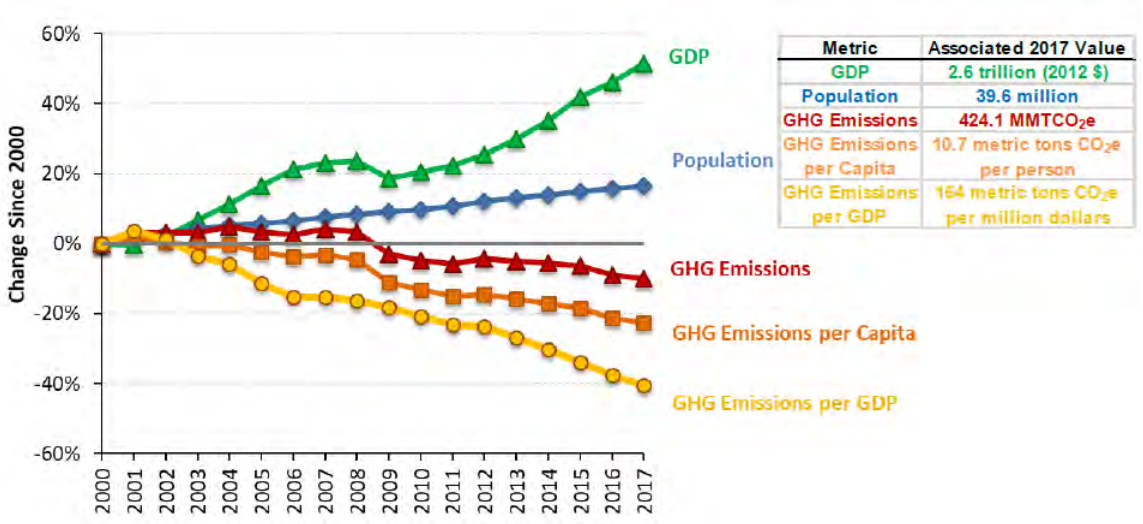

Figure 4. Change in California GDP, Population, and GHG Emissions since 2000

(*Source*: ARB 2019b)

AB 32 required ARB to develop a Scoping Plan that describes the approach California plans to take to achieve the goal of reducing GHG emissions to 1990 levels by 2020, and to update it every 5 years. ARB adopted the first scoping plan in 2008. The second updated plan, California's 2017 Climate Change Scoping Plan, adopted on December 14, 2017, reflects the 2030 target established in EO B-30-15 and SB 32. The AB 32 Scoping Plan and the subsequent updates contain the main strategies California plans to use to reduce GHG emissions.

Regional Plans

ARB sets regional targets for California's 18 MPOs to use in their Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) to plan future projects that cumulatively achieve GHG reduction goals. Targets are set at a percent reduction of passenger vehicle GHG emissions per person from 2005 levels.

The proposed project is in Shasta County and is within the jurisdiction of the SRTA, which is the federally designated MPO and state-designated RTPA for Shasta County, and guides transportation development within the County. The *2018 Regional Transportation Plan & Sustainable Communities Strategy for the Shasta Region* (SRTA 2019) identifies strategies for GHG reduction within the County. The following strategies, if implemented, are believed to offer the highest greenhouse gas emission reduction benefit-per-dollar and greatest community support due to their direct and collateral benefits, including economic development, public health and safety, and quality of life benefits:

- Expansion of SRTA's Infill and Redevelopment Incentive Program combined with first- and last-mile strategies.
    - Utilizing SB 1 formula funds, SRTA may increase incentives available for infill and redevelopment projects inside strategic growth areas and along high-frequency transit corridors and designated active transportation trunk lines.

- SRTA plans to also lead and participate in complementary projects and programs that address the crucial first- and last-mile between transit stops and trip origins and destinations.

- Enhanced management of interregional corridors during exceptional events.
    - Intelligent transportation systems (ITS) traffic operations.
    - Advanced vehicle-to-vehicle and vehicle-to-infrastructure technologies.
    - Other such strategies are planned to reduce the scale and duration of traffic congestion as a result of winter storm and collision-related closures and lane restrictions, thereby minimizing idling and low-speed stop-and-go travel.

Project Analysis

GHG emissions from transportation projects can be divided into those produced during operation of the SHS and those produced during construction. The primary GHGs produced by the transportation sector are CO_2, CH_4, N_2O, and HFCs. CO_2 emissions are a product of the combustion of petroleum-based products, like gasoline, in internal combustion engines. Relatively small amounts of CH_4 and N_2O are emitted during fuel combustion. In addition, a small amount of HFC emissions are included in the transportation sector.

The CEQA Guidelines generally address greenhouse gas emissions as a cumulative impact due to the global nature of climate change (Pub. Resources Code, § 21083(b)(2)). As the California Supreme Court explained, “because of the global scale of climate change, any one project's contribution is unlikely to be significant by itself.” (Cleveland National Forest Foundation v. San Diego Assn. of Governments (2017) 3 Cal.5th 497, 512.) In assessing cumulative impacts, it must be determined if a project’s incremental effect is “cumulatively considerable” (CEQA Guidelines Sections 15064(h)(1) and 15130).

To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. Although climate change is ultimately a cumulative impact, not every individual project that emits greenhouse gases must necessarily be found to contribute to a significant cumulative impact on the environment.

Operational Emissions for Capacity-Increasing Projects

Capacity-increasing projects require a quantitative analysis, using CT-EMFAC to estimate operational GHG emissions. ARB developed the EMission FACtors (EMFAC) model to facilitate preparation of statewide and regional mobile source emissions inventories. The model generates emissions rates that can be multiplied by vehicle activity data from all motor vehicles, including passenger cars to heavy-duty trucks, operating on highways, freeways, and local roads in California. Caltrans’ CT-EMFAC model uses data derived from EMFAC to streamline project-level emissions analyses. Caltrans recommends using the CT-EMFAC model for quantifying mobile source emissions from transportation projects on the California State Highway System. The EMFAC2017/CT-EMFAC2017 model has been approved by U.S. EPA and meets the FHWA’s transportation planning requirements.

CO_2 accounts for 95 percent of transportation GHG emissions in the U.S. The largest sources of transportation-related GHG emissions are passenger cars and light-duty trucks, including sport

utility vehicles, pickup trucks, and minivans. These sources account for over half of the emissions from the sector. The remainder of GHG emissions comes from other modes of transportation, including freight trucks, commercial aircraft, ships, boats, and trains, as well as pipelines and lubricants. Because CO_2 emissions represent the greatest percentage of GHG emissions it has been selected as a proxy within the following analysis for potential climate change impacts generally expected to occur.

The highest levels of CO_2 from mobile sources such as automobiles occur at stop-and-go speeds (0–25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0–25 miles per hour (Figure 5). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, GHG emissions, particularly CO_2, may be reduced.

Four primary strategies can reduce GHG emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity, (3) transitioning to lower GHG-emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective, all four strategies should be pursued concurrently.

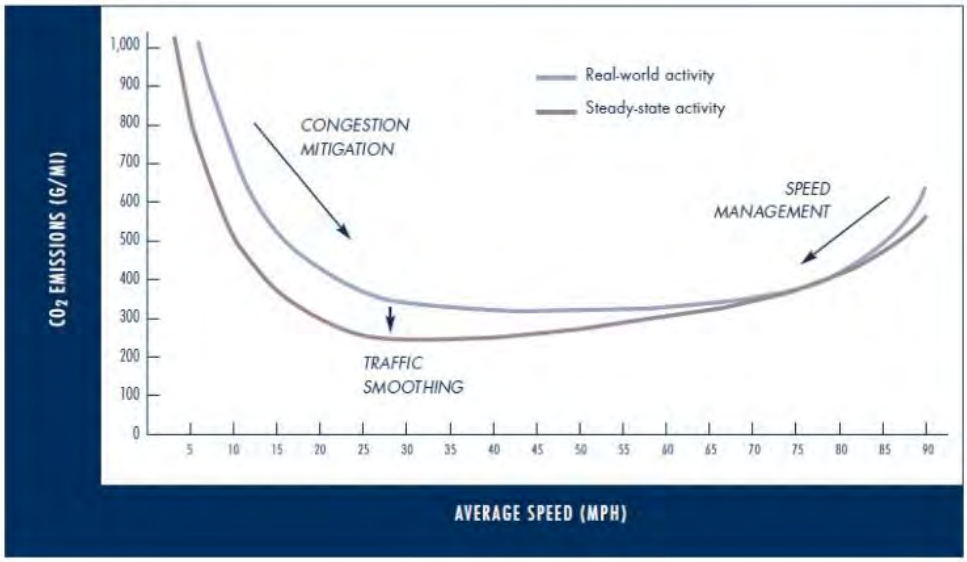

Figure 5. Possible Use of Traffic Operation Strategies in Reducing On-road CO_2 Emissions (Source: Barth and Boriboonsomsin 2010)

As discussed previously, the proposed project is subject to the *2018 Regional Transportation Plan & Sustainable Communities Strategy for the Shasta Region* (SRTA 2019). Because the project includes design features that would improve traffic flow and would not result in a substantial increase in construction GHG emissions or operational GHG emissions, the project is generally consistent with the *2018 Regional Transportation Plan & Sustainable Communities Strategy for the Shasta Region* (SRTA 2019).

Quantitative Analysis

The ARB released EMFAC2017 in March 2018 and Caltrans released CT-EMFAC2017, which incorporates the EMFAC2017 database, in January 2019. The U.S. EPA approved the EMFAC2017 model for transportation conformity purposes on August 15, 2019. Caltrans recommends using CT-EMFAC2017 to quantify GHG emissions because it incorporates the latest planning assumptions and quantification methods.

Vehicle miles traveled (VMT) is the primary metric utilized by Caltrans to evaluate impacts of greenhouse gases to the state highway system. As part of the traffic modeling analysis to analyze/estimate daily VMT, three years were considered: the base year (2016), which is the year that environmental studies were initiated); the opening year (2026), which is the year the project would be completed and open to traffic); and the design year (2046), which is the conclusion of a 20-year planning period after the project has been constructed and open to the public). In 2016, daily VMT was estimated at 330,400. Although the proposed project would increase the structural capacity of the Interstate, traffic modeling analysis predicted no difference in daily VMT between the no-build and build alternatives for the opening year (daily VMT is estimated at 369,600 in each scenario) and design year (daily VMT is estimated at 481,600 in each scenario).

Using the latest approved version of the EMFAC model to evaluate annual CO_2 emissions in relation to annual VMT, a separate model run was conducted for the base year, the opening year, and the design-year for both the no-build and build alternatives (Table 3). For the opening year (2026), CO_2 emissions associated with the build alternative are expected to increase slightly (but not substantially) compared to the no-build alternative. For the design year (2046), CO_2 emissions associated with the build alternative are expected to increase slightly (but not substantially) compared to the no-build alternative. Under the future build conditions, CO_2 emissions are expected to decrease compared to existing conditions probably due to improvements in speeds and emission factors.

It should be noted that while these emissions numbers are useful for comparing alternatives, they do not necessarily accurately reflect what the true CO_2 emissions would be because CO_2 emissions are dependent on other factors that are not part of the CT-EMFAC model such as fuel mix, rate of acceleration, and the aerodynamics and efficiency of vehicles.

Table 3. Modeled Annual CO_2 Emissions and Vehicle Miles Traveled, by Alternative

Alternative	CO_2 Emissions (U.S. Tons/Year)[1]	Annual Vehicle Miles Traveled[2]
Existing/Baseline 2016	57,230.905	114,648,800
Open to Traffic 2026		
No Build Alternative	49,751.325	128,251,200
Build Alternative	49,970.690	128,251,200
20-Year Horizon/Design-Year 2046		
No Build Alternative	52,796.520	167,115,200
Build Alternative	53,968.900	167,115,200

CO_2 = carbon dioxide
Source: EMFAC 2014
[1] Annual CO_2 emissions derived from daily CO_2 values multiplied by 365.
[2] Annual vehicle miles traveled (VMT) values derived from Daily VMT values multiplied by 347, per ARB methodology (ARB 2008).

A summary of operational emissions of CO and NO_x by alternative is shown in Table 4. The overall operational emissions of CO and NO_x within the proposed project area under the future build alternatives is not expected to increase in comparison with those under the baseline year (2016) or be substantially higher than those under the no-build alternative.

Table 4. Summary of Operational Emissions of CO and NO_x by Alternative

Scenario/ Analysis Year	Segment/ Location	CO (US Tons/Day)	NO_x (US Tons/Day)
Baseline Year (2016)	Existing 4-Lanes	0.455	0.192
	Existing 6-Lanes	0.166	0.070
No Build Alternative Opening Year (2026)	Existing 4-Lanes	0.166	0.075
	Existing 6-Lanes	0.061	0.028
No Build Alternative Design Year (2046)	Existing 4-Lanes	0.126	0.058
	Existing 6-Lanes	0.046	0.021

Table 4. Summary of Operational Emissions of CO and NO_x by Alternative

Scenario/ Analysis Year	Segment/ Location	CO (US Tons/Day)	NO_x (US Tons/Day)
Build Alternative Opening Year (2026)	Full Project	0.226	0.104
Build Alternative Design Year (2046)	Full Project	0.170	0.084

While CT-EMFAC has a rigorous scientific foundation and has been vetted through multiple stakeholder reviews, its GHG emission rates are based on tailpipe emission test data.[3] Moreover, the model does not account for factors such as the rate of acceleration and vehicle aerodynamics, which influence the amount of emissions generated by a vehicle. GHG emissions quantified using CT-EMFAC are therefore estimates and may not reflect actual physical emissions. Though CT-EMFAC is currently the best available tool for calculating GHG emissions from mobile sources, it is important to note that the GHG results are only useful for a comparison among alternatives.

Construction Emissions

Construction GHG emissions would result from material processing, on-site construction equipment, and traffic delays due to construction. These emissions would be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

GHG emissions would occur during construction. Estimates of various GHG including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and hydroflourocarbons (HFCs) were made

[3] This analysis does not currently account for the effects of the US National Highway Traffic Safety Administration and Environmental Protection Agency SAFE (Safer Affordable Fuel-Efficient) Vehicles Rule. Part One revoking California's authority to set its own greenhouse gas emissions standards was published on September 27, 2019 and effective November 26, 2019. The SAFE Vehicles Rule Part 2 would amend existing Corporate Average Fuel Economy (CAFE) and tailpipe carbon dioxide emissions standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026. The proposal would retain the model year 2020 standards for both programs through model year 2026. Although CARB has not yet provided adjustment factors for greenhouse gas emissions to be utilized in light of the SAFE Rule, modeling these estimates with EMFAC2017 or CT-EMFAC2017 remains the most precise means of estimating future greenhouse gas emissions.

for each year of construction using Cal-CET2018. As shown in Table 5, the primary GHG released during construction is CO_2. Table 6 shows projected CO_2 emissions by alternative.

Table 5. Estimates of GHG Emissions During Construction (in U.S. Tons)

Construction Year	CO_2	CO	NO_x	ROGs
2026/2027	1,144	4.67	6.41	<1

Table 6. Modeled CO_2 Emissions by Alternatives (in U.S. Tons)

Scenario/ Analysis Year	Segment/ Location	CO_2 Emissions (U.S. Tons/Day)	Daily Vehicle Miles Traveled
Baseline Year (2016)	Existing 4-Lanes	114.798	241,900
	Existing 6-Lanes	41.999	88,500
No Build Alternative Opening Year (2026)	Existing 4-Lanes	99.795	270,600
	Existing 6-Lanes	36.510	99,000
No Build Alternative Design Year (2046)	Existing 4-Lanes	105.903	352,600
	Existing 6-Lanes	38.745	129,000
Build Alternative Opening Year (2026)	Full Project	136.906	369,600
Build Alternative Design Year (2046)	Full Project	147.860	481,600

All construction contracts include Caltrans Standard Specifications Section 7-1.02A and 7-1.02C, Emissions Reduction, which require contractors to comply with all laws applicable to the project and to certify they are aware of and would comply with all ARB emission reduction regulations; and Section 14-9.02, Air Pollution Control, which requires contractors to comply with all air pollution control rules, regulations, ordinances, and statutes. Certain common regulations, such as equipment idling restrictions, that reduce construction vehicle emissions also help reduce GHG emissions.

CEQA Determination

While the proposed project would result in direct and indirect GHG emissions during construction, it is anticipated that the project would not result in a substantial increase in

operational GHG emissions. The proposed project would not conflict substantially with any applicable plan, policy, or regulation adopted for reducing the emissions of greenhouse gases. With implementation of construction GHG-reduction measures, construction-related impacts on the environment would be less than significant. Operational GHG emissions would increase minimally but would have a less than significant impact on the environment.

Greenhouse Gas Reduction Strategies

Statewide Efforts

Major sectors of the California economy, including transportation, need to reduce emissions to meet the 2030 and 2050 GHG emissions targets. Former Governor Edmund G. Brown promoted GHG reduction goals that involved (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent our electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farms and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy, Safeguarding California.

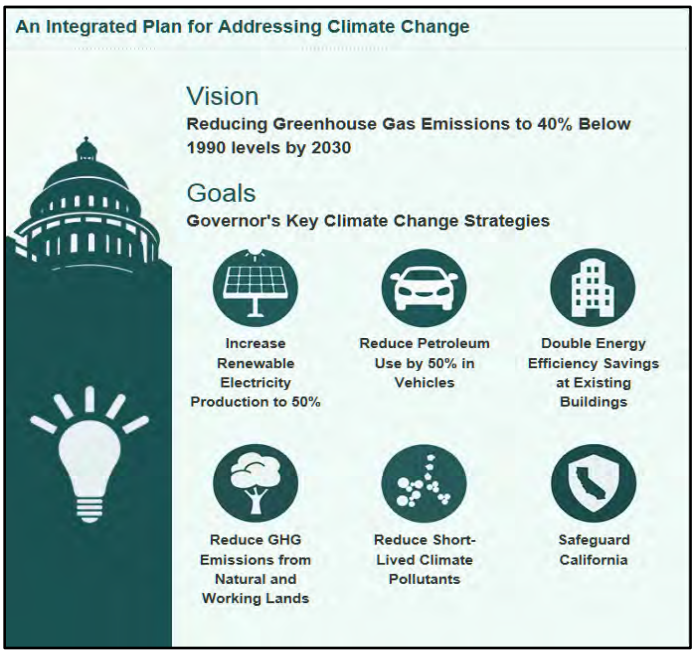

Figure 6. California Climate Strategy

The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that the state build on past successes in reducing criteria and toxic air pollutants from transportation and goods movement. GHG emission reductions would come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled (VMT). A key state goal for reducing greenhouse gas emissions is to reduce today's petroleum use in cars and trucks by up to 50 percent by 2030 (State of California 2019).

In addition, SB 1386 (Wolk 2016) established as state policy the protection and management of natural and working lands and requires state agencies to consider that policy in their own decision making. Trees and vegetation on forests, rangelands, farms, and wetlands remove carbon dioxide from the atmosphere through biological processes and sequester the carbon in above- and below-ground matter.

Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the ARB works to implement EOs S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. EO B-30-15, issued in April 2015, and SB 32 (2016), set an interim target to cut GHG emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

CALIFORNIA TRANSPORTATION PLAN (CTP 2040)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. In 2016, Caltrans completed the California Transportation Plan 2040, which establishes a new model for developing ground transportation systems, consistent with CO_2 reduction goals. It serves as an umbrella document for all the other statewide transportation planning documents. Over the next 25 years, California will be working to improve transit and reduce long-run repair and maintenance costs of roadways and developing a comprehensive assessment of climate-related transportation demand management and new technologies rather than continuing to expand capacity on existing roadways.

SB 391 (Liu 2009) requires the CTP to meet California's climate change goals under AB 32. Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce GHG emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

CALTRANS STRATEGIC MANAGEMENT PLAN

The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce GHG emissions, among other goals. Specific performance targets in the plan that help to reduce GHG emissions include:

- Increasing percentage of non-auto mode share
- Reducing VMT
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) GHG emissions

FUNDING AND TECHNICAL ASSISTANCE PROGRAMS

In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several sustainable transportation planning grants. These grants encourage local and regional multimodal transportation, housing, and land use planning that furthers the region's RTP/SCS; contribute to the State's GHG reduction targets and advance transportation-related GHG emission reduction project types/strategies; and support other climate adaptation goals (e.g., Safeguarding California).

CALTRANS POLICY DIRECTIVES AND OTHER INITIATIVES

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a Department policy that ensures coordinated efforts to incorporate climate change into Departmental decisions and activities. Caltrans Activities to Address Climate Change (April 2013) provides a comprehensive overview of Caltrans' statewide activities to reduce GHG emissions resulting from agency operations.

Project-Level GHG Reduction Strategies

The following measures shall be implemented to reduce GHG emissions and potential climate change impacts:

- The construction contractor shall comply with the *2018 Caltrans Standard Specifications* in Section 14-9. Section 14-9.02 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including the Shasta County Air Pollution Control District regulations and local ordinances.

- Compliance with Title 13 of the California Code of Regulations, which includes idling restrictions on construction vehicles and equipment to no more than 5 minutes.

- Compliance with Caltrans Standard Specifications 7-1.02A and 7-1.02C "Emissions Reduction."

- Utilize a traffic management plan to minimize vehicle delays.

- To the extent feasible, construction traffic shall be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.

Adaptation

Reducing GHG emissions is only one part of an approach to addressing climate change. Caltrans must plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and in the frequency and intensity of wildfires. Flooding and erosion can damage or wash out roads; longer periods of intense heat can buckle pavement and railroad tracks; storm surges combined with a rising sea level can inundate highways. Wildfire can directly burn facilities and indirectly cause damage when rain falls on denuded slopes that landslide after a fire. Effects vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. Accordingly, Caltrans must consider these types of climate stressors in how highways are planned, designed, built, operated, and maintained.

Federal Efforts

Under NEPA assignment, Caltrans is obligated to comply with all applicable federal environmental laws and FHWA NEPA regulations, policies, and guidance.

The U.S. Global Change Research Program (USGCRP) delivers a report to Congress and the president every 4 years, in accordance with the Global Change Research Act of 1990 (15 U.S.C. ch. 56A § 2921 et seq). The Fourth National Climate Assessment, published in 2018,

presents the foundational science and the "human welfare, societal, and environmental elements of climate change and variability for 10 regions and 18 national topics, with particular attention paid to observed and projected risks, impacts, consideration of risk reduction, and implications under different mitigation pathways." Chapter 12, "Transportation," presents a key discussion of vulnerability assessments. It notes that "asset owners and operators have increasingly conducted more focused studies of particular assets that consider multiple climate hazards and scenarios in the context of asset-specific information, such as design lifetime" (USGCRP 2018).

The U.S. DOT Policy Statement on Climate Adaptation in June 2011 committed the federal Department of Transportation to "integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely, and that transportation infrastructure, services and operations remain effective in current and future climate conditions" (U.S. DOT 2011).

FHWA order 5520 (Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events, December 15, 2014) established FHWA policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. FHWA has developed guidance and tools for transportation planning that foster resilience to climate effects and sustainability at the federal, state, and local levels (FHWA 2019).

State Efforts

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system. California's Fourth Climate Change Assessment (2018) is the state's effort to "translate the state of climate science into useful information for action" in a variety of sectors at both statewide and local scales. It adopts the following key terms used widely in climate change analysis and policy documents:

- *Adaptation* to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

- *Adaptive capacity* is the "combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities."

- *Exposure* is the presence of people, infrastructure, natural systems, and economic, cultural, and social resources in areas that are subject to harm.

- *Resilience* is the "capacity of any entity – an individual, a community, an organization, or a natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience". Adaptation actions contribute to increasing resilience, which is a desired outcome or state of being.

- *Sensitivity* is the level to which a species, natural system, or community, government, etc., would be affected by changing climate conditions.

- *Vulnerability* is the "susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt." Vulnerability can increase because of physical (built and environmental), social, political, and/or economic factor(s). These factors include, but are not limited to: ethnicity, class, sexual orientation and identification, national origin, and income inequality.2 Vulnerability is often defined as the combination of sensitivity and adaptive capacity as affected by the level of exposure to changing climate.

Several key state policies have guided climate change adaptation efforts to date. Recent state publications produced in response to these policies draw on these definitions.

EO S-13-08, issued by then-governor Arnold Schwarzenegger in November 2008, focused on sea-level rise and resulted in the *California Climate Adaptation Strategy* (2009), updated in 2014 as *Safeguarding California: Reducing Climate Risk* (Safeguarding California Plan). The Safeguarding California Plan offers policy principles and recommendations and continues to be revised and augmented with sector-specific adaptation strategies, ongoing actions, and next steps for agencies.

EO S-13-08 also led to the publication of a series of sea-level rise assessment reports and associated guidance and policies. These reports formed the foundation of an interim *State of California Sea-Level Rise Interim Guidance Document* (SLR Guidance) in 2010, with instructions for how state agencies could incorporate "sea-level rise (SLR) projections into planning and decision making for projects in California" in a consistent way across agencies. The guidance was revised and augmented in 2013. *Rising Seas in California – An Update on Sea-Level Rise Science* was published in 2017 and its updated projections of sea-level rise and new understanding of processes and potential impacts in California were incorporated into the *State of California Sea-Level Rise Guidance Update* in 2018.

EO B-30-15, signed in April 2015, requires state agencies to factor climate change into all planning and investment decisions. This EO recognizes that effects of climate change other than sea-level rise also threaten California's infrastructure. At the direction of EO B-30-15, the Office of Planning and Research published *Planning and Investing for a Resilient California: A Guidebook for State Agencies* in 2017, to encourage a uniform and systematic approach. Representatives of Caltrans participated in the multi-agency, multidisciplinary technical advisory group that developed this guidance on how to integrate climate change into planning and investment.

AB 2800 (Quirk 2016) created the multidisciplinary Climate-Safe Infrastructure Working Group, which in 2018 released its report, *Paying it Forward: The Path Toward Climate-Safe Infrastructure in California*. The report provides guidance to agencies on how to address the challenges of assessing risk in the face of inherent uncertainties still posed by the best available science on climate change. It also examines how state agencies can use infrastructure planning, design, and implementation processes to address the observed and anticipated climate change impacts.

Caltrans Adaptation Efforts

CALTRANS VULNERABILITY ASSESSMENTS

Caltrans is conducting climate change vulnerability assessments to identify segments of the State Highway System vulnerable to climate change effects including precipitation, temperature, wildfire, storm surge, and sea-level rise. The approach to the vulnerability assessments was

tailored to the practices of a transportation agency, and involves the following concepts and actions:

- *Exposure* – Identify Caltrans assets exposed to damage or reduced service life from expected future conditions.

- *Consequence* – Determine what might occur to system assets in terms of loss of use or costs of repair.

- *Prioritization* – Develop a method for making capital programming decisions to address identified risks, including considerations of system use and/or timing of expected exposure.

The climate change data in the assessments were developed in coordination with climate change scientists and experts at federal, state, and regional organizations at the forefront of climate science. The findings of the vulnerability assessments guide analysis of at-risk assets and development of adaptation plans to reduce the likelihood of damage to the State Highway System, allowing Caltrans to both reduce the costs of storm damage and to provide and maintain transportation that meets the needs of all Californians.

Project Adaptation Analysis

SEA LEVEL RISE
The proposed project is outside the coastal zone and not in an area subject to sea-level rise. Accordingly, direct impacts to transportation facilities due to projected sea-level rise are not expected.

FLOODPLAINS
The proposed project would not result in a substantial increase in short-term or operational emissions of greenhouse gases that would cause climate change, which could affect floodplains.

WILDFIRE
Most of the project area is not within an area that is designated as “Very High”, “High”, or “Moderate” for wildfire hazard; a small portion of the project area near Twin View Boulevard is rated as “High” for wildfire hazard (Cal fire 2020). Further, the proposed project would not result in a substantial increase in short-term or operational emissions of greenhouse gases that would cause climate change, which could exacerbate the hazard of wildfire.

3.7 Hazards and Hazardous Materials

Regulatory Setting

Hazardous materials, including hazardous substances and wastes, are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, and the Resource Conservation and Recovery Act (RCRA) of 1976. The purpose of CERCLA, often referred to as

"Superfund," is to identify and cleanup abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order (EO) 12088, *Federal Compliance with Pollution Control Standards*, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires cleanup of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and cleanup of contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

Affected Environment and Environmental Consequences

A Hazardous Waste Initial Site Assessment was completed for the PA&ED Phase of the project in March 2019.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

1. **Aerially deposited lead (ADL)** from the historical use of leaded gasoline, exists along roadways throughout California. There is the likely presence of soils with elevated concentrations of lead as a result of ADL on the state highway system right

of way within the limits of the project alternatives. Soil determined to contain lead concentrations exceeding stipulated thresholds must be managed under the July 1, 2016, ADL Agreement between Caltrans and the California Department of Toxic Substances Control. This ADL Agreement allows such soils to be safely reused within the project limits as long as all requirements of the ADL Agreement are met. It would be determined in Phase 1 whether an ADL site investigation with soil testing would be required. If it is determined that aerially deposited lead exists within the project limits and would be disturbed during construction, a Caltrans contract specification(s) related to excavation, management, and disposal of ADL soils would be included in the construction contract. **Lead Containing Paint (LCP)**--LCP may be present on the structures that would be widened/demolished. As a result, this office may conduct a structural survey with sampling and testing of existing paint in Phase 1 (approximately six months prior to PS&E) to access the presence and extent of LCP so that specifications can be provided. The specifications, if necessary, would address health and safety, removal, handling, containment, and disposal of LCP.

2. **Asbestos Containing Material (ACM)**—ACM may be present on the structures that would be widened/demolished. As a result, a structural survey with sampling and testing of suspect bridge components would be conducted in Phase 1 to access the presence and extent of ACM so that specifications can be included in the construction contract to ensure proper handling. The specifications, if necessary, would address health and safety, notification, removal, handling, containment, and disposal of ACM.

3. **Paint and Thermoplastic Striping Containing Lead**- The project would likely involve cold planning and grinding pavement, the residue would likely have non-hazardous levels of lead from the paint and thermoplastic striping that is removed with the pavement. In addition, the project may also involve striping removal separate from pavement cold planning and grinding. Specification(s) o be included in the construction contract for handling and disposing traffic paint and striping.

   The contractor would be required to prepare a lead compliance plan.

4. **Treated Wood Waste** - Since the project would likely remove and dispose of treated wood waste (TWW) from existing guardrail and roadside sign wood posts, the project would require specifications to address disposal of these items. These wood products are typically treated with preserving chemicals that may be hazardous (carcinogenic) and include, but are not limited to arsenic, chromium, copper, creosote, and pentachlorophenol. The contract specification provides requirements for handling, storing, transporting, and disposing of treated wood waste.

5. **Naturally Occurring Asbestos (NOA)-** There is no known NOA within the project limits based upon geologic mapping and previous hazardous waste studies carried out within project area.

6. **Cortese List -** The project should not be considered a listed hazardous waste site (not on the Cortese List).

CEQA Determination

The proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, nor would it create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The project construction would require use of materials that could be considered hazardous.

The project would not expose construction workers at the project site to a safety hazard or excessive noise.

The proposed project would not impair implementation or physically interfere with an adopted emergency response plan or emergency evacuation plan. In the event of an emergency during construction, Caltrans would coordinate with the California Highway Patrol to resolve any traffic-related concerns. Once constructed, the project would improve conditions during emergency response and emergency evacuations in the project area.

The proposed project does not expose people or structures to additional risk of loss, injury, or death as a result of wildfire by using the existing highway.

Given the above findings, the proposed project would have a less than significant impact on hazards and hazardous materials.

Avoidance, Minimization, and/or Mitigation Measures

- Grindings associated with removal of yellow and white traffic striping would be removed and disposed of in accordance with Caltrans SSP 36-4. Any treated wood sign posts that would be removed would be disposed of in accordance with Caltrans SSP 14-11.14.

- A site investigation for aerially deposited lead and asbestos would be conducted in the Design phase to determine whether hazardous soils/asbestos are present and what actions, if any, would be required.

- The project contract would include SSP 14-11.14. The SSP provides requirements for handling, storing, transporting, and disposing of treated wood waste.

- The contract would require that the contractor prepare a lead compliance plan.

- A specification(s) related to excavation, management, and disposal of ADL soils would be included in the contract if needed.

- If asbestos containing materials are identified in the 1 Phase, specifications would be included in the construction contract to address health and safety, notification, removal, handling, containment, and disposal of ACM.

3.8 Hydrology and Water Quality

Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source[4] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.

- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge would comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).

- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCBs) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The goal of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's (U.S. EPA) Section 404 (b)(1) Guidelines (40 Code of Federal Regulations [CFR] Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the

[4] A point source is any discrete conveyance such as a pipe or a man-made ditch.

discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent[5] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

State Requirements: Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined, and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, RWQCBs designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect those uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are

[5] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

- **National Pollutant Discharge Elimination System (NPDES) Program**

  Municipal Separate Storm Sewer Systems (MS4)

  Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water." The SWRCB has identified the Department as an owner/operator of an MS4 under federal regulations. The Department's MS4 permit covers all Department rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

  The Department's MS4 Permit, Order No. 2012-0011-DWQ (adopted on September 19, 2012 and effective on July 1, 2013), as amended by Order No. 2014-0006-EXEC (effective January 17, 2014), Order No. 2014-0077-DWQ (effective May 20, 2014) and Order No. 2015-0036-EXEC (conformed and effective April 7, 2015) has three basic requirements:

  1. The Department must comply with the requirements of the Construction General Permit (see below);

  2. The Department must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and

  3. The Department storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs), to the maximum extent practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

  To comply with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within the Department for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project would be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit, Order No. 2009-0009-DWQ (adopted on September 2, 2009 and effective on July 1, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14,

2011) and Order No. 2012-0006-DWQ (effective on July 17, 2012). The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop Storm Water Pollution Prevention Plans (SWPPPs); to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP. In accordance with the Department's SWMP and Standard Specifications, a Water Pollution Control Program (WPCP) is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project would be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration (FHWA) requirements for compliance are outlined in 23 Code of Federal Regulations (CFR) 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments.
- Risks of the action.
- Impacts on natural and beneficial floodplain values.

- Support of incompatible floodplain development.

- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as “the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

Affected Environment

The project area is located within the Sacramento River watershed. This watershed is a part of the Redding Groundwater Basin Planning Area, which is managed by the Central Valley Regional Water Quality Control Board. The project is in the Redding and Enterprise Flat hydrologic Unit and Area, respectively. Stormwater runoff from the project area discharges to the Keswick Dam to Cottonwood Creek reach of the Sacramento River. Two named watercourses traverse the project area, Boulder Creek and Churn Creek. Boulder Creek flows into a Churn Creek, a Sacramento River tributary. There are no direct discharges to either watercourse from the project area. An exception being where these streams cross the project area. Stormwater runoff from the project site is conveyed by roadside ditches, inlets and culverts.

Environmental Consequences

Earthwork would entail relatively minor excavation, except at a median segment where higher ground currently exists. The soil from these areas would be removed and used as embankment for leveling depressions and low-lying ground. Structural work includes widening the bridge that spans Churn Creek. Associated work includes extending three existing piers and replacing the westside wingwall. Pier work includes modifying the spread footing. This would entail excavating below Ordinary High Water and removing some riparian vegetation. Instream work may require installing a clear water diversion if flow is present and dewatering excavations. Structure work at other locations does not involve being near water or stream channels. Construction activities that may impact hydrology and water quality include dewatering the in-channel work area or diverting water around the in-channel work area and widening of the existing bridge (including piers and abutments). This work, which includes in-channel work and earthwork, has the potential to degrade water quality onsite and offsite due to erosion and siltation. This project includes new impervious surface of approximately 21.87 ac, which may increase if auxiliary lanes are added. Hence, providing post-construction treatment BMPs is a requirement. Potential treatment BMPs that are practical for this project would be evaluated during the design phase. Post-construction stormwater flows would not exceed pre-construction stormwater flows and would not increase the amount of pollutants in surface runoff above existing levels.

The Floodplain Evaluation Report Summary (California Department of Transportation 2020e) determined that the proposed project is located within a mapped 100-year flood hazard area. However, the project would only minimally alter surface elevations within the mapped 100-year floodplain and would not result in a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).

CEQA Determination

The proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Specifically, the project would not deplete groundwater supplies or interfere with groundwater recharge such that the project may impeded sustainable groundwater management of the basin. As described above, work would include dewatering the in-channel work area, potential installation of a temporary water diversion, and performing earthwork. There is a potential for limited erosion/siltation to occur during construction, which could temporarily degrade surface water quality. However, the proposed project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river. The project would increase impervious surfaces; however, it would be treated in a manner that would not substantially increase the rate or amount of surface runoff such that it would result in flooding onsite/offsite; impede or redirect flows; create or contribute stormwater runoff which would exceed the capacity of existing or planned stormwater drainage systems; or provide substantial additional sources of polluted runoff. The proposed project would not risk release of pollutants due to inundation by flood, tsunami (California Department of Conservation 2020g), or seiche. With implementation of measures to control erosion and siltation, the proposed project would have a less than significant impact on hydrology and water quality.

Avoidance, Minimization, and/or Mitigation Measures

The following measures identified in the Water Quality Assessment Report (California Department of Transportation 2020f) would be implemented to avoid/minimize impacts to water quality during construction:

- All construction site BMPs shall follow the most current edition of the *Construction Site Best Management Practices (BMPs) Manual* (California Department of Transportation 2017). For this project, these are likely to include erosion and sediment control BMPs such as ground cover, fiber rolls, gravel bag check dams, and other listed methods.

- Prior to any ground-disturbing activities, the contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP) that identifies measures to be implemented for erosion control, spill prevention, and construction waste containment. These measures shall be implemented during construction to minimize impacts on water quality and the aquatic environment.

- Environmentally sensitive areas (ESAs) shall be designated and clearly delineated with high-visibility fence on the contract plans during the design phase to avoid potential discharges and unauthorized disturbance to riparian habitat.

In addition to the above measures, the following measure identified in the Natural Environment Study (California Department of Transportation 2020d) shall be implemented to avoid/minimize impacts to water quality during construction:

- Work in Churn Creek would be limited to the period between June 1 and October 15, or as otherwise specified in resource-agency permits. Upon completion of work, the contractor shall restore temporarily disturbed streambed to as close as possible to pre-construction conditions.

3.9 Noise

Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project would have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The rest of this section would focus on the NEPA/Title 23 Part 772 of the Code of Federal Regulations (23 CFR 772) noise analysis; please see the Affected Environment, Environmental Consequences, and CEQA Conclusion sections of this document for further information on noise analysis under CEQA.

NATIONAL ENVIRONMENTAL POLICY ACT AND 23 CFR 772

For highway transportation projects with Federal Highway Administration (FHWA) involvement (and the Department, as assigned), the Federal-Aid Highway Act of 1970 and its implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). Table 7 lists the noise abatement criteria for use in the NEPA/23 CFR 772 analysis.

Table 7. Noise Abatement Criteria		
Activity Category	**NAC, Hourly A- Weighted Noise Level, Leq(h)**	**Description of activity category**
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.
[1] Includes undeveloped lands permitted for this activity category.		

Figure 7 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

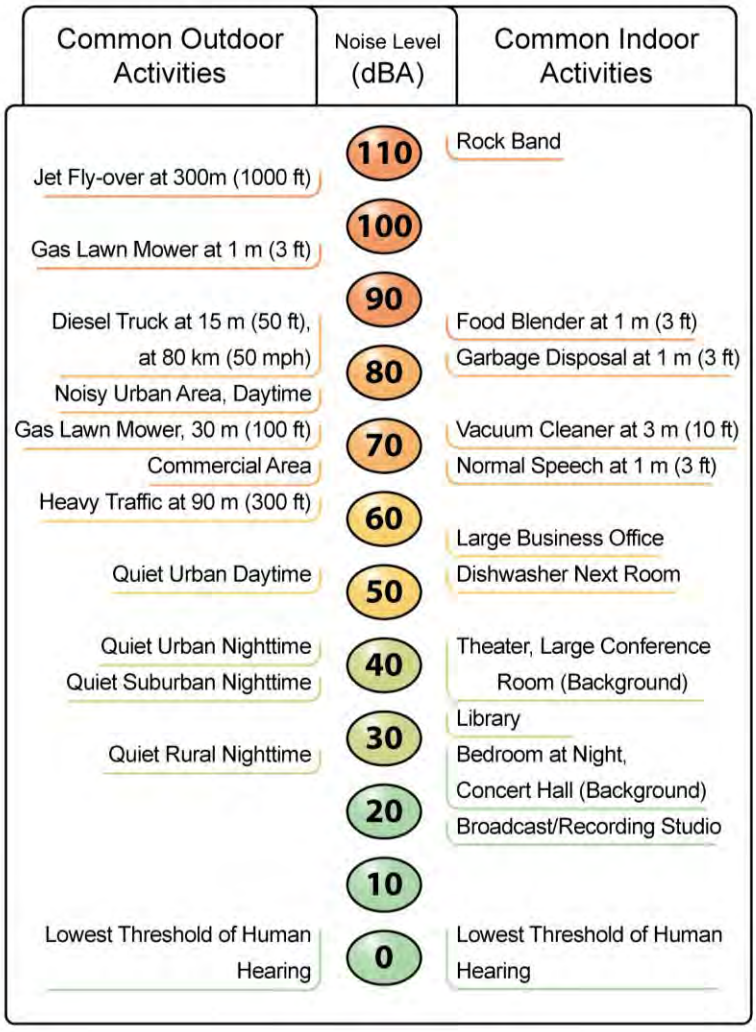

Figure 7. Noise Levels of Common Activities

According to the Department's *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011*, a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more) or when the future noise level with the project approaches or exceeds the NAC. A noise level is considered to approach the NAC if it is within 1 dBA of the NAC.

If it is determined that the project would have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

The Department's *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an

engineering concern. Noise abatement must be predicted to reduce noise by at least 5 dB at an impacted receptor to be considered feasible from an acoustical perspective. It must also be possible to design and construct the noise abatement measure for it to be considered feasible. Factors that affect the design and constructability of noise abatement include, but are not limited to, safety, barrier height, topography, drainage, access requirements for driveways, presence of local cross streets, underground utilities, other noise sources in the area, and maintenance of the abatement measure. The overall reasonableness of noise abatement is determined by the following three factors: 1) the noise reduction design goal of 7 dB at one or more impacted receptors; 2) the cost of noise abatement; and 3) the viewpoints of benefited receptors (including property owners and residents of the benefited receptors).

Affected Environment

The project area includes Single-family residences, hotels, commercial retail and undeveloped areas adjacent to Interstate 5 just North of Redding. Noise measurements were performed at various locations in the project area to determine existing background noise levels and to validate the traffic noise model. The measured noise levels at these locations currently range from 56 to 65 A-weighted decibels hourly equivalent sound level (dBA Leq[h]).

Environmental Consequences

A Noise Study Report was completed for this project in March 2020 which included research of land uses, measuring existing noise levels at a number of locations in the project study area, modeling existing noise levels in areas that could not be measured due to restrictions during field measurements (e.g. such as barking dogs, receiver exposure limitations), and modeling future noise levels to predict what noise levels would be if the project is constructed.

Under controlled conditions, the trained healthy human ear is able to discern a one decibel change in noise levels. In typical noisy environments, a change in noise levels of one to two decibels is generally not perceptible. It is generally accepted that people are able to begin to detect sound level increases of three decibels in typical noisy environments and that a five-decibel increase is perceived as a distinctly noticeable increase. A ten-decibel increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy, such as doubling the volume of traffic on a highway that would result in a three decibel increase in sound would generally be perceived as barely detectable. The general consideration for a community noise environment would be that a change in noise levels over five decibels would be a noticeable change and a change of less than three decibels would not be noticeable.

Due to the complexity of the project area traffic noise modeling was broken down into the 3 areas identified in the table below to determine noise level impacts.

Area ID	Location
A	Begin Project Limit (PM 14.8) to Route 44 (PM 15.45)
B	Route 44 (PM 154.45) to Route 299 (PM 17.32)
C	Route 299 (PM 17.32) to End Project Limit (PM 20.0)

Area A

The traffic noise modeling results indicate traffic noise levels at residences in Area A are predicted to be in the range of 64 to 73 dBA L_{eq}(h) in the design-year, and that the increase in noise be 2 dB in the design-year. Because the predicted noise level in the design-year exceeds

67 dBA L_{eq} (h), traffic noise impacts are predicted at residences in this area, and noise abatement must be considered in this area. The predicted noise levels at two hotels ranges from 64 to 66 dBA L_{eq}(h), this is below the noise abatement criteria of 72 dBA, therefore, no traffic noise impact is predicted to occur.

Area B

The traffic noise modeling results indicate traffic noise levels at residences in Area B are predicted to be in the range of 60 to 73 dBA L_{eq}(h) in the design-year, and that the increase in noise would be 2 dB in the design-year. Because the predicted noise level in the design-year exceeds 67 dBA L_{eq} (h), traffic noise impacts are predicted at residences in this area, and noise abatement must be considered in this area.

The traffic noise levels at commercial uses in Area C would be 73 dBA L_{eq}(h) in the design-year. The results also indicate that the increase in noise between existing conditions and the design-year is 2 dB. Because there is no noise abatement criterion for this category of use and because the project would not result in a substantial increase in noise, noise abatement does not need to be considered.

Area C

The traffic noise modeling results indicate traffic noise levels at residences in Area C are predicted to be in the range of 61 to 73 dBA L_{eq}(h) in the design-year, and that the increase in noise would be 2 dB in the design-year. Because the predicted noise level in the design-year exceeds 67 dBA L_{eq} (h), traffic noise impacts are predicted at residences in this area, and noise abatement must be considered in this area.

The traffic noise levels at commercial uses in Area C would be 70 dBA L_{eq}(h) in the design-year. The results also indicate that the increase in noise between existing conditions and the design-year is 2 dB. The predicted noise levels at hotels ranges from 66 to 70 dBA L_{eq}(h), this is below the noise abatement criteria of 72 dBA, therefore, no traffic noise impact is predicted to occur, and abatement is not considered.

Table 8 (below) compares measured sound levels and summarizes the traffic noise modeling results for existing conditions and design-year conditions with and without the project including noise barrier analysis.

Table 8. I-5 Future worst hour noise levels

Receptor I.D.	Land Use	Existing Noise Level $L_{eq}(h)$, dBA	I-5 Future Worst Hour Noise Levels - $L_{eq}(h)$, dBA																							
									Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																
									6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
			Design Year Noise Level without Project $L_{eq}(h)$, dBA	Design Year Noise Level with Project $L_{eq}(h)$, dBA	Design Year Noise Level without Project minus Existing Conditions $L_{eq}(h)$, dBA	Design Year Noise Level with Project Minus No Project Conditions $L_{eq}(h)$, dBA	Activity Category (NAC)	Impact Type	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
ST-1	Residential	70	71	71	1	0	B (67)	A/E	67	4	0	65	6	3	63	8	3	62	-9	3	61	-10	3	61	-10	3
ST-1A	Residential	61	63	64	2	1	B (67)	None	63	1	0	63	1	0	63	1	0	61	2	0	60	4	0	60	4	0
R-1	Residential	71	73	73	2	0	B (67)	A/E	69	4	0	66	6	2	64	9	2	63	10	2	63	10	2	62	11	2
R-1A	Residential	64	65	66	1	1	B (67)	A/E	65	1	0	63	3	0	61	5	4	60	6	4	60	6	4	59	7	4
R-2	Hotel	64	65	66	1	1	E (72)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-2A	Hotel	62	63	64	1	1	E (72)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ST-2	Residential	69	70	71	1	1	B (67)	A/E	67	4	0	65	6	3	63	8	3	61	10	3	61	10	3	61	10	3
R-3	Residential	69	70	70	1	0	B (67)	A/E	67	3	0	65	5	3	64	6	3	62	8	3	61	9	3	61	9	3
R-4	Residential	70	72	73	2	1	B (67)	A/E	73	0	0	70	2	0	67	5	4	65	7	4	64	8	4	63	9	4
ST-3A	Residential	61	62	62	1	0	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-5	Commercial	71	73	73	2	0	F N/A	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-5A	Commercial	70	71	71	1	0	F N/A	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ST-3	Residential	63	65	65	2	0	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-6A	Residential	63	64	64	1	0	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-6B	Residential	63	64	65	1	1	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-7	Residential	58	60	60	2	0	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R-7B	Residential	59	60	60	1	0	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ST-4	RV Park	62	64	65	2	1	C (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ST-5	Residential	63	65	65	2	0	B (67)	None	65	0	0	65	0	0	64	1	0	63	2	0	63	2	0	62	3	0
ST-5A	Residential	62	63	64	1	1	B (67)	None	63	1	0	62	2	0	61	3	0	60	4	0	59	5	5	59	5	5
ST-7	Residential	70	72	72	2	0	B (67)	A/E	70	2	0	69	3	0	67	5	6	66	6	6	65	7	6	65	7	6
R-8	Residential	64	66	66	2	1	B (67)	A/E	66	0	0	66	0	0	65	1	0	65	1	0	64	2	0	63	3	0
R-8A	Residential	67	68	69	1	1	B (67)	A/E	67	2	0	66	3	0	65	4	0	65	4	0	63	6	4	61	8	4
R-10	Residential	68	69	70	1	1	B (67)	A/E	67	3	0	67	3	0	66	4	0	63	7	9	62	8	9	61	9	9
ST-6	Residential	64	66	66	2	0	B (67)	A/E	64	2	0	63	3	0	59	7	6	58	8	6	57	9	6	57	9	6
ST-8	Residential	72	73	73	1	0	B (67)	A/E	70	3	0	70	3	0	69	4	0	67	6	3	67	6	3	67	6	3
R-9	Residential	65	66	66	1	0	B (67)	A/E	62	4	0	61	5	7	59	7	7	57	9	7	57	9	7	57	9	7
R-11	Residential	64	65	66	1	1	B (67)	A/E	63	2	0	63	2	0	59	6	5	58	7	5	58	7	5	58	7	5
R-11A	Residential	64	65	65	1	0	B (67)	None	63	2	0	62	3	0	60	5	4	59	6	4	59	6	4	59	6	4
R-9A	Residential	63	64	64	1	0	B (67)	None	62	3	0	61	3	0	61	3	0	61	3	0	60	4	0	60	4	0
R-9B	Residential	60	61	61	1	0	B (67)	None	59	2	0	59	2	0	58	3	0	58	3	0	58	3	0	57	4	0

R-12	Residential	62	64	65	2	1	B (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-13	Commercial	63	65	66	2	1	F N/A	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-14	Commercial	62	64	65	2	1	F N/A	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-15	Hotel	69	70	71	2	1	E (72)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-15A	Hotel	70	71	73	1	2	E (72)	A/E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-16	Hotel	68	69	70	1	1	E (67)	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-17	Commercial	69	70	72	1	2	F N/A	None																	
R-18	Commercial	68	69	71	1	1	F N/A	None																	
R-19	Commercial	69	70	72	1	2	F N/A	None																	
R-20	CHP Center	67	69	70	2	1	F NA	None																	
R-21	Fun Center	62	64	65	2	1	F N/A	None																	
R-22	Commercial	69	70	71	1	1	F N/A	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R-23	Commercial	70	72	72	2	1	F N/A	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CEQA Determination

The proposed project would not have a significant effect under the California Environmental Quality Act for the following reasons: increase in noise levels would occur over an approximate twenty-year timeframe, and traffic increases are anticipated at the same levels with either the Build or No Build Alternatives. The maximum modeled increase in decibel level with the project is 2 decibels.

Avoidance, Minimization, and/or Mitigation Measures

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 7-1.01I "Sound Control Requirements," which states that noise levels generated during construction shall comply with applicable local, state, and federal regulations, and that all equipment shall be fitted with adequate mufflers according to the manufacturers' specifications. Construction noise would be temporary, intermittent, and overshadowed by local traffic noise. Because construction would be conducted following Caltrans' Standard Specifications, no adverse noise impacts from construction are anticipated.

Though not required for CEQA mitigation, Title 23, Code of Federal Regulations (CFR), Part 772 of the Federal Highway Administration (FHWA) standards (23 CFR 772) and the 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 decibel (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 non-acoustical 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.

A Draft Noise Abatement Decision Report was completed for the project in April of 2020. The potential traffic noise impacts to the local receptors within the project limits were studied. All sound walls studied were for abatement, not mitigation. Sound wall locations identified in the project noise study report (NSR) were considered for economic effectiveness. All sound walls studied were accoustically feasible and would provide a minimum of 5-dBA attenuation. All four accoustically feasible sound walls, did not meet the reasonable allowance criterion (i.e., construction cost are greater than estimated benefit value). The project as currently proposed, does not include sound attenuation walls.

3.10 Transportation/Traffic

Regulatory Setting

The Department, as assigned by the Federal Highway Administration (FHWA), directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of Federal-aid highway projects (see 23 Code of Federal Regulations [CFR] 652). It further directs that the special needs of the elderly and the disabled must be considered in all Federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation (USDOT) issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the USDOT regulations (49 CFR 27) implementing Section 504 of the Rehabilitation Act (29 United States Code [USC] 794). The FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to federal-aid projects, including Transportation Enhancement Activities.

Affected Environment

Interstate 5 serves a mix of interregional traffic, as well as regional and local traffic. The Interstate 5 corridor in Shasta County has the highest traffic volumes in California north of Sacramento and interregional traffic is projected to continue to grow over time. Recent projects on the Interstate 5 corridor from the Tehama/Shasta County line to the City of Redding have

added a third lane in each direction to reduce traffic congestion. The currently proposed project is a capacity-increasing project, which would widen Interstate 5 from four to six lanes from 0.3 miles north of the Cypress Avenue Overcrossing (post mile R14.8) in Redding to 0.6 miles north of the Oasis Road Overcrossing (post mile R20.0) near Shasta Lake City. Work includes widening almost exclusively to the median with limited outside widening as needed to provide a 12-foot-wide lane and 10-foot median shoulder in each direction. Currently, there is not a need to improve capacity within the project area (Redding's population has grown minimally from 89,861 in 2010 to an estimated 91,772 in 2018), but there is a need to improve operations within the project area. This need is most evident during regular winter storms and multiple recent wildfire events. During winter weather events, traffic backs up from highway closures or chain control check points north of Redding creating backups south through the City Redding. This segment was identified as a bottleneck during mass evacuations from the City of Redding and surrounding areas that occurred during the Carr Fire in 2018. This four lane gap section of freeway is the only bottleneck point on I-5 in Shasta County from the Tehama County line to Shasta Lake City, restricting freeway operations and interregional goods movement. Once completed, the project would improve traffic circulation and improve system resiliency on this portion of I-5.

The proposed project is consistent with state and local transportation plans and programs. Operational improvements to enhance interregional connectivity for motorized travel on Interstate 5 is consistent with the corridor vision described in the *2008 Interstate 5 Transportation Concept Report* (California Department of Transportation 2008) and is shared with the Shasta Regional Transportation Agency. The *2008 Interstate 5 Transportation Concept Report* stated that the twenty-year facility concept at this location is a six-lane freeway and the post-twenty-year concept is an eight-lane freeway. The Shasta County Regional Transportation Agency identified the Interstate 5 corridor from the Tehama/Shasta County line north to the Mountain Gate near Lake Shasta as a top priority. The *2018 Shasta County Regional Transportation Plan* (Shasta County Regional Transportation Agency 2018) identified the currently proposed project as a high priority to alleviate forecasted congestion and bottlenecks on Interstate 5 between Redding and Shasta Lake City.

Existing freeway features in the project area include five freeway interchanges and 12 bridges in each direction of traffic. The five interchanges within the project area consist of four full interchanges and one partial interchange (Table 9). The southern portion of the project area includes the City of Redding's Sacramento River Trail, which links downtown with Hilltop Avenue.

Table 9. Freeway Interchanges

Exit Number	Road Served	Ramp Movements Provided	Post Mile (PM)	Distance Between Interchanges (miles)	Local Government Jurisdiction and Comments
678	44	• NB Off • NB On • SB Off • SB On	15.45		State Facility Weaving conflicts SB 5 and EB 44
				1.9	
680	299	• NB Off • NB On • SB Off • SB On	17.32		State Facility

				0.8	
681	Twin View Boulevard	• NB Off • NB On	18.07		City of Redding
681A	Twin View Boulevard	• SB Off • SB On	18.07		
				0.4	
681B	273	• NB On • SB Off	18.48		State Facility
				0.9	
682	Oasis Road	• NB Off • NB On • SB Off • SB On	19.40		City of Redding

Level of Service (LOS) is a qualitative measure of traffic operating conditions as perceived by drivers, which varies from LOS “A” (un-congested conditions) to LOS “F” (congested conditions). Figure 8 illustrates and describes the LOS thresholds from the *Highway Capacity Manual* for freeway sections.

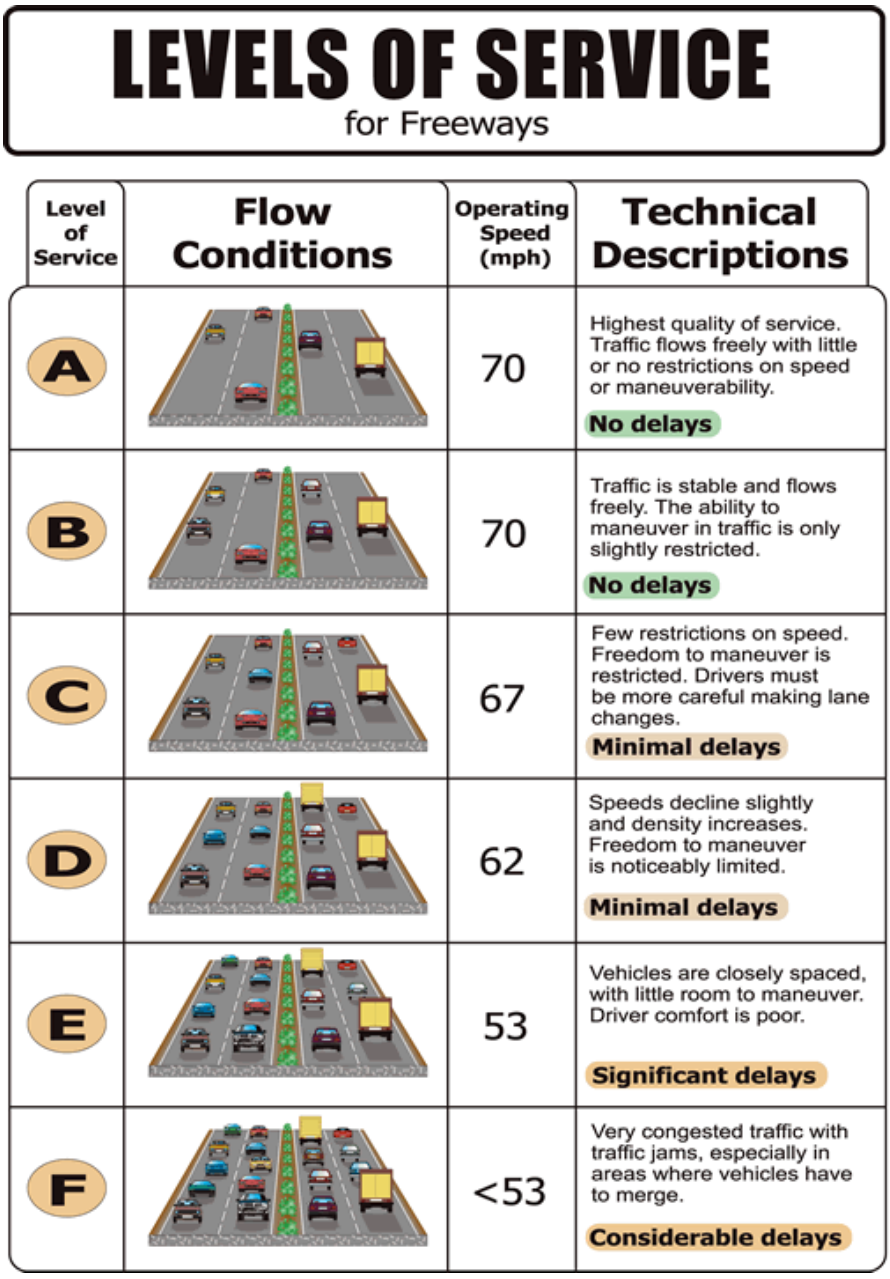

Figure 8. Levels of Service for Freeways

Caltrans District 2 seeks to implement improvements on Interstate 5 when LOS is projected to fall below LOS "C". This improvement standard is commonly referred to as the "C/D Threshold." When projections show a segment would fall to LOS "D" under average monthly conditions, improvements should be pursued. Without the proposed improvements to this section of Interstate 5, traffic congestion that reduces the LOS below the "C/D" Threshold is anticipated by 2035.

Environmental Consequences

Projected vehicle miles traveled (VMT) for the project area was calculated utilizing three different models: Caltrans District 2 Traffic Operations Unit modeling, the National Center for Sustainable Transportation's (NCST) Induced Travel Calculator, and the Shasta Regional Transportation Agency's (SRTA) ShastaSIM regional traffic model. The results of each model are discussed below.

Caltrans VMT Modeling

Traffic data for this project is based on and compared to the existing traffic counts and classifications determined by the Caltrans District 2 Traffic Operations Unit as well as projected data provided by the Caltrans District 2 Office of System Planning. The Caltrans volumes are based on two data sources:

1. Historical traffic counts collected by Caltrans Traffic Census and corresponding growth trends.
2. The Shasta Regional Travel Demand Model (ShastaSim 1.2).

Growth was calculated based on historical growth and adjusted with consideration of the Regional model data and anticipated development in the area. Shasta Regional Transportation Agency, an MPO, uses their traffic model for the Regional Transportation Plan and it is accepted by FHWA.

Table 10. Existing and Projected Traffic Volumes and Other Metrics in the Project Area

Scenario/ Analysis Year	[1]Segment/ Location	Average Annual Daily Traffic (AADT)	Vehicle Miles Traveled (Daily)	Time Saved (Hours/Day)	Corridor Travel Time (Hours/Day)	Average Speed (mph)		Level of Service
						Peak Travel	Off-Peak Travel	
Baseline Year (2016)	Existing 4-Lanes	59,000	241,900	—	—	59	60	C
	Existing 6-Lanes		88,500	—	—	60	60	B
No Build Alternative Opening Year (2026)	Existing 4-Lanes	66,000	270,600	—	6,397	50	57	D
	Existing 6-Lanes		99,000			59	60	B
No Build Alternative Design Year (2046)	Existing 4-Lanes	86,000	352,600	—	9,202	43	50	E
	Existing 6-Lanes		129,000			58	60	C
Build Alternative Opening Year (2026)	Full Project	66,000	369,600	237	6,160	60	60	B
Build Alternative Design Year (2046)	Full Project	86,000	481,600	1,125	8,027	59	60	C

[1] Segment/Location
Existing 4-lane section (Post Miles R14.4–R18.5)
Existing 6-lane section (Post Miles R18.5–R20.0)
Full Project: 6-lanes throughout entire project area (Post Miles R14.4–R20.0)

Using 2016 as the base year, AADT in the project area was estimated at 59,000. Traffic modeling predicts no difference in AADT between the no-build and build alternative for the opening year (2026) and design year (2046). The AADT is predicted to be 66,000 and 86,000 for the no-build and build alternative in 2026 and 2046, respectively. Without the proposed improvements, congestion that reduces LOS below the "C/D" Threshold is anticipated for the existing 4-lane section of roadway by 2024; the existing 6-lane section of roadway is anticipated to remain above the "C/D" Threshold until approximately 2064. With the proposed improvements, the addition of a third lane in each direction of travel would increase the structural capacity of the Interstate and the LOS for the entire project area would remain above the "C/D" Threshold until approximately 2054. However, because the proposed improvements would not increase vehicles on the Interstate, an induced travel analysis is not required for the build alternative.

Time saved, expressed as time saved by comparing VMT and vehicle hours traveled (VHT), and corridor travel time are shown in Table 10 for each scenario. No time is saved in the baseline year and the no build scenarios. When compared to the baseline year (2016), the time saved for the build alternative is 237 hours in the opening year (2026) and 1,125 hours in the design year (2046).

NCST VMT Modeling
The NCST at the University of California at Davis developed the Induced Travel Calculator, which allows users to estimate the VMT induced annually because of adding general-purpose or high-occupancy-vehicle lane miles to roadways managed by Caltrans in urbanized counties (counties within a metropolitan statistical area). The calculator applies only to Caltrans-managed facilities with FHWA functional classifications of 1, 2 or 3. That corresponds to interstate highways (class 1), other freeways and expressways (class 2), and other principal arterials (class 3). The Induced Travel Calculator, when factored to include the Redding geographic area and 9 miles of new lanes added (this includes 3.33 miles of new auxiliary lanes), projects an increase in 18.8 million VMT per year. However, given that Shasta County is not an urbanized county, this model may not be an accurate predictor of VMT for the project area.

Shasta Regional Transportation Agency VMT Modeling
According to SRTA's ShastaSIM regional traffic model, without changes resulting from implementation of the 2015 RTP, total daily VMT in Shasta County would increase by approximately 32% between 2005 and 2035 (Table 11). Daily per capita VMT would remain relatively steady, increasing by only 6% over the same 30-year period. However, given that SRTA's ShastaSim regional traffic model is most useful for modeling VMT at a regional level and not at the project-level, this model may not be an accurate predictor of VMT for the project area.

Table 11. Total Daily VMT and VMT Per Capita[1]

Year	Total Daily VMT	VMT/Capita
2005	5,606,121	26.81
2020	6,171,441	26.88
2035	7,390,629	28.51

[1] Results from the Shasta SIM travel model reflect the current growth trend of the region without changes resulting from implementation of the 2015 RTP. Includes all trip types (inter-regional, intra-regional, and through trips).

Comparison of VMT Model Results

As described previously, the Caltrans model shows no change in VMT between the build and the no build alternative for 2026 and 2046; the NCST Induced Travel Calculator shows an increase of 18 million VMT because of the lane additions; and SRTA'S ShastaSIM regional traffic model shows a 32% increase in total daily VMT between 2005 and 2035 and a 6% increase in daily per capita VMT over that same period. Given the results of the three models and considering their applicability to the specific project location, it was determined that the most accurate model to predict VMT for the project area is the Caltrans model. As such, the results of Caltrans model are the basis for the CEQA significance determination regarding VMT.

Impacts

Construction of the proposed project would require day and night work, lane and ramp closures, reducing the posted speed limit in construction zones, periodic closure of the City of Redding's Sacramento River Trail beneath Interstate 5 at the SR 44 interchange, and periodic closure of a paved pedestrian/bicycle trail beneath Interstate 5 at the SR 299 interchange. The proposed project would not result in long-term/operational impacts. Short-term impacts during construction would include a slightly longer travel time for motorists to transit through construction zones because the posted speed limit in the available lane(s) would be reduced from 65 miles per hour to 55 miles per hour or lower. However, no substantial delays in travel time are expected. Cross traffic on roadways beneath Interstate 5 would be minimally impacted during placement of girders for new bridges because full roadway closures at night would be required periodically. Bicyclists and pedestrians who utilize the Sacramento River Trail beneath Interstate 5 at the SR 44 interchange and the trail beneath Interstate 5 at the SR 299 interchange would be minimally impacted by work at these locations, which would require periodic closure to allow for installation of falsework and shoring or placement of girders to widen the roadway. The project would have minimal to no impact on local roads. The addition of an auxiliary lane to the SR 44/Interstate 5 connector is considered a connector improvement. However, given that the proposed project would not induce vehicle traffic on the interstate, freeway connector volumes are not expected to change.

CEQA Determination

The proposed project would not substantially conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities; would not substantially increase hazards due to a geometric design feature or incompatible

uses; would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b), based on VMT traffic modeling; and would not result in inadequate emergency access. With implementation of the measures to minimize impacts to traffic, bicyclists, and pedestrians during construction, the proposed project would have a less than significant impact on transportation.

Avoidance, Minimization, and/or Mitigation Measures

A Traffic Management Plan (TMP) was prepared for the proposed project (California Department of Transportation 2020b). The TMP identified various traffic/transportation impacts that would occur during construction of the project. In addition, the TMP identified measures to be implemented during construction to minimize traffic/transportation impacts. The following measures shall be implemented to minimize potential impacts on traffic, bicyclists, and pedestrians:

Public Outreach
Prior to construction, the following public outreach efforts shall be made:

- Inform the public about the proposed project.
- Notify adjacent homeowners, property owners, and businesses about the proposed project.
- Coordinate with local bicycle/pedestrian trail user groups that use the Sacramento River Trail.
- Coordinate with the City, County, and local hospitals to ensure that emergency response personnel and public transportation personnel are aware of the proposed project.
- Coordinate with local school districts to ensure that the proposed project would have minimal disruption on transporting students to and from schools.
- Implement a public information campaign (e.g., news releases and worker safety media campaign).

Vehicle Traffic

- Lane Closures: No lane closures on Interstate 5 shall occur when traffic volumes exceed the carrying capacity of the remaining open lane (for this segment of Interstate 5, the carrying capacity is estimated at 1,200 vehicles per lane). Based on review of traffic volumes for this segment of Interstate 5, 2 lanes of traffic in each direction of travel shall remain open during daytime and after 3:00 p.m. on Fridays, on weekends, on designated legal holidays, and on special days/special events. Lane closures that reduce the traveled way to 1 lane shall be allowed only at night. During night work, at least one 12-foot-wide paved lane with a shoulder to provide a 16-foot horizontal clearance shall be provided at all times. Standard Plan T10 shall be used for lane and shoulder closures.
- Ramp Closures: Ramps shall remain open after 3:00 p.m. on Fridays, on weekends, designated legal holidays, and on special days/special events. One ramp closure is allowed in each direction of travel at any one time. Night closures

shall be allowed for a limited number of times at each ramp. Standard Plan T14 shall be used for ramp closures.

- Motorist Information: A portable changeable message sign (PCMS) shall be placed before the first traffic control sign for each approach. Additional PCMSs be required to inform motorists of ramp and highway closures and speed zone reductions.

Bicyclists and Pedestrians

- Cyclists and pedestrians are prohibited on this section of I-5. When preparatory work on bridge columns would encroach onto trails, the contractor shall provide a temporary detour for pedestrians and bicyclists. When temporary closure of trails is required, closures shall be kept to a minimum, restricted to night time, and the contractor shall transport trail users around the construction zone as needed.

3.11 Utilities and Service Systems

Affected Environment

Various utilities are present within the project area. These include overhead electrical lines mounted on utility poles, underground telephone cables, and underground fiber optic cables. In addition, solid waste collection service providers transit through the project area as part of solid waste collection.

Environmental Consequences

Construction of the project would not disrupt solid waste collection services nor result in any planned loss of telephone services. Construction of the project would require the relocation of underground telephone cables located east of the existing bridge. The earthwork associated with the relocation of underground telephone cables (as well as other construction-related activities) has the potential to impact water quality and the aquatic environment. The contractor would need water for implementing palliative dust control, and a municipal supply location would be identified prior to awarding the contract.

CEQA Determination

The proposed project would use a municipal water supply location and would not need a wastewater treatment provider to service the project. The project would not generate solid waste exceeding state or local standards, or exceeding the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. As such, the proposed project would comply with federal, state, and local statutes and regulations related to solid waste. With implementation of standard BMPs for erosion control and spill prevention during utilities work, the proposed project would have a less than significant impact on utilities and service systems.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are included for utilities and service systems.

3.12 Wildfire

Regulatory Setting

Senate Bill 1241 required the Office of Planning and Research, the Natural Resources Agency, and the California Department of Forestry and Fire Protection to develop amendments to the "CEQA Checklist" for the inclusion of questions related to fire hazard impacts for projects located on lands classified as very high fire hazard severity zones. The 2018 updates to the CEQA Guidelines expanded this to include projects "near" these very high fire hazard severity zones.

Affected Environment

Most of the project area is located within the City limits of Redding, which is classified as a Local Responsibility Area by the California State Department of Forestry and Fire Protection's Office of the State Fire Marshal Fire Assessment Mapping program (FRAP). The City of Redding is responsible for providing fire protection in this area. FRAP classifications in the project area include Very High Fire Severity zones, High Fire Severity zones, Moderate Fire Severity zones, as well as un-zoned areas. The majority of land outside the City limits of Redding within Shasta County is classified by FRAP as State Responsibility Area meaning the State of California through Cal Fire is responsible for providing fire protection. Other lands within California are Federally owned and not mapped by the FRAP program. Figures 9 and 10 below illustrate the Shasta County mapped Fire Severity Zones provided by the FRAP program.

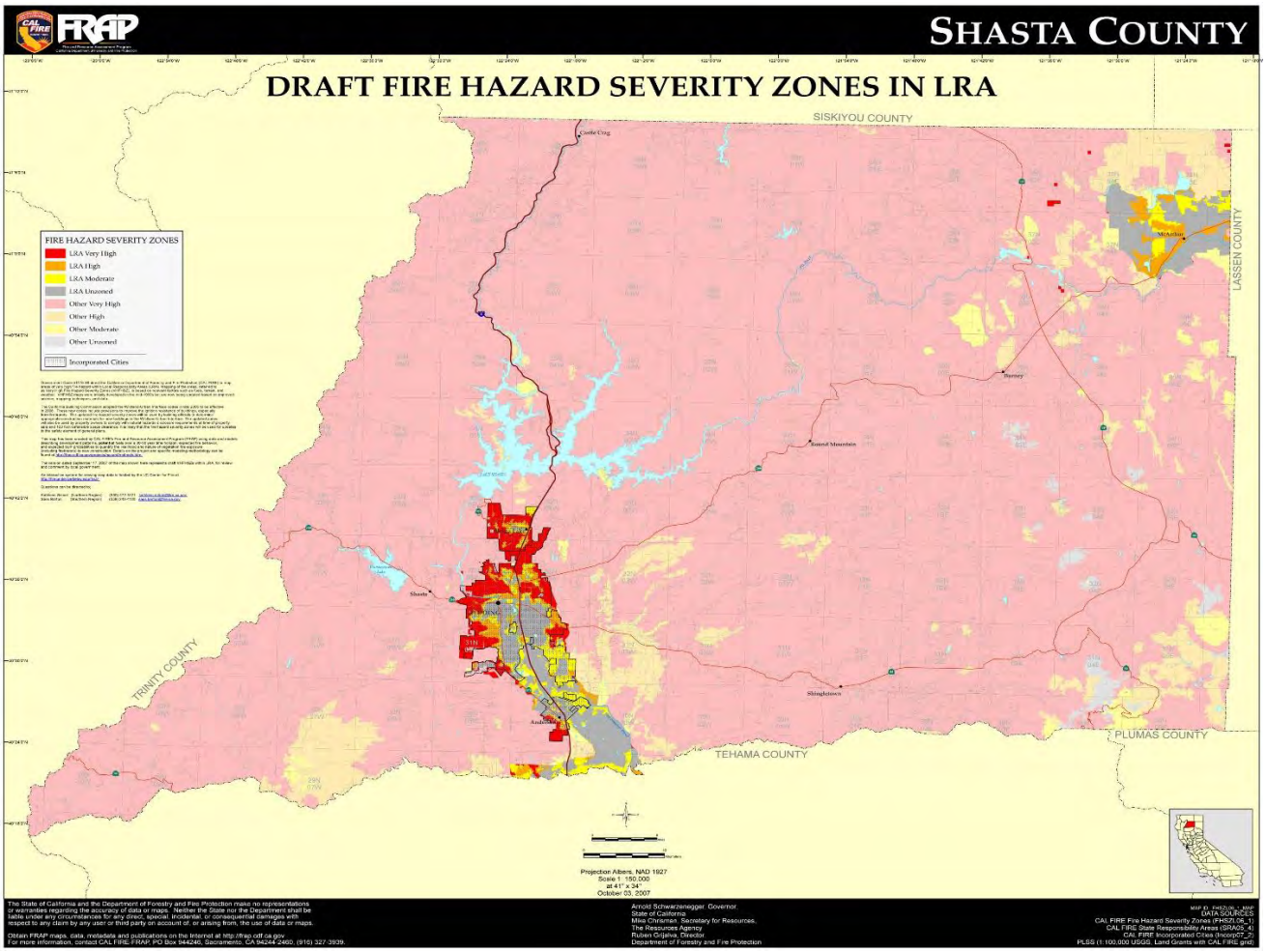

Figure 9. Draft fire hazard severity zones in Local Responsibility Area

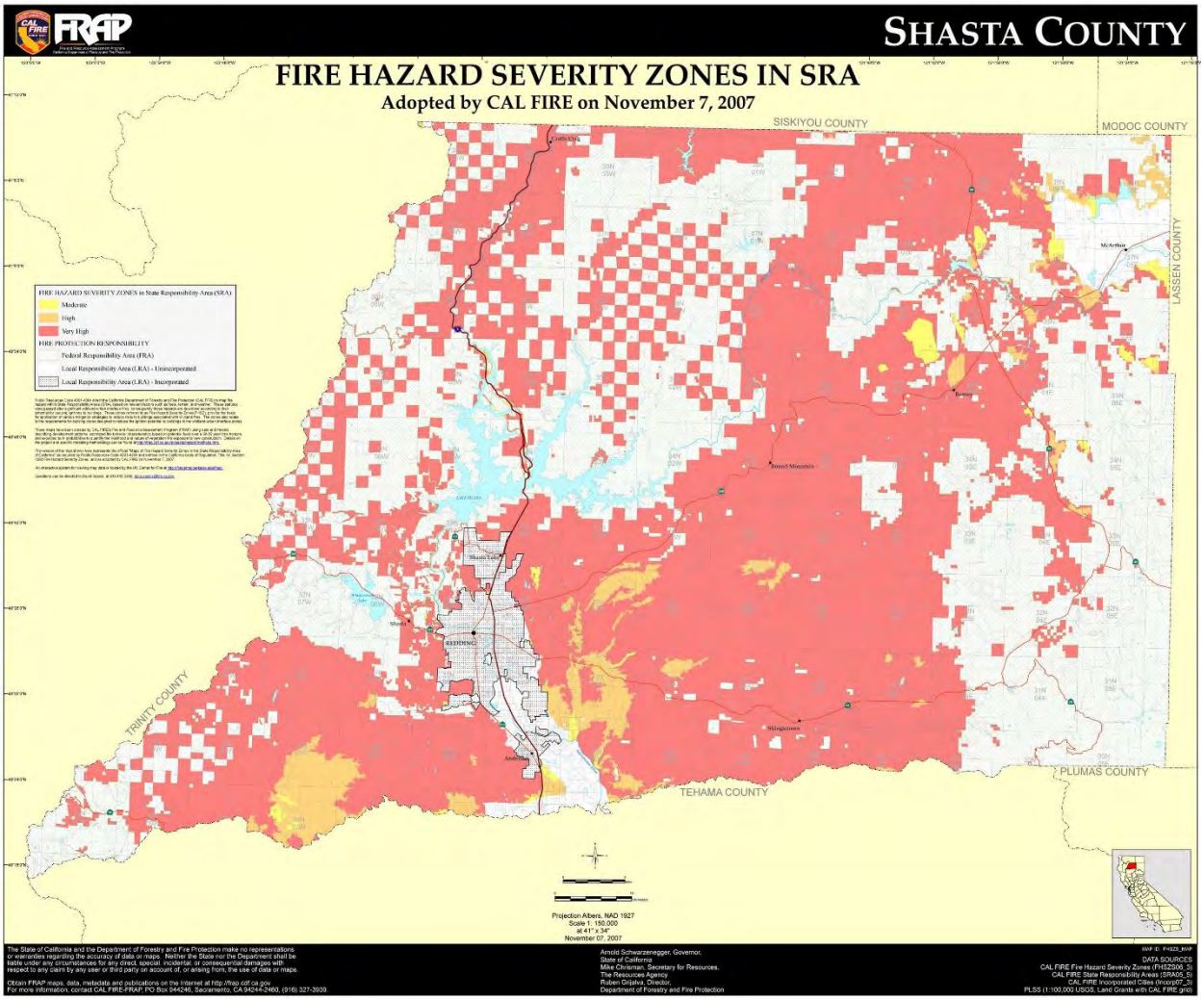

Figure 10. Fire hazard severity zones in State Responsibility Area

Caltrans is one of two primary State Agencies tasked with the Essential Function of Transportation within the Shasta County Emergency Operations Plan. According to the Plan, the immediate use of transportation systems for emergency operational activities may exceed local capabilities thus requiring assistance from the Mutual Aid system. With multiple large wildfires impacting Interstate-5 within the last three years, including the Carr fire, Delta fire, and Hirtz fire, improved system resiliency is needed.

Environmental Consequences

The project would improve the existing 4-lane highway into a 6-lane highway. Currently the facility within the project limits has 2 lanes of traffic in each direction (north and south). Outside of the project limits, to the north and south, the highway has 3 lanes of traffic in each direction. The proposed project would fill in the last gap of 6-lane highway, creating over 22 miles of continuous 6-lane highway serving the entire corridor between Shasta Lake City to the north and Cottonwood to the south. During construction, work would be staged to maintain 2 lanes of traffic in each direction through the project area which would not impede emergency response or potential evacuations.

Project construction could require lane reductions for items of work such as lifting bridge girders into place for bridge widening. If needed, lane reductions and traffic closures would be closely coordinated and approved by the Caltrans Traffic Management Branch. Coordination and outreach with the California Highway Patrol, local law enforcement and emergency response agencies would occur prior to the closures and a public information campaign would be implemented. The proposed project would not substantially impair an adopted emergency response plan or emergency evacuation plan.

After construction is complete, the project would improve the ability of traffic to move through the area, which would improve the ability of the highway to serve the public during wildfire emergencies (emergency response times, congestion relief, evacuation plans and capacity, etc.).

The proposed project would improve existing transportation infrastructure by adding a multi-use lane and widening the paved shoulders on both sides of the road, in each direction.

The proposed project would not construct a new highway on a new alignment that would introduce the public to a different environment. The project does not include facilities for human occupation, shelter or storage such as housing, habitable structures or gathering areas.

The proposed project does not exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Therefore, there would be no impact.

The proposed project is an infrastructure improvement project. Materials used to construct the project are non-combustible. All sources of electrical power would either be underground or contained in conduit and meet current electrical, building, and fire code, standards.

The proposed project does not require the installation or maintenance of additional associated infrastructure that may exacerbate fire risk or that may result in temporary ongoing impacts to the environment. Therefore, there would be no impact.

The proposed project does not include facilities for human occupation, shelter or storage such as housing, habitable structures or gathering areas. The project does not include facilities that would delay, hold, or limit movement of the traveling public such as, an intersection, tunnel, or a long bridge high off the ground, which could expose the public to increased risk in the event of a wildfire.

Therefore, the project as proposed does not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. There would be no impact to people or structures.

Project Benefits

The project increases the width of the road which improves its function as a firebreak, reducing vegetation adjacent to the roadside, and provides additional paved areas for emergency response vehicle staging. The bioswales and detention basins would function improve firebreak function. If wildfire burned within the project limits, the project would reduce exposure to the public by increasing the distance between the travelling public and combustible material.

The project would improve travel time which can decrease emergency response time.

Changeable Message Signs would be available to provide critical information during an emergency and would be used to alert the public during times of high fire danger.

This portion of I-5 was identified as a bottleneck segment during the evacuation of over 40,000 people during the Carr fire in 2018. Improving the segment would increase system resiliency for future emergency events.

CEQA Determination

The project could have short term temporary impacts during construction, but once completed, the project would have beneficial impacts to wildfire associated issues. The project would have a less than significant impact to wildfire.

Avoidance, Minimization, and/or Mitigation Measures

It is Caltrans District 2 standard practice to require the contractor to produce an Emergency Evacuation Plan for projects located within elevated fire danger areas mapped by the Cal Fire FRA program. Standard Special Provision 12-4.02A(3)(c) would be included in contract specifications to require the contractor prepare an EEP.

Chapter 4. List of Preparers

This Initial Study was prepared by the California Department of Transportation, North Region Office of Environmental Management, with input from the following staff:

Russell Adamson, Archaeologist
Contribution: Cultural Resource Report

Joe Baltazar, Transportation Engineer
Contribution: Traffic Management Plan

André Benoist, Environmental Planner
Contribution: Wildfire section writer

Rajive Chadha, Hazardous Waste Specialist
Contribution: Initial Site Assessment Report

Yongil Cho, Transportation Engineer
Contribution: Air Quality/Greenhouse Gas Analysis and Energy Analysis Report

Cabe Cornelius, Environmental Planner
Contribution: Noise section writer

Darrin Doyle, Environmental Planner
Contribution: Air Quality, Greenhouse Gas, and Traffic section writer

Travis Gurney, Engineer
Contribution: Project design, Noise Abatement Decision Report

Steve Mintz, Hydraulic Engineer
Contribution: Location Hydraulic Study Report

Eric L. Rulison, Biologist
Contribution: Natural Environment Study, Document Editor

Sean Shepard, Project Manager
Contribution: Project management

Carolyn Sullivan, Environmental Branch Chief
Contribution: Document oversight

Miguel Villicana, NPDES Coordinator
Contribution: Water Quality Assessment Report

Saeid Zandian, Transportation Engineer
Contribution: Noise Study Report

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Appendix B Public Comments Received and Responses to Comments

Comment 1

-----Original Message-----
From: Lu <lupshaw@ymail.com>
Sent: Thursday, June 18, 2020 7:04 PM
To: D2PIO@DOT <D2PIO@dot.ca.gov>
Subject: Interstate 5 suggestion

EXTERNAL EMAIL. Links/attachments may not be safe.

Hello,

You asked for input on lane expansion north of Redding. 3 lanes to Shasta Lake would be far enough.

The real congestion and your next project should be the ARSL, the “Anderson to Red Bluff Six Lanes”. But maybe outside of your jurisdiction.

Thanks for the work you do, any lane expansion is good.

-Lu

Sent from my iPhone

Response 1

Caltrans would like to thank you for participating in the project delivery process by providing written comments. Your comments are important as they help inform the project team, they help refine the scope, and they reveal and highlight aspects of special concern.

Although the Transportation Concept Report for the Interstate 5 corridor expects six lanes will someday be needed between Anderson and Red Bluff, there is currently no funding available to develop this concept into a project. There is a current project, the 'Tehama Clear-Recovery-Zone' project in the Interstate 5 corridor between Cottonwood and Red Bluff, in the design phase now which will enhance traveler safety by increasing the recovery area for drivers who inadvertently depart from their lane. Any additional lane addition projects will be shared with the public through outreach such as the public outreach completed for the current Fix 5 Cascade Gateway project.

Comment 2

-----Original Message-----
From: Homer Woods <homkat@sbcglobal.net>
Sent: Wednesday, June 24, 2020 9:53 AM
To: D2PIO@DOT <D2PIO@dot.ca.gov>
Subject: I-5 Widening

EXTERNAL EMAIL. Links/attachments may not be safe.

Yes, this should have been done a long time ago. So go ahead.

Sent from my iPhone

Response 2

Caltrans would like to thank you for participating in the project delivery process by providing written comments. Your comments are important as they help inform the project team, they help refine the scope, and they reveal and highlight aspects of special concern. Your support of the project will be shared with the project team and Caltrans decision makers.

Comment 3

-----Original Message-----
From: Michael Gould <mgould101@gmail.com>
Sent: Wednesday, June 24, 2020 10:11 AM
To: D2PIO@DOT <D2PIO@dot.ca.gov>
Subject: I-5 Widening

EXTERNAL EMAIL. Links/attachments may not be safe.

District 2,

I am all for the widening of N/B and S/B lanes to Oasis Road.

Having been a firefighter for over 30 years for the City of Redding, I have been on numerous traffic collisions from Cypress up to Oasis Road. Merging seemed to be causes of many; along with speed when approaching Redding.

I appreciate Cal-Trans asking for input.

Is there any chance California could do the same from Stockton to the Grapevine, lol. Two lanes is terrible!

Regards,

Mike Gould - Redding!

Sent from my iPhone

Response 3

Caltrans would like to thank you for participating in the project delivery process by providing written comments. Your comments are important as they help inform the project team, they help refine the scope, and they reveal and highlight aspects of special concern. Your support will be shared with the project team and Caltrans decision makers. The area between Stockton and the Grapevine is not within the boundaries of Caltrans District 2, but we will share your comments with the other Caltrans Districts responsible for that area.

Comment 4

From: cowboy@shasta.com <cowboy@shasta.com>
Sent: Wednesday, June 24, 2020 10:24 AM
To: D2PIO@DOT <D2PIO@dot.ca.gov>
Subject: Redding FIX 5 Project

EXTERNAL EMAIL. Links/attachments may not be safe.

The widening is fine, but what you NEED to also do is develop circular on/off ramps at each of the street intersections (Bonnyview, Cypress) so that the traffic on those streets can be reduced. Right now the stop lights increase the traffic and rush hour is crazy. Also, the entrance ramp to 44 that exists at Dana and Hilltop needs to include on ramps to Hwy 5, possible even at the Hilltop overpass.

Also fix the 44 to Eureka Way to 299 mess through Redding.

Jim Policastro
22687 River View Drive
Cottonwood, CA 96022
530-227-1144
cowboy@shasta.com

Response 4

Caltrans would like to thank you for participating in the project delivery process by providing written comments. Your comments are important as they help inform the project team, they help refine the scope, and they reveal and highlight aspects of special concern.

Local Caltrans planners and engineers recognize the busy nature of the Cypress and Bonnyview interchanges. We also appreciate that direct access to I-5 from the Dana/Hilltop area would alleviate some congestion on Dana. Proposals to reconfigure the ramps and streets would be the domain of the City of Redding, with whom Caltrans has partnered and cooperated in the past (for example, with the recent work on the northbound onramp at Bonnyview). At this time funding for efforts of this nature is not available, but we will share your observations and comments with the City of Redding and the Shasta Regional Transportation Agency.

Comment 5

From: Brandon Campbell <brandonc@iron-mountainllc.com>
Sent: Wednesday, June 24, 2020 10:39 AM
To: D2PIO@DOT <D2PIO@dot.ca.gov>
Subject: Feed Back Fix 5

EXTERNAL EMAIL. Links/attachments may not be safe.

Redding cal Trans should consider new over passes to be included in this project at the intersections of 44 and interstate 5 as well as the intersection of 299 and interstate 5. The 299 intersection If designed correctly will eliminate the need for crossing traffic on lake blvd to enter I-5 south and 44 east, allowing better free way flow. The I-5, 44 interchange can be designed for 44 east to go over I 5 and merge north bound as well as Fromm 44 west over I-5 to merge south I-5. This would eliminate the dangerous mergers that slow to speeds of 15-20 MPH and make these mergers modern and safer for everyone. A good Engineering designer can find these ideas are doable for both 44 and 299.
I could draw what this looks like if needed.

Brandon Campbell
530-356-1416

Get Outlook for iOS

Response 5

Caltrans would like to thank you for participating in the project delivery process by providing written comments. Your comments are important as they help inform the project team, they help refine the scope, and they reveal and highlight aspects of special concern.

The Caltrans District 2 Advance Planning office has previously explored the concept of using "fly-overs" to improve the interchange geometry at I-5 and SR44. Significant traffic operations improvements would be realized by implementing new reconfigured connector ramps, but the construction cost for such proposals puts them well outside the reach of potentially available funding for this project at this time. We will pass your comments on to the Shasta Regional Transportation Agency for consideration during future funding cycles and long-range planning discussions.

Comment 6

From: carol thelander <certhelander@gmail.com>
Sent: Wednesday, June 24, 2020 10:42 AM
To: D2PIO@DOT <D2PIO@dot.ca.gov>
Subject: I-5 Redding to Shasta Lake expansion

EXTERNAL EMAIL. Links/attachments may not be safe.

June 24, 2020

Just heard on KRCR 7 about the purposed expansion of I-5 from Redding to Shasta Lake. WELL IT'S ABOUT TIME!! My husband and I drive from Shasta Lake City to Redding everyday for work.
There has been several close calls for both of us driving north, as the highway narrows at the Hilltop Drive overpass. It's a terrible bottleneck. Vehicles speed up to pass on the left just as The lane merges to 2 lanes. No one slows down.

We have both grown up in the Redding area (we are now in our sixties) and have seen many accidents from the increase of traffic on the I-5 corridor. In all reality, I-5 needs to be 6 lanes all the
way up to the Oregon border. The inconvenience of highway construction for a couple of years will be worth it.

Thank you for reading our comments.

Rick and Carol Thelander
Sent from Mail for Windows 10

Response 6

Caltrans would like to thank you for participating in the project delivery process by providing written comments. Your comments are important as they help inform the project team, they help refine the scope, and they reveal and highlight aspects of special concern. Your support will be shared with the project team and Caltrans decision makers.

Comment 7

From: Jackson Hurst <ghostlightmater@yahoo.com>
Sent: Wednesday, June 24, 2020 10:57 AM
To: D2PIO@DOT <D2PIO@dot.ca.gov>
Subject: Fix 5 Cascade Gateway Project
EXTERNAL EMAIL. Links/attachments may not be safe.
Hi i would like to sign up for project updates and be added to the mailing list for the Fix 5 Cascade Gateway Project. My mailing address is 4216 Cornell Crossing, Kennesaw, Georgia 30144.

sent from ghostlightmater@yahoo.com

Response 7

Thank you for contacting us about the Fix 5 Cascade Gateway project. Your name will be added to the mailing list.

Comment 8

From: Charmae Chandley <maemaepolara@gmail.com>
Sent: Wednesday, June 24, 2020 11:20 AM
To: D2PIO@DOT <D2PIO@dot.ca.gov>
Subject: Fix 5

EXTERNAL EMAIL. Links/attachments may not be safe.

Yes please widen I-5 further from Cypress to Oasis!!! I travel this daily for work and it is just a huge cluster. Besides the clusters of on/off ramps so close together, this will definitely help with extra room for merging, big rigs and a better of traffic!

Response 8

Caltrans would like to thank you for participating in the project delivery process by providing written comments. Your comments are important as they help inform the project team, they help refine the scope, and they reveal and highlight aspects of special concern. Your support will be shared with the project team and Caltrans decision makers.

Comment 9

From: Sterling Tenney <emailsterling2360@gmail.com>
Sent: Wednesday, June 24, 2020 1:31 PM
To: D2PIO@DOT <D2PIO@dot.ca.gov>
Subject: Fix 5 Project

EXTERNAL EMAIL. Links/attachments may not be safe.
It is needed. You have my support.

Thank You

Sterling Tenney

Response 9

Caltrans would like to thank you for participating in the project delivery process by providing written comments. Your comments are important as they help inform the project team, they help refine the scope, and they reveal and highlight aspects of special concern. Your support will be shared with the project team and Caltrans decision makers.

Comment 10

From: Don Barich <donbarich@yahoo.com>
Sent: Friday, June 26, 2020 3:22 PM
To: D2PIO@DOT <D2PIO@dot.ca.gov>
Subject: Highway 5 widening through Central Redding....

EXTERNAL EMAIL. Links/attachments may not be safe.

To whom it may concern,

I am extremely opposed to the widening of I-5 through Central Redding if the materials for this project are sourced from the JF Shea Gravel Plant off Smith Rd and Gravel Plant Rd in south Redding.

While this quarry has been there for a long time, the pace of development has rapidly surrounded it. As a result, communities are subject to a high level of industrial noise at all hours. Many studies have found that this type of noise, and the level it is exerted at, is extremely detrimental to the mental, emotional, and physical health of the community. Furthermore, there are minute dust particles emitted from the process and from the coming and going of rolling stock (trucks) that have a negative effect on the health of people who reside in the area. Also, studies show that this type of operation can have a negative effect on the local water tables that communities rely on.

Due to the significant negative effects that are inflicted upon the community by sourcing materials from this facility, I am opposed to the project if said facility is utilized for this project.

Sincerely,

Don Barich

Response 10

Caltrans would like to thank you for participating in the project delivery process by providing written comments. Your comments are important as they help inform the project team, they help refine the scope, and they reveal and highlight aspects of special concern.

This project is being developed by Caltrans staff and will be constructed by a contractor after a competitive bidding process takes place to award the contract. At this time, it is not yet known which contractor will be awarded the contract or where the materials for the project will be sourced. Both temporary and long-term impacts have been analyzed as part of project development, however that analysis does not extend to commercially available supplies as the development of a facility such as the gravel plant would require a separate environmental analysis prior to its construction.

Attachment F
Right of Way Data Sheet

State of California - Department of Transportation

RIGHT OF WAY DATASHEET

EA: 0H920
PROJECT NO.: 02 1500 0083
LOCATION: 02-Sha-5-R14.8/R20
Description: Fix 5 Cascade Gateway Widen to 6 lanes in Shasta County in Redding from 0.3 mile north of Cypress Avenue Overcrossing to 0.6 mile north of Oasis Road Overcrossing.
ALTERNATE: 1
DATE: 3/18/2020
Datasheet Type: Revision

---

1. Right of Way Cost Estimate:

	Current Value Future Use	Escalation Rate	Escalated Value
A. Total Acquisition Cost	$0		$0
B. Appraisal Fees Estimate	$0	N/A	$0
C. Mitigation Acquisition & Credits	$650,000	0%	$650,000
D. Project Development Permit Fees	$75,000	0%	$75,000
Subtotal	$725,000		$725,000
E. Utility Relocation (State's Share)	$15,000	5%	$19,454
(Owner's Share: $75,000)			
F. Relocation Assistance (RAP)	$0		$0
G. Clearance/Demolition	$0		$0
H. Title & Escrow	$0		$0
I. Total Estimated Right of Way Cost	$740,000	**Rounded**	**$744,000** *
J. Construction Contract Work	$0		

2. Current Date of Right of Way Certification July 15, 2025

3. Parcel Data:

Type		Dual/Appr	Utilities		Railroad	
X	0		U4 - 1	2	C&M Agreement	0
A	0		- 2	0	Service Contract	0
B	0		- 3	0	Easements	0
C	0	0	- 4	0	Rights of Entry	0
D	0	0	U5 - 7	6	Clauses	0
RR	0		- 8	0		
Total	**0**		- 9	2		

Excess 0

Areas:		Mitigation		Misc. R/W Work	
R/W	N/A	Impacts	5	RAP Displacees	N/A
TCE	N/A	Parcels	0	Clear/Demo	N/A
Excess	N/A	Credits	0	Permit to Enters	N/A
Mitigation	3 Ac.			Condemnation	N/A
				USA Involvement	No

4. **Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, etc.).**

All work will be performed within the existing RW. See Assumptions and Limiting Conditions.

5. **Are any properties acquired for this project expected to be rented, leased, or sold?**

Yes _____ No **X**

6. **Are RAP displacements required?**

Yes _____ No **X**

No. of single family N/A No. of business/nonprofit N/A

No. of multi-family N/A No. of farms N/A

Based on Draft/Final Relocation Impact Statement/Study dated N/A

N/A Sufficient replacement housing will be available without last resort housing.

N/A Sufficient replacement housing will not be available without last resort housing.

7. **Is there an effect on assessed valuation?**

Yes _____ No **X** Not Significant _____

8. **Are there any items of Construction Contract Work?**

Yes _____ No **X**

There is no Construction Contract Work associated with the project.

9. **Are utility facilities or rights of way affected?**

Yes **X** No _____

Names of Utility Companies requiring verification only.

Redding Electric Utility - electric (aerial); City of Redding - water & sewer; Charter - CATV (aerial); AT&T - telephone (aerial/underground); PG&E - electric (aerial)

Names of Utility Companies requiring involvements.

PG&E - gas (underground); AT&T Legacy - fiber optic (underground)

Additional information concerning Utility Involvement on this project.

10. **Are railroad facilities or rights of way affected?**

Yes _____ No **X** Phase 4 Capital **$0**

11. Are USA Lands or Rights Affected?

Yes _____ No **X** Phase 4 Capital **$0**

Agencies Involved:

US Forest Service _____	BLM _____	Army Corps of Engineers _____
National Parks _____	BIA _____	Veterans Administration _____
US Fish & Wildlife _____	GSA _____	_____

Rights or Permissions to acquire:

Easement _____	Special Use Permit _____	Courtesy Letter _____
Right of Way Grant _____	Cooperative Work Agreement _____	Cost Recovery _____
Mineral Agreement _____	Letter of Concurrence _____	Timber Sale _____
		_____

12. Is an RE Office required for the project?

Yes _____ No **X**

Type of RE Office

Modular _____ Move In _____

13. Were any previously unidentified sites with hazardous waste and/or material found?

Yes _____ None Evident **X**

14. Are there material borrow and/or disposal sites required?

No _____ Optional **X** Mandatory _____

Material will either be the responsibility of the contractor or an existing material borrow/disposal site will be utilized, or one will be established within the state's existing RW. See Assumptions and Limiting Conditions.

15. Are there potential relinquishments and/or abandonments?

Yes _____ No **X**

16. Are there any existing and/or potential airspace sites?

Yes _____ No **X**

17. What type of mitigation is required for the project?

Environmental permits 1602, 401, 404 and Initial Take Permit will be required for the project. Environmental mitigation payments will also be required for this project. Estimates per Carolyn Sullivan 9/13/19. See Assumptions and Limiting Conditions.

18. Is it anticipated that Caltrans will perform all Right of Way work?

Yes **X** No _____

19. Indicate the anticipated Right of Way schedule and lead time requirements.
Right of Way Lead Time will require a minimum of **15** months after we receive first appraisal maps, utility conflict maps, necessary environmental clearances and freeway agreements have been approved and obtained. Additionally a minimum of **15** months will be required after receiving the last appraisal map to Right of Way for certification.

20. Assumptions and Limiting Conditions: (Check boxes that apply.)

- ☐ Mapping did not provide sufficient detail to determine the limits of the right of way required.
- ☐ Transportation facilities have not been sufficiently designed to 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 the preliminary nature of the early design requirements.
- ☑ Design will secure necessary encroachment permits from local agencies.
- ☐ Project permits are not required for the project.
- ☑ This data sheet assumes condemnation will not be necessary.
- ☑ The data sheet estimate does not include Right of Way Engineering support costs.
- ☑ This estimate assumes, no Yellow Legged Frog is present, no Valley Elderberry Longhorn Beetle mitigation is needed, and CEQA required mitigation for wildlife connectivity can be "out of kind" (not building a crossing structure/culvert).
- ☑ This estimate assumes permits to enter for environmental studies will not be required. This data sheet does not include those support costs for RW.
- ☑ This estimate assumes no Mitigation will be needed for Greenhouse Gas and Noise Attenuation will be determined at a later date. Both costs are considered not to be Phase 9.
- ☑ This estimate assumes the purchase of a Material Borrow/Disposal site will not be required for the project.
- ☑ The RW Certification date of 07/15/25 from the Project Manager provided to RW by Project Engineer on 03/18/20.
- ☐

Evaluation Prepared By:

Right of Way _____ Date 3/18/20
NEOMA WARD

Reviewed By

_____ Date 3/18/20
RW Project Coordinator NEOMA WARD

I have personally reviewed this Right of Way Data Sheet and all 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 to be complete and current.

_____
CAROL DETWILER
Senior Right of Way Agent
Project Delivery Branch
Redding

3-18-2020
Date

_____
KAREN E. HAWKINS
Assistant Chief
North Region Right of Way
Eureka/Redding

3/18/20
Date

Attachment G
Transportation Management Plan Data Sheet

STATE OF CALIFORNIA-DEPARTMENT OF TRANSPORTATION

TRANSPORTATION MANAGEMENT PLAN DATA SHEET

To: Travis Gurney, PE
Design R6
02-0316, MS #76
225-3533

From: Department of Transportation
District 2 - Office of Traffic Management

Date: January 23,2020

File: Sha-5-PM R14.8/R20.0

EA: 02-0H920 (02-1500-0083)

Work: Fix 5 Cascade Gateway

1. POLICY

The Caltrans Deputy Directive titled "Transportation Management Plans" (DD-60-R2) establishes the current policy for mitigating traffic impacts resulting from construction, maintenance, encroachment permit, planned emergency restoration, locally or specially funded, or other activities. The directive states that Transportation Management Plans (TMPs) and contingency plans shall be completed for all work activities on the State highway system. **The purpose of this Transportation Management Plan Data Sheet is to ensure all anticipated TMP costs are included in the Project Report (PR).**

2. SCOPE OF WORK

This project in Shasta County on Interstate 5 from 0.3 mile north of Cypress Avenue Undercrossing to 0.6 mile north of Oasis Road Overcrossing will widen I-5 from four lanes to six lanes.

Scope of work includes:

- Widening seven bridges, upgrading bridge rail and adding polyester overlay to six of the bridges
- Constructing new structural section mostly to the median, paving existing mainline and ramps
- Improving vertical clearance at SR 299, Twinview Blvd and NB SR 273/NB I-5 Connector OC
- Adding stormwater treatment and drainage facilities as needed
- Placing high tension cable barrier or concrete barrier in the median
- Placement of signs
- Maintaining and modifying as needed existing ITS devices and other improvements

There are 240 working days (WD's) for this project. Approximately 200 working days are expected to require traffic control. Construction is scheduled to occur between May 2026 and October 2027.

3. FACILITY

ROADWAY: Interstate 5 is a 4-lane freeway that is the main north-south route in the Western United States and is the principle arterial in District 2. In addition, I-5 is a high emphasis route and part of the National Highway System (NHS) and the Interregional Road System (IRRS). Alignment is mostly tangent with a couple of sweeping curves on rolling terrain. There are two 12-ft paved lanes with 10-ft outside shoulders and varying inside shoulder widths at the project location. There are also merge lanes as the ramps join the highway. The regulatory speed limit is 65 MPH.

State Route 44 serves as the primary route between Redding and Susanville. At the project location SR 44 is a multilane highway of divided alignment in an urban setting with three 12-ft lanes provided for each direction of travel. The regulatory speed limit is 65 MPH. Although there are minimal construction activities on State Route 44, traffic on 44 will be impacted, especially during bridge construction activities.

3. FACILITY - continued

STRUCTURES: There are 16 structures within the project limits. This project does include structure work. Ramp closures will be necessary.

Location	Structure Number	Name	Length (ft)	Width (ft)	Work on Structure
Sha-5-PM R15.31	06-0099G	N5-E44 Connector OC (over Hilltop)	140	26	N/A
Sha-5-PM R15.43	06-0126G	N5-W44 Connector OC (over 44)	215	34	N/A
Sha-5-PM R15.43	06-0126L	East Redding (5/44) Separation (over 44)	198	73	Widen to Median and Polyester Overlay
Sha-5-PM R15.43	06-0126R	East Redding (5/44) Separation (over 44)	202	74	N/A
Sha-5-PM R15.56	06-0127L	N5-W44 Connector UC (over ramp and bike path)	131	65	Widen to Median and Polyester Overlay
Sha-5-PM R15.56 (R15.59)	06-0127R	N5-W44 Connector UC (over ramp and bike path)	131	74	N/A
Sha-5-PM R16.15	06-0101	Hilltop Drive OC	239	34	N/A
Sha-5-PM R17.13	06-0167	Boulder Creek	23	0*	N/A
Sha-5-PM R17.30	06-0129L	Route 5/299 Separation	195	42	Widen to Median and Polyester Overlay
Sha-5-PM R17.30	06-0129R	Route 5/299 Separation	195	42	Widen to Median, Polyester Overlay and Vertical Clearance
Sha-5-PM R17.32	06-0088E	S5-299 Connector	23	0*	N/A
Sha-5-PM R18.07	06-0143L	Twinview Blvd UC	105	42	Widen to Median, Polyester Overlay and Vertical Clearance
Sha-5-PM R18.07	06-0143R	Twinview Blvd UC	105	42	Widen to Median, Polyester Overlay and Vertical Clearance
Sha-5-PM R18.48	06-0137G	N273-N5 Connector OC	357	34	Vertical Clearance
Sha-5-PM R19.00	06-0107	Churn Creek	139	131	Widen to Outside
Sha-5-PM R19.40	06-0155	Oasis Road OC	200	34	N/A

*0 width indicate box culvert.

RAMPS: There are 32 ramps or ramp segments associated with 1 overcrossing (OC), 1 undercrossing (UC) and 2 separations (SEP) within the project limits. 5/44/Hilltop interchange consists of 17 ramp segments, some associated with Interstate 5 and some with State Route 44 with access to Hilltop Drive. Ramp closures will be required for construction activities and determination of which ramps/segments can be closed at the same time will need to be evaluated. Detours will be provided to keep traffic on state highways as much as possible.

TRAFFIC VOLUMES:

2017 AADT Volumes			
Description	**Co-Rte-Reference PM (Leg)**	**Vehicle AADT Total***	**Truck % Total Vehicles**
Redding, Jct Rte 44	Sha-5-R15.448 (A)	60,000	11.46
Redding, Jct Rte 299	Sha-5-R17.322 (A)	46,500	14.11
Redding, Twinview Blvd	Sha-5-R18.068 (A)	39,500	16.33
Redding, Jct Rte 273	Sha-5-R18.481 (A)	47,000	13.17
Redding, Oasis Road	Sha-5-R19.402 (A)	38,500	16.76
Redding, Jct Rte 5	Sha-44-L1.808 (B)	56,000	1.48
Redding, Jct Rte 5	Sha-44-R0.0 (A)	48,000	1.08
Hilltop Drive	Sha-44-R0.134 (A)	37,000	1.54

*(AADT) Annual Average Daily Traffic is for both directions.

3. FACILITY - continued

TSN Volumes for Project Traffic Delay			
Description	Peak VPH** (1 Direction)		Data Source for Peak VPH Co-Rte-Reference PM (Leg)
	WK	WE	
MAINLINE I-5, 44, 273 and 299			
Redding, Cypress Avenue	3,141	2,610	TMS #304, Sha-5-R14.159 June 2019
Redding, Jct Rte 44	2,693	2,350	TMS #196, Sha-5-R15.448 June 2019
Redding, Oasis Road	2,210	1,965	TMS #312, Sha-5-R19.402 June 2019
Butte Street***	2,337	1,517	TMS #302, Sha-44-L0.852 June 2019
Jct Rte 5, Central Redding Interchange	3,201	2,049	TMS #161, Sha-44-L1.808 June 2019
Redding, Victor Avenue***	2,170	1,275	TMS #282, Sha-44-R1.239 June 2019
Twinview Blvd***	697	463	TMS #315, Sha-273-18.920 February 2018
Jct Rte 273/299***	1,162	991	TMS #317, Sha-299-24.088 November 2019
Redding, Jct Rte 5***	1,253	656	TMS #162, Sha-299-24.822 July 2018
I-5 RAMP/Ramp Segments			
Cypress NB On***	945	667	TMS #R217, Sha-5-R14.761 July 2019
Cypress SB Off***	986	635	TMS #R216, Sha-5-R14.665 July 2019
NB Off to WB 44	684	362	TMS #R1, Sha-5-R15.147 July 2019
Seg WB 44 On from Dana Drive	760	513	TMS #R360, Sha-5-R15.149 July 2019
Seg EB 44 On from NB 5	328	224	TMS #R2, Sha-5-R15.266 July 2019
Hilltop NB Off	567	546	TMS #R3, Sha-5-R15.265 May 2014
SB Off to EB 44	566	504	TMS #R4, Sha-5-R15.391 July 2019
SB Off to WB 44	493	196	TMS # R5, Sha-5-R15.706 July 2019
NB Off to Rte 299/Lake Blvd	749	579	TMS # R7, Sha-5-R17.110 July 2019
SB On from Rte 299/Lake Blvd	741	560	TMS # R6, Sha-5-R17.048 July 2019
SB Off to Lake Blvd/Rte 299	282	273	TMS # R8, Sha-5-R17534 July 2019
NB On from Rte 299/Lake Blvd	311	294	TMS # R9, Sha-5-R17.569 July 2019
Twinview SB On	565	253	TMS # R10, Sha-5-R17.916 July 2019
Twinview NB Off	433	267	TMS # R11, Sha-5-R17.926 July 2019
Twinview SB Off	73	60	TMS # R12, Sha-5-R18.217 July 2019
Twinview NB On	79	71	TMS # R13, Sha-5-R18.222 July 2019

3. FACILITY - continued

TSN Volumes for Project Traffic Delay			
Description	Peak VPH** (1 Direction)		Data Source for Peak VPH Co-Rte-Reference PM (Leg)
	WK	WE	
I-5 RAMP/Ramp Segments			
SB Off to Rte 273	317	234	TMS # R14, Sha-5-R18.734 May 2014
NB On from Rte 273	446	255	TMS # R15, Sha-5-R18.781 July 2019
Oasis Road SB On from EB Oasis	290	187	TMS # R16A, Sha-5-R19.251 July 2019
Oasis Road SB On from WB Oasis	247	179	TMS # R16B, Sha-5-R19.464 July 2019
Oasis Road NB Off	563	333	TMS # R17, Sha-5-R19.255 July 2019
Oasis Road NB On	82	64	TMS # R18, Sha-5-R19.530 July 2019
Oasis Road SB Off	96	67	TMS # R19, Sha-5-R19.674 July 2019
Pine Grove SB On***	414	220	TMS # R20, Sha-5-R20.862 July 2019
Pine Grove NB Off***	408	232	TMS # R21, Sha-5-R20.869 July 2019
44 RAMP/Ramp Segments			
Park Marina EB On***	919	491	TMS # R115, Sha-44-L0.958 July 2019
Auditorium Drive WB Off*** (2 Lanes)	1,222	524	TMS # R116, Sha-44-L0.969 July 2019
EB 44 Off to SB 5	740	377	TMS # R117, Sha-44-L1.562 July 2019
WB 44 Off to SB 5	583	499	TMS # R118, Sha-44-L1.738 July 2019
EB 44 Off to NB 5	298	140	TMS #R90, Sha-44-R0.058 July 2019
WB 44 Off to NB 5	582	433	TMS #R91, Sha-44-R0.086 July 2019
EB Off to Hilltop	1,160	878	TMS #R92 , Sha-44-R0.161 July 2019
Seg EB 44 On from Hilltop	227	161	TMS #R94, Sha-44-R0.219 July 2019
Victor WB On***	420	309	TMS #R96 Sha-44-R1.083 June 2015
Victor EB Off***	738	485	TMS #R97 Sha-44-R1.117 June 2015

**Peak vehicle per hour volumes: WK = Weekday; WE=Weekend
***Associated with detours, no work at location.

CENSUS LOOPS: There are 34 existing traffic monitoring stations with 64 loops and 6 piezos within the project limits. Of these:

- 19 loops must be protected in place or replaced if damaged during construction
- 6 piezos and 45 loops on the main line will be replaced or modified by bid item as part of this project
- 3 new loops will be will be added by bid item

3. FACILITY – continued

The actual cost of this work will be determined by Electrical Design, but the initial estimate is $2,500 for each modified, replaced or new loop detector and $10,000 for each modified, replaced or new piezo. **SSP 15-1.03A for existing loop detectors will be included.** For further information contact Karen Law, Traffic Census, at 530-225-3042.

TMS No.	Cabinet*	Co-Rte-Actual PM	Description	Potential Impact	Condition
304	1	Sha-5-R14.459	Cypress Ave South of NB off ramp Central Redding Interchange	Not Likely - Protect in place (8 Loops)	Active
R216	0	Sha-5-R14.64	Cypress Ave SB Off PB 950' n/o Cypress Ave CL	Not Likely - Protect in place (1 Loop)	Active
R217	0	Sha-5-R14.62	Cypress Ave NB On PB 834' n/o Cypress CL	Not Likely - Protect in place (1 Loop)	Active
R1	0	Sha-5-R15.71	NB Off to WB 44 Coordinates for loop, goes to cabinet with R360	Provide Bid item to replace if work will cause damage (2 Loops)	Active
R360	0	Sha-5-R15.149	Seg WB 44 On from Dana Dr On Cabinet located on S side of Dana onramp to WB 44	Not Likely - Protect in place (1 Loop)	Active
R2	0	Sha-5-R0.18	Seg EB 44 On from NB 5 285' east of Hilltop NB ETW. Pullbox shared with R94 EB on from Hilltop	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R3	0	Sha-5-R15.27	Hilltop NB Off Pullbox 82' south of Hilltop OC	Not Likely - Protect in place (2 Loops)	Active
R4	0	Sha-5-R15.39	SB Off to EB 44 Pull box is located in gore area by 30 MPH Curve sign	Provide Bid item to replace if work will cause damage (1 Loop)	Active
196	1	Sha-5-R15.448	Redding, Jct Rte 44 Cab on SB shldr 825' S/O PM 16.0, pullout avail	Provide Bid item to replace if work will cause damage (6 Loops), Bid item to add (1 Loop), if SB 5 aux lane gets added	Active
R5	0	Sha-5-R15.71	SB Off to WB 44 Loop with ramp metering loops and terminates in Ramp Metering side cabinet with R1/R360	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R6	0	Sha-5-R17.231	S/B On from Rte 299 / Lake Blvd.	Provide Bid item to replace if work will cause damage (2 Loops)	Active
R7	0	Sha-5-R17.278	Rte 299/Lake NB Off PB on W shoulder 178' S/O 299 CL, 11' ETW, loops adjacent PB	Provide Bid item to replace if work will cause damage (3 Loops)	Active
R8	0	Sha-5-R17.534	Rte 299/Lake Blvd. SB off PB located on W shoulder 4' S/O LS 17551, 32' N/O edge paved gore	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R9	0	Sha-5-R17.569	Rte 299/Lake NB On Proposed	Bid item to add (1 Loop)	Proposed
R10	0	Sha-5-R17.916	Twinview SB On Proposed	Bid item to add (1 Loop)	Proposed
R11	0	Sha-5-R17.905	Twinview NB Off 114' south of exit sign in gore.	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R12	0	Sha-5-R18.21	Twinview SB Off 4' south of dbl post direction sign	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R13	0	Sha-5-R18.02	Twinview NB On 3' north of PEDESTRIAN PROHIBITED sign	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R14	0	Sha-5-R18.734	Rte 273 SB Off 1320' north of Caterpillar Road S/B	Provide Bid item to replace if work will cause damage (2 Loops)	Active

3. FACILITY – continued

TMS No.	Cabinet*	Co-Rte-Actual PM	Description	Potential Impact	Condition
R15	0	Sha-5-R18.781	Rte 273 NB On 740' north of Caterpillar Road NB	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R16A	0	Sha-5-R19.374	Oasis Road SB On from EB Oasis 144' from Oasis Rd CL across from PEDS PROHIBITED sign.	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R17	0	Sha-5-R19.25	Oasis Road NB Off 196' south of Oasis Rd CL near PEDS PROHIBITED sign.	Provide Bid item to replace if work will cause damage (2 Loops)	Active
312	1	Sha-5-R19.08	Redding, Oasis Road 291' North of Churn Creek Bridge	Yes - Bid item to replace 6 Piezos and 12 Loops	Active
R16B	0	Sha-5-R19.43	Oasis Road SB On from EB Oasis PB on W shoulder near beg. MBGR, 60' N/O LS 19419	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R18	0	Sha-5-R19.53	Oasis Road NB On 185' north of Oasis Rd CL by PEDESTRIANS PROHIBITED sign	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R19	0	Sha-5-R19.45	Oasis Road SB Off 292' north of Oasis Rd CL, 50 S/O Beg. Concrete wall at PEDS PROHIBITED sign	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R20	0	Sha-5-R20.86	173' south of Pine Grove CL at PEDS PROHIBITED sign.	Not Likely - Protect in place (1 Loop) Outside limits	Active
R21	0	Sha-5-R20.86	186' south of Pine Grove CL at PEDS PROHIBITED sign	Not Likely - Protect in place (1 Loop) Outside limits	Active
161	1	Sha-44-L1.808	East End of Sacramento River Bridge	Not Likely - Protect in place (4 Loops mainline, 3 loops ramps) Outside limits	Active
R90	0	Sha-44-R0.058	EB off to NB 5 65' east of FREEWAY ENTRANCE sign	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R91	0	Sha-44-R0.086	WB off to NB 5 155' from gore pt	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R117	0	Sha-44-L1.562	EB off to SB 5 Pull box located in gore point 192' E/O edge paved gore	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R118	0	Sha-44-L1.738	WB off to SB 5 193' west of paved gore	Provide Bid item to replace if work will cause damage (1 Loop)	Active
R96	0	Sha-44-R1.083	Victor WB on PB directly across from end of paved gore.	Not Likely - Protect in place (1 Loop) Outside limits	Active
R97	0	Sha-44-R1.117	Victor EB off 47' east of paved gore nose on Rt shld.	Not Likely - Protect in place (1 Loop) Outside limits	Active
315	0	Sha-273-18.920	Twin View Blvd 81' N of Lake Blvd sign. PB centered in median strip	Not Likely - Protect in place (5 Loops) Outside limits	Active
317	0	Sha-299-24.088	Jct Rte 273 Hookup PB at luminaire # 18.70 on WB shld.	Not Likely - Protect in place (5 Loops) Outside limits	Active
162	1	Sha-299-24.822	Jct Rte 5 Pull box located on S/S 205' from ramp 40 MPH sign mounted on light standard #17.380	Not Likely - Protect in place (5 Loops, 10 piezos) Outside limits	Active

*Cabinet: 0 = A station that does not connect to the Traffic Management Office via phone line or wireless modem.
1 = A station that does connect to the Traffic Management Office via phone line or wireless modem.

3. FACILITY – continued

ITS FIELD ELEMENTS: There are seven existing ITS Field Elements within the project limits that must be protected in place or replaced if damaged during construction. **Therefore, sections 10-1.02B, "Traffic Elements", and 87-21.03B(2), "Maintaining Existing Traffic Management System Elements During Construction" of the RSS will apply. Include bid item 870009 for "Maintaining Existing Traffic Management System Elements During Construction" and the ITS Field Elements Pre-Bid Cert List.** Further information regarding ITS field elements can be obtained by contacting Jeremiah Pearce, Chief, Office of ITS Engineering & Support at 530-225-3320.

See table below for description of existing and new elements within project limits.

Element	Location	Description	Potential Impact	Condition
CCTV	Sha-5-R15.42	I-5/SR 44	Not Likely - Protect in place	Active
CCTV	Sha-5-R15.51	I-5/SR 44 Hub	Not Likely - Protect in place	Active
HAR	Sha-5-R16.13	Redding (I-5 at Hilltop OC)	Upgrade Element	Active
CCTV	Sha-5-R16.15	Hilltop	New Element (Proposed)	N/A
CCTV	Sha-5-R17.30	I-5/SR 299	Not Likely - Protect in place	Active
TMS	Sha-5-R14.9, R15.8, R16.4, R16.9, R17.4, R17.8, R18.2, R18.6, R19.1, R19.7	Redding Area	New Elements – 10 Locations (Proposed)	N/A
HUB	Sha-5-R18.47	Fiber Hub	New Infrastructure	N/A
FIBER	Sha-5-R18.47	Fiber Optic	New Infrastructure	N/A
CCTV	Sha-5-R18.60	I-5/SR 273	Not Likely - Protect in place	Active
CMS	Sha-5-R19.40	Oasis Road	Upgrade Element to single post structure (Proposed)	Active
CMS	Sha-5-R19.40	Oasis Road	Upgrade Element to single post structure (Proposed)	Active

4. TRAFFIC IMPACTS

TRAFFIC CONTROL: Construction will be conducted under Standard PlanT10 type lane and shoulder closures. Although most operations can be conducted during typical 12-hour work shifts, 24-hr closures will be required for some activities and the use of Type K temporary railing will be required.

Day time construction on I-5 will be conducted with 2 adjacent paved traffic lanes with adjacent shoulders remaining open in the direction of travel, with a minimum 30-ft horizontal clearance.

Lane closures on I-5 and SR 44 are not normally allowed when traffic volumes exceed the carrying capacity of the remaining open lane. For this segment of I-5 the carrying capacity is estimated at 1,200 vehicles per lane. Based on a review of the traffic volumes, lane closures that reduce the traveled way to 1 lane are allowed only at night. During night work at least one 12-ft lane with adjacent paved shoulder, for a minimum 16-ft horizontal clearance, must remain open in the direction of travel. Based on traffic volumes, lane and shoulder closures will be allowed as shown on lane closure charts.

Full closure of SR 44 at the East Redding, 5/44 Separation will be allowed when bridge girders are being placed over the traffic lanes. The work will be restricted to 6 or 7 hours late night to early morning and will only be allowed a limited number of times. Details will be provided in the TMP and a detour will be provided. We will also look at providing an incentive/disincentive or additional liquidated damages to ensure timely completion of the work and the least possible impact to traffic.

4. TRAFFIC IMPACTS- continued

Also, at the East Redding, 5/44 Separation during structure, work a horizontal clearance of less than 16-ft may be allowed for specific times and locations as an alternative to freeway closure and detour. This work will also be restricted to 6 or 7 hours late night to early morning and will only be allowed a limited number of times. Details will be provided in the TMP and COZEEP and end of queue monitoring and warning may be implemented.

RAMP CLOSURES: Standard Plan T14 will be used for ramp closures. Based on traffic volumes, night time ramp closures will be allowed as shown on ramp closure chart SSPs that will be provided with the TMP. Ramp closures will not be allowed after 3:00 p.m. Fridays, on weekends, designated "legal holidays", and Special Days. In most situations, only one ramp closure for each direction of travel will be allowed at any one time. Night time closures will allowed for a limited number of times at each ramp.

The 5/44 Sep interchange is composed of 17 ramp segments. Closure of 1 segment may result in the closure of others and detours can impact many segments. A clear understanding of which ramp segments can be closed at the same time will be critical. It will be important to develop a consistent way to identify the segments to facilitate accurate understanding when the Contractor calls in closures to TMC.

The ramp segment to WB 44 that goes under I-5 with traffic from NB I-5 and Dana Drive will need to be reduced to 1 lane during the bridge widening. The combined volume from NB 5 and Dana would result in delays during peak hours and closing the ramp from Dana may be necessary. Traffic handling sheets and a detour will be provided.

Traffic handling sheets will be provided for extended ramp closures or lane closures on ramps that have a significant traffic impact. These may require end of queue warning and monitoring for detours when combined ramp volumes are high and they will not be allowed on "designated holidays" or Special Days.

Incentive/disincentives will be incorporated into the contract to minimize the time 24-hr ramp or highway closures are used.

PROJECT TRAFFIC DELAYS: Throughout the project significant mainline delays are not expected since traffic handling plans will keep 2 lanes open for each direction of travel during the day. Extended closures for some items of work will be mitigated to cause as little impact as possible. Because of the close proximity of alternate routes, detours on state highways will be provided with little to no impact on local roads.

BICYCLES & PEDESTRIANS: Bicycles are allowed within portions of the project limits. During operations, bicyclists will use the shoulder and when this cannot be provided a detour will be considered. There is a bike and pedestrian trail under I-5 at 44 and 299 that may need to be closed during bridge construction. Closures will be kept to limited time at night and transportation may be provided by the contractor. If pedestrian facilities off the freeway are impacted detours will be necessary. Other than the bike trails, no significant impacts to either user group is expected since few of these users are expected to be present on the freeway.

TRUCKS: Interstate 5 is designated as a National Network (STAA) for California State Highways. It is not anticipated that traffic control for this project will significantly alter the requirement for this route. Annual permit trucks up to 12-ft wide are common, and single trip permit trucks between 12-ft and 16-ft in width can occur several times a week. Two lanes with 30' horizontal clearance are expected during the daytime and during night closures, a 12-ft paved lane with shoulder to provide a 16-ft horizontal clearance will be provided.

State Route 299 is designated as Terminal Access route for STAA trucks. It is anticipated that traffic control for this project will alter the requirement for STAA truck routes due to bridge widening over SR 44, but restrictions will be kept to a minimum; therefore minimal truck impacts are anticipated. Annual permit trucks up to 12-ft wide are common, and Single Trip permit trucks between 12-ft and 16-ft in width can occur several times a week. A 12-ft paved lane with shoulder to provide a 16-ft horizontal clearance shall be provided at all locations. This project will include the use of Type K temporary railing on SR 299; changes in roadway width available to trucks will occur.

State Route 273 is designated as a Terminal Access route for STAA trucks. It is not anticipated that traffic control for this project will alter the requirement for STAA truck routes; except when ramp closures are necessary and detours will be provided. Annual permits are issued for trucks 8.5-ft to 12-ft in width.

4. TRAFFIC IMPACTS- continued

State Route 44 is designated as a Terminal Access route for STAA trucks. It is anticipated that traffic control for this project will alter the requirement for STAA truck routes due to bridge widening over SR 44, but restrictions will be kept to a minimum; therefore minimal truck impacts are anticipated. Annual permits are issued for trucks 8.5' to 12' in width. Occasionally under special approval, single trip permits are issued for trucks over 12' in width. Most of the time, two lanes with 30' horizontal clearance are expected during the daytime and during night closures, a 12-ft paved lane with shoulder to provide a 16-ft horizontal clearance will be provided. This project will include the use of Type K temporary railing on SR 44; changes in roadway width available to trucks will occur.

ROAD CONNECTIONS: Interstate 5 is access controlled. There are no public road connections within the project limits.

5. TRAFFIC IMPACT MITIGATION

LANE CLOSURES: Lane closures on I-5 are not be allowed when traffic volumes exceed the carrying capacity of the remaining open lane. For this segment of I-5 the carrying capacity is estimated at 1,200 vehicles per lane. Based on review of traffic volumes, 2 lanes must remain open during the day and after 3:00 p.m. Fridays, on weekends, or "designated holidays". Lane closure charts will be provided.

Lane closures and full closure for several nights on SR 44 will be necessary when the bridges on I-5 are being widened.

COORDINATE CONSTRUCTION: There are no other projects scheduled on this route in close proximity during the 2026/2027 CY (known of at the time of this Data Sheet). The PE should review the project status (and the route conflicts spreadsheet) as the construction year approaches to identify any other projects that may pose closure conflicts. The TMP will include a list of any overlapping or adjacent projects.

PORTABLE CHANGEABLE MESSAGE SIGNS: PCMSs are typically used for safety reasons on roadways where high approach speeds are present, sight distance is limited, night work is anticipated, or there is a history of work zone accidents related to high approach speeds. Multiple PCMSs are required for this project. One PCMS shall be placed before the first traffic control sign for each approach. Additional PCMSs will be required for ramp closures for advance warning and during ramp and highway closures, for work zone speed limit reductions and possibly for extended lane reduction where public awareness is critical.

WORK ZONE SPEED LIMIT REDUCTION: Per Caltrans Director 4-19-19 memo, Portable Vehicle Speed Feedback Signs and associated plan sheet details are required on all projects on the State Highway System. If lane width is reduced to less than 12 feet, speed may be reduced more than 20 mph.

COZEEP: Work with Traffic Safety and Construction Safety to determine the cost of COZEEP during Construction

TRAFFIC INCIDENT RESPONSE PLAN (TIRP): Consider costs for TIRP, as part of the Contractor's contingency plan to handle traffic related incidents during construction. The TIRP will need to include strategies to minimize response time and clear obstructions.

INCENTIVE/DISINCENTIVE: Including money for an incentive may be beneficial if timely completion of certain activities is critical.

TMP PUBLIC INFORMATION CAMPAIGN: The PE should include $40,000 in the estimate to cover preparation of news releases to the local media as needed throughout the duration of the project.

WORKER SAFETY MEDIA CAMPAIGN: Worker safety media campaigns have been shown to reduce work zone vehicle collisions. With safety and reliability being the Department's #1 and #2 goals respectively, it is appropriate for funding to be set aside for worker safety media advertisements. To assist in filling these goals, the PE shall add to the estimate $10,000 for item #066063 - Transportation Management Plan Public Information.

5. TRAFFIC IMPACT MITIGATION - continued

WORKER SAFETY MEDIA CAMPAIGN: Worker safety media campaigns have been shown to reduce work zone vehicle collisions. With safety and reliability being the Department's #1 and #2 goals respectively, it is appropriate for funding to be set aside for worker safety media advertisements. To assist in filling these goals, the PE shall add to the estimate $10,000 for item #066063 - Transportation Management Plan Public Information.

COSTS: In addition to costs associated with typical traffic control measures for Standard Plan T10 type Lane Closures and detours, the following shall be incorporated into the project estimate:

- PCMS: Include cost for multiple PCMS.
- End of Queue Warning System and End of Queue Warning and Monitoring: Include cost for traffic control surveillance vehicles
- Incentive/Disincentive: Include money in Supplemental Funds to facilitate timely completion of critical activities.
- Contingency Costs: Include contingency costs for TIRP Plan, equipment breakdowns, shortage of materials, etc.
- Department Furnished Item #066063 - Transportation Management Plan Public Information: Include $50,000; $40,000 for TMP Public Information Campaign and $10,000 for Worker Safety Media Campaign
- COZEEP: Include money in Department Furnished Funds for COZEEP.

TMP: The TMP for this project will summarize the traditional traffic handling practices and other traffic mitigation strategies that will be implemented during construction. These traffic handling practices and mitigation strategies will include, but not be limited to: pre-notification of closures (lane closure schedule), DTM evaluation of cumulative traffic corridor delays for multiple projects, California Highway Information Network (CHIN), Road Work Information Bulletin (RIB), local agency contacts, ITS field element locations, census loop locations, CHP commander contacts, incident response (accident, natural event) contacts, contingency plans, and maintenance contacts. **A TMP for this project is required and should be requested when the design is complete enough to determine specific traffic impacts but early enough to make design changes/additions required for traffic mitigation.**

This TMP Data Sheet was prepared by Linda Jones. I have personally reviewed this document and all supporting information. I certify that the assumptions are reasonable and proper subject to the limiting conditions set forth and I find the Data Sheet complete and current.

Joe Baltazar, P.E.
Chief, Office of Traffic Management
District 2
530-225-3245

01-28-2020
Date

Jeremiah Pearce, P.E.
Chief, Office of ITS Engineering & Support
District 2
530-225-3320

01-28-2020
Date

SEE ATTACHED RESOURCE SPREADSHEET

DISTRICT 2 ITS ELEMENTS

C - Construction, D - Design, E - Existing, P - Possible, EU - Existing Element (Upgrade)

CCTV = Closed Circuit Television----------CMS = Changeable Message Sigs
HAR = Highway Advisory Radio----------EMS = Extinguishable Message Sign
LED = Light Emitting Diode----------TMS = Traffic Monitoring System
SRRA = Safety Roadside Rest Area----------DS = Data Sheet
RWIS = Roadside Weather Information System----------FCS = Flashing Chain Sign

EXISTING ELEMENT	E	POSSIBLE	P	LAST UPDATED = 2020-01-23
EXISTING ELEMENT (UPGRADE)	EU	DESIGN	D	
CONSTRUCTION	C	CORRECTED PM	RED FONT	

NOTE>>>>>>>>>> ALL POST MILE LOCATIONS FOR 'POSSIBLE' SITES ARE APPROXIMATE <<<<<<<<<<NOTE

LOCATION	TYPE	CO.	RTE	P	PM	STATUS	EA	Secondary EA	CY	NOTES
Hartnell	CCTV	SHA	5	R	13.96	E	02-0C590		13	Fiber optic project
Cypress Avenue	CCTV	SHA	5	R	14.44	P				
I-5/SR44	CCTV	SHA	5	R	15.42	E	02-3C000			Microwave comm BBS installed
I-5/SR44 Hub	CCTV	SHA	5	R	15.51	E	02-4H130			Location name subject to change
Redding (I-5 @ Hilltop OC)	HAR	SHA	5	R	16.13	E				**#7 HAR** - Superstation - WPFK506
Hilltop	CCTV	SHA	5	R	16.15	D	02-0H920		25	
I5-SR299	CCTV	SHA	5	R	17.30	E	02-0C590		13	Fiber optic project Constructed, awaiting power supply
Redding Area	TMS	SHA	5	R	17.70	E				
I5-SR273	CCTV	SHA	5	R	18.60	E	02-0C590		13	Fiber optic project
Oasis Road	CMS	SHA	5	R	19.40	EU	02-0H920			**#9 FNBT** - Model 500 Upgrade to Single Post Structure
Oasis Road	CMS	SHA	5	R	19.40	EU	02-0H920			**#10 FSBT** - Model 500 Upgrade to Single Post Structure
Pine Grove	CMS	SHA	5	R	20.98	EU	02-15258			**#2 FNBT** - Model 500 Upgrade to Single Post Structure
Pine Grove	CCTV	SHA	5	R	20.98	E	02-1C740			Microwave comm BBS installed

Attachment H
Risk Management Plan

Risk Management Plan for 02-0H920, Fix 5 Cascade Gateway

Risk Checkpoint:	PA&ED
Date:	5/15/2020
Project Nickname:	Fix 5 Cascade Gateway
EA:	02-0H920
Co-Rt, Post Miles:	
Project Manager:	
Total Costs (Capital & Support):	
RTL Target:	

Phase	Funding Table Range		Known Risk		
	Low	High	Support (hours)	Cost ($k)	Schedule (Days)
0-PA&ED			0 hours	$0	0
1-PS&E			0 hours	$0	0
2-RW Support			0 hours	$0	0
3-Construction Support			0 hours	$0	0
4-Construction Capital			-	$0	0
9-RW Capital			-	$0	0

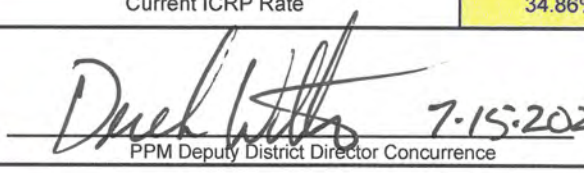
Risk Identification							Risk Assessment			"Red" Quantitative Analysis		Risk Response			
									Cost Rating / Schedule Rating	Impacted Phase(s) for Red Risk	Support (hours) / Capital Cost $k / Schedule (Days)	Strategy	Response Actions	Risk Owner	Updated
Active	1	Opportunity	Funding	Accelerate to Reduce Costs	If complete funding for the future phases is identified sooner than assumed, escalation costs could be reduced.	Only the 0 phase is fully funded at this time. Complete funding will be identified for construction in 2026.	2-Low (11-30%)			1-PS&E	hours	Enhance	Caltrans planning, D2 management, and SRTA are actively seeking additional funding sources and grants to develop the project.	PM,SRTA	7/15/2020
										4-Con Cap					
Active	2	Threat	Political/Legal	CARB	Outside entities may challenge the project environmental document and/or determination in court, leading to an injunction and requiring a higher level environmental document.	The IS-MND will be sufficiently supported by environmental studies.	2-Low (11-30%)					Mitigate	Environmental studies and content in the IS-MND address new SB743 requirements.	ENV, PM	7/15/2020
										0-PA&ED	hours				
Active	4	Threat	Environmental	Impact Reliability	If environmental impacts are altered by a change in scope or construction methods, the necessary re-consultation would create rework to develop an ammended environmental document.	The scope and methods have been adequately recognized and communicated to environmental staff in the ESR.	2-Low (11-30%)			0-PA&ED	hours	Mitigate	Ongoing communication between grant writers, management, and the PDT should protect the relevance of the environmental document being developed.	PDT	7/15/2020
										0-PA&ED	hours				
Active	8	Threat	Environmental	Scope Refinements	If additional scope elements are described in various grant applications that bring funding to the project, the significance determinations may change which could require a new, higher-level document or recirculation of an amended document in the 1 Phase.	No changes proposed will significantly affect the environmental impacts.	2-Low (11-30%)			0-PA&ED	hours	Avoid	By discussing the consequences of all proposals between environmental and regional planning staff, this risk can be avoided by eliminating proposals that would invalidate the current environmental document.	ENV / PLANNING	7/15/2020
										0-PA&ED	hours				
Active	10	Threat	Right of Way	Potholing	If late potholing reveals conflicts requiring relocation, PS&E delivery could be delayed, leading to a loss of grant funding.	Due to lack of sufficient 0 phase funds, potholing of utilities under I-5 has been delayed to the 1 phase.	1-Very Low (1-10%)			1-PS&E	hours	Accept	If sufficient budget remains after PA&ED, potholing may be completed to reduce design risk during PS&E.	Design / RW Utilities	7/15/2020
										1-PS&E	hours				
Active	12	Threat	Organizational	COVID-19	If COVID-19 infects enough staff, project development could be halted long enough to delay ultimate delivery.	Most critical team members will remain safe and healthy to continue working on the project.	1-Very Low (1-10%)					Mitigate	Work Remotely, establish communication protocols, provide equipment and software to continue developing the project.	Caltrans	7/15/2020
Active	13	Threat	Political/Legal	COVID-19 related change in CEQA Statute of Limitations	If project opponents want to sue under CEQA, they now have additional time to prepare court filings, increasing the liklihood of a lawsuit.	The California statute of limitations for CEQA has been changed from 30 days post Notice of Determination to 90 days after the end of the COVID-19 State of Emergency.	2-Low (11-30%)			0-PA&ED	hours	Accept	Ensure adequate public noticing and outreach occur during circulation of the DED. Ensure adequate follow up is carried out with any project opponents.	ENV, PM	4/28/2020
										1-PS&E	hours				
Active	14	Threat	Project Management	Performance Measures	As new information arrives from surveys and other data sources, alterations in the number and type of assets could affect project performance measure commitments, possibly requiring a PCR to explain differences between PA&ED and RTL.	Preliminary information is accurate.	3-Moderate (31-50%)					Accept	As new information and data becomes available, continue to monitor scope of work and validate performance measure commitments.	PM/Design	5/7/2020
								2 - Low (<1 month)	6						

Risk Identification							Risk Assessment			"Red" Quantitative Analysis		Risk Response			
Status	ID #	Type	Category	Title	Risk Statement	Current status / assumptions	Probability	Cost Impact Schedule Impact	Cost Rating Schedule Rating	Impacted Phase(s) for Red Risk	Support (hours) Capital Cost $k Schedule (Days)	Strategy	Response Actions	Risk Owner	Updated
Retired	6	Threat	Environmental	CESA Determination	If CDFW does not concur with NMFS's biological opinion, they may withhold the CESA consistency determination, requiring additional work in the 1 Phase.	CDFW will concur.	2-Low (11-30%)	1 - Very Low (Insignificant)	2	0-PA&ED	hours days	Accept	Environmental team will work with both agencies to request the language needed for CDFW CESA concurrence to be included in the Letter of Concurrence from NMFS.	ENV	7/15/2020
								4 - Moderate (1-3 months)	8	0-PA&ED	hours days				
Retired	11	Opportunity	Geotechnical	Perform Drilling	PA&ED costs are under-running earlier projections. If sufficient funding remains after PA&ED, geotechnical drilling information could be obtained with current programming.	Drilling is underway.	3-Moderate (31-50%)	2 - Low (<$4736k)	6			Exploit	If sufficient budget remains after PA&ED, geotechnical drilling will be completed to accelerate bridge design during PS&E.	PM/SRTA/ DES	4/9/2020
								1 - Very Low (Insignificant)	3						
Retired	7	Threat	Political/Legal	Public Opposition	If the general public or other agencies are strongly opposed to the project during DED circulation, there may not be sufficient time to adequately respond and still meet the PA&ED schedule.	The most recent similar project on I-5 was well supported and we do not anticipate large-scale opposition. Sound walls could be desired by some.	2-Low (11-30%)	1 - Very Low (Insignificant)	2	0-PA&ED	hours days	Accept	Thorough technical stedies support the anticipated CEQA and NEPA findings. If public opposition occurs, the project sponsors will work with the public or regulatory entities to resolve objections.	ENV	7/15/2020
								2 - Low (<1 month)	4	0-PA&ED	hours days				
Retired	9	Threat	Geotechnical	Lack of drilling	If grant funding is received that requires a quick design, quick delivery may not be possible because of the time required to perform geotechnical drilling investigations prior to structures design.	Sufficient funds were left at completion of PA&ED to proceed with drilling.	3-Moderate (31-50%)	2 - Low (<$80k)	6	1-PS&E	hours days	Accept	Due to limited 0 phase funds, drilling work was not included during PA&ED. Look for opportunity to pick up this work at the end of the PA&ED phase if funds will allow.	DES - Geotech	7/15/2020
								8 - High (3-6 months)	24	1-PS&E	hours days				
Retired	3	Threat	Organizational	Staff Changes	If the assigned staff leave Caltrans, PA&ED delivery could be delayed, forcing a higher-level CEQA document (EIR) to be developed at additional time and expense.	A key environmental team member has left, but others remain to deliver PA&ED.	2-Low (11-30%)	4 - Moderate ($80k - $160k)	8	0-PA&ED	hours days	Mitigate	The work has been distributed in pieces over several team members for redundancy and timeliness.	ENV, PM	7/15/2020
								2 - Low (<1 month)	4	0-PA&ED	hours days				
Retired	5	Threat	Traffic	Traffic Data	If latest traffic data is delayed, Air and Noise studies likely would not be completed on time, delaying PA&ED.	Sufficient traffic data or projections was received to complete PA&ED.	2-Low (11-30%)	2 - Low (<$80k)	4	0-PA&ED	hours days	Mitigate	Reasonable assumptions will be made if updated data does not become available when needed.	ENV	2/24/2020
								4 - Moderate (1-3 months)	8	0-PA&ED	hours days				

Attachment I
Programming Sheet

EA 02-0H920 EFIS 02 1500 0083		CAPITAL & SUPPORT COSTS BY PROGRAM AND PROJECT FUNDING Fix 5 Cascade Gateway										
Program	**Component**	**Project Funding**				**Expended to Date**			**Estimate at Complete**			
		Fiscal Year	Programmed (x1,000)	Approved Budget	Programmed Support/ Capital (%)	$ (x1,000)	% Expended	% Complete	Current Estimate (x1,000)	Escalated Estimate (x1,000)	Support/ Capital (%)	EAC / Budget
075.600	PA&ED	18/19	$1,600	$1,600		$1,155	72%	90%	$1,600	$1,600	2%	100%
075.600	PS&E	22/23	$2,227			$0		0%	$5,358	$5,849	9%	
075.600	R/W Sup	22/23	$50			$0		0%	$70	$77	0%	
075.600	CON Sup	22/23				$0		0%	$6,963	$8,254	12%	
SUPPORT SUBTOTAL			**$3,877**	**$1,600**		**$1,155**			**$13,991**	**$15,780**	**23%**	**986%**

		Programmed	Current Escalated Estimate	Applied Rates	
075.600	R/W Capital (25/26)	$631	$744	Capital Contingency Rate	10.00%
				Construction Capital Escalation Rate	3.20%
				R/W Capital Escalation Rate	5.00%
075.600	CON Capital (25/26)		$66,709	Baseline ICRP Rate	30.47%
				Current ICRP Rate	34.86%
CAPITAL SUBTOTAL		**$631**	**$67,453**		
PROJECT TOTALS		**$4,508**	**$83,233**		



PPM Deputy District Director Concurrence

Form Revision Date: 7/14/2020ses

Notes:

1. Table is incomplete because additional funding is needed to fully program all phases beyond PA&ED.
2. Support and capital cost estimates are escalated based on a 25/26 delivery year.
3. PS&E, R/W Support, and R/W Capital programming shown is in the 2020 STIP. Funds are STIP-RIP.
4. PS&E, R/W Support, and R/W Capital are expected to be supplemented from other funding sources.

Attachment J
Stormwater Data Report PA&ED

Dist-County-Route: 02-SHA-5
Post Mile Limits: R14.8/R20.0
Type of Work: Roadway widening (added lanes)
Project ID (EA): 021500083/02-0H920
Program Identification: 20.XX.075.600
Phase: ☐ PID ☒ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): Central Valley
Total Disturbed Soil Area: 32.0 acres PCTA: 25.9 acres
Alternative Compliance (acres): TBD ATA 2 (50% Rule)? Yes ☐ No ☒
Estimated Const. Start Date: 05/01/26 Estimated Const. Completion Date: 11/03/27
Risk Level: RL 1 ☐ RL 2 ☒ RL 3 ☐ WPCP ☐ Other: _____
Is MWELO applicable? Yes ☐ No ☐
Is the Project within a TMDL watershed? Yes ☐ No ☒
TMDL Compliance Units (acres): Not Applicable
Notification of ADL reuse (if yes, provide date): Yes ☐ Date: _____ 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 date upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E only.

Travis Gurney, Registered Project Engineer — 3-16-2020 Date

I have reviewed the stormwater quality design issues and find this report to be complete, current and accurate:

Sean Shepard — 16 MAR 2020
Sean Shepard, Project Manager — *Date*

Eric Akana, Designated Maintenance Representative — 3-17-2020 *Date*

Steve Thorne, Designated Landscape Architect Representative — 3-16-2020 *Date*

[Stamp Required at PS&E only]

Steve Thorne, District/Regional Design SW Coordinator or Designee — 3-16-2020 *Date*

STORMWATER DATA INFORMATION

1. Project Description

This project will widen Interstate 5 (I-5) from four to six lanes starting 0.3 mile north of the Cypress Avenue Overcrossing to 0.6 mile north of the Oasis Road overcrossing. Widening will occur mostly in the median; it will occur in a limited amount outside the existing edge of pavement. The goal will be to provide three 12-foot (ft) lanes and 10 ft median shoulders in each direction. One bridge spans Churn Creek, a perennial watercourse. Work will also require widening seven bridges and adding stormwater treatment and drainage features to account for new impervious areas associated with the project.

The total disturbed area (DSA) is approximately 32.0 acres. The project will add 16.6 acres of new impervious area (plus 9.3 acres replaced) due to lane, shoulder widening, and median paving. The estimated existing impervious area is 53.1 acres (including the 9.3 acres being replaced). The total site area (R/W to R/W) for this project is about 256.9 acres.

2. Site Data and Stormwater Quality Design Issues

This project is located within the Redding hydrologic unit and Enterprise Flat hydrologic area (508.10). Churn Creek and Boulder Creek are the two named tributaries flowing through the project limits. Boulder Creek eventually flows into Churn Creek, which discharges to the Sacramento River in the Keswick Dam to Cottonwood Creek reach. This reach is included in the Clean Water Act (CWA) Section 303(d) list for toxicity.

DSA will result from removing a relatively small hill existing within portions of the median, minor embankment construction, and roadway grading activities. Some existing cut slopes may be disturbed to obtain added roadway width. In general, any resulting slopes will be short. During construction, temporary BMPs might be deployed to protect any disturbed slopes and prevent erosion and subsequent sediment transport. Post-construction, all DSA will be treated in accordance with erosion control plans prepared or approved by the District Landscape Architect. Final erosion control applications will be focused on promoting vegetation establishment for permanently stabilizing the DSA. Erosion control treatment would include seed, fibrous matrix, fertilizer or soil amendments, tackifier, and other products specified by the Landscape Architect. If deemed necessary, linear barriers such as biodegradable fiber rolls may be left in place to reduce concentrated flow velocities.

During construction, potential stormwater impacts include sediment transported from unprotected DSA, chemical pollutants from incidental fuel and lubricant spill/leakage associated with heavy equipment, and pollutants associated with concrete, asphalt and other products used in the project. These potential temporary impacts are addressed by deploying commonly used construction site Best Management Practices (BMPs). BMPs include erosion control such as straw, hydromulch, wood mulch, and temporary plastic among others. Erosion control BMPs protect the ground surface from rainfall. Sedimentation controls are linear barriers such as fiber rolls, silt fence, gravel bag check dams, and gravel berms that slow flow velocity. Construction site housekeeping-type BMPs are employed for ensuring any incidental spills and leakage are adequately contained and cleaned before being exposed to stormwater or receiving waters. Similar BMPs are used for containing and cleaning wastes resulting from

products used in the project. These temporary construction BMPs are covered in the Standard Specifications, Section 13.

Topographic mapping shows the terrain being flat to rolling. The elevation range is 400 feet to 650 feet above mean sea level. The climate is mild with temperatures in the low 30s in January to near 110 degrees Fahrenheit in July. The average monthly precipitation ranges from 0.16 inches in July to 7.9 inches in January and falls primarily between the months of October and April. It is not unusual to see long dry spells during the typical rainy season. Adjacent land use is urban, residential, and commercial. Based upon a desk top review of native project soils as from the USDA Web Soil Survey the predominate project soils are classified as Hydrologic Group B.

Lead-contaminated soil may exist within the highway shoulders due to historical use of leaded gasoline. The ADL concentrations will not exceed the allowable threshold. A lead compliance plan will be provided during the construction of this project.

3. Construction Site BMPs to be used on Project

Temporary construction BMPs will be deployed under a contractor prepared SWPPP approved by the engineer with specific BMPs offered as contract items as listed in the attached NR Construction BMP Estimator. The project has been determined as Risk Level 2 using Method 1, GIS Map Method in accordance with Appendix 1 of the Construction General Permit. The project will have approximately 240 working days spanning two full dry seasons and one rainy season.

Monitoring and sampling will be required at each outfall location in accordance with the Construction General Permit. Work will be required at the Churn Creek bridge structure. This work will likely require instream activities. The instream work will likely require a clear water diversion during construction.

4. Maintenance BMPs

This project does not have pedestrian access areas. Stenciling drain inlets does not apply for this project.

Pullouts or other access will be provided for personnel to conduct maintenance activities on any Treatment BMPs or flow attenuation underground vaults.

5. Other Water Quality Requirements and Agreements

There are no negotiated agreements with the CVRWQCB for this project. A future meeting will be scheduled for proposing excess treatment acreage, resulting from the Redding to Anderson Six Lane Project (02-4C40V), as Alternative Compliance for this project. This would apply if there are not enough opportunities for meeting the required treatment within the project limits.

6. Permanent BMPs

Post-construction long-term potential impacts include pollutants associated with traffic vehicles and hydromodification impacts resulting from increased runoff flows. Treatment BMPs such as bioswales and Design Pollution Prevention Infiltration Areas (DPPIAs) will be evaluated to determine their feasibility for incorporation into the project. These would be intended to reduce water quality impacts associated with pollutants resulting from traffic. Attenuation features such as detention basins and underground vaults, as well as end treatments at culvert inlets and outlets would address potential hydromodification impacts.

7. Rapid Stability Assessment

Churn Creek and Boulder Creek require Rapid Stream Stability Assessments (RSSA's). None of the RSSA's require a higher-level analysis because the streams are rated in overall "good" condition. Thirteen (13) other crossings or drainage systems require a Rapid Stability Assessment because they are or potentially are a Water of the United States or discharge to a water of the United States.

8. Design Pollution Prevention (DPP) BMP Strategy

The proposed improvements will increase the impervious area within the project limits by approximately 16.6 acres. The new impervious area will increase overall runoff originating within the project limits. The project will require incorporating flow attenuation features for addressing a 2-year design storm event. Features that will be evaluated include detention basins and underground vaults. Any flow attenuation feature incorporated in the project will also reduce potential hydromodification impacts to receiving waters. Additionally, other feasible low impact design features will be evaluated to reduce project runoff. These features would include maintaining existing vegetated areas, drainage facilities that mimic the existing drainage pattern of the area, incorporating compost into the soil, and landscape planting.

9. Treatment BMP Strategy

The Sacramento River, Keswick Dam to Cottonwood Creek, is 303(d) listed for toxicity. Since the toxicity source is not well defined the strategy for this project is to attempt treating any pollutants in stormwater that may occur within the roadway system.

Biofiltration strips and swales, and DPPIAs will be evaluated as potential treatment BMPs intended to treat stormwater runoff. Detention basins and underground vaults will be evaluated to provide flow attenuation. Flow attenuation features, which are designed for storm events that are greater than the 85th percentile 24-hour events used for Treatment BMPs, should also reduce potential hydromodification impacts associated with increased impervious surfaces. Currently existing treatment BMPs will be preserved or replaced if these need to be removed for completing project activities.

Excess treatment acreage resulting from the 02-4C40V Redding to Anderson Six Lane Project will be proposed as Alternative Compliance for this project if it is determined that the implemented treatment BMPs do not achieve all the required treatment. Approximately 44 acres of extra treatment were estimated to result from 02-4C40V. The proposal will be subject to RWQCB concurrence.

Treatment BMP locations will be shown on the Project Plans.

Complete the following table if treatment is required for the project.

Table E-1. Overall Project Treatment Summary Table[1]

	PCTA (ac)[2]	A = 25.9 ac
Total Area to be Treated	Treated Impervious Area (CT RW) (ac)	B = 25.9 ac
	Treated Impervious Area (Outside CT RW) (ac)[3]	C = 0
	PCTA Balance (ac)[4]	D = (B+C) – A = (25.9 + 0) - 25.9 = 0

1 This table is provided as an example. The table may be edited, altered, or removed as applicable or as directed by the District/Regional Design Stormwater Coordinator.

2 Provide treatment for ATA 1 even if NIS is less than 1 acre.

3 Requires Regional Board approval. Coordinate with District/Regional NPDES Coordinator.

4 If less than 0, additional treatment must be identified.

Net New Impervious Area (NNI) = 16.6 ac

Replaced Impervious Surface (RIS) = 9.3 ac

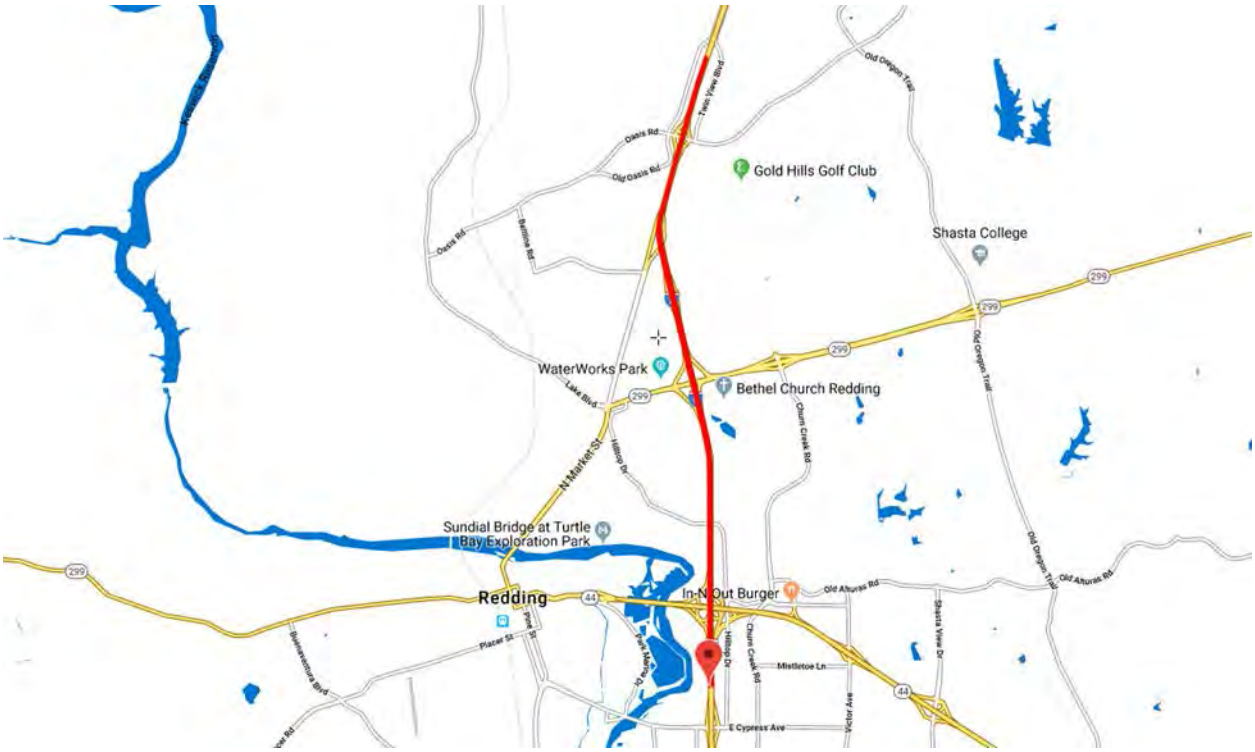
New Impervious Surface (NIS) = NNI + RIS
= 16.6 ac+9.3 ac = 25.9 ac

There will be no exisiting Treatment BMPs removed. Therefore ATA1 = 0 ac.

Total post project impervious area (TPPI) = Existing +RIS + NNI
= 48.1 ac+9.3 ac+16.6 ac
= 69.8 ac

ATA 2 = 0 because: $\frac{NNI}{TPPIA} * 100 = 27.2\% < 50\%$

Post Construction Treatment Area (PCTA) = NIS + ATA1 + ATA2
= 25.9 ac +0 ac+0 ac
= 25.9 ac


Gold Hills Golf Club
Shasta College
WaterWorks Park
Bethel Church Redding
Sundial Bridge at Turtle Bay Exploration Park
Redding
In-N-Out Burger
Oasis Rd
Old Oasis Rd
Lake Blvd
N Market St
Hilltop Dr
Churn Creek Rd
Old Oregon Trail
Old Alturas Rd
Placer St
Mistletoe Ln
E Cypress Ave
Victor Ave
Shasta View Dr
299
44

10. Attachments

- Vicinity Map
- Evaluation Documentation Form
- Construction Site BMP Consideration Form
- SWDR Attachment for SMARTS Input

INDEX OF PLANS

SHEET No.	DESCRIPTION
1	TITLE AND LOCATION MAP
X-X	TYPICAL CROSS SECTIONS
X	KEY MAP AND LINE INDEX
XX-XX	LAYOUTS
XX-XX	PROFILES AND SUPERELEVATION DIAGRAMS
XX-XX	CONSTRUCTION DETAILS
XX-XX	TEMPORARY WATER POLLUTION CONTROL PLANS
XX-XX	CONTOUR GRADING PLANS
XX-XX	DRAINAGE PLANS, PROFILES, DETAILS AND QUANTITIES
XX-XX	UTILITY PLANS
XX	CONSTRUCTION AREA SIGNS
XX-XX	MOTORIST INFORMATION PLANS
XX-XX	STAGE CONSTRUCTION PLANS
XX-XX	TRAFFIC HANDLING PLANS AND QUANTITIES
XX-XX	PAVEMENT DELINEATION PLANS, DETAILS AND QUANTITIES
XX-XX	SIGN PLANS, DETAILS AND QUANTITIES
XX-XX	SUMMARY OF QUANTITIES
XX-XX	REVISED STANDARD PLANS
XX-XX	VENDOR DRAWINGS

STRUCTURES

XX-XXX	NAME OF BRIDGE, Br No. XX-XXXX
XXX-XXX	NAME OF BRIDGE, BR No. XX-XXXXX

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON

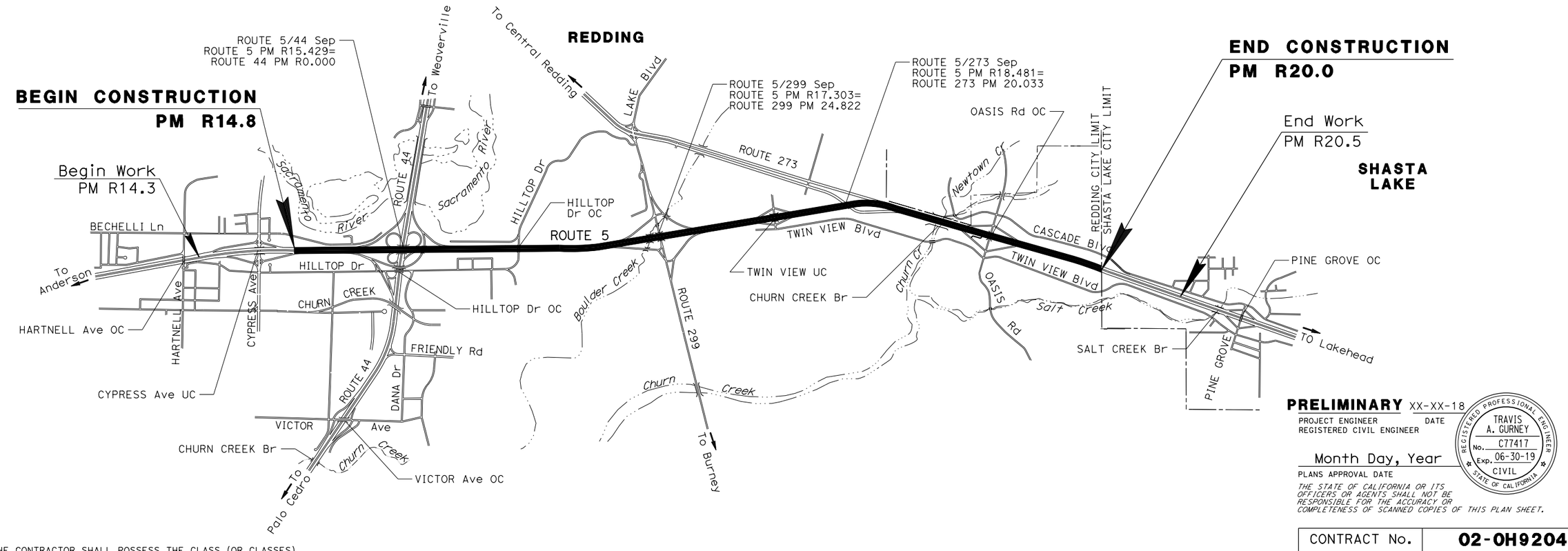
STATE HIGHWAY

IN SHASTA COUNTY IN REDDING FROM 0.3 MILE NORTH OF CYPRESS AVENUE OVECROSSING TO 0.6 MILE NORTH OF OASIS ROAD OVERCROSSING

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2018

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	005	R14.8/R20.0	1	1

LOCATION MAP



THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

PRELIMINARY XX-XX-18

PROJECT ENGINEER DATE
REGISTERED CIVIL ENGINEER

TRAVIS A. GURNEY
No. C77417
Exp. 06-30-19
CIVIL
STATE OF CALIFORNIA

Month Day, Year
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.

CONTRACT No.	02-0H9204
PROJECT ID	0215000083

PROJECT MANAGER: ERIC ORR
DESIGN MANAGER: TOBY CRAWFORD

P:\proj3\02\0h920\design\P&E\0215000083ab001.dgn

DATE PLOTTED => 15-JAN-2020
TIME PLOTTED => 06:45
LAST REVISION 12-19-18

BORDER LAST REVISED 8/1/2016 | CALTRANS WEB SITE IS: HTTP//WWW.DOT.CA.GOV/ | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s134830 DGN FILE => 0215000083ab001.dgn | UNIT 0316 | PROJECT NUMBER & PHASE 02150000831

DATE: 3/10/2020

Project ID (EA): 0215000083 (02-0H920)

No.	Criteria	Yes ✓	No ✓	Supplemental Information for Evaluation
1.	Begin Project evaluation regarding requirement for implementation of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Treatment BMPs. Continue to 2.
2.	Is the scope of the Project to install Treatment BMPs (e.g., Alternative Compliance or TMDL Compliance Units)?		✓	If **Yes**, go to 8. If **No**, continue to 3.
3.	Is there a direct or indirect discharge to surface waters?	✓		If **Yes**, continue to 4. If **No**, go to 9.
4.	As defined in the WQAR or ED, does the project: a. discharge to areas of Special Biological Significance (ASBS), or b. discharge to a TMDL watershed where Caltrans is named stakeholder, or c. have other pollution control requirements for surface waters within the project limits?		✓ ✓ ✓	If **Yes to any**, contact the District/Regional Design Stormwater Coordinator or District/Regional NPDES Coordinator to discuss the Department's obligations, go to 8 or 5. _____*(Dist./Reg. Coordinator initials)* If **No** to all, continue to 5.
5.	Are any existing Treatment BMPs partially or completely removed? (ATA condition #1, Section 4.4.1)		✓	If **Yes**, go to 8 **AND** continue to 6. If **No**, continue to 6.
6.	Is this a Routine Maintenance Project?		✓	If **Yes**, go to 9. If **No**, continue to 7.
7.	Does the project result in an increase of one acre or more of new impervious surface (NIS)?	✓		If **Yes**, go to 8. If **No**, go to 9.
8.	Project is required to implement Treatment BMPs.	Complete Checklist T-1, Part 1.		
9.	Project is not required to implement Treatment BMPs. _____*(Dist./Reg. Design SW Coord. Initials)* _____*(Project Engineer Initials)* _____ *(Date)*	Document for Project Files by completing this form and attaching it to the SWDR.		

DATE: 12/14/19

Project ID / EA: 0215000083 (02-0H920)

Project Evaluation Process for the Consideration of Construction Site BMPs

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. Review 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 RW, etc.?	✓		If Yes, Construction Site BMPs for Sediment Control (SC) will be required. Review 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. Review 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. Review 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-Stormwater Management (NS) will be required. Review 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-Stormwater Management (NS) will be required. Review CS-1, Parts 5 & 6. 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. Review CS-1, Part 6. Continue to 8.
8.	Is there a potential for construction related materials and wastes to have direct contact with precipitation; stormwater 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. Review CS-1, Part 6.

SWDR Attachment for SMARTS Input

Design Information for RE File

EA 02-0H920 **EFIS** **Loc** SHA-5-PM 14.8 - R20.0

The following information is based on the PS&E design plans and specifications. If contract amendments or change orders are made after the design is complete, then the information should be updated by construction, as appropriate.

Enter the following data into the CGP SMARTS Notice of Intent-Site Information page.

1. **Total site size** *(acres); for project area use Caltrans R/W x post mile limits (begin-end) on plan sheets.*

Total Site Size in acres	256.6	Acres

2. Enter **latitude and longitude** *in decimal degrees to 5 significant figures. Use a location from the center of the project. This information can be obtained from Survey information, GPS units, Google earth, CT Earth, or other mapping software.*

Site Latitude:	40.6109
Site Longitude:	-122.367

3. **Total Area to be Disturbed** *(total Disturbed Soil Area (DSA)): This information is already calculated and can be taken from section one of the SWDR. It is should be described in acres.*

Disturbed Soil Area	26.8	Acres

4. **Imperviousness before Construction** *(percentage) - This is calculated as the total impervious area of the project area divided by the total project area (see total site size), multiplied by 100. The impervious area is all paved areas or hard surfaces within the project limits.*

Impervious area before construction	20.69368667	%

5. **Percent of total area disturbed** *(percentage); This should be calculated by dividing the total disturbed soil area by the total project area and multiply by 100.*

Percent of total disturbed area	10.44427124	%

6. **Imperviousness after Construction** *(percentage), This should be calculated by adding all impervious area paved and hard surfaces based on the final design within project limits from above and dividing by the total project area from above multiply by 100.*

Impervious area after construction	27.20187062	%

7. **Mile Post Marker**, *enter the approximate post mile at the center of the project or take the average of the "begin" and "end" post mile markers from the title sheet.*

Mile Post Marker	N/A

8. **Is the construction site part of a larger common plan of development?** *Yes or No; in most cases mark no for Caltrans projects, as this is intended for developers (in accordance with the EPA definitions referenced by the CGP in 40 CFR title 22). This clarification is based on direction from the State Board. Get a confirmation with the Design Stormwater coordinator to determine if there is a special case project where the "common plan of development" may apply.*

Yes	
No	X

9. **Name of development.** *Mark "Not Applicable (N/A)" in most cases.*

Name of planned development	N/A

10. **Construction Commencement Date, mm/dd/yyyy.** *The PE provides the estimated construction start date from the cover of the SWDR. The actual construction start date should be used to input into SMARTS. After the contract is awarded, the RE will use an updated start date (if different) when entering in SMARTS. The RE needs to be aware of the original date provided by Design, as this date was used to calculate the design information including the Risk Level Determination. If the actual start date is different, construction should coordinate with the PE to determine if the Risk Level has changed.*

Construction commencement date	5/1/2026

11. **Complete Grading Date/Complete Project Date;** *The PE provides the estimated construction completion date from the cover of the SWDR to be used for both of these inputs. After the contract is awarded, the RE will use an updated completion date (if different) when entering in SMARTS. The RE needs to be aware of the original completion date provided by Design, as this date was used to calculate the design information including the Risk Level Determination. If the completion date is different, construction should coordinate with the PE to determine if the Risk Level has changed.*

Complete grading/complete project date	11/3/2027

Use the same date for both inputs, unless instructed otherwise.

12. **Does the Stormwater from the construction site discharge directly or indirectly into waters of the United States.**

Indirect Discharge	No	(No Discharge from the Site)	
If yes, list name(s) of receiving water(s)			

Direct Discharge	No	(No Discharge from the Site)	
If yes, list name(s) of receiving water(s)			

13. **Risk Level;** *the combined project risk level is calculated using the sediment risk factor and the water body risk factor to give one overall project risk level. Use the Caltrans risk level determination guidance, (see the Storm water design web page). Attach all risk calculations.*

R Factor Value	68.52
K Factor Value	0.20
LS Factor Value	1.22
Combined Value	16.72

Receiving water risk *comes from the state water resources control board mapping of water bodies for 303-d listing or TMDLs for sediment or water body with the beneficial use of cold and spawn and migratory. The input will either be high= yes and low=no;*

Receiving Water Risk	Y

The dates used for determining the project risk level and other design elements of the project required for CGP compliance are dependent on having the same sediment risk factor. This is a critical element for compliance, as modifying the estimated construction dates may cause the sediment risk factor to change and ultimately modify the overall project risk factor. This could impact the projects CGP compliance requirements and the assumptions used for the design documents and engineers estimate.

14. *Provide electronic copy of plan sheets in .pdf format that can be loaded to SMARTS, burn a CD for the RE to use for the project. The Title sheet can be used as the site map.*

Attachment K
SHOPP Performance Measures

From: Eckard, Kathy B@DOT
To: Gurney, Travis A@DOT
Cc: Rogers, Steve J@DOT; Shepard, Sean E@DOT; Kingsley, Kristen A@DOT
Subject: Cascade CAPM
Date: Friday, February 21, 2020 11:55:06 AM
Attachments: image001.png

Hi Travis,

Here is what we have in the AM Tool:

TEN YEAR PLAN PROJECT NOMINATION (Pre-PID) — Project Book: — Performance

District Priority		ID	22190	EA	1J380	EFIS Project ID	0220000064
PPNO	3790	TYP *	2019				
District *	02	County *	SHA	Route *	005	BackPM *	R14.8
AheadPM *	R20.0	Additional Locations					
Activity Category *	Pavement	Activity/Project Location *	Cascade CAPM	Long Lead			
Target RTL FY *	2025/26	HQ PAC Review					

TEN YEAR PLAN COST

R/W Cap ($K) *	Const Cap ($K) *	Support Cost ($K) *	Total Cost ($K)
110.0	28200.0	6000.0	34310.0

PID WORKPLAN INFORMATION (Pre-PID)

EA	ProjID	PID Cycle	PID Type	Projected SHOPP Cycle
1J380	0220000064	2022	PIR	2022

Resourced PID Workplan	PID Start Date	PID Finish Date	Project Manager
			Sean Shepard 530.225.3530

Comments: Legal: In Shasta County in Redding from 0.3 mile north of Cypress Avenue Undercrossing to 0.6 mile north of Oasis Road Overcrossing

Checked In: Kathy Eckard

SHOPP Project - Accomplishment - Performance Measures - Benefits

District: 02 Tool ID: 22190 Project ID: 0220000064 EA: 1J380 Co-Rte-PM: SHA-005-R14.8/R20.0 (Primary Location) — View Performance Report

County: SHA Route: 005 BackPM: R14.8 AheadPM: R20.0

Bridge | Pavement P | Drainage | Facilities | Safety | Mobility | Roadside | Complete Streets | Sustainability /Climate Change | Advance Mitigation/Mitigation | Major Damage | Green-

Performance & Accomplishments (TYP)

	Activity Detail	Performance Objective	Unit of Measurement	Quantity	Assets in Good Cond	Assets in Fair Cond	Assets in Poor Cond	New Asset Added	
1	Asphalt Pavement Minor Rehab (CAPM)	Pavement Class I	Lane Miles	24.481	3.797	20.684	0.0		
2	Replace/Install Culverts (201.151) - EA	No Performance Objective in the SHSMP	EA	13.0		3.0	10.0		
3	Replace Install/Culverts (201.151) - LF	Drainage System Restoration	LF	2204.0		244.0	1960.0		
4	Guard Rail (201.010, 015)	No Performance Objective in the SHSMP	LF	26400.0			26400.0		
5	CCTV (201.315)	Transportation Management Systems	EA	1.0			1.0		CCTV at I5 and 44: Sha-5-PM15.4
6	Complete Streets Not Applicable (1)	No Performance Objective in the SHSMP	1						Bike/Peds not allowed on this segment of I-5
7	Is any location within the project limits Ped/Bike accessible?	No Performance Objective in the SHSMP	Yes/No	No					
8	Defer	No Performance Objective in the SHSMP							defer to K phase
9	- Select Activity Detail -								
10	- Select Activity Detail -								
11	- Select Activity Detail -								

ID: 22190 — **Replace/Install Culverts (201.151) - 13 EA.**

Crossing Boundary? District County Route Submit

Drainage Worksheet (TYP)

No.	SYSNO	INETNO	OUTETNO	Heath Assessment	Dia (in.)	Width (ft)	Height (ft)	Number of Barrels	Length (ft)	Extension of Existing Culvert (LF/Barrel)	Total length (LF)
1	060050101496	060050101496002	060050101496001	35	24	0	0	1	167.69		167.69
2	060050101496	060050101496016	060050101496014	61	24	0	0	1	77.82		77.82
3	060050101598	060050101598003	060050101598002	42	24	0	0	1	142.56		142.56
4	060050101785	060050101785003	060050101785001	37	0	1	1	1	18.13		18.13
5	060054101458	060054101458006	060054101458003	44	24	0	0	1	666.88		666.88
6	060054101694	060054101694003	060054101694002	42	36	0	0	1	104.39		104.39
7	060054101730	060054101730002	060054101730001	21	18	0	0	1	143.23		143.23
8	060054101974	060054101974004	060054101974003	42	18	0	0	1	161.34		161.34
9	060058101804	060058101804003	060058101804002	27	24	0	0	1	188.52		188.52
10	060058101850	060058101850004	060058101850003	17	18	0	0	1	94.80		94.80
11	060058101872	060058101872002	060058101872001	60	18	0	0	1	70.64		70.64
12	060058101872	060058101872003	060058101872002	60	18	0	0	1	94.90		94.90
13	060058101873	060058101873002	060058101873001	32	54	0	0	1	272.80		272.80
	Save Drainage Worksheet										2203.70

Enjoy!

Kathy Eckard, P.E.
Caltrans, District 2
SHOPP Asset Coordinator
530.225.3117

Attachment L
Culvert Inventory Assessment

EA# 02-0H920 **Fix 5 Cascade Gateway / 14.58 - 20.00** **Sorted by Health Assessment**

Priority No.	Assessment Code	Health Assess	AADT	System Number (Required)	Post Mile	Upstream ETNO	Downstream ETNO	Notes	Culvert Diameter	Culvert Length/ft	# Barrels
1	4	17	54000	60058101850	18.50	60058101850004	60058101850003	Replace a Section	1.5	95	1
2	3	21	68000	60054101730	17.30	60054101730002	60054101730001	Replace a Section	1.5	143	1
3	3	28	53000	60058101804	18.04	60058101804003	60058101804002	Joint Sealing/Repair	2	189	1
4	3	31	54000	60058101873	18.73	60058101873002	60058101873001	Replace	4.5	273	1
5	3	35	68000	60050101496	14.96	60050101496002	60050101496001	Replace	2	168	1
6	3	37	53000	60050101785	17.85	60050101785003	60050101785001	Joint Sealing/Repair	Chute	18	1
7	3	42	68000	60054101458	14.58	60054101458006	60054101458003	Concrete Repair	2	667	1
8	3	42	68000	60050101569	15.69	60050101569002	60050101569001	Flush Sediment	1.5	126	1
9	3	42	54000	60058101850	18.50	60058101850003	60058101850002	Debris Removal	1.5	64	1
10	3	42	54000	60058101927	19.27	60058101927002	60058101927001	Flush Sediment	2	50	1
11	3	43	68000	60050101496	14.96	60050101496005	60050101496004	Flush Sediment	2	111	1
12	3	44	68000	60050101598	15.98	60050101598003	60050101598002	Joint Sealing/Repair	2	143	1
13	3	44	68000	60054101694	16.94	60054101694003	60054101694002	Joint Sealing/Repair	3	104	1
14	3	44	53000	60058101804	18.04	60058101804008	60058101804007	Do Nothing	1.5	144	1
15	3	44	46000	60054101974	19.74	60054101974004	60054101974003	Joint Sealing/Repair	1.5	161	1
16	3	46	68000	60050101550	15.50	60050101550002	60050101550001	Flush Sediment	2	98	1
17	3	46	68000	60050101550	15.50	60050101550003	60050101550002	Debris Removal	1.5	211	1
18	3	46	68000	60050101560	15.60	60050101560007	60050101560006	Debris Removal	1.5	99	1
19	3	46	68000	60050101582	15.82	60050101582002	60050101582001	Flush Sediment	1.5	106	1
20	3	46	53000	60050101740	17.40	60050101740003	60050101740002	Flush Sediment	2	121	1
21	3	46	53000	60058101804	18.04	60058101804009	60058101804008	Flush Sediment	1.5	36	1
22	3	46	54000	60058101879	18.79	60058101879003	60058101879002	Flush Sediment	1.5	151	1
23	2	57	68000	60050101646	16.46	60050101646002	60050101646001	Do Nothing	1.5	43	1
24	2	58	68000	60056101721	17.21	60056101721002	60056101721001	Do Nothing	1.5	65	1
25	2	60	68000	60054101621	16.21	60054101621002	60054101621001	Do Nothing	1.5	103	1
26	2	60	68000	60054101706	17.06	60054101706002	60054101706001	Do Nothing	2	115	1
27	2	60	54000	60058101872	18.72	60058101872002	60058101872001	Joint Sealing/Repair	1.5	71	1
28	2	60	54000	60058101872	18.72	60058101872003	60058101872002	Joint Sealing/Repair	1.5	95	1
29	2	61	53000	60058101804	18.04	60058101804012	60058101804011	Flush Sediment	1.5	67	1
30	2	61	54000	60056101938	19.38	60056101938002	60056101938001	Flush Sediment	2	159	1
31	2	61	54000	60056101938	19.38	60056101938003	60056101938002	Flush Sediment	2	13	1
32	2	61	46000	60054101974	19.74	60054101974002	60054101974001	Do Nothing	2	95	1
33	2	62	68000	60050101496	14.96	60050101496016	60050101496014	Joint Sealing/Repair	2	78	1
34	2	63	54000	60056101929	19.29	60056101929002	60056101929001	Do Nothing	2	53	1
35	2	64	68000	60054101458	14.58	60054101458011	60054101458010	Do Nothing	2	129	1
36	2	64	45500	60054101829	18.29	60054101829002	60054101829001	Do Nothing	2	105	1
37	2	64	45500	60054101829	18.29	60054101829003	60054101829002	Do Nothing	2	88	1
38	2	64	45500	60054101840	18.40	60054101840002	60054101840001	Do Nothing	2	157	1
39	2	64	45500	60054101840	18.40	60054101840003	60054101840002	Do Nothing	2	111	1
40	2	64	54000	60058101879	18.79	60058101879002	60058101879001	Do Nothing	1.5	105	1
41	2	64	54000	60058101930	19.30	60058101930002	60058101930001	Do Nothing	1.5	29	1
42	2	65	68000	60054101458	14.58	60054101458008	60054101458006	Do Nothing	1.5	81	1
43	2	65	68000	60054101458	14.58	60054101458012	60054101458009	Do Nothing	3	222	1
44	2	65	68000	60050101496	14.96	60050101496004	60050101496003	Flush Sediment	2	11	1

45	2	65	68000	60050101560	15.60	60050101560006	60050101560005	Do Nothing	1.5	100	1
46	2	65	68000	60050101560	15.60	60050101560008	60050101560004	Do Nothing	1	159	1
47	2	65	68000	60050101569	15.69	60050101569005	60050101569004	Do Nothing	1.5	97	1
48	2	65	68000	60056101713	17.13	60056101713002	60056101713001	Do Nothing	2.5	92	1
49	2	65	53000	60050101740	17.40	60050101740002	60050101740001	Flush Sediment	2	114	1
50	2	65	53000	60058001750	17.50	60058001750002	60058001750001	Flush Sediment	1.5	47	1
51	2	65	53000	60058101804	18.04	60058101804002	60058101804001	Do Nothing	3	303	1
52	2	65	54000	60058101850	18.50	60058101850002	60058101850001	Flush Sediment	1.5	192	1
53	1	80	68000	60054101458	14.58	60054101458002	60054101458001	Do Nothing	2	32	1
54	1	80	68000	60054101458	14.58	60054101458003	60054101458002	Do Nothing	2	126	1
55	1	80	68000	60054101458	14.58	60054101458004	60054101458003	Do Nothing	2	6	1
56	1	80	68000	60054101458	14.58	60054101458005	60054101458004	Do Nothing	2	214	1
57	1	80	68000	60054101458	14.58	60054101458007	60054101458006	Do Nothing	2	21	1
58	1	80	68000	60054101458	14.58	60054101458009	60054101458010	Do Nothing	2	11	1
59	1	80	68000	60054101458	14.58	60054101458010	60054101458006	Do Nothing	2	478	1
60	1	80	68000	60050101496	14.96	60050101496003	60050101496002	Do Nothing	2	97	1
61	1	80	68000	60050101496	14.96	60050101496006	60050101496003	Do Nothing	2	213	1
62	1	80	68000	60050101496	14.96	60050101496007	60050101496006	Do Nothing	2	22	1
63	1	80	68000	60050101496	14.96	60050101496008	60050101496007	Do Nothing	2	60	1
64	1	80	68000	60050101496	14.96	60050101496009	60050101496006	Do Nothing	2	393	1
65	1	80	68000	60050101496	14.96	60050101496010	60050101496009	Do Nothing	1	8	1
66	1	80	68000	60050101496	14.96	60050101496011	60050101496012	Do Nothing	2	85	1
67	1	80	68000	60050101496	14.96	60050101496012	60050101496009	Do Nothing	2	9	1
68	1	80	68000	60050101496	14.96	60050101496013	60050101496012	Do Nothing	2	83	1
69	1	80	68000	60050101496	14.96	60050101496014	60050101496009	Do Nothing	2	307	1
70	1	80	68000	60050101496	14.96	60050101496015	60050101496014	Do Nothing	2	6	1
71	1	80	68000	60050101496	14.96	60050101496017	60050101496016	Do Nothing	2	122	1
72	1	80	68000	60050101496	14.96	60050101496018	60050101496016	Do Nothing	Asphalt ditch	51	1
73	1	80	68000	60050101496	14.96	60050101496019	60050101496017	Do Nothing	1.5	121	1
74	1	80	68000	60050101560	15.60	60050101560002	60050101560001	Do Nothing	1.5	14	1
75	1	80	68000	60050101560	15.60	60050101560003	60050101560002	Do Nothing	5' wide Chute	74	1
76	1	80	68000	60050101560	15.60	60050101560004	60050101560003	Do Nothing	1.5	90	1
77	1	80	68000	60050101560	15.60	60050101560005	60050101560004	Do Nothing	1.5	18	1
78	1	80	68000	60050101569	15.69	60050101569003	60050101569002	Do Nothing	1.5	55	1
79	1	80	68000	60050101569	15.69	60050101569004	60050101569002	Do Nothing	1.5	22	1
80	1	80	68000	60050101598	15.98	60050101598002	60050101598001	Do Nothing	2	105	1
81	1	80	68000	60054101621	16.21	60054101621003	60054101621002	Do Nothing	3	74	1
82	1	80	68000	60054101632	16.32	60054101632002	60054101632001	Do Nothing	5	345	1
83	1	80	68000	60050101653	16.53	60050101653002	60050101653003	Do Nothing	2	7	1
84	1	80	68000	60050101653	16.53	60050101653003	60050101653001	Do Nothing	2	124	1
85	1	80	68000	60050101653	16.53	60050101653004	60050101653003	Do Nothing	2	107	1
86	1	80	68000	60050101653	16.53	60050101653005	60050101653002	Do Nothing	3	202	1
87	1	80	68000	60054101676	16.76	60054101676002	60054101676001	Do Nothing	2	123	1
88	1	80	68000	60054101676	16.76	60054101676003	60054101676002	Do Nothing	2	63	1
89	1	80	68000	60050101689	16.89	60050101689002	60050101689001	Do Nothing	1.5	21	1
90	1	80	68000	60054101694	16.94	60054101694002	60054101694001	Do Nothing	3	135	1
91	1	80	68000	60050101696	16.96	60050101696002	60050101696001	Do Nothing	1.5	26	1

92	1	80	68000	60056101713	17.13	60056101713003	60056101713002	Do Nothing	1.5	67	1
93	1	80	68000	60056101713	17.13	60056101713004	60056101713003	Do Nothing	1.5	96	1
94	1	80	68000	60056101713	17.13	60056101713005	60056101713004	Do Nothing	1.5	125	1
95	1	80	68000	60056101713	17.13	60056101713006	60056101713005	Do Nothing	1.5	71	1
96	1	80	68000	60054101715	17.15	60054101715002	60054101715001	Do Nothing	10' x 10' box	255	2
97	1	80	68000	60058101717	17.17	60058101717002	60058101717001	Do Nothing	2	109	1
98	1	80	68000	60058101717	17.17	60058101717003	60058101717002	Do Nothing	1.5	72	1
99	1	80	68000	60056101726	17.26	60056101726002	60056101726001	Do Nothing	1	57	1
100	1	80	53000	60054101755	17.55	60054101755002	60054101755001	Do Nothing	2	257	1
101	1	80	53000	60054101770	17.70	60054101770002	60054101770001	Do Nothing	3.5	301	1
102	1	80	53000	60050101775	17.75	60050101775002	60050101775001	Do Nothing	2	110	1
103	1	80	53000	60050101785	17.85	60050101785002	60050101785001	Do Nothing	2.5	341	1
104	1	80	53000	60054101788	17.88	60054101788002	60054101788001	Do Nothing	1.5	143	1
105	1	80	53000	60054101788	17.88	60054101788003	60054101788002	Do Nothing	1.5	100	1
106	1	80	53000	60054101788	17.88	60054101788004	60054101788003	Do Nothing	1.5	108	1
107	1	80	53000	60054101788	17.88	60054101788005	60054101788001	Do Nothing	Chute	18	1
108	1	80	53000	60058101804	18.04	60058101804004	60058101804003	Do Nothing	2	27	1
109	1	80	53000	60058101804	18.04	60058101804005	60058101804003	Do Nothing	2	92	1
110	1	80	53000	60058101804	18.04	60058101804006	60058101804003	Do Nothing	1.5	88	1
111	1	80	53000	60058101804	18.04	60058101804007	60058101804005	Do Nothing	1.5	56	1
112	1	80	53000	60058101804	18.04	60058101804010	60058101804008	Do Nothing	1.5	196	1
113	1	80	53000	60058101804	18.04	60058101804011	60058101804010	Do Nothing	1.5	76	1
114	1	80	53000	60058101804	18.04	60058101804013	60058101804010	Do Nothing	1.5	59	1
115	1	80	54000	60056101871	18.71	60056101871002	60056101871001	Do Nothing	1.5	64	1
116	1	80	54000	60058101872	18.72	60058101872004	60058101872003	Do Nothing	1.5	309	1
117	1	80	54000	60058101872	18.72	60058101872005	60058101872004	Do Nothing	1.5	345	1
118	1	80	54000	60058101872	18.72	60058101872006	60058101872005	Do Nothing	1.5	24	1
119	1	80	54000	60056101929	19.29	60056101929003	60056101929002	Do Nothing	2	57	1
120	1	80	54000	60056101929	19.29	60056101929004	60056101929003	Do Nothing	2	230	1
121	1	80	54000	60056101929	19.29	60056101929005	60056101929004	Do Nothing	2	230	1
122	1	80	54000	60056101929	19.29	60056101929006	60056101929005	Do Nothing	2	137	1
123	1	80	54000	60056101929	19.29	60056101929007	60056101929006	Do Nothing	2	92	1
124	1	80	54000	60056101929	19.29	60056101929008	60056101929007	Do Nothing	1.5	31	1
125	1	80	54000	60056101929	19.29	60056101929009	60056101929008	Do Nothing	1.5	24	1
126	1	80	54000	60056101929	19.29	60056101929010	60056101929009	Do Nothing	1.5	73	1
127	1	80	54000	60056101940	19.40	60056101940002	60056101940001	Do Nothing	2	55	1
128	1	80	46000	60058101941	19.41	60058101941002	60058101941001	Do Nothing	2	114	1
129	1	80	46000	60054101963	19.63	60054101963002	60054101963001	Do Nothing	3' x 6' box	180	3
130	1	80	46000	60054101974	19.74	60054101974003	60054101974002	Do Nothing	1.5	300	1
131	1	80	46000	60054101974	19.74	60054101974005	60054101974002	Do Nothing	2	87	1
132	1	80	46000	60054101982	19.82	60054101982002	60054101982001	Do Nothing	2	174	1
133	1	80	46000	60054101986	19.86	60054101986002	60054101986001	Do Nothing	2	96	1
134	1	80	46000	60054101986	19.86	60054101986003	60054101986002	Do Nothing	2	85	1
135	1	80	46000	60054101993	19.93	60054101993002	60054101993001	Do Nothing	2	163	1