

INFORMATION HANDOUT

PLAC SUMMARY

PLAC CONDITION RESPONSIBILITY SUMMARY

IMPACTED AREA MAPPING

WATER QUALITY

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

WDID#5A45CR00447

PERMITS

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME
NOTIFICATION NO. 1600-2012-0240-R1

UNITED STATES ARMY CORPS OF ENGINEERS
PERMIT FILE NO.: SPK-2011-00424

CENTRAL VALLEY FLOOD PROTECTION BOARD
18858 BD PERMIT

AGREEMENTS

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICES
LETTER DATED 5/24/2011

MATERIALS INFORMATION

(NOT A PART OF THE CONTRACT)

REVISED FOUNDATION REPORT FOR LEMN CREEK BRIDGE
DATED NOVEMBER 1, 2012

FOUNDATION REPORT FOR SALT CREEK BRIDGE (WIDENING)
ADDENDUM DATED OCTOBER 16, 2012

FINAL HYDRAULIC REPORT FOR SALT CREEK
DATED MARCH 12, 2012

FINAL HYDRAULIC REPORT FOR LEMN CREEK
DATED APRIL 6, 2012

ADDENDUM TO THE FINAL HYDRAULIC REPORT FOR LEMN CREEK
DATED OCTOBER 30, 2012

GEOTECHNICAL DESIGN REPORT
DATED NOVEMBER 18, 2009

PLAC SUMMARY

PLAC CONDITION RESPONSIBILITY SUMMARY

PLAC CONDITION RESPONSIBILITY (PCR) SUMMARY

General:

This PCR Summary clarifies various PLAC requirements. Perform all work described in the PLACs on behalf of the Department unless otherwise stated in Table 2 below. If a discrepancy exists between the PCR Summary and the PLAC, the PCR Summary governs.

Definitions:

Agency: A board, agency, or other entity that issues a PLAC

Activity: A task, event or other project element

PLAC Condition: A work activity and/or submittal required by a PLAC

Table 1 - Clarification of PLAC Requirements

PLAC Name	Section of the PLAC	PLAC Requirement
All PLACs	Applicable PLAC section	<p>Submittals: Submit to the Engineer when PLAC conditions require:</p> <ol style="list-style-type: none"> 1. Communications. The Engineer will contact the agencies. 2. Records to be maintained, within 5 working days after the inactivity. 3. Submittals 5 days before the agencies require them. The Engineer will review and submit to the agencies. <p>ESA: Environmentally Sensitive Areas (ESAs) exist within the project limits and are shown on the plans. Some ESAs are located on or are within a close proximity to the cut/fill catch lines. You may not enter the ESAs for any reason other than to install the ESA fence.</p>

<p align="center">Central Valley Regional Water Quality Control Board WDID# 5A5CR00447</p>	<p align="center">Additional Technically Conditioned Certification Conditions</p>	<p>Measure 1 - Last Sentence. Both the Contractor and the Department "shall provide Regional Water Board staff access to the project site to document compliance with this order."</p>
		<p>Measure 4 - Meetings are required: 1. During active construction activities 2. For people working on the grade</p>
		<p>Measure 10 - All waste material resulting from the project shall be removed from the site and disposed of properly.</p>
		<p>Measure 12 - Do not use synthetic products for erosion control within waters of the US or waters of the State.</p>
		<p>Measure 18 - Adjust Nationwide Permit reference from #14 to #23.</p>
<p align="center">California Department of Fish and Game Streambed Alteration Agreement Notification No. 1600-2012-0240-R1</p>	<p align="center">Section 1 - Administrative Measures</p>	<p>Measure 1.4 - Both the Contractor and the Department "agrees that DFG personnel may enter the project site at any time to verify compliance with the Agreement."</p>
	<p align="center">Section 2 - Avoidance and Minimization Measures</p>	<p>Measure 2.6 - All but sentence 3 to be performed by the Contractor.</p>
		<p>Measure 2.30 - Apply erosion control mix to areas shown on the plans to receive erosion control (Hydroseed).</p>
<p align="center">United States Department of Commerce National Oceanic and Atmospheric Administration</p>	<p align="center">Measures to Avoid and Minimize Potential Impacts to Central Valley Steelhead</p>	<p>Measure 4 - The last sentence does not apply.</p>

Table 2 - Work to be Performed by the Department

PLAC Name	Section of the PLAC	PLAC Requirement	
California Department of Fish and Game Streambed Alteration Agreement Notification No. 1600-2012-0240-R1	Section 1 - Administrative Measures	Measures 1.1 & 1.3	
	Measure 1.2 - Both the Contractor and the Department are responsible for this measure.	Measure 2.31	
	Section 2 - Avoidance and Minimization Measures	Measure 3.1	
	Section 3 - Compensatory Measures Section 4 - Reporting Measures	Measure 4.1	
United States Army Corps of Engineers Permit No. SPK-2011-00424	Special Conditions	Conditions 1 - 7	
	Condition 10	Conditions 1 - 4	
	Regional Conditions	Condition 5 (excluding 5a, 5b, and 5c)	Conditions 7 - 11
		Conditions 13 - 26	Condition 23
		Condition 25 - 26	Condition 30 - 31
	General Conditions	Condition 30 - 31	Measure 1
Measure 1		Paragraph 2	
United States Department of Commerce National Oceanic and Atmospheric Administration	Measures to Avoid and Minimize Potential Impacts to Central Valley Steelhead	Measure 1	
	ESA Section 7 Consultation	Paragraph 2	
	EFH Consultation	Paragraph 1	
Central Valley Regional Water Quality Control Board WDID# 5A5CR00447	Additional Technically Conditioned Certification Conditions	Measure 2	
		Measure 3 - Both the Contractor and the Department are responsible for this measure.	Measure 20
		Measure 20	Measures 22 - 24
		Measures 22 - 24	Measures 19- 27
Central Valley Flood Protection Board Permit No. 18858 BD	Special Conditions	Measures 19- 27	
		Measure 40	Measures 42 & 43
		Measures 42 & 43	Measures 51 & 52
		Measures 51 & 52	Measures 51 & 52

PLAC SUMMARY

IMPACTED AREA MAPPING

P:\proj1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ea002.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

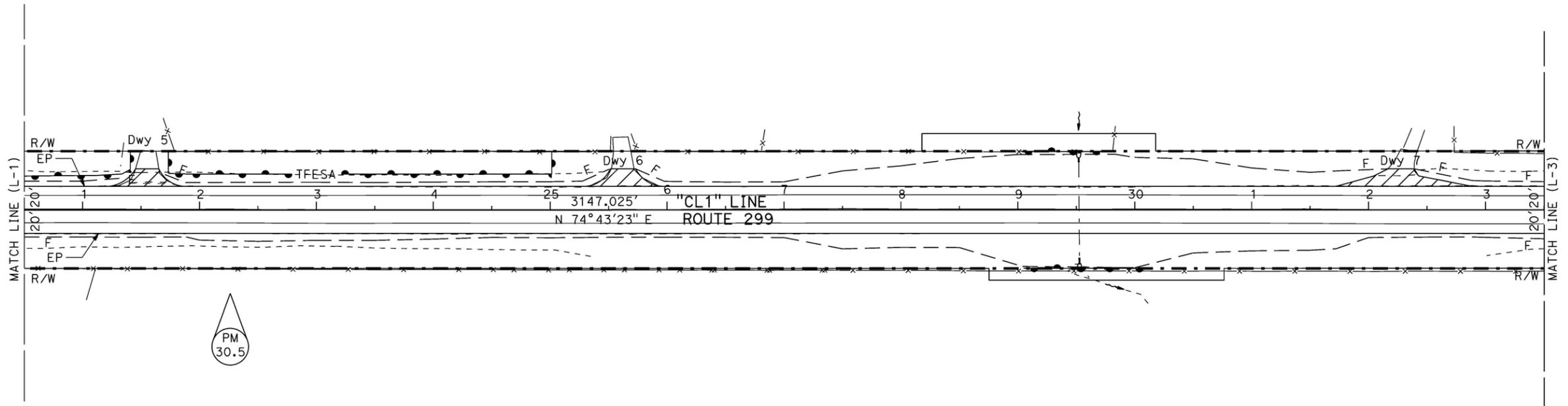
Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER
MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



LAYOUT
 SCALE: 1" = 50'
L-2

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans DESIGN
 FUNCTIONAL SUPERVISOR JULIE CASEY
 CALCULATED-DANIEL FISHER
 DESIGNED BY MIKE MOGEN
 CHECKED BY
 REVISED BY
 DATE REVISED

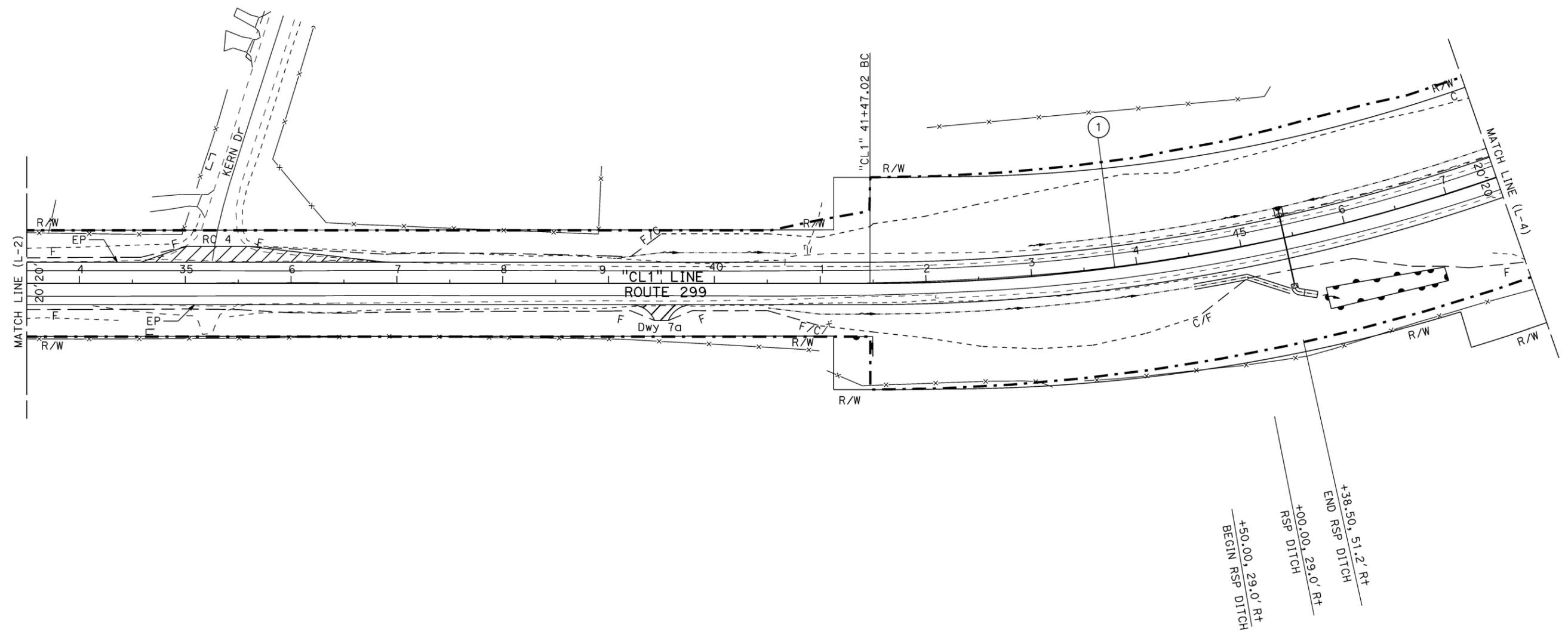
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		Michael J. Mogen 04-22-13		REGISTERED CIVIL ENGINEER DATE	
		MIKE MOGEN		No. C67018	
		PLANS APPROVAL DATE		EXP. 9-30-14	
				CIVIL	
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NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(1)	1800.00	28°29'10"	456.91	894.92



+50.00, 29.0' Rt
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 RSP DITCH
 +38.50, 51.2' Rt
 END RSP DITCH

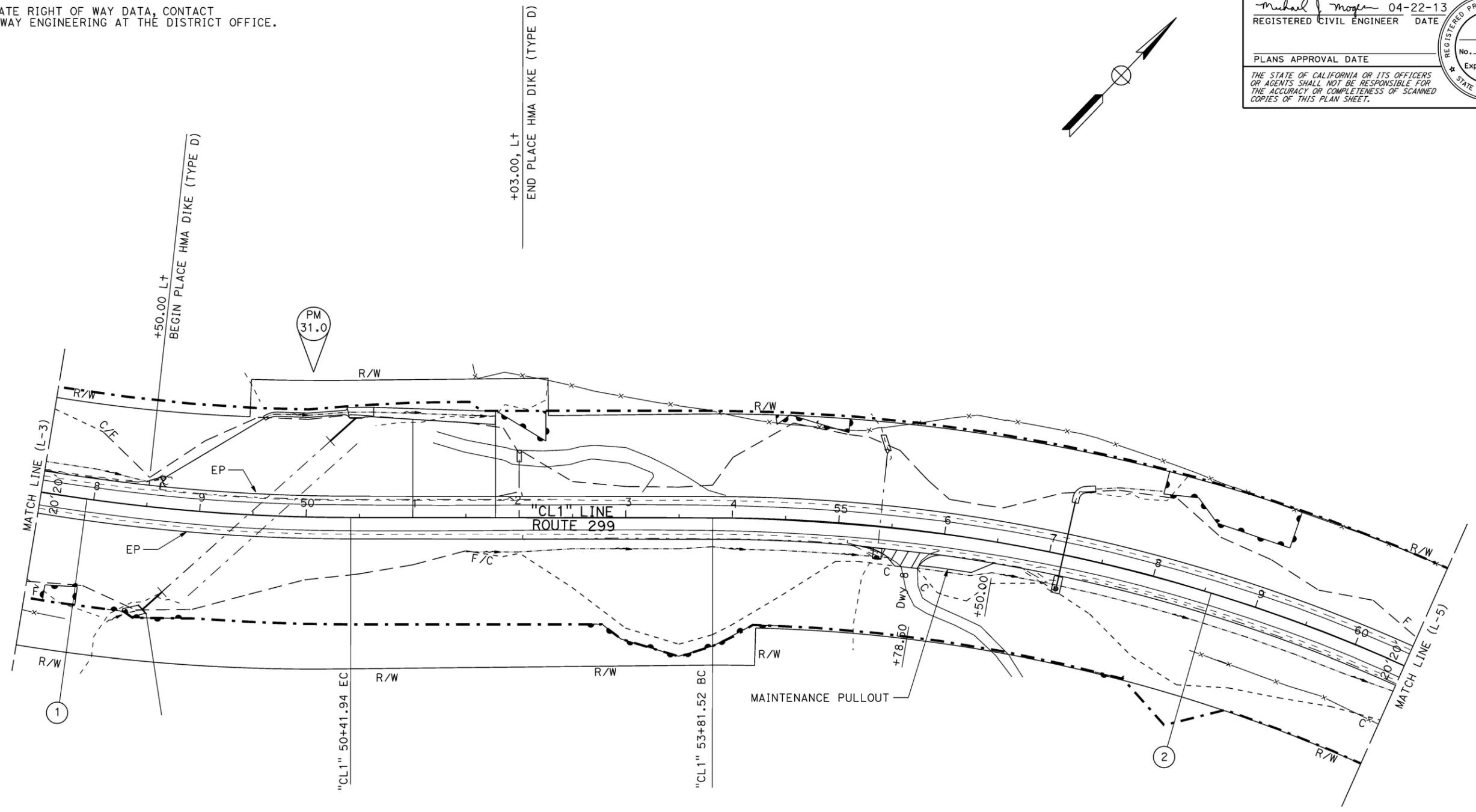
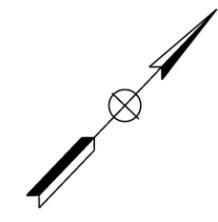
LAYOUT
 SCALE: 1" = 50'
L-3

DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 10:56
 LAST REVISION 04-11-13

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CHECKED BY: MIKE MOGEN
 DESIGNED BY: DANIEL FISHER
 REVISIONS: REVISOR: DATE
 REVISOR: DATE
 REVISOR: DATE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		<i>Michael J. Mogen</i> 04-22-13 REGISTERED CIVIL ENGINEER DATE			
PLANS APPROVAL DATE					
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NOTE:
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CURVE DATA

No.	R	Δ	T	L
①	1800.00	28° 29' 10"	456.91	894.92
②	1600.00	33° 11' 20"	476.81	926.81

LAYOUT
 SCALE: 1" = 50'

L-4

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 10:56

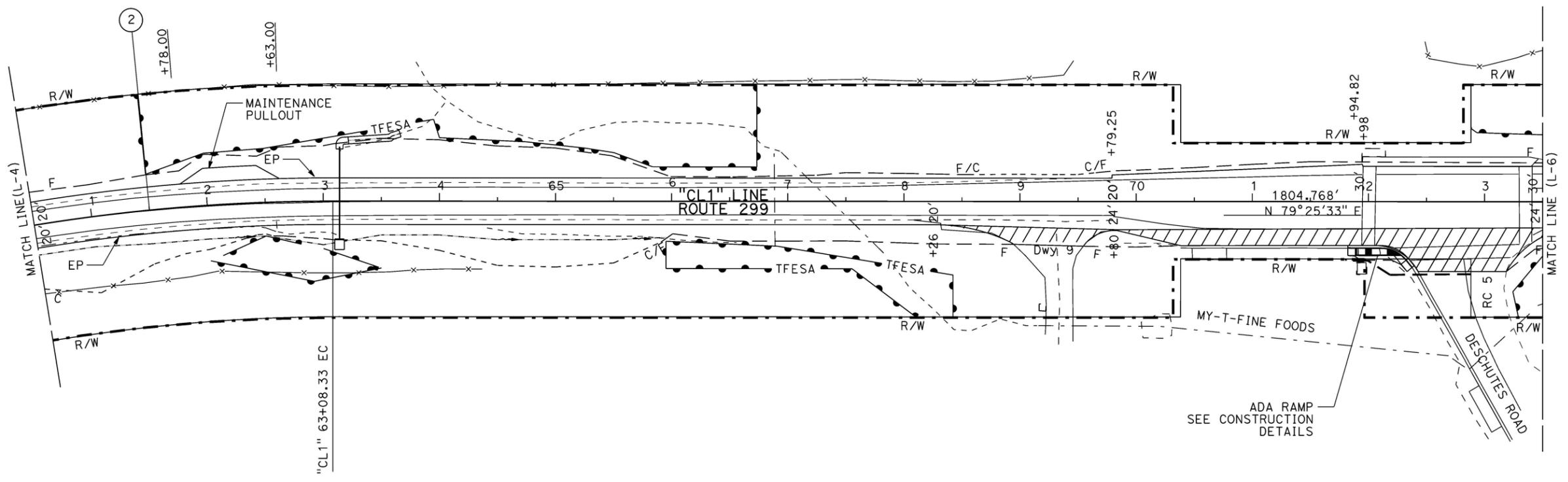
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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED/DESIGNED BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		<i>Michael J. Mogen</i> 04-22-13 REGISTERED CIVIL ENGINEER DATE			
		PLANS APPROVAL DATE			
		THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.			

NOTE:
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CURVE DATA

No.	R	Δ	T	L
(2)	1600.00	33°11'20"	476.81	926.81



LAYOUT
 SCALE: 1" = 50' **L-5**

DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 10:56
 LAST REVISION 04-11-13

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CHECKED BY: MIKE MOGEN
 REVISIONS: REVISOR: DANIEL FISHER, DATE: [blank]
 REVISOR: MIKE MOGEN, DATE: [blank]

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

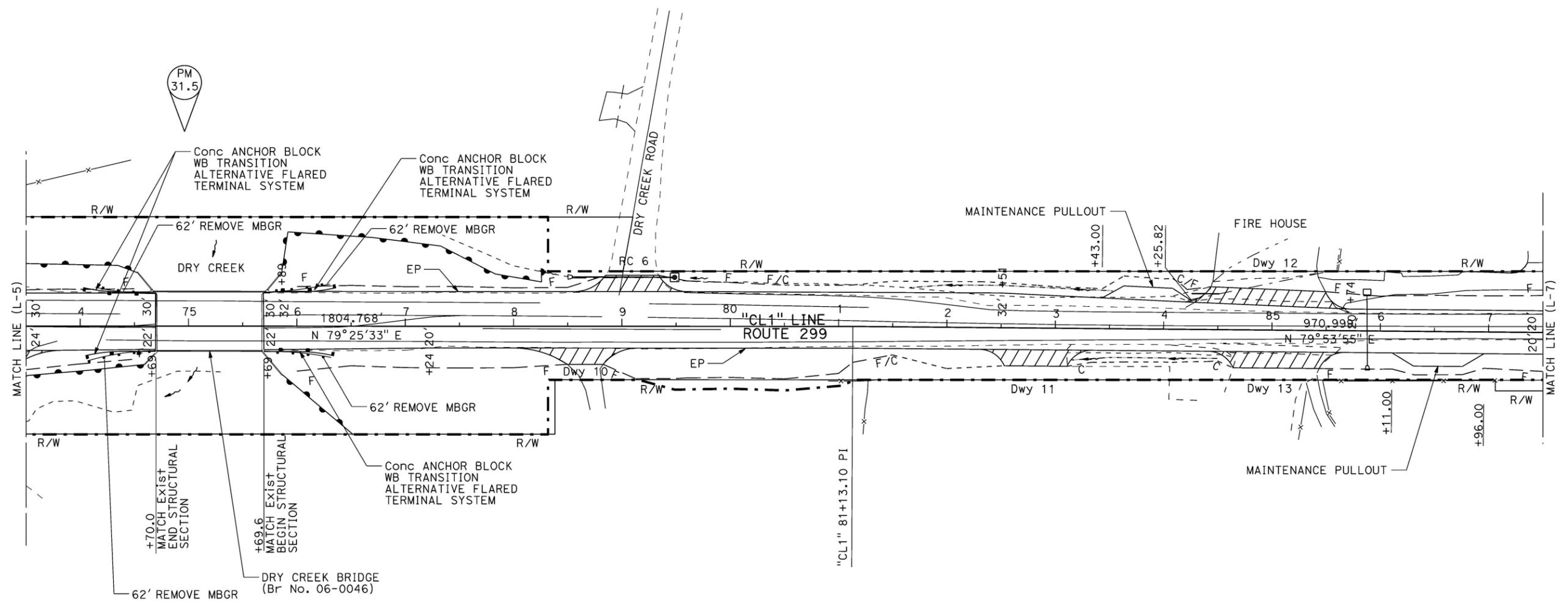
Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER
MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

NOTE:
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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CHECKED BY: DANIEL FISHER
 REVISIONS: REVISOR: MIKE MOGEN, DATE: [REDACTED]
 REVISOR: [REDACTED], DATE: [REDACTED]

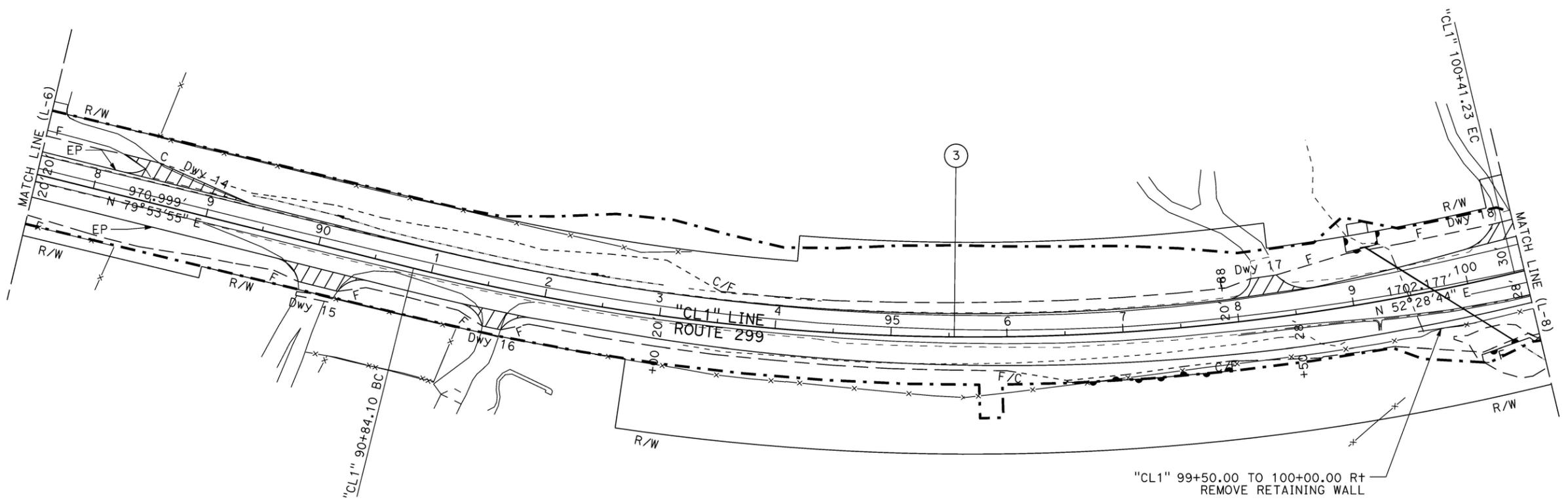
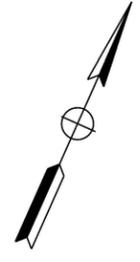
NOTE:

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		Michael J. Mogen 04-22-13		REGISTERED CIVIL ENGINEER DATE	
		MIKE MOGEN		No. C67018	
		PLANS APPROVAL DATE		EXP. 9-30-14	
				CIVIL	
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CURVE DATA

No.	R	Δ	T	L
(3)	2000.00	27° 25' 11"	487.91	957.13



LAYOUT
SCALE: 1" = 50'

L-7

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CHECKED BY: MIKE MOGEN
 DESIGNED BY: DANIEL FISHER
 REVISIONS: REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

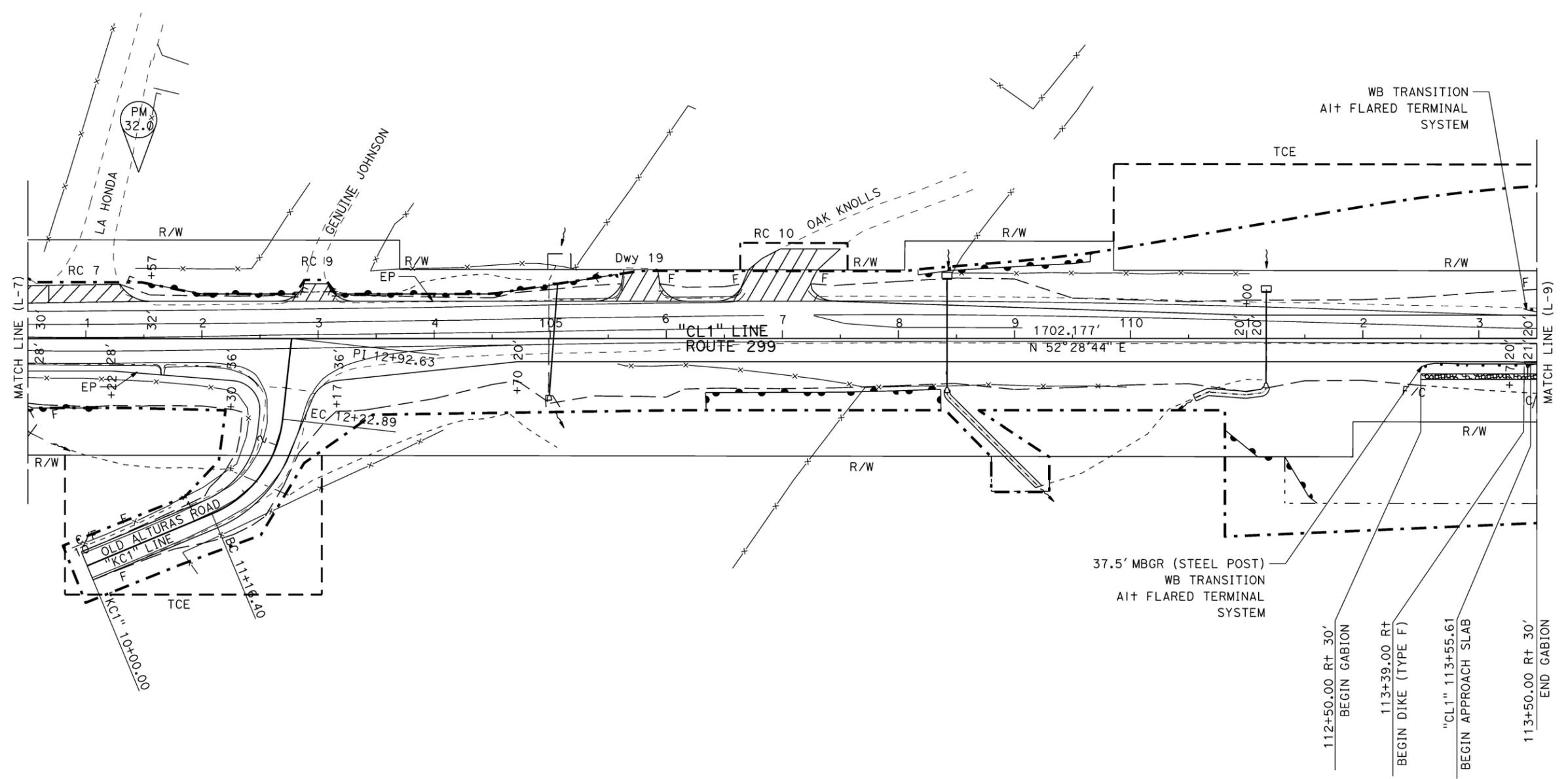
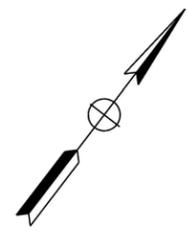
Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER
MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

NOTE:
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LAYOUT
 SCALE: 1" = 50'
L-8

DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 10:57

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

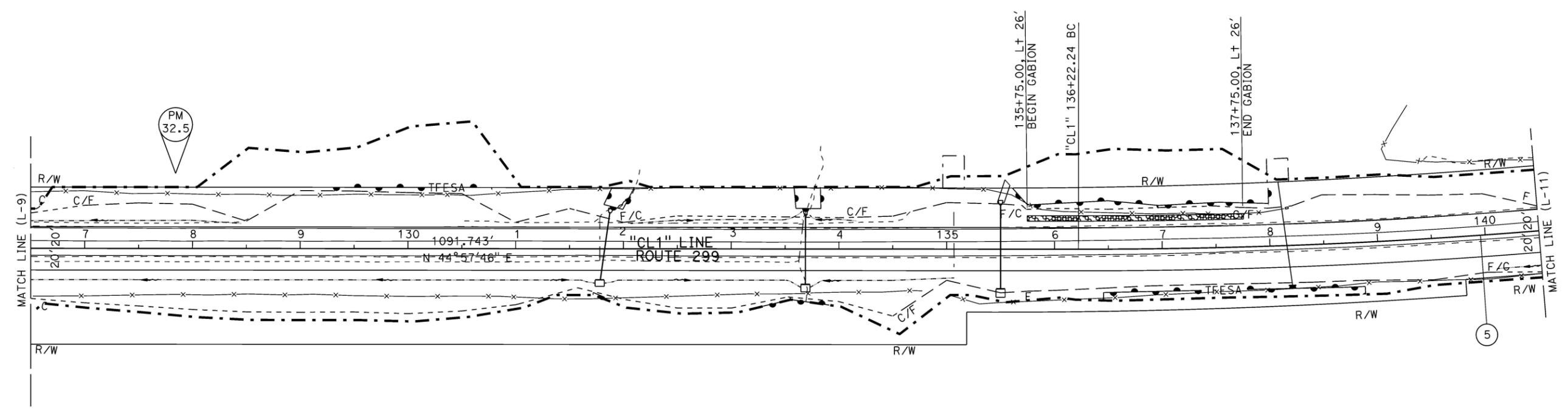
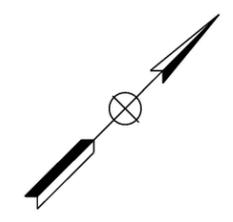
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 STATE OF CALIFORNIA

NOTE:
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CURVE DATA

No.	R	Δ	T	L
(5)	5250.00	10° 4' 51"	463.05	923.70



LAYOUT
 SCALE: 1" = 50' **L-10**

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 10:58

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED/DESIGNED BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DANIEL FISHER
 DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

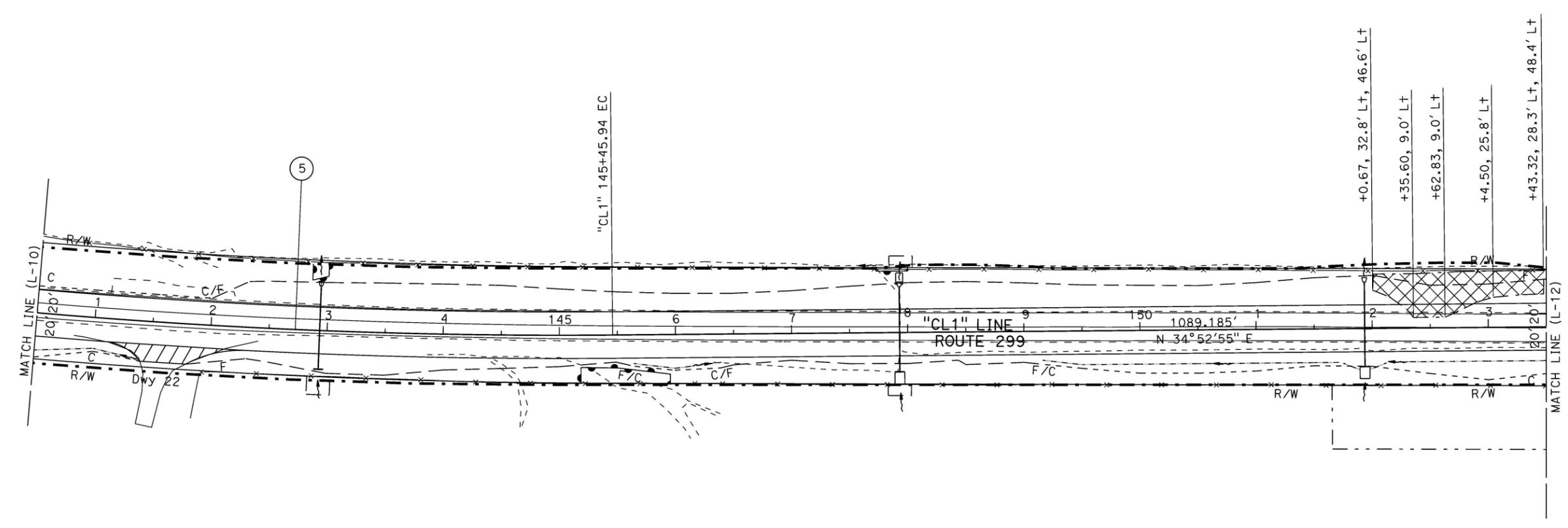
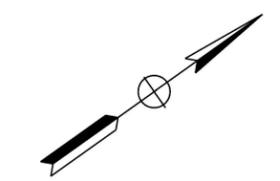
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER
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 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

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CURVE DATA

No.	R	Δ	T	L
(5)	5250.00	10° 4' 51"	463.05	923.70



LAYOUT
 SCALE: 1" = 50'
L-11

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 10:58

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DANIEL FISHER
 DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

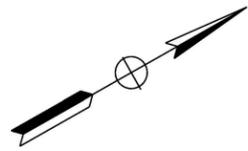
Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

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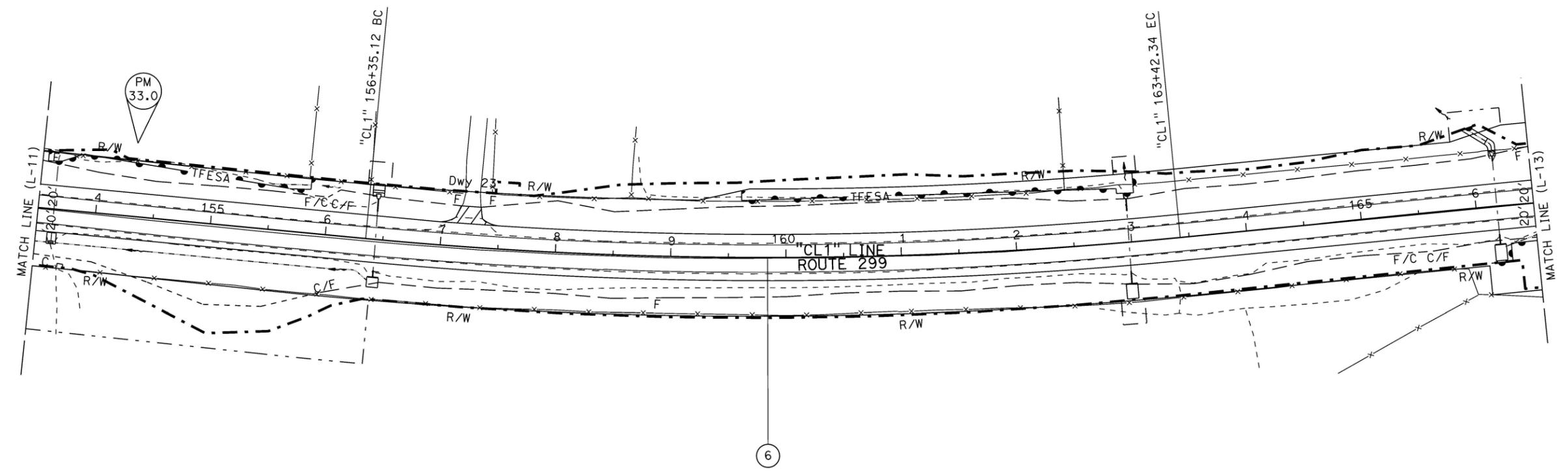
REGISTERED PROFESSIONAL ENGINEER
MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

NOTE:
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CURVE DATA

No.	R	Δ	T	L
⑥	3700.00	10°57'5"	354.69	707.21



LAYOUT
 SCALE: 1" = 50'
L-12

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 10:58

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

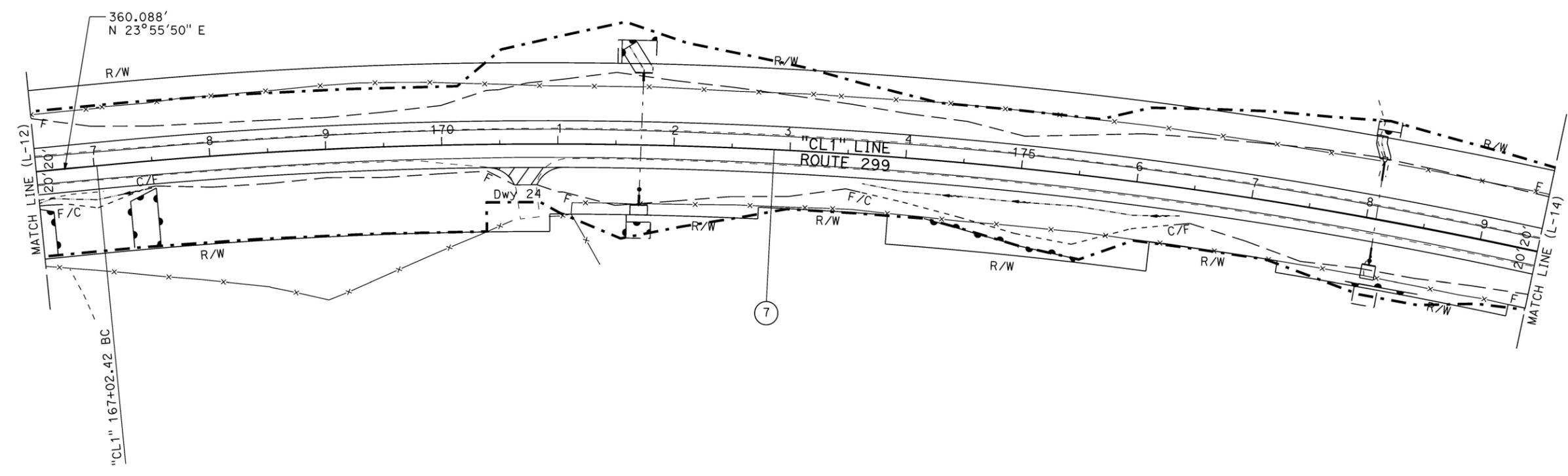
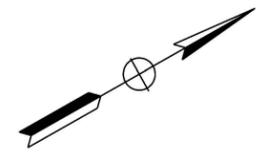
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REGISTERED PROFESSIONAL ENGINEER
MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

NOTE:
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CURVE DATA

No.	R	Δ	T	L
(7)	4000.00	18°46'44"	661.44	1311.01



LAYOUT
 SCALE: 1" = 50'
L-13

LAST REVISION: 04-11-13 DATE PLOTTED => 26-JUN-2013 TIME PLOTTED => 10:58

P:\proj1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ed015.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED/DESIGNED BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

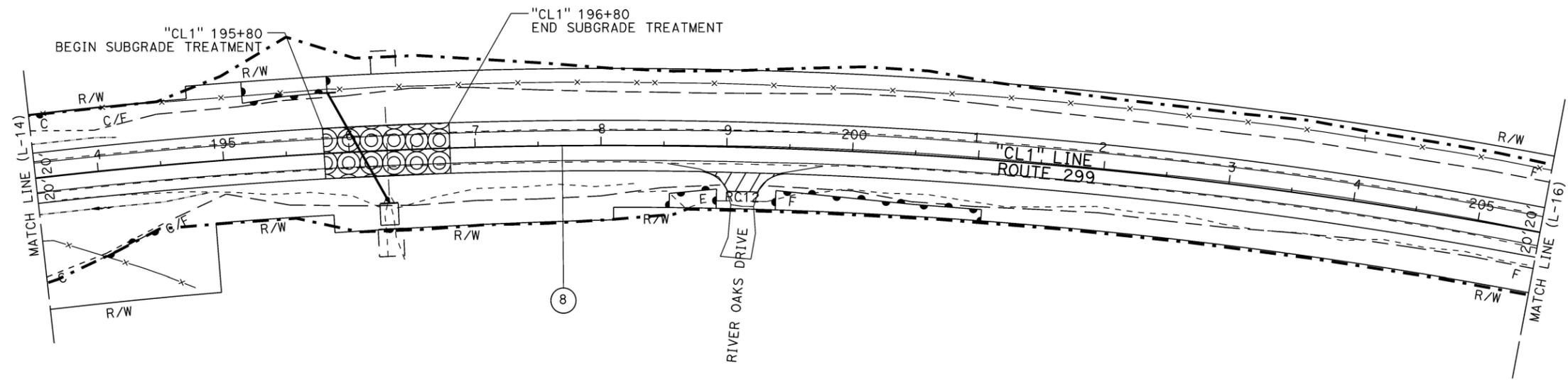
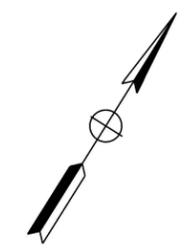
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REGISTERED PROFESSIONAL ENGINEER
MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

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 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(8)	4000.00	60°27'32"	2330.81	4220.83



LAYOUT
 SCALE: 1" = 50'
L-15

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 10:59

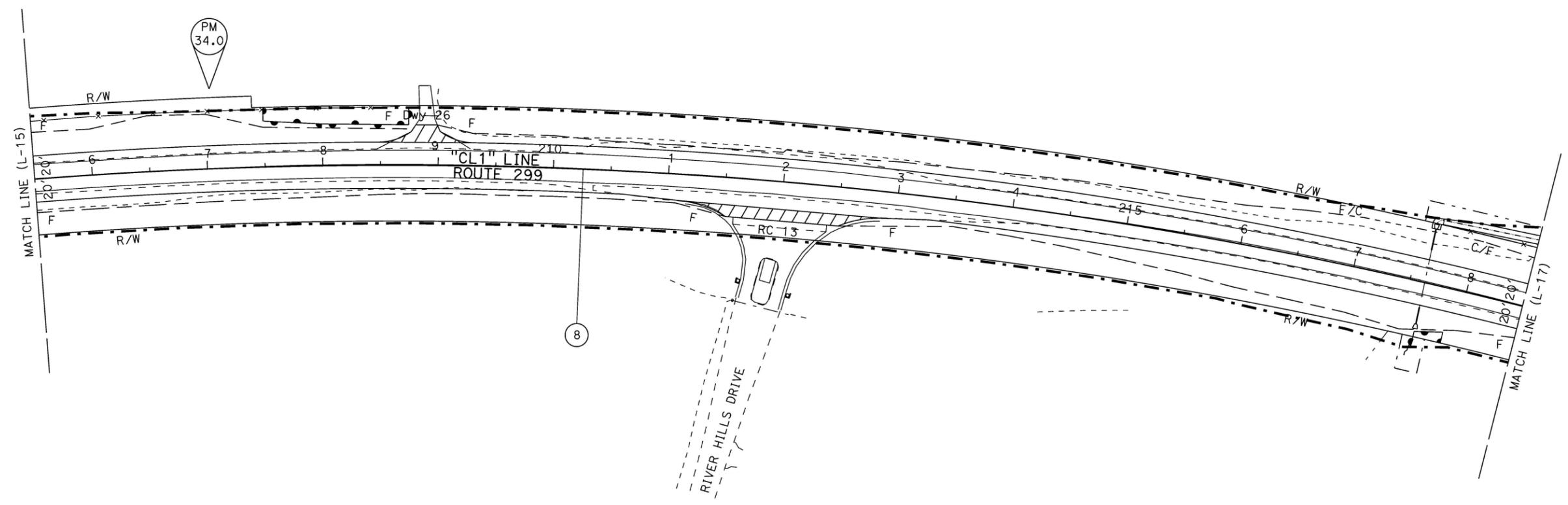
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		Michael J. Mogen 04-22-13		REGISTERED CIVIL ENGINEER DATE	
		No. C67018		EXP. 9-30-14	
		PLANS APPROVAL DATE		MIKE MOGEN REGISTERED PROFESSIONAL ENGINEER CIVIL STATE OF CALIFORNIA	
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					



CURVE DATA

No.	R	Δ	T	L
(8)	4000.00	60° 27' 32"	2330.81	4220.83

NOTE:
1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



P:\proj\1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ed016.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED

BORDER LAST REVISED 7/2/2010

USERNAME => s112529
DGN FILE => 236070ed016.dgn

RELATIVE BORDER SCALE IS IN INCHES

UNIT 0318

PROJECT NUMBER & PHASE: 02000002621

LAYOUT
SCALE: 1" = 50'

L-16

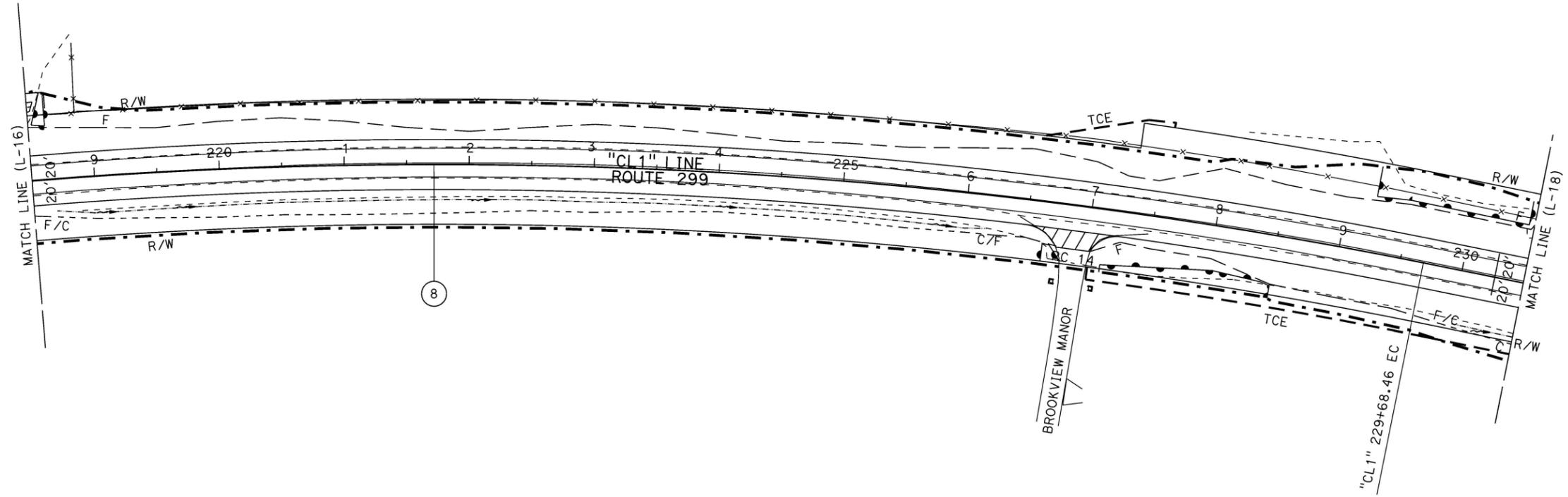
LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 10:59

P:\proj1\02\36070\design\plan_sheets\ESL_MAP_INFO_HANDOUT\236070ed017.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
<i>Michael J. Mogen</i> 04-22-13 REGISTERED CIVIL ENGINEER DATE			PLANS APPROVAL DATE		
No. C67018 Exp. 9-30-14 CIVIL STATE OF CALIFORNIA			THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.		

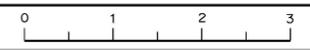


NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



CURVE DATA

No.	R	Δ	T	L
(8)	4000.00	60°27'32"	2330.81	4220.83



LAYOUT
 SCALE: 1" = 50'
L-17

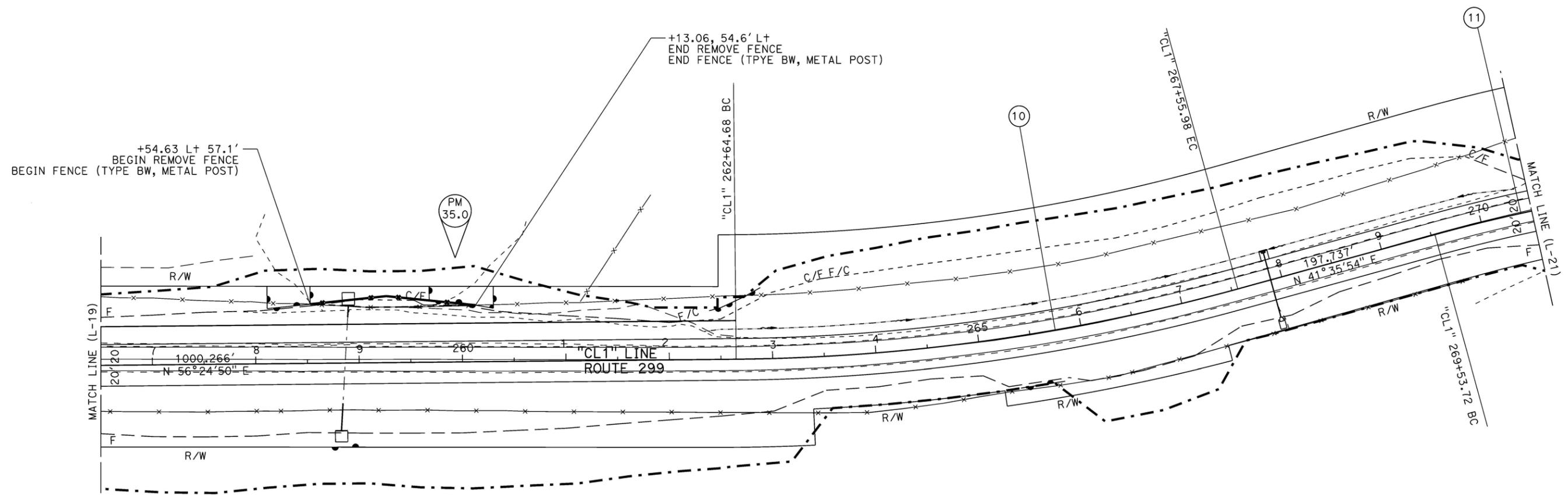
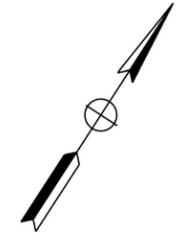
LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 10:59

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
Michael J. Mogen			04-22-13		
REGISTERED CIVIL ENGINEER			DATE		
PLANS APPROVAL DATE					
<small>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.</small>					

NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

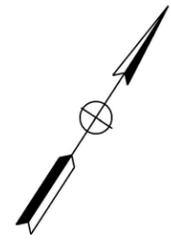
No.	R	Δ	T	L
(10)	1900.00	14° 48' 56"	247.03	491.30
(11)	1625.00	24° 58' 23"	359.85	708.27



P:\proj1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ed020.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DANIEL FISHER
 DATE REVISED: MIKE MOGEN

LAYOUT
 SCALE: 1" = 50'
L-20

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		Michael J. Mogen 04-22-13		REGISTERED CIVIL ENGINEER DATE	
		PLANS APPROVAL DATE			
<small>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.</small>					



NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(1)	1625.00	24° 58' 23"	359.85	708.27
(2)	1625.00	21° 34' 17"	309.56	611.80

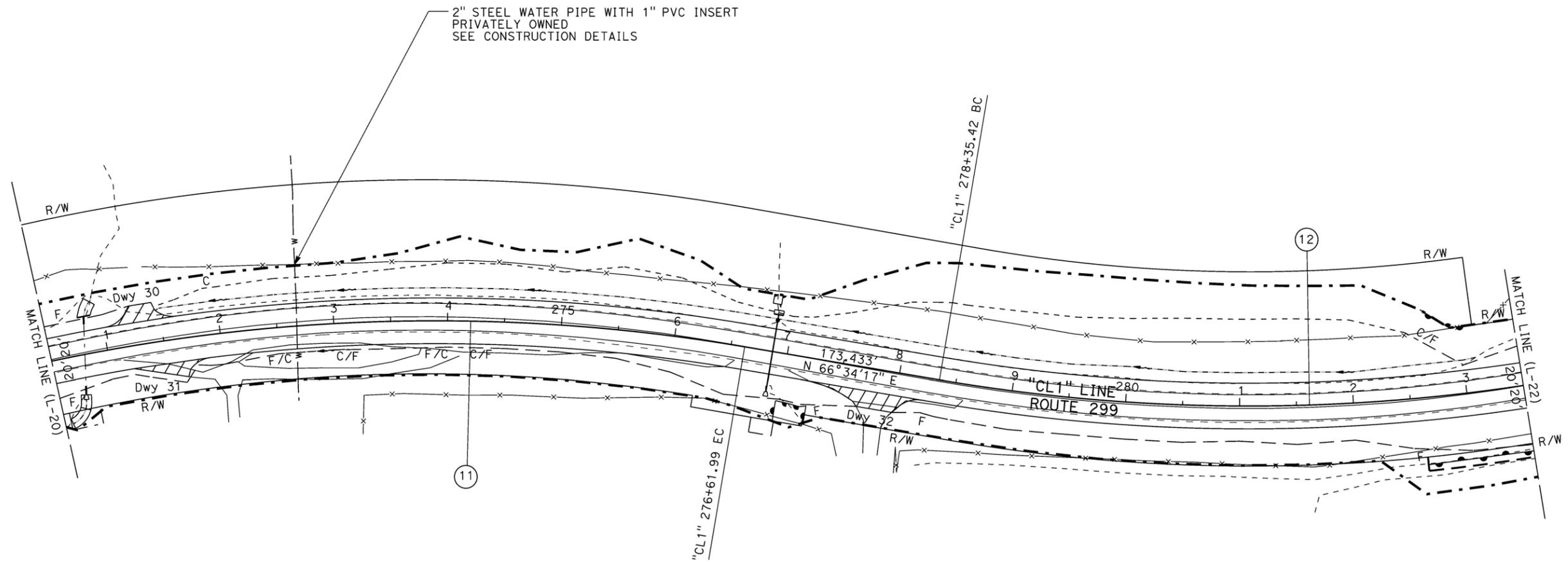
P:\proj1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ed021.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN

REVISOR
 DATE

DESIGNED BY
 CHECKED BY

FUNCTIONAL SUPERVISOR
 JULIE CASEY

DANIEL FISHER
 MIKE MOGEN



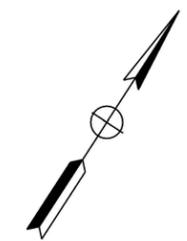
LAYOUT
 SCALE: 1" = 50'
L-21

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
<i>Michael J. Mogen</i> 04-22-13 REGISTERED CIVIL ENGINEER DATE			PROFESSIONAL ENGINEER MIKE MOGEN No. C67018 Exp. 9-30-14 CIVIL STATE OF CALIFORNIA		
PLANS APPROVAL DATE					
<small>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.</small>					

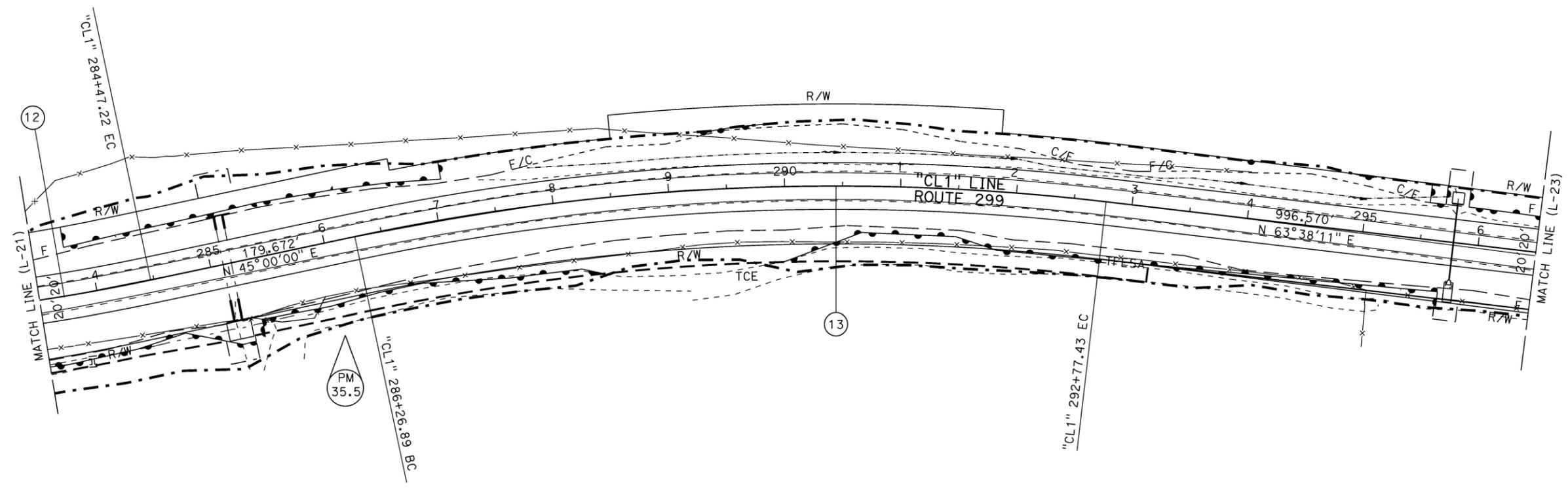
NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(12)	1625.00	21°34'17"	309.56	611.80
(13)	2000.00	18°38'11"	328.17	650.53



P:\proj1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ed022.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED



LAYOUT
 SCALE: 1" = 50'
L-22

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:01

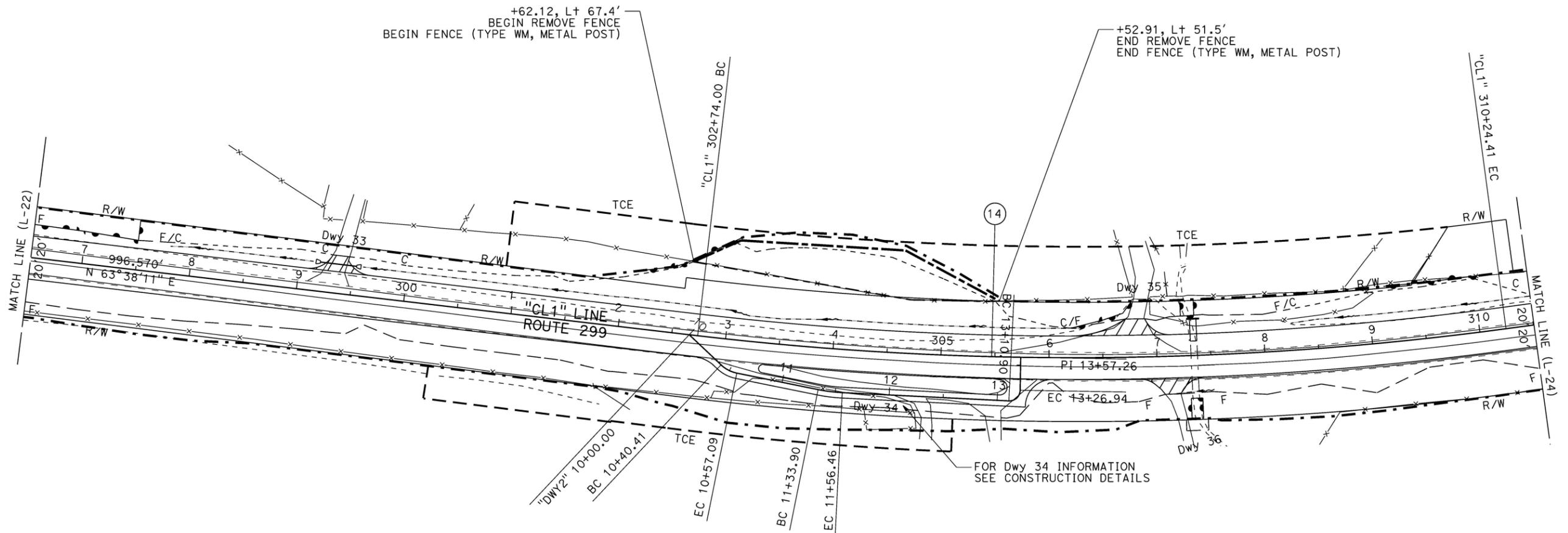
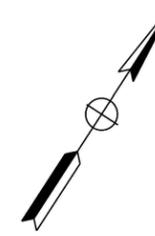
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		Michael J. Mogen 04-22-13 REGISTERED CIVIL ENGINEER DATE			
		PLANS APPROVAL DATE			
		MIKE MOGEN No. C67018 Exp. 9-30-14 CIVIL STATE OF CALIFORNIA			
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					

NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(14)	3000.00	14° 19' 55"	377.18	750.42

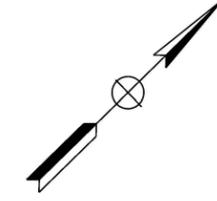


P:\proj1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ed023.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED

DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:01
 LAST REVISION: 04-11-13

LAYOUT
SCALE: 1" = 50'
L-23

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		Michael J. Mogen 04-22-13		REGISTERED CIVIL ENGINEER DATE	
		MIKE MOGEN		No. C67018	
		PLANS APPROVAL DATE		EXP. 9-30-14	
				CIVIL	
<small>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.</small>					

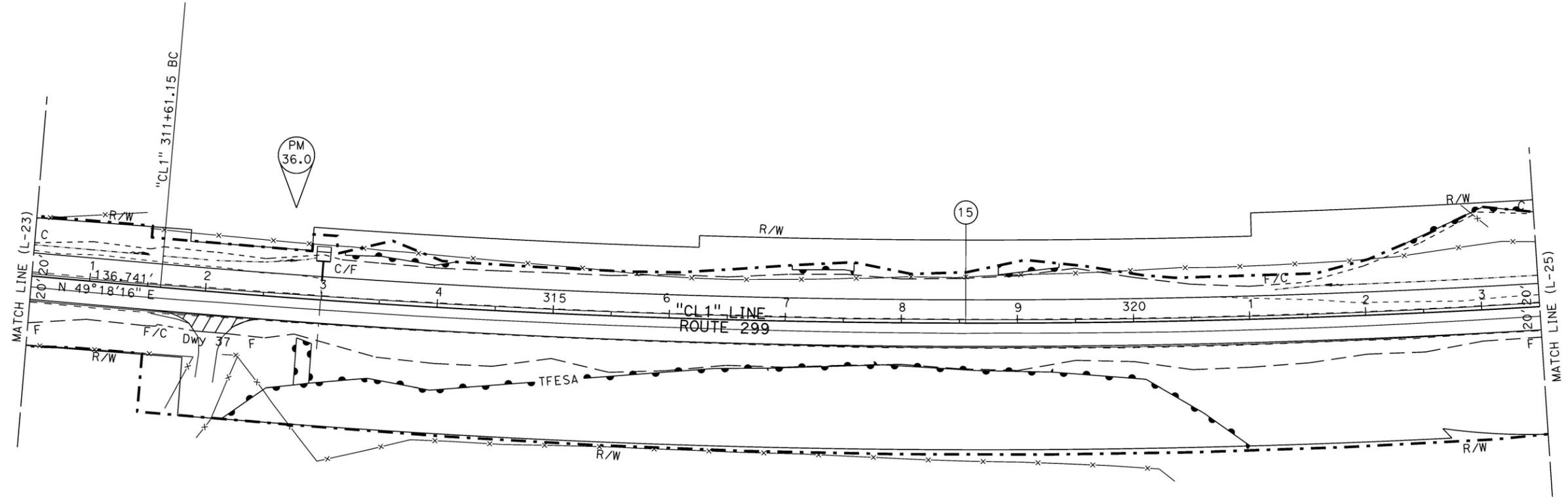


NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(15)	8150.00	9°24'18"	670.41	1337.81

P:\proj\1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ed024.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:



LAYOUT
 SCALE: 1" = 50'
L-24

DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:01
 LAST REVISION
 04-11-13

P:\proj1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ed025.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CHECKED BY: DANIEL FISHER
 REVISIONS: REVISOR: MIKE MOGEN
 DATE:

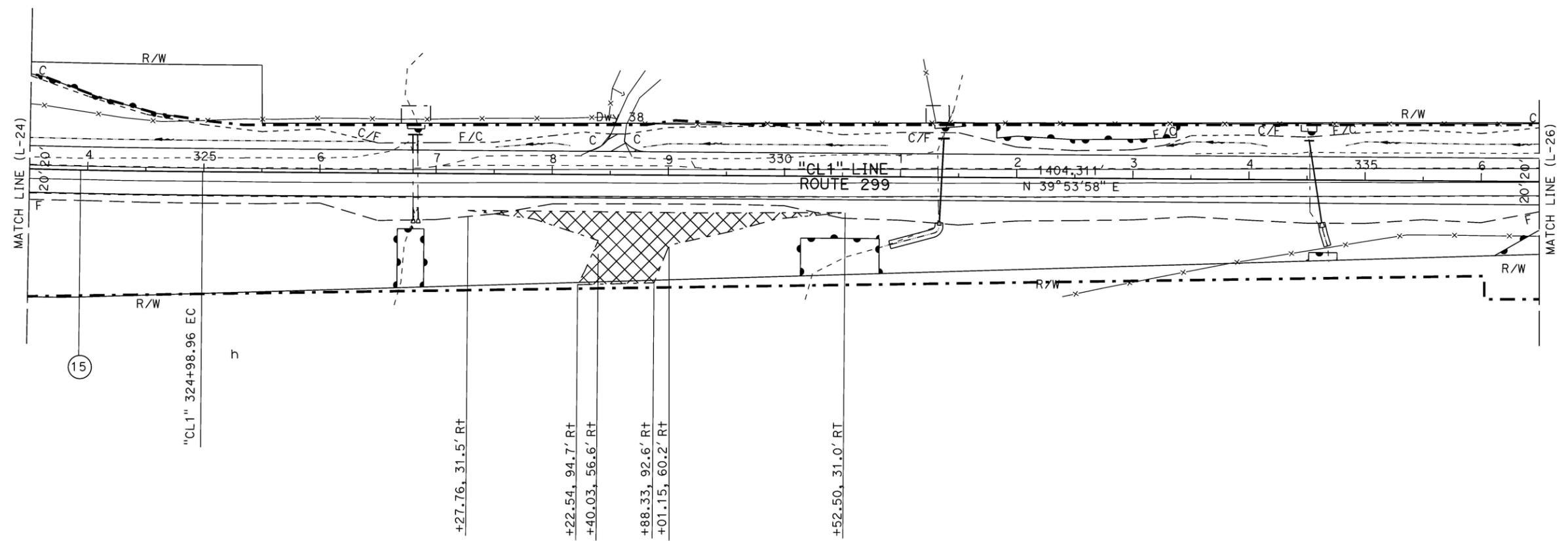
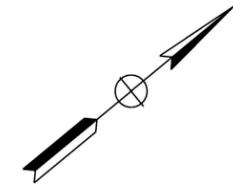
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
<i>Michael J. Mogen</i> 04-22-13 REGISTERED CIVIL ENGINEER DATE					
PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

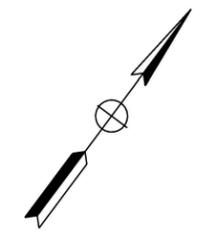
No.	R	Δ	T	L
(15)	8150	9°24'18"	670.41	1337.81



LAYOUT
SCALE: 1" = 50'

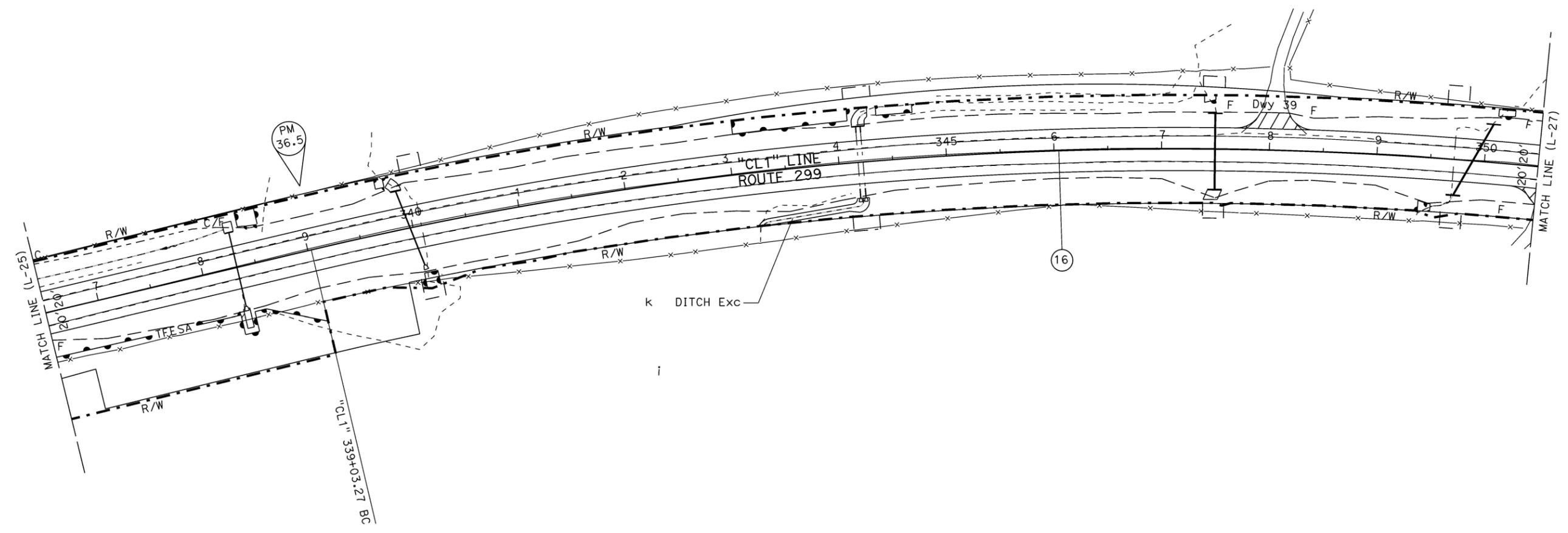
L-25

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		Michael J. Mogen 04-22-13		REGISTERED CIVIL ENGINEER DATE	
		MIKE MOGEN		No. C67018	
		PLANS APPROVAL DATE		EXP. 9-30-14	
				CIVIL	
<small>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.</small>					



NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

No.	R	Δ	T	L
(16)	3485.00	26°52'49"	832.82	1634.98



P:\proj1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ed026.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED

LAYOUT
 SCALE: 1" = 50'
L-26

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:02

P:\proj1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ea027.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

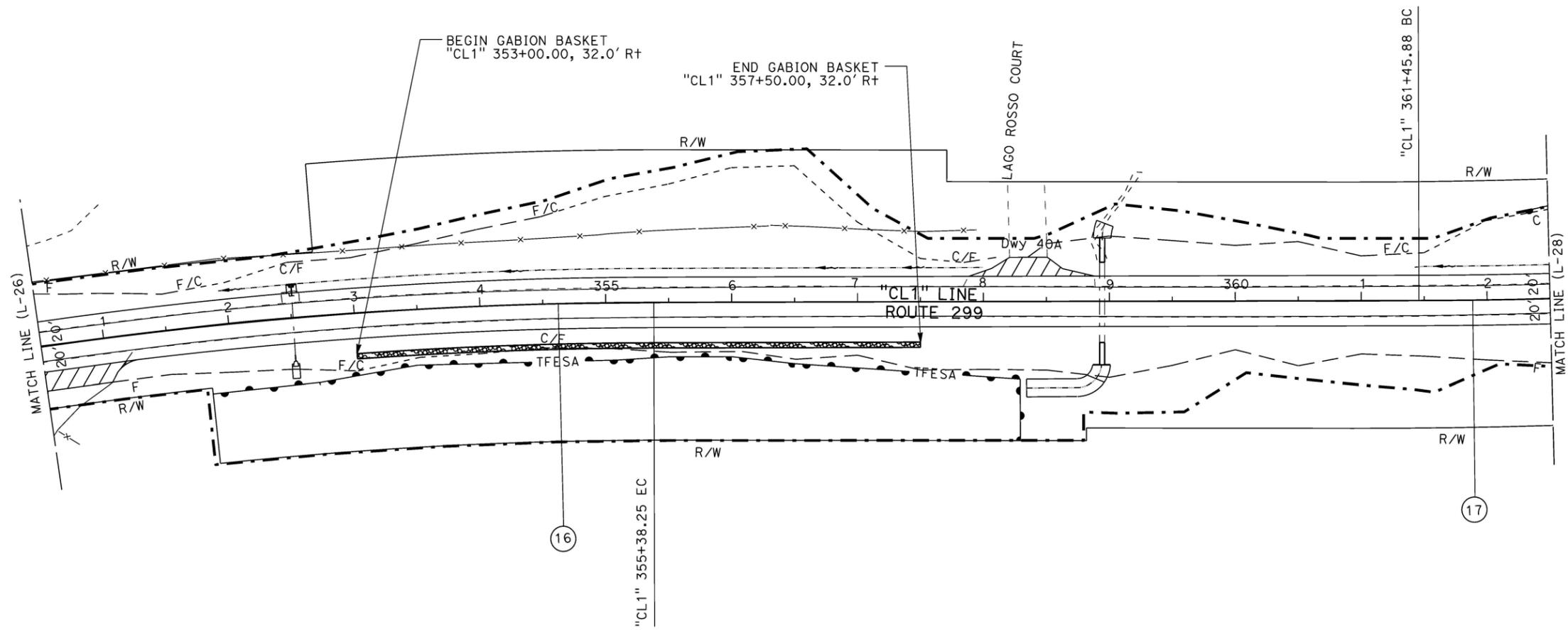
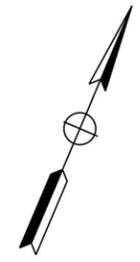
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(16)	3485.00	26°52'49"	832.82	1634.98
(17)	4500.00	6°54'48"	271.82	542.98



P:\proj1\02\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ed028.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

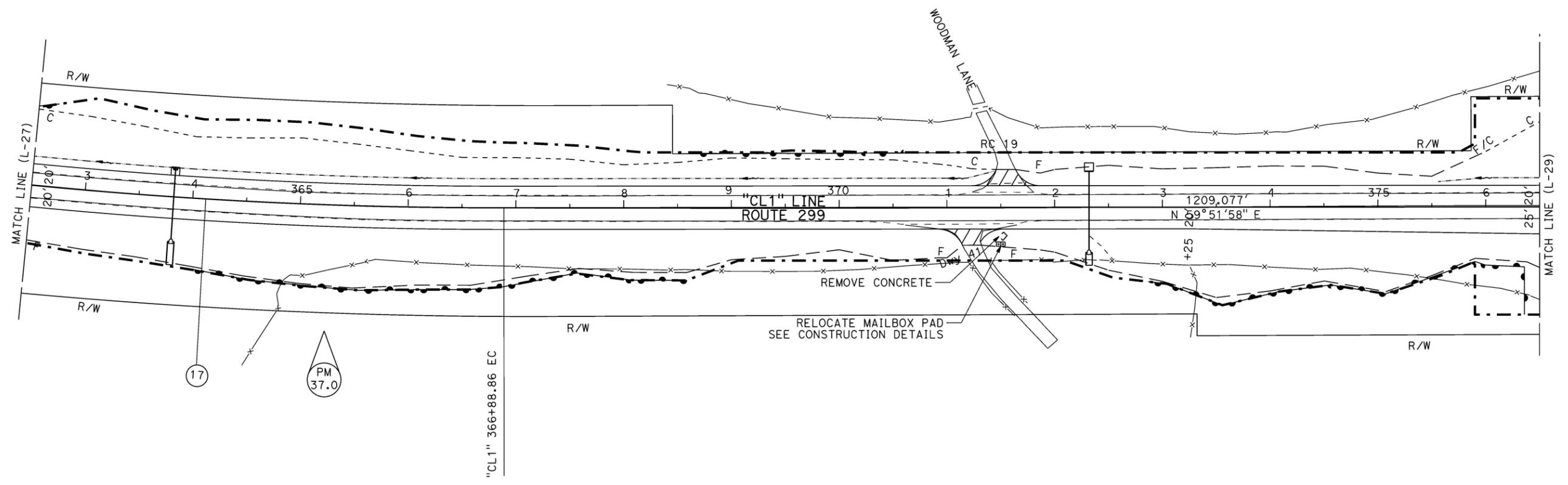
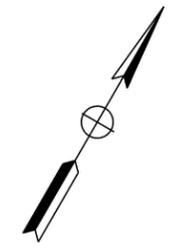
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER
MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(17)	4500.00	6°54'48"	271.82	542.98



LAYOUT
 SCALE: 1" = 50'
L-28

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:02

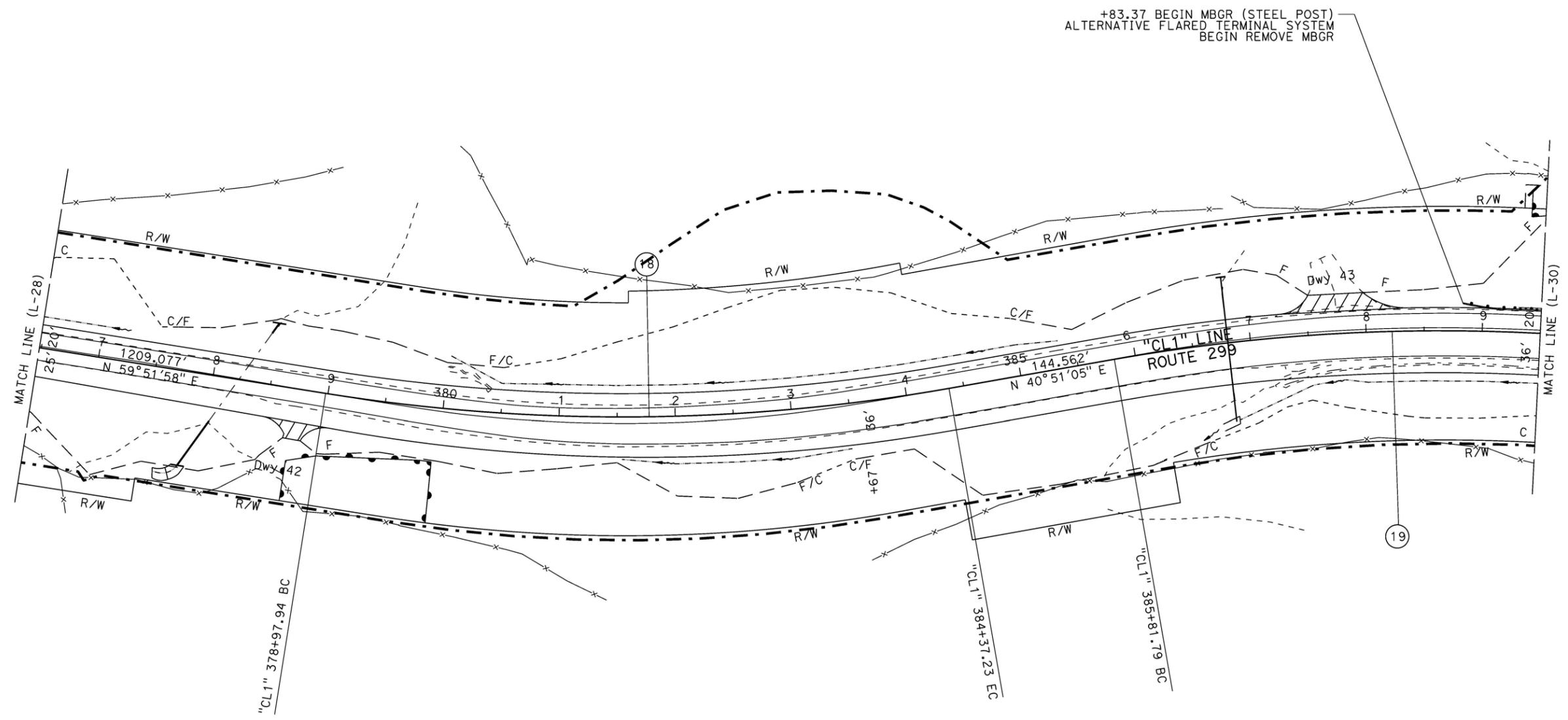
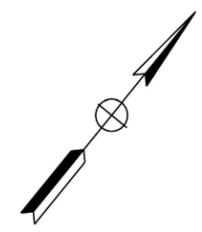
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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
Michael J. Mogen 04-22-13 REGISTERED CIVIL ENGINEER DATE					
PLANS APPROVAL DATE					
<small>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.</small>					

NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

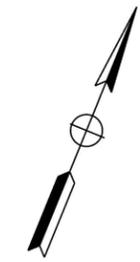
No.	R	Δ	T	L
18	1625.00	19° 0' 53"	272.15	539.29
19	1625.00	26° 55' 52"	389.10	763.81



LAYOUT
 SCALE: 1" = 50'
L-29

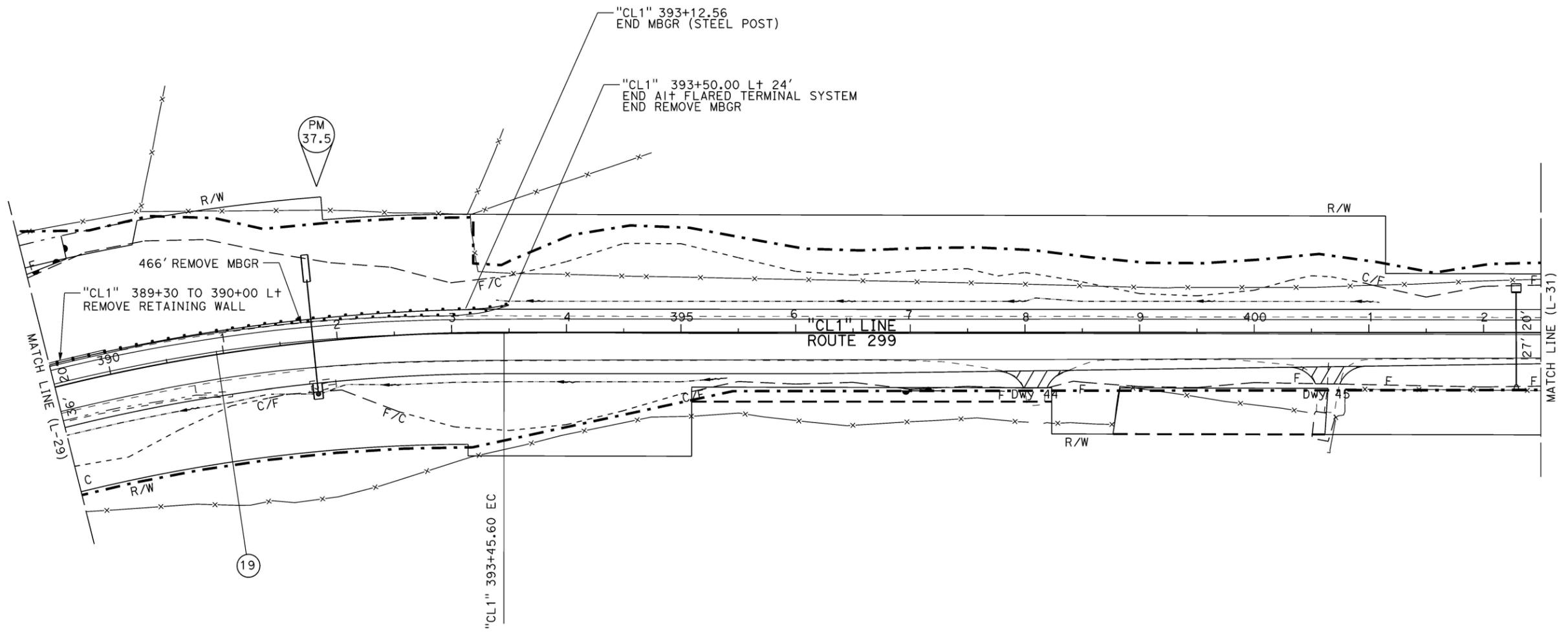
DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:02

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
Michael J. Mogen		04-22-13	REGISTERED CIVIL ENGINEER DATE		
MIKE MOGEN		No. C67018	EXP. 9-30-14		
PLANS APPROVAL DATE		CIVIL			
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.					



NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA				
No.	R	Δ	T	L
19	1625.00	26°55'52"	389.10	763.81



P:\proj\102\36070\design\Plan Sheets\ESL_MAP_INFO_HANDOUT\236070ea030.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CHECKED BY: MIKE MOGEN
 REVISIONS: (None listed)
 REVISOR: DANIEL FISHER
 DATE: (None listed)
 REVISIONS: (None listed)
 REVISOR: (None listed)
 DATE: (None listed)

LAYOUT
 SCALE: 1" = 50' **L-30**

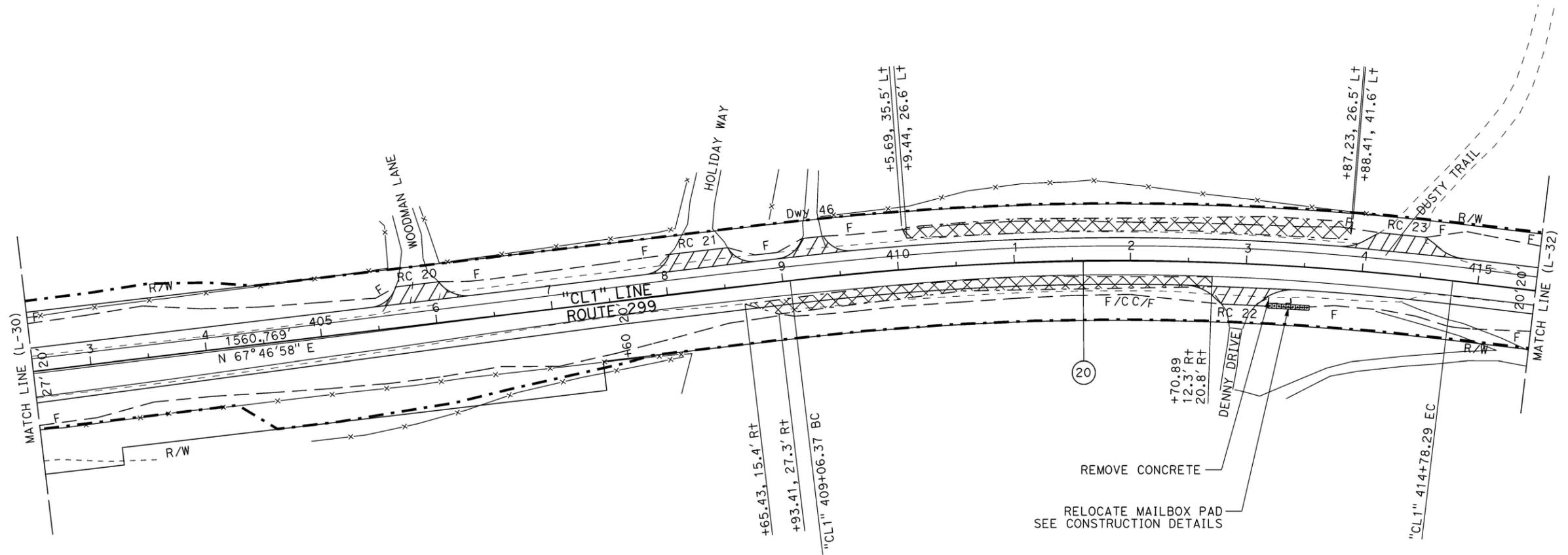
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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED/DESIGNED BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
Michael J. Mogen			04-22-13		
REGISTERED CIVIL ENGINEER			DATE		
PLANS APPROVAL DATE					
<small>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.</small>					

NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
20	2400.00	13°39'13"	287.32	571.92



LAYOUT
 SCALE: 1" = 50'
L-31

DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:03
 LAST REVISION 04-11-13

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

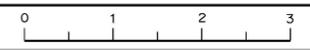
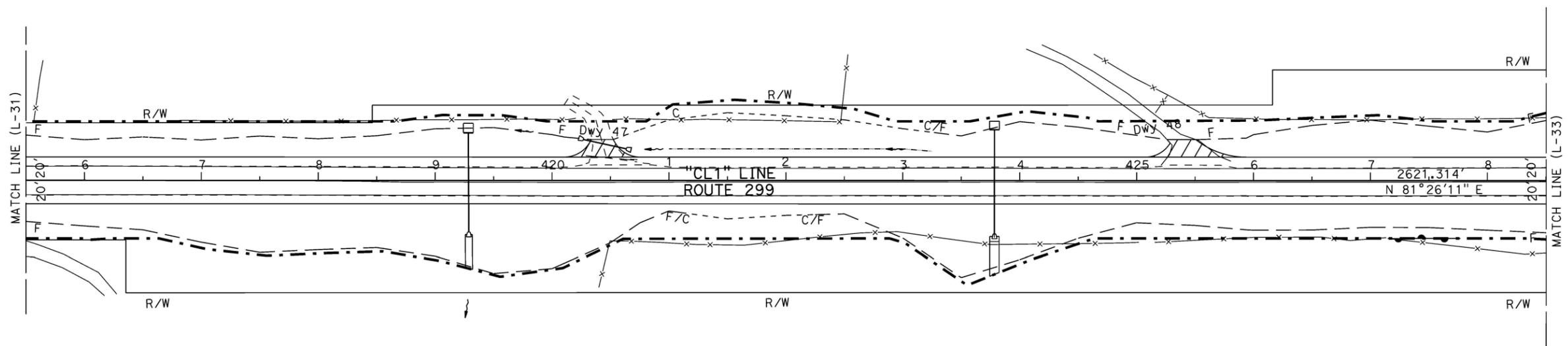
<i>Michael J. Mogen</i>	04-22-13
REGISTERED CIVIL ENGINEER	DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



LAYOUT
 SCALE: 1" = 50'
L-32

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
 DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED

BORDER LAST REVISED 7/2/2010

USERNAME => s112529
 DGN FILE => 236070ed032.dgn

RELATIVE BORDER SCALE IS IN INCHES

UNIT 0318

PROJECT NUMBER & PHASE: 0200002621

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:03

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

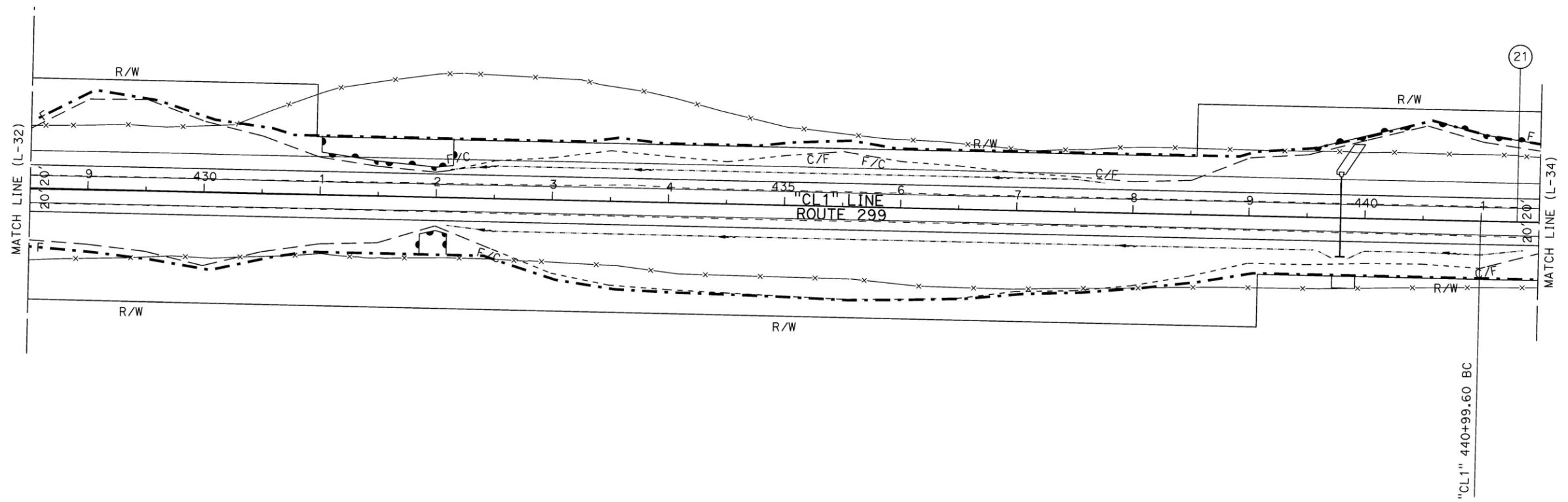
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
<i>Michael J. Mogen</i> 04-22-13 REGISTERED CIVIL ENGINEER DATE			PLANS APPROVAL DATE		
No. C67018 Exp. 9-30-14 CIVIL STATE OF CALIFORNIA			THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.		



NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(21)	9200.00	2° 36' 47"	209.83	419.58



LAYOUT
 SCALE: 1" = 50'
L-33

DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:03
 LAST REVISION 04-11-13

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

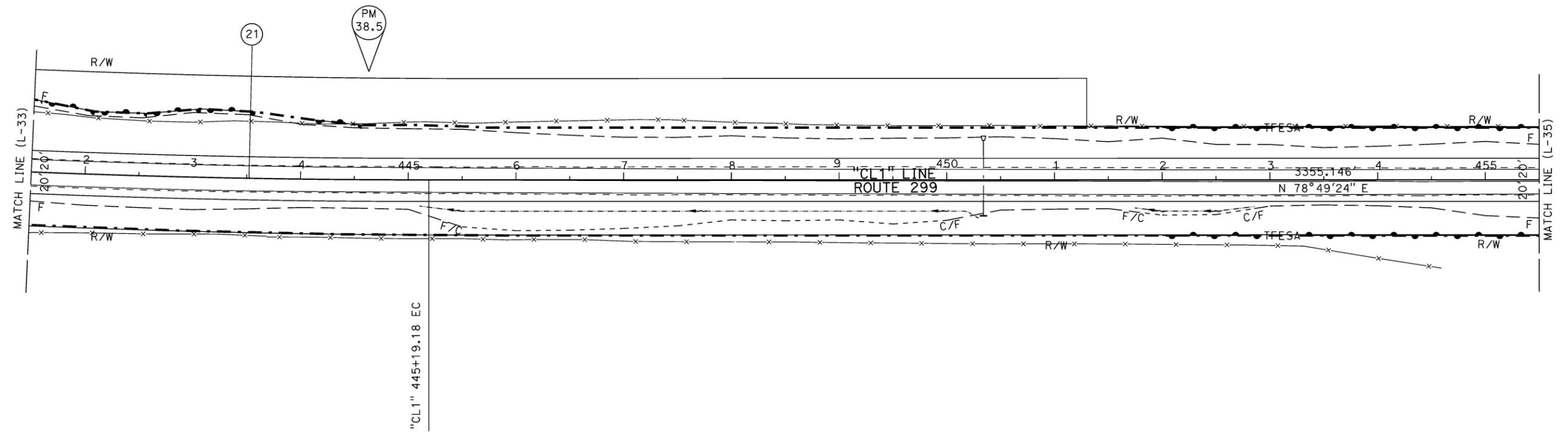
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(2)	9200.00	2° 36' 47"	209.83	419.58



LAYOUT
 SCALE: 1" = 50'
L-34

DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:04
 LAST REVISION 04-11-13

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



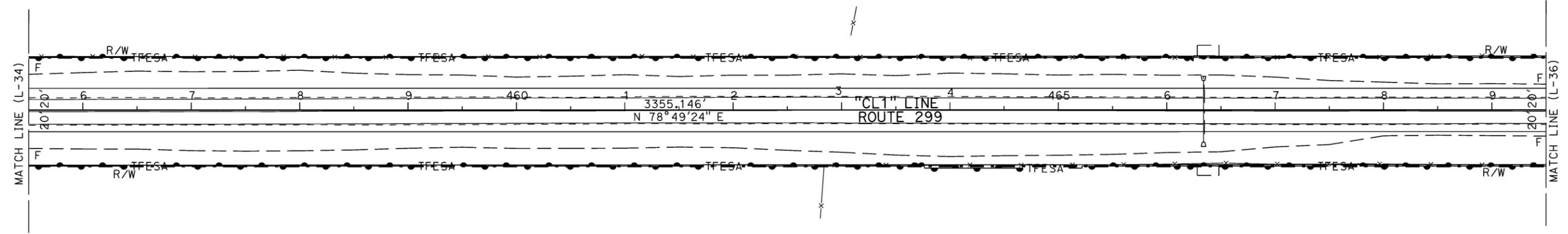
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02	Sha	299	30.3/40.7		

Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



LAYOUT
 SCALE: 1" = 50'
L-35

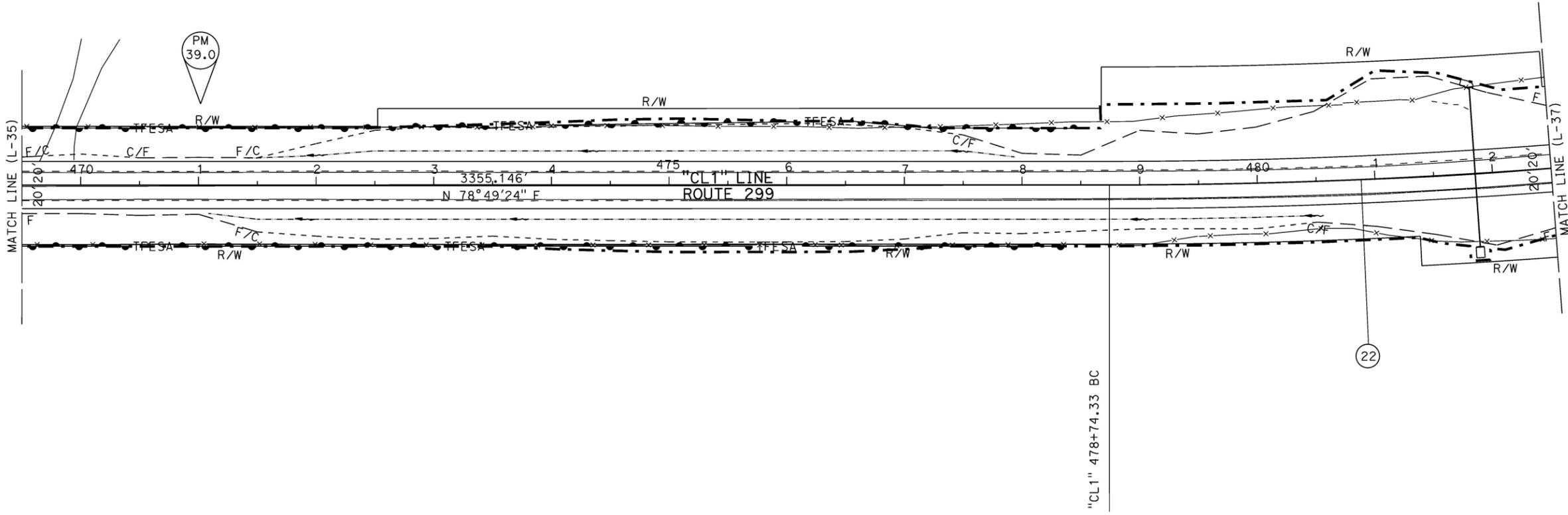
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02	Sha	299	30.3/40.7		
		Michael J. Mogen 04-22-13			
		REGISTERED CIVIL ENGINEER	DATE		
PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
 DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

BORDER LAST REVISED 7/2/2010

USERNAME => s112529
DGN FILE => 236070ea036.dgn

RELATIVE BORDER SCALE IS IN INCHES

UNIT 0318

PROJECT NUMBER & PHASE: 02000002621

LAYOUT
SCALE: 1" = 50'
L-36

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:04

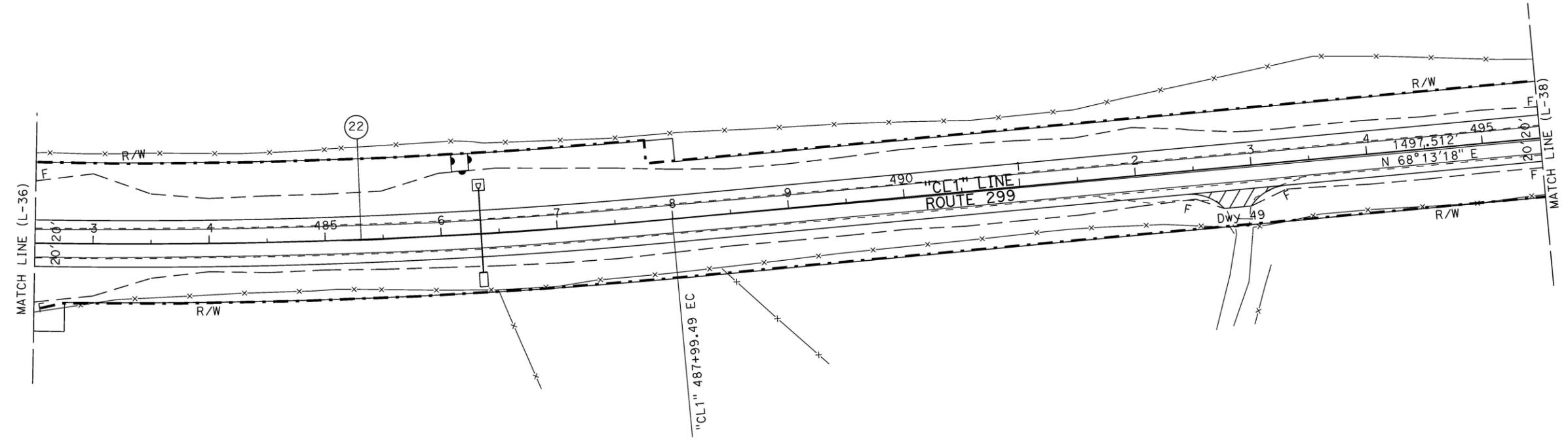
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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
<i>Michael J. Mogen</i> 04-22-13 REGISTERED CIVIL ENGINEER DATE					
PLANS APPROVAL DATE					
<small>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.</small>					

NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
22	5000.00	10°36'6"	463.90	925.16



LAYOUT
 SCALE: 1" = 50'
L-37

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:04

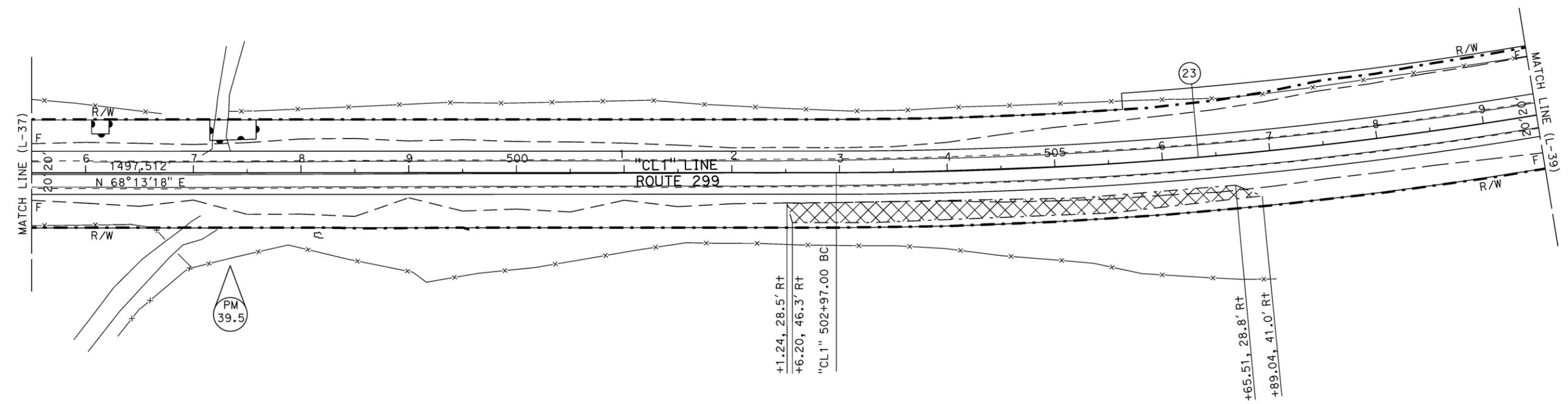
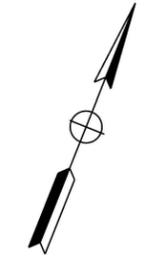
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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		<i>Michael J. Mogen</i> 04-22-13 REGISTERED CIVIL ENGINEER DATE			
		PLANS APPROVAL DATE			
<small>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.</small>					

NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
(23)	4000.00	17°20'37"	610.07	1210.82



LAYOUT
 SCALE: 1" = 50'
L-38

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:05

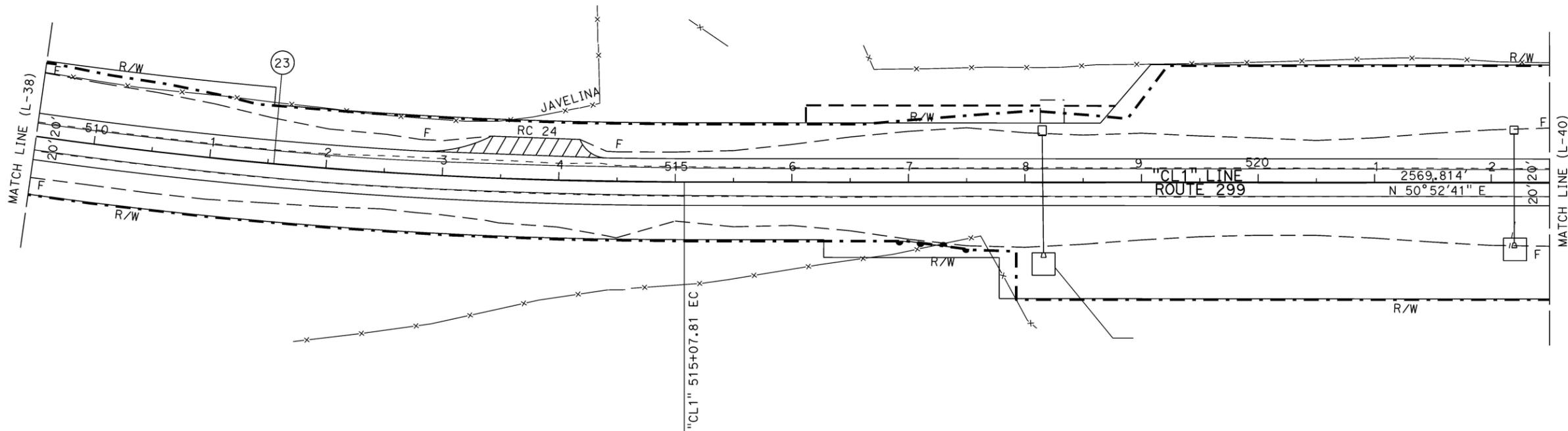
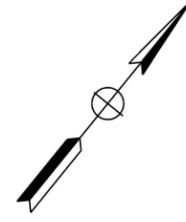
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		Michael J. Mogen 04-22-13		REGISTERED CIVIL ENGINEER DATE	
		PLANS APPROVAL DATE			
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CALCULATED-DRAWN BY: DANIEL FISHER
 CHECKED BY: MIKE MOGEN
 REVISED BY: DATE REVISED:

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
St. Gobans
DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CHECKED BY: DANIEL FISHER
 REVISIONS: REVISOR: MIKE MOGEN, DATE: [REDACTED]
 DESIGNED BY: [REDACTED]
 DATE REVISION: [REDACTED]

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		

Michael J. Mogen 04-22-13
 REGISTERED CIVIL ENGINEER DATE

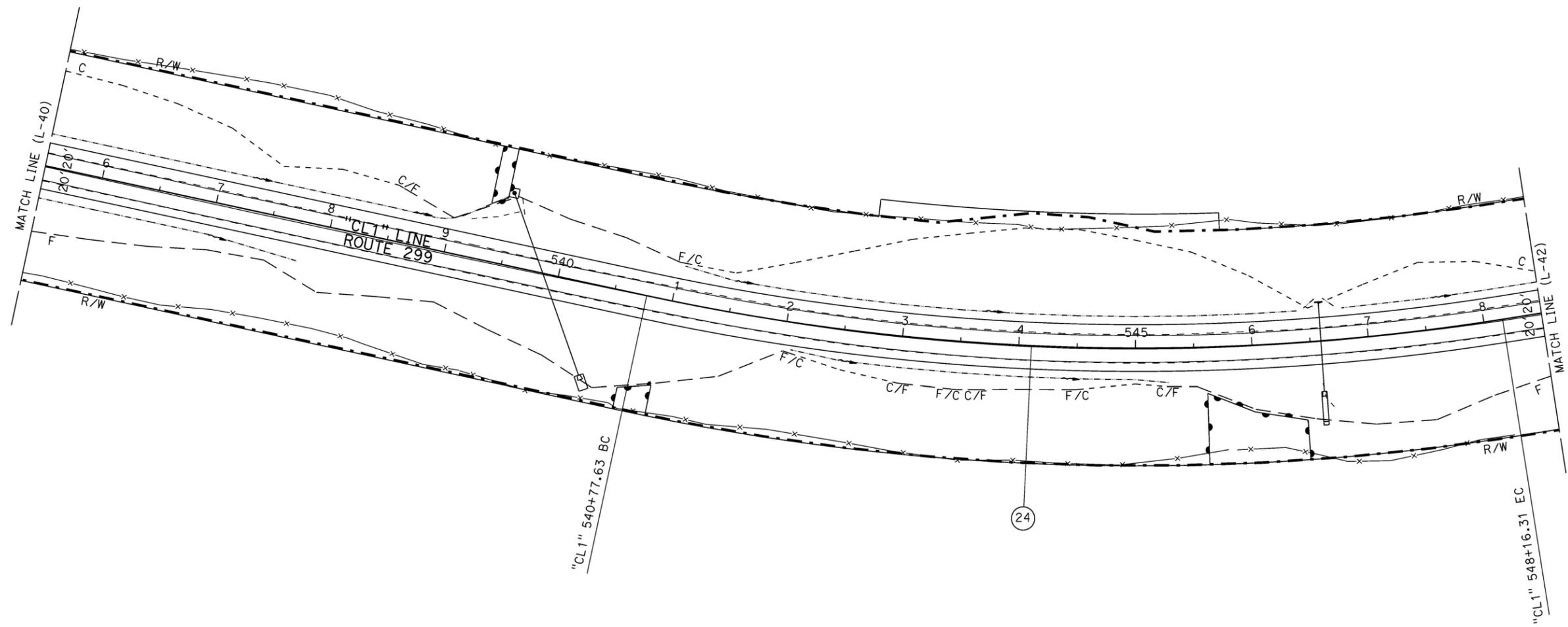
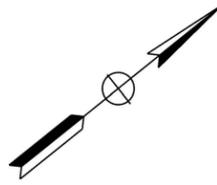
PLANS APPROVAL DATE: _____
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER
MIKE MOGEN
 No. C67018
 Exp. 9-30-14
 CIVIL
 STATE OF CALIFORNIA

NOTE:
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L
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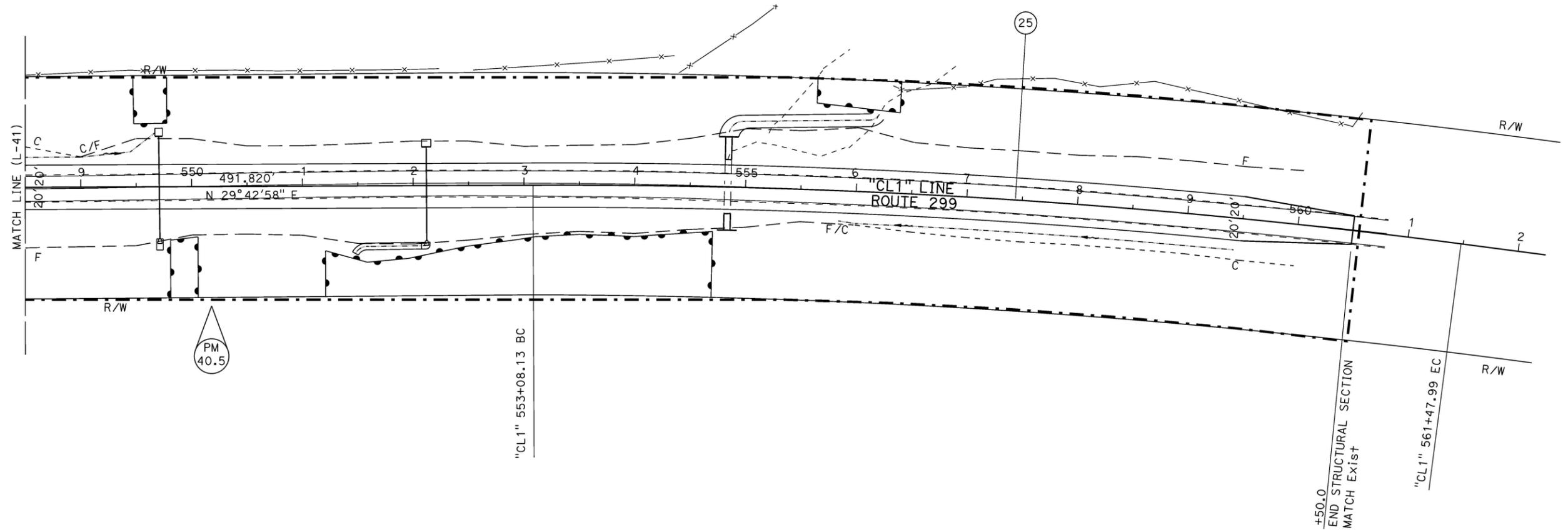
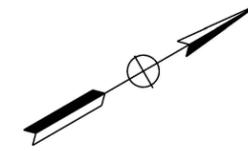
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Sha	299	30.3/40.7		
		Michael J. Mogen 04-22-13			
		REGISTERED CIVIL ENGINEER DATE			
PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

NOTE:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
 DESIGN
 FUNCTIONAL SUPERVISOR: JULIE CASEY
 CHECKED BY: MIKE MOGEN
 CALCULATED-DESIGNED BY: DANIEL FISHER
 REVISED BY: MIKE MOGEN
 DATE REVISED:

LAST REVISION: 04-11-13
 DATE PLOTTED => 26-JUN-2013
 TIME PLOTTED => 11:06

LAYOUT
SCALE: 1" = 50'
L-42

WATER QUALITY

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL VALLEY REGION

WDID#5A45CR00447

Central Valley Regional Water Quality Control Board

11 June 2013

Ms. Amber Kelley
California Department of Transportation
1031 Butte Street, Suite 205 MS#30
Redding, CA 96001

CLEAN WATER ACT §401 TECHNICALLY CONDITIONED WATER QUALITY CERTIFICATION FOR DISCHARGE OF DREDGED AND/OR FILL MATERIALS FOR THE BELLA DIDDY ROADWAY REHABILITATION PROJECT (WDID#5A45CR00447), BELLA VISTA, SHASTA COUNTY

ACTION:

1. Order for Standard Certification
2. Order for Technically-conditioned Certification
3. Order for Denial of Certification

WATER QUALITY CERTIFICATION STANDARD CONDITIONS:

1. This Water Quality Certification (Certification) action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to §13330 of the California Water Code and §3867 of the California Code of Regulations.
2. This Certification action is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent Certification application was filed pursuant to §3855(b) and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.
3. The validity of any non-denial Certification action shall be conditioned upon total payment of the full fee required under §3833 of the California Code of Regulations, unless otherwise stated in writing by the certifying agency.
4. This Certification is valid for the duration of the described project. This Certification is no longer valid if the project (as currently described) is modified, or coverage under §404 of the Clean Water Act has expired.

ADDITIONAL TECHNICALLY CONDITIONED CERTIFICATION CONDITIONS:

In addition to the above standard conditions, Caltrans shall satisfy the following:

1. The California Department of Transportation (Caltrans) shall notify the Central Valley Regional Water Quality Control Board (Central Valley Water Board) in writing at least five working days (working days are Monday – Friday) prior to the commencement of ground disturbing activities or any in-water activities with details regarding the construction schedule, in order to allow Regional Water Board staff to be present on-site during installation and removal activities, and to answer any public inquiries that may arise regarding the project. Caltrans shall provide Regional Water Board staff access to the project site to document compliance with this order.
2. All conditions required by this Order shall be included in the Plans and Specifications prepared by Caltrans for the Contractor. In addition, Caltrans shall require compliance with all conditions included in this Order in the bid contract for this project.
3. Caltrans shall provide a copy of this Order, associated attachments, and State Water Resources Control Board (SWRCB) Order No. 2003-0017-DWQ to the contractor, all subcontractors, and all utility companies conducting the work, and require that copies remain in their possession at the work site. Caltrans shall be responsible for work conducted by its employees, contractors, subcontractors, and utility companies.
4. The Resident Engineer (or appropriately authorized agent) shall hold on-site water quality permit compliance meetings (similar to tailgate safety meetings) to discuss permit compliance, including instructions on how to avoid violations and procedures for reporting violations. The meetings shall be held at least every other week, before forecasted storm events, and when a new contractor or subcontractor arrives to begin work at the site. The contractors, subcontractors and their employees, as well as any inspectors or monitors assigned to the project, shall be present at the meetings. Caltrans shall maintain dated sign-in sheets for attendees at these meetings, and shall make them available to the Regional Water Board on request.
5. Except for activities permitted by the U.S. Army Corps under §404 of the Clean Water Act, soil, silt, or other organic materials shall not be placed where such materials could pass into surface water or surface water drainage courses.
6. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete the project.
7. All areas disturbed by project activities shall be protected from washout or erosion.
8. All temporarily affected areas will be restored to pre-construction contours and conditions upon completion of construction activities.
9. In-stream work will occur during periods of no or low flow and no precipitation.

10. All materials resulting from the project shall be removed from the site and disposed of properly.
11. Best management practices (BMPs) for erosion, sediment, turbidity and pollutant control shall be implemented and in place at commencement of, during, and after any ground clearing activities, construction activities, or any other project activities that could result in erosion, sediment, or other pollutant discharges to waters of the State. An effective combination of erosion and sediment control BMPs shall be implemented year round, regardless of season or time of year. Caltrans shall stage erosion and sediment control materials at the work site.
12. The applicant shall utilize wildlife-friendly 100% biodegradable erosion control products. Photodegradable synthetic products are not considered biodegradable. The applicant shall not use or allow the use of permanent erosion control products that contain synthetic (e.g., plastic or nylon, or monofilament) netting or materials. Permanent erosion control products are considered to be products left in place for two years or more or after the project is completed. The applicant shall not use or allow the use of soil stabilization products that contain synthetic materials within waters of the United States or waters of the State at any time, unless otherwise authorized by the Central Valley Water Board staff.
13. Caltrans shall perform surface water sampling: 1) When performing any in-water work; 2) In the event that project activities result in any materials reaching surface waters or; 3) When any activities result in the creation of a visible plume in surface waters. The following monitoring shall be conducted immediately upstream out of the influence of the project and 300 feet downstream of the active work area. Sampling results shall be submitted to this office within two weeks of initiation of sampling and every two weeks thereafter. The sampling frequency may be modified for certain projects with written permission from the Central Valley Water Board.

Parameter	Unit	Type of Sample	Frequency of Sample
Turbidity	NTU	Grab	Every 4 hours during in water work
Settleable Material	ml/l	Grab	Same as above.
Visible construction related pollutants	Observations	Visible Inspections	Continuous throughout the construction period

A surface water monitoring report shall be submitted to the Central Valley Water Board Contact indicated in this Certification within two weeks of initiation of sampling and every two weeks thereafter. In reporting the monitoring data, Caltrans shall arrange the data in tabular form so that the sampling locations, date, constituents, and concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the project complies with Certification requirements. The report shall include

surface water sampling results and visual observations, laboratory reports, chain of custody records, and identification of the turbidity increase in the receiving water applicable to the natural turbidity conditions specified in the turbidity criteria below.

14. The Central Valley Water Board adopted a *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins*, Fourth Edition, revised October 2011 (Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. Turbidity, settleable matter, temperature, pH, and dissolved oxygen limits are based on water quality objectives contained in the Basin Plan and are part of this Certification as follows:

- A. Activities shall not cause turbidity increases in surface water to exceed:
 - i. where natural turbidity is less than 1 Nephelometric Turbidity Units (NTUs), controllable factors shall not cause downstream turbidity to exceed 2 NTUs;
 - ii. where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU;
 - iii. where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent;
 - iv. where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs; and
 - v. where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

Except that these limits will be eased during in-water working periods to allow a turbidity increase of 15 NTUs over background turbidity. In determining compliance with the above limits, appropriate averaging periods may be applied provided that beneficial uses will be fully protected. Averaging periods may only be used with prior approval of the Central Valley Water Board staff.

- B. Activities shall not cause settleable matter to exceed 0.1 mL/L in surface waters as measured in surface waters within 300 feet downstream of the project.
 - C. Activities shall not cause pH to be depressed below 6.5 nor raised above 8.5 in surface water.
15. Caltrans is prohibited from discharging waste to waters of the State, unless explicitly authorized by this Order. No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete, concrete washings, oil or petroleum products, or other organic or earthen material from any construction or associated activity of whatever nature, other than that authorized by this Order, shall be allowed to enter into or be placed where it may be washed by rainfall into waters of the State.
16. If at any time the above criteria for turbidity or settleable material are exceeded, or an unauthorized discharge to surface water (including wetlands, rivers or streams) occurs, the

associated project activities shall cease immediately until adequate BMPs are implemented. The Central Valley Water Board shall be notified promptly and in no case more than 24 hours after the exceedance or unauthorized discharge occurs.

17. Activities shall not cause degradation of waters of the State.
18. Caltrans shall comply with all U.S. Army Corps of Engineers requirements and conditions for the project, including, but not limited to, those requirements and special conditions described in Nationwide Permit #14.
19. Caltrans shall comply with all California Department of Fish and Wildlife requirements and recommendations, including, but not limited to, those requirements and recommendations described in Streambed Alteration Agreement No. 1600-2012-0240-R1.
20. Caltrans must obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board for this project.
21. Caltrans shall comply with their General NPDES Permit Order No 2012-011-DWQ (NPDES No. CAS 000003) issued by the State Water Resources Control Board.
22. In the event of any violation or threatened violation of the conditions of this Certification, the violation or threatened violation shall be subject to any remedies, penalties, process, or sanctions as provided for under state and federal law. The applicability of any state law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance with this Certification.
 - a. If Caltrans or a duly authorized representative of the project fails or refuses to furnish technical or monitoring reports, as required under this Certification, or falsifies any information provided in the monitoring reports, the applicant is subject to civil liability, for each day of violation, and/or criminal liability.
 - b. In response to a suspected violation of any condition of this Certification, the Central Valley Water Board may require Caltrans to furnish, under penalty of perjury, any technical or monitoring reports the Central Valley Water Board deems appropriate, provided that the burden, including cost of the reports, shall be in reasonable relationship to the need for the reports and the benefits to be obtained from the reports.
 - c. Caltrans shall allow the staff(s) of the Central Valley Water Board, or an authorized representative(s), upon the presentation of credentials and other documents, as may be required by law, to enter the project premises for inspection, including taking photographs and securing copies of project-related records, for the purpose of assuring compliance with this Certification and determining the ecological success of the project.
23. The Conditions in this water quality certification are based on the information in the attached "Project Information." If the information in the attached Project Information is modified or the project changes, this water quality certification is no longer valid until amended by the Central Valley Water Board.

24. Caltrans shall provide a Notice of Completion (NOC) no later than 30 days after the project completion. The NOC shall demonstrate that the project has been carried out in accordance with the project's description (and any amendments approved). The NOC shall include a map of the project location and representative pre and post construction; photographs. Each photograph shall include a descriptive title, date taken, photographic site, and photographic orientation.

REGIONAL WATER QUALITY CONTROL BOARD CONTACT PERSON:

Dannas J. Berchtold, Engineering Associate, Redding Branch Office, 354 Knollcrest Drive, Suite 205, Redding, California 96002, dberchtold@waterboards.ca.gov, (530) 224-4783

WATER QUALITY CERTIFICATION:

I hereby issue an order certifying that any discharge from Caltrans, Bella Diddy Roadway Rehabilitation Project (WDID# 5A45CR00447) will comply with the applicable provisions of §301 ("Effluent Limitations"), §302 ("Water Quality Related Effluent Limitations"), §303 ("Water Quality Standards and Implementation Plans"), §306 ("National Standards of Performance"), and §307 ("Toxic and Pretreatment Effluent Standards") of the Clean Water Act. This discharge is also regulated under State Water Resources Control Board Water Quality Order No. 2003-0017 DWQ "Statewide General Waste Discharge Requirements For Dredged Or Fill Discharges That Have Received State Water Quality Certification" which requires compliance with all conditions of this Certification. Order No. 2003-0017-DWQ is available at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0017.pdf

Except insofar as may be modified by any preceding conditions, all certification actions are contingent on (a) the discharge being limited and all proposed mitigation being completed in strict compliance with Caltrans's project description and the attached Project Information Sheet, and (b) compliance with all applicable requirements of the Water Quality Control Plan for the Sacramento River and San Joaquin River, Fourth Edition, revised October 2011.


(for) PAMELA C. CREEDON
Executive Officer

DJB:lmw

Enclosure: Project Information

cc: Mr. Matt Kelley, U.S. Army Corp of Engineers, Redding
U.S. Fish and Wildlife Service, Sacramento
Ms. Donna Cobb, Department of Fish and Wildlife, Region 1, Redding
Mr. Bill Jennings, CALSPA, Stockton

cc by email: U.S. EPA, Region 9, San Francisco
Mr. Bill Orme, SWRCB, Certification Unit, Sacramento

PROJECT INFORMATION

Application Date: 22 April 2013

Applicant: California Department of Transportation, Attn: Ms. Amber Kelley

Project Name: Bella Diddy Roadway Rehabilitation Project

Application Number: WDID No. 5A45CR00447

U.S. Army Corps of Engineers File Number: SPK-2011-00424

U.S. Army Corps of Engineers Permit Number: Nationwide Permit #23 (Approved Categorical Exclusions)

Type of Project: Roadway rehabilitation project involving removal of trees and vegetation, earthwork, drainage improvements, new bridge construction, bridge widening, right of way acquisition, controlled blasting, paving, striping, and installation of new metal beam guardrail and signs.

Project Location: In and near the community of Bella Vista, approximately 6 miles east of Redding. Latitude: 40°39'50" and Longitude: -121°11'11"

County: Shasta County

Receiving Water(s) (hydrologic unit): Yank Creek and Salt Creek, which are tributary to Sacramento River. Redding Hydrologic Unit-Enterprise Flat Hydrologic Area No. 508.10

Water Body Type: Wetlands, Streambed, Riparian

Designated Beneficial Uses: The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins*, Fourth Edition, revised October 2011 (Basin Plan) has designated beneficial uses for surface and ground waters within the region. Beneficial uses that could be impacted by the project include, but are not limited to: Municipal and Domestic Water Supply (MUN); Agricultural Supply (AGR); Industrial Supply (IND); Hydropower Generation (POW); Groundwater Recharge (GWR); Water Contact Recreation (REC-1); Non-Contact Water Recreation (REC-2); Warm Freshwater Habitat (WARM); Cold Freshwater Habitat (COLD); Preservation of Biological Habitats of Special Significance (BIOL); Rare, Threatened, or Endangered Species (RARE); Migration of Aquatic Organisms (MIGR); Spawning, Reproduction, and/or Early Development (SPWN); and Wildlife Habitat (WILD). A comprehensive and specific list of the Beneficial Uses applicable for the project area can be found at http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/index.shtml.

Project Description (purpose/goal): The Bella Diddy Roadway Rehabilitation Project is located on State Route 299 in Shasta County, and extends from the community of Bella Vista to the Diddy Wells Fire Station (from Post Mile 30.3 to Post Mile 40.7). The project consists of replacing the roadway structural section, providing eight-foot paved shoulders, improving the

roadway geometrics, improving sight distances, and increasing the clear recovery zone. The roadway requires replacement due to an aging structural section and pavement with 78% distress rate. The roadway will be brought up to current design standards during rehabilitation (existing roadway has 11-12 foot lane widths, very few locations with paved shoulders, and limited clear recovery zone).

The project will involve tree and vegetation removal, earthwork (excavation and embankment construction – 211,000 cubic yards), drainage improvements, new bridge construction, bridge widening, right of way acquisition, controlled blasting, paving, striping, and installation of new metal beam guardrails and signs. The project will require approximately 240 working days over two construction seasons.

There are three major stream crossings within the project limits: Dry Creek – no work will occur at this location; Salt Creek – the existing bridge will be widened to provide ten foot shoulders; Yank Creek (aka Lemm Creek) – three large box culverts will be removed and replaced with a single span bridge. In addition there are multiple ephemeral, intermittent, and storm water drainages channeled through culverts under the existing highway. These culverts will be removed, abandoned, replaced, or extended depending on the location, and new drainage facilities will be installed as needed.

The existing impervious area of the project is 36 acres. After the completion of the project, the total impervious area will be 53 acres, which is a 17 acre increase. The increase in impervious area will have a net increase in surface runoff of approximately 45 cubic feet per second for the ten-year storm event, for the ten mile project.

A jurisdictional delineation was conducted for the project in 2009, 2010, 2012, and 2013. Potentially jurisdictional features within the project limits include: freshwater emergent wetland, riparian wetland, seasonal wet meadow, concrete lined pond, agricultural ditch, ephemeral stream, intermittent stream, perennial stream, roadside ditch, intermittent stream/riparian wetland complex, and culverts. It is anticipated that approximately 2.32 acres of wetlands and other waters will be permanently impacted, and 0.26 acres will be temporarily impacted.

Preliminary Water Quality Concerns: Construction activities may impact surface waters with increased turbidity and settleable matter.

Proposed Mitigation to Address Concerns: Caltrans will implement Best Management Practices (BMPs) to control sedimentation and erosion. All temporary affected areas will be restored to pre-construction contours and conditions upon completion of construction activities. Caltrans will conduct turbidity and settleable matter testing during in-water work, stopping work if Basin Plan criteria are exceeded or are observed.

Fill/Excavation Area: Project implementation will permanently impact 0.222 acres of riparian, 1.22 acres of jurisdictional wetlands and 0.878 acres of un-vegetated streambed and temporarily impact 0.218 acres of riparian, .033 acres of jurisdictional wetlands and 0.004 acres of un-vegetated streambed.

Dredge Volume: Not Applicable

U.S. Army Corps of Engineers Permit Number: Nationwide Permit #23 (Approved Categorical Exclusions)

Department of Fish and Wildlife Streambed Alteration Agreement: Caltrans applied for a Streambed Alteration Agreement on 30 August 2013. Lake & Streambed Alteration Agreement Number: 1600-2012-0240-R1

Possible Listed Species: Vernal pool tadpole shrimp, Vernal pool fairy shrimp, Conservancy fair shrimp, Central Valley steelhead, Pacific salmon.

Status of CEQA Compliance: The California Department of Transportation issued a final Notice of Determination approving a Negative Declaration on 7 October 2011 in compliance with Section 21108 or 21152 of the Public Resources Code, stating the project will not have a significant effect on the environment. Mitigation measures were not made a condition of approval. (State Clearinghouse Number 2011072037).

Compensatory Mitigation: The applicant must comply with the U.S. Army Corps of Engineers' requirements for compensatory mitigation for the impacts to jurisdictional waters. Caltrans will pay the amount of \$198,000 to purchase 1.32 acres of open water credits at Stillwater Plains Mitigation Bank in Shasta County, and provide for 1.25 acres of created wetlands through the U.S. Army Corps of Engineers in-lieu fee program

Application Fee Provided: On 22 April 2013 a certification application fee of \$944.00 was submitted as required by 23 CCR §3833b(3)(A) and by 23 CCR §2200(e). A remaining certification fee of \$59,000 was received on 23 May 2013 as required by 23 CCR §3833b(2)(A) and by 23 CCR § 2200(e).

STATE WATER RESOURCES CONTROL BOARD

WATER QUALITY ORDER NO. 2003 - 0017 - DWQ

STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR DREDGED OR FILL DISCHARGES THAT HAVE RECEIVED STATE WATER QUALITY CERTIFICATION (GENERAL WDRs)

The State Water Resources Control Board (SWRCB) finds that:

1. Discharges eligible for coverage under these General WDRs are discharges of dredged or fill material that have received State Water Quality Certification (Certification) pursuant to federal Clean Water Act (CWA) section 401.
2. Discharges of dredged or fill material are commonly associated with port development, stream channelization, utility crossing land development, transportation water resource, and flood control projects. Other activities, such as land clearing, may also involve discharges of dredged or fill materials (e.g., soil) into waters of the United States.
3. CWA section 404 establishes a permit program under which the U.S. Army Corps of Engineers (ACOE) regulates the discharge of dredged or fill material into waters of the United States.
4. CWA section 401 requires every applicant for a federal permit or license for an activity that may result in a discharge of pollutants to a water of the United States (including permits under section 404) to obtain Certification that the proposed activity will comply with State water quality standards. In California, Certifications are issued by the Regional Water Quality Control Boards (RWQCB) or for multi-Region discharges, the SWRCB, in accordance with the requirements of California Code of Regulations (CCR) section 3830 et seq. The SWRCB's water quality regulations do not authorize the SWRCB or RWQCBs to waive certification, and therefore, these General WDRs do not apply to any discharge authorized by federal license or permit that was issued based on a determination by the issuing agency that certification has been waived. Certifications are issued by the RWQCB or SWRCB before the ACOE may issue CWA section 404 permits. Any conditions set forth in a Certification become conditions of the federal permit or license if and when it is ultimately issued.
5. Article 4, of Chapter 4 of Division 7 of the California Water Code (CWC), commencing with section 13260(a), requires that any person discharging or proposing to discharge waste, other than to a community sewer system, that could affect the quality of the waters of the State,¹ file a report of waste discharge (ROWD). Pursuant to Article 4, the RWQCBs are required to prescribe waste discharge requirements (WDRs) for any proposed or existing discharge unless WDRs are waived pursuant to CWC section 13269. These General WDRs fulfill the requirements of Article 4 for proposed dredge or fill discharges to waters of the United States that are regulated under the State's CWA section 401 authority.

¹ "Waters of the State" as defined in CWC Section 13050(e)

6. These General WDRs require compliance with all conditions of Certification orders to ensure that water quality standards are met.
7. The U.S. Supreme Court decision of *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) (the *SWANCC* decision) called into question the extent to which certain "isolated" waters are subject to federal jurisdiction. The SWRCB believes that a Certification is a valid and enforceable order of the SWRCB or RWQCBs irrespective of whether the water body in question is subsequently determined not to be federally jurisdictional. Nonetheless, it is the intent of the SWRCB that all Certification conditions be incorporated into these General WDRs and enforceable hereunder even if the federal permit is subsequently deemed invalid because the water is not deemed subject to federal jurisdiction.
8. The beneficial uses for the waters of the State include, but are not limited to, domestic and municipal supply, agricultural and industrial supply, power generation, recreation, aesthetic enjoyment, navigation, and preservation and enhancement of fish, wildlife, and other aquatic resources.
9. Projects covered by these General WDRs shall be assessed a fee pursuant to Title 23, CCR section 3833.
10. These General WDRs are exempt from the California Environmental Quality Act (CEQA) because (a) they are not a "project" within the meaning of CEQA, since a "project" results in a direct or indirect physical change in the environment (Title 14, CCR section 15378); and (b) the term "project" does not mean each separate governmental approval (Title 14, CCR section 15378(c)). These WDRs do not authorize any specific project. They recognize that dredge and fill discharges that need a federal license or permit must be regulated under CWA section 401 Certification, pursuant to CWA section 401 and Title 23, CCR section 3855, et seq. Certification and issuance of waste discharge requirements are overlapping regulatory processes, which are both administered by the SWRCB and RWQCBs. Each project subject to Certification requires independent compliance with CEQA and is regulated through the Certification process in the context of its specific characteristics. Any effects on the environment will therefore be as a result of the certification process, not from these General WDRs. (Title 14, CCR section 15061(b)(3)).
11. Potential dischargers and other known interested parties have been notified of the intent to adopt these General WDRs by public hearing notice.
12. All comments pertaining to the proposed discharges have been heard and considered at the November 4, 2003 SWRCB Workshop Session.
13. The RWQCBs retain discretion to impose individual or general WDRs or waivers of WDRs in lieu of these General WDRs whenever they deem it appropriate. Furthermore, these General WDRs are not intended to supersede any existing WDRs or waivers of WDRs issued by a RWQCB.

IT IS HEREBY ORDERED that WDRs are issued to all persons proposing to discharge dredged or fill material to waters of the United States where such discharge is also subject to the water quality certification requirements of CWA section 401 of the federal Clean Water Act (Title 33 United States Code section 1341), and such certification has been issued by the applicable RWQCB or the SWRCB, unless the applicable RWQCB notifies the applicant that its discharge will be regulated through WDRs or waivers of WDRs issued by the RWQCB. In order to meet the provisions contained in Division 7 of CWC and regulations adopted thereunder, dischargers shall comply with the following:

1. Dischargers shall implement all the terms and conditions of the applicable CWA section 401 Certification issued for the discharge. This provision shall apply irrespective of whether the federal license or permit for which the Certification was obtained is subsequently deemed invalid because the water body subject to the discharge has been deemed outside of federal jurisdiction.
2. Dischargers are prohibited from discharging dredged or fill material to waters of the United States without first obtaining Certification from the applicable RWQCB or SWRCB.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on November 19, 2003.

AYE: Arthur G. Baggett, Jr.
Peter S. Silva
Richard Katz
Gary M. Carlton
Nancy H. Sutley

NO: None.

ABSENT: None.

ABSTAIN: None.


Debbie Irvin
Clerk to the Board

PERMITS

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

NOTIFICATION NO. 1600-2012-0240-R1

CALIFORNIA DEPARTMENT OF FISH AND GAME
NORTHERN REGION
601 LOCUST STREET
REDDING, CA 96001



STREAMBED ALTERATION AGREEMENT
NOTIFICATION No. 1600-2012-0240-R1
Yank and Salt Creeks

CALIFORNIA DEPARTMENT OF TRANSPORTATION
BELLA DIDDY ROADWAY IMPROVEMENT PROJECT

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Game (DFG) and the California Department of Transportation (Permittee) as represented by Mr. Phil Baker.

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified DFG on August 31, 2012 that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, DFG has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in the Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with the Agreement.

PROJECT LOCATION

The project is located on State Route (SR) 299 at the crossings of Yank Creek and Salt Creek, tributaries to Dry Creek, between Post Miles (PM) 30.3 and 40.7 in the County of Shasta, State of California; Latitude 40.6640° North, Longitude 122.1885° West.

PROJECT DESCRIPTION

The project is limited to the replacement of the roadway structural section to provide eight-foot paved shoulders, improve sight distance, and increase the clear recovery zone for errant vehicles. The roadway will be brought up to current design standards during the rehabilitation.



Work will occur at both the Yank Creek and Salt Creek crossings. At Salt Creek, each side of the existing bridge will be widened to provide ten-foot shoulders. At Yank Creek, the existing triple concrete box culvert will be replaced with a single span bridge and the stream channel restored beneath the new structure. Specific construction activities at Yank and Salt Creeks include:

- Establishing environmentally sensitive areas (ESAs) to protect habitats adjacent to the work area,
- Removing approximately 0.38 acre of Valley Foothill Riparian vegetation,
- Constructing a temporary crossing at Yank Creek to accommodate traffic during construction,
- Removing the existing concrete box culverts at Yank Creek and constructing a new single span bridge,
- Widening the existing bridge structure at Salt Creek, and
- Replanting riparian vegetation in areas of temporary disturbance adjacent to Yank Creek and Salt Creek following completion of work.

PROJECT IMPACTS

Existing fish or wildlife resources the project could substantially adversely affect include: Central Valley steelhead (*Oncorhynchus mykiss*), Foothill yellow-legged frog (*Rana boylei*), cliff swallows (*Petrochelidon pyrrhonota*), yellow warbler (*Dendroica petechia brewsteri*) and other nesting resident and migratory birds, as well as other aquatic and riparian species.

The adverse effects the project could have on the fish or wildlife resources identified above include: potential mortality of nesting birds, eggs or young through vegetation removal and construction disturbance, as well as injury to downstream fish and benthic invertebrates through sediment transport and deposition and/or spills of deleterious materials.

In addition to temporary impacts during construction, the project will result in the permanent loss of 0.32 acre of Valley Foothill Riparian habitat adjacent to Yank Creek.

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1 Administrative Measures

Permittee shall meet each administrative requirement described below.

- 1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to DFG personnel, or personnel from another state, federal, or local agency upon request.

- 1.2 **Providing Agreement to Persons at Project Site.** Permittee shall provide copies of the Agreement and any extensions and amendments to the Agreement to all persons in responsible positions who will be working on the project site on behalf of the Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.
- 1.3 **Notification of Conflicting Provisions.** Permittee shall notify DFG if Permittee determines or learns that a provision in the Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, DFG shall contact Permittee to resolve any conflict.
- 1.4 **Project Site Entry.** Permittee agrees that DFG personnel may enter the project site at any time to verify compliance with the Agreement.

2 Avoidance and Minimization Measures

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below.

PROJECT TIMING

- 2.1 **General Work Period for Stream Channel and Banks.** All work within the channel or on the stream banks shall be confined to the period commencing May 1 and ending October 15, of any year in which this Agreement is valid, provided the stream is dry or at low flow. If weather conditions permit and the stream remains dry or flows remain low, Permittee may perform work in the channel or on the stream banks after October 15 provided a written request is made to the Department at least 5 days before the proposed work period variance. Written approval from the Department for the work period variance must be received by the Permittee prior to the start or continuation of work after October 15.
- 2.2 **Required Measures for Work after October 15.** If work is performed within the channel or on the stream banks after October 15, the Permittee shall do all of the following:
 - a. Stage erosion and sediment control materials at the work site.
 - b. Monitor the seventy-two (72) hour forecast from the National Weather Service.
 - c. When the 72-hour forecast indicates a probability of precipitation of 60% or greater, or at the onset of any precipitation, ground disturbing activities shall cease and erosion control measures shall be implemented to stabilize exposed soils and prevent the mobilization of sediment into the stream channel or adjacent wetland or riparian areas.

HABITAT AND SPECIES PROTECTION

- 2.3 Delineating Limits of Work.** Prior to initiating vegetation- or ground-disturbing Project activities, Permittee shall clearly delineate the limits of the work area. Permittee shall restrict all Project activities to the designated work area and shall maintain all fencing, stakes and flags until the completion of Project activities.
- 2.4 Minimize Loss of Riparian Vegetation.** Removal of existing riparian vegetation shall not exceed the minimum necessary to complete operations.
- 2.5 Environmentally Sensitive Areas.** All riparian areas beyond the construction limits shall be protected as Environmentally Sensitive Areas (ESAs) and shall be off limits to construction equipment and personnel except as specifically authorized in this Agreement.
- 2.6 Installation of ESA Fencing.** ESA fencing shall be installed as the first order of work. The placement of ESA fencing shall be inspected and approved by DFG prior to the initiation of work. Permittee shall provide written notification for inspection a minimum of 5 working days prior to beginning work. If DFG is unable to conduct a site inspection during this period, the inspection may be conducted by the Environmental Construction Liaison and the results forwarded to DFG for approval.
- 2.7 ESA Fencing Shown on Project Plans.** ESA fencing shall consist of temporary orange construction fence or other highly visible material that clearly delineates the limits of the work area. Environmentally Sensitive Areas shall be clearly shown on the Project plans and drawings. The Permittee shall ensure that the contractor, subcontractors, and all personnel working on the Project are instructed on the purpose of the ESA fencing and understand the limits of the work area.
- 2.8 Nest Exclusion on Bridge Structures.** Permittee shall prevent swallows and other migratory birds from nesting on the existing bridge if construction activities on or adjacent to the structure will occur during the nesting season (February 15 – August 31). Prevention measures shall be in place prior to February 15 and be inspected on a regular basis to maintain their effectiveness.
- 2.9 Removal of Partially Constructed Nests.** In lieu of excluding swallows from nesting on structures, Permittee may remove partially constructed and unoccupied nests from the work area prior to and during the nesting season. Nest materials shall be removed on a regular basis at a frequency sufficient to prevent nests from being completed and eggs from being laid. At no time shall occupied nests be destroyed as a result of Project activities.
- 2.10 Vegetation Removal Period.** Removal of trees and shrubs from the work area shall take place between September 1 and February 28 to avoid impacts to nesting birds.

CONSTRUCTION DEWATERING AND INSTREAM STRUCTURES

- 2.11 **Isolating Work Area from Flow.** All work within the channel or on the banks shall be performed when the stream is at low flow. If water is present during construction, all work shall be performed in isolation from surface or subsurface flow.
- 2.12 **Temporary Stream Diversion.** Where water is present, a temporary stream diversion shall be constructed to isolate the work area from flow. Temporary diversions may be constructed using gravel berms, clean washed spawning gravels, sand bags, K-rail, plastic sheeting, or a combination of these materials upstream from the work area. Flows will then be diverted into a temporary culvert, pipe, or conduit and released downstream from the work area.
- 2.13 **Diversion Facilities to Accommodate Stream Flows.** The clear water diversion shall be adequately sized to accommodate the full range of flows that may occur during the diversion period without overtopping into the work area.
- 2.14 **Preventing Discharge of Deleterious Materials.** Dewatering shall be done in a manner that prevents the discharge of material that could be deleterious to fish, plants or other aquatic life and maintains adequate flows to downstream reaches during all times natural flow would have supported aquatic life.
- 2.15 **Proper Disposal of Turbid Water.** Any turbid water pumped from the work area shall be used for construction purposes (compaction, dust abatement, etc.) or properly disposed of in an upland area where it will not drain to surface waters or wetlands.
- 2.16 **Fish Capture and Relocation.** Permittee shall remove and relocate fish and other aquatic organisms from the stream channel as flows are shifted into the clear water diversion in order to minimize mortality due to stranding. One or more of the following methods shall be used to capture and relocate aquatic species: dip net, seine, throw net, or electrofishing. Fish relocation activities shall be overseen by a qualified fisheries biologist.
- 2.17 **Removal of Temporary Equipment and Materials from the Channel.** Temporary culverts, structures and materials not designed to withstand high flows shall be removed from the channel prior to October 15.

ROCK SLOPE PROTECTION

- 2.18 **Materials for Rock Slope Protection.** RSP and energy dissipation materials shall consist of clean rock, competent for the application, sized and properly installed to resist washout. RSP slopes shall be supported with competent boulders keyed into a footing trench with a depth sufficient to properly seat the footing course boulders and prevent instability (typically at least 1/3 diameter of footing course

boulders). Excavation spoils shall not be side-cast into the channel nor is any manipulation of the substrate of the channel authorized except as herein expressly provided.

PETROLEUM, CHEMICAL AND OTHER POLLUTANTS

- 2.19 **Storage of Construction Materials.** All construction-related materials and equipment shall be stored in designated staging areas.
- 2.20 **Refueling.** Refueling and vehicle maintenance shall be performed at least 100 feet from streams or other water bodies unless approved in writing by DFG.
- 2.21 **Use of Equipment Prohibited in Live Streams.** No equipment or machinery shall be operated within any flowing stream.
- 2.22 **Maintenance and Inspection of Equipment to Prevent Leaks.** Any equipment or vehicles driven and/or operated within or adjacent to the stream channel shall be checked and maintained daily to prevent leaks of materials that could be deleterious to aquatic and terrestrial life or riparian habitat.
- 2.23 **Drip Pans.** Stationary equipment such as motors, pumps, generators, and welders that contain deleterious materials, located adjacent to the stream channel shall be positioned over drip pans.
- 2.24 **Disposal of Concrete Water.** Water that has been in contact with uncured concrete shall be contained in a sealed concrete washout facility or other impervious container and shall not be discharged to surface or ground waters.
- 2.25 **Spill Containment, Clean up and Discharge Notification.** All construction activities performed in or near the stream shall have absorbent materials designated for spill containment and clean up activities on-site for use in an accidental spill. In the event of a discharge, the Permittee shall immediately notify the California Emergency Management Agency at 1-800-852-7550 and immediately initiate clean up activities. DFG shall be notified by the Permittee and consulted regarding clean-up procedures
- 2.26 **Pollution of Waters of the State Prohibited.** No debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, asphalt, paint or other coating material, oil or petroleum products or other organic or earthen material from any construction, or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, waters of the State. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any stream or lake.

EROSION AND SEDIMENT CONTROL

- 2.27 Erosion Control Measures Required.** The project shall at all times feature adequate erosion and sediment control devices to prevent the degradation of water quality.
- 2.28 Installation and Maintenance of Best Management Practices.** Soils exposed by project operations shall be treated to prevent sediment runoff and transport. Erosion control measures shall include the proper installation and maintenance of approved Best Management Practices (BMPs) and may include applications of seed, weed-free straw, compost, fiber, commercial fertilizer, stabilizing emulsion and mulch, or combinations thereof.
- 2.29 Soil Stabilization and Sediment Prevention.** Soils adjacent to the stream channel that are exposed by project operations shall be adequately stabilized when rainfall is reasonably expected during construction, and immediately upon completion of construction, to prevent the mobilization of such sediment into the stream channel or adjacent riparian areas. National Weather Service forecasts shall be monitored by the Permittee to determine the chance of precipitation.
- 2.30 Erosion Control Seeding.** Prior to the end of construction, all disturbed areas shall be stabilized and reseeded with a regionally appropriate California native seed mix.
- 2.31 On-site Riparian Revegetation.** Riparian vegetation shall be replanted in suitable locations on-site following completion of construction. All riparian plantings shall be maintained for a minimum of 3 years to insure plants are adequately established.

3 Compensatory Measures

To compensate for adverse impacts to fish and wildlife resources identified above that cannot be avoided or minimized, Permittee shall implement each measure listed below.

- 3.1 Off-site Riparian Restoration.** To compensate for the permanent loss of 0.32 acre of Valley Foothill Riparian habitat, Permittee shall establish 0.96 acre of riparian vegetation at the Jelly's Ferry Mitigation Site in Tehama County. The mitigation shall occur prior to or concurrently with project construction. A draft riparian restoration plan shall be reviewed and approved by DFG prior to conducting planting activities at the site.

4 Reporting Measures

Permittee shall meet each reporting requirement described below.

- 4.1 Post-Construction Monitoring and Annual Reporting. Permittee shall monitor riparian plantings at the Jelly's Ferry Mitigation Site for a minimum of five years following planting. Annual reports shall be submitted to DFG by December 31 of each year. Reports shall document the survival, growth and vigor of riparian plantings, including any replacement plantings required.

CONTACT INFORMATION

Any communication that Permittee or DFG submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or DFG specifies by written notice to the other.

To Permittee:

Mr. Phil Baker
Department of Transportation
P.O. Box 496073
Redding, CA 96049-6073
Fax: (530) 225-3019
Email: phil.baker@dot.ca.gov

To DFG:

Department of Fish and Game
Northern Region
601 Locust Street
Redding, CA 96001
Attn: Lake and Streambed Alteration Program – Craig Martz
Notification #1600-2012-0240-R1
Fax: (530) 225-2267
Email: cmartz@dfg.ca.gov

LIABILITY

Permittee shall be solely liable for any violations of the Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that the Agreement authorizes.

This Agreement does not constitute DFG's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

SUSPENSION AND REVOCATION

DFG may suspend or revoke in its entirety the Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with the Agreement.

Before DFG suspends or revokes the Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before DFG suspends or revokes the Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused DFG to issue the notice.

ENFORCEMENT

Nothing in the Agreement precludes DFG from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking the Agreement.

Nothing in the Agreement limits or otherwise affects DFG's enforcement authority or that of its enforcement personnel.

OTHER LEGAL OBLIGATIONS

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from obtaining any other permits or authorizations that might be required under other federal, state, or local laws or regulations before beginning the project or an activity related to it.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the FGC including, but not limited to, FGC sections 2050 et seq. (threatened and endangered species), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5937 (sufficient water for fish), and 5948 (obstruction of stream).

Nothing in the Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

AMENDMENT

DFG may amend the Agreement at any time during its term if DFG determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by DFG and Permittee. To request an amendment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the corresponding amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of the Agreement to another entity shall not be valid or effective, unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter DFG approves the transfer or assignment in writing.

The transfer or assignment of the Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to DFG a completed DFG "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

EXTENSIONS

In accordance with FGC section 1605(b), Permittee may request one extension of the Agreement, provided the request is made prior to the expiration of the Agreement's term. To request an extension, Permittee shall submit to DFG a completed DFG "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in DFG's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). DFG shall process the extension request in accordance with FGC 1605(b) through (e).

If Permittee fails to submit a request to extend the Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers (Fish & G. Code, § 1605, subd. (f)).

EFFECTIVE DATE

The Agreement becomes effective on the date of DFG's signature, which shall be: 1) after Permittee's signature; 2) after DFG complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable FGC section 711.4 filing fee listed at:
http://www.dfg.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire on December 31, 2015, unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a) (2) requires.

EXHIBITS

The documents listed below are included as exhibits to the Agreement and incorporated herein by reference.

- A. Exhibit 1. *Bella Diddy Roadway Rehabilitation Project Initial Study with Negative Declaration (SCH #2011072037)*. California Department of Transportation. 2012.
- B. Exhibit 2. *Bella Diddy Roadway Rehabilitation Project Natural Environment Study*. California Department of Transportation. 2011.

AUTHORITY

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

AUTHORIZATION

This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project the Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify DFG in accordance with FGC section 1602.

CONCURRENCE

The undersigned accepts and agrees to comply with all provisions contained herein.

FOR DEPARTMENT OF TRANSPORTATION



Phil Baker
Project Manager

1-9-13

Date

FOR DEPARTMENT OF FISH AND GAME



Ali Aghili
Senior Environmental Scientist- Supervisor

2/14/13

Date

PERMITS

UNITED STATES ARMY CORPS OF ENGINEERS

PERMIT FILE NO.: SPK-2011-00424



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

June 25, 2013

Regulatory Division (SPK-2011-00424)

State of California
Department of Transportation
Attn: Mr. Phil Baker
1031 Butte Street, Suite 205, MS 30
Redding, California 96001

Dear Mr. Baker:

We are responding to your agency's April 18, 2013 request for a Department of the Army Nationwide Permit (NWP) verification for the State Route (SR) 299 Bella Diddy Roadway Rehabilitation project (EA 02-36070). This approximately 170-acre project involves activities, including discharges of dredged or fill material, in waters of the United States to perform road widening and rehabilitation, and bridge modification and replacement. The project is located on SR 299 between post miles 30.3 to 40.7, in Sections 3, 4, 7, 8, 9, 13, 18, 20, 21, 29, and 30, Townships 32 and 33 North, Ranges 2, 3, and 4 West, Mount Diablo Meridian, Latitude 40.6886598°, Longitude -122.125954°, near Bella Vista and Oak Run, Shasta County, California.

Based on the information provided in the Pre-construction Notification, the proposed activity, resulting in the permanent loss of approximately 2.32 acres waters of the U.S., including 0.26 acre of temporary impacts, is authorized by NWP Number 23, Approved Categorical Exclusions. However, until Section 401 Water Quality Certification for the activity has been issued or waived, our authorization is denied without prejudice. Once you have provided us evidence of water quality certification, the activity is authorized and the work may proceed subject to the conditions of certification and the NWP. Your work must comply with the general terms and conditions listed in the enclosed 2012 NWP 23 summary sheets, the Final Sacramento District NWP Regional Conditions for California, and the following Special Conditions:

Special Conditions

1. We understand the State of California, Department of Transportation (Caltrans) is the National Environmental Policy Act (NEPA) lead Federal agency for this project, and as such, will ensure compliance with NEPA and all other applicable Federal Laws. You shall include this office in all future consultation and coordination activities involving compliance with the Endangered Species Act, the Magnuson-Stevens Act, and the National Historic Preservation Act, as they pertain to the activities authorized herein, so that we may consult as appropriate or designate you to consult on our behalf.
2. This permit is contingent upon the permittee applying for and being issued a Section 401 Water Quality Certification. Evidence of a water quality certification must be submitted to this office, prior to commencing work in Waters of the U.S. All terms and conditions of the Section 401 Water Quality Certification are expressly incorporated as conditions of this permit.
3. To mitigate for the permanent loss of 2.32 acres of waters of the United States, including 0.26 acre of temporary impacts, you shall purchase 1.25 credits of seasonal wetlands creation and 1.32 credits of open water creation at Stillwater Plains Mitigation Bank. Evidence of this purchase shall be provided to this office prior to initiation of construction activities within waters of the U.S.

4. To ensure your project complies with the National Historic Preservation Act, you must implement all of the mitigating measures proposed as part of your project description, which are identified in the State Historic Preservation Officer's (SHPO) letter of concurrence (Number FHWA110915A, dated December 22, 2011). If you are unable to implement the proposed measures, you must immediately notify this office and the SHPO's office so we may consult as appropriate, prior to initiating the work, in accordance with Federal law.

5. To ensure your project complies with the Federal Endangered Species Act, you must implement all of the mitigating measures proposed as part of your project description, which are identified in the U.S. Fish and Wildlife Service letter of concurrence (Number 81420-2011-1-0642-1, dated August 8, 2011) and National Marine Fisheries Service letter of concurrence (Number 2011/01135, dated May 24, 2011). If you are unable to implement any of the proposed measures, you must immediately notify this office, the U.S. Fish and Wildlife Office, and the National Marine Fisheries Service so we may consult as appropriate, prior to initiating the work, in accordance with Federal law.

6. To ensure impacts to salmonid habitat are minimized and your project complies with the Magnuson-Stevens Fishery and Consultation Act, you must implement all of the specific measures identified in the document entitled *Bella-Diddy Rehabilitation and Widening, Biological Assessment for Steelhead, Central Valley ESU and Chinook Salmon Essential Fish Habitat Assessment*, dated February 2011.

7. The plan drawings entitled *Project Plans for Construction on State Highway in Shasta County at and near Bella Vista from 0.3 Mile East of Intermountain Road to 0.2 Mile West of Backbone Ridge Road, Layout (L1-42) & Drainage Profiles (D 1-31)*, last revised April 11, 2013, and *Lemm Creek Bridge Replacement, Foundation Plan* and *Salt Creek Bridge (widening), Foundation Plan*, last revised December 2012, created by Caltrans, are incorporated by reference as a condition of this authorization. Any deviations from the work as authorized, which result in additional impacts to waters of the U.S., including wetlands, must be coordinated with this office prior to impacts.

8. The map drawings entitled *Bella Diddy Roadway Rehabilitation Project Impact Map, Sheets 1-37*, revised May 2013, created by Caltrans, are incorporated by reference as a condition of this authorization. Any deviations from the work as authorized, which result in additional impacts to waters of the U.S., including wetlands, must be coordinated with this office prior to impacts.

9. No work shall occur within standing or flowing waters. Temporary dewatering structures (e.g. coffer dams) shall be deployed when the channel is naturally dry. Dewatering plans must be approved, in writing, by this office prior to commencement of construction activities. Plans, maps and/or drawings may be submitted electronically to regulatory-info@usace.army.mil.

10. Excavated materials from the permit area shall not be stockpiled or disposed of outside the permit area. Disposal and stockpile areas must be reviewed and approved by this office prior to commencement of construction activities. Plans, maps and/or drawings may be submitted electronically to regulatory-info@usace.army.mil.

11. If any of the above conditions are violated or unauthorized activities occur, you shall stop work immediately and notify this office. You shall provide us with a detailed description of the unauthorized activity(s), photo documentation, and any measures taken to remedy the violation.

You must sign the enclosed Compliance Certification and return it to this office within 30 days after completion of the authorized work.

This verification is valid until March 18, 2017, when the existing NWP's are scheduled to be modified, reissued, or revoked. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant NWP is modified, reissued or revoked, you will have twelve (12) months from the date of the modification, reissuance or revocation of the NWP to complete the activity under the present terms and conditions. Failure to comply with the General and Regional Conditions of this NWP, or the project-specific Special Conditions of this authorization, may result in the suspension or revocation of your authorization.

We would appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer survey on our website under *Customer Service Survey*.

Please refer to identification number SPK-2011-00424 in any correspondence concerning this project. If you have any questions, please contact Ms. Leah Fisher at our California North Branch Office at 1325 J Street, Room 1350, Sacramento, California 95814-2922, email Leah.M.Fisher@usace.army.mil, or telephone 916-557-6639. For more information regarding our program, please visit our website at www.spk.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,

ORIGINAL SIGNED

Nancy Arcady Haley
Chief, California North Branch

Enclosures

Copies Furnished without enclosures:

- Ms. Amber Kelly, California Department of Transportation, Environmental Management Office, 1031 Butte Street, Suite 205, MS30, Redding, California 96001
- Ms. Sharon Stacey, California Department of Transportation, Environmental Management Office, 1031 Butte Street, Suite 205, MS 30, Redding, California 96001
- Mr. Paul Jones, U.S. Environmental Protection Agency, Region IX, Wetlands Regulatory Office (WTR-8), 75 Hawthorne Street, San Francisco, California, 94105-3901
- Mr. Scott Zaitz, California Regional Water Quality Control Board, Central Valley Region, 364 Knollcrest Drive, Suite 205, Redding, California 96002
- Dr. Carol Roland-Nawi, State Historic Preservation Officer, Office of Historic Preservation, 1725 23rd Street, Suite 100, Sacramento, California 95816
- Ms. Kellie Berry, U.S. Fish and Wildlife Service, Endangered Species Division, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-3901
- Ms. Maria Rea, National Marine Fisheries Service, Central Valley Office, 650 Capitol Mall, Suite 5-100, Sacramento, California 95814-4708

COMPLIANCE CERTIFICATION

Permit File Name: State Route (SR) 299 Bella Diddy Roadway Rehabilitation Project

Permit File Number: SPK-2011-00424

Nationwide Permit Number: 23, Approved Categorical Exclusions

Permittee: State of California
Department of Transportation, District 2
1031 Butte Street, Suite 205, MS 30
Redding, California 96001

County: Shasta

Date of Verification: June 25, 2013

Within 30 days after completion of the activity authorized by this permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Sacramento District
1325 J Street, Room 1350
Sacramento, California 95814-2922
DLL-CESPK-RD-Compliance@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of the permit your authorization may be suspended, modified, or revoked. If you have any questions about this certification, please contact the Corps of Engineers.

* * * * *

I hereby certify that the work authorized by the above-referenced permit, including all the required mitigation, was completed in accordance with the terms and conditions of the permit verification.

Signature of Permittee

Date

Final Sacramento District Nationwide Permit
Regional Conditions for California, excluding the Lake Tahoe Basin
(Effective March 19, 2012 until March 18, 2017)

1.* When pre-construction notification (PCN) is required, the permittee shall notify the U.S. Army Corps of Engineers, Sacramento District (Corps) in accordance with General Condition 31 using either the South Pacific Division Preconstruction Notification (PCN) Checklist or a signed application form (ENG Form 4345) with an attachment providing information on compliance with all of the General and Regional Conditions. In addition, the PCN shall include:

a. A written statement describing how the activity has been designed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States;

b. Drawings, including plan and cross-section views, clearly depicting the location, size and dimensions of the proposed activity, as well as the location of delineated waters of the U.S. on the site. The drawings shall contain a title block, legend and scale, amount (in cubic yards) and area (in acres) of fill in Corps jurisdiction, including both permanent and temporary fills/structures. The ordinary high water mark or, if tidal waters, the mean high water mark and high tide line, should be shown (in feet), based on National Geodetic Vertical Datum (NGVD) or other appropriate referenced elevation. All drawings for activities located within the boundaries of the Los Angeles District shall comply with the September 15, 2010 Special Public Notice: *Map and Drawing Standards for the Los Angeles District Regulatory Division*, (available on the Los Angeles District Regulatory Division website at: www.spl.usace.army.mil/regulatory/); and

c. Numbered and dated pre-project color photographs showing a representative sample of waters proposed to be impacted on the site, and all waters of the U.S. proposed to be avoided on and immediately adjacent to the project site. The compass angle and position of each photograph shall be identified on the plan-view drawing(s) required in subpart b of this Regional Condition.

2. For all Nationwide Permits (NWP), the permittee shall submit a PCN in accordance with General Condition 31 and Regional Condition 1, in the following circumstances:

a. For all activities that would result in the discharge of fill material into any vernal pool;

b. For any activity in the Primary and Secondary Zones of the Legal Delta, the Sacramento River, the San Joaquin River, and the immediate tributaries of these waters;

c. For all crossings of perennial waters and intermittent waters;

d. For all activities proposed within 100 feet of the point of discharge of a known natural spring source, which is any location where ground water emanates from a point in the ground excluding seeps or other discharges which lack a defined channel; and

e.* For all activities located in areas designated as Essential Fish Habitat (EFH) by the Pacific Fishery Management Council (i.e., all tidally influenced areas - Federal Register dated March 12, 2007 (72 FR 11092)), in which case the PCN shall include an EFH assessment and extent of proposed impacts to EFH. Examples of EFH habitat assessments can be found at: <http://www.swr.noaa.gov/efh.htm>.

3. The permittee shall record the NWP verification with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records of title to or interest in real property for areas (1) designated to be preserved as part of compensatory mitigation for authorized impacts, including any associated covenants or restrictions, or (2) where boat ramps or docks, marinas, piers, and permanently moored vessels will be constructed or placed in or adjacent to navigable waters. The recordation shall also include a map showing the surveyed location of the preserved area or authorized structure.

* Regional Condition developed jointly between Sacramento District, Los Angeles District, and San Francisco District.

4. For all waters of the U.S. proposed to be avoided on a site, unless determined to be impracticable by the Corps, the permittee shall:

- a. Establish and maintain, in perpetuity, a preserve containing all avoided waters of the U.S. to ensure that the functions of the aquatic environment are protected;
- b. Place all avoided waters of the U.S. and any upland buffers into a separate parcel prior to discharging dredge or fill material into waters of the U.S., and
- c. Establish permanent legal protection for all preserve parcels, following Corps approval of the legal instrument;

If the Corps determines that it is impracticable to require permanent preservation of the avoided waters, additional mitigation may be required in order to compensate for indirect impacts to the waters of the U.S.

5. For all temporary fills, the PCN shall include a description of the proposed temporary fill, including the type and amount of material to be placed, the area proposed to be impacted, and the proposed plan for restoration of the temporary fill area to pre-project contours and conditions, including a plan for the re-vegetation of the temporary fill area, if necessary. In addition, the PCN shall include the reason(s) why avoidance of temporary impacts is not practicable.

In addition, for all activities resulting in temporary fill within waters of the U.S., the permittee shall:

- a. Utilize material consisting of clean and washed gravel. For temporary fills within waters of the U.S. supporting anadromous fisheries, spawning quality gravel shall be used, where practicable, as determined by the Corps, after consultation with appropriate Federal and state fish and wildlife agencies;
- b. Place a horizontal marker (e.g. fabric, certified weed free straw, etc.) to delineate the existing ground elevation of the waters temporarily filled during construction; and
- c. Remove all temporary fill within 30 days following completion of construction activities.

6. In addition to the requirements of General Condition 2, unless determined to be impracticable by the Corps, the following criteria shall apply to all road crossings:

a.* For all activities in waters of the U.S. that are suitable habitat for Federally-listed fish species, the permittee shall design all road crossings to ensure that the passage and/or spawning of fish is not hindered. In these areas, the permittee shall employ bridge designs that span the stream or river, including pier- or pile-supported spans, or designs that use a bottomless arch culvert with a natural stream bed;

b. Road crossings shall be designed to ensure that no more than minor impacts would occur to fish and wildlife passage or expected high flows, following the criteria listed in Regional Condition 6(a). Culverted crossings that do not utilize a bottomless arch culvert with a natural stream bed may be authorized for waters that do not contain suitable habitat for Federally listed fish species, if it can be demonstrated and is specifically determined by the Corps, that such crossing will result in no more than minor impacts to fish and wildlife passage or expected high flows;

c. No construction activities shall occur within standing or flowing waters. For ephemeral or intermittent streams, this may be accomplished through construction during the dry season. In perennial streams, this may be accomplished through dewatering of the work area. Any proposed dewatering plans must be approved, in writing, by the Corps prior to commencement of construction activities; and

* Regional Condition developed jointly between Sacramento District, Los Angeles District, and San Francisco District.

d. All bank stabilization activities associated with a road crossing shall comply with Regional Condition 19.

In no case shall stream crossings result in a reduction in the pre-construction bankfull width or depth of perennial streams or negatively alter the flood control capacity of perennial streams.

7.* For activities in which the Corps designates another Federal agency as the lead for compliance with Section 7 of the Endangered Species Act (ESA) of 1973 as amended, pursuant to 50 CFR Part 402.07, Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act (EFH), pursuant to 50 CFR 600.920(b) and/or Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, pursuant to 36 CFR 800.2(a)(2), the lead Federal agency shall provide all relevant documentation to the Corps demonstrating any previous consultation efforts, as it pertains to the Corps Regulatory permit area (for Section 7 and EFH compliance) and the Corps Regulatory area of potential effect (APE) (for Section 106 compliance). For activities requiring a PCN, this information shall be submitted with the PCN. If the Corps does not designate another Federal agency as the lead for ESA, EFH and/or NHPA, the Corps will initiate consultation for compliance, as appropriate.

8. For all NWP's which require a PCN, the permittee shall submit the following additional information with the compliance certificate required under General Condition 30:

a. As-built drawings of the work conducted on the project site and any on-site and/or off-site compensatory mitigation, preservation, and/or avoidance area(s). The as-builts shall include a plan-view drawing of the location of the authorized work footprint (as shown on the permit drawings), with an overlay of the work as constructed in the same scale as the permit drawings. The drawing shall show all areas of ground disturbance, wetland impacts, structures, and the boundaries of any on-site and/or off-site mitigation or avoidance areas. Please note that any deviations from the work as authorized, which result in additional impacts to waters of the U.S., must be coordinated with the appropriate Corps office prior to impacts; and

b. Numbered and dated post-construction color photographs of the work conducted within a representative sample of the impacted waters of the U.S., and within all avoided waters of the U.S. on and immediately adjacent to the proposed project area. The compass angle and position of all photographs shall be similar to the pre-construction color photographs required in Regional Condition 1(c) and shall be identified on the plan-view drawing(s) required in subpart a of this Regional Condition.

9. For all activities requiring permittee responsible mitigation, the permittee shall develop and submit to the Corps for review and approval, a final comprehensive mitigation and monitoring plan for all permittee responsible mitigation prior to commencement of construction activities within waters of the U.S. The plan shall include the mitigation location and design drawings, vegetation plans, including target species to be planted, and final success criteria, presented in the format of the *Sacramento District's Habitat Mitigation and Monitoring Proposal Guidelines*, dated December 30, 2004, and in compliance with the requirements of 33 CFR 332.

10.* The permittee shall complete the construction of any compensatory mitigation required by special condition(s) of the NWP verification before or concurrent with commencement of construction of the authorized activity, except when specifically determined to be impracticable by the Corps. When mitigation involves use of a mitigation bank or in-lieu fee program, the permittee shall submit proof of payment to the Corps prior to commencement of construction of the authorized activity.

11. The permittee is responsible for all authorized work and ensuring that all contractors and workers are made aware and adhere to the terms and conditions of the permit authorization. The permittee shall ensure

that a copy of the permit authorization and associated drawings are available and visible for quick reference at the site until all construction activities are completed.

12. The permittee shall clearly identify the limits of disturbance in the field with highly visible markers (e.g. construction fencing, flagging, silt barriers, etc.) prior to commencement of construction activities within waters of the U.S. The permittee shall maintain such identification properly until construction is completed and the soils have been stabilized. The permittee is prohibited from any activity (e.g. equipment usage or materials storage) that impacts waters of the U.S. outside of the permit limits (as shown on the permit drawings).

13. For all activities in which a PCN is required, the permittee shall notify the appropriate district office of the start date for the authorized work within 10 days prior to initiation of construction activities.

14. The permittee shall allow Corps representatives to inspect the authorized activity and any mitigation areas at any time deemed necessary to determine compliance with the terms and conditions of the NWP verification. The permittee will be notified in advance of an inspection.

15. For all activities located in the Mather Core Recovery Area in Sacramento County, as identified in the U.S. Fish and Wildlife Service's *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* dated December 15, 2005, NWPs 14, 18, 23, 29, 39, 40, 42, 43 and 44 are revoked from use in vernal pools that may contain habitat for Federally-listed threatened and/or endangered vernal pool species.

16. For activities located in the Primary or Secondary Zone of the Legal Delta, NWPs 29 and 39 are revoked.

17. For all activities within the Secondary Zone of the Legal Delta, the permittee shall conduct compensatory mitigation for unavoidable impacts within the Secondary Zone of the Legal Delta.

18. For NWP 12: Permittees shall ensure the construction of utility lines does not result in the draining of any water of the U.S., including wetlands. This may be accomplished through the use of clay blocks, bentonite, or other suitable material (as approved by the Corps) to seal the trench. For utility line trenches, during construction, the permittee shall remove and stockpile, separately, the top 6 – 12 inches of topsoil. Following installation of the utility line(s), the permittee shall replace the stockpiled topsoil on top and seed the area with native vegetation. The permittee shall submit a PCN for utility line activities in the following circumstances:

a. The utility line crossing would result in a discharge of dredged and/or fill material into perennial waters, intermittent waters, wetlands, mudflats, vegetated shallows, riffle and pool complexes, sanctuaries and refuges or coral reefs;

b. The utility line activity would result in a discharge of dredged and/or fill material into greater than 100 linear feet of ephemeral waters of the U.S.;

c. The utility line installation would include the construction of a temporary or permanent access road, substation or foundation within waters of the U.S.; or

d. The proposed activity would not involve the restoration of all utility line trenches to pre-project contours and conditions within 30 days following completion of construction activities.

19. For NWP 13 and 14: All bank stabilization activities shall involve either the sole use of native vegetation or other bioengineered design techniques (e.g. willow plantings, root wads, large woody debris, etc.), or a combination of hard-armoring (e.g. rip-rap) and native vegetation or bioengineered design

techniques, unless specifically determined to be impracticable by the Corps. The permittee shall submit a PCN for any bank stabilization activity that involves hard-armoring or the placement of any non-vegetated or non-bioengineered technique below the ordinary high water mark or, if tidal waters, the high tide line of waters of the U.S. The request to utilize non-vegetated techniques must include information on why the sole use of vegetated techniques is not practicable.

20. For NWP 23: The permittee shall submit a PCN for all activities proposed for this NWP, in accordance with General Condition 31 and Regional Condition 1. The PCN shall include a copy of the signed Categorical Exclusion document and final agency determinations regarding compliance with ESA, EFH and NHPA, in accordance with General Conditions 18 and 20 and Regional Condition 7.

21. For NWP 27: The permittee shall submit a PCN for aquatic habitat restoration, establishment, and enhancement activities in the following circumstances:

a. The restoration, establishment or enhancement activity would result in a discharge of dredged and/or fill material into perennial waters, intermittent waters, wetlands, mudflats, vegetated shallows, riffle and pool complexes, sanctuaries and refuges or coral reefs; or

b. The restoration, establishment or enhancement activity would result in a discharge of dredged and/or fill material into greater than 100 linear feet of ephemeral waters of the U.S.

22. For NWPs 29 and 39: The channelization or relocation of intermittent or perennial drainages is not authorized, except when, as determined by the Corps, the relocation would result in a net increase in functions of the aquatic ecosystem within the watershed.

23.* Any requests to waive the 300 linear foot limitation for intermittent and ephemeral streams for NWPs 21, 29, 39, 40, 42, 43, 44, 50, 51 and 52, or to waive the 500 linear foot limitation along the bank for NWP 13, must include the following:

a. A narrative description of the stream. This should include known information on: volume and duration of flow; the approximate length, width, and depth of the waterbody and characteristics observed associated with an Ordinary High Water Mark (e.g. bed and bank, wrack line or scour marks); a description of the adjacent vegetation community and a statement regarding the wetland status of the adjacent areas (i.e. wetland, non-wetland); surrounding land use; water quality; issues related to cumulative impacts in the watershed, and; any other relevant information;

b. An analysis of the proposed impacts to the waterbody, in accordance with General Condition 31 and Regional Condition 1;

c. Measures taken to avoid and minimize losses to waters of the U.S., including other methods of constructing the proposed activity(s); and

d. A compensatory mitigation plan describing how the unavoidable losses are proposed to be offset, in accordance with 33 CFR 332.

24. For NWPs 29, 39, 40, 42, and 43: The permittee shall establish and maintain upland vegetated buffers in perpetuity, unless specifically determined to be impracticable by the Corps, next to all preserved open waters, streams and wetlands including created, restored, enhanced or preserved waters of the U.S., consistent with General Condition 23(f). Except in unusual circumstances, as determined by the Corps, vegetated buffers shall be at least 50 feet in width.

25. For NWP 46: The discharge shall not cause the loss of greater than 0.5 acres of waters of the United States or the loss of more than 300 linear feet of ditch, unless specifically waived in writing by the Corps.

26. All NWPs except 3, 6, 20, 27, 32, and 38 are revoked for activities in histosols, fens, bogs and peatlands and in wetlands contiguous with fens. Fens are defined as slope wetlands with a histic epipedon that are hydrologically supported by groundwater. Fens are normally saturated throughout the growing season, although they may not be during drought conditions. For NWPs 3, 6, 20, 27, 32, and 38, the permittee shall submit a PCN to the Corps in accordance with General Condition 31 and Regional Condition 1. This condition does not apply to NWPs 1, 2, 8, 9, 10, 11, 24, 28, 35 or 36, as these NWPs either apply to Section 10 only activities or do not authorize impacts to special aquatic sites.



U S Army Corps of
Engineers
Sacramento District

Nationwide Permit Summary

33 CFR Part 330; Issuance of Nationwide
Permits – March 19, 2012

23. Approved Categorical Exclusions. Activities undertaken, assisted, authorized, regulated, funded, or financed, in whole or in part, by another Federal agency or department where:

(a) That agency or department has determined, pursuant to the Council on Environmental Quality's implementing regulations for the National Environmental Policy Act (40 CFR part 1500 et seq.), that the activity is categorically excluded from environmental documentation, because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the human environment; and

(b) The Office of the Chief of Engineers (Attn: CECW-CO) has concurred with that agency's or department's determination that the activity is categorically excluded and approved the activity for authorization under NWP 23.

The Office of the Chief of Engineers may require additional conditions, including pre-construction notification, for authorization of an agency's categorical exclusions under this NWP.

Notification: Certain categorical exclusions approved for authorization under this NWP require the permittee to submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 31). The activities that require pre-construction notification are listed in the appropriate Regulatory Guidance Letters. (Sections 10 and 404)

Note: The agency or department may submit an application for an activity believed to be categorically excluded to the Office of the Chief of Engineers (Attn: CECW-CO). Prior to approval for authorization under this NWP of any agency's activity, the Office of the Chief of Engineers will solicit public comment. As of the date of issuance of this NWP, agencies with approved categorical exclusions are the: Bureau of Reclamation, Federal Highway Administration, and U.S. Coast Guard. Activities approved for authorization under this NWP as of the date of this notice are found in Corps Regulatory Guidance Letter 05-07, which is available at:

<http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/GuidanceLetters.aspx>. Any future approved categorical exclusions will be announced in Regulatory Guidance Letters and posted on this same web site

A. Regional Conditions

1. Regional Conditions for California, excluding the Tahoe Basin

http://www.spk.usace.army.mil/Portals/12/documents/regulatory/nwp/2012_nwps/2012-NWP-RC-CA.pdf

2. Regional Conditions for Nevada, including the Tahoe Basin

http://www.spk.usace.army.mil/Portals/12/documents/regulatory/nwp/2012_nwps/2012-NWP-RC-NV.pdf

3. Regional Conditions for Utah

http://www.spk.usace.army.mil/Portals/12/documents/regulatory/nwp/2012_nwps/2012-NWP-RC-UT.pdf

4. Regional Conditions for Colorado.

http://www.spk.usace.army.mil/Portals/12/documents/regulatory/nwp/2012_nwps/2012-NWP-RC-CO.pdf

B. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer.

Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR §§ 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR § 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. Navigation.

(a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters,

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the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

- 2. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.
- 3. **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.
- 4. **Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
- 5. **Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.
- 6. **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).
- 7. **Water Supply Intakes.** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.
- 8. **Adverse Effects From Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.
- 9. **Management of Water Flows.** To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).
- 10. **Fills Within 100-Year Floodplains.** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.
- 11. **Equipment.** Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.
- 12. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
- 13. **Removal of Temporary Fills.** Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.
- 14. **Proper Maintenance.** Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.
- 15. **Single and Complete Project.** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.
- 16. **Wild and Scenic Rivers.** No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
- 17. **Tribal Rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
- 18. **Endangered Species.**
 - (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.
 - (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to

demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the NWP activity, or whether additional ESA consultation is necessary.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed work or that utilize the designated critical habitat that might be affected by the proposed work. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have “no effect” on listed species or critical habitat, or until Section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

(e) Authorization of an activity by a NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the U.S. FWS or the NMFS, The Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take” means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide web pages at

<http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.noaa.gov/fisheries.html> respectively.

19. **Migratory Birds and Bald and Golden Eagles.** The permittee is responsible for obtaining any “take” permits required under the U.S. Fish and Wildlife Service’s regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the U.S. Fish and Wildlife Service to determine if such “take” permits are required for a particular activity.

20. **Historic Properties.**

(a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the NWP activity, or whether additional section 106 consultation is necessary.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties on which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has

no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NHPAs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NHPAs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 31, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NHPAs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment.

Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in minimal adverse effects on the aquatic environment.

(2) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(3) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan

that addresses the applicable requirements of 33 CFR 332.4(c)(2) – (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

- (4) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.
- (5) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan.
- (d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream rehabilitation, enhancement, or preservation, to ensure that the activity results in minimal adverse effects on the aquatic environment.
- (e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.
- (f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the restoration or establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate

form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For

example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any required compensatory mitigation. The success of any required permittee responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

- (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;
- (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and
- (c) The signature of the permittee certifying the completion of the work and mitigation.

31. Pre-Construction Notification.

(a) **Timing.** Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information

necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

- (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or
- (2) 45 calendar days have passed from the district engineer’s receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is “no effect” on listed species or “no potential to cause effects” on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee’s right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2)..

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

- (1) Name, address and telephone numbers of the prospective permittee;
- (2) Location of the proposed project;
- (3) A description of the proposed project; the project’s purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result from the NWP

activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(4) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with

Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: he standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination:

(1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of intermittent and ephemeral stream bed, and for all NWP 48 activities that require pre-construction notification, the district engineer will immediately provide (e.g., via email, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization

should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

C. District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. For a linear project, this determination will include an evaluation of the individual crossings to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to intermittent or ephemeral streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 50, 51 or 52, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in minimal adverse effects. When making minimal effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

2. If the proposed activity requires a PCN and will result in a loss of greater than 1/10- acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity

complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

3. If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (a) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (c) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period, with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

D. Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWP's do not grant any property rights or exclusive privileges.
4. NWP's do not authorize any injury to the property or rights of others.
5. NWP's do not authorize interference with any existing or proposed Federal project.

E. Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term "discharge" means any discharge of dredged or fill material.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Intermittent stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities eligible for exemptions under Section 404(f) of the Clean Water Act are not considered when calculating the loss of waters of the United States.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWP's, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are

considered to be open waters. Examples of “open waters” include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (see 33 CFR 328.3(e)).

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a

turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands adjacent to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term “single and complete project” is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term “single and complete project” is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of “independent utility”). Single and complete non-linear projects may not be “piecemealed” to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a wetland (i.e., water of the United States) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line, which is defined at 33 CFR 328.3(d).

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWP, a waterbody is a jurisdictional water of the United States. If a jurisdictional wetland is adjacent – meaning bordering, contiguous, or neighboring – to a waterbody determined to be a water of the United States under 33 CFR 328.3(a)(1)-(6), that waterbody and its adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of “waterbodies” include streams, rivers, lakes, ponds, and wetlands.

PERMITS

CENTRAL VALLEY FLOOD PROTECTION BOARD

18858 BD PERMIT

STATE OF CALIFORNIA
THE RESOURCES AGENCY
THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 18858 BD

This Permit is issued to:

California Department of Transportation
1031 Butte Street Ste. 205
Redding, California 96001

To widen the existing Salt Creek Bridge (No. 06-0049) by 6 feet, 9 inches to provide 10-foot left and right shoulders for a total width of 47 feet, 6 inches. Construction includes 200 cubic yards of excavation of banks and channel bottom for abutments, revegetation, spread footings and columns, temporary structure supports, clear water diversions, coffer dams, and work mats.

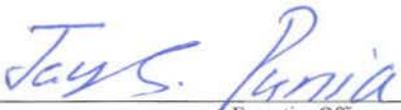
The project is located at the State Route 299 crossing of Salt Creek in Shasta County. (Section 3, T32N, R3W, MDB&M, Salt Creek, Shasta County).

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

JUN 28 2013

Dated: _____



Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to

change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 18858 BD

THIRTEEN: All work completed under this permit, as directed by the general and special conditions herein, shall be accomplished to ensure that the work is not injurious to adopted plans of flood control, regulated streams, and designated floodways under Board jurisdiction, as defined in California Code of Regulations, Title 23. This permit only applies to the completion of work in the project description located within, or adjacent to and having bearing on Board jurisdiction, and which directly or indirectly affects the Board's jurisdiction. This special condition shall apply to all subsequent conditions herein.

LIABILITY AND INDEMNIFICATION

FOURTEEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the Central Valley Flood Protection Board, the Department of Water Resources, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim. This condition shall supersede condition TEN, above.

FIFTEEN: The permittee shall defend, indemnify, and hold the Central Valley Flood Protection Board, the Department of Water Resources, and their respective officers, agents, employees, successors and assigns, safe and harmless, of and from all claims and damages related to the Central Valley Flood Protection Board's approval of this permit, including but not limited to claims filed pursuant to the California Environmental Quality Act. The Central Valley Flood Control Board and the Department of Water Resources expressly reserve the right to supplement or take over their defense, in their sole discretion.

SIXTEEN: The permittee is responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend, indemnify, and hold the Central Valley Flood Protection Board, the Department of Water Resources, and their respective officers, agents, employees, successors and assigns, safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The Central Valley Flood Control Board and the Department of Water Resources expressly reserve the right to supplement or take over their defense, in their sole discretion.

SEVENTEEN: The Central Valley Flood Protection Board and the Department of Water Resources shall not be held liable for damages to the permitted encroachment(s) resulting from releases of water from reservoirs, flood fight, operation, maintenance, inspection, or emergency repair.

PERMITTING AND AGENCY CONDITIONS

EIGHTEEN: The letter from the U.S. Army Corps of Engineers, Sacramento District, dated June 19, 2013 is attached to this permit as Exhibit A in reference to this project.

NINETEEN: The permittee should contact the U.S. Army Corps of Engineers, Sacramento District, Regulatory Branch, 1325 J Street, Sacramento, California 95814, telephone (916) 557-5250, as compliance with Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act may be required.

TWENTY: If the permittee does not comply with the conditions of this permit and enforcement by the Board is required, the permittee shall be responsible for bearing all costs associated with the enforcement action, including reasonable attorney's fees.

TWENTY-ONE: The permittee shall be responsible for securing any necessary permits incidental to habitat manipulation and restoration work completed in the flood control project, and will provide any biological surveying, monitoring, and reporting needed to satisfy those permits.

TWENTY-TWO: The permittee agrees to incur all costs for compliance with local, State, and federal permitting and resolve conflicts between any of the terms and conditions that agencies might impose under the laws and regulations it administers and enforces.

PRE-CONSTRUCTION

TWENTY-THREE: The permittee shall contact the Central Valley Flood Protection Board by telephone at (916) 574-0609, and submit the enclosed postcard to schedule a preconstruction conference. Failure to do so at least 10 working days prior to start of work may result in delay of the project.

TWENTY-FOUR: Thirty (30) calendar days prior to start of any demolition and/or construction activities within the channel and banks of Salt Creek, the permittee shall submit to the Chief Engineer two sets of plans, specifications and supporting geotechnical and / or hydraulic impact analyses, for any and all temporary, in channel cofferdam(s), gravel work pad(s), work trestle(s), scaffolding, piles, and/or other appurtenances that are to remain in the floodway during the flood season from November 1 through April 15. The Central Valley Flood Protection Board shall acknowledge receipt of this submittal in writing within ten (10) working days of receipt, and shall work with the permittee to

review and respond to the request as quickly as possible. Time is of the essence. The Central Valley Flood Protection Board may request additional information as needed and will seek comment from the U.S. Army Corps of Engineers and / or local maintaining agency when necessary. The Central Valley Flood Protection Board will provide written notification to the permittee if the review period is likely to exceed thirty (30) calendar days.

TWENTY-FIVE: Prior to commencement of work, the permittee shall create a photo record, including associated descriptions of project conditions. The photo record shall be certified (signed and stamped) by a licensed land surveyor or professional engineer registered in the State of California and submitted to the Central Valley Flood Protection Board within thirty (30) calendar days of beginning the project.

TWENTY-SIX: All addenda or other changes made to the submitted documents by the permittee after issuance of this permit shall be submitted to the Chief Engineer for review and approval prior to incorporation into the permitted project. The submittal shall include supplemental plans, specifications, and supporting geotechnical, hydrology and hydraulics, or other technical analyses. The Central Valley Flood Protection Board shall acknowledge receipt of the addendum or change submittal in writing within ten (10) working days of receipt, and shall work with the permittee to review and respond to the request as quickly as possible. Time is of the essence. The Central Valley Flood Protection Board may request additional information as needed. The Central Valley Flood Protection Board will provide written notification to the permittee if the review period is likely to exceed thirty (30) calendar days. Upon approval of submitted documents the permit shall be revised, if needed, prior to construction related to the proposed changes.

TWENTY-SEVEN: The permittee shall provide construction supervision and inspection services acceptable to the Central Valley Flood Protection Board. A professional engineer registered in the State of California shall certify that all work was inspected and performed in accordance with submitted drawings, specifications, and permit conditions.

CONSTRUCTION

TWENTY-EIGHT: All work approved by this permit shall be in accordance with the submitted drawings and specifications except as modified by special permit conditions herein. No work, other than that approved by this permit, shall be done in the project area without prior approval of the Central Valley Flood Protection Board.

TWENTY-NINE: No construction work of any kind shall be done during the flood season from November 1st to April 15th without prior approval of the Central Valley Flood Protection Board.

THIRTY: No material stockpiles, temporary buildings, or equipment shall remain in the floodway during the flood season from November 1 to April 15.

THIRTY-ONE: Cleared trees and brush shall be completely burned or removed from the floodway, and downed trees or brush shall not remain in the floodway during the flood season from November 1 to April 15.

THIRTY-TWO: All debris generated by this project shall be disposed outside of the channel and banks of Salt Creek.

THIRTY-THREE: Fill material shall be placed only within the area indicated on the approved plans.

THIRTY-FOUR: Backfill material for excavations shall be placed in up to 8-inch layers and compacted with material as specified in CalTrans Standard Specifications (2010) SS19-3.0E to the density also specified, which is attached to this permit as Exhibit B and is incorporated by reference.

THIRTY-FIVE: Density tests by a certified materials laboratory will be required to verify compaction of backfill within the creek.

THIRTY-SIX: In the event existing revetment on the creek bank is disturbed or displaced, it shall be restored to its original condition or brought to a higher standard, to the satisfaction of Board staff, upon completion of the proposed work.

THIRTY-SEVEN: Except with respect to the activities expressly allowed under this permit, the work area shall be restored to the condition that existed prior to start of work.

THIRTY-EIGHT: The permittee shall be responsible for all damages due to settlement, consolidation, or heave from any construction-induced activities.

VEGETATION / ENVIRONMENTAL MITIGATION

THIRTY-NINE: Fill placed at slopes greater than 2 horizontal to 1 vertical shall be seeded with a native grass mix to reduce the risk of erosion.

FORTY: Any vegetative material, living or dead, that interferes with the successful execution, functioning, maintenance, or operation of the adopted plan of flood control must be removed by the permittee at permittee's expense upon request by the Central Valley Flood Protection Board, Department of Water Resources, or local maintaining agency. If the permittee does not remove such vegetation or trees upon request, the Central Valley Flood Protection Board reserves the right to remove such at the permittee's expense.

POST-CONSTRUCTION

FORTY-ONE: The permittee shall be responsible for repair of any damages to the Salt Creek channel and banks due to construction, operation, or maintenance of the proposed project.

FORTY-TWO: Within 120 days of completion of the project, the permittee shall submit to the Central Valley Flood Protection Board as-built drawings and a certification report, stamped and signed by a professional engineer registered in the State of California, certifying the work was performed and inspected in accordance with the Central Valley Flood Protection Board permit conditions and submitted drawings and specifications.

OPERATIONS AND MAINTENANCE

FORTY-THREE: The permittee shall maintain the permitted encroachment(s) and the project works within the utilized area in the manner required and as requested by the authorized representative of the Central Valley Flood Protection Board, Department of Water Resources, or any other agency

responsible for maintenance.

FORTY-FOUR: If the bridge is damaged to the extent that it may impair the channel or floodway capacity, it shall be repaired or removed prior to the next flood season.

FORTY-FIVE: Drainage from the bridge or highway shall not be discharged directly into Salt Creek without proper erosion control measures in-place.

FORTY-SIX: If the permitted structure results in any adverse hydraulic impact or scouring the permittee shall provide appropriate mitigation measures subject to review and approval of the Central Valley Flood Protection Board.

FORTY-SEVEN: All debris that may accumulate around the bridge piers and abutments within Salt Creek shall be completely removed from the floodway following each flood season.

FORTY-EIGHT: If erosion occurs adjacent to the permitted encroachment(s), the permittee shall repair the eroded areas and place adequate revetment on the affected areas to prevent further erosion.

FORTY-NINE: The permitted encroachment(s) shall not interfere with the flood conveyance capability of the Salt Creek channel. If the permitted encroachment(s) are determined by any agency responsible for operation or maintenance of the flood control project to interfere, the permittee shall be required, at permittee's cost and expense, to modify or remove the permitted encroachment(s) under direction of the Central Valley Flood Protection Board or Department of Water Resources. If the permittee does not comply, the Central Valley Flood Protection Board may modify or remove the encroachment(s) at the permittee's expense.

FIFTY: At the request of either the permittee or Central Valley Flood Protection Board the permittee and Board shall conduct joint inspections of the project and channel after significant flood events or flood seasons to assess the integrity and operation of the project, and to assess and respond to any adverse impacts on the channel or adjacent properties.

PROJECT ABANDONMENT, CHANGE IN PLAN OF FLOOD CONTROL

FIFTY-ONE: If the project, or any portion thereof, is to be abandoned in the future, the permittee shall abandon the project under direction of the Central Valley Flood Protection Board and Department of Water Resources, at the permittee's cost and expense.

FIFTY-TWO: The permittee may be required, at permittee's cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted encroachment(s) if removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with any present or future flood control plan or project or if damaged by any cause. If the permittee does not comply, the Central Valley Flood Protection Board may remove the encroachment(s) at the permittee's expense.

END OF CONDITIONS



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U.S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Flood Protection and Navigation Section (18858)

Mr. Jay Punia, Executive Officer
Central Valley Flood Protection Board
3310 El Camino Avenue, Room 151
Sacramento, California 95821

JUN 19 2013

Dear Mr. Punia:

We have reviewed a permit application by the California Department of Transportation (application number 18858). This project includes widening the existing Salt Creek Bridge (No. 06-0049) and excavation 125 cubic yards of banks and channel bottom. The project is located at the Highway 299 crossing of Salt Creek, at 40.6611°N 122.1959°W NAD83, Shasta County, California.

The District Engineer has no comments or recommendations regarding flood control because the proposed work does not affect a federally constructed project.

A Section 10 and/or Section 404 permit application (2011-00424) is in process for this work.

A copy of this letter is being furnished to Mr. Don Rasmussen, Chief, Flood Project Integrity and Inspection Branch, 3310 El Camino Avenue, Suite LL30, Sacramento, CA 95821.

Sincerely,

for Handwritten signature of Meegan G. Nagy in cursive script.

Meegan G. Nagy, P.E.
Chief, Flood Protection and Navigation Section

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
 Transportation Laboratory
 5900 Folsom Boulevard
 Sacramento, California 95819-4612



METHOD OF TEST FOR RELATIVE COMPACTION OF UNTREATED AND TREATED SOILS AND AGGREGATES

CAUTION: Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read "**SAFETY AND HEALTH**" in Section K of this method. It is the responsibility of the user of this method to consult and use departmental safety and health practices and determine the applicability of regulatory limitations before any testing is performed.

A. GENERAL SCOPE

This method of test shall be used to determine the relative compaction of untreated and treated soils and aggregates.

Relative compaction in this method is defined as the ratio of the in-place wet density of a soil or aggregate to the test maximum wet density of the same soil or aggregate when compacted by a specific test method.

The in-place, wet density shall be determined in accordance with Part 1 of this method of test.

The laboratory test maximum wet density and percent relative compaction shall be determined in accordance with Part 2 of this method of test.

PART 1. IN-PLACE WET DENSITY

A. SCOPE

The principal use of the in-place wet density value is in the relative compaction control of earthwork construction; however, the identical procedure and apparatus are also employed to obtain data for volume-to-weight conversion factors and shrinkage or swell factors. The determination of the in-place wet density requires excavating and weighing

a sample of soil from the area under investigation, measuring the volume of the sample excavation by back-filling with a calibrated test sand, and calculating the unit wet weight of the excavated sample.

B. TEST PROCEDURE

This test shall be done in accordance with AASHTO T 191, "Density of Soil In-Place by the Sand-Cone Method."

NOTE: Typically, the test hole excavation alone will not provide a sufficient volume of material required for completion of Part 2 of this test method. Therefore, it is necessary to obtain a bulk sample of soil immediately adjacent to the excavated test hole following the completion of the sand volume measurement.

C. RECORDING DATA

The block headed "Sand Volume Data" on the Relative Compaction Test Worksheet provides for the data accumulated at the in-place test hole site.

PART 2. LABORATORY COMPACTED TEST MAXIMUM WET DENSITY AND PERCENT RELATIVE COMPACTION

A. SCOPE

A bulk sample of soil is divided into smaller portions. These portions are prepared with varying moisture contents

**California Test 216
October 2006**

to form test specimens, which are individually compacted by a uniform compactive effort, to determine the test maximum density for the particular soil under consideration.

NOTE: The test maximum density determination and percent relative compaction for Class A CTB is determined according to California Test 312.

B. APPARATUS

1. The standard California impact compaction test apparatus consisting of a split cylindrical mold, a 10.0 lb tamper, a metal piston, and a piston-handling rod, as illustrated in Attachment 1. (Note: see CTM 110 for calibration.)
2. A concrete base block, or an equally rigid body, approximately 1 cubic foot in size.
3. A balance or scale of at least 3 kg capacity and sensitive to 1 g.
4. Miscellaneous mixing bowls, spoons and spatulas, five moisture-sealed containers (approximately 1 gallon capacity) to be used to store each specimen and five moisture-sealed containers (approximately 1/4 gallon capacity) to be used to store each portion of a specimen.

C. BULK SAMPLE

Obtain a bulk sample of soil, 35 lbs minimum in weight, at the site of the in-place density test hole. It is essential that the bulk sample be preserved at the same moisture as prevailed at the time of excavation for the duration of the test. Use only moisture-proof containers and protect from high temperatures.

D. PREPARATION OF TEST SPECIMENS

1. Separate the bulk sample on the 3/4-inch sieve, and weigh both the retained and passing fractions and compute the percentage retained in

terms of wet weight of the total bulk sample. If 10 % or more of the total weight is retained on 3/4-inch sieve, follow the test procedure set forth in Section I of this Part 2. If the retained 3/4-inch fraction comprises less than 10 % by weight of the total bulk sample, discard it and divide the passing 3/4-inch fraction into representative test specimens of exactly equal weight, each sufficient in amount to form a compacted test specimen of 10 to 12 inches in height when compacted as specified in the following section E.

2. It is of the utmost importance that all of the bulk sample material be thoroughly mixed. Each test specimen must be representative of the mass, be of equal weight, be weighed in immediate succession, and be placed at once in the one-gallon moisture-sealed individual containers.
3. The correct weight for each test specimen will depend on the soil type and the moisture content; 2200 to 2700 grams wet weight is the usual range of weight.
4. Record the initial weight of the individual test specimens on line "I" of the Relative Compaction Test Worksheet.

E. COMPACTION OF TEST SPECIMENS

1. Divide one of the test specimens prepared as outlined in the foregoing Section D into five approximately equal portions by either weight or volume measurement, and store in separate 1/4-gallon moisture-sealed containers. Place one portion in the test mold and compact it with 20 blows of the tamper dropping free from a height of 18 inches above the surface of the material in the mold. Repeat this operation for each of the remaining four portions. After the compaction of the fifth portion, place the piston in the mold and level the top of the compacted specimen with five blows of the tamper dropping free

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October 2006**

- from a height of 18 inches above the surface of the piston.
2. With the tamper foot resting on the piston atop the compacted test specimen, read the graduated tamper shaft to the nearest graduation at a point level with the top of the mold. Enter this value on line "J."
 3. Obtain the adjusted wet density in grams per cubic centimeter from Table 1 corresponding to the tamper shaft graduation reading using the column corresponding to the initial wet weight of test specimen (line "I") and record it on line "K."
 4. Save the specimen temporarily for possible later use. (See the first paragraph of Section G of this Part 2).
 5. Adjust the moisture contents of the remaining test specimens to satisfy the following conditions:
 - a. The object is to have at least one test specimen with a moisture content below test optimum, one close to optimum and one above optimum, at about 2 % moisture content increments, with a minimum of three test specimens. While the actual moisture contents will not be known, the moisture content of the test specimen with the highest adjusted wet density is the test optimum moisture content even though the moisture content is unknown. Therefore, the primary objective is to have a number of test specimens and a range of moisture contents such that at least one specimen will be compacted at a moisture content less than, and one at a moisture content greater than, the moisture content of the specimen having the highest adjusted wet density. If this condition cannot be satisfied with the minimum three test specimens it will be necessary to fabricate additional specimens.
 - b. The first test specimen is generally compacted at the moisture content present in the bulk sample. If this specimen appears to be considerably drier than the optimum, mix additional water into each of the remaining specimens. If it appears to be definitely wetter than the optimum, reduce the moisture content of the other specimens by aeration. Partial oven drying may be used, but do not completely oven-dry the specimens and then remix with water. If it appears to be close to the optimum, increase the moisture content of one of the remaining test specimens and reduce it in the other one to bracket the initial specimen thought to be at optimum.
 - c. The test optimum moisture content will usually be the minimum moisture content which will ball the soil readily when compressed into a roll by the grip of the hand, but still permit the roll to be broken without crumbling or pulverizing appreciably at the breaking point.
 - d. The base plate of the test mold normally shows indications of dampness when a soil is compacted at the test optimum moisture content. Free water on the base plate definitely denotes excessive moisture content. A dry, dusty base plate signifies a deficiency of water.
 6. After adjustment of the moisture content, compact each of the remaining test specimens in the mold, then record the water adjustment, tamper reading and the corresponding adjusted wet density from the chart on Table 1 using the column corresponding to the initial wet weight (line "I").
 7. Regardless of the soil type or particle sizes involved, fresh soil (not soil

from previously compacted specimens) must be used in the compaction of each test specimen. The compactive effort being equal for each layer, it is also important that the thickness of layers be equal to assure uniformity of compaction between test specimens.

8. Throughout the compacting operation the test mold must stand either on the standard concrete base block or on an equally rigid body.
9. In reassembling the test mold after removing a core, the wing nut should be drawn up only finger tight. The purpose of the wrench is to release the wing nuts when locked by expansive soils in the mold. Excessive tightening of the nuts distorts the circular cross-section of the mold. In gauging the 18-inch height of fall for the tamper, the hook and rod arrangement, shown in Attachment 1, should be used.

F. COMPUTATION OF RELATIVE COMPACTION

Compute the percent relative compaction to the nearest 0.1 % by the formula:

$$\% \text{ Relative Compaction} = (D_1/D_2) \times 100$$

Where:

- D_1 = In-place wet density as shown on line "H."
- D_2 = Highest adjusted wet density as determined by this method.

For reporting and specification compliance purposes, show the percent relative compaction as a whole number. If the computed value ends in a number with a fractional portion of 0.5 % or greater, report the relative compaction as the next higher whole number. If the computed value ends in a number with a fractional portion of less than 0.5 %, report it without changing the whole number.

Attachment 3 presents an example of a properly completed Relative Compaction Test Worksheet.

G. MOISTURE CONTENTS

The moisture content of the specimen with the highest adjusted wet density is the optimum moisture. The moisture content of the specimen compacted without addition or reduction of water will represent the in-place moisture content of the soil at the test site. If either moisture content is desired, the determination is made in accordance with California Test 226. Once the moisture contents are determined, percent relative compaction can also be determined by relating dry in-place density to dry test maximum density.

Provision is made at the bottom of the Relative Compaction Test Worksheet for determination of the Moisture Adjustment for Aggregate Base Pay Quantities, if desired.

H. MOISTURE-DENSITY CURVE

A moisture-density curve may be formed by plotting the adjusted wet density versus change in grams of water added or subtracted in adjusting the moisture contents of the test specimens. The sample curve appearing on Attachment 3 was plotted from the data presented on line "K" and the "Water Adjustment" line.

The highest point on the curve represents the maximum density, in this instance 2.14 at 0 grams of water ("0 grams" thus means in-place moisture content at test site is optimum moisture).

I. CORRECTION FOR OVERSIZE MATERIAL

1. The diameter of the test mold limits the size of particles that may be included in the test to that passing $\frac{3}{4}$ -inch sieve. In those instances where the original material from which the test specimens are obtained contains 10 % or more by weight of particles retained on the $\frac{3}{4}$ -inch sieve,

a correction must be applied to the test.

The density correction is calculated by the following:

$$\text{Corrected Density} = \frac{100}{\frac{\% -3/4 \text{ inch}}{G_1} + \frac{\% +3/4 \text{ inch}}{YG_2}}$$

- G₁ = Specific gravity of - 3/4 inch material
- G₂ = Specific gravity of +3/4 inch material
- Y = Coefficient for +3/4 inch aggregate

% +3/4 inch	Y
20 or less	1.00
21-25	0.99
26-30	0.98
31-35	0.97
36-40	0.96
41-45	0.95
46-50	0.94

2. Record the total weight of bulk sample on line "L."
3. Separate the bulk sample on the 3/4-inch sieve, wash the retained 3/4-inch material, remove excess surface water by rolling sample in a large, absorbent cloth. Weigh in air and record on line "M."
1. Weigh the retained 3/4-inch fraction in water and record on line "N."
5. The impact test is performed on the passing 3/4-inch fraction as outlined in Sections C through E of this Part 2.
6. The remainder of the calculations necessary to compensate for the retained 3/4-inch material and to determine percent relative compaction is shown on lines "O" through "V."
7. When a number of tests on soil containing essentially the same nature of retained 3/4-inch material are anticipated, a constant may be developed to minimize the weighing in air and water operations.

J. SIMPLIFICATIONS FOR CONSTRUCTION CONTROL

Construction control by wet density tests may be expedited. If the relative compaction based on any test specimen density is below the specified minimum it may be immediately reported that the area under test has failed to meet the specifications. It is not necessary to fabricate additional test cores for the reason that if a higher wet density was reached with subsequent test cores the relative compaction based on this higher density would be still lower than that indicated by the single core. When the relative compaction indicated by a single test core is more than the minimum specified, additional cores are necessary to be certain that any increase in wet test maximum density attained with the subsequent cores does not lower the relative compaction value to below the specification minimum.

K. SAFETY AND HEALTH

Prior to handling, testing or disposing of any waste material, testers are required to read Part A, (Section 5.0), Part B, (Section 5.0, 6.0, 10), and Part C, (Section 1.0) of Caltrans Laboratory Safety Manual.

REFERENCES

California Tests 231, 312, 226 and 110
ASTM D 1556

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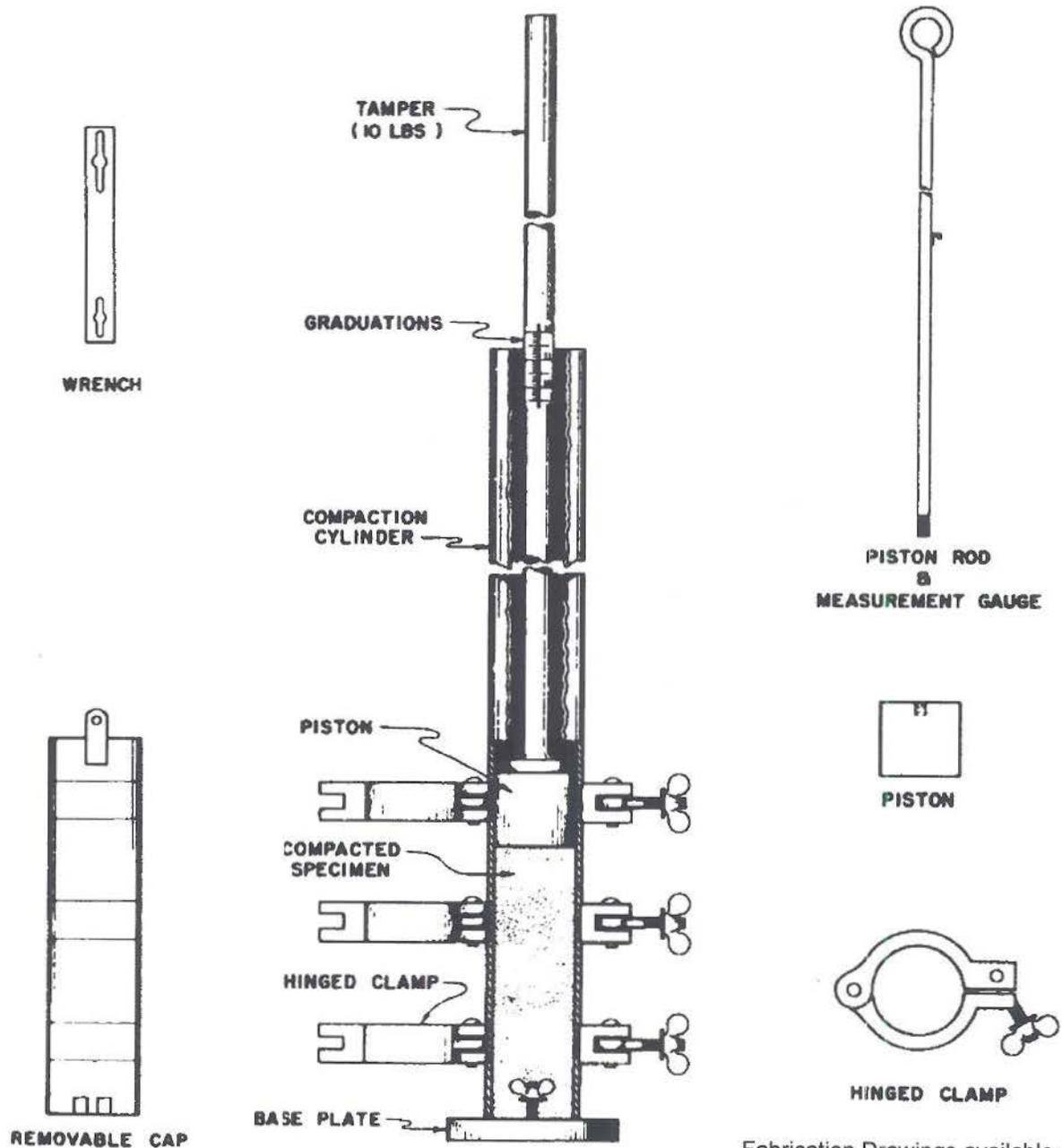
(California Test 216 contains 9 pages)

TABLE 1
CALIFORNIA IMPACT TEST APPARATUS CONVERSION TABLE

Tampers Reading to Grams per Cubic Centimeter for Impact Test Core Weights

Tampers Reading	Weight of Test Core (g)										
	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700
10	2.09	2.13	2.18	2.23	2.27	2.32	2.37	2.42	2.46	2.51	2.56
10.1	2.06	2.11	2.16	2.21	2.25	2.30	2.35	2.39	2.44	2.49	2.53
10.2	2.04	2.09	2.14	2.18	2.23	2.28	2.32	2.37	2.42	2.46	2.51
10.3	2.02	2.07	2.12	2.16	2.21	2.25	2.30	2.35	2.39	2.44	2.48
10.4	2.01	2.05	2.10	2.14	2.19	2.23	2.28	2.32	2.37	2.42	2.46
10.5	1.99	2.03	2.08	2.12	2.17	2.21	2.26	2.30	2.35	2.39	2.44
10.6	1.97	2.01	2.06	2.10	2.15	2.19	2.24	2.28	2.33	2.37	2.41
10.7	1.95	1.99	2.04	2.08	2.13	2.17	2.21	2.26	2.30	2.35	2.39
10.8	1.93	1.97	2.02	2.06	2.11	2.15	2.19	2.24	2.28	2.33	2.37
10.9	1.91	1.96	2.00	2.04	2.09	2.13	2.17	2.22	2.26	2.30	2.35
11	1.90	1.94	1.98	2.03	2.07	2.11	2.15	2.20	2.24	2.28	2.33
11.1	1.88	1.92	1.96	2.01	2.05	2.09	2.13	2.18	2.22	2.26	2.31
11.2	1.86	1.90	1.95	1.99	2.03	2.07	2.12	2.16	2.20	2.24	2.29
11.3	1.85	1.89	1.93	1.97	2.01	2.06	2.10	2.14	2.18	2.22	2.26
11.4	1.83	1.87	1.91	1.95	2.00	2.04	2.08	2.12	2.16	2.20	2.25
11.5	1.81	1.85	1.90	1.94	1.98	2.02	2.06	2.10	2.14	2.18	2.23
11.6	1.80	1.84	1.88	1.92	1.96	2.00	2.04	2.08	2.12	2.17	2.21
11.7	1.78	1.82	1.86	1.90	1.94	1.98	2.03	2.07	2.11	2.15	2.19
11.8	1.77	1.81	1.85	1.89	1.93	1.97	2.01	2.05	2.09	2.13	2.17
11.9	1.75	1.79	1.83	1.87	1.91	1.95	1.99	2.03	2.07	2.11	2.15
12	1.74	1.78	1.82	1.86	1.90	1.94	1.97	2.01	2.05	2.09	2.13

CALIFORNIA IMPACT COMPACTION APPARATUS



Fabrication Drawings available at:

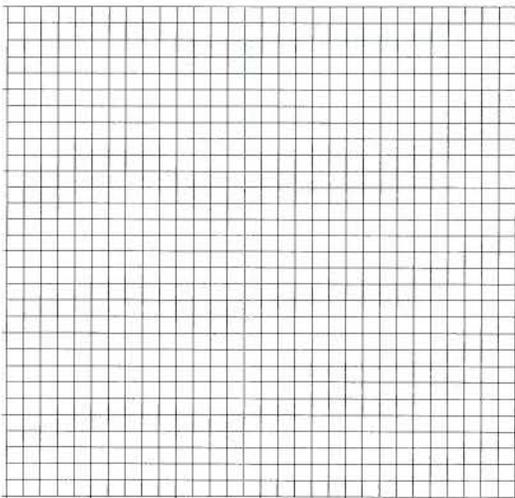
Transportation Laboratory
5900 Folsom Blvd
Sacramento, CA 95819
916-227-7000

ATTACHMENT 1

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

RELATIVE COMPACTION TEST

TL-297 (REV 10/2005)

Job Stamp		Location		Test No.										
		Material		From										
		Impact by		Sand Vol. By										
		Date		Date										
SAND VOLUME DATA			Remarks:											
A	Initial Wt. of Sand (g)													
B	Wt. of Residue (g)													
C	Wt. of Sand Used (A-B)													
D	Cone Correction (g)		IMPACT TEST DATA											
E	Wt. of Sand in Hole (C-D)		I	Initial Wet Weight of Test Specimen (g)										
F	Sand Density (g/cc)			Increment	1	2	3	4						
G	Volume of Hole (E/F)			Water Adjustment (g)										
H	Wet Density (g/cc) (L/G)		J	Tamper Reading										
			K	Adjusted Wet Density (g/cc)										
ROCK CORRECTION			<div style="display: flex; align-items: center; justify-content: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; margin-right: 5px;">Adjusted Wet Density (g/cc)</div>  </div>											
L	Total Sample Weight	(g)												
M	+ 3/4-inch Weight in Air	(g)												
N	+3/4-inch Weight in Water	(g)												
O	+3/4-inch Volume	(M - N)												
P	% +3/4-inch	100 * (M / L)												
Q	% -3/4-inch	100 - P												
R	Density of +3/4-inch	(M / O)												
S	(%+3/4-inch) / Density of +3/4-inch	(P / RY)												
T	(%-3/4-inch) / Density of -3/4-inch	(Q / K)												
U	Sum of S and T	(S + T)												
V	Average Adjusted Wet Density	(100 / U)												
Percent Relative Compaction*		Spec							Failed	or less				
									Passed					
*(H / K) for 10% or less +3/4-inch; (H / V) for > 10% +3/4-inch														
MOISTURE ADJUSTMENT FOR AGGREGATE BASE PAY QUANTITY					+ 3/4-inch Aggregate Adjustment (Y)									
a	In-place Wet wt.		e	Test Spec. Wet Wt. (opt.)		<u>% + 3/4-inch (P)</u> <u>Adjustment</u>								
b	In-place Dry wt.		f	Test Spec. Dry Wt.		20 or less.....	1.00							
c	In-place Water (a - b)		g	Test Spec. Water (e - f)		21-25.....	0.99							
d	In-place % Water (c / b)		h	Test Spec. % Water (g / f)		26-30.....	0.98							
Moisture Corr. (h + 1%) - d =						31-35.....	0.97							
Moisture Corr. in excess of Opt. + 1%					% Moisture by CTM 226	36-40.....	0.96							
						41-45.....	0.95							
						46-50.....	0.94							

ATTACHMENT 2

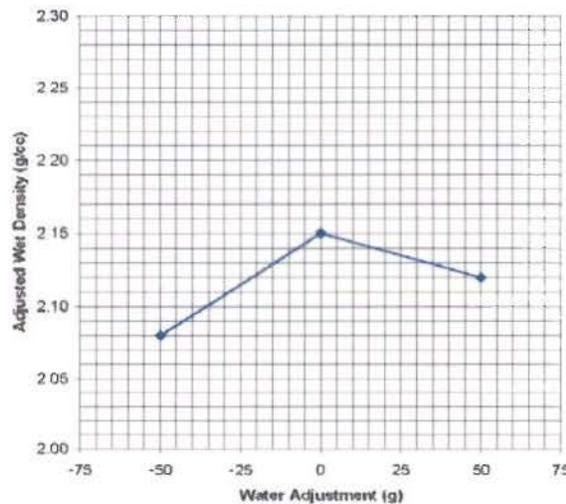
California Test 216
October 2006

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION
RELATIVE COMPACTION TEST
TL-297 (REV 10/2005)

Job Stamp	Location	Test No.
	Material	From
	Impact by	Sand Vol By
	Date	Date

SAND VOLUME DATA			IMPACT TEST DATA					
A	Initial Wt. of Sand (g)	11250	Remarks:					
B	Wt of Residue (g)	1429						
C	Wt of Sand Used (A-B)	9821						
D	Cone Correction (g)	1641						
E	Wt. of Sand in Hole (C-D)	8180	I	Initial Wet Weight of Test Specimen (g)	2500			
F	Sand Density (g/cc)	1.55		Increment	1	2	3	4
G	Volume of Hole (cc) (E/F)	5277		Water Adjustment (g)	-50	0	50	
H	Wet Density (g/cc) (L/G)	2.06	J	Tamper Reading	11.4	11.0	11.2	
			K	Adjusted Wet Density (g/cc)	2.08	2.15	2.12	

ROCK CORRECTION		
L	Total Sample Weight (g)	10865
M	+3/4-inch Weight in Air (g)	3568
N	+3/4-inch Weight in Water (g)	2322
O	+3/4-inch Volume (M - N)	1246
P	% +3/4-inch 100 * (M / L)	32.8
Q	% -3/4-inch 100 - P	67.2
R	Density of +3/4-inch (M / O)	2.86
S	(%+3/4-inch) / Density of +3/4-inch (P / R)	11.8
T	(%-3/4-inch) / Density of -3/4-inch (Q / K)	31.3
U	Sum of S and T (S + T)	43.1
V	Average Adjusted Wet Density (100 / U)	2.32



Percent Relative Compaction*	Spec	Failed	89	or less
	90	Passed		

* (H / K) for 10% or less +3/4-inch; (H / V) for > 10% +3/4-inch

MOISTURE ADJUSTMENT FOR AGGREGATE BASE PAY QUANTITY				+ 3/4-inch Aggregate Adjustment (Y)	
a	In-place Wet wt	e	Test Spec. Wet Wt (opt.)	% + 3/4-inch (P)	Adjustment
b	In-place Dry wt	f	Test Spec. Dry Wt	20 or less.....	1.00
c	In-place Water (a - b)	g	Test Spec. Water (e - f)	21-25.....	0.99
d	In-place % Water (c / b)	h	Test Spec. % Water (g / f)	26-30.....	0.98
Moisture Corr. (h + 1%) - d =				31-35.....	0.97
Moisture Corr. in excess of Opt. + 1%				36-40.....	0.96
% Moisture by CTM 226				41-45.....	0.95
				46-50.....	0.94

ATTACHMENT 3

DEPARTMENT OF TRANSPORTATION
ENGINEERING SERVICE CENTER
 Office of Materials Engineering and Testing Services
 5900 Folsom Blvd.
 Sacramento, California 95819-4612



METHOD OF TEST FOR RELATIVE COMPACTION OF UNTREATED AND TREATED SOILS AND AGGREGATES BY THE AREA CONCEPT UTILIZING NUCLEAR GAGES

CAUTION: Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read **“SAFETY AND HEALTH”** in Part III of this method. It is the responsibility of whoever uses this method to consult and use departmental safety and health practices and determine the applicability of regulatory limitations before any testing is performed.

OVERVIEW

This test method provides a procedure for selecting a test area, for determining the in-place wet density and moisture of untreated and treated soils and aggregates by the use of a nuclear gage, and for determining relative compaction. Wet density measurements are made in the direct transmission position where the rod is placed into the ground.

Select a direct transmission depth as close as possible to, but not equal to or greater than, the thickness of material being tested, i.e., use a 75 mm direct transmission depth and corresponding calibration to test a layer of material 100 mm thick, and use a 125 mm direct transmission depth and corresponding calibration to test a layer of material 150 mm thick.

The laboratory wet test maximum density shall be determined as specified in California Test 312 for Class A Cement Treated Base; and as specified in California Test 216 for untreated materials, Class B cement treated base and lime treated soils and aggregates. On the basis of specified acceptance criteria, the relative compaction values are then used to determine the compliance or noncompliance of compaction specifications within the designated area. All calculations are based on wet relationships and are made in the metric system.

NOTE: See California Test 121 of the Manual of Test, Administrative Instructions, regarding use of nuclear gages.

This test method (231) is divided into the following parts:

- I. Method of field determination of in-place wet density and moisture.
- II. Method of applying the area concept and determining percent relative compaction.
- III. Safety and Health

PART I. METHOD OF FIELD DETERMINATION OF IN-PLACE WET DENSITY AND MOISTURE

A. APPARATUS

1. Nuclear gage and standardizing block.
2. Miscellaneous tools such as trowels, scrapers, sieve, etc. for site preparation.
3. Guide plate, approximately 300 x 460 x 6 mm.
4. Pin, approximately 20 mm diameter x 600 mm long.

B. STANDARDIZATION OF NUCLEAR GAGE FOR WET DENSITY AND MOISTURE

1. Set the standardizing block 1.5 m from any object and 8 m from any other nuclear gage. Place the gage on the standardizing block in the closed (safe) position and take four (4) 1-min density counts. Repeat the four 1-min counts for moisture in the safe position. Record on Form TL 2148 (Figure 1) and in the gage logbook. When the nuclear gage is equipped with electronic circuitry capable of automatically averaging four one-minute density and moisture standard counts simultaneously, place the gage on the standardizing block in the closed (safe) position and take the average of the four one-minute counts. Record the density and moisture standard count averages on Form TL 2148 and in the gage logbook. For additional gage operation information not covered in this paragraph, follow instructions given in the manufacturer's manual.
2. The average of the four one-minute counts determined in C.1 is to be within \pm ADL (see note) of the value used to establish the calibration table.

If it is not, contact the Radiation Safety Officer who will establish a new standard count or have the gage sent in to be checked and/or repaired. Perform the standard count *at least* once during every 8 h of operation.

NOTE: The acceptable deviation limit (ADL) is defined in this test method as $ADL = \sqrt{n}$ where n = number of counts indicated on the gage. This relationship is valid when the number of counts is over 10,000. Table I shows values of ADL for various counts.

C. SITE PREPARATION

1. Remove all loose surface material and prepare a plane surface large enough to seat the gage. Where sheepsfoot and similar type tamping rollers have been used, remove the loose surface material to a depth of not less than 50 mm below the deepest penetration by the roller. After the surface has been prepared to a flatness and smoothness within 3 mm, use a No. 4 (4.7 mm) or smaller sieve to obtain native fines to fill minor depressions, protrusions or to correct slight

lack of plane. Tamp fines and any loosened material with the guide plate.

2. Make a hole using the pin and guide plate. Extract the pin with a pin puller. A drill may be used in lieu of the pin. The depth of hole shall be 50 mm greater than the transmission depth being used. This hole must be as close as possible to 90 degrees from the plane surface. If the plate is rotated slightly around the pin and the plate does not make contact with the ground, or if it appears that the hole is crooked, make a new hole.

D. FIELD TEST FOR DENSITY DETERMINATION

1. Place the nuclear gage on the prepared surface so that the bottom of the gage is firmly seated in contact with the soil. Insert the rod into the hole to the predetermined depth. Adjust the gage so that the rod is firmly against the side of the hole that is nearest to the gage.

Obtain a 1-min reading. Record the data as shown on Figure 1.

2. Average counts from all test sites and determine count ratio by dividing the average field count by the average standard count.
3. Find the average count ratio and corresponding direct transmission average wet density (kg/m³) on the table supplied with the gage (Example Table 2). Record the data on Figure 1.

NOTE: No obstruction or foreign element should be within a distance of 200 mm on both sides of the *source-detector axis*. Density calibration tables for the various depths are determined in accordance with California Test 111.

E. FIELD TEST FOR MOISTURE

This test is used for cases where moistures are desired or when common composite test maximum densities are used (Part II, F).

1. Obtain a standard count for moisture as specified in Section C of this Part I.
2. For site preparation, use procedure in Section D.1 of this Part I.

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3. Place the gage on the prepared surface and take a 1-min moisture count. Record the data on Figure 1.
4. Determine a count ratio by dividing the field count by the moisture standard count.
5. Find the count ratio and corresponding moisture (kg/m³) from the table supplied with the gage (Example Table 3)

NOTE: No obstruction or foreign element should be within a distance of 250 mm *from the side of the gage*. Moisture calibration tables are determined in accordance with California Test 111.

PART II. METHOD OF APPLYING THE AREA CONCEPT AND DETERMINING PERCENT RELATIVE COMPACTION

A. SCOPE

This is a statistical procedure where a number of test measurements are taken to evaluate the state of compaction of a selected area.

B. NUMBER AND LOCATION OF NUCLEAR TESTS

1. The area concept will be used with this test. The engineer will determine from a series of density tests whether to accept or reject a designated area. The engineer shall determine the area by inspection, based on uniformity of factors affecting compaction. Insofar as possible, the area designated shall be generally homogeneous for both character of material and conditions of production and compaction. Portions of the area, which may be observed or suspected to be different from the area as a whole, will be excluded from the test. If a relative compaction test is desired for these different portions, they shall be designated as a separate test area or areas and tested separately. Do not designate test areas which include: (1) materials from separate sources, unless such materials were intermixed during placing of the compacted area; (2) materials which were placed and compacted by different types of operations or processes; or (3) material placed during different periods of production or in nonadjacent areas.

2. Select a *minimum* of 5 test sites for areas 800 m² or more by using a set of 10 random sample plans (Figure 3). Follow instructions given in Figure 3.

Obtain nuclear counts at all test sites and average all counts for the area (Figure 1). If the designated test area, described in B.1, is of limited size (e.g., structure backfill, short length of shoulders, or other areas less than 800 m²) then a *minimum* of three test sites are required.

C. DETERMINATION OF WET TEST MAXIMUM DENSITY

1. For all treated and untreated soils and aggregates, except Class A Cement Treated Bases, obtain equal representative portions of material from each nuclear test site within the area and thoroughly mix together to form a composite sample. Determine the laboratory wet test maximum density (kg/m³) on the composite sample in accordance with California Test 216. Record the data on Form TL 2148 in the section identified as "IMPACT TEST DATA" (Figure 1). *The moisture content of the composite sample must be maintained in the same state as when the in-place tests were performed.* If the impact test result is to be used in a "common" composite control density, a nuclear moisture, as well as a nuclear density must be taken for each test site in an area and be averaged.

D. CORRECTION FOR OVERSIZE MATERIAL

1. A correction is applied to the composite wet test maximum density in those instances where the composite sample contains more than 10% by weight of aggregate retained on the 19 mm sieve. The data is recorded on Figure 2 in the section titled "SAMPLE FOR ROCK CORRECTION". California Test 216 shows details for handling rock corrections.

E. PERCENT RELATIVE COMPACTION

1. Calculate percent relative compaction as follows:

Percent relative compaction = [(Average In-Place Wet Density)/(Composite Wet Test Maximum Density)] x 100

2. The calculations for cases where there is 10% or less of +19 mm aggregate is shown on

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Figure 1. Note that gage readings for the individual sites are averaged and a mean percent relative compaction calculated for the area.

3. The calculations for cases where there is more than 10% of +19 mm aggregate is shown in Figure 1.
4. The average relative compaction of the test sites in an area must be at or above the specified minimum compaction density for acceptance of the compaction in the area. The percent relative compaction value is calculated to the nearest 0.1% and then reported as a whole number. For rounding the average percent relative compaction value (Test Result), if the computed value ends in a number with a fractional portion 0.5 or greater, report as the next higher whole number. If the computed value ends in a number with fractional portion less than 0.5, report without changing the whole number.

Example:

Computed Value	Reporting Value
94.5 to 95.0%	95%
95.0 to 95.4%	

F. WET COMMON-COMPOSITE TEST MAXIMUM VALUE

1. In many cases where the material is the "same", it is permissible to use a "common" wet composite test maximum density for use in different areas in lieu of that specified in Section C.1 of this Part II. For a material to be the same, it must comply with the following general criteria:
 - a. It must be from the same general source (excavation area, balance point, plant, etc.).
 - b. It must generally have the same visual characteristics of color, gradation, and type of soil.
 - c. The average in-place moistures must be the "same". Adjustments in moisture are to be made to meet this criteria when "common" wet composite test maximum values are used.

2. A "common" wet composite test maximum density is initially established by averaging two consecutive wet composite test maximum densities which are within 50 kg/m³ density and performed within three days. The average moistures between the areas represented by the two consecutive wet composite test maximum values must also be within 50 kg/m³.
3. Anytime that a wet composite test maximum density is determined for an area, it shall be used to calculate the percent relative compaction for that area.
4. A "check" wet composite test maximum must be performed at *least* every 7th calendar day or after the "common" wet composite test maximum density has been used for 14 areas, whichever comes first.
 - a. If the "check" test is within 50 kg/m³ moisture and density of the "common" density, the two values are averaged to establish a new "common" density and average moisture. If it is not, wet composite test maximum densities must be performed for each compaction test area until the criteria for F-2 of this PART II are met.
5. If average relative moistures between areas differ and a common composite test maximum is to be established, a correction is applied. The following example illustrates use of a common composite test maximum with moisture corrections. Anytime the engineer judges conditions have changed, a new common composite test maximum should be established. An example where a common composite test maximum is used is shown in Figure 2.

PART III. SAFETY AND HEALTH

Personnel are required to be trained by a qualified instructor approved by the California Department of Health and the Divisions of Industrial Safety.

Caltrans personnel are required to read and be familiar with California Test 121, Administrative Instructions for Use of Nuclear Gages. Caltrans personnel are required to wear a film badge.

This method does not purport to address all the safety problems associated with its use.

REFERENCES:

California Tests 121, 216, 312, and 911

End of Text (14 Pages) on California Test 231

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Example:	Area I	Area II	Area III	Area IV	Area V	Area VI
Date.....	4-18-96	4-19-96	4-20-96	4-21-96	4-25-96	4-26-96
Average In-Place Wet Density, kg/m ³	2040	2150	2060	2080	2120	2110
Average In-Place Moisture, kg/m ³	90	110	140	80	130	100
Wet Composite Test Maximum Density, kg/m ³	2150	2200	-	-	2160	-
Common Composite Wet Test Maximum Density, kg/m ³	-	-	2175	2175	-	2168
(Average Moisture, kg/m ³).....	-	-	(100)	(100)	-	(115)
Moisture Correction, kg/m ³	-	-	-40	+20	-	+15

a. Area I

$$\% \text{ Relative Compaction} = \frac{2040}{2150} \times 100 = 95\%$$

b. Area II

$$\% \text{ Relative Compaction} = \frac{2150}{2200} \times 100 = 98\%$$

c. Area III

$$\text{Moisture Correction} = \left(\frac{90 + 110}{2} \right) - 140 = -40$$

$$\text{Common Composite Test Max} = \frac{2150 + 2200}{2} = 2175$$

$$\% \text{ Relative Compaction} = \frac{2060 - 40}{2175} \times 100 = 93\%$$

See sample forms figures 1 and 2.

State of California		Relative Compaction Test-Nuclear				Dept of Transportation				
Job Stamp		Contract				Test No.				
		Type of Material								
		Material From								
		Impact By				Nuclear By				
		Date				Date				
Show Test Location and Area Limits		Nonbiased Plan No.				Gage No.				
In-Place Test by Nuclear					Impact Test Data					
Site	Den. Ct.	mm	Std. Ct.	Density	J	Initial Wet Weight of Test Specimen (g)				
1						Specimen	1	2	3	4
						Water Adjustment				
2						Tamper Reading				
						K Wet Density				
3						K From Table 1 Test Method 216. Highest Density is Test Max.				
						L (+) 19mm Agg. Adj.	Sample for Rock Correction			
4						F \bar{x}	M Total Sample Wt.	(g)		
						Moist Count	N + 19mm Wt.in Air	(g)		
5						1	O + 19mm Wt. In Water	(g)		
						2	P + 19mm Vol	(N-O)		
6						3	Q % + 19mm	100(N/M)		
						4	R % - 19mm	(100-Q)		
7						5	S Density of + 19mm	(N/P)		
						6	T % + 19mm /Den. Of + 19mm	(Q/SL)		
8						7	U % -19mm /Den. Of - 19mr	(R/K)		
						8	V Sum of T and U	(T+U)		
B	Σ						W Adjusted Density	(100/V)		
C	\bar{x}					G \bar{x}				
CR(C/F)		CR(G/I)								
D	\bar{x} Den. g/ml	H \bar{x} H2O g/ml		Σ						
E	\bar{x} Den. Corr. For Moist.** \pm	I \bar{x}								
**E = D + Diff. Bet. \bar{x} Moist.Fr. Common TM & H										
Percent Relative Compaction		Spec. Individual								
		Moving Ave.								
*E/K for 10% \leq + 19mm				E/W for > 10% + 19mm						
If Common Test Maximum is used (\bar{x}) K or W = \bar{x} H2O=										
From Tests:					Dated:					
Remarks:										
Water Adj. (g)										

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Figure 1

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State of California		Relative Compaction Test-Nuclear		Dept of Transportation	
Job Stamp		Contract		Test No. <u>25</u>	
		Type of Material <u>EMB</u>			
		Material From			
		Impact By <u>FC</u>		Nuclear By <u>BL</u>	
		Date <u>03/30/00</u>		Date <u>03/30/00</u>	
Show Test Location and Area Limits		Nonbiased Plan No. <u>8</u>		Gage No. <u>NE 59</u>	
EXAMPLE ONLY					
In-Place Test by Nuclear			Impact Test Data		
Site	Den. Ct. <u>200</u> mm	Std. Ct. Density	J	Initial Wet Weight of Test Specimen (g) <u>2700</u>	
1	<u>46658</u>	<u>51547</u>		Specimen	1 2 3 4
				Water Adjustment	<u>0 +50 +100</u>
2	<u>44598</u>	<u>51904</u>		Tamper Reading	<u>10.5 10.3 10.4</u>
				Wet Density	<u>2.44 2.48 2.46</u>
3	<u>49747</u>			K From Table 1 Test Method 216. Highest Density is Test Max.	
		<u>Σ 206240</u>	L	Sample for Rock Correction	
A 4	<u>46453</u>	<u>51560</u>		M Total Sample Wt. (g)	<u>14000</u>
				N + 19mm Wt. in Air (g)	<u>2380</u>
5	<u>47741</u>	<u>1</u>		O + 19mm Wt. In Water (g)	<u>1465</u>
				P + 19mm Vol (N-O)	<u>915</u>
6	<u>46380</u>	<u>3</u>		Q % + 19mm 100(N/M)	<u>17.0</u>
				R % - 19mm (100-Q)	<u>83.0</u>
7		<u>5</u>		S Density of + 19mm (N/P)	<u>2.60</u>
				T % + 19mm /Den. Of + 19mm (Q/SL)	<u>6.5</u>
8		<u>7</u>		U % - 19mm /Den. Of - 19mm (R/K)	<u>33.5</u>
				V Sum of T and U (T+U)	<u>40.0</u>
B	<u>Σ 281577</u>	<u>Σ</u>		W Adjusted Density (100/V)	<u>2.50</u>
C	<u>Σ 46930</u>	<u>Σ</u>			
CR(C/F)	<u>910</u>	CR(G/I)			
D	<u>Σ Den g/ml 2.23</u>	H <u>Σ H2O g/ml</u>	<u>Σ</u>		
E	<u>Σ Den. Corr. For Moist</u>	<u>Σ</u>			
**E = D + Diff. Bet. <u>Σ</u> Moist. Fr. Common TM & H					
Percent Relative Compaction	<u>89</u>	Spec. Individual	<u>90</u>		
		Moving Ave.			
*E/K for 10% ≤ + 19mm		E/W for > 10% + 19mm			
If Common Test Maximum is used : <u>Σ</u> K or W = <u>Σ</u> H2O =					
From Tests:		Dated:			
Remarks:					

Figure 2

NONBIASED SAMPLE PLANS

Once an area is selected on the basis of uniformity of factors, nonbiased location of measurement sites is required for applying statistical control procedures. The nonbiased sample location plans will randomly locate the approximate measurement sites.

NOTE: The number of measurement sites must be determined after the area has been determined and *before* any tests performed.

PROCEDURE FOR USE OF NONBIASED SAMPLE PLANS

1. a. Use the last digit from the first reading taken for the daily standard count to select the plan for the first area. For subsequent areas, use the last digit from the second, third, and fourth readings. If five through nine areas are tested, use the second to the last digit from the first through the fourth readings taken for the daily standard count.
- b. For nuclear gages that electronically

average the standard counts — Take a $\frac{1}{4}$ minute count in the safe position at any convenient location, i.e., ground, truck bed, carry case, etc., prior to selecting the plan for an area. Use the last digit of the density reading for selecting the plan. A new count should be taken for each area.

2. Visualize the plan as a map of the area to be sampled.
3. Each dot represents a measurement site. There are ten dots numbered from one (1) through ten (10). If you are to take a five- (5) site test, then use the dots numbered from one (1) through five (5). If a three-site test is going to be used, then use the locations of the first three dots. This procedure will be used for all tests, with Number 1 dot the first site, Number 2 dot the second site and so on until the desired number of sites have been used.
4. Test at the approximate locations on the grade represented by the dots on the plan. Some adjustments are necessary for irregular areas. (See Figure 3)

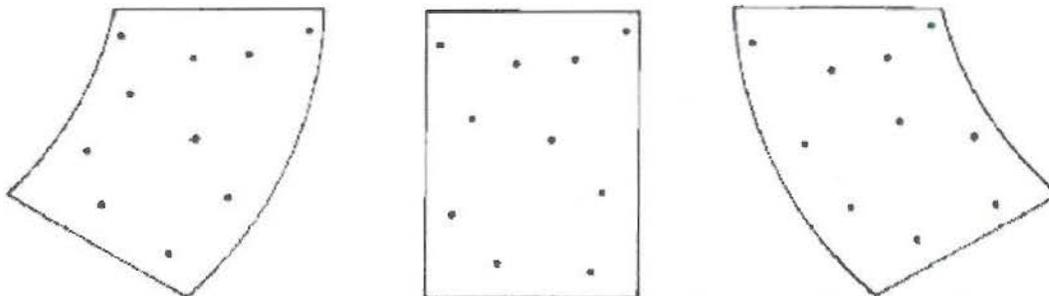
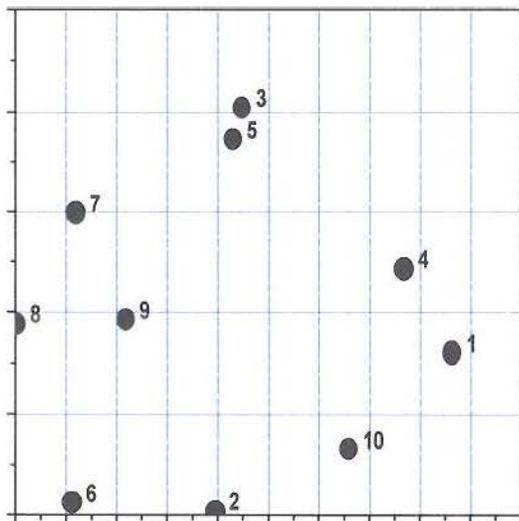


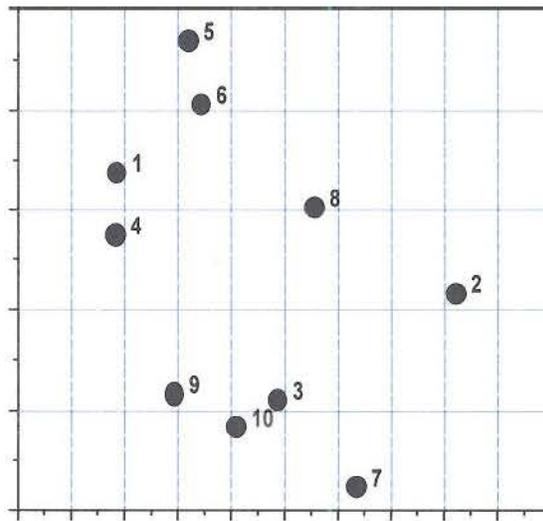
Figure 3

Figure 3 Cont.

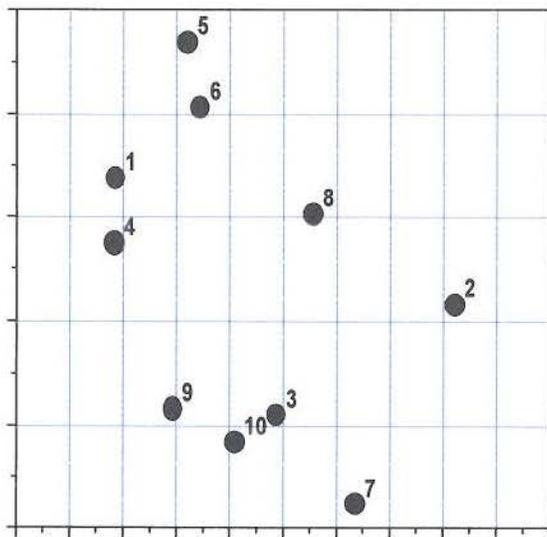
NONBIASED PLAN 1



NONBIASED PLAN 2



NONBIASED PLAN #3



NONBIASED PLAN #4

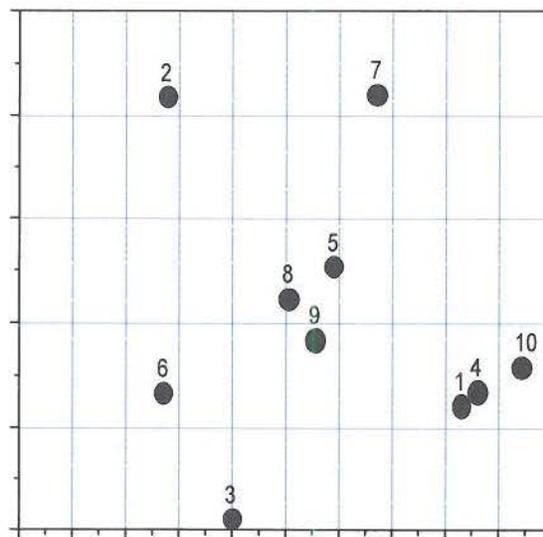
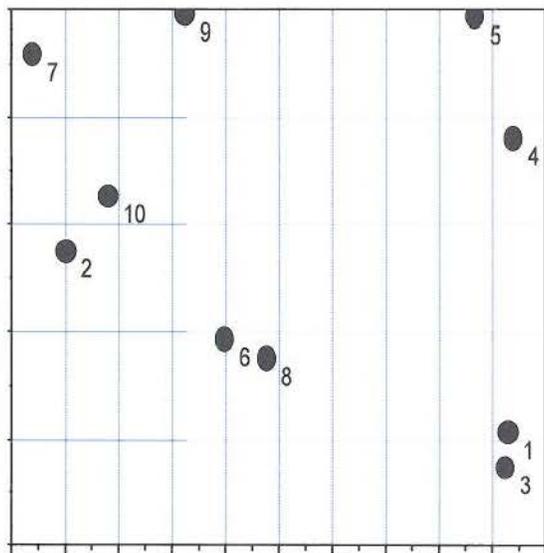
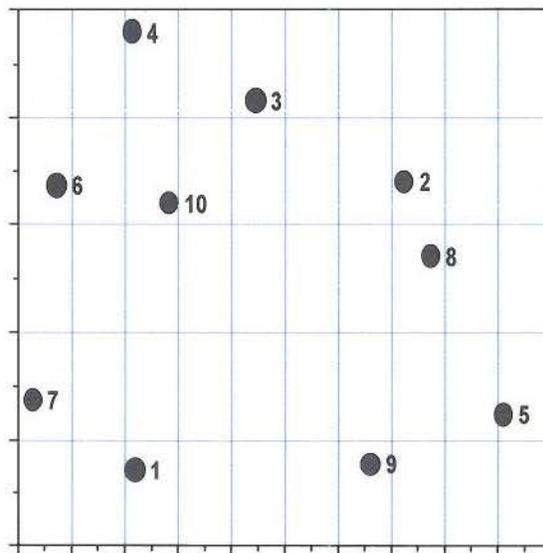


Figure 3 Cont.

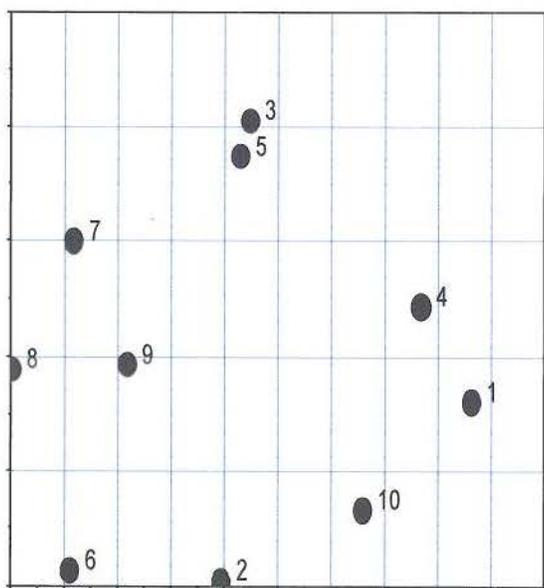
NONBIASED PLAN 5



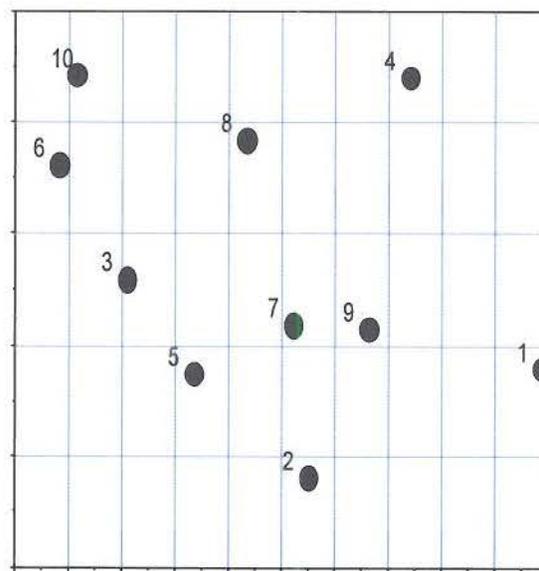
NONBIASED PLAN 6



NONBIASED PLAN #7



NONBIASED PLAN #8



NONBIASED PLAN 9

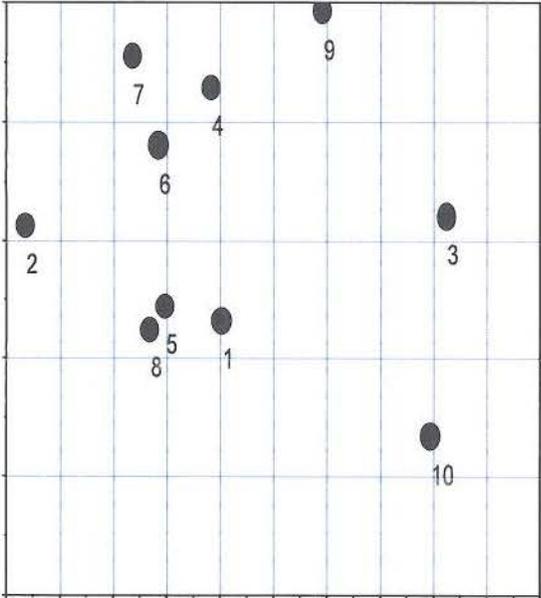


Figure 3 Cont.

NONBIASED PLAN 10

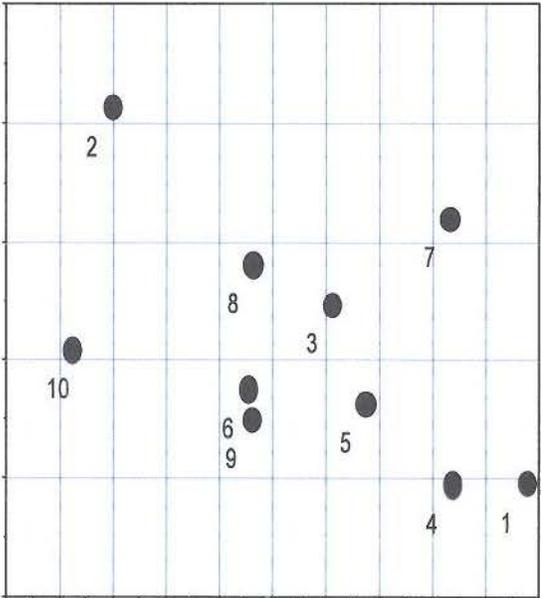


TABLE 2
COUNT RATIO VS. DENSITY FOR NUCLEAR GAGE NO. NE 59

District 19 January 3, 1978 Std. Ct 51500 200 mm D/T By B. Lister
BASED ON: DENSITY (kg/m³) 1532 1636 2018 2153 2680 2771

COUNT RATIO 1.791 1.553 1.192 .933 .597 .542

CR TO CR	kg/m ³	CR TO CR	kg/m ³	CR TO CR	kg/m ³
2.000-2.018	1400	1.364-1.376	1800	.931- .939	2200
1.981-1.999	1410	1.351-1.363	1810	.922- .930	2210
1.962-1.980	1420	1.338-1.350	1820	.913- .921	2220
1.943-1.961	1430	1.326-1.337	1830	.905- .912	2230
1.925-1.942	1440	1.313-1.325	1840	.896- .904	2240
1.907-1.924	1450	1.300-1.312	1850	.887- .895	2250
1.888-1.906	1460	1.288-1.299	1860	.879- .886	2260
1.870-1.887	1470	1.276-1.287	1870	.874- .878	2270
1.853-1.869	1480	1.264-1.275	1880	.862- .870	2280
1.835-1.852	1490	1.252-1.263	1890	.854- .861	2290
1.817-1.834	1500	1.240-1.251	1900	.846- .853	2300
1.800-1.816	1510	1.228-1.239	1910	.838- .845	2310
1.783-1.799	1520	1.216-1.227	1920	.830- .837	2320
1.766-1.782	1530	1.205-1.215	1930	.822- .829	2330
1.749-1.765	1540	1.193-1.204	1940	.814- .821	2340
1.733-1.748	1550	1.182-1.192	1950	.807- .813	2350
1.716-1.732	1560	1.171-1.181	1960	.799- .806	2360
1.700-1.715	1570	1.160-1.170	1970	.791- .798	2370
1.684-1.699	1580	1.148-1.159	1980	.784- .790	2380
1.667-1.683	1590	1.138-1.147	1990	.776- .783	2390
1.652-1.666	1600	1.127-1.137	2000	.769- .775	2400
1.636-1.651	1610	1.116-1.126	2010	.762- .768	2410
1.620-1.635	1620	1.105-1.115	2020	.755- .761	2420
1.605-1.619	1630	1.095-1.104	2030	.747- .754	2430
1.590-1.604	1640	1.085-1.094	2040	.740- .746	2440
1.574-1.589	1650	1.074-1.084	2050	.733- .739	2450
1.560-1.573	1660	1.064-1.073	2060	.726- .732	2460
1.545-1.559	1670	1.054-1.063	2070	.719- .725	2470
1.530-1.544	1680	1.044-1.053	2080	.713- .718	2480
1.515-1.529	1690	1.034-1.043	2090	.706- .712	2490
1.501-1.514	1700	1.024-1.033	2100	.699- .705	2500
1.487-1.500	1710	1.014-1.023	2110	.692- .698	2510
1.473-1.486	1720	1.005-1.013	2120	.686- .691	2520
1.458-1.472	1730	.995-1.004	2130	.679- .685	2530
1.445-1.457	1740	.986- .994	2140	.673- .678	2540
1.431-1.444	1750	.976- .985	2150	.667- .672	2550
1.417-1.430	1760	.967- .975	2160	.660- .666	2560
1.404-1.416	1770	.958- .966	2170	.654- .659	2570
1.390-1.403	1780	.949- .957	2180	.648- .653	2580
1.377-1.389	1790	.940- .948	2190	.642- .647	2590

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TABLE 3
COUNT RATIO VS DENSITY FOR NUCLEAR GAUGE NO. NE 59

District 19, January 3, 1978, Std. Ct 11400 By B. Lister

		BASED ON kg/m3		0	303		
		COUNT RATIO		.168	.686		
CR TO CR	kg/m3	CR TO CR	kg/m3			CR TO CR	kg/m3
.155- .171	00	.501- .517	200			.847- .863	400
.172- .188	10	.518- .534	210			.864- .880	410
.189- .206	20	.535- .552	220			.881- .897	420
.207- .223	30	.553- .569	230			.898- .915	430
.224- .240	40	.570- .586	240			.916- .932	440
.241- .258	50	.587- .603	250			.933- .949	450
.259- .275	60	.604- .621	260			.950- .967	460
.276- .292	70	.622- .638	270			.968- .984	470
.293- .309	80	.639- .655	280			.985-1.001	480
.310- .327	90	.656- .673	290			1.002-1.018	490
.328- .344	100	.674- .690	300			1.019-1.036	500
.345- .361	110	.691- .707	310			1.037-1.053	510
.362- .379	120	.708- .724	320			1.054-1.070	520
.380- .396	130	.725- .742	330			1.071-1.088	530
.397- .413	140	.743- .759	340			1.089-1.105	540
.414- .431	150	.760- .776	350			1.106-1.122	550
.432- .448	160	.777- .794	360			1.123-1.140	560
.449- .465	170	.795- .811	370			1.141-1.157	570
.466- .482	180	.812- .828	380			1.158-1.174	580
.483- .500	190	.829- .846	390			1.175-1.191	590

AGREEMENTS

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICES

LETTER DATED 5/24/2011



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

NATIONAL MARINE FISHERIES SERVICE

Southwest Region

650 Capitol Mall, Suite 5-100

Sacramento, CA 95814-4700

In response refer to:

2011/01135

MAY 24 2011

Mr. Tom Balkow
Senior Environmental Planner
Department of Transportation
District 2
1657 Riverside Drive
Redding, California 96001

Dear Mr. Balkow:

This letter is in response to your February 10, 2011, request for initiation of section 7 consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), concerning the State Route (SR) 299 Widening and Rehabilitation project located in Shasta County, California. The California Department of Transportation (Caltrans) has determined that the proposed project may affect, but is not likely to adversely affect, threatened Central Valley (CV) steelhead (*Oncorhynchus mykiss*). Critical habitat for this species does not occur within the project limits. In addition, Caltrans has determined that the proposed project may adversely affect the Essential Fish Habitat (EFH) of Pacific salmon, and has requested initiation of consultation pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA). This letter also serves as consultation under the authority of, and in accordance with, the provisions of the Fish and Wildlife Coordination Act of 1934 (FWCA), as amended. NMFS recognizes that Caltrans is acting in conjunction with the Federal Highway Administration (FHWA) for this project and has assumed FHWA's responsibilities under Federal environmental laws as allowed by the Memorandum of Understanding between FHWA and Caltrans, which became effective on July 1, 2007.

The proposed project is located northeast of the city of Redding on SR 299 between post mile (PM) 30.3 and 40.7, from approximately one mile west of the community of Bella Vista to extending eastward to the Diddy Wells fire station. Caltrans is proposing to perform road widening and rehabilitation that will involve ground disturbance, slope excavation, construction of a retaining wall, culvert work, temporary stream diversion, and bridge modification and replacement. There are two specific project locations that are being evaluated for potential affects to downstream salmonids: Yank Creek box culvert and Salt Creek Bridge. The culvert consists of three separate concrete boxes that convey the intermittent flow of Yank Creek. Yank Creek is generally dry from mid-June to mid-November. The culvert has a concrete bottom, wing walls at each of the four corners, and has a short one-foot drop off at the outlet. There is unconsolidated rock slope protection (RSP) at three corners of the culvert. The concrete



abutments also extend into the riparian zone. Caltrans will replace the culvert with a clear-span bridge with a natural stream bottom. This will provide fish passage, increase floodplain width, and create more riparian vegetation. The SR 299 Bridge over Salt Creek consists of 25 small pier columns (five pier columns at each of the five bents). To accommodate the widening of the bridge deck, two pier columns will be added at each bent for a total of 10 additional piers. The ten additional piles will be driven or vibrated into the soft substrate or cast in a drilled hole (CIDH). CIDH will consist of drilling into the substrate within a steel sleeve, then pouring concrete into the sleeve. The bottom of the steel sleeve will have a slurry seal pumped in prior to pouring the concrete to prevent any uncured concrete from leaking out the bottom in order to prevent contact with the stream. The mud and rock excavated by drilling will be exported out of the stream floodplain. Four of the new piers (one foot in diameter) will be within the ordinary high water mark and the remaining six in the surrounding wet meadow area. Salt Creek is a very slow moving (almost stagnant) perennial stream at the bridge site. Tail-water runoff from upstream irrigated cattle pastures provides much of the summer water. Heavy livestock grazing occurs beneath the bridge. The wet meadow and in-stream work will occur from May through October in one summer season.

In general, the project area contains numerous small to medium sized ranches and rural residences. Almost all of the stream margins within the project area are heavily grazed, with many areas completely devoid of riparian vegetation and with livestock using stream areas as perpetual resting and grazing sites. Woody riparian vegetation occurs along creeks and drainages in the delineation area. Yank Creek flows into Dry Creek which in turn flows into Little Cow Creek. NMFS and The California Department of Fish and Game (DFG) have no evidence that any salmonids are present during any life-history stage in Yank or Salt Creeks. Currently there is an absence of deep pools in both channels. However, NMFS and DFG maintain that it is possible that CV steelhead could utilize these creeks primarily because of their downstream connection to Dry Creek and Little Cow Creek respectively. There is no proposed or designated salmonid critical habitat within Yank or Salt Creeks. The nearest designated critical habitat is located in Little Cow Creek, approximately $\frac{3}{4}$ miles downstream of the Salt Creek Bridge and 2.5 miles downstream of the Yank Creek box culvert. The nearest EFH for Chinook salmon is located approximately six miles downstream in Cow Creek. Possible Chinook spawning and non-natal rearing of juveniles occurs in the same area as well.

In-stream work at both locations will occur during the summer period (May to October) when Yank Creek is in the dry and when Salt Creek is nearly stagnant, supplied with irrigation tail-water, and with water temperatures over 70°F. Project work may cause temporary turbidity at each site during the summer construction season. There will be a temporary (one summer season) clean water diversion at Yank Creek. Because of the stagnant flow at Salt Creek and the lack of flow at Yank Creek during the summer construction season, any temporary turbidity would not extend or reach Dry Creek or Little Cow Creek. The CIDH or driven method for installation of the four in-stream piers at Salt Creek will not create sediment input to the stream. There will be no net change in sediment input at Yank Creek. Some sediment will be removed offsite to enable the excavation of the existing culvert and abutments. Upstream sediments will be allowed to re-fill the new natural bottom channel beneath the new bridge. The new bridge over Yank Creek will have new abutments outside the riparian zone and will clear-span over the stream, the new riparian zone, and the natural stream bottom. By default, riparian function will

be improved. An estimate of approximately 2400 square feet of new natural stream channel and riparian vegetation will be created with the replacement of the triple-box culvert with a clear-span bridge. This amount will likely be greater because there will be riparian planting along the downstream embankment also.

Caltrans is incorporating the following measures to avoid and minimize potential impacts to CV steelhead:

- (1) Prior to start of construction activities, a qualified Biologist will inspect the work area to verify the absence of listed fish.
- (2) In-water work will be limited to the summer time period between May and October when salmonid presence is unlikely, flows are low, and water temperatures may likely be too warm to support salmonids.
- (3) Fish passage will not be impeded due to remediation of the culvert on Yank Creek and since no barriers are present on Salt Creek to any potential salmonid life-history stage.
- (4) Loss of riparian habitat will be minimized within the project area through preserving existing vegetation to the maximum extent possible and revegetating disturbed areas to establish permanent riparian cover. No woody vegetation will be removed.

ESA Section 7 Consultation

Based on our review of the material provided with your request and the best scientific and commercial information currently available, NMFS concurs that the SR 299 Widening and Rehabilitation project may affect, but is not likely to adversely affect, CV steelhead. NMFS reached this determination based on the incorporation of the following measures into the project description:

- (1) Activities conducted in the active channel of both sites will be limited to the timeframe between May and October when Yank Creek is predominantly dry, Salt Creek is nearly stagnant, and the presence of salmonids is very unlikely. Therefore impacts to listed fish will be insignificant or discountable.
- (2) Spawning habitat for CV steelhead is approximately 6 miles downstream from the proposed project sites and critical habitat will be avoided, therefore construction activities will be insignificant or discountable.
- (3) No net change in passage ability at Salt Creek and a substantial increase of passage ability at Yank Creek will ensure fish passage to their respective critical habitat(s) and maintain cover, shelter, shade, and food for rearing juveniles and migrating adults. As a result, impacts to listed fish will be insignificant or discountable.
- (4) At least 2400 square feet of new natural stream channel and riparian vegetation will be created with the new clear-span bridge over Yank Creek to maintain and preserve shaded

riverine aquatic habitat and riparian function, therefore impacts to listed fish will be insignificant or discountable.

This concludes ESA consultation for the SR 299 Widening and Rehabilitation project. This concurrence does not provide incidental take authorization pursuant to section 7(b)(4) and section 7(o)(2) of the ESA. Re-initiation of the consultation is required where discretionary Federal agency involvement or control over the proposed project has been retained (or is authorized by law), and if: (1) new information reveals effects of the proposed project that may affect listed species or critical habitat in a manner or to an extent not considered; (2) the proposed project is subsequently modified in a manner that causes adverse effects to listed species or critical habitat; or (3) a new species is listed or critical habitat designated that may be affected by the proposed project.

EFH Consultation

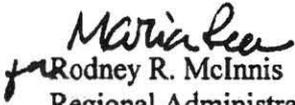
With regards to EFH consultation, the action area has been identified as EFH for Chinook salmon in Amendment 14 of the Pacific Salmon Fishery Management Plan pursuant to the MSA. Federal action agencies are mandated by the MSA (section 305(b)(2)) to consult with NMFS on all actions that may adversely affect EFH and NMFS must provide EFH conservation recommendations to those agencies (section 305(b)(4)(A)). Because the proposed project has incorporated specific measures designed to minimize impacts to salmonid habitat, NMFS concurs with Caltrans that the proposed project will not adversely affect EFH. As a result, additional EFH conservation recommendations are not being provided at this time. However, if there are substantial revisions to the proposed project, the lead Federal agency will need to re-initiate EFH consultation.

FWCA

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development (16 U.S.C. 661). The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage (16 U.S.C 662(a)). Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA provides the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA and MSA. Because the proposed project is designed to avoid environmental impacts to aquatic habitat within the action area, NMFS has no additional FWCA comments to provide.

Please contact Dylan Van Dyne at (916) 930-3725, or via e-mail at Dylan.VanDyne@noaa.gov, if you have any questions or require additional information concerning this project.

Sincerely,


Rodney R. McInnis
Regional Administrator

cc: Copy to File ARN # 151422SWR2011SH00164
NMFS-PRD, Long Beach, CA

MATERIALS INFORMATION

(NOT A PART OF THE CONTRACT)

REVISED FOUNDATION REPORT FOR LEMN CREEK BRIDGE

DATED NOVEMBER 1, 2012

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. JOE DOWNING
BRANCH CHIEF
Division of Engineering Services
Structural Design-Mail Station 9
Office of Bridge Design West-Branch 3

Date: November 1, 2012

File: 02-SHA-299-PM 30.3
Lemn Creek Bridge
Br. No. 06-0211
E.A. 02-360701
EFIS 0200000262

Attn: Lewis Shen

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services – MS 5
Office of Geotechnical Design – North

Subject: Revised Foundation Report for Lemn Creek Bridge
THIS MEMO SUPERSEDES AND REPLACES THE MEMOS DATED October 2, 2012 and October 16, 2012

Project Description

The Office of Geotechnical Design-North (OGD-N) has prepared the Foundation Report for the proposed replacement of a culvert at Lemn Creek with the bridge Lemn Creek Bridge (Br. No. 06-0211) located on State Route 299 at PM 30.3, in Shasta County, California, approximately 10 miles east of the City of Redding.

The proposed Lemn Creek Bridge (Br. No. 06-0211) will replace an existing culvert that Lemn Creek currently flows through. The proposed Lemn Creek Bridge (Br. No. 06-0211) will be a single span concrete box girder structure supported on spread footings at the abutments. The length of the structure is 91 feet 5 inches long and 47 feet 6 inches wide.

The following foundation recommendations are based on the subsurface information gathered during a recent subsurface investigation (November 2011). With regards to the foundation recommendations provided in this report, elevations are based on the NAVD88 vertical datum, and horizontal coordinates are based on the NAD83 horizontal datum, unless otherwise noted.

Field Investigation and Testing Program

The Office of Geotechnical Design-North conducted a subsurface investigation in November 2011.

The 2011 subsurface investigation consisted of two mud rotary borings (Nos. RC-10-001 and RC-10-002). The mud rotary borings were advanced using a self-casing wireline drilling method. The maximum depth reached by the 2011 subsurface investigation was approximately 80 feet. Sampling was achieved in all borings by utilizing the Standard Penetration Test (SPT) sampler. Selected soil and rock samples were tested in the Caltrans Geotechnical Laboratory. A summary of the borings drilled during the subsurface investigation is included below in Table 1.

**Table 1. The 2011 Subsurface Exploration Summary for Lemn Creek Bridge
(Br. No. 06-0211)**

Boring No.	Completion Date	Drill Rig Type	Hammer Type	Hammer Efficiency (%)	Approx. Ground Surface Elevation (ft)	Boring Depth (ft)
RC-10-001	11/2/2011	Acker	Auto	80	541.9	80
RC-10-002	11/8/2010	Acker	Auto	80	540.5	40

Laboratory Testing

Laboratory testing was performed on selected samples of the subsurface materials obtained from the 2011 subsurface investigation. Tests were performed to determine the corrosion and engineering properties of the subsurface materials for use in the foundation analyses. Refer to the Corrosion Evaluation section of this report for information concerning corrosion test results. In addition to the corrosion tests, the following tests were performed on selected samples: unconfined compression strength and moisture content. All tests were performed in general accordance with American Society for Testing and Materials (ASTM) standards or California Test Methods (CTM). Laboratory test results are available upon request.

Site Geology and Subsurface Conditions

Regional Setting and Area Geology

Based on the Geologic Map of California, Redding Sheet (Jenkins, 1977), the site consists of Upper Cretaceous Marine Sedimentary Rocks (Ku) and recent alluvium (Qal).

The material encountered during the 2011 subsurface investigation generally consists of cohesive soil underlain by sedimentary rock. The cohesive soil consists of very soft, stiff, medium stiff, and hard sandy lean clay, sandy lean clay with gravel and gravelly lean clay with sand. The rock consists of moderately weathered to fresh siltstone that ranges from soft to very hard.

For subsurface data and boring locations, please refer to the Log of Test Borings for detailed observations, information and conditions. These sheets will be forwarded once completed.

Groundwater

During the 2011 subsurface investigation, two boreholes were completed and one was left open for at least 24 hours. Groundwater elevations were then measured in Borehole RC-11-001 and RC-11-002 just prior to being backfilled with a neat cement grout. The groundwater was encountered at elevation 531.3 feet in Boring RC-11-001 on November 8, 2011 and at elevation at 532.5 feet in RC-11-002 on November 9, 2011.

Groundwater elevations are subject to seasonal fluctuations and may occur at higher or lower elevations than those observed. Groundwater elevations respond to rainfall patterns, groundwater usage patterns and upstream stream flow regulation and diversions. For more details, please refer to the LOTB sheets.

Scour Evaluation

The Memorandum “Geotechnical Evaluation for Scour” dated January 30, 2012, was written by Muhammad Luqman, a Senior Engineering Geologist with the Scour Critical Program based on the recent borings. Abutment 1 and Abutment 2 will be founded below what is considered scourable resistant material. Scour resistant material can be expected at elevation 523 feet at Abutment 1 and at elevation 525 feet at Abutment 2. The scour resistant material consists of siltstone that is slightly weathered to fresh, moderately hard to hard, and moderately fractured.

For more information, refer to the Final Hydraulic Report by Tony Nedwick with Structure Hydraulics and Hydrology.

Corrosion Evaluation

A composite soil sample was collected from Boring RC-11-001 drilled during the 2011 subsurface investigation. The Office of Testing and Technology Services, Corrosive Technology Branch tested the composite samples for corrosive potential. The Corrosion Technology Branch considers a site to be corrosive if one or more of the following conditions exist for the representative soil or water samples collected at the site: chloride concentration is 550 ppm or greater, sulfate concentration is 2000 ppm or greater, or the pH is 5.5 or less. The minimum resistivity serves only as an indicator parameter for the possible presence of soluble salts and is not used to define a site as being corrosive. It is the practice of the Corrosion Technology Branch that if the minimum resistivity of the sample is greater than 1000 ohm-cm, the sample is considered to be non-corrosive and testing to determine the sulfate and chloride content is not performed.

The results of the laboratory tests determined that the composite samples were considered to be non-corrosive at this site. Refer to Table 2 for specific test results.

Table 2. Corrosion Test Summary of the Composite Samples for Lemn Creek Bridge. (Br. No. 06-0211)

SIC Corrosion Number	Nearby Support Location	Boring Number	Sample Depth (ft)	pH	Minimum Resistivity (Ohm-Cm)	Chloride Content (ppm)	Sulfate Content (ppm)
C739504	Abutment 2	RC-10-001	10-11.5	7.04	953	2.8	343

Seismic Recommendations

Based on the “Deterministic PGA Map and Caltrans ARS Online Report,” July 2009 and “Caltrans 2011 Fault Database,” the nearest active fault to the site is the Keswick fault (Fault ID No.37) with MMax of 6.0. The fault is located north northeast of the bridge site, and the rupture distance to the fault plane from the bridge site is estimated to be 10.7 miles.

Based on the log of test borings, a V_{S30} (average shear wave velocity for the top approximate 100 feet of soil) of 1840 feet per second was selected to estimate the ground motion.

Using the above shear wave velocity, the design ground motion is controlled by the probabilistic method; and the procedure is based on the USGS 5% probability of exceedance in 50 years with a return period of 975 years. The final design Acceleration Response Spectrum curve is attached, and the peak ground acceleration is estimated to be 0.22g.

Due to shallow rock formation, the foundation material does not have potential to liquefy.

The potential for surface rupture at the site due to fault movement is considered insignificant since there are no known faults projecting towards or passing directly through the project site.

Foundation Recommendations

The following foundation recommendations are based on the General Plan, conversations with Mr. Lewis Shen from the Division of Structure Design and the subsurface investigations conducted at the site. Spread footing foundations are recommended at all support locations

Table 5. Foundation Design Recommendations for Spread Footings, Bridge No. 06-0211^{1,2}.

Support Location	Footing Size (ft)		Bottom of Footing Elevation (ft)	Minimum Footing Embedment Depth (ft)	WSD (LRFD Service-I Limit State Load)		LRFD		
	B	L			Permissible Gross Contact Stress (ksf)	Allowable Gross Bearing Capacity (ksf)	Service	Strength $\phi = 0.45$	Extreme Event $\phi = 1.0$
							Permissible Net Contact Stress (ksf)	Factored Gross Nominal Bearing Resistance (ksf)	Factored Gross Nominal Bearing Resistance (ksf)
Abut 1	10.5	64	523	7	10.0	10.0	N/A	N/A	N/A
Abut 2	10.5	64	525	5	10.0	10.0	N/A	N/A	N/A

- Notes: 1) Recommendations are based on the foundation geometry and the load data provided by Structure Design in the Foundation Design Data Sheet. The footing contact area is taken as equal to the effective footing area, where applicable.
 2) See MTD 4-1 for definitions and applications of the recommended design parameters.

Table 6. Spread Footing Data Table

Support Location	Working Stress Design (WSD)		Load and Resistance Design (LRFD)		
	Permissible Gross Contact Stress (Settlement) (ksf)	Allowable Gross Bearing Capacity (ksf)	Service Permissible Net Contact Stress (Settlement) (ksf)	Strength Factored Gross Nominal Bearing Resistance $\phi_b=0.45$ (ksf)	Extreme Event Factored Gross Nominal Bearing Resistance $\phi_b=1.00$ (ksf)
Abutment 1	10.0	10.0	N/A	N/A	N/A
Abutment 2	10.0	10.0	N/A	N/A	N/A

A new Standard Plan Type 1 retaining wall on spread footings will be built at the abutments to accommodate the new bridge. The Standard Plan Type 1 retaining wall foundations should be designed in accordance to Caltrans' Standard Plans 2010. The footing elevations of the retaining walls will match their adjacent abutment. The foundation material at this elevation meets or exceeds the minimum requirements for Type 1 Standard Plan retaining walls.

Construction Considerations

1. Groundwater was encountered during the subsurface investigation and should be considered during all phases of construction and footing installation. Groundwater surface elevation is subject to seasonal fluctuations. Groundwater may occur higher or lower than indicated on the Log of Test Boring Sheets (LOTB) at the time of construction.
2. Groundwater should be expected to be encountered. The Contractor shall take measures to deal with the groundwater along with the water in Lemn Creek.
3. If excavations for spread footings expose unsuitable materials for support of the proposed structure foundations, the bottom of footing elevation shall be lowered to undisturbed competent material.
4. Spread footings shall be placed neat against competent materials. All loose materials shall be removed prior to placement of concrete.
5. All footing excavations are to be inspected and approved by this Office or a representative of the Office of Structure Construction, when excavations are completed to the bottom of footing and prior to placement of concrete.

Project Information

“Project Information,” discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is information originating from Geotechnical Services.

Data and information attached with the project plans are:

- A. Log of Test Borings (Lemn Creek Bridge, Br. No. 06-0211).

Data and information included in the Information Handout provided to the bidders and contractors are:

- A. Revised Foundation Report for Lemn Creek Bridge (Br. No. 06-0211), dated November 1, 2012.
- B. Foundation Report for Lemn Creek Bridge Addendum (Br. No. 06-0211), dated October 16, 2012.
- C. Foundation Report for Lemn Creek Bridge (Br. No. 06-0211), dated October 2, 2012.

Data and information available for inspection at the Transportation Laboratory:

- A. Core Samples.
- B. Rock and Soil Laboratory Data.

The recommendations contained in this report are based on specific project information regarding design loads and structure locations that has been provided by the Office of Bridge Design West. If any conceptual changes are made during final project design, the Office of Geotechnical Design-North, should review those changes to determine if the foundation recommendations provided in this report are still applicable. Any questions regarding the above recommendations should be directed to Joseph Kaump (916) 227-1044, of the Office of Geotechnical Design-North.

Report by:



JOSEPH KAUMP
Engineering Geologist
Office of Geotechnical Design-North



REZA MAHALLATI
Senior Materials and Research Engineer
Office of Geotechnical Design-North

- c: Reid Buell
Michael Mogen– District Project Engineer
Structure Construction R.E. Pending File – RE_Pending_File@dot.ca.gov
John Stayton - DES Office Engineer
Byron Berger - District Materials Engineer
Carl Anderson – District Project Manager

Lemn Creek Bridge

Bridge No. 06-0211

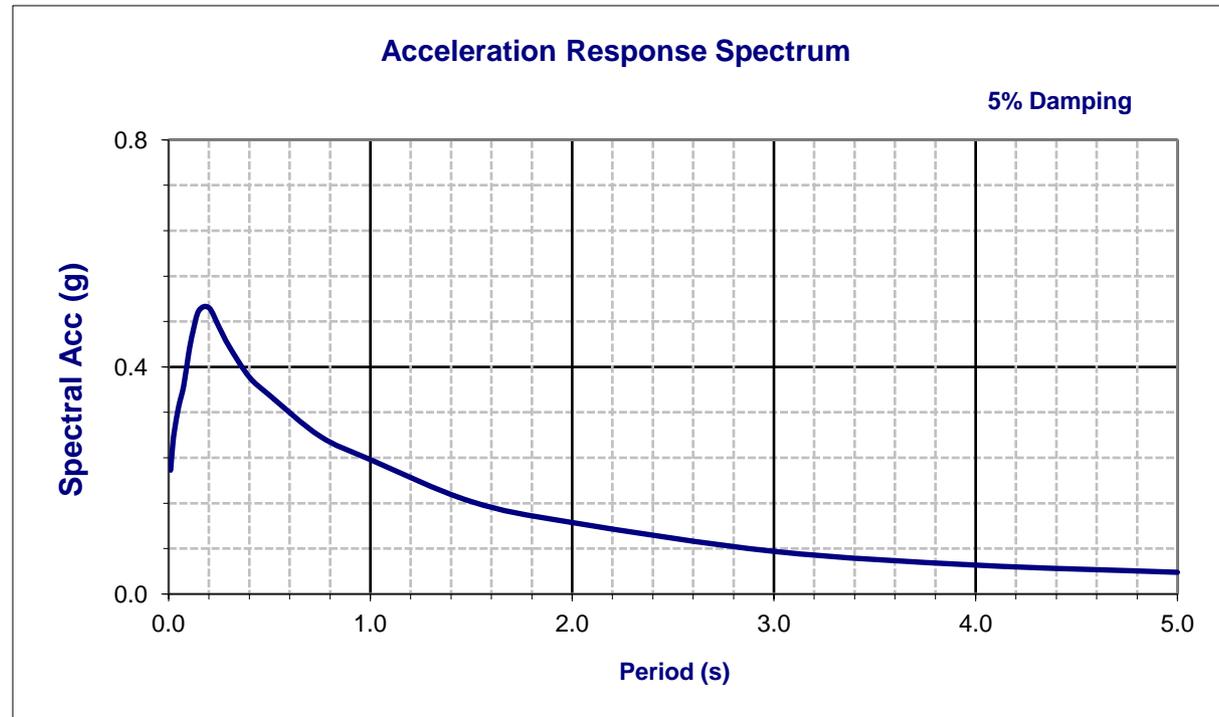
EFIS 0200000262

Latitude 40.6426

Longitude -122.2286

Control Probabilistic

Period (s)	Sa(g)
0.010	0.218
0.020	0.261
0.030	0.290
0.050	0.330
0.075	0.367
0.100	0.425
0.120	0.461
0.150	0.499
0.200	0.504
0.250	0.470
0.300	0.436
0.400	0.382
0.500	0.350
0.750	0.278
1.000	0.237
1.500	0.163
2.000	0.126
3.000	0.075
4.000	0.051
5.000	0.038



Deterministic Procedure Data

Fault Keswick fault

Fault ID 37

Style R

Mmax 6

Dip 65 deg

Z_{TOR} 5 km

R_{rup} 17.3 km

R_{jb} 7.4 km

R_x 16.7 km

V_{S30} 560 m/s

Z_{1.0} N/A m

Z_{2.5} N/A km

Notes

Please note the Design ARS curve is based on the USGS 5% Probability of Exceedance in 50 Years (975 year return period).

Final Design Response Spectrum

MATERIALS INFORMATION
(NOT A PART OF THE CONTRACT)

FOUNDATION REPORT FOR SALT CREEK BRIDGE (WIDENING)
ADDENDUM DATED OCTOBER 16, 2012

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. JOE DOWNING
BRANCH CHIEF
Division of Engineering Services
Structural Design-Mail Station 9
Office of Bridge Design West-Branch 3

Date: October 16, 2012

File: 02-SHA-299-PM 34.56
Salt Creek Bridge (Widening)
Br. No. 06-0049
E.A. 02-360701
EFIS 0200000262

Attn: Lewis Shen

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services – MS 5
Office of Geotechnical Design – North

Subject: Foundation Report for Salt Creek Bridge (Widening) Addendum
THIS MEMO SUPERSEDES AND REPLACES THE MEMO DATED October 2, 2012

Project Description

The Office of Geotechnical Design-North (OGD-N) has prepared the Foundation Report for the proposed widening of the Salt Creek Bridge (Br. No. 06-0049) located on State Route 299 at PM 34.56, in Shasta County, California, approximately 10 miles east of the City of Redding.

The proposed widening of Salt Creek Bridge (Br. No. 06-0049) will widen the shoulders 6 feet 8 inches on each side of the structure. Salt Creek Bridge (Br. No. 06-0049) is a six span concrete slab structure supported on spread footings at all support locations. The length of the structure is 162 feet 4 inches long and is currently 34 feet wide and is proposed to be widened to 47 feet 6 inches wide.

The following foundation recommendations are based on the subsurface information gathered during a recent subsurface investigation (October and November 2011) and LOTBs dated March 23, 1953 and February 13, 1968. With regards to the foundation recommendations provided in this report, elevations are based on the NAVD88 vertical datum, and horizontal coordinates are based on the NAD83 horizontal datum, unless otherwise noted.

Field Investigation and Testing Program

The Office of Geotechnical Design-North conducted a subsurface investigation in October and November 2011.

The 2011 subsurface investigation consisted of three mud rotary borings (Nos. RC-10-001, RC-10-002, and RC-10-003). The mud rotary borings were advanced using a self-casing wireline drilling method. The maximum depth reached by the 2011 subsurface investigation was approximately 75 feet. Sampling was achieved in all borings by utilizing the Standard Penetration Test (SPT) sampler. Selected soil and rock samples were tested in the Caltrans Geotechnical Laboratory. A summary of the borings drilled during the subsurface investigation is included below in Table 1.

Table 1. The 2011 Subsurface Exploration Summary for Salt Creek Bridge (Widening)
(Br. No. 06-0049)

Boring No.	Completion Date	Drill Rig Type	Hammer Type	Hammer Efficiency (%)	Approx. Ground Surface Elevation (ft)	Boring Depth (ft)
RC-10-001	10/19/2011	Acker	Auto	80	574.3	75
RC-10-002	10/26/2010	Acker	Auto	80	571.4	40
RC-10-003	11/9/2011	Acker	Auto	80	571.6	7.5

Laboratory Testing

Laboratory testing was performed on selected samples of the subsurface materials obtained from the 2011 subsurface investigation. Tests were performed to determine the corrosion and engineering properties of the subsurface materials for use in the foundation analyses. Refer to the Corrosion Evaluation section of this report for information concerning corrosion test results. In addition to the corrosion tests, the following tests were performed on selected samples: unconfined compression strength and moisture content. All tests were performed in general accordance with American Society for Testing and Materials (ASTM) standards or California Test Methods (CTM). Laboratory test results are available upon request.

Site Geology and Subsurface Conditions

Regional Setting and Area Geology

Based on the Geologic Map of California, Redding Sheet (Jenkins, 1977), the site consists of Upper Cretaceous Marine Sedimentary Rocks (Ku) and recent alluvium (Qal).

The material encountered during the 2011 subsurface investigation generally consists of cohesive soil underlain by sedimentary rock. The cohesive soil consists of soft and stiff, lean clay, lean clay with sand, and gravelly lean clay with sand. The rock consists of intensely weathered to fresh siltstone that ranges from soft to moderately hard.

There are two previous Log of Test Borings (LOTB) for the existing bridge (Br. No. 06-0049).

The LOTB dated March 23, 1953 shows five 1-inch soil tube sampler borings 2.5 to 4 feet deep. The borings were shallow and slightly penetrated the top of bedrock. The material is described as silty sand with gravel overlying hard, dry, blue clay.

The As-Built LOTB dated February 13, 1968 consisted of one 2.5-inch rotary boring, six 1-inch soil tube sampler borings, and two cone penetrometer borings. The deepest boring was 20 feet in depth at an elevation of 546.5 feet. According to this LOTB the site consists of slightly compact sand, gravel, and cobbles overlying siltstone.

For subsurface data and boring locations, please refer to the Log of Test Borings for detailed observations, information and conditions. These sheets will be forwarded once completed.

Groundwater

During the 2011 subsurface investigation, three boreholes were completed and one was left open for at least 24 hours. Groundwater elevations were then measured in Borehole RC-11-001 just prior to being backfilled with neat cement grout. The groundwater at RC-11-001 was encountered at elevation 571.4 feet on October 20, 2011. The groundwater was encountered generally at the soil/rock boundary. It should be assumed that the groundwater elevation is near the top of rock elevation, or at the elevation of Salt Creek, whichever is higher.

According to the Foundation Report for Salt Creek Bridge, Br. No. 6-49, by B.S. Statton the Resident Engineer on September 19, 1968, said that “Water which was flowing on top of the bedrock did present a minor problem, was handled with ditches and pumping. The volume of water was fairly small and therefore difficult to estimate.”

Groundwater elevations are subject to seasonal fluctuations and may occur at higher or lower elevations than those observed. Groundwater elevations respond to rainfall patterns, groundwater usage patterns and upstream stream flow regulation and diversions. For more details, please refer to the LOTB sheets.

Scour Evaluation

The Memorandum “Geotechnical Evaluation for Scour” dated January 30, 2012, was written by Muhammad Luqman, a Senior Engineering Geologist with the Scour Critical Program based on the As-Built LOTBs and recent borings. Abutment 1, and Bents 2 through 6 are all founded below what is considered scourable resistant material. Scour resistant material can be expected at elevation 565.4 feet at Bent 2 through 5, at elevation ± 567.4 feet at Bent 6, and elevation ± 567.5 feet at Abutments 1 and 7. The scour resistant material consists of siltstone that is moderately and slightly weathered, moderately hard to moderately soft, and moderately fractured.

For more information, refer to the Final Hydraulic Report by Tony Nedwick with Structure Hydraulics and Hydrology.

Corrosion Evaluation

A composite soil sample was collected from Boring RC-11-001 drilled during the 2011 subsurface investigation. The Office of Testing and Technology Services, Corrosive Technology Branch tested the composite samples for corrosive potential. The Corrosion Technology Branch considers a site to be corrosive if one or more of the following conditions exist for the representative soil or water samples collected at the site: chloride concentration is 550 ppm or greater, sulfate concentration is 2000 ppm or greater, or the pH is 5.5 or less. The minimum resistivity serves only as an indicator parameter for the possible presence of soluble salts and is not used to define a site as being corrosive. It is the practice of the Corrosion Technology Branch that if the minimum resistivity of the sample is greater than 1000 ohm-cm, the sample is considered to be non-corrosive and testing to determine the sulfate and chloride content is not performed.

The results of the laboratory tests determined that the composite samples were considered to be non-corrosive at this site. Refer to Table 2 for specific test results.

Table 2. Corrosion Test Summary of the Composite Samples for Salt Creek Bridge (Widening). (Br. No. 06-0049)

SIC Corrosion Number	Nearby Support Location	Boring Number	Sample Depth (ft)	pH	Minimum Resistivity (Ohm-Cm)	Chloride Content (ppm)	Sulfate Content (ppm)
C739503	Abutment 7	RC-10-001	2.5-4.0	9.4	1758.7	N/A	N/A

Seismic Recommendations

Based on the “Deterministic PGA Map and Caltrans ARS Online Report,” July 2009 and “Caltrans 2011 Fault Database,” the nearest active fault to the site is the Keswick fault (Fault ID No.37) with MMax of 6.0. The fault is located north northeast of the bridge site, and the rupture distance to the fault plane from the bridge site is estimated to be 10.8 miles.

Based on the log of test borings, a V_{S30} (average shear wave velocity for the top approximate 100 feet of soil) of 1840 feet per second was selected to estimate the ground motion.

Using the above shear wave velocity, the design ground motion is controlled by the probabilistic method; and the procedure is based on the USGS 5% probability of exceedance in 50 years with a return period of 975 years. The design Acceleration Response Spectrum curve is attached, and the peak ground acceleration is estimated to be 0.22g.

Due to shallow rock formation, the foundation material does not have potential to liquefy.

The potential for surface rupture at the site due to fault movement is considered insignificant since there are no known faults projecting towards or passing directly through the project site.

As-Built Foundation Data

According to the As-Built Plans, the existing structure is supported on spread footings at all support locations. During construction the bottom of footing elevation for the bents were raised due to finding competent material at higher elevations. While excavating to the specified bottom of footing elevations, the rock was becoming very fractured and broken. According to the Foundation Report for Salt Creek Bridge, Br. No. 6-49, by B.S. Statton, dated September 19, 1968, the Resident Engineer stated that, “It appeared that there was better footing excavation before blasting, the Bridge Department Geology section was called and sent out Messrs, Reynolds and Goldsmith who agreed after examining the site and rock, that it would be alright to go ahead and raise the footings.”

Table 3. As-Built Spread Footing Data Table for Salt Creek Bridge (Br. No. 06-0049).

Support Location	Footing Width (ft)	Maximum Footing Elevation (ft)	Allowable Load (ksf)	Design Load (ksf)
Abutment 1	N/A	566.3	N/A	N/A
Bent 2	3.0	563.6	10.0	4.0
Bent 3	3.0	564.1	10.0	4.0
Bent 4	3.0	563.7	10.0	4.0
Bent 5	3.0	563.5	10.0	4.0
Bent 6	3.0	566.1	10.0	4.0
Abutment 7	N/A	569.4	N/A	N/A

Foundation Recommendations

The following foundation recommendations are based on the General Plan, conversations with Mr. Lewis Shen from the Division of Structure Design and the subsurface investigations conducted at the site. Spread footing foundations are recommended at all support locations. Load Factor Design and Working Stress Design was used to calculate the loads for the proposed supports for the widening.

The Wing Walls at Abutment 1 and Abutment 7 are to be founded on spread footings. The wing walls will have various footing widths increasing with the rise in height of the wall. The bottom of footing elevation will be the same as the bottom of footing elevation of the adjacent abutment widening, with an Allowable Bearing Capacity of 10.0 ksf.

Table 4. Foundation Design Recommendations for Spread Footings for Bridge No. 06-0049^{1,2}.

Support Location	Minimum Footing Width (feet)	Maximum Footing Elevation (feet)	Recommended Bearing Limits	
			WSD ¹	LFD ²
			Allowable Bearing Capacity q_{all} (ksf)	Nominal Bearing Resistance (q_n) (ksf)
Abut 1	11	566.3	10.0	N/A
Bent 2	3	563.6	N/A	30.0
Bent 3	3	564.1	N/A	30.0
Bent 4	3	563.7	N/A	30.0
Bent 5	3	563.5	N/A	30.0
Bent 6	3	566.1	N/A	30.0
Abut 7	11	566.5	10.0	N/A

Notes: 1. Working Stress Design (WSD): The Maximum Contact Pressure (q_{max}) is not to exceed the recommended Gross Allowable Soil Bearing Capacity, (q_{all}).
 2. Load Factor Design (LFD): The Maximum Contact Pressure (q_{max}), divide by the Strength Reduction Factor (ϕ), is not to exceed the Nominal Bearing Resistance (q_n).

Table 5. Spread Footing Data Table, Salt Creek Bridge (Br. No. 06-0049).

Support Location	Allowable Bearing Capacity q_{all} (ksf)	Nominal Bearing Resistance (q_n) (ksf)
Abut. 1 & Wing. Wall	10.0	N/A
Bent 2	N/A	30.0
Bent 3	N/A	30.0
Bent 4	N/A	30.0
Bent 5	N/A	30.0
Bent 6	N/A	30.0
Abut. 7 & Wing Wall	10.0	N/A

Construction Considerations

1. Groundwater was encountered during the subsurface investigation and should be considered during all phases of construction and footing installation. Groundwater surface elevation is subject to seasonal fluctuations. Groundwater may occur higher or lower than indicated on the Log of Test Boring Sheets (LOTB) at the time of construction.
2. Groundwater should be expected to be encountered. The Contractor shall take measures to deal with the groundwater along with the water in Salt Creek.
3. If excavations for spread footings expose unsuitable materials for support of the proposed structure foundations, the bottom of footing elevation shall be lowered to undisturbed competent material.

4. Spread footings shall be placed neat against competent materials. All loose materials shall be removed prior to placement of concrete.
5. All footing excavations are to be inspected and approved by this Office or a representative of the Office of Structure Construction, when excavations are completed to the bottom of footing and prior to placement of concrete.

Project Information

“Project Information,” discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is information originating from Geotechnical Services.

Data and information attached with the project plans are:

- A. Log of Test Borings (Salt Creek Bridge (Widening), Br. No. 06-0049).

Data and information included in the Information Handout provided to the bidders and contractors are:

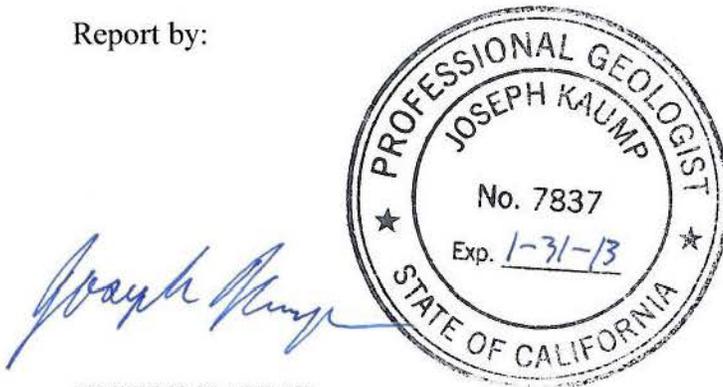
- A. Foundation Report for Salt Creek Bridge (Widening) Addendum, (Br. No. 06-0049) dated October 16, 2012.
- B. Foundation Report for Salt Creek Bridge (Widening), (Br. No. 06-0049) dated October 2, 2012.

Data and information available for inspection at the Transportation Laboratory:

- A. Core Samples.
- B. Rock and Soil Laboratory Data.

The recommendations contained in this report are based on specific project information regarding design loads and structure locations that has been provided by the Office of Bridge Design West. If any conceptual changes are made during final project design, the Office of Geotechnical Design-North, should review those changes to determine if the foundation recommendations provided in this report are still applicable. Any questions regarding the above recommendations should be directed to Joseph Kaump (916) 227-1044, of the Office of Geotechnical Design-North.

Report by:



JOSEPH KAUMP
Engineering Geologist
Office of Geotechnical Design-North



REZA MAHALLATI
Senior Materials and Research Engineer
Office of Geotechnical Design-North

- c: Reid Buell
- Michael Mogen - District Project Engineer
Structure Construction R.E. Pending File – RE_Pending_File@dot.ca.gov
- John Stayton - DES Office Engineer
- Byron Berger - District Materials Engineer
- Carl Anderson – District Project Manager

Salt Creek Bridge

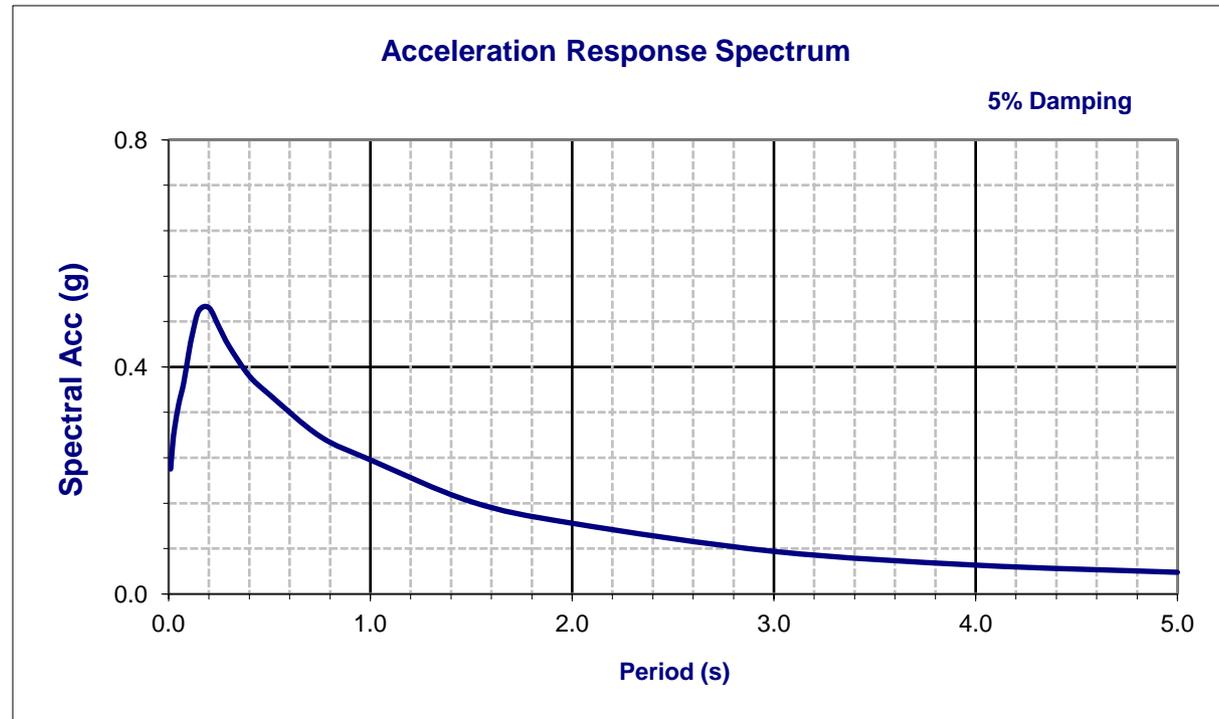
Bridge No. 06-0049

EFIS 0200000262

Latitude 40.6610
Longitude -122.1959

Control Probabilistic

Period (s)	Sa(g)
0.010	0.220
0.020	0.263
0.030	0.293
0.050	0.334
0.075	0.372
0.100	0.425
0.120	0.461
0.150	0.499
0.200	0.504
0.250	0.470
0.300	0.436
0.400	0.384
0.500	0.351
0.750	0.278
1.000	0.236
1.500	0.162
2.000	0.124
3.000	0.075
4.000	0.051
5.000	0.038



Deterministic Procedure Data

Fault Keswick fault

Fault ID 37

Style R

Mmax 6

Dip 65 deg

Z_{TOR} 5 km

R_{rup} 17.4 km

R_{jb} 8.0 km

R_x 16.4 km

V_{S30} 560 m/s

Z_{1.0} N/A m

Z_{2.5} N/A km

Notes

Please note the Design ARS curve is based on the USGS 5% Probability of Exceedance in 50 Years (975 year return period).

Final Design Response Spectrum

MATERIALS INFORMATION
(NOT A PART OF THE CONTRACT)

FINAL HYDRAULIC REPORT FOR SALT CREEK
DATED MARCH 12, 2012

State of California – Department of Transportation
Division of Engineering Services
Structure Design Services

FINAL HYDRAULIC REPORT

Salt Creek

Bridge No. 06 0049
02 - SHA – 299 PM 34.6
EA 02-360701
Project ID 02 0000 0262

Prepared by:



Anthony Nedwick, PE
Structure Hydraulics and Hydrology
March 12, 2012



General:

It is proposed to widen the existing Salt Creek (Bridge No. 06-0049). The bridge is located on State Route 299 in Shasta County, east of the City of Redding. The existing bridge was originally constructed in 1968.

The current structure consists of a 162'-4" long, 34'- 2" wide, 6-span concrete slab bridge on multi-column bents. The columns are 1'-3" diameter reinforced concrete, all founded on spread footings.

The proposed widening would add 6'-8" to both upstream and downstream sides of the structure, for an overall bridge width of 47'-6". The proposed widening would also incorporate two new columns at each bent, one on the upstream side and one on the downstream side, all on spread footings. The columns are proposed to match the existing columns and the footings will be tied into the existing footings.

This report is based on the plans and information provided by Lewis Shen of Structure Design Branch 3 and survey data provided by Preliminary Investigations-North.

All elevations indicated in this report are based on the Vertical Datum NAVD 1988.

Basin:

At the bridge site, the watershed for Salt Creek encompasses approximately 13.5 square miles. Salt Creek originates at the northern end of the Sacramento Valley, draining areas on the southern side of Backbone Ridge, which separates Shasta Lake and the Pit River watershed from the Sacramento Valley. Elevations in the watershed range from approximately 570 feet at the bridge site to almost 1,850 feet in the higher elevations of Backbone Ridge. Average annual precipitation in the watershed is about 42 inches per year. Salt Creek is a tributary to Cow Creek, which is a tributary to the Sacramento River.

Discharge:

WMS (Watershed Modeling System by Aquaveo), version 8.4, was utilized to determine the watershed area of approximately 13.5 square miles. The FEMA Flood Insurance Study for Shasta County did not contain any specific information for this stream. Regional regression equations were utilized, based on USGS publication 77-21; Magnitude and Frequency of Floods in California. The 50-year and 100-year discharges for Salt Creek were estimated to be 4,650 cfs and 5,800 cfs, respectively.

Hydraulic Analysis:

The channel hydraulics were modeled using the Army Corps of Engineers HEC-RAS modeling program, version 4.1.0, utilizing survey data gathered in late 2011, provided by Preliminary Investigations-North. HEC-RAS was used to determine the water surface elevations and velocities throughout the project reach in an effort to compare the pre and post-project conditions at the site. Manning's roughness coefficients were estimated using USGS guides as well as data gathered during site investigations and Log of Test Boring information. Manning's coefficients were estimated at approximately 0.047. The channel has a very flat average slope of approximately 0.4 % in the reach at the project site.

Two different scenarios were evaluated: the existing structure and the proposed widening. The limits of the study extend approximately 750 feet upstream, and 660 feet downstream of the structure. Boundary conditions for the model were based on normal depth methods.

The post-project channel was assumed to closely match the pre-project channel with regards to vegetation, configuration and embankment lining. Therefore, Manning's roughness coefficients remained the same for both scenarios modeled.

Based on the hydraulic model, the water surface elevation for the 100-year event increases approximately 0.03 feet at the bridge due to the widening. The average velocity for the 100-year event decreased by approximately 0.04 fps to 6.5 fps at this location.

Streambed:

Based on the 1968 Log of Borings, the channel bed materials at the bridge site consist of sand and fine gravels over siltstone. Based on the June 29, 2001 Scour Evaluation conducted by Caltrans Structure Maintenance and Investigations Hydraulics Office, Geologist Mark Palmer of the Office of Structure Foundations Geotechnical Support Office indicated that the Siltstone bedrock the bridge footings are founded on was determined to resist scour within the service life of the bridge.

Based on discussions with Joe Kaump, Engineering Geologist with the Office of Geotechnical Design-North, scour resistant material can be expected at approximately elevation 567.5 ft at Abutments 1 and 7, elevation 565.4 ft at Bents 2 through 5 and elevation 567.4 ft at Bent 6. The scour resistant material consists of Siltstone that is weathered and fractured to varying degrees. This information should be included in the 2012 Final Foundation Report.

Scour Analysis:

Scour was estimated utilizing the methods set forth in the FHWA HEC-18, "Evaluating Scour at Bridges." All scour elevations are based on the 100-year

discharge and assume no mitigation measures will be in place. Based on the HEC-RAS model, the current channel invert at the structure is approximately 567.6 ft (NAVD88 datum).

Due to the location and quality of the bedrock at this site, there are no scour concerns with this structure. No channel degradation or contraction scour below the surface of the bedrock are expected to occur at this site. There is a potential for minor erosion at the abutments, as was noted by the exposure of the Abutment 1 footing mentioned in several Bridge Inspection Reports from 1979 through 1995.

Despite the moderate to heavy vegetation in the channel, debris loading was considered negligible for scour calculations. Most of the vegetation was smaller trees and brush and historical Bridge Inspection Reports made no mention of debris or drift.

Summary & Recommendations:

Below is a summary of key design parameters based on the hydrology and hydraulic analysis performed for these structures.

The spread footings should be placed neat against competent, scour resistant material. All loose materials shall be removed prior to placement of concrete. All footing excavations are to be inspected and approved by the Office of Geotechnical Design or a representative of the Office of Structure Construction, when excavations are completed to the bottom of footing and prior to the placement of concrete.

All elevations given are referenced to the data provided by Structures Design and Preliminary Investigations-North, using the NAVD 88 vertical datum.

Hydrologic Summary for Salt Creek, 06-0049		
Drainage Area: 13.5 mi ²		
Frequency	Design Flood	Base Flood
	50-year	100-year
Discharge	4,650 cfs	5,800 cfs
Water Surface Elevation at Bridge	574.7 ft	575.5 ft
<small>Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.</small>		
Minimum Required Soffit Elevation*	578.5 ft	

*The Minimum Required Soffit Elevation for this location is based on the CVFPB requirement of a minimum of 3 feet over the 100-year event or matching the existing soffit elevation for a widening.

Long Term Scour Depths, Salt Creek, Br. No. 06-0049		
Supports	Degradation Scour Depth	Contraction Scour Depth
All Supports	0.0 ft	0.0 ft

Scour Data (Elevation and Depth), Salt Creek, Br. No. 06-0049		
Supports	Long Term Scour Elevation	Short Term (Local) Scour Elevation
Abutment 1	567.5 ft	567.5 ft
Bent 2	565.4 ft	565.4 ft
Bent 3	565.4 ft	565.4 ft
Bent 4	565.4 ft	565.4 ft
Bent 5	565.4 ft	565.4 ft
Bent 6	567.4 ft	567.4 ft
Abutment 7	567.5 ft	567.5 ft

Design Information		Existing (Pre-Construction)				Future (Post-Construction)				Δ Existing to Future	
Bridge No.	100-yr Design Flow cfs	Soffit ft	100-yr WSE ft	100-yr Velocity fps	100-yr Freeboard ft	Soffit ft	100-yr WSE ft	100-yr Velocity fps	100-yr Freeboard ft	Δ WSE ft	Δ Velocity fps
06 0049	5800	581.82	575.42	6.54	6.4	581.71	575.45	6.5	6.26	0.03	-0.04

This report has been prepared under my direction as the professional engineer in responsible charge of the work, in accordance with the provisions of the Professional Engineers Act of the State of California.

MATERIALS INFORMATION
(NOT A PART OF THE CONTRACT)

FINAL HYDRAULIC REPORT FOR LEMN CREEK
DATED APRIL 6, 2012

State of California – Department of Transportation
Division of Engineering Services
Structure Design Services

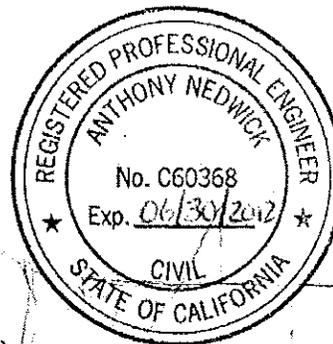
FINAL HYDRAULIC REPORT

Lemn Creek

Bridge No. 06 0211 (new)
Bridge No. 06 0102 (existing)
02 - SHA – 299 PM 32.25
EA 02-360701
Project ID 02 0000 0262

Prepared by:

Anthony Nedwick, PE
Structure Hydraulics and Hydrology
April 6, 2012



A handwritten signature in black ink, appearing to read "Anthony Nedwick", written over a horizontal line.

General:

It is proposed to replace the Lemn Creek structure over Yank Creek (existing Bridge No. 06-0102, new Bridge No. 06-0211). The existing structure is located on State Route 299 in Shasta County, east of the City of Redding.

The existing structure is a triple-barrel reinforced concrete box culvert, consisting of two 8' X 6' barrels (constructed in 1933) along with one 10' X 6' barrel (added in 1938). The existing structure is inadequately sized for the watershed discharge. There were reports of debris clogging the barrels and periodic overtopping of the roadway.

The proposed replacement is a single-span, reinforced concrete, cast-in-place, pre-stressed box girder bridge, with an overall length of 89'-10" and a width of 47'-6". The proposed replacement will be relocated to the west approximately 45 feet to realign the channel with the upstream and downstream channels.

It should be noted that while the structure is named "Lemn Creek", the stream is actually named Yank Creek, per the USGS and several other sources. Little Valley Creek converges with Yank Creek immediately upstream from the proposed structure.

This report is based on the plans and information provided by Lewis Shen of Structure Design Branch 3 and survey data provided by Preliminary Investigations-North.

All elevations indicated in this report are based on the Vertical Datum NAVD 1988.

Basin:

At the bridge site, the watershed for Yank Creek, including Little Valley Creek, encompasses approximately 5.45 square miles. Yank Creek and its tributaries originate at the northern end of the Sacramento Valley. Elevations in the watershed range from about 530 feet at the bridge site to almost 1,340 feet in the higher elevations. Average annual precipitation in the watershed is about 35 inches per year. Yank Creek is a tributary to Dry Creek, which is a tributary to the Cow Creek.

Discharge:

WMS (Watershed Modeling System by Aquaveo), version 8.4, was utilized to determine the watershed area of approximately 5.45 square miles. The FEMA Flood Insurance Study for Shasta County did not contain any specific information for this stream. Regional regression equations were utilized based on USGS publication 77-21; Magnitude and Frequency of Floods in California. The 50-year and 100-year

discharges for Yank Creek were estimated to be 2,150 cfs and 2,700 cfs, respectively.

Hydraulic Analysis:

The channel hydraulics were modeled using the Army Corps of Engineers HEC-RAS modeling program, version 4.1.0, utilizing survey data gathered in late 2011, provided by Preliminary Investigations-North along with design data from both DES as well as District 2. HEC-RAS was used to determine the water surface elevations and velocities throughout the project reach in an effort to compare the pre and post-project conditions at the site. Manning's roughness coefficients were estimated using USGS guides as well as data gathered during site investigations and Log of Test Boring information. Manning's coefficients were estimated at approximately 0.030. The channel has a very flat average slope of approximately 0.5 % in the reach at the project site.

The post-project channel was assumed to closely match the pre-project channel with regards to vegetation and embankment lining. Therefore, Manning's roughness coefficients remained the same for both scenarios modeled.

Based on the hydraulic model, the water surface elevation at the bridge is about 538.7 feet for the 50-year discharge, and 539.5 feet for the 100-year discharge.

Streambed:

Based on the Bridge Inspection Reports, the channel consists of gravel. There were no reports of scour, but there were several reports of exposure of both the upstream and downstream ends of the concrete apron. The proposed structure will be placed over a realigned section of the stream, therefore initial bed material may differ from the existing channel.

Based on discussions with Joe Kaump, Engineering Geologist with the Office of Geotechnical Design-North, scour resistant material can be expected at approximately elevation 523 ft at Abutment 1 and 525 ft at Abutment 2. The scour resistant material consists of Siltstone that is weathered and fractured to varying degrees. This information should be included in the 2012 Final Foundation Report.

Scour Analysis:

Scour was estimated utilizing the methods set forth in the FHWA HEC-18, "Evaluating Scour at Bridges." All scour elevations are based on the 100-year discharge and assume no mitigation measures will be in place. Based on the HEC-RAS model, the proposed channel invert at the structure will be approximately 532.8 ft (NAVD88 datum).

The structural configuration of the proposed structure will allow local scour, contraction scour and abutment scour to be negligible. However, based on historical inspection reports for the existing structure, it is likely that the channel will experience minor degradation. Lateral migration of the thalweg within the channel is likely. It is recommended that both abutments be founded of competent, scour resistant bedrock. The elevation of the competent material is approximately 523 ft at Abutment 1 and 525 ft at Abutment 2.

Summary & Recommendations:

Below is a summary of key design parameters based on the hydrology and hydraulic analysis performed for these structures.

The spread footings should be placed neat against competent, scour resistant material. All loose materials shall be removed prior to placement of concrete. All footing excavations are to be inspected and approved by the Office of Geotechnical Design or a representative of the Office of Structure Construction, when excavations are completed to the bottom of footing and prior to the placement of concrete.

All elevations given are referenced to the data provided by Structures Design and Preliminary Investigations-North, using the NAVD 88 vertical datum.

Hydrologic Summary for Lemn Creek, 06-0211		
Drainage Area: 5.45 mi ²		
Frequency	Design Flood	Base Flood
		50-year
Discharge	2,150 cfs	2,700 cfs
Water Surface Elevation at Bridge	538.7 ft	539.5 ft
<small>Flood plain data are based upon information available when the plans were prepared and are shown to meet federal requirements. The accuracy of said information is not warranted by the State and interested or affected parties should make their own investigation.</small>		
Minimum Required Soffit Elevation	540.7 ft	

LongTerm Scour Depths, Lemn Creek, Br. No. 06-0211		
Supports	Degradation Scour Depth	Contraction Scour Depth
Abutment 1	9.8 ft	0.0 ft
Abutment 2	7.8 ft	0.0 ft

Scour Data (Elevation and Depth),		Lemn Creek, Br. No. 06-0211	
Supports	Long Term Scour Elev	Short Term (Local) Scour Elevation	
		Depth	Elevation
Abutment 1	523 ft	N/A	N/A
Abutment 2	525 ft	N/A	N/A

This report has been prepared under my direction as the professional engineer in responsible charge of the work, in accordance with the provisions of the Professional Engineers Act of the State of California.

MATERIALS INFORMATION
(NOT A PART OF THE CONTRACT)

ADDENDUM TO THE FINAL HYDRAULIC REPORT FOR LEMN CREEK
DATED OCTOBER 30, 2012

Memorandum

To: Lewis Shen
Office of Bridge Design North
Division of Engineering Services

Date: October 30, 2012

File: Lemn Creek
Br. No. 06-0211
02-SHA-299-PM 32.25
EA 02-360701
EFIS 02 0000 0262

From: Department of Transportation
Division of Engineering Services
Office of Design and Technical Services
Structure Hydraulics and Hydrology, MS#9-HYD-1/2I

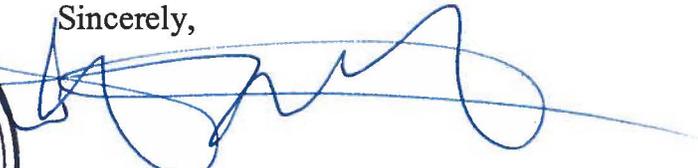
Subject: Addendum to the Final Hydraulic Report for Lemn Creek

Structures Hydraulics has prepared this addendum to the Final Hydraulic Report dated April 6, 2012 for Lemn Creek Bridge. The addendum is in response to an October 2012 design change in the overall bridge length and the thickness of the abutments. The clear span between the abutment faces does not change. Therefore, there are no changes in the hydraulics of Lemn Creek at the project site. All previous assumptions, estimates and elevations contained in the April 6, 2012 Final Hydraulic Report are still valid.

If you have any questions, please call me at 916-227-8852.



Sincerely,


TONY NEDWICK,
Hydrology/Hydraulics Office

MATERIALS INFORMATION
(NOT A PART OF THE CONTRACT)

GEOTECHNICAL DESIGN REPORT
DATED NOVEMBER 18, 2009

Memorandum

*Flex your power!
Be energy efficient!*

To: JULIE CASEY
Senior, Branch Chief Design R4
Division of Program Project Development

Attention: Mike Mogen

Date: November 18, 2009

File: 02-SHA-299-PM 30.3/40.7
02-360700
Bella Diddy
Rehabilitation/Widening

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Geotechnical Design Report

1. Introduction

Per your request dated March 16, 2009, we have prepared this Geotechnical Design Report (GDR), which presents recommendations for slope cuts and fills, slope ratios, slope stability, rippability, rock fall and ground water concerns for the 8-foot shoulder widening of Route 299 between PM 30.3 (immediately east of Hootenanny Lane) and 40.7 (west of Seaman Gulch Road). Additionally, Salt Creek Bridge, Dry Creek Bridge, and Yank Creek Box Culvert are to be widened as a result of the road shoulder widening. The project is located east of the city of Redding, on Route 299 in Shasta County (See Figure 1, Vicinity Map).

2. Pertinent Reports and Investigations

The District has provided us with basic project information including the aerial strip images and typical slope cross sections profiles. Our research yielded the following documents, and maps that were utilized in preparing this report.

- Geologic Map of California, Redding Sheet - Scale 1: 250,000 (1962) published by California Division of Mines and Geology (Third printing, 1977).
- Mualchin, L., A Technical Report to Accompany the Caltrans-California Seismic Hazard Map 1996.

- Mualchin, L., Caltrans Draft Seismic Hazard Map, September 2007.
- United States Department of Agriculture, soil Conservation Service and Forest Service, "Soil Survey of Shasta County Area, California", August 1974.
- Pierce, J. M. 1983, Ground Water in the Redding Basin, Shasta and Tehama Counties, California, United States Geological Survey in cooperation with the California Department of Water Resources, Water-Resources Investigations Report 83-4052.
- California Department of Transportation, 1978, Calculating Earthwork Factors Using Seismic Velocities, FHWA-CA-TL 78-23, 51 pages.
- Streile, G.P., K. D., Shields, et. al., 1966. Multimedia Environmental Pollutant Assessment System (mepas): Source-Term Release Formulation. http://mepas.pnl.gov/mepas/formulations/source_term/source_form.html

3. Existing Facilities and Proposed Improvements

Within the project limits, State Route 299 is a two-lane highway with passing lanes where the road grade becomes steep. The road is paved with asphalt concrete, built on cuts and fills, and aligned in a general Northeast/Southwest direction. The existing road shoulders are unpaved and are about one to 6 feet wide. The project is located both inside and outside of a suburban environment and across active agricultural lands, rocky and rolling hill terrain. Most of the intersections are controlled by stop signs, except that of Bella Vista which is controlled by a traffic light.

The first half of the state route, from the beginning of the project at station 11+00 (PM 30.3) to station 340+00 (PM 36.76), is generally constructed on minimal fills with the exception of the fills and cuts west of Deschutes Road. Most of this section traverses relatively flat terrain. The existing cut slopes have slope ratios ranging from 0.75:1 to 2:1 (H:V). The second half of the project interval, from station 340+00 to 560+00 (PM 36.76 to 40.7) is generally built on significant fills and cuts placed on smooth and rolling hills. The existing fill side slopes range from 2:1 to 4:1 (H:V). Existing road fills seem to be performing adequately. The roadway within the project interval appears to be in fairly good condition.

The proposed road improvements include the installation of a new overlay and widen the shoulders to 8 feet in both directions. Existing slopes and fills would have to be cut and extended to accommodate the proposed road widening. Additionally, road culverts and bridges would have to be extended and widened accordingly.

This Geotechnical Design Report addresses geotechnical considerations related to the widening for the roadway portions of the proposed alignment interval.

4. Physical Setting

The physical setting of the project site and the surrounding area was reviewed to provide climate, topography and drainage, geology, and seismicity characteristics to aid in the project design and construction. The following is a discussion of our review:

Climate

Two sets of data were utilized to best describe the climate for the project interval. The first database was obtained from Redding Station (047296) for 1988 – 2008 for project elevations that are more compatible with those of the Redding area. The second weather database was obtained from Round Mountain Station (047580) for higher elevations that are more compatible with those of the foothills of the Sierra Nevada. According to the National Weather Service, California Climate Normals from both weather stations, the average annual precipitation for the lower and higher elevations in the project area are about 34.43 and 62.21 in respectively. The average daily minimum temperature for lower elevations ranges from 36.1° F in December to 65.9° F in July while the average daily maximum temperature ranges from 55.0° F in December to 98.8° F in July. For higher elevations there is not average daily minimum temperature data available. Snowfall typically occurs between the months of December to March for lower elevations. And, for higher elevations snowfall typically occurs between the months of November and March. Road construction for the road widening will be difficult during the winter due to freezing temperatures, rainfall and snowfall.

Table 1 and 2 present the climatic summary for the Redding station for lower elevations and Round Mountain station for higher elevations. Yearly updates are available from the western Regional Climate Center (WRCC) web site.

**Table 1: Average Monthly Climate Summary, Redding (047296), California.
 Period of Record: 11/1/1986 to 12/31/2008**

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Ave. Max. Temp °F	54.8	59.8	65.3	71.2	80.8	90.3	98.8	97.0	91.4	79.3	63.5	55	75.6
Ave. Min. Temp °F	36.6	39.2	42.7	46.6	53.8	61.2	65.9	62.8	57.6	49.5	41.1	36.1	49.4
Ave. Total Precipitation (in.)	6.68	5.62	4.47	2.4	2.15	0.70	0.11	0.17	0.58	1.79	3.59	6.17	34.43
Average Total Snow Fall (in.)	1.5	0.2	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.0	4.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Western Regional Climate Center, "<http://www.wrcc.dri.edu>"

**Table 2: Average Monthly Climate Summary, Round Mountain, California (047580)
 California. Period of Record: 11/1/1986 to 12/31/2008**

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Ave. Max. Temp °F		INSUFFICIENT DATA											
Ave. Min. Temp °F		INSUFFICIENT DATA											
Ave. Total Precipitation (in.)	13.67	8.06	6.16	4.55	2.76	1.56	0.06	0.79	0.70	3.96	8.44	11.50	62.21
Average Total Snow Fall (in.)	1.5	1.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.2	5.9
Average Snow Depth (in.)	2	1	1	0	0	0	0	0	0	0	0	1	0

Source: Western Regional Climate Center, "<http://www.wrcc.dri.edu>"

Topography and Drainage

The first half of the road interval is characterized as broad terraces that have been dissected by entrenched streams. Generally the top of the terraces are approximately 50 to 100 feet above the bottom of the streams. Highway elevations in the first half vary from 534 feet above mean sea level (msl) at the intersection of Deschutes Road and Route 299

to 700 feet above msl at the area east of Woodman Hill. The vegetation of this area consists of grasses, oaks, shrubs, and Digger Pines. The highway in this section is intersected by Dry Creek, Yank Creek, and Salt Creek.

The second half the road interval is characterized as low rolling hills with narrow to broad valleys. Highway elevations in this section vary from 700 feet to 1250 feet msl at Diddy Wells Fire Station. The highway in this section is intersected by the Woodman Creek. The natural surface drainage is generally toward the southwest.

Man-made and Natural Features of Engineering and Construction Significance

Overhead power lines are located in both road directions as they cross from one side of the road to the other at various locations. In general, power lines are outside of Caltrans Right of Way. Underground utilities, such as fiber optic cable, are generally located within Caltrans Right of Way, on the northbound direction lane outside the roadway limits. Relocation of the fiber optic cable may be required whenever the location of the fiber optic cable is within the construction limits.

The roadway interval is drained by numerous 2 to 3 feet-diameter corrugated metal and plastic culverts pipes. Additionally, there are two 3 and 4.5 foot-diameter metal culvert pipes that cross the roadway at the base of the hill located at station 67+00 (PM 31.35) just west of Deschutes Road. Most of the culverts will have to be extended to accommodate the road widening.

A box culvert over the Yank Creek at station 114+60 (PM32.26) as well as bridges over Dry Creek at station 75+00 (PM 31.52) and Salt Creek, station 237+00 (PM 34.56) will have to be replaced or lengthened to accommodate the proposed road widening.

Regional Geology

The project site is located in the northern section of the Sacramento Valley, which forms the northern segment of the Great Valley. The Great Valley is elongated lowland of about 400 miles long and 50 miles wide flanked to the west by the Coast Ranges and to the east by the Sierra Nevada. It is divided in two segments, the northern, where the project is located, the Sacramento Valley and the southern, the San Joaquin Valley. The former occupies about two thirds of the Great Valley, whereas the latter makes up one third of the province. The south-flowing Sacramento River drains the northern Valley and the north-flowing San Joaquin River the southern portion of the Great Valley.

Unconsolidated Recent and Pleistocene Sediments from eroded sediments mainly from the Sierra Nevada, forms the surface of the Great Valley (See Figures 2 and 3, Geology of

Project Site Legend and Geology of Project Site). Underlying the recent alluvium is a 65,000 feet thick sedimentary basin filled with a sequence of sedimentary rocks deposited from the Mesozoic (Jurassic and Cretaceous) to Cenozoic. This sequence of sedimentary rocks, also called the Great Valley Sequence, consists of marine and terrestrial sediments that reflect the geologic history of the Great Valley. Mesozoic sediments, consisting of sandstone, shale, and conglomerate, were deposited in an ocean basin that lay west of the Mesozoic North American Margin. Cenozoic rocks deposited in increasingly shallow marine environments reflect the rapid uplift of the Sierra Nevada and gradual filling up of the sedimentary basin. Terrestrial sediments began to be deposited in the Sacramento Valley as early as 24 million years ago when the Lovejoy Basalt buried alluvium across the Sacramento Valley. However, a deep marine environment persisted much longer in the San Joaquin Valley as marine shale and sandstone were deposited during early and middle Cenozoic time. Sediments from the Sierra Nevada and the newly formed Coast Ranges were deposited until the late Pliocene. During the same time, pyroclasts flows and ash from the Cascades were deposited throughout the Sacramento Valley particularly in the northern portion of the valley. During the late Pliocene more volcanic debris flows and pyroclastic lavas flowed into the northeastern portion of the Sacramento Valley. These deposits form the Tuscan Formation. At the same time, alluvial deposits eroded from the sediments of the Coast Ranges deposited in the western portion of the Sacramento Valley as the Tehama Formation.

Three million years ago, during the Pliocene time, much of the southern portion of the San Joaquin Valley was open to the sea and formed a large embayment in the coastline. By the end of the Pliocene time, about 2 million years ago, the San Joaquin Valley emerged above sea level, and about one million years ago, during the Pleistocene time, the valley was completely cut off from the Pacific Ocean leaving an extensive lake that occupied the southern section of the Sacramento Valley and most of the San Joaquin Valley. The evidence of the existence of this lake is a 30 to 50 feet thick clay layer with Pleistocene fossils, known as the Corcoran Clay.

According to the Geologic Map of California, Redding Quadrangle (1962), Pleistocene alluvial terraces underlay the project site from the beginning of the project to the town of Bella Vista. These alluvial terraces consist of gravelly sand and silt and cemented conglomerates. From Bella Vista to the end of the project the project site is underlie by recent alluvial deposits, Upper Cretaceous marine deposits, Triassic marine deposits, Jura-Triass metavolvanic rocks, and Pliocene pyroclastic rocks (See Figures 2 and 3, Legend of Regional Geologic Map, and Regional Geologic Map). The alluvial deposits consist of gravelly silty sand and are located from station 49+00 to 138+00 (PM 31.0 to 32.7) approximately. Upper Cretaceous marine deposits consisting of shale, siltstone and thin-bedded sandstone are located from station 138+00 to 375+00 (PM 32.70 to 37.2) approximately. The Upper Cretaceous marine deposits are thickly bedded, hard, and well

cemented sandstone, from station 314+00 to 334+00 (PM 36.0 to 36.4) approximately. Triassic marine deposits consisting of thinly-bedded, hard, sandstone, siltstone and shale, straddle the road from station 375+00 to 433+00 (PM 37.2 to 38.3) approximately. Pliocene pyroclastic rocks consisting of volcanic ash and basaltic flows are present from station 433+00 to 538+00 (PM 38.3 to 40.30). Jura-Triassic metavolcanic rock outcrops were observed on the remaining of interval of the project.

Seismicity

The Department has recently recognized a fault in the area of Shasta Lake; this fault, named Keswick Fault, has been classified as a blind thrust fault oriented N 42° E and dipping 65° toward the southeast. This fault has been assigned a maximum moment magnitude (M_{Max}) of 6.0 (See Figure 4 Caltrans Draft Seismic Hazard Map, September 2007). The vertical projection of the Keswick Fault onto the ground surface is located approximately 10.15 miles northwest of the project location. Based in the attenuation relationship by Sadigh et al (1997), it is estimated that the site is likely to experience a Peak Bedrock Acceleration (PBA) of 0.2g in the event of a 6.0 magnitude earthquake associated with the Keswick Fault.

Soils

According to the Soil Survey of Shasta County Area, California, 1974, the project site is underlain by a variety of soil types (See Figures 5 through 8, Soils Map and Legend of Soils Map). The United States Department of Agriculture (USDA) maps the following soils within the project limits.

Table 3: USDA Soil Survey Units along Route 299 Project Interval from Station 0+00 to Station 236+00.

Soil Name	Station Interval
<i>Clough gravelly loam(CgB)</i>	Begin Project to 11+50
<i>Churn gravelly loam(CfA)</i>	Sta. 11+50 to Sta. 15+00
<i>Clough gravelly loam(CgB)</i>	Sta. 15+00 to Sta. 30+00
<i>Redding gravelly loam (RdB)</i>	Sta. 30+00 to Sta. 40+00
<i>Newton stony loam (NfE2)</i>	Sta. 40+00 to Sta. 44+00
<i>Newton gravelly loam (NeE2)</i>	Sta. 44+00 to Sta. 57+00
<i>Newton gravelly loam (NeD)</i>	Sta. 57+00 to Sta. 66+00
<i>Churn gravelly loam (CeB)</i>	Sta. 66+00 to Sta. 67+50
<i>Churn gravelly loam (CeA)</i>	Sta. 67+50 to Sta. 74+00
<i>Coobly alluvial land (Ck)</i>	Sta. 74+00 to Sta. 79+00
<i>Churn gravelly loam (CeA)</i>	Sta. 79+00 to Sta. 82+00
<i>Churn gravelly loam (CfA)</i>	Sta. 82+00 to Sta. 94+00
<i>Perkins gravelly loam (PoB)</i>	Sta. 94+00 to Sta. 100+00
<i>Newton gravelly loam (NeD)</i>	Sta. 100+00 to Sta. 105+00
<i>Honn fine sandy loam (HgA)</i>	Sta. 105+00 to Sta. 115+00
<i>Cobbly alluvial land (Ck)</i>	Sta. 115+00 to Sta. 125+00
<i>Newton gravelly loam (NeE2)</i>	Sta. 125+00 to Sta. 135+00
<i>Honn fine sandy loam (HgA)</i>	Sta. 135+00 to Sta. 146+00
<i>Tehama loam (TbA)</i>	Sta. 146+00 to Sta. 155+00
<i>Newton gravelly loam (NeE2)</i>	Sta. 155+00 to Sta. 158+00
<i>Tehama loam (TbA)</i>	Sta. 158+00 to Sta. 161+00
<i>Sehorn silty clay (SeD)</i>	Sta. 158+00 to Sta. 165+00
<i>Newton gravelly loam (NeE2)</i>	Sta. 165+00 to Sta. 168+00
<i>Sehorn silty clay (SeD)</i>	Sta. 168+00 to Sta. 174+00
<i>Tehama loam (TbB)</i>	Sta. 174+00 to Sta. 179+00
<i>Sehorn silty clay (SeD)</i>	Sta. 179+00 to Sta. 182+50
<i>Tehama loam (TbB)</i>	Sta. 182+50 to Sta. 188+50
<i>Sehorn silty clay (SeD)</i>	Sta. 188+50 to Sta. 192+50

Table 3 (Continued): USDA Soil Survey Units along Route 299 Project Interval from Station 236+00 to Station 560+00.

Soil Name	Station Interval
<i>Tehama loam (TbB)</i>	Sta. 192+50 to Sta. 231+00
<i>Churn gravelly loam (CeA)</i>	Sta. 231+00 to Sta. 236+00
<i>Coobly alluvial land (Ck)</i>	Sta. 236+00 to Sta. 239+00
<i>Churn gravelly loam (CfA)</i>	Sta. 239+00 to Sta.244+00
<i>Tehama loam (TbB)</i>	Sta. 244+00 to Sta. 247+00
<i>Millsholm gravelly loam (MeD)</i>	Sta. 247+00 to Sta. 297+00
<i>Tehama loam (TbA)</i>	Sta. 297+00 to Sta.310+50
<i>Anderson gravelly sandy loam (Ad)</i>	Sta. 310+50 to Sta. 322+00
Rockland (RxF)	Sta.322+00 to Sta. 327+00
<i>Gaviota very rocky sandy loam (GbD)</i>	Sta.327+00 to Sta. 367+00
<i>Auburn clay loam (AsD2)</i>	Sta. 367+00 to Sta. 430+00
<i>Toomes very stony loam (TeD)</i>	Sta. 430+00 to Sta. 450+00
<i>Toomes very rocky loam (TcE)</i>	Sta. 450+00 to Sta. 477+50
<i>Toomes very stony loam (TeD)</i>	Sta. 477+50 to Sta. 485+00
<i>Toomes very rocky loam (TcE)</i>	Sta. 485+00 to Sta. 500+50
<i>Toomes very stony loam (TeD)</i>	Sta. 500+50 to Sta. 538+50
<i>Boomer gravelly loam (BkD)</i>	Sta. 538+50 to Sta. 560+00

Based on USDA Soil Survey for Shasta County Area, California a range of soil engineering properties for most of the soils within the project limits is shown in the table below.

Table 4. Soil Engineering Properties*

Soil Name	Depth (in)		Soil Texture	Unified Soil Classification	Rock Clasts >3 in	Percent Passing Sieve				Atterberg Limits		Shrink Swell Potential
	To Bed-rock or Hardpan	Typical Profile				4	10	40	200	Liquid	Plastic	
Churn (CeA, CeB, CfA, CfB)	> 60	0 - 13 13 - 60	Gravelly loam Gravelly clay loam	SM or SC CL	- -	70 - 85 80 - 90	60-70 60-70	50-60 55-65	35-45 50-60	20-30 25-35	0-10 10-20	Low Moderate
Clough (CgB)	16 - 30	0-18 18-29 29-44 44-60	Gravelly Loam— V. Gravelly Clay and Clay Loam. Strongly Cemented Hardpan Stratified old mixed alluvium	SM or SC GC -- --	-- -- -- 0-50	70-85 40-60 -- --	55-65 30-50 -- --	50-60 25-40 -- --	35-45 20-35 -- --	20-30 50-60 -- --	0-10 25-35 -- --	Low Low -- --
Redding(Rd A,RdB)	12 - 30	0-6 6-13 13-28 28-60	Gravelly Loam Clay Hardpan Mixed Old Stratified Alluvium	SM CH-MH -- --	-- -- -- 0-50	75-85 95-100 -- --	70-80 90-95 -- --	60-70 85-95 -- --	40-50 75-85 -- --	25-35 60-70 -- --	0-10 30-40 -- --	Low Moderate -- --
Newton (NE2, NeE2, NeD)	>60	0-18 8-18 18-35 35-65	Gravelly Loam Very Gravelly Clay Loam Clay Silty Clay Loam	SM GC CL CL	1-3 -- -- --	65-75 40-60 90-100 90-100	50 60 35-50 85-95 90-100	35-45 30-40 70-80 65-75	20-35 25-35 50-60 50-60	-- 20-30 35-45 20-30	NP 10-20 15-25 10-20	Low Low High Moderate
Cobbly Alluvial Land (Ck)												
Perkins (PoB)	>60	0-10 10-60	Gravelly Loam Gravelly Clay Loam	SC SC	-- --	80-90 75-90	70-85 70-85	50-65 50-65	35-45 40-50	20-30 30-40	5-15 15-25	Low Moderate
Honn (HgA)	>60	0-17 17-46 46-60	Gravelly Sandy Loam (fine sandy loam in places) Gravelly Sandy Clay Loam. V. Gravelly Sandy Clay Loam.	SM SC GC	-- -- --	65-85 65-85 40-55	60-75 60-75 35-45	50-65 50-65 30-40	15-25 25-35 15-25	-- 20-30 20-30	NP 10-20 10-20	Moderate Low Moderate
Tehama Loam (TbA, TbB)	>60	0-30 30-45 45-60	Loam Silty Clay Loam Very Gravelly Clay Loam.	ML CL GC	-- -- --	100 100 30-60	95-100 95-100 20-50	85-95 85-95 15-40	65-75 85-95 10-25	25-35 30-40 30-40	0-10 20-30 15-25	Low Moderate Low
Sehorn Silty Clay (SeD)	18-48	0-28 28	Silty Clay & Silty Clay Loam. Weathered Shale	CH	3-15	95-100	95-100	85-95	80-90	70-80	45-55	High
Millsholm Gravelly Loam (MeD)	6-18	0-16 16	Gravelly Loam Sandstone and Conglomerate	SC	--	65-85	60-80	35-45	25-35	25-35	10-20	Low
Anderson Gravelly Sandy Loam (Ad)	>60	0-24 24-60	Gravelly Sandy Loam Very Gravelly Sand	SM GM-GP or GM SM	0-5 0-20	85-90 40-60	50-75 30-50	45-60 25-35	15-25 5-15	-- --	NP NP	Low Low
Rock land (RxF)												

*Based on USDA Soil Survey of Shasta County Area, California, August 1974

Table 4 (Continued). Soil Engineering Properties*

Soil Name	Depth (in)		Soil Texture	Unified Soil Classification	Rock Clasts >3 in	Percent Passing Sieve				Atterberg Limits		Shrink Swell Potential
	To Bed-rock or hardpan	Typical Profile				4	10	40	200	Liquid	Plastic	
Gaviota very rocky sandy loam (GbD)	6-18	0-17 17	Sandy Loam Hard Sandstone	SM	-- --	90-100	90-95	60-70	25-35	--	NP	Low
Auburn Clay Loam (AsD2)	12-30	0-27 27	Gravelly Clay Loam. Metabasic Rock.	ML or CL	--	65-100	60-85	55-70	50-60	30-40	5-15	Low
Tommes Very stony and rocky loam (TcE, TeD)	6-18	0-11 11	Stony Loam Tuff Breccia	ML or CL	10-20	75-85	70-80	60-70	55-65	25-35	5-15	Low
Boomer gravelly loam (BkD)	42->60	0-23	Gravelly Clay Loam.	CL	3-15	75-85	65-80	60-75	55-65	30-40	15-25	Moderate
		23-45 45	Clay Loam Weathered Greenstone	CL --	-- --	100 --	90-100 --	85-95 --	65-75 --	30-40 --	15-25 --	Moderate --

*Based on USDA Soil Survey of Shasta County Area, California, August 1974

The following is a description of the soils present within the project limits.

Churn Series

Representative Profile: The surface layer is light yellowish-brown, medium acid gravelly loam about 9 in thick. The upper part of the subsoil is light yellowish-brown medium acid gravelly loam about 4 in thick. The lower part of the subsoil is light yellowish-brown to strong-brown, medium acid gravelly clay loam that extends to a depth of more than 60 in.

Churn gravelly loam, 0 to 3 percent slopes (CeA) consist of well drain drained soils with moderately slow permeability. This soil has the profile described as representative for the series. This soil formed in alluvium from mixed sources. The content of gravel is 15 to 30 percent throughout the profile. Degree of limitation for excavation is slight

Churn gravelly loam, 3 to 8 percent slopes (CeB) consists of well drained with moderately slow permeability soil. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Degree of limitation for excavation is slight

Churn gravelly loam, 0 to 3 percent slopes (CfA) consists narrow channeled valley bottoms soil. It is moderately well drained. This soil has the profile described as representative for the series except that consolidated alluvium is 36 to 60 inches. Permeability and runoff are slow. Degree of limitation for excavation is slight

Churn gravelly loam, 3 to 8 percent slopes (CfB). This soil has the profile described as representative for the series except that consolidated alluvium is 36 to 60 inches. This soil is well drained and permeability is slow. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Degree of limitation for excavation is slight

Clough Series

Representative profile: the surface layer is brown, medium acid gravelly loam about 18 in thick. The subsoil is light yellowish-brown, very strongly acid very gravelly clay and very gravelly clay loam about 11 in thick. Below this layer is a strongly cemented hardpan about 15 in thick. Below the hardpan is stratified mixed alluvium.

Clough gravelly loam, 3 to 8 percent slopes (CgB). It has very slow permeability. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Degree of limitation for excavation is moderate to severe.

Redding Series

Representative profile: The surface layer is strong-brown, strongly acid gravelly loam about 5 in thick. The subsoil is mixed, reddish-brown and red, strongly acid clay that extends to a depth of about 13 in. Below this layer is an indurate very gravelly hardpan about 15 in thick. Stratified mixed alluvial material is below the hardpan.

Redding gravelly loam, 3 to 8 percent slopes (RdB). This soil has very slow permeability with a runoff slow to medium, and the hazard of erosion is slight to moderate. Degree of limitation for excavation is moderate to severe.

Newton Series

Representative profile: The surface layer is brown, slightly acid gravelly loam and mixed very pale brown and brown, slightly acid silty clay loam about 18 in thick. The subsoil is brown, strongly acid clay and pale-brown, strongly acid silty clay loam. At a depth of about 65 in, the substratum is pale-brown, neutral cobbly silty clay loam.

Newton gravelly loam, 15 to 30 percent slopes (NeD). It has slow permeability and runoff is medium to rapid, and the hazard for erosion is moderate to high. Degree of limitation for excavation is slight

Newton gravelly loam , 30 to 50 percent slopes, eroded (NeE2). This soil has slow permeability. Runoff is medium to rapid, and the hazard of further erosion is moderate to high. Degree of limitation for excavation is slight

Cobbly Alluvial Land

Cobbly Alluvial Land, frequently flooded (Ck). It consists of very gravelly or very cobbly sandy alluvium. It is nearly level and is on flood plains and in old channels of larger streams. Cobbly alluvial land, frequently flooded, is excessively drained, and it has very rapid permeability. Runoff is very slow, and the hazard of erosion is very severe. Degree of limitation for excavation is moderate to severe.

The vegetation is a sparse to dense cover of annual grasses, digger pine, cottonwood, sycamore, willow, and oaks.

Honn Series

Representative profile: The surface layer is grayish-brown, medium acid gravelly sandy loam, about 8 in thick, and brown, medium acid gravelly heavy sandy loam about 9 in thick. The subsoil is medium acid gravelly sandy clay loam about 29 in thick. It is brown and pale-brown in the upper part and light brownish-gray and dark yellowish-brown in the lower part. The substratum is light-gray, slightly acid, very gravelly sandy clay loam about 15 in thick.

Honn fine sandy loam, 0 to 3 percent slopes (HgA). This soil has a profile similar to that described as representative for the series, except that it has a surface layer of fine sandy loam about 20 in thick. Permeability is moderately slow. Runoff is very slow, and the hazard of erosion is none to slight. Degree of limitation for excavation is slight

Perkins Series

Representative profile: The surface layer is brown, slightly acid gravelly loam about 10 in thick. The subsoil is yellowish-red and reddish-brown, slightly acid gravelly clay loam about 44 in thick. The substratum is slightly acid, yellowish-red gravelly clay loam that extends to a depth of more than 60 in.

Perkins gravelly loam, moderately deep, 3 to 8 percent slopes (PoB). This soil has a profile similar to the one described as representative for the series, except that it is 24 to 36 inc deep over a weakly consolidated substratum that restrict penetration of plant roots. This soil is moderately well drained and has very slow permeability. Runoff is slow to

medium, and the hazard of erosion is slight to moderate. Degree of limitation for excavation is slight

Tehama Series

Representative profile: The surface layer is pale-brown, medium acid and slightly acid loam about 30 in thick. The upper part of the subsoil is pale-brown and light yellowish-brown, neutral silty clay loam that grades, at a depth of about 45 in, to yellowish-brown, neutral very gravelly clay loam.

Tehama loam, 0 to 3 percent slopes (TbA). This soil has the profile described as representative for the series. Permeability is slow and runoff is very slow. The hazard of erosion is none to slight. Degree of limitation for excavation is slight

Tehama loam, 3 to 8 percent slopes (TbB). This soil has the profile described as representative for the series, except that sedimentary rock is at a depth of 48 to more than 60 in. Permeability is slow and runoff is very slow. The hazard of erosion is none to slight. Degree of limitation for excavation is moderate.

Sehorns Series

Representative profile: The surface layer is light olive-brown, slightly acid silty clay about 20 in thick. The substratum is mottled, grayish-brown light olive-brown, and yellowish-brown, neutral silty clay loam. Weathered calcareous shale is a depth of about 28 in.

Sehorns silty clay, moderately deep, 8 to 30 percent slopes (SeD). This soil has slow permeability. Runoff is medium to rapid, and the hazard of erosion is moderate to high. Weathered bedrock is at a depth of 16 to 28 in. Degree of limitation for excavation is moderate.

Millsholm Series

Representative profile: The surface layer is grayish-brown and light brownish-gray, slightly acid gravelly loam about 7 in thick. The subsoil is brown, medium acid gravelly loam. Sandstone and conglomerate are at a depth of 16 in.

Millsholm gravelly loam, 3 to 30 percent slopes (MeD). This soil has moderate permeability. Runoff is medium to rapid, and the hazard of erosion is moderate to high. Degree of limitation for excavation is moderate to severe.

Anderson Series

Representative profile: The surface layer is brown, medium acid gravelly sandy loam about 14 in thick. The surface layer is underlain by a layer of strong-brown, medium acid gravelly sandy loam about 10 in thick. The next layer is strong-brown, medium acid very gravelly sand that extends to a depth of more than 60 in.

Anderson gravelly sandy loam (Ad). This soil has de profile described as representative for the series. Permeability is rapid. Runoff is slow, and the hazard of erosion is none to slight. Degree of limitation for excavation is slight to moderate.

Rock Land

Rock land (RxF) consist of shale, sandstone, conglomerate, limestone, greenstone quartz diorite, andesite, basalt, rhyolite, schist, gneiss, serpentine, or peridotite. It is nearly level to very steep and is on uplands in the mountainous parts. Rock outcrops cover 25 to 90 percent of the surface. Elevation ranges from 700 to 6900 ft. Degree of limitation for excavation is severe.

The vegetation, where present, is similar to that on adjacent soils, except that Rock land has less grass and more drought-resistant plant species, such as canyon live oak, manzanita, toyon, buckeye, and yerba santa.

Gaviota Series

Representative profile: The surface layer is yellowish-brown, medium acid and slightly acid sandy loam about 17 in thick. It is underlain by hard sandstone.

Gaviota very rocky sandy loam, 0 to 30 percent slopes (GbD). This soil has the profile described as representative for the series. It is well drained and has moderately rapid permeability. Runoff is medium to rapid, and the hazard of erosion is moderate to high. Degree of limitation for excavation is severe.

Auburn Series

Representative profile: The surface layer is yellowish-red, medium acid clay loam about 5 in thick. The subsoil is yellowish-red, medium acid gravelly clay loam. Decomposed greenish-gray, slightly acid metavolcanic rock mixed with gravelly clay loam is at depth of about 27 in.

Auburn clay loam, 8 to 30 percent slopes, eroded (AsD2). This soil has the profile described as representative for the series. Permeability is moderate. Runoff is medium to rapid, and the hazard of further erosion is moderate to high. Degree of limitation for excavation is severe.

Toomes Series

Representative profile: The surface layer is brown, slightly acid very stony and stony loam. Tuff breccia is at a depth of about 11 in.

Toomes very rocky loam, 0 to 50 percent slopes (TcE). This soil is somewhat excessively drained and has moderate permeability. Runoff is medium to rapid, and the hazard of erosion is moderate to high. Degree of limitation for excavation is severe.

Toomes very stony loam, 0 to 30 percent of slopes (TeD). This soil has the profile described as representative for the series. It is well drained. Permeability is moderate. Runoff is medium to rapid, and the hazard of erosion is moderate to high. Degree of limitation for excavation is severe.

Boomer Series

Representative profile: The surface layer is light brown, medium acid gravelly loam about 3 in thick. The subsoil, to a depth of about 11 in, is reddish-yellow, medium acid gravelly sandy clay loam. Below this, the subsoil is red, medium acid gravelly clay loam, clay loam, and silty clay loam. Red, medium acid, strongly weathered and fracture greenstone is at a depth of 45 in.

Boomer gravelly loam, 15 to 30 percent slopes (BkD). This soil has the profile described as representative for the series. This soil has moderately slow permeability. Run off is medium to rapid, and the hazard of erosion is moderate to high. Weathered bedrock is at a depth of 40 to more than 60 in. Degree of limitation for excavation is severe.

Ground Water

No recent ground water information from the project area was available for our review. However, according to the United States Geological Survey (Pierce, 1983), the groundwater gradient in this area is toward the Sacramento River, or south-southwest. Ground water levels generally follow the topographic gradients, that is, ground water level elevations will be higher on the east toward the foothills of the Sierra and gradually taper down toward the center of the valley. The elevations of the ground water west of

Bella Vista varied from 575 to 650 ft above msl approximately. The corresponding depths for these elevations are approximately 5 feet deep at the lowest point at Dry Creek, to 15 to 30 feet deep at the beginning of the project. From Bella Vista to the fringe of the foothills, the elevations of the ground water levels may vary from 600 to 650 ft above msl. The corresponding depths for these elevations are between few feet to 25 feet below ground surface. The elevations of the ground water levels in this section may be correlated to the running water levels of the different creeks, including Salt Creek, Yank Creek and Dry Creek. Ground water may discharge into the creeks through springs and seeps. From the beginning of the foothills to the Diddy Wells Fire Control Station, ground water levels may vary 650 to 800 ft above msl. The corresponding depths for these elevations are approximately 150 to 400 ft below the surface.

During our visits to the project site in March and June 2009, no springs were observed along the project interval. However, running water was observed through culverts located between stations 156+60 and 186+00 (PM 33.06 and 33.60). It is anticipated that ground water will generally not interfere with the slope excavations and placement of the fills. Conversely, the presence of water at these culverts indicates that ground water or perched ground water may be encountered during the excavation of the slopes located in the vicinity or between the vicinities of the culverts located. The contractor should be aware of the presence of ground water during the excavation of the slopes within the mentioned road interval.

5. Geophysical Investigation and Subsurface Conditions

The seismic refraction survey performed from May 5 to May 15, 2009 consists of five seismic lines of variable length at various locations. These seismic lines were positioned to image as much bedrock in the cut slopes as possible (See Figure 9, Seismic Survey Line Locations). Seismic refraction data was recorded using an EG&G Smartseis 24-channel seismograph with 14 Hz geophones. The energy source employed was a hammer and striker plate, or a downhole seisgun using 8 gauge blank shells. Refraction data from each shot were stored in a seismograph's memory. Both profile geometry and refraction data were backed-up to paper and floppy disk upon completion of the survey.

Profiles in the seismic refraction survey report were presented in terms of velocity units. A velocity unit is a three-dimensional unit which, due to its elastic properties and density, propagates seismic waves at a characteristic velocity or within a characteristic velocity range. Velocities denoted in that report and in the seismic refraction sections are expressed in meters per second. At least one velocity is present within a geological rock unit. In addition, each weathered zone, or fractured zone within that geological unit can constitute its own velocity unit. Conversely, when two units such as water saturated gravel and moderately weathered rock propagate seismic waves at the same velocity and

are adjacent to each other, both units would be part of the same velocity unit. Lastly, discontinuous velocities might result from variation in the degree of alteration in the form of physical and chemical weathering and should be considered in the interpretation of the data.

Ripping ability is based on unpublished Caltrans data for a Caterpillar D9 series bulldozer with a single-tooth ripper. These values are presented in the table below and are as follows:

Table 5: Ripping Ability Values

Ripping Ability		
Velocity (m/s)	Velocity (ft/s)	Rippability
<1050	<3445	Easily Ripped
1050 – 1500	3445 - 4920	Moderately Difficult
1500 – 2000	4921 - 6560	Difficult Ripping
>2000	>6560	Not Rippable

Different excavation equipment may experience different results. Penetrating efficacy of the ripping tooth is often more important in predicting ripping success than seismic velocity alone. Undetected block or lenses of high-velocity material may also be present within rippable zones, requiring blasting or other means of mechanical breakage for excavation.

Seismic Refraction Survey Results

Results of the seismic refraction survey, including the number of layers and their thickness, line stationing and length, inferred material, and rippability of the materials encountered are summarized in Table 6.

Table 6: Seismic Refraction Survey Data

Line			Layer					
Num	Approx. Stationing (ft)		Length (ft)	Num.	Average Thickness (ft)	Average Velocity (ft/s)	Inferred Material	Rippability
	From	To						
1	363+00	364+60	160	1	5.0	1200	Colluvium	ER
				2	25	4000	Weathered sediments	MD
				3	N/A	8700	Less weathered sediments	NR
2	381+40	383+00	160	1	4	1200	Colluvium	ER
				2	12-20	3000-5000	Weathered sediments	MD
				3	N/A	9800	Less weathered sediments	NR
3	411+40	413+00	160	1	0-8	1200	Colluvium	ER
				2	20-37	4000	Weathered sediments	MD
				3	N/A	7500	Less weathered sediments	NR
4	526+70	531+70	500	1	4	1200	Colluvium	ER
				2	1-32	3000-5000	Weathered Volcanics	MD
					N/A	6800	Less weathered sediments	NR
5	534+30	537+80	350	1	8	1200	Colluvium	ER
				2	4-28	5000	Baked Soil?	DR
				3	N/A	9800	Weathered Volcanics	NR

ER = Easily ripped, MD = Moderately Difficult, DR = Difficult Ripping, NR = Not Rippable.

Seismic refraction survey results at line 1, from station 363+00 to 364+60 (PM 36.97 to 37.0) show that materials in the slope, sandstone, siltstone and shale, are rippable except for the altered rock imaged below road grade. The average seismic refraction velocity 8700 ft/s indicates that this rock material can not be excavated with conventional tools (See Figure 33, Cut Slope Photographs). It appears that the non-rippable bedrock is beyond the construction limits of the slope and consequently, will not interfere with the slope construction efforts.

The seismic velocities at Line 2, from station 381+40 to 383+00 (PM 37.32 to 37.35) imaged non-rippable materials, above road grade, from few feet to approximately 30 ft thick. These materials are classified as hard sandstone, siltstone and shales. These materials are not rippable with conventional excavation equipment. The construction of the new cut slope will require controlled blasting to reduce damage of the slope face and reduce long-term highway maintenance. (See Figure 36, Cut Slope Photographs).

Based on the seismic refraction, the material encountered in Line 3, from station 411+40 to 413+00 (PM 37.88 to 37.91) on southbound direction cut slope, is considered to be easy to difficult ripping. This material can be excavated with conventional equipment. Conversely, hard bedrock, found from 28 to 22 feet below road grade, classified as hard sandstone, siltstone and shale, is considered non-rippable. (See Figure 39, Cut Slope

Photographs). Because bedrock is encountered beyond the excavation, it will not hamper the construction efforts of the slope. However, the same bedrock outcrops on the opposite cut slope, the northbound road cut slope. Hard sandstone, siltstone and shale can be observed on the road cut slope. This cut slope is not included in the road rehabilitation efforts. If for any reason the designer or the contractor decides to re-grade this slope, then controlled blasting will be required. (See Figure 40, Cut Slope Photographs)

Material imaged on Line 4 from station 526+70 to 531+70 (PM 40.07 to 40.16) is regarded as pyroclastic origin with occasional hard basalt boulders. The size of these basalt boulders varies from 1 to 5 feet in diameter. This imaged material has seismic velocities that correspond to an easily rippable material. However, unrippable material is right below road grade, if not at road grade between stations 528+40 and 529+60 (PM 40.07 to 40.09). It is very likely that the non-rippable material is volcanic bedrock. Seismic velocities for this material above road grade indicate that most of the excavation will be possible using conventional excavation equipment. Should unrippable material be found, it will be up to the contractor to decide to use either blasting or mechanical means of excavation. Based on the seismic refraction results, the volume of unrippable material may not be enough to warrant blasting methods. Should boulders equal or greater to 5 feet in diameter be encountered during the construction of the slope, it is recommended that boulder reduction be used. Boulder reduction methods include the use of hydraulic splitters, chemical expanders and hoe rams. (See Figure 45, Cut Slope Photographs).

Seismic line 5 is the continuation of the previous seismic line at the same cut slope (Station 526+70 to 538+80). This seismic line, from station 534+30 to 537+80 (PM 40.21 to 40.28), did not image any unrippable material to road grade at and above elevation 1187 ft above msl. The slope is underlain by material of pyroclastic origin with occasional hard basalt boulders. The size of these basalt boulders varies from 1 to 5 feet in diameter. However, non-rippable material is found immediately below grade from station 535+90 to 536+20 (PM 40.51 to 40.516). This material may interfere with the construction of the proposed slope if found above road grade. It will be up to the contractor to decide to use either blasting or mechanical means of excavation since the volume of bedrock that may be encountered is small enough to use both excavation methods. Should boulders equal or greater to 5 feet in diameter be encountered during the construction of the slope, it is recommended that boulder reduction methods be used. (See also Figure 45, Cut Slope Photographs).

Field Observations

The field observations and the geotechnical recommendations for the cut slopes are based on limited cross sections and satellite images as well as on our visits to the project in May

and June 2009. The proposed cut slope ratios that were not provided in the cross section plans are being included in this report section for recommendation to the Engineer.

Slope between Stations 39+00 to 48+00 (PM 30.9 to 31.1)

Material in the cut slope between station 39+00 and 48+00 (PM 30.9 and 31.0) consists of silty sand capped by a 1 to 2 feet thick, partially cemented conglomerate. Most of the conglomerate clasts are fine to medium gravel size. The road cut slope seems to be performing adequately. It is anticipated that this conglomerate can be excavated with conventional excavation equipment although it is considered difficult ripping. The existing slope ratio is 1:1 (H:V) and its maximum height is approximately 25 feet. It is recommended that re-grading the existing slope to its existing slope ratio or flatter be completed. (See Figure 11, Cut Slope Photographs).

Slopes between Stations 52+00 and 62+00 (PM 31.08 and 31.27)

Two main road cuts are located within this road interval. The first cut slope located at 52+00 is benched in its lower section. The slope ratio of the lower section is 1.5:1 (H:V) and the upper section is approximately 1:1. The slope ratio of the slope at station 57+00 (PM 31.2) is 1:1 with a maximum height of 15 feet. The lithologic composition of the slopes within this interval consists of dense to medium dense silty sand and sandy silts with gravel. The slopes show signs of erosion in the upper section, but in general seem to be performing relatively well. Because of the lithologic composition of the slopes it is recommended that the slopes be re-graded to 2:1 or flatter as it has been proposed in the Design Study plans. Based on our field observations the slope material is considered easily rippable with conventional excavation equipment. (See Figures 12 through 14, Cut Slope Photographs)

Slopes between Stations 99+00 and 135+00 (PM 31.95 and 32.64)

Two major road cut slopes located in this road interval have slopes ratios of 1:1 with a maximum height of 15 and 25 feet. These slopes are vegetated with grasses. The material in the two slopes consists of gravelly silty sand. Slopes are performing adequately, although that the top section of the southbound slope is moderately eroded. Field observation indicates that this material is rippable with conventional excavation equipment and they can be re-graded to 1.5:1 ratio or flatter to avoid erosion of the slopes. (See Figures 15 through 17, Cut Slope Photographs)

Slopes between Stations 152+00 and 195+00 (PM 32.98 and 33.77)

Road cut slopes within this road interval have slopes ratios that vary from 1.5:1 to 1:1 and maximum height ranging from 15 to 35 feet approximately. These slopes are vegetated with grasses. The material contained in these slopes consists of decomposed shale and siltstone. The slopes are performing adequately. This soil product of this material has been classified as Sehorn silty clay that is characterized as having a high swell-shrink potential. Additionally, the clay and its parent material are regarded as degradable not only by exposing to the them open air but also by ground water conditions. The slope material can be excavated with conventional excavation equipment and may be re-graded 1:1 or flatter. It is recommended that the use of this material in the construction of fills be avoided. Moreover, our Office recommends that surface runoff be controlled by constructing an adequate surface drainage such as diversion ditches, upslope drainage ditches, and interception drains to prevent the infiltration of surface runoff in the slopes. Perched ground water may be encountered during the construction of the slopes between stations 156+60 and 186+00 approximately (PM33.06 and 33.60). (See Figures 18 through 22).

Slope at Station 243+00 to 254+00 (PM 34.68 to 34.91)

The road cut slope at this station is benched. The section below the bench has a slope ratio of 1:1. The slope ratio for the section above the bench varies from 1.5:1 to 2:1. Maximum height of the slope is 25 feet. The slope is vegetated with grass and is performing well. The material in the slope consists of gravelly clayey silt and gravelly silty clay product of decomposition of shale and siltstone. The gravel fraction is consists of elongated and moderately hard shale and siltstone. In general, the soils drape the decomposed shale and are approximately 1.0 to 1.0 foot thick. The decomposed shale is considered moderately hard and friable. The shrink-well potential of this soil is low to moderate. Based on field observation, the material in the slope is considered rippable and can be excavated with conventional excavation equipment. The slope can be re-graded to a slope ratio of 2:1 to prevent erosion of the slope materials. (See Figure 23, Cut Slope Photographs).

Slopes between Stations 262+40 and 283+00 (PM 35.05 and 35.44)

Road cut slopes within this interval have slope ratios that range from 0.75:1 to 1:1 with maximum heights that range from 10 to 40 feet. The slopes are performing adequately except for that at station 262+40 (PM 35.05) where slope erosion has taken place in the upper section. Slopes are vegetated with grass with the exception of the one mentioned above. The material in the slopes consists of thin bedded, weathered to decomposed sandstone, siltstone and shale with cobble to boulder size rounded concretions. Dislodged

cobble-sized concretions were observed at the toe of the slope and in the shoulder area. The material is moderately hard and considered difficult ripping. Our office recommends that the slopes be re-graded to at least 1.5:1 to prevent erosion of the slope material and to reduce the rock fall potential of the cobble and boulder-sized concretions dislodged by the erosion of the parent material. An alternative to the latter recommendation would be a constructing a catchment area adjacent to the cut slope which will be re-graded to the existing slope ratio. The catchment area or basin will be 6 feet wide with a slope ratio of 4:1 (H:V) or 13 feet wide with a slope ratio of 6:1. At least 50 percent of the rock fall will be retained in the basin at the area where the slope is the highest. This retained rock percentage will increase as the slope height diminishes. In this option, a smaller amount of volume of material needs to be excavated to construct the proposed slope. (See Figures 10, Catchment Basin, and 24 through 27, Cut Slope Photographs).

Slopes between Stations 287+00 and 310+50 (PM 35.51 and 35.96)

There are three major cut slopes within this interval and each has two different slopes ratios. The lower section has a gradient of 1:1, whereas the upper section has a slope ratio of 1.5:1 to 2:1. The height of the slopes varies from 10 to 50 feet and they seem to be performing well. They are vegetated with grass. The material in the cut slope at 287+00 is composed of silty sand with hard gravel and scattered hard boulders. This material is a product of decomposition of thin bedded and hard sandstone. The material in the other two cut slopes at station 302+00 and 307+30 (PM 35.82 and 35.96) consist of weathered to decomposed, thinly bedded, cemented to partially cemented, hard to very hard sandstone. The sandstone is regarded as difficult ripping and can be excavated with conventional excavation equipment. It is recommended that the proposed slopes be re-graded to a ratio of 1.5:1 or flatter. (See Figures 28 and 29, Cut Slope Photographs).

Slopes at Stations 321+20 and 331+00 (PM 36.14 and 36.34)

There are two cut slopes within this road interval. The first slope has a slope ratio of 1:1 and maximum height of 15 feet while the second slope is only 3 feet high. Both slopes are vegetated with grass and they seem to be performing well. The material in both slopes consists of hard, massive and well cemented sandstone. It is anticipated that this material is non-rippable and it is recommended that non-blasting methods such as hydraulic splitters, hoe-rams and chemical expanders be utilized for hard rock excavation. Blasting methods are not recommended because of the proximity of a residential structure. The slope can be re-graded to the existing slope ratio. (See Figure 30, Cut Slope Photographs).

Slopes between Stations 351+50 and 371+60 (PM 36.74 and 37.12)

Cut slope ratios, at this road interval, range between 0:75:1 and 1:1. The height of the slopes varies from 8 to 30 feet. Slopes are performing well and are vegetated with grasses except slope at station 340+00 (PM 36.76). This slope has been partially eroded and is mostly denuded of vegetation. The upper section of this slope is populated with manzanita trees and mature pine trees. These slopes are comprised of weathered to decomposed, laminated, sandstone and siltstone overlying hard, fissile shale. A portion of this road interval was seismically surveyed and showed that this material is rippable with conventional excavation equipment. The seismic survey also imaged non-rippable bedrock below road grade and it is anticipated that the bedrock will not interfere with the slope re-grading efforts. It is recommended that the slopes within this road interval be re-graded to at maximum ratio of 2:1 to avoid erosion of the decomposed bedrock. (See Figures 31 through 33, Cut Slope Photographs).

Slopes between Stations 375+50 and 413+00 (PM 37.18 and 37.92)

This road interval is characterized for its cut rock slopes. The slope ratio and height of these slopes varies 0.75:1 to 1:1 and 15 to 50 feet. Some areas of the slopes are vegetated with grass, but wherever bedrock outcrops the slopes are denuded of any kind of vegetation. Mature trees populate the upper section of the slopes. The slopes seem to be performing well. Bedrock, consisting of metasedimentary sandstone, siltstone and shales, is very hard, fractured and weathered. The construction of the slope at station 381+00 (PM 37.27) will require controlled blasting to reduce damage of the slope face and reduce long-term highway maintenance, in addition to control overbreak at the excavation limits. The material of the slopes at 376+00 and 393+00 and 404+00 (PM 37.20, 37.51 and 37.76) is considered difficult ripping because the bedrock is partially decomposed and blasting as well as non-blasting methods may be required. These slopes may be re-graded to 1.5:1 to avoid the erosion of the decomposed bedrock. (See Figures 34 through 40, Cut Slopes Photographs).

Slope stability analysis on slope at station 381+00 (PM 37.29) indicate that there are two prevalent fractures. The intersection of these fractures produces blocks of maximum size of 5 by 5 feet, with an average size of 1 by 1 feet. In addition, numerous non-persistent fractures were observed in the outcrop creating small blocks and/or slabs of rock. The slope stability analysis indicates that these fractures do not present any unstable conditions and the slope can be re-graded to a slope ratio equal to the existing slope ratio. The rock slope stability analysis for this slope was performed using the computer program ROCKPACK III BETA version 3.1.0. It was observed that the presence of few dislodged rocks resting on the road ditch indicates that the existing rockfall potential is minor. According to the area Maintenance Supervisor, David Handa (personal communication),

minor rockfall occurs at this location and in general, it does not present a problem to the vehicular traffic.

Slopes between Stations 420+50 to 442+00 (PM 38.07 and 38.46)

Cut slope ratios and heights at this road interval ranged from 1:1 to 0.75:1 and 10 to 15 feet. The composition of the slopes in the lower section of the slope is comprised by decomposed, soft to moderately hard volcanic ash whereas the upper section is partially cemented volcanic ash with sub-rounded volcanic boulders. The size of these boulders ranges from 1 to 3 feet. The slopes are performing moderately well because they seem to be stable, but deep erosion of the soft volcanic ash can be observed along the length of the slope. Slopes are vegetated with grass where erosion has not taken place and are populated with mature trees at the top of the slope. The construction of the slope will be accomplished with conventional excavation equipment. It is recommended that the slopes be re-graded to 2:1 to prevent the removal of the soft materials due to erosion. (See Figure 41, Cut Slopes Photographs).

Slope between Station 471+20 and 538+70 (PM 39.01 and 40.30)

The cut slopes located in this road interval has a slope ratio 1:1 with a maximum height of 25 feet. The composition of the cut slope between stations 526+70 and 538+80 (PM 40.07 and 40.30) (Line 4 and 5) has been discussed on the section Seismic Refraction Survey Results and it is applicable to that slope between stations 471+20 and 480+60 (PM 39.01 and 39.16). The slopes are vegetated with grasses with very sparse manzanita underbrush. The slopes seem to be performing well, although minor erosion can be observed in the upper section of the slope at station 526+70. Most of the construction of the slopes can be accomplished with conventional excavation equipment. Based on the results of seismic survey, our Office considers that a minor volume of hard bedrock may be encountered at road grade. Should unrippable material be found, it will be up to the contractor to decide whether to use blasting or mechanical means of excavation. The volume of bedrock that may be encountered may not be enough to warrant the use of blasting methods. It is recommended that the slopes be re-graded to 2:1 to prevent the removal of the soft materials due to erosion. (See Figures 42 through 45, Cut Slopes Photographs).

Slope between Station 541+20 and 549+00 (PM 40.35 and 40.5)

The cut slope located at this station has a slope ratio that ranges from 0.75:1 to 1:1 and is 20 feet high approximately. The slope material consists of slightly weathered to decomposed, bluish dark, hard metavolcanic bedrock. This metavolcanic rock decomposes to friable and soft reddish silty sand with clay. The slope seems to be

performing well, although erosion of the soft material is evident. It is vegetated with grasses where erosion has not taken place. Manzanita underbrush grows mainly on the decomposed bedrock. Slightly weathered bedrock is considered non rippable and will require controlled blasting to reduce damage of the slope face and reduce long-term highway maintenance. The section where decomposed material is present can be excavated with non-blasting methods such as hydraulic splitters, hoe-rams and chemical expanders. Our Office recommends that slopes be re-graded to 1.5:1 to avoid erosion of the soft decomposed bedrock. (See Figure 46, Cut Slopes Photographs).

6. Geotechnical Recommendations

Earthwork Factors

Earthwork factors, defined as the ratio of embankment to excavation volume, can be estimated from the seismic refraction velocities as demonstrated in published charts (Caltrans, 1978) and the geology of the area. According to the document, rounded gravel in a sandy clay matrix from the alluvial terraces located between PM 25.0 and 27.9 have an earthwork factor of 1.02. The same earthwork factor can be applied to the material located within stations 20+50 and 48+00 (PM 30.3 and 30.95) because of the lithological similarities.

The thinly moderately hard and thinly bedded sandstone, siltstone and shale located between stations 338+20 and 371+00 (PM 36.5 and 37.08) and below road grade have been assigned an approximate earthwork factor between 1.1 and 1.2. Outcropping material above this material, exposed on the road cuts and classified as weathered sandstone, siltstone and shale correspond to an approximated earthwork factor of 1.0. The thickness of the weathered material is approximately 20 feet. The upper 5 feet, colluvium has an earthwork factor of approximately 0.9.

The earthwork factor obtained for the slightly weathered metasedimentary rocks of the rock slopes found after PM 37.2 is approximately 1.4. For the weathered metasedimentary the approximated earthwork factor is between 1.0 and 1.1.

The non-rippable volcanic rocks from cut road slopes from PM 40.15 and 40.23 found at immediately below road grade, if not at road grade have an earthwork factor that range from 1.1 and 1.2. Pyroclastic material above the non-rippable volcanic rocks with a variable thickness ranging from 1 to 30 feet has an approximated earthwork factor of 1.0 or less.

Road Fills

It is assumed that some of the material used for the construction of the widening of the existing fills will be excavated from the cut slopes that will be re-sloped. Most of the material extracted during construction of the slopes is considered adequate for the construction of the fill except that located between stations 52+00 and 67+00 (PM 31.15 and 31.35), and stations 152+00 and 195+00 (PM 32+99 and 33.79). According to the United States Department of Agriculture, "Soil Survey of Shasta County Area, California", these soils have high swell-shrink potential and are considered non-suitable for construction of new fills.

Our Office considers that 4:1 to 2:1 side slopes proposed for the new fills will be adequate for the construction of the embankment fill.

Before slope removal or resloping of existing slopes, and placement of additional fill, clear and grub slopes and fill grades in accordance with the Caltrans Standard Specification, Section 16. Removal or resloping of the existing road slopes should be performed in accordance with Caltrans "Standard Specifications", Section 19-2. New fill shall be placed in accordance with Caltrans "Standard Specifications" (including in Section 19 titled "Earthwork").

Any non-structural fill material accumulated on top and sides of the fill must be removed prior to the placement of new fill. The Engineer must approve the prepared slope surface prior the placement of new fill.

Road Cut Slopes

Based on the layouts, cross-sections, and field observations, our Office proposes the following slope ratios shown in the table below. Slope dressing above the new cuts that may remove existing vegetation and cause more surficial erosion is not recommended.

Table 7: Proposed Road Cut Slope Ratios

Stationing		Post Mile		Approximate Maximum Vertical Height (ft)	Proposed Slope Ratio (H:V)
From	To	From	To		
39+00	48+00	30.90	31.10	25	1:1 or flatter
52+00	62+00	31.08	31.27	15	2:1 or flatter
99+00	135+00	31.95	32.64	15 – 25	1:5 or flatter
152+00	195+00	32.98	33.77	15 – 35	1:1 or flatter
243+00	254+00	34.68	34.91	25	2:1
262+00	283+00	35.05	35.44	10 – 40	1.5:1
287+00	310+50	35.51	35.96	10 – 15	1.5:1 or flatter
321+20	331+00	36.14	36.34	3 – 15	1:1
335+50	371+60	36.74	37.12	8 – 30	2:1
375+50	413+00	37.18	37.92	15	1.5:1
381+00	386+00	37.29	37.40	50	0.75:1
420+50	442+00	38.07	38.46	10 -15	2:1 or flatter
471+20	538+70	39.01	40.31	25	2:1 or flatter
541+20	549+70	40.35	40.50	20	1.5:1

Settlement

Our Office estimates that settlement of the proposed widened fills will be nominal (1 inch or less) and will occur substantially during construction.

Borrow Areas

Two areas have been located adjacent to Route 299 and within the project limits are to be used as borrow areas if material is needed for the construction of the road fills. The soil material located immediately north of the road interval from station 200+00 to 230+00 (PM 33.86 to 34.50) may be suitable for the construction of the widening of the existing fills. This soil has been classified as Tehama Series, silty clay loam overlaying gravelly clay loam based on United States Department of Agriculture, "Soil Survey of Shasta County Area, California". For practical purposes loams may best be referred as a mixture of sand, silt, clay and decay plant material. Additionally, the soils located immediately north of the road portion between stations 240+00 and 310+00 (PM 34.64 and 37.94), classified as Millsholm Series, may also be suitable for the construction of the proposed widening of the existing fills. These two soils have been regarded as poor to good and good materials for road fill according to United States Department of Agriculture, "Soil Survey of Shasta County Area, California". Testing of these areas is recommended to determine the suitability of these potential borrow areas.

Landslide Potential

Examination of satellite images and maps of the project area indicate that there is no evidence of significant landslides within the project limits.

Erosion

The soil erodibility factor, or K-factor, measures the susceptibility of soil particles to detachment and transport by rainfall or runoff. On other words, it indicates how likely a soil is to erode based on its physical and chemical properties. The soil erodibility factor ranges from 0.02 to 0.69. The lowest K-factor corresponds to sand (K= 0.02), whereas higher values are for silt (K = 0.6).

The soil materials classified as sandy silt and silty sand are susceptible to erosion when exposed on slopes, as it can be observed on the existing road cut slopes. Roads fills containing this material are also very susceptible to erosion. It is recommended that a landscape architecture be consulted regarding erosion prevention. The coefficient of erodibility for the soils from the proposed borrow areas classified as silty clay loam ranges from 0.37 to 0.32 for an organic content of less than 0.5 to 2 percent.

Perched Ground Water

Perched ground water may be encountered during the construction re-sloping of the existing cut slopes located between stations 152+00 and 195+00 (PM 32.99 and 33.79). It is recommended that dewatering methods be adopted in case of encountering perched ground water in order to facilitate construction.

Slope Stability

The proposed road fills range from less than 1 feet to over 50 feet high variable width. Proposed embankment side slopes will have a gradient that ranges from 2:1 to 4:1 (H:V). Fill material will generally consist of sandy clay with gravel from the proposed borrow areas. It is assumed that the unit weight of the material used for the widening of the road fills ranges between 115 to 120 pcf with an angle of friction of 30°.

Our Office considers that proposed widening of the existing road fill slopes with proposed side slopes gradients is stable.

Rockfall

The potential for rockfall in the project area is considered minimal according to the Caltrans Maintenance Supervisor. Some dislodged rocks were observed at the rock cut slopes along the road ditch corroborating what the Caltrans Maintenance Supervisor had said. The resloping of the rock cut slopes will greatly diminish the production of dislodged rocks, but it may not be eliminated. It is recommended that the rock cuts be stabilized after the construction of the slope by using scaling methods.

Rippability

Rippability is the ease with which soil or rock can be excavated mechanically. The following table is a summary of the material rippability mentioned in the geophysical investigation and field observation sections.

Table 8: Summary of Material Rippability

Stationing		Post Mile		Lithology	Rippability	Excavation Method
From	To	From	To			
31+00	48+00	30.90	31.10	Cemented conglomerate	Difficult	Conventional
52+00	62+00	31.08	31.27	Silty Sand w/ gravel	Easy	Conventional
99+00	135+00	31.76	32.64	Gravelly silty sand	Easy to moderate	Conventional
152+00	195+00	32.98	33.77	Clay, decomposed shale.	Easy	Conventional
243+00	287+00	34.68	35.51	Gravelly clayey silt and shale and siltstone	Easy to difficult	Conventional
287+00	310+50	35.51	35.96	Silty sand w/gravel, sandstone	Difficult	Conventional
321+20	331+00	36.14	36.34	Cemented Sandstone	Non-rippable	Non-blasting
335+50	371+60	36.34	37.08	Soft Sandstone, siltstone, shales	Difficult	Conventional
375+50	413+00	37.18	37.92	Sandstone, siltstone, shales	Non-rippable	Blasting
381+00	386+00	37.29	37.40	Sandstone, siltstone, shales	Non-rippable	Blasting
420+50	442+00	38.07	38.46	Volcanic ash, boulders	Easy to Moderate	Conventional, boulder reduction
471+20	538+70	39.01	40.31	Volcanic ash, boulder, Basalt flow.	Easy to Non-rippable	Conventional, non-blasting.
541+20	549+70	40.35	40.50	Metavolcanic rocks, decomposed metavolcanic	Non-rippable and difficult	Blasting and non-blasting

7. Construction Considerations

Where boulders are expected to be encountered it is recommended that boulder reduction be used in the removal of the large boulders greater or equal to 5 ft in diameter. Boulder reduction methods include the use of hydraulic splitters, chemical expanders and hoe rams. With the approval of the Resident Engineer, localized blasting would be an alternative for boulder reduction or excavation of competent bedrock. Blasting should be in accordance with Caltrans "Standard Specifications" (including Sections 7-1.10 and 19-2.03). The specifications and special provisions developed for blasting should address safety issues and avoidance of damage to existing pavement, utilities, structures and other natural and man-made features.

We recommend that rock cuts be stabilized after the use of controlled blasting by using scaling methods.

It is highly recommended that the surface of the slopes be re-vegetated immediately after construction of the slope is complete in order to improve slope stability and promote rapid runoff.

The purpose of a controlled blasting, when required, for the excavation of a new slope is to reduce damage of the slope face, to reduce long-term highway maintenance, and to control overbreak at the excavation limits. Furthermore, long-term rock stability is improved when this blasting method is used.

9. Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

1. None

Data and Information included in the Information Handout provided to the bidders and Contractors are:

- A. *Geotechnical Design Report for the Bella Diddy Rehabilitation/Widening. Dated 11/18/2009*

Data and Information available for inspection at the District Office:

A. None

Data and Information available for inspection at the Transportation Laboratory are:

A. None

If you have any questions or comments, please call Luis Paredes-Mejia at (916) 227-1047 or Douglas Brittsan at (916) 227-1079.



LUIS M. PAREDES-MEJIA
Engineering Geologist, CEG 2329
Geotechnical Design – North, Branch C

C: Douglas Brittsan
DME D2 (e-copy)
GDNFile
RE Pending File



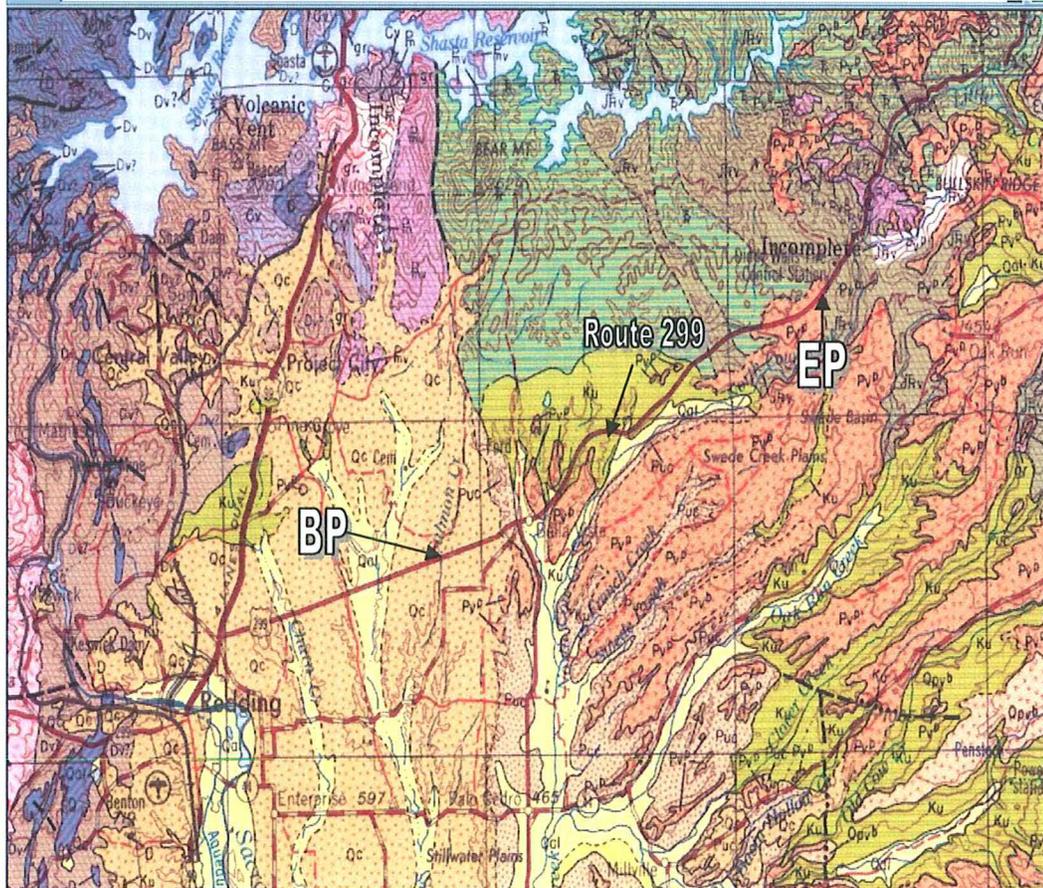
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Vicinity Map

02-SHA-299-PM 30.3/40.7
Bella-Diddy Rehabilitation and Widening

Figure
1



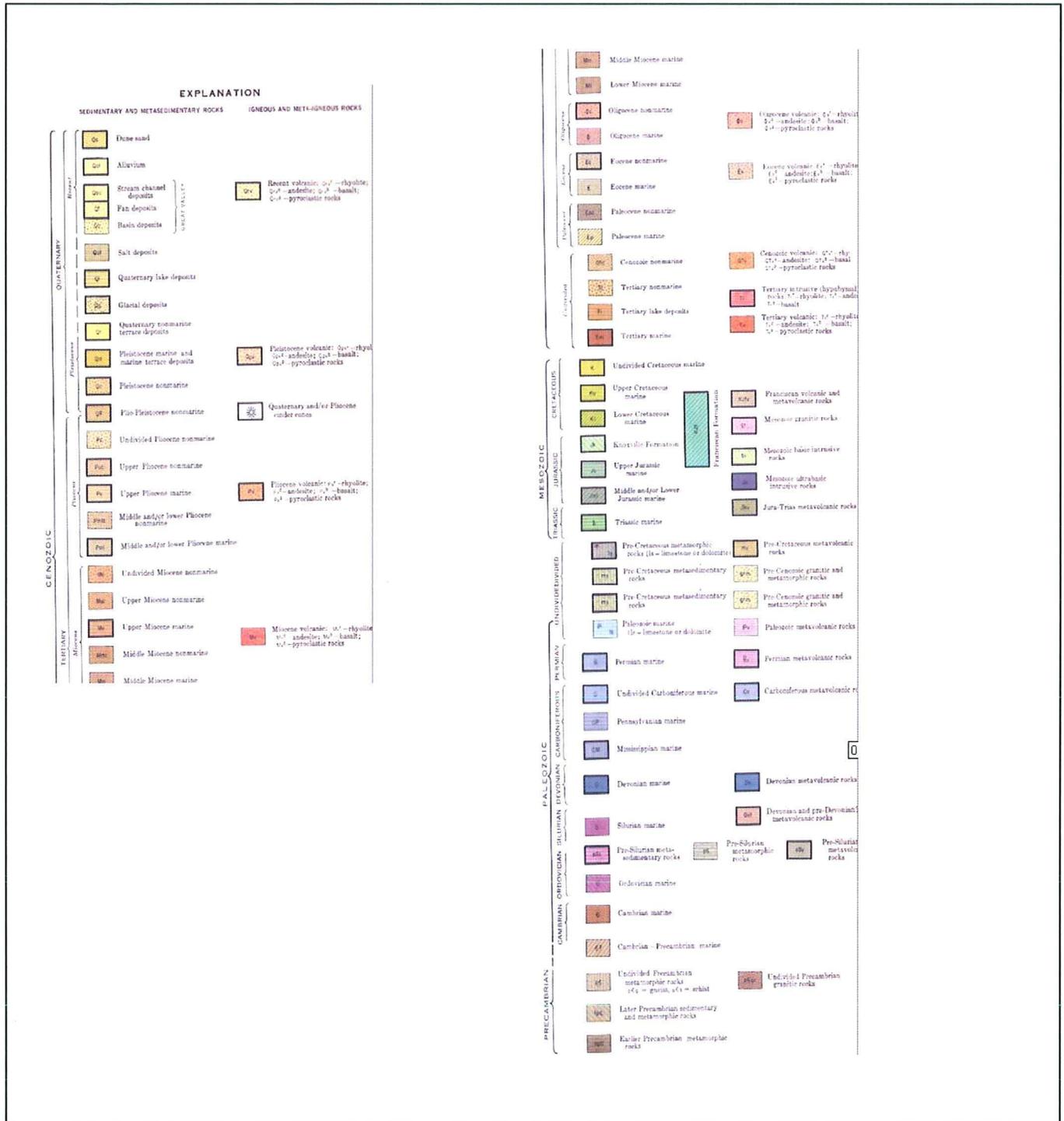
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Geologic Map

02-SHA-299-PM 30.3/40.7
Bella-Diddy Rehabilitation and Widening

Figure
2

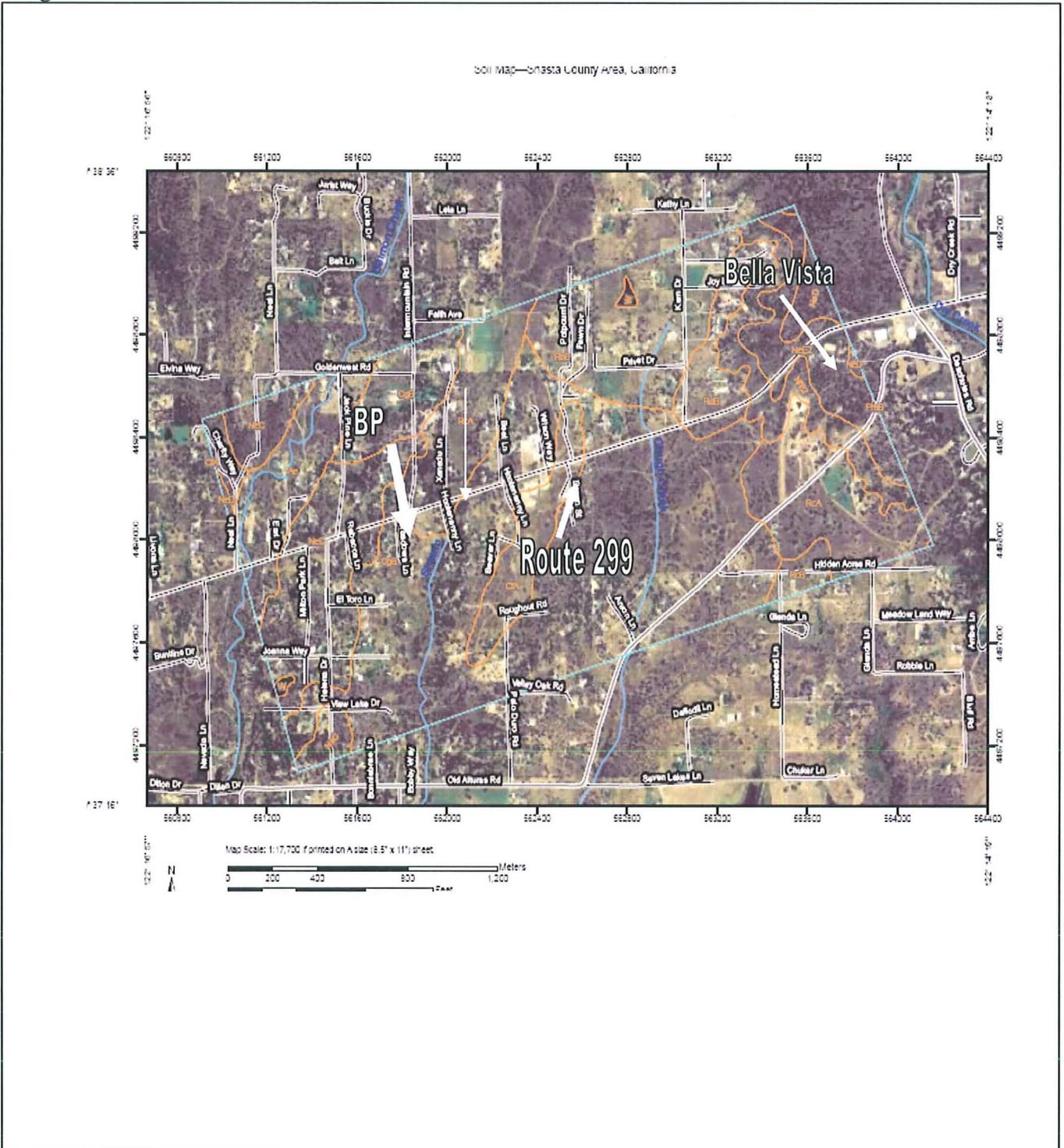


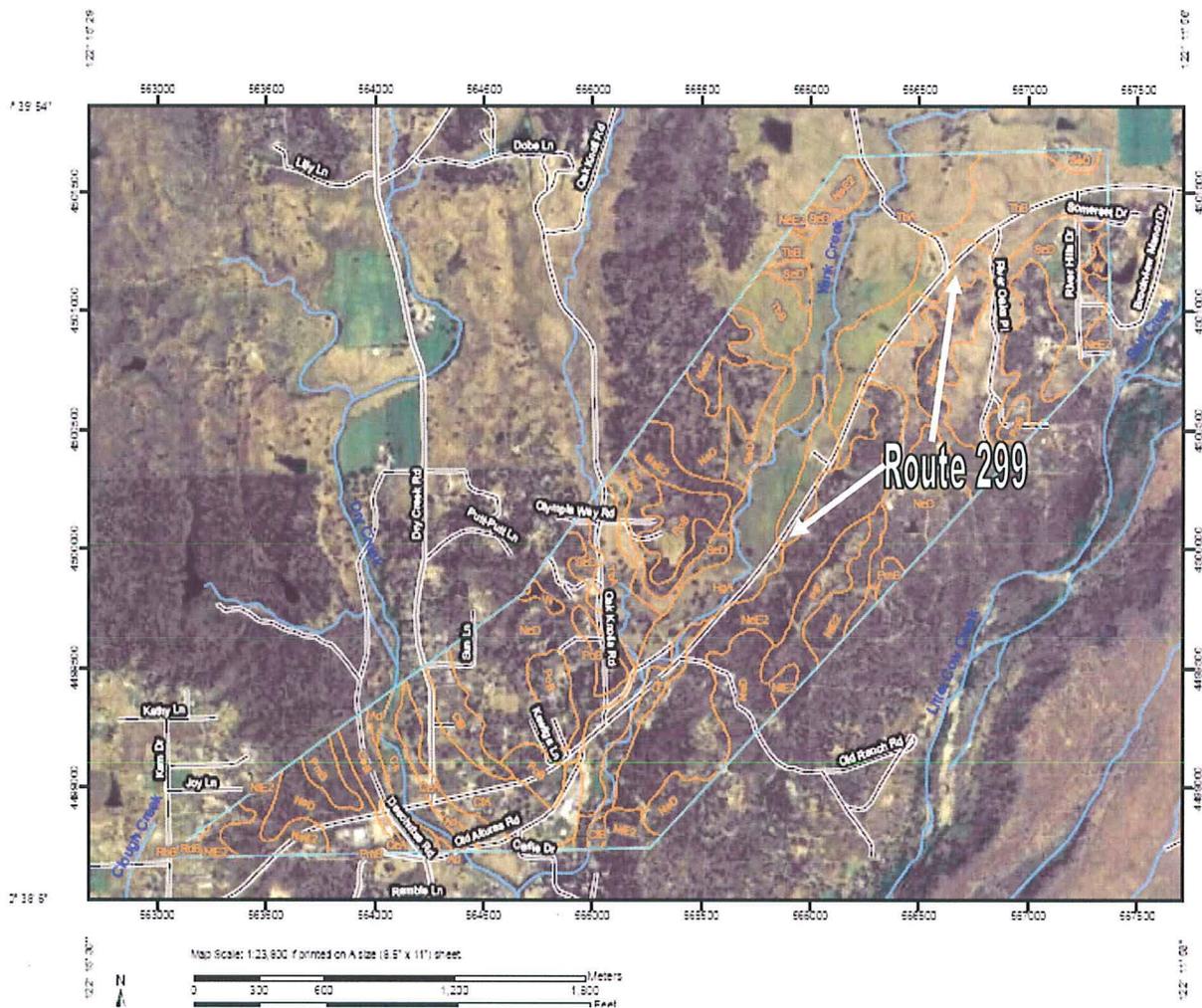
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EA: 02-360700	Geologic Map Legend
02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening	
Figure 3	

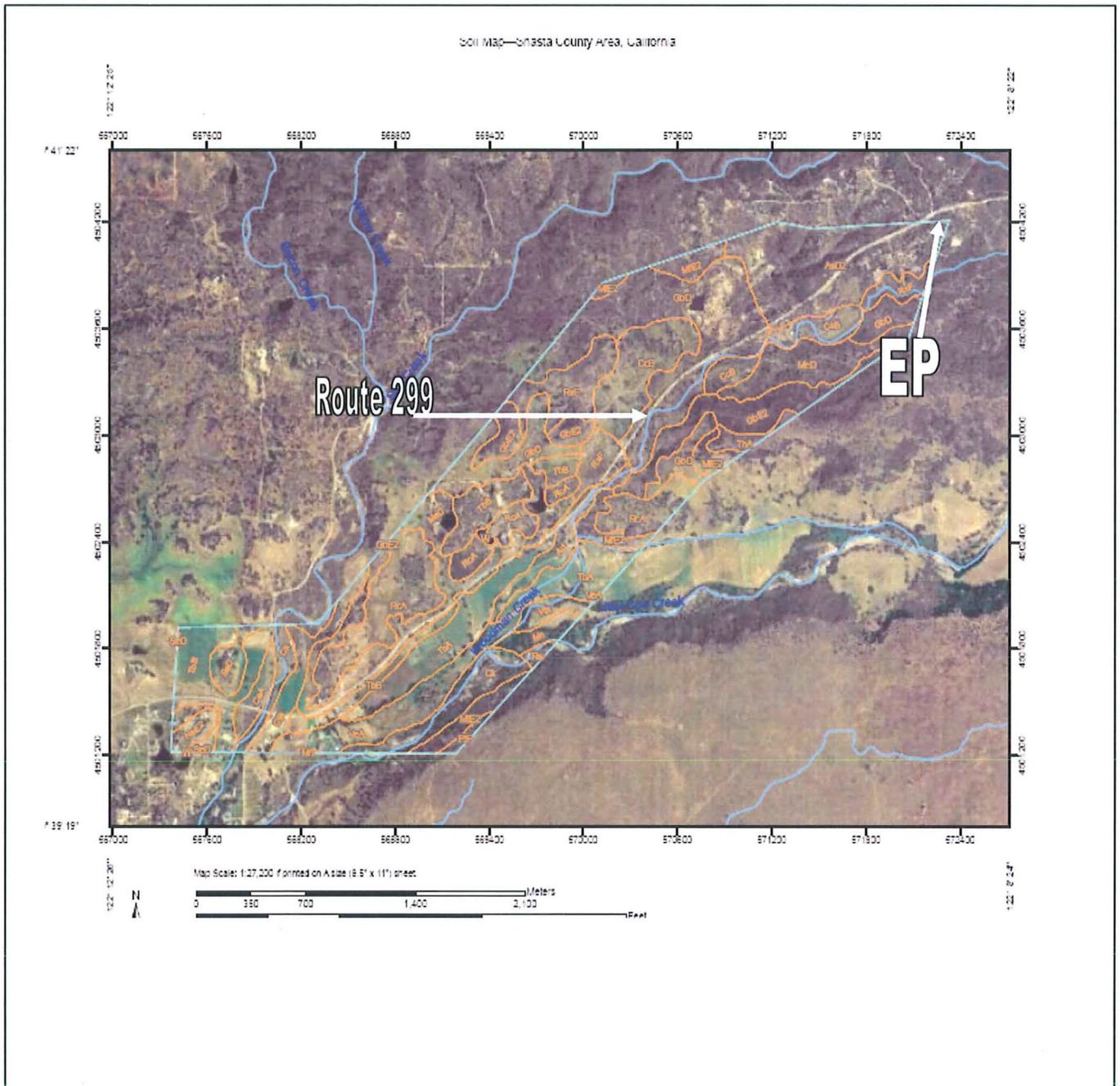


 CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North	EA: 02-360700	California Seismic Hazard Map 1996
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening	Figure 4





 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Soils Map	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figure 6



 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Soils Map	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figure 7

Map Unit Legend		Map Unit Legend	
Shasta County Area, Ca		Shasta County Area, Ca	
Map Unit Symbol	Map Unit Name	Map Unit Symbol	Map Unit Name
Ae	Anderson gravely sandy loam, moderately deep	Ad	Anderson gravely sandy loam
CfA	Chum gravely loam, deep, 0 to 3 percent slopes	AdD2	Auburn clay loam, 5 to 30 percent slopes, eroded
CgB	Clough gravely loam, 3 to 8 percent slopes	CcB	Chum loam, 3 to 8 percent slopes
NeC	Newtown gravely loam, 5 to 15 percent slopes	CeA	Chum gravely loam, 0 to 3 percent slopes
NeD	Newtown gravely loam, 15 to 30 percent slopes	CeB	Chum gravely loam, 3 to 8 percent slopes
NeE2	Newtown gravely loam, 30 to 50 percent slopes, eroded	CfA	Chum gravely loam, deep, 0 to 3 percent slopes
NfE2	Newtown stony loam, 5 to 50 percent slopes, eroded	Ck	Cobbly alluvial land, frequently flooded
FmB	Fertins gravely loam, 3 to 8 percent slopes	GoD	Gaviota very rocky sandy loam, 0 to 30 percent slopes
RtB	Red Bluff loam, 3 to 8 percent slopes	GoE2	Gaviota very rocky sandy loam, 30 to 50 percent slopes, eroded
RcA	Red Bluff gravely loam, moderately deep, 0 to 3 percent slopes	MeD	Milsholm gravely loam, 3 to 30 percent slopes
RcB	Red Bluff gravely loam, moderately deep, 3 to 8 percent slopes	MfE2	Milsholm very rocky loam, 30 to 50 percent slopes, eroded
RdB	Redding gravely loam, 3 to 8 percent slopes	Mn	Malins fine sandy loam
		NeE2	Newtown gravely loam, 30 to 50 percent slopes, eroded
AdD2	Auburn clay loam, 5 to 30 percent slopes, eroded		
AfE2	Auburn very stony clay loam, 30 to 50 percent slopes, eroded	RfF	Pentz-Supan complex, 50 to 70 percent slopes
BfD	Boomer gravely loam, 15 to 30 percent slopes	RcA	Red Bluff gravely loam, moderately deep, 0 to 3 percent slopes
BfE	Boomer gravely loam, 30 to 50 percent slopes	RW	Riverwash
GoD	Gaviota very rocky sandy loam, 0 to 30 percent slopes	RxF	Rockland
GoD	Goulding very stony loam, 10 to 30 percent slopes	ReD	Rehom silty clay, moderately deep, 5 to 30 percent slopes
GoE2	Goulding very rocky loam, 30 to 50 percent slopes, eroded	TcA	Tehama loam, 0 to 3 percent slopes
MeD	Milsholm gravely loam, 3 to 30 percent slopes	TcB	Tehama loam, 3 to 8 percent slopes
MfE2	Milsholm very rocky loam, 30 to 50 percent slopes, eroded	ThA	Tuscan cobbly loam, 0 to 3 percent slopes
NdE	Neuns very stony loam, 5 to 50 percent slopes	VeA	Vina loam, 0 to 3 percent slopes
RxF	Rockland	VfA	Vina loam, seeded, 0 to 3 percent slopes
TcE	Toomes very rocky loam, 0 to 50 percent slopes	W	Water
TeD	Toomes very stony loam, 0 to 30 percent slopes		

 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Soils Map	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figure 8



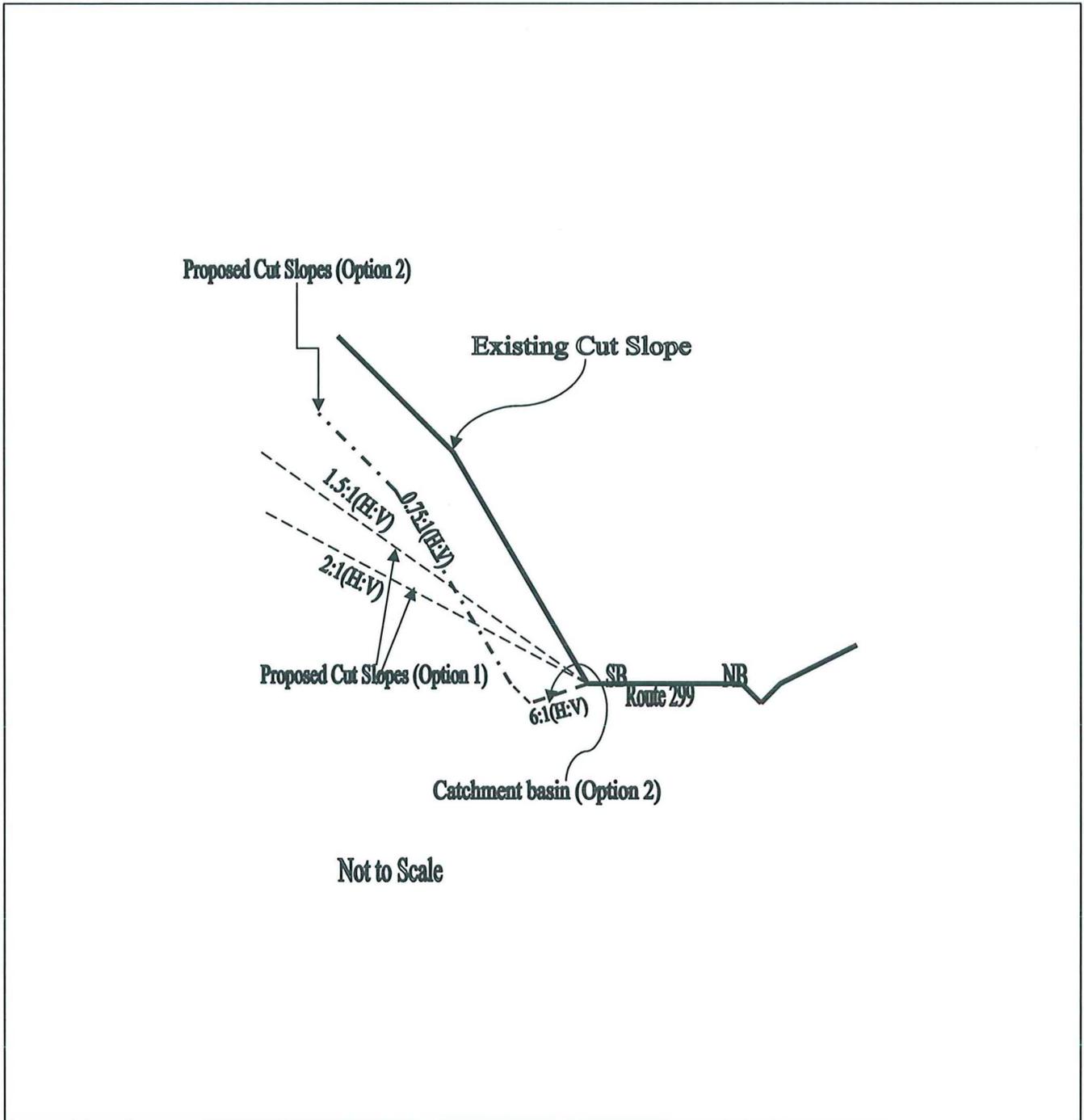
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Seismic Lines Location

02-SHA-299-PM 30.3/40.7
 Bella-Diddy Rehabilitation and Widening

Figure
 9



 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Catchment Basin	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figure 10



Figure 11: Cut Slope at station 39+00 (PM 30.9) Southbound



Figure 12: Cut Slope at station 52+00 (PM 31.15) Northbound

 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 11 & 12



Figure 13: Cut Slope at station 57+00 (PM 31.17) Northbound



Figure 14: Cut Slope at station 61+50 (PM 31.27) Northbound

 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening	Figures 13 & 14	



Figure 15: Cut Slope at station 99+00 (PM 31.90) Northbound



Figure 16: Cut Slope at station 99+00 (PM 31.90) Southbound

 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 15 & 16



Figure 17: Cut Slope at station 126+00 (PM 32.44) Northbound

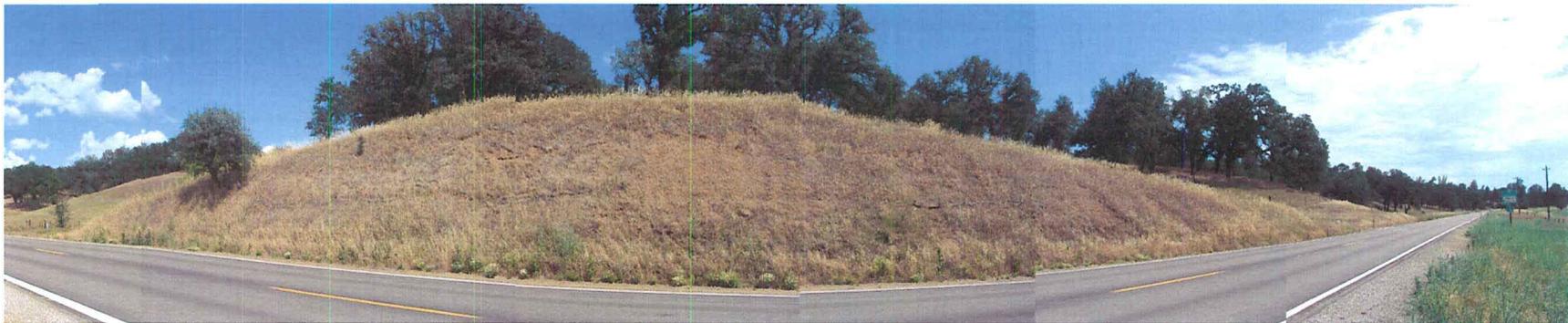


Figure 18: Cut Slope at station 153+50 (PM 33.0) Northbound

	CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North	EA: 02-360700	Cut Slope Photographs
		02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening	Figures 17 & 18



Figure 19: Cut Slope at station 166+00 (PM 33.23) Northbound



Figure 20: Cut Slope at station 174+00 (PM 33.35) Northbound

 CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 19 & 20



Figure 21: Cut Slope at station 180+80 (PM 33.50) Northbound



Figure 22: Cut Slope at station 191+00 (PM 33.70) Northbound

 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 21 & 22

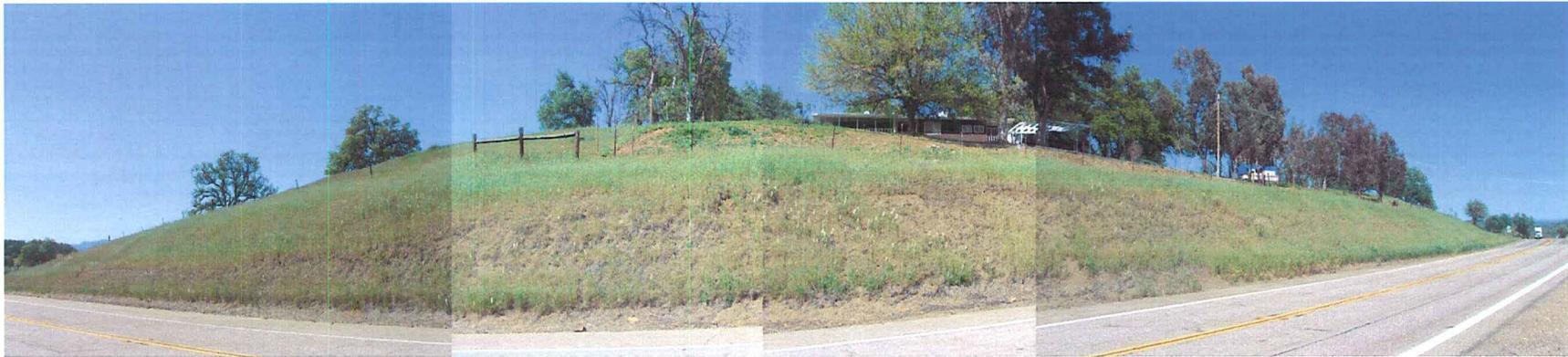


Figure 23: Cut Slope at station 248+00 (PM 34.66) Southbound



Figure 24: Cut Slope at station 262+40 (PM 34.66) Southbound

 CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 23 & 24

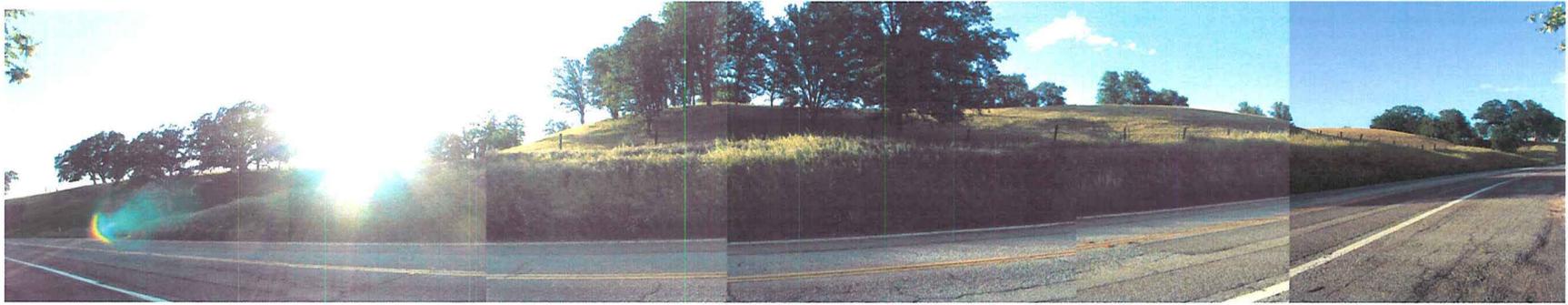


Figure 25: Cut Slope at station 271+ 00(PM 35.22) Southbound



Figure 26: Cut Slope at station 277+00 (PM 35.33) Southbound

 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 25 & 26



Figure 27: Cut Slope at station 287+00 (PM 35.51) Southbound

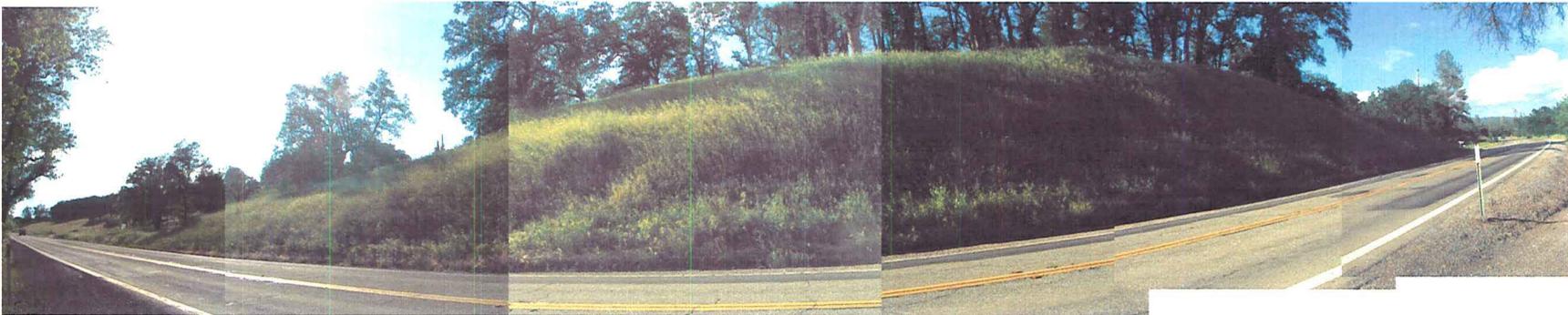


Figure 28: Cut Slope at station 302+00 (PM 35.83) Southbound

	CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North	EA: 02-360700	Cut Slope Photographs
		02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening	Figures 27 & 28



Figure 29: Cut Slope at station 309+00 (PM 35.96) Southbound



Figure 30: Cut Slope at station 321+00 (PM 36.20) Southbound

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	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening	Figures 29 & 30



Figure 31: Cut Slope at station 340+00 (PM 36.76) Southbound



Figure 32: Cut Slope at station 352+50 (PM 36.85) Southbound

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	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 31 & 32



Figure 33: Cut Slope at station 363+70 (PM 37.10) Southbound



Figure 34: Cut Slope at station 376+0 (PM 37.19) Southbound

 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening	Figures 33 & 34	



Figure 35: Cut Slope at station 381+00 (PM 37.27) Northbound



Figure 36: Cut Slope at station 381+00 (PM 37.27) Southbound

 CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 35 & 36



Figure 37: Cut Slope at station 389+00 (PM 37.42) Northbound



Figure 38: Cut Slope at station 390+00 (PM 37.51) Northbound

 CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 37 & 38



Figure 39: Cut Slope at station 409+00 (PM 37.80) Northbound



Figure 40: Cut Slope at station 409+00 (PM 37.80) Southbound

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	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 39 & 40



Figure 41: Cut Slope at station 432+00 (PM 38.30) Northbound



Figure 42: Cut Slope at station 472+00 (PM 39.00) Northbound

 CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 41 & 42



Figure 43: Cut Slope at station 472+00 (PM 39.00) Southbound



Figure 44: Cut Slope at station 529+00 (PM 40.15) Northbound

 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 43 & 44



Figure 45: Cut Slope from station 526+70 to 538+80 (PM 40.07 to 40.30) Southbound



Figure 46: Cut Slope at station 541+00 (PM 40.50) Southbound

 <p>CALTRANS Division of Engineering Services Geotechnical Services Geotechnical Design – North</p>	EA: 02-360700	Cut Slope Photographs	
	02-SHA-299-PM 30.3/40.7 Bella-Diddy Rehabilitation and Widening		Figures 45 & 46