

**STATE OF CALIFORNIA**  
**DEPARTMENT OF TRANSPORTATION**  
**PROJECT PLANS FOR CONSTRUCTION ON**  
**STATE HIGHWAY**  
**IN ORANGE COUNTY**  
**AT VARIOUS LOCATIONS**

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010

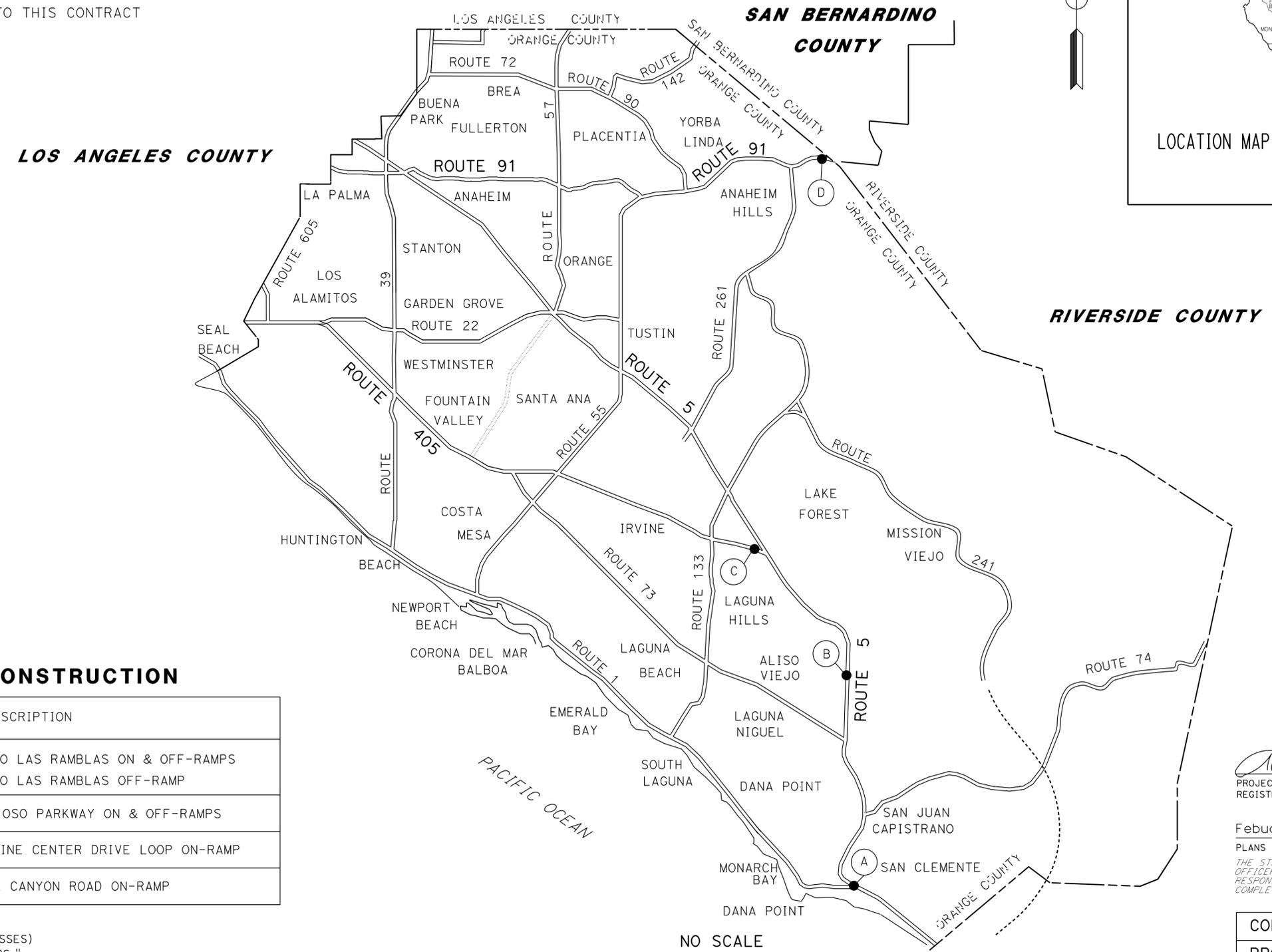
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	1	45



**INDEX OF PLANS**

SHEET No.	DESCRIPTION
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11	TRAFFIC HANDLING QUANTITIES (DETOUR)
12	SIGN PLAN
13-26	ELECTRICAL PLANS
27-45	REVISED STANDARD PLANS

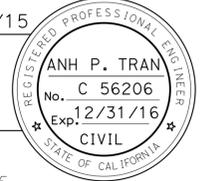
THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.



**LOCATIONS OF CONSTRUCTION**

LOCATION No.	ROUTE	PM	DESCRIPTION
(A)	5	6.8	NB ROUTE 5 CAMINO LAS RAMBLAS ON & OFF-RAMPS SB ROUTE 5 CAMINO LAS RAMBLAS OFF-RAMP
(B)	5	15.3	NB & SB ROUTE 5 OSO PARKWAY ON & OFF-RAMPS
(C)	405	0.9	NB ROUTE 405 IRVINE CENTER DRIVE LOOP ON-RAMP
(D)	91	17.8	WB ROUTE 91 COAL CANYON ROAD ON-RAMP

*Anh Tran* 01/05/15  
 PROJECT ENGINEER DATE  
 REGISTERED CIVIL ENGINEER  
 February 23, 2015  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



CONTRACT No.	<b>12-ON3504</b>
PROJECT ID	<b>1214000003</b>

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

NO SCALE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** MAINTENANCE

REVISOR BY  
 PHAT TRAN  
 ANH TRAN

CALCULATED-DESIGNED BY  
 CHECKED BY

FUNCTIONAL SUPERVISOR  
 MASSOUD TAJIK

DATE: 01/05/15  
 SHEET NO.: 2  
 TOTAL SHEETS: 45

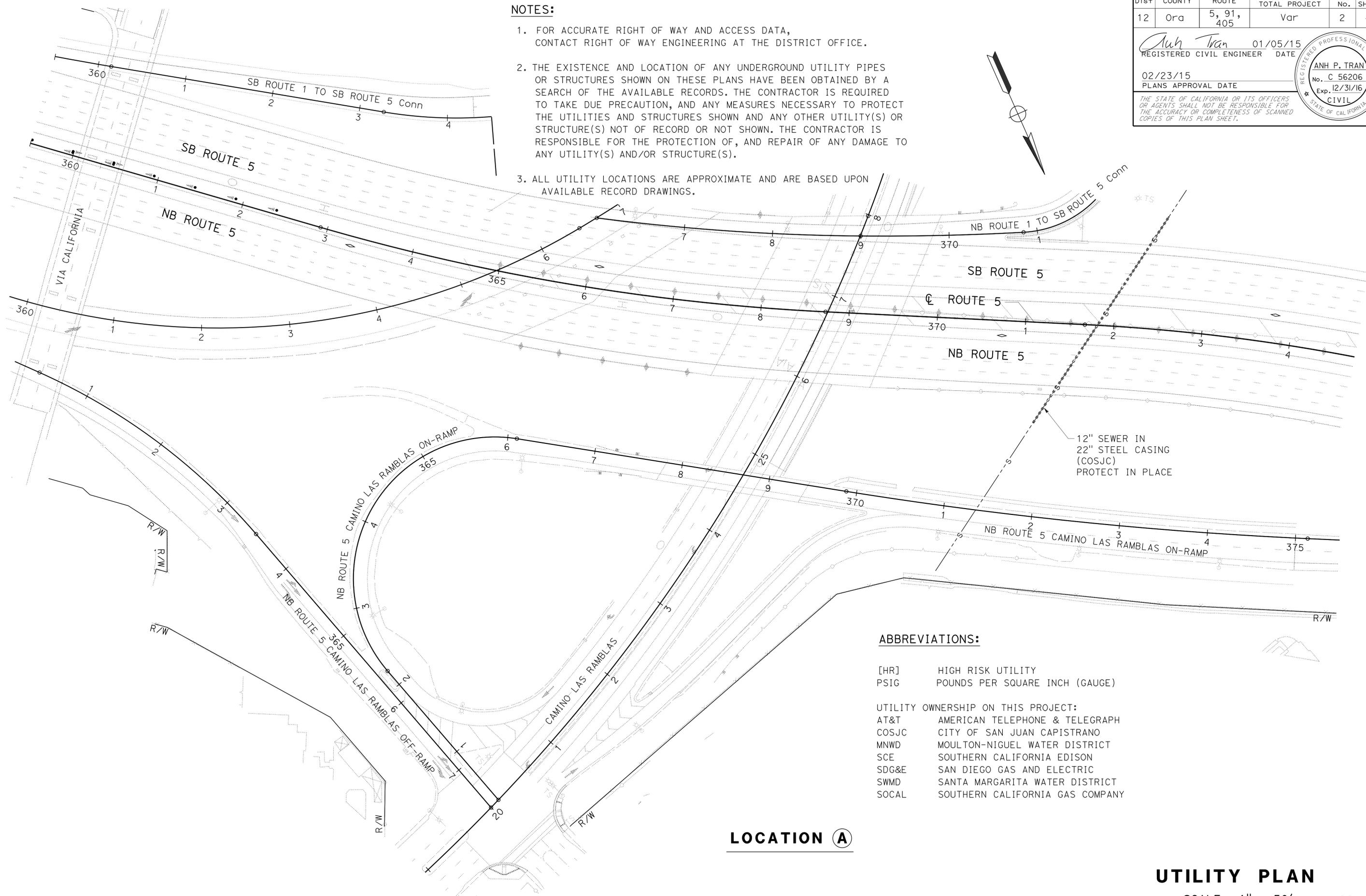
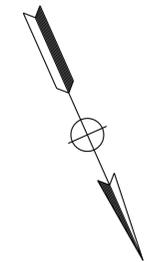
**NOTES:**

- FOR ACCURATE RIGHT OF WAY AND ACCESS DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS HAVE BEEN OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTION, AND ANY MEASURES NECESSARY TO PROTECT THE UTILITIES AND STRUCTURES SHOWN AND ANY OTHER UTILITY(S) OR STRUCTURE(S) NOT OF RECORD OR NOT SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF, AND REPAIR OF ANY DAMAGE TO ANY UTILITY(S) AND/OR STRUCTURE(S).
- ALL UTILITY LOCATIONS ARE APPROXIMATE AND ARE BASED UPON AVAILABLE RECORD DRAWINGS.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	2	45

*Anh Tran* 01/05/15  
 REGISTERED CIVIL ENGINEER DATE  
 02/23/15  
 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  
 ANH P. TRAN  
 No. C 56206  
 Exp. 12/31/16  
 CIVIL  
 STATE OF CALIFORNIA



12" SEWER IN  
 22" STEEL CASING  
 (COSJC)  
 PROTECT IN PLACE

**ABBREVIATIONS:**

- [HR] HIGH RISK UTILITY  
 PSIG POUNDS PER SQUARE INCH (GAUGE)
- UTILITY OWNERSHIP ON THIS PROJECT:  
 AT&T AMERICAN TELEPHONE & TELEGRAPH  
 COSJC CITY OF SAN JUAN CAPISTRANO  
 MNWD MOULTON-NIGUEL WATER DISTRICT  
 SCE SOUTHERN CALIFORNIA EDISON  
 SDG&E SAN DIEGO GAS AND ELECTRIC  
 SWMD SANTA MARGARITA WATER DISTRICT  
 SOCAL SOUTHERN CALIFORNIA GAS COMPANY

**LOCATION A**

**UTILITY PLAN**

SCALE: 1" = 50'

**U-1**

APPROVED FOR UTILITY INFORMATION ONLY





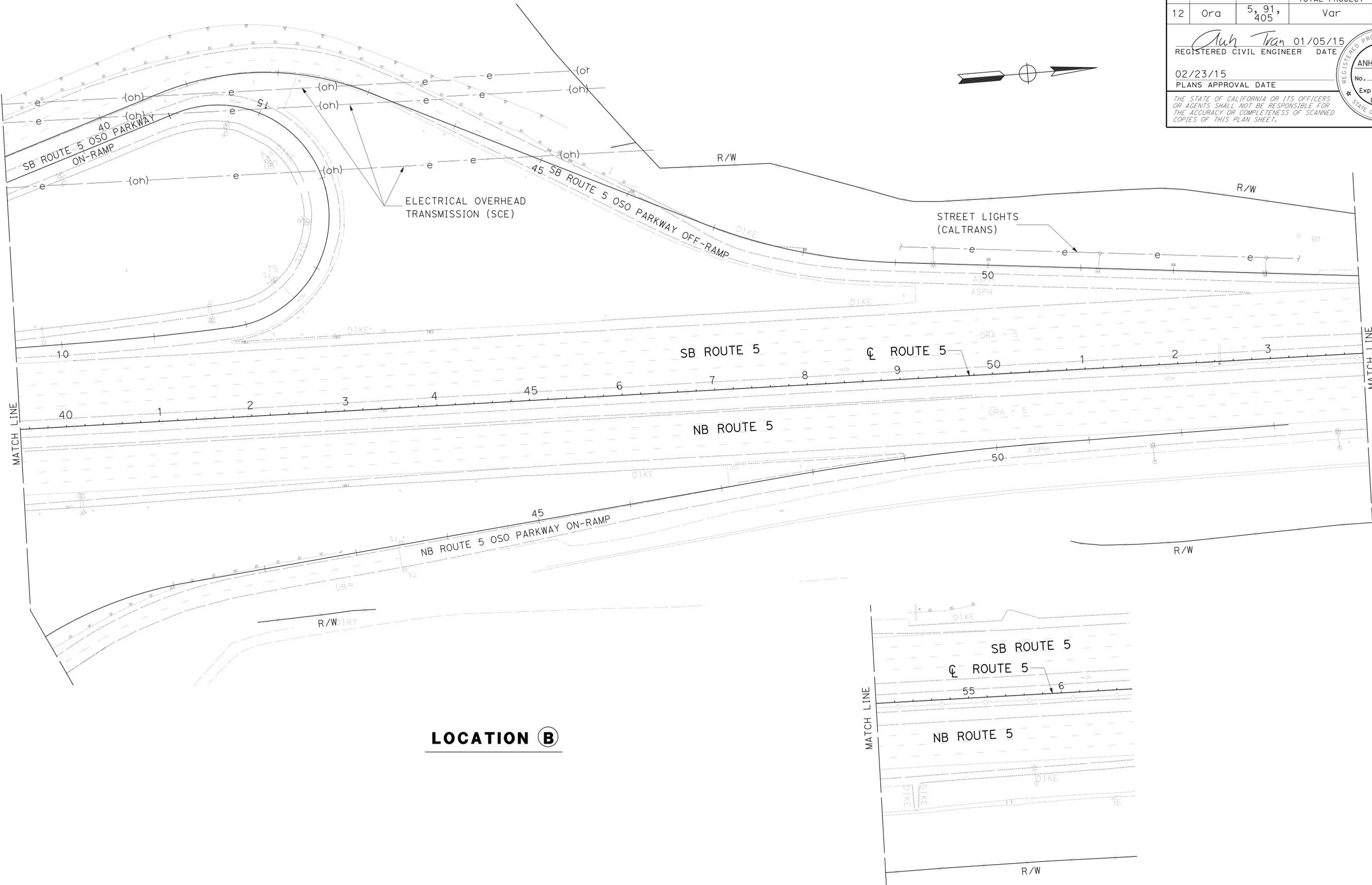


STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** MAINTENANCE

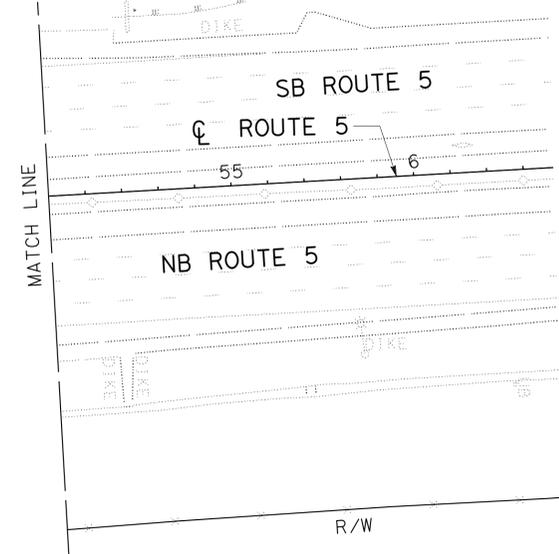
FUNCTIONAL SUPERVISOR: MASSOUD TAJIK  
 CALCULATED/DESIGNED BY: [Blank]  
 CHECKED BY: [Blank]  
 PHAT TRAN, ANH TRAN  
 REVISED BY: [Blank]  
 DATE REVISED: [Blank]

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	5	45

*Anh Tran* 01/05/15  
 REGISTERED CIVIL ENGINEER DATE  
 02/23/15  
 PLANS APPROVAL DATE  
 ANH P. TRAN  
 No. C 56206  
 Exp. 12/31/16  
 CIVIL  
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**LOCATION B**



**UTILITY PLAN**

SCALE: 1" = 50'

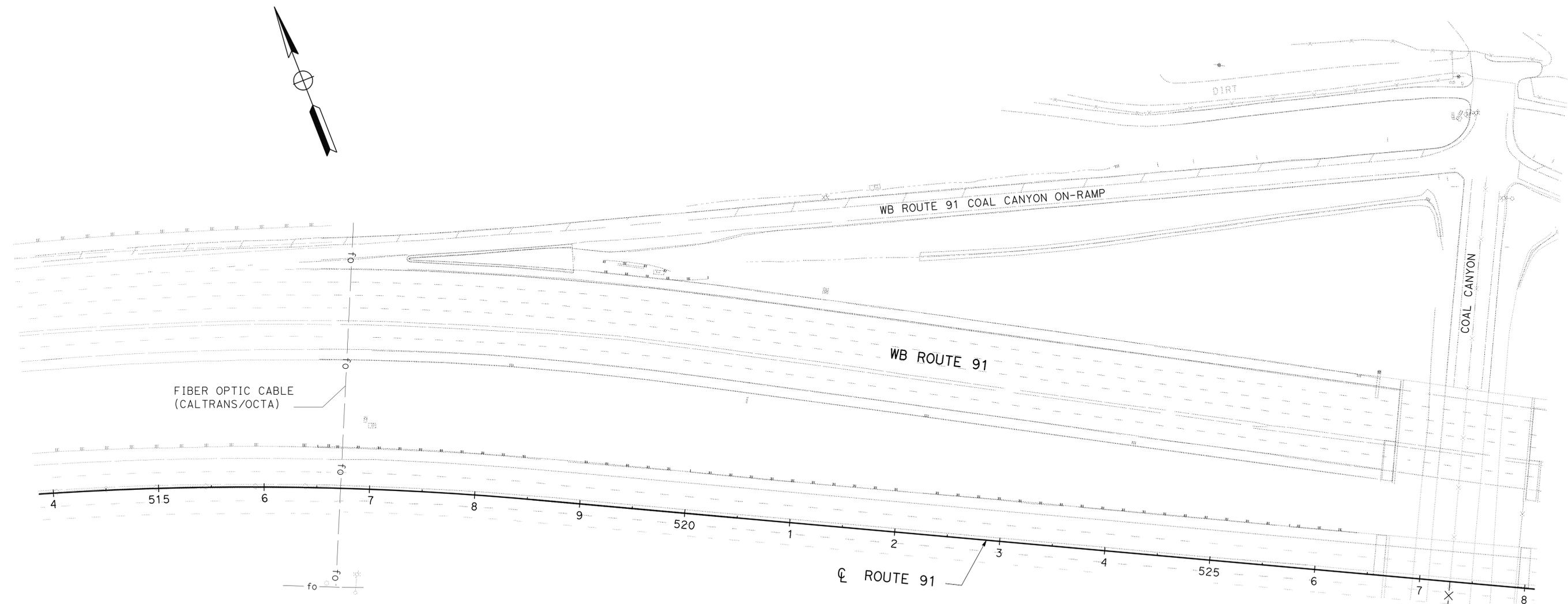
**U-4**

APPROVED FOR UTILITY INFORMATION ONLY

LAST REVISION DATE PLOTTED => 25-FEB-2015 11-01-14 TIME PLOTTED => 10:46

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	6	45
<i>Anh Tran</i> 01/05/15 REGISTERED CIVIL ENGINEER DATE			ANH P. TRAN No. C 56206 Exp. 12/31/16 CIVIL		
02/23/15 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>					

PHAT TRAN	REVISOR	DATE
ANH TRAN	REVISOR	DATE
CALCULATED/DESIGNED BY	CHECKED BY	
FUNCTIONAL SUPERVISOR		
MASSOUD TAJIK		
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION		
<b>Caltrans</b> MAINTENANCE		



**LOCATION D**

**UTILITY PLAN**  
 SCALE: 1" = 50'

APPROVED FOR UTILITY INFORMATION ONLY

**U-5**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** MAINTENANCE

**NOTES:**

1. CONSTRUCTION AREA SIGN LOCATIONS SHOWN ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER.
2. FOR ADDITIONAL QUANTITIES OF CONSTRUCTION AREA SIGNS SEE SHEET THQ-1.

**LEGEND:**

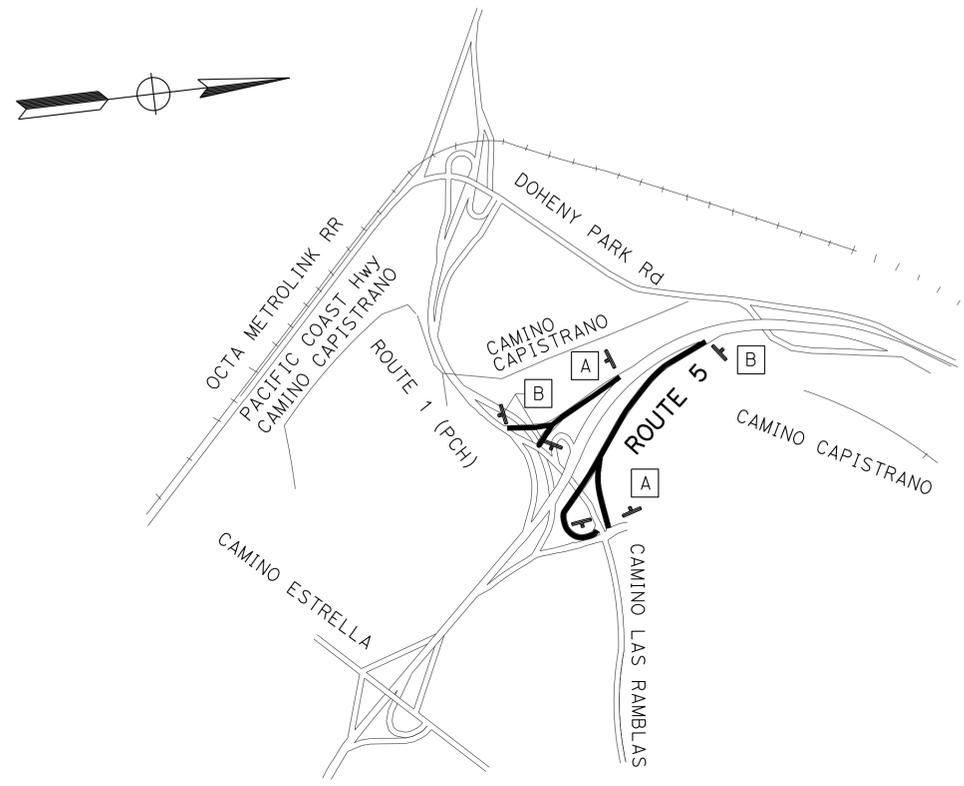
- CONSTRUCTION AREA SIGN NO.
- CONSTRUCTION AREA
- ⊥ CONSTRUCTION AREA SIGN, 1-POST
- ⊥ CONSTRUCTION AREA SIGN, 2-POST

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	7	45

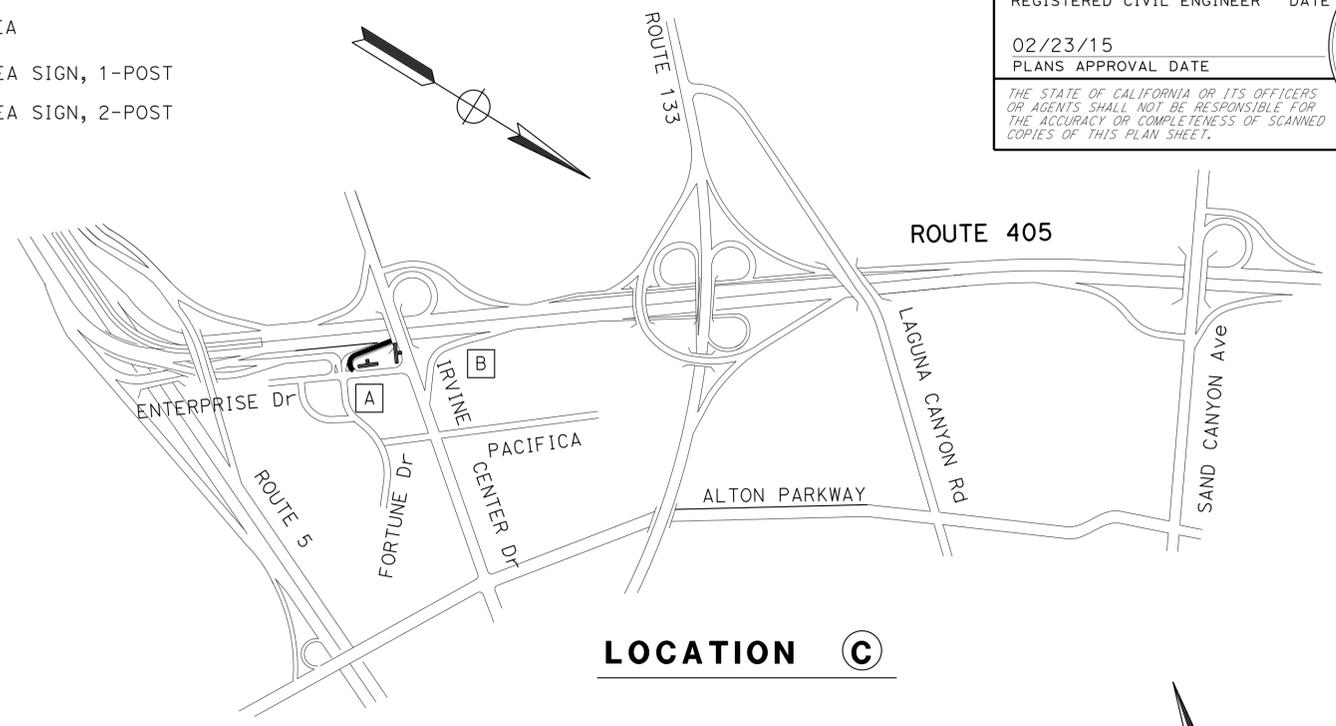
Anh Tran 01/05/15  
 REGISTERED CIVIL ENGINEER DATE  
 02/23/15  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 ANH P. TRAN  
 No. C. 56206  
 Exp. 12/31/16  
 CIVIL  
 STATE OF CALIFORNIA

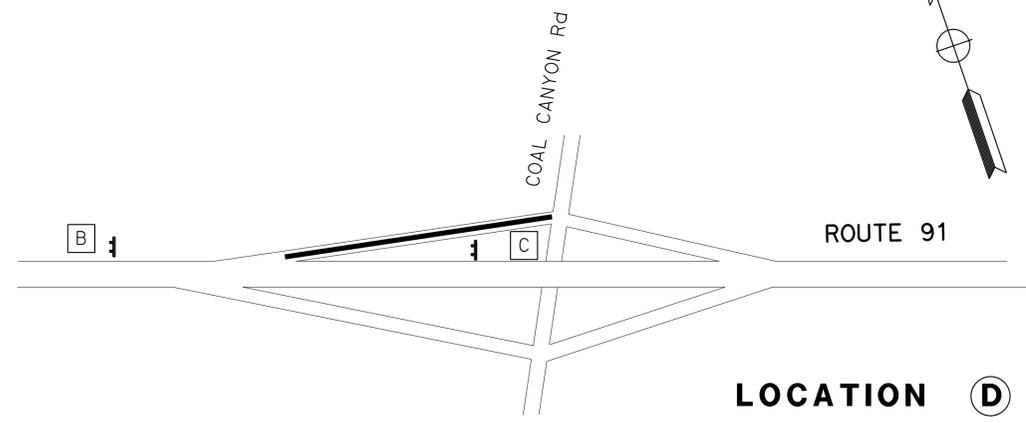
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



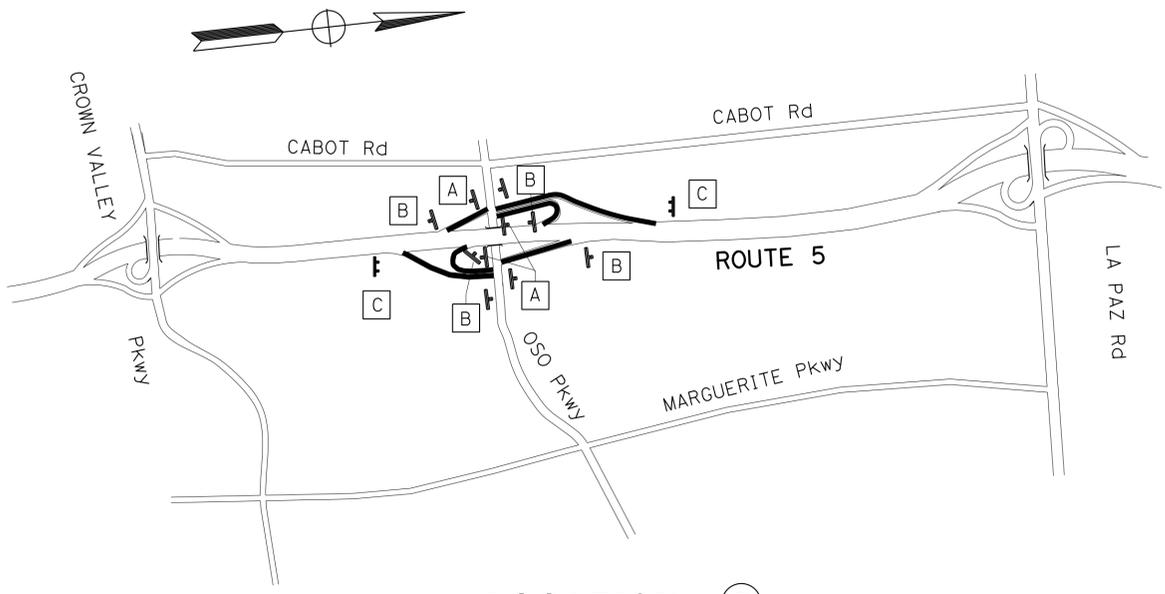
**LOCATION A**



**LOCATION C**



**LOCATION D**



**LOCATION B**

**CONSTRUCTION AREA SIGNS (STATIONARY MOUNTED)**

SIGN No.	TYPE	PANEL SIZE	SIGN MESSAGE	No. OF POST AND SIZE	No. OF SIGNS
A	W20-1	48" x 48"	ROAD WORK AHEAD	1 - 4" x 6"	8
B	G20-2	60" x 24"	END ROAD WORK	2 - 4" x 4"	11
C	W20-1	72" x 72"	ROAD WORK AHEAD	2 - 6" x 6"	3

**CONSTRUCTION AREA SIGNS**

NO SCALE

**CS-1**

APPROVED FOR CONSTRUCTION AREA SIGN WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** MAINTENANCE  
 FUNCTIONAL SUPERVISOR MASSOUD TAJIK  
 PHAT TRAN ANH TRAN  
 REVISOR BY PHAT TRAN ANH TRAN  
 CALCULATED/DESIGNED BY PHAT TRAN ANH TRAN  
 CHECKED BY PHAT TRAN ANH TRAN  
 REVISOR BY PHAT TRAN ANH TRAN  
 DATE REVISOR DATE

**NOTE:**

1. LOCATIONS OF CONSTRUCTION AREA SIGNS (DETOUR) AND PCMS SHOWN ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER.
2. EXACT MESSAGE ON THE PCMS TO BE DETERMINED BY THE ENGINEER.

**LEGEND:**

- DIRECTION OF TRAVEL THROUGH DETOUR
- ⊥ CONSTRUCTION AREA SIGN (DETOUR), 1-POST
- PCMS-X PORTABLE CHANGEABLE MESSAGE SIGN NO.
- ⬡(X) CONSTRUCTION AREA SIGN (DETOUR) NO.
- RAMP CLOSURE

**CLOSURE #1:**

RAMP - NB ROUTE 5 CAMINO LAS RAMBLAS LOOP ON-RAMP AND STRAIGHT ON-RAMP

**DETOUR:**

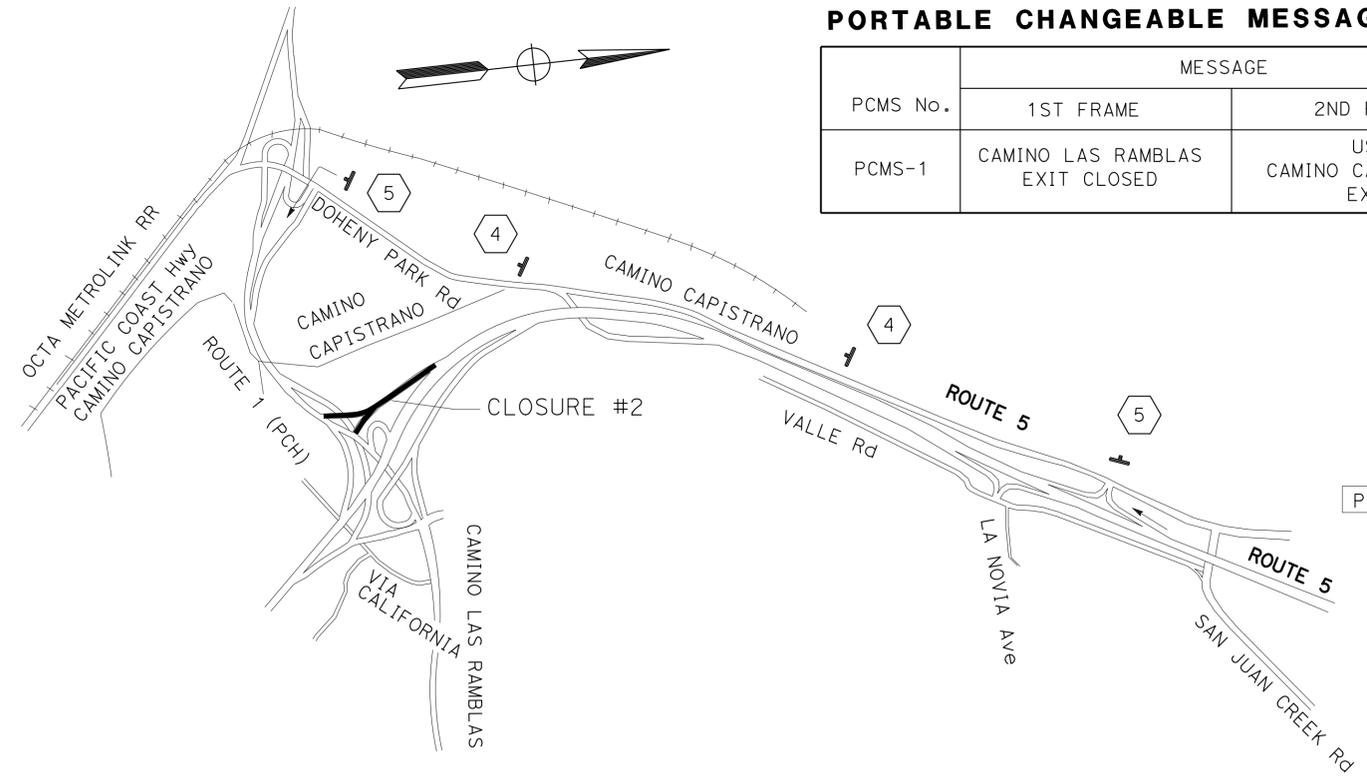
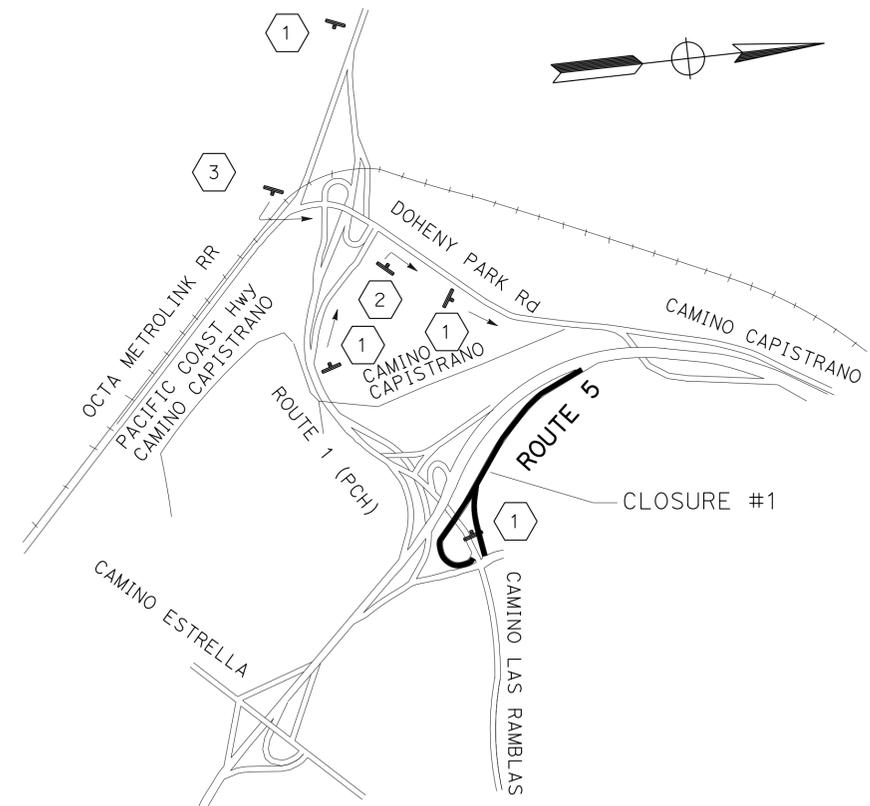
FROM CAMINO LAS RAMBLAS: CONTINUE ON ROUTE 1 (PCH), EXIT DOHENY PARK Rd, AND RIGHT ON DOHENY PARK Rd  
 FROM PCH: TAKE COAST HIGHWAY EXIT AND LEFT ON DOHENY PARK Rd

**CLOSURE #2:**

RAMP - SB ROUTE 5 CAMINO LAS RAMBLAS OFF-RAMP

**DETOUR:**

EXIT AT SB ROUTE 5 CAMINO CAPISTRANO. LEFT ON CAMINO CAPISTRANO. CONTINUE ON DOHENY PARK Rd



**PORTABLE CHANGEABLE MESSAGE SIGN**

PCMS No.	MESSAGE	
	1ST FRAME	2ND FRAME
PCMS-1	CAMINO LAS RAMBLAS EXIT CLOSED	USE CAMINO CAPISTRANO EXIT

**TRAFFIC HANDLING PLAN  
 (LOCATION A DETOUR)**

NO SCALE

**TH-1**

APPROVED FOR TRAFFIC HANDLING (DETOUR) ONLY



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	8	45

Anh Tran 01/05/15  
 REGISTERED CIVIL ENGINEER DATE  
 02/23/15  
 PLANS APPROVAL DATE

ANH P. TRAN  
 No. C 56206  
 Exp. 12/31/16  
 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.

LAST REVISION DATE PLOTTED => 25-FEB-2015  
 11-01-14 TIME PLOTTED => 10:46

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	9	45

Anh Tran 01/05/15  
 REGISTERED CIVIL ENGINEER DATE

02/23/15  
 PLANS APPROVAL DATE

ANH P. TRAN  
 No. C 56206  
 Exp. 12/31/16  
 CIVIL

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**CLOSURE #3:**

1. SB ROUTE 5 OSO Pkwy ON-RAMPS
2. SB ROUTE 5 OSO Pkwy OFF-RAMP

**DETOUR:**

1. FROM EB OSO Pkwy: CONTINUE ON OSO Pkwy, RIGHT ON MARGUERITE Pkwy, AND RIGHT ON CROWN VALLEY Pkwy  
FROM WB OSO Pkwy: RIGHT ON CABOT Rd
2. EXIT CROWN VALLEY Pkwy, LEFT ON CROWN VALLEY Pkwy, AND LEFT ON MARGUERITE Pkwy

**CLOSURE #4:**

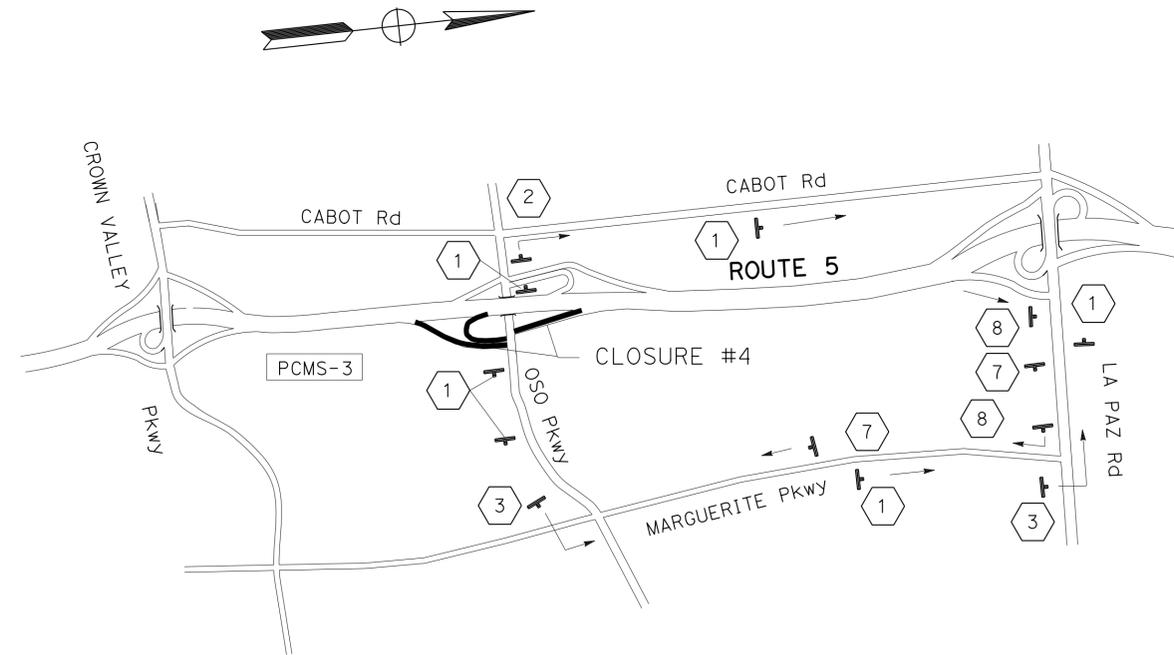
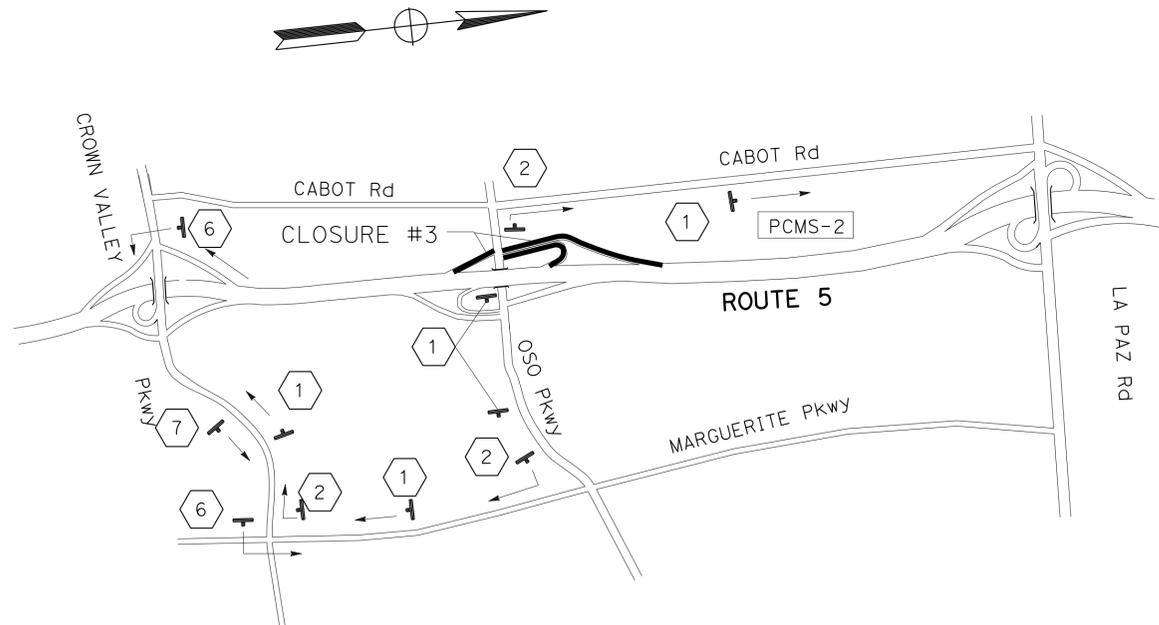
1. NB ROUTE 5 OSO Pkwy ON-RAMPS
2. NB ROUTE 5 OSO Pkwy OFF-RAMP

**DETOUR:**

1. FROM EB OSO Pkwy: CONTINUE ON OSO Pkwy, LEFT ON MARGUERITE Pkwy, AND LEFT ON LA PAZ Rd  
FROM WB OSO Pkwy: RIGHT ON CABOT Rd
2. EXIT LA PAZ Rd, RIGHT ON LA PAZ Rd, AND RIGHT ON MARGUERITE Pkwy

**PORTABLE CHANGEABLE MESSAGE SIGN**

PCMS No.	MESSAGE	
	1ST FRAME	2ND FRAME
PCMS-2	OSO Pkwy EXIT CLOSED	USE CROWN VALLEY Pkwy EXIT
PCMS-3	OSO Pkwy EXIT CLOSED	USE LA PAZ Rd EXIT



**TRAFFIC HANDLING PLAN  
(LOCATION B DETOUR)**

NO SCALE

**TH-2**

APPROVED FOR TRAFFIC HANDLING (DETOUR) ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - MAINTENANCE  
 Caltrans

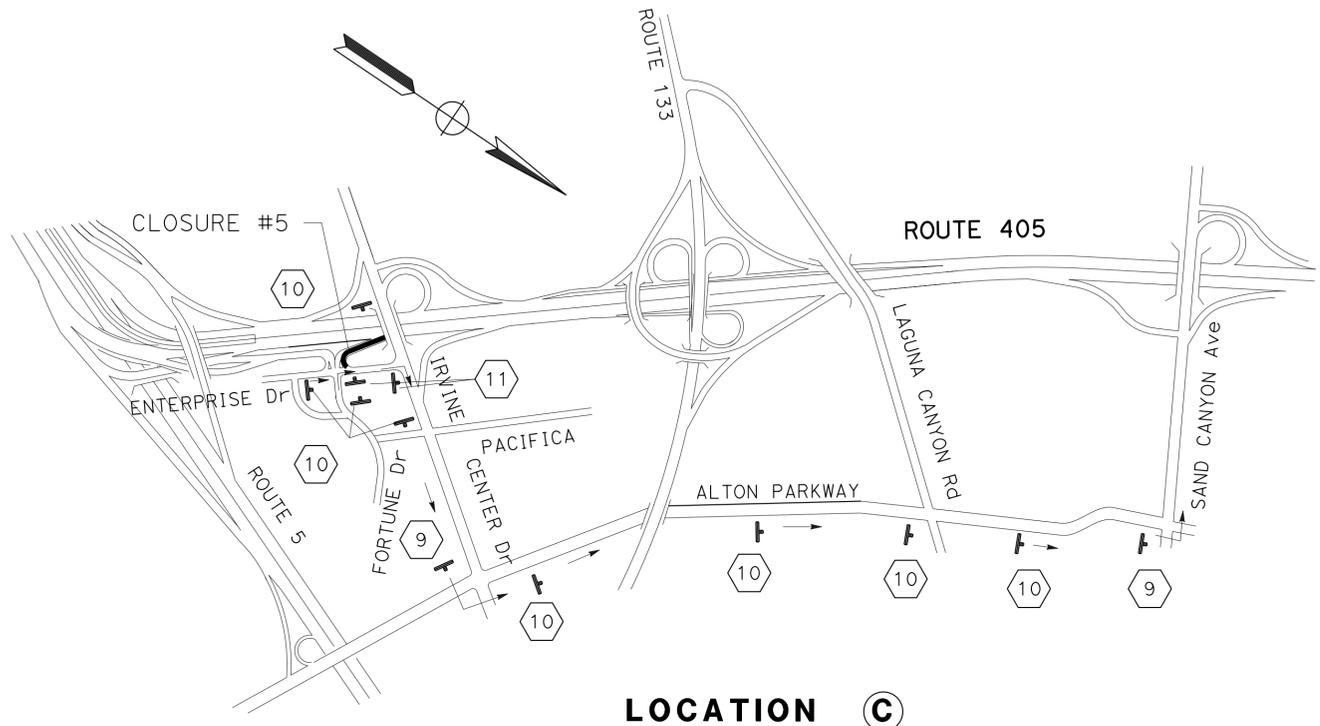
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** MAINTENANCE  
 FUNCTIONAL SUPERVISOR: MASSOUD TAJIK  
 REVISIONS: PHAT TRAN, ANH TRAN, REVISOR, DATE

**CLOSURE #5:**

RAMP - NB ROUTE 405 IRVINE CENTER Dr LOOP ON-RAMP

**DETOUR:**

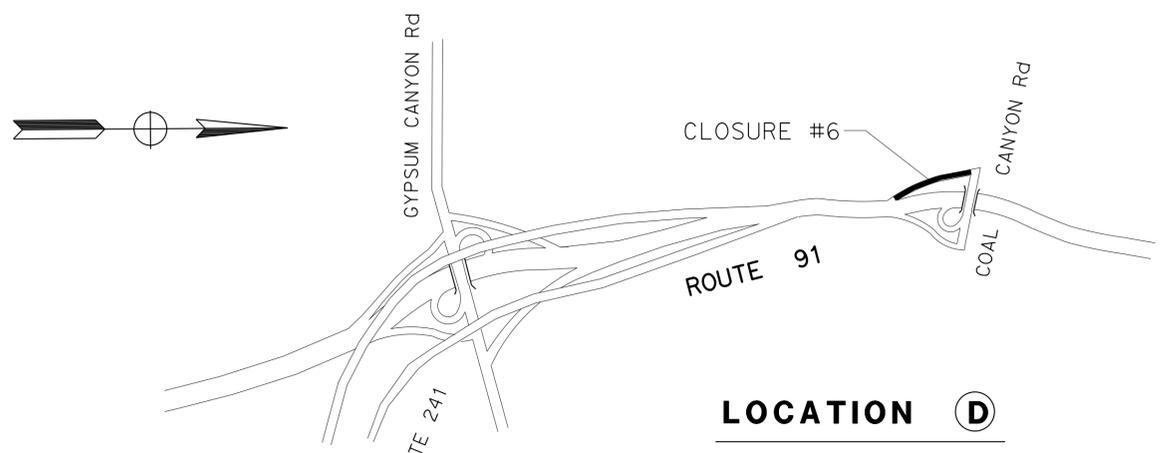
- FROM NORTH IRVINE CENTER Dr - LEFT ON ALTON Pkwy, AND LEFT ON SAND CANYON Ave
- FROM NORTH ENTERPRISE Dr - RIGHT ON IRVINE CENTER Dr, LEFT ON ALTON Pkwy, AND LEFT ON SAND CANYON Ave
- FROM SOUTH FORTUNE Dr - RIGHT ON ENTERPRISE Dr, RIGHT ON IRVINE CENTER Dr, LEFT ON ALTON Pkwy, AND LEFT ON SAND CANYON Ave



**LOCATION C**

**CLOSURE #6:**

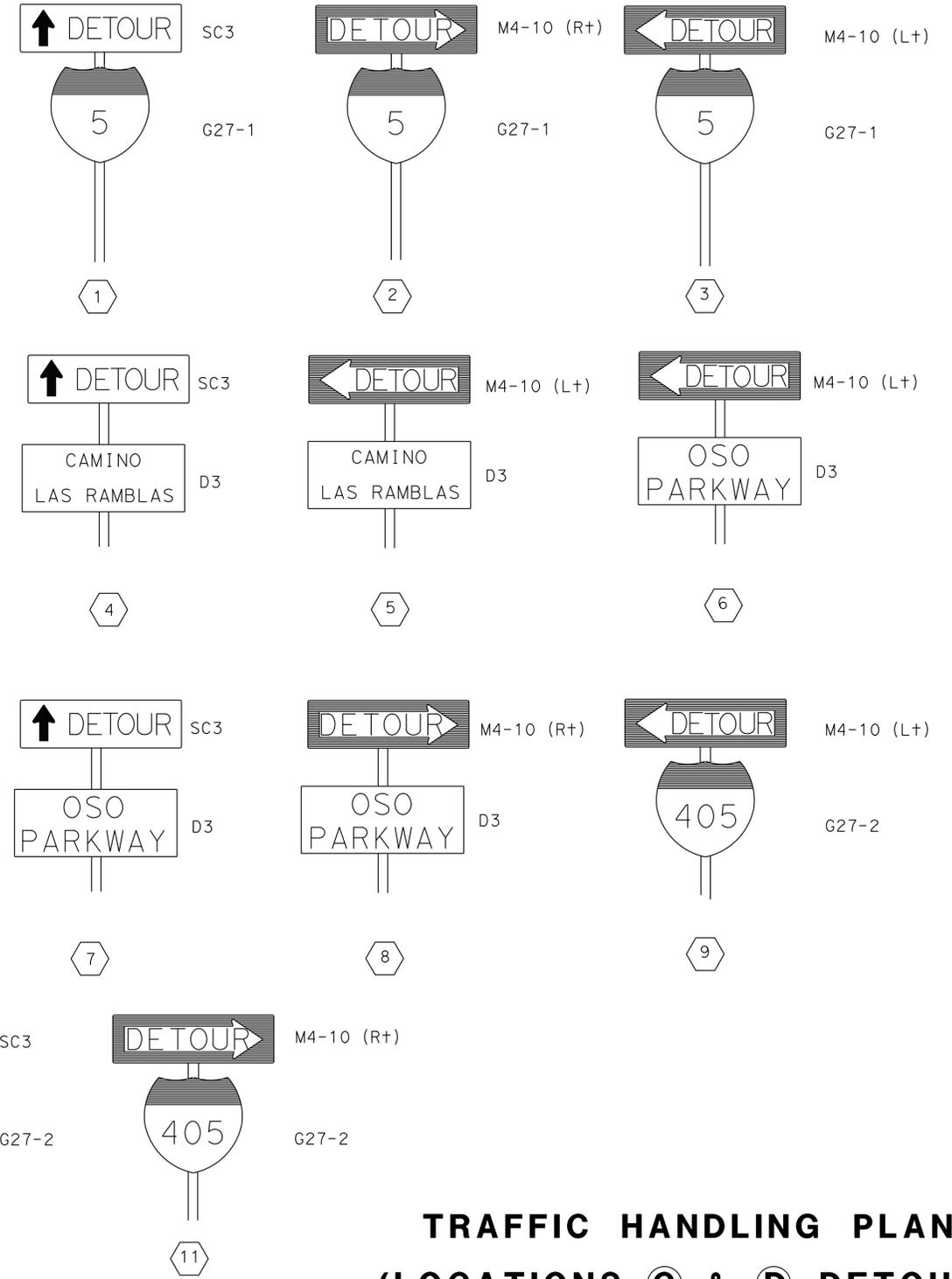
RAMP - WB ROUTE 91 COAL CANYON Rd ON-RAMP



**LOCATION D**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	10	45

01/05/15  
 REGISTERED CIVIL ENGINEER DATE  
 02/23/15  
 PLANS APPROVAL DATE  
 ANH P. TRAN  
 No. C 56206  
 Exp. 12/31/16  
 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.



**TRAFFIC HANDLING PLAN  
 (LOCATIONS C & D DETOUR)  
 NO SCALE**

APPROVED FOR TRAFFIC HANDLING (DETOUR) ONLY

**TH-3**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** MAINTENANCE

ANH TRAN  
08-01-13

REVISED BY  
DATE REVISED

PHAT TRAN  
ANH TRAN

CALCULATED-  
DESIGNED BY  
CHECKED BY

FUNCTIONAL SUPERVISOR  
MASSOUD TAJIK

**NOTE:**

FOR ADDITIONAL QUANTITIES OF CONSTRUCTION AREA SIGNS, SEE SHEET CS-1.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	11	45

*Anh Tran* 01/05/15  
 REGISTERED CIVIL ENGINEER DATE

02/23/15  
 PLANS APPROVAL DATE

ANH P. TRAN  
 No. C56206  
 Exp. 12/31/16  
 CIVIL

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**CONSTRUCTION AREA SIGNS (DETOUR)  
STATIONARY MOUNTED**

SHEET No.	SIGN No.	SIGN CODE	No. OF POST AND SIZE	No. OF SIGNS
TH-1 & TH-2	1	SC3	1-4" X 6"	15
		G27-1		
TH-1 & TH-2	2	M4-10 (R+)	1-4" X 6"	5
		G27-1		
TH-1 & TH-2	3	M4-10 (L+)	1-4" X 6"	3
		G27-1		
TH-1	4	SC3	1-4" X 6"	2
		D3		
TH-1	5	M4-10 (L+)	1-4" X 6"	2
		D3		
TH-2	6	M4-10 (L+)	1-4" X 6"	2
		D3		
TH-2	7	SC3	1-4" X 6"	3
		D3		
TH-2	8	M4-10 (R+)	1-4" X 6"	2
		D3		
TH-3	9	M4-10 (L+)	1-4" X 6"	2
		G27-2		
TH-3	10	SC3	1-4" X 6"	8
		G27-2		
TH-3	11	M4-10 (R+)	1-4" X 6"	2
		G27-2		

**PORTABLE CHANGEABLE MESSAGE SIGN**

SHEET No.	PCMS
	EA
TH-1 TO TH-2 MAXIMUM No. OF PCMS REQUIRED	2

**TRAFFIC HANDLING QUANTITIES  
(DETOUR)**

**THQ-1**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	12	45

*Anh Tran* 01/05/15  
 REGISTERED CIVIL ENGINEER DATE

02/23/15  
 PLANS APPROVAL DATE

ANH P. TRAN  
 No. C 56206  
 Exp 12/31/16  
 CIVIL

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**NOTE:**

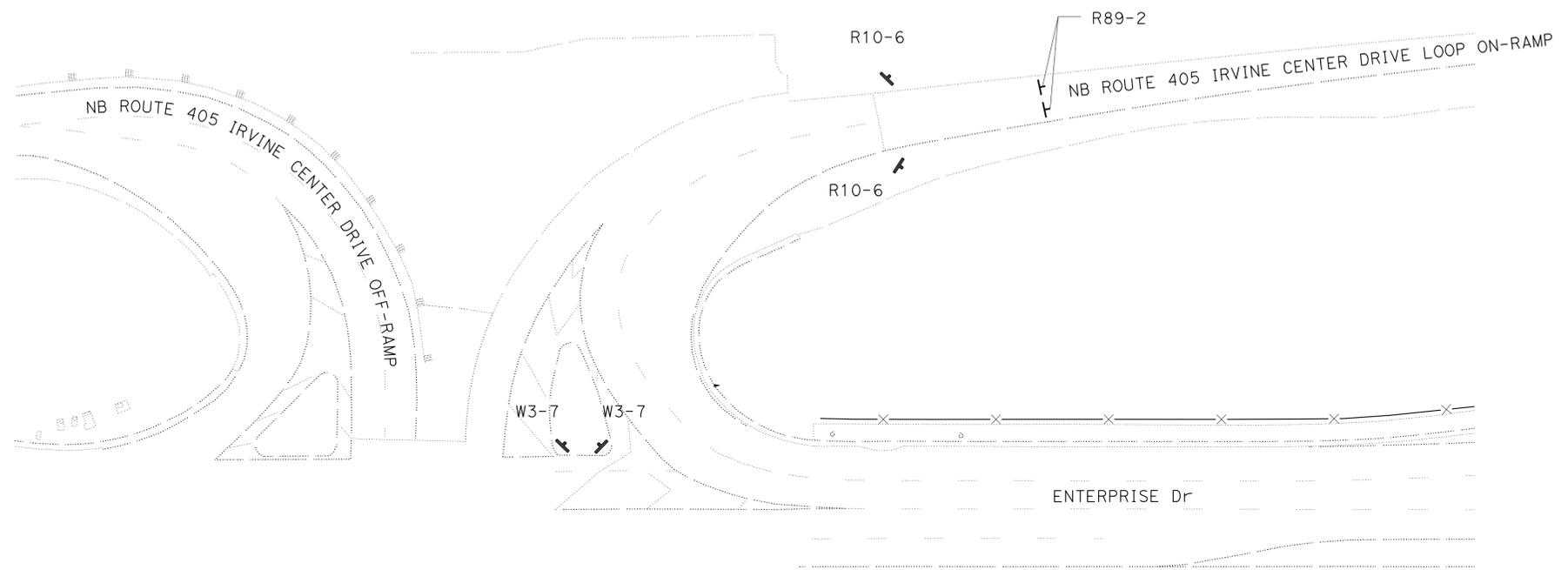
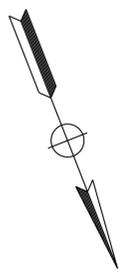
1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

**LEGEND:**

- ↓ ROADSIDE SIGN
- ↑ SIGN INSTALLED ON MAST-ARM

**ABBREVIATIONS:**

- B - BLACK
- W - WHITE
- Y - YELLOW



**LOCATION C**

SIGN CODE	PANEL SIZE W x D  INCHS	SIGN AREA  SQFT	ROADSIDE SIGN	INSTALL ROADSIDE SIGN (STRAP AND SADDLE BRACKET METHOD) (N) EA	INSTALL SIGN (MAST-ARM HANGER METHOD) (N) EA	SINGLE FACED	BACKGROUND		LEGEND		PROTECTIVE OVERLAY  PREMIUM	FURNISH SINGLE SHEET ALUMINUM SIGN		SIGN LOCATION
			ONE POST EA				SHEETING COLOR	RETRO-REFLECTIVE	SHEETING COLOR	RETRO-REFLECTIVE		UNFRAMED		
												0.063" SQFT	0.080" SQFT	
W3-7	36 x 36	9.00		2		X	Y	III	B	X	X	18.00		NB ROUTE 405 IRVINE CENTER DRIVE LOOP ON-RAMP
R10-6	24 x 36	6.00	2			X	W	III	B	X	X	12.00		
R89-2 (CA)	48 x 20	6.70			2	X	W	XI	B	X	X		13.40	
TOTAL			2	2	2							30.00	13.40	

(N) NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.

**SIGN PLAN**  
NO SCALE

APPROVED FOR SIGN WORK ONLY

**S-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION - MAINTENANCE  
 PHAT TRAN  
 ANH TRAN  
 CALCULATED-DESIGNED BY  
 CHECKED BY  
 FUNCTIONAL SUPERVISOR  
 MASSOUD TAJIK

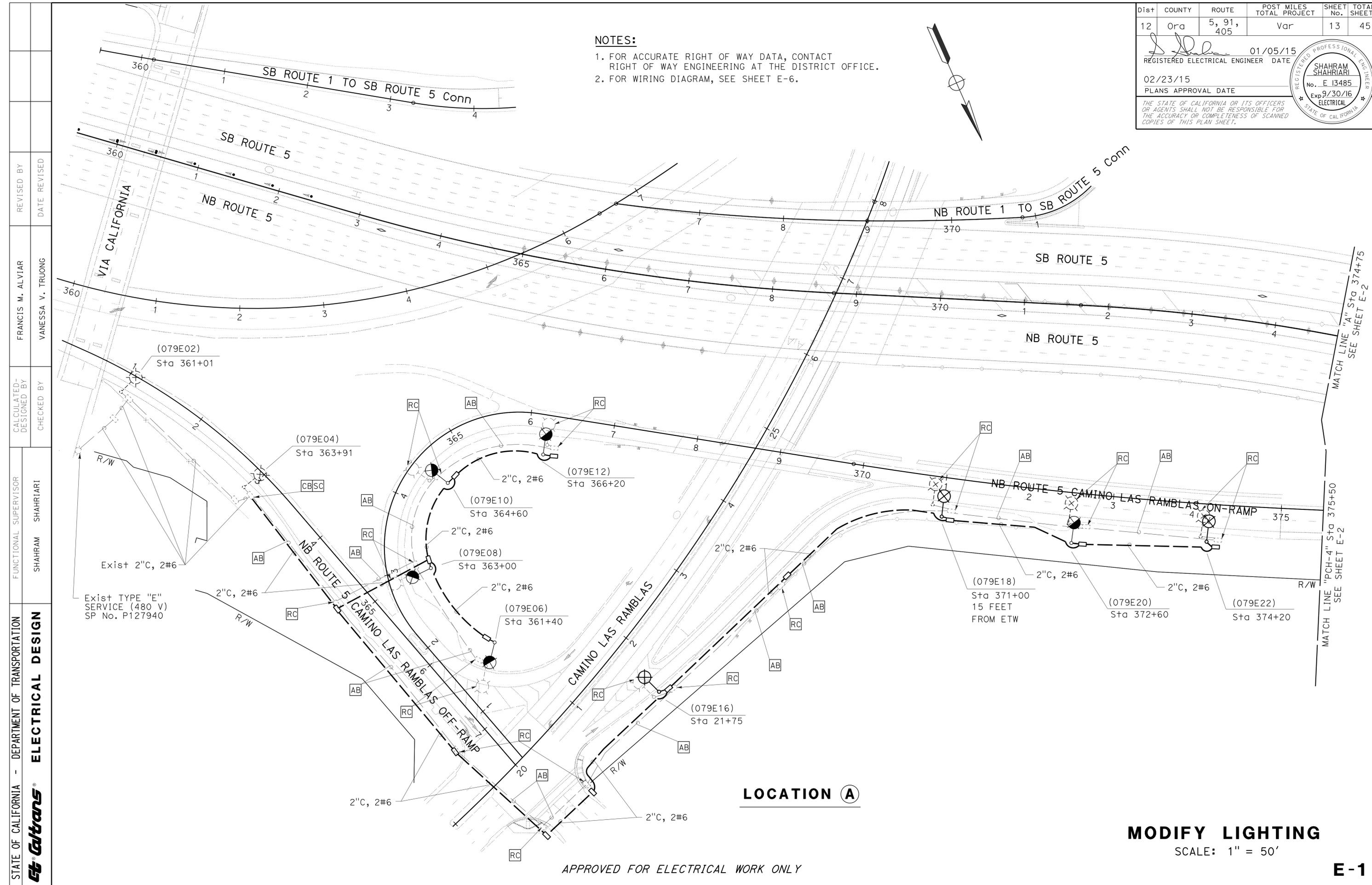
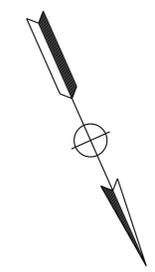
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	13	45

01/05/15  
 REGISTERED ELECTRICAL ENGINEER DATE  
 02/23/15  
 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  
**SHAHRAM SHAHRIARI**  
 No. E 13485  
 Exp 9/30/16  
 ELECTRICAL  
 STATE OF CALIFORNIA

**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR WIRING DIAGRAM, SEE SHEET E-6.



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** ELECTRICAL DESIGN  
 FUNCTIONAL SUPERVISOR: SHAHRAM SHAHRIARI  
 CHECKED BY: VANESSA V. TRUONG  
 DESIGNED BY: FRANCIS M. ALVIAR  
 REVISIONS: (None listed)

**LOCATION A**

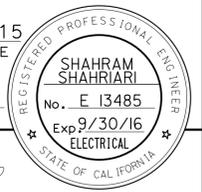
APPROVED FOR ELECTRICAL WORK ONLY

**MODIFY LIGHTING**  
 SCALE: 1" = 50'

**E-1**

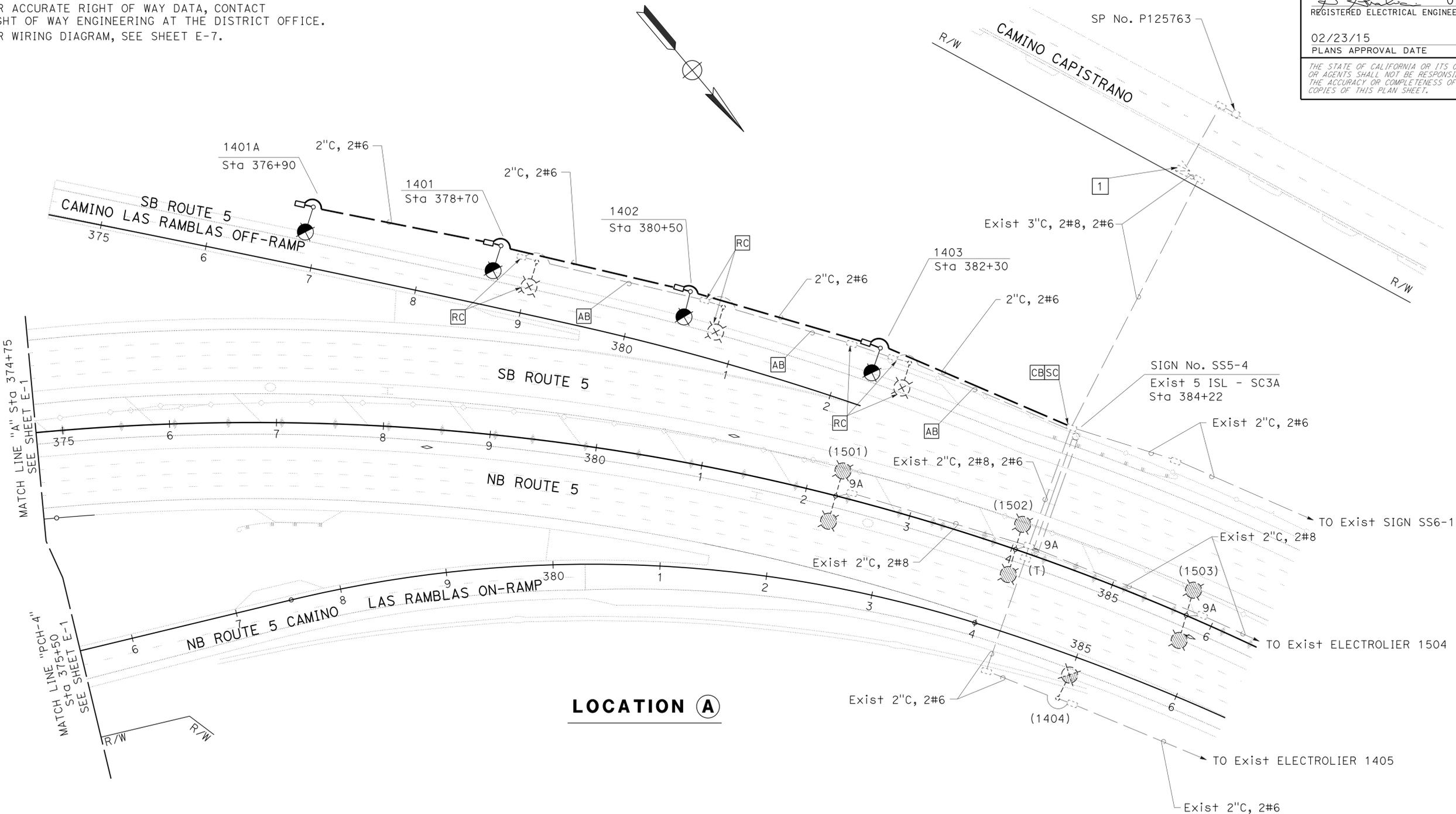
LAST REVISION DATE PLOTTED => 25-FEB-2015  
 01-02-15 TIME PLOTTED => 10:46

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	14	45
			01/05/15	DATE	
REGISTERED ELECTRICAL ENGINEER			DATE		
02/23/15			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>					



**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR WIRING DIAGRAM, SEE SHEET E-7.



**LOCATION A**

**LEGEND:**

- 1 EXISTING 480 V TYPE III-BF SERVICE EQUIPMENT ENCLOSURE (ID No. 12-55-005-0-069.500):
  - 100 A, 480 V, 2P, CB MAIN
  - 30 A, 480 V, 2P, CB LIGHTING
  - 30 A, 480 V, 2P, CB LIGHTING
  - 15 A, 120 V, 1P, CB PEC

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** ELECTRICAL DESIGN  
 FUNCTIONAL SUPERVISOR: SHAHRAM SHAHRIARI  
 CALCULATED/DESIGNED BY: SHAHRAM SHAHRIARI  
 CHECKED BY: VANESSA V. TRUONG  
 REVISIONS: FRANCIS M. ALVIAR, VANESSA V. TRUONG  
 REVISIONS: FRANCIS M. ALVIAR, VANESSA V. TRUONG

APPROVED FOR ELECTRICAL WORK ONLY

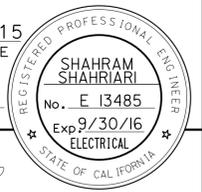
**MODIFY LIGHTING**

SCALE: 1" = 50'

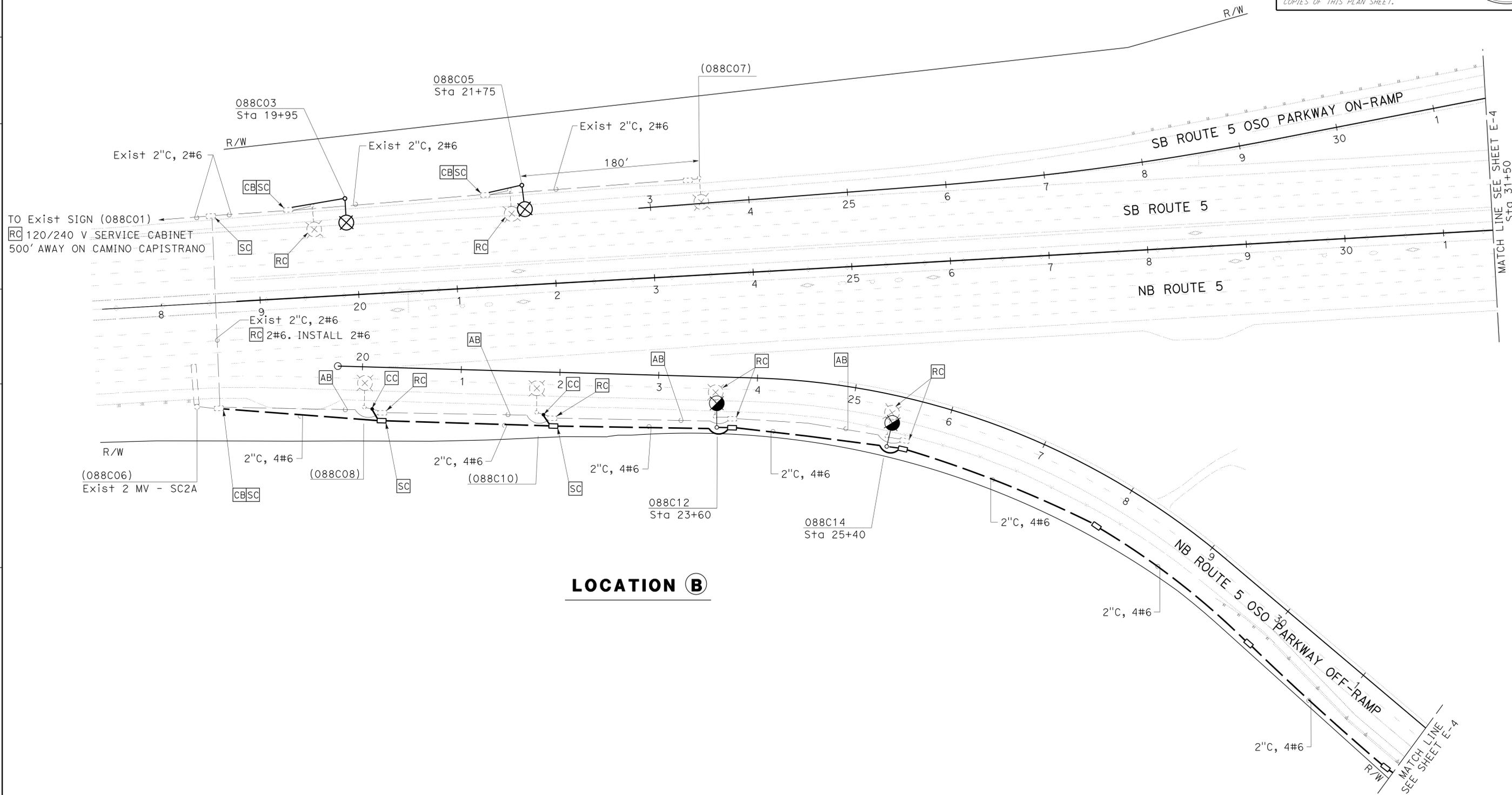
**E-2**

LAST REVISION DATE PLOTTED => 25-FEB-2015  
 01-02-15 TIME PLOTTED => 10:46

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	15	45
			01/05/15		
REGISTERED ELECTRICAL ENGINEER			DATE		
02/23/15					
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>					



- NOTES:**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - FOR WIRING DIAGRAM, SEE SHEET E-8.



**LOCATION B**

**MODIFY LIGHTING**  
SCALE: 1" = 50'

APPROVED FOR ELECTRICAL WORK ONLY

**E-3**

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

REVISOR BY DATE

FRANCIS M. ALVIAR  
VANESSA V. TRUONG

CALCULATED/DESIGNED BY  
CHECKED BY

FUNCTIONAL SUPERVISOR  
SHAHRAM SHAHRIARI

SHAHRAM SHAHRIARI

USERNAME => s127956  
DGN FILE => 121400003Ua003.dgn

RELATIVE BORDER SCALE 1" = 10' INCHES

UNIT 3024

PROJECT NUMBER & PHASE

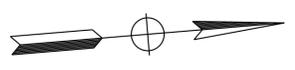
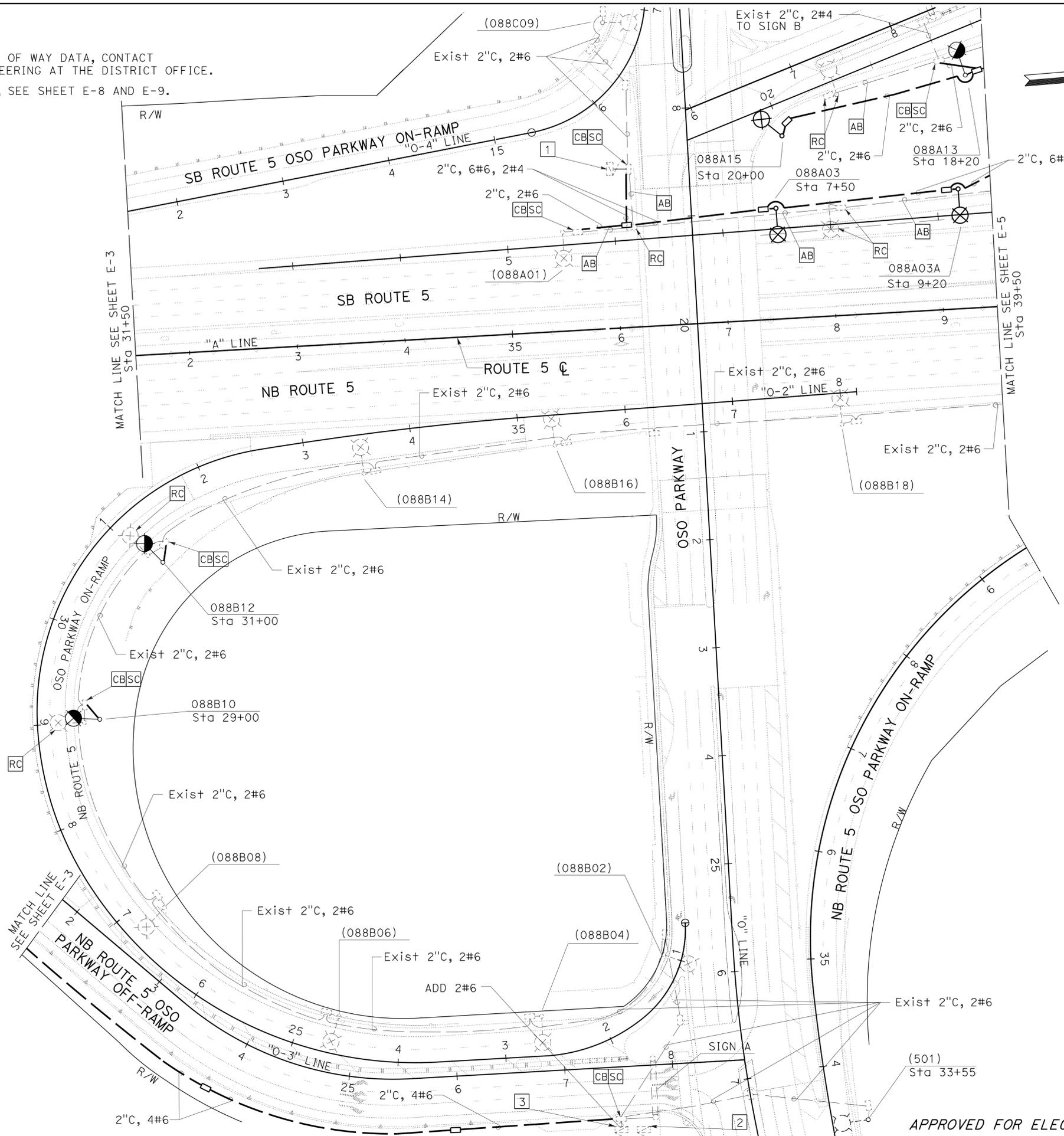
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LAST REVISION DATE PLOTTED => 25-FEB-2015  
01-02-15 TIME PLOTTED => 10:46

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

FUNCTIONAL SUPERVISOR	SHAHRIARI
CALCULATED/DESIGNED BY	SHAHRIARI
CHECKED BY	SHAHRIARI
REVISOR	FRANCIS M. ALVIAR
DATE	VANESSA V. TRUONG

**NOTES:**  
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.  
 2. FOR WIRING DIAGRAM, SEE SHEET E-8 AND E-9.



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	16	45

01/05/15  
 REGISTERED ELECTRICAL ENGINEER DATE

02/23/15  
 PLANS APPROVAL DATE

SHAHRAM SHAHRIARI  
 No. E 13485  
 Exp 9/30/16  
 ELECTRICAL

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.

- LEGEND:**
- 1 EXISTING 120/240 V TYPE III-CF SERVICE EQUIPMENT ENCLOSURE  
 ID No. 12-55-005-0-015.001  
 METER A:  
 100 A, 240 V, 2P, CB MAIN  
 50 A, 120 V, 1P, CB SIGNAL  
 20 A, 120 V, 1P, CB IISNS  
 30 A, 120 V, 1P, CB RAMP METERING  
 30 A, 120 V, 1P, CB RAMP METERING  
 30 A, 120 V, 1P, CB CCTV  
 30 A, 120 V, 1P, CB CMS  
 METER B:  
 100 A, 240 V, 2P, CB MAIN  
 20 A, 120 V, 1P, CB IRRIGATION  
 20 A, 120 V, 1P, CB IRRIGATION  
 30 A, 120 V, 1P, CB BRIDGE SIGN  
 30 A, 240 V, 2P, CB HWY SIGN  
 40 A, 240 V, 2P, CB LIGHTING  
 40 A, 240 V, 2P, CB LIGHTING  
 30 A, 240 V, 2P, CB SOFFIT  
 15 A, 120 V, 1P, CB CONTROL  
 UNMETERED:  
 30 A, 120 V, 1P, CB SAFETY LIGHTING  
 15 A, 120 V, 1P, CB CONTROL
- 2 EXISTING 120/240 V TYPE III-CF SERVICE EQUIPMENT ENCLOSURE  
 ID No. 12-55-005-0-015.003  
 METER A:  
 100 A, 240 V, 2P, CB MAIN  
 30 A, 120 V, 1P, CB RAMP METERING (LOC 1)  
 30 A, 120 V, 1P, CB RAMP METERING (LOC 2)  
 20 A, 120 V, 1P, CB IRRIGATION C  
 20 A, 120 V, 1P, CB IRRIGATION D  
 30 A, 120 V, 1P, CB CCTV #90  
 ID No. 12-55-005-0-015.003A  
 METER B:  
 100 A, 240 V, 2P, CB MAIN  
 50 A, 120 V, 1P, CB SIGNAL (LOC 1)  
 30 A, 240 V, 2P, CB LIGHTING
- 3 EXISTING 120/240 V TYPE III-BF SERVICE EQUIPMENT ENCLOSURE  
 ID No. 07-55-005-015.002  
 100 A, 240 V, 3P, CB MAIN  
 15 A, 120 V, 1P, CB CONTROL (LTG)  
 15 A, 120 V, 1P, CB CONTROL (SIGN)  
 30 A, 240 V, 2P, CB LIGHTING (CIRCUIT 88B)  
 30 A, 240 V, 2P, CB SIGN A & SB ON RAMP LIGHTING  
 ADD 30 A, 240 V, 2P, CB SIGN AND NB OFF RAMP LIGHTING

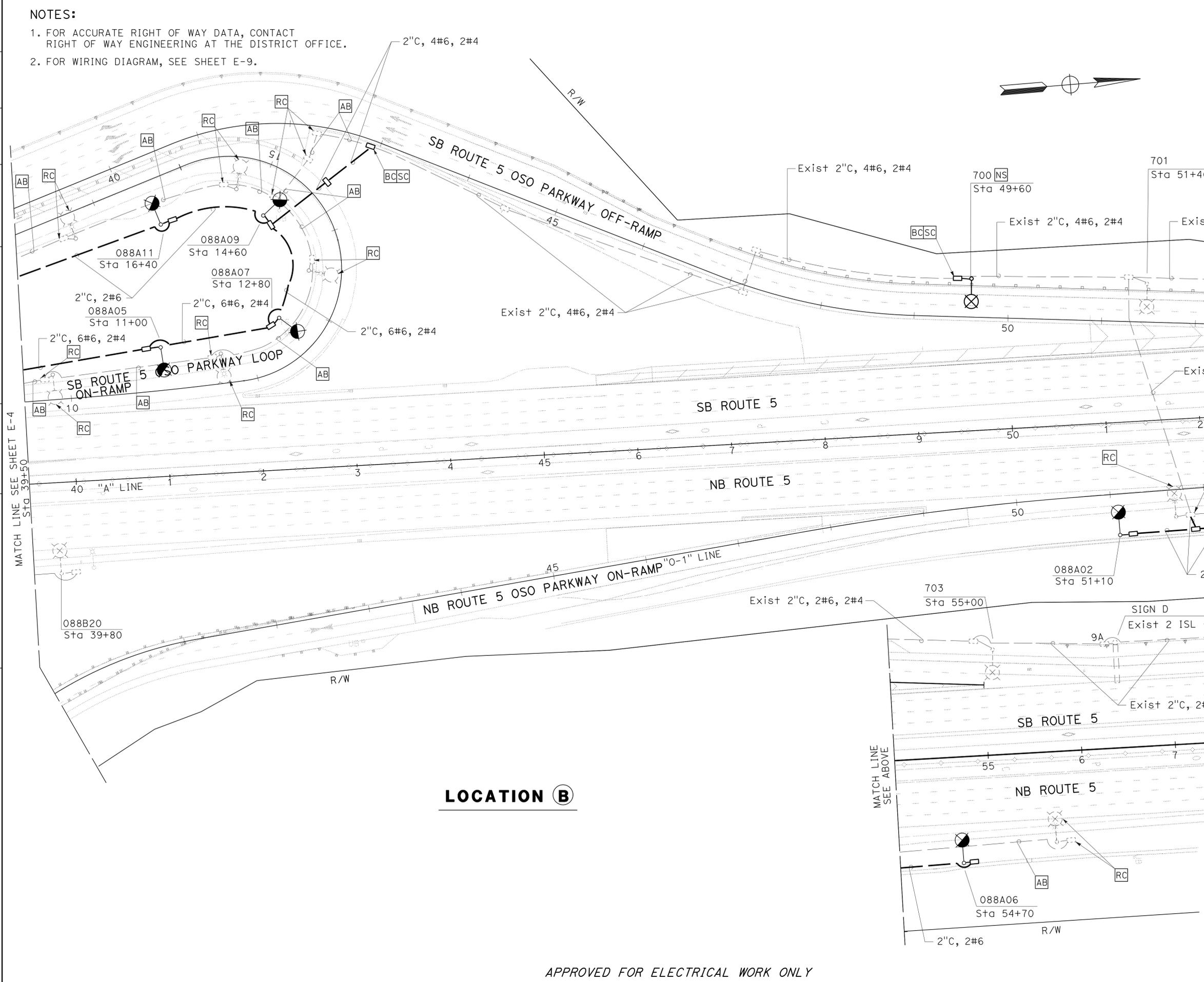
**LOCATION B**

**MODIFY LIGHTING**  
 SCALE: 1" = 50'

APPROVED FOR ELECTRICAL WORK ONLY

**E-4**

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



**LOCATION B**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	17	45

01/05/15  
 REGISTERED ELECTRICAL ENGINEER DATE

02/23/15  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 SHAHRAM SHAHRIARI  
 No. E 13485  
 Exp 9/30/16  
 ELECTRICAL

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.



APPROVED FOR ELECTRICAL WORK ONLY



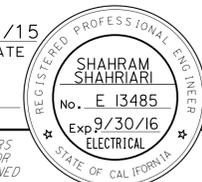
**MODIFY LIGHTING**  
 SCALE: 1" = 50'

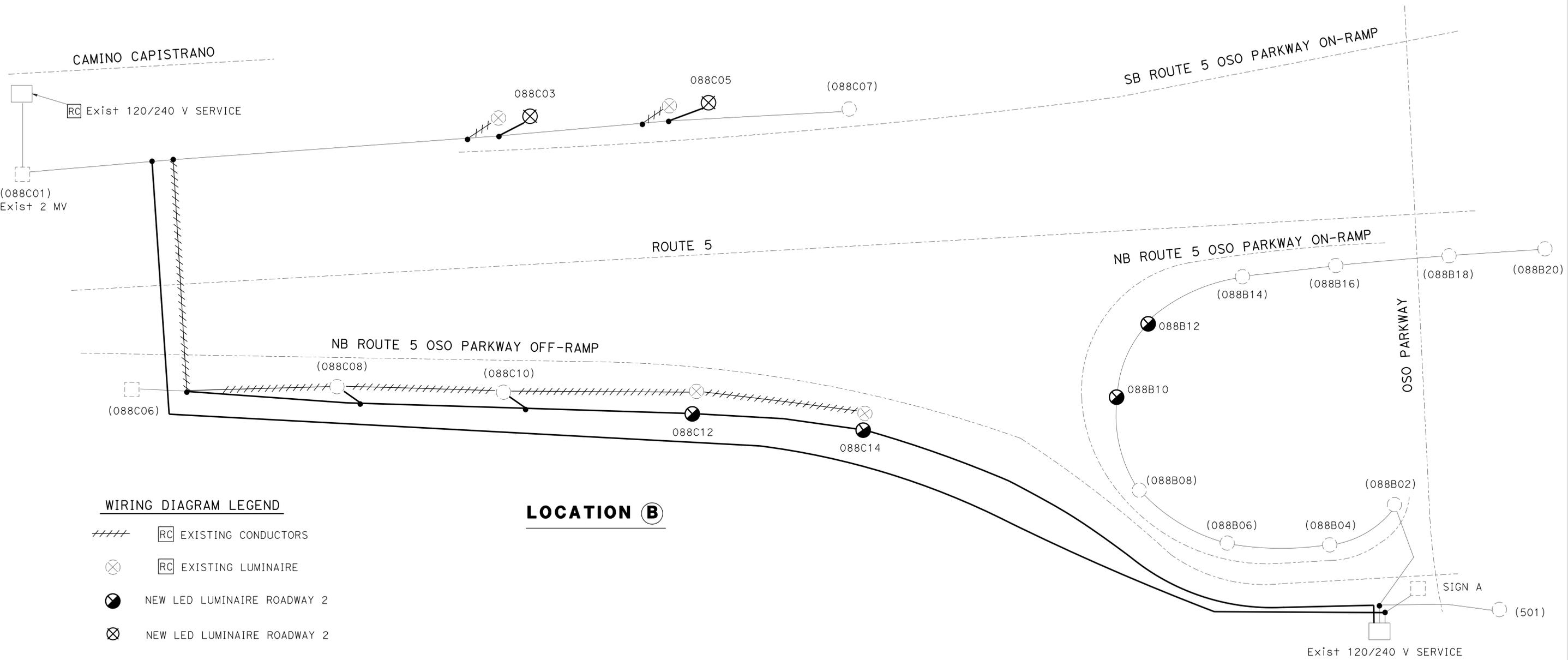
**E-5**

LAST REVISION DATE PLOTTED => 25-FEB-2015 01-21-15 TIME PLOTTED => 10:46





Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	20	45
 REGISTERED ELECTRICAL ENGINEER DATE 01/05/15					
02/23/15 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>					



- WIRING DIAGRAM LEGEND**
- ////// RC EXISTING CONDUCTORS
  - ⊗ RC EXISTING LUMINAIRE
  - NEW LED LUMINAIRE ROADWAY 2
  - ⊗ NEW LED LUMINAIRE ROADWAY 2
  - EXISTING LUMINAIRE
  - EXISTING SIGN
  - SPLICE
  - EXISTING 2#6 CONDUCTORS
  - NEW 2#6 AWG CONDUCTORS

**LOCATION B**

**WIRING DIAGRAM**

**MODIFY LIGHTING**  
NO SCALE

APPROVED FOR ELECTRICAL WORK ONLY

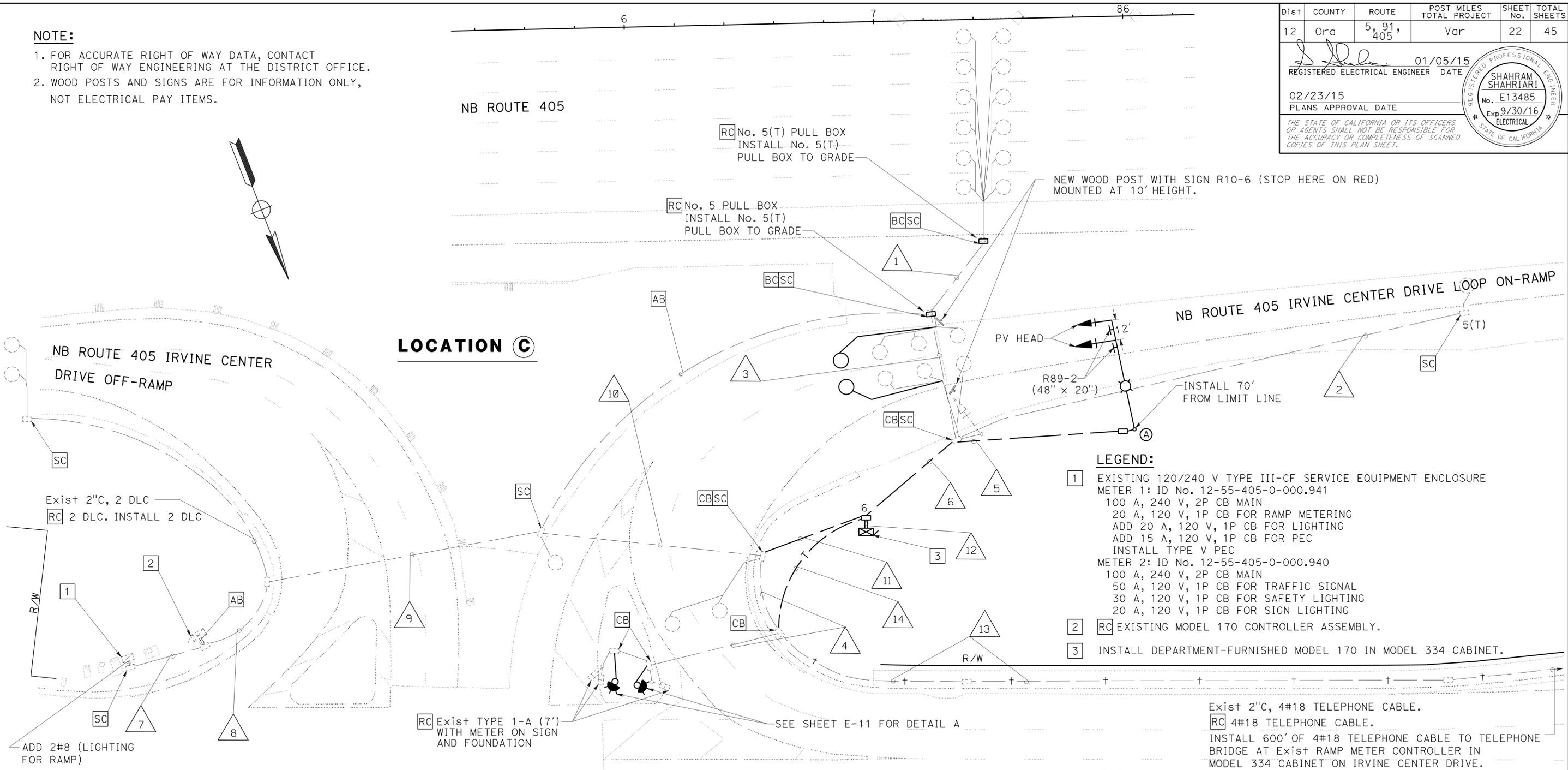
**E-8**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** ELECTRICAL DESIGN  
 FUNCTIONAL SUPERVISOR: SHAHRAM SHAHRIARI  
 CHECKED BY: VANESSA V. TRUONG  
 DESIGNED BY: FRANCIS M. ALVIAR  
 REVISIONS: 01-05-15 TIME PLOTTED => 10:46



**NOTE:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- WOOD POSTS AND SIGNS ARE FOR INFORMATION ONLY, NOT ELECTRICAL PAY ITEMS.



- LEGEND:**
- 1 EXISTING 120/240 V TYPE III-CF SERVICE EQUIPMENT ENCLOSURE  
METER 1: ID No. 12-55-405-0-000.941  
100 A, 240 V, 2P CB MAIN  
20 A, 120 V, 1P CB FOR RAMP METERING  
ADD 20 A, 120 V, 1P CB FOR LIGHTING  
ADD 15 A, 120 V, 1P CB FOR PEC  
INSTALL TYPE V PEC  
METER 2: ID No. 12-55-405-0-000.940  
100 A, 240 V, 2P CB MAIN  
50 A, 120 V, 1P CB FOR TRAFFIC SIGNAL  
30 A, 120 V, 1P CB FOR SAFETY LIGHTING  
20 A, 120 V, 1P CB FOR SIGN LIGHTING
  - 2 RC EXISTING MODEL 170 CONTROLLER ASSEMBLY.
  - 3 INSTALL DEPARTMENT-FURNISHED MODEL 170 IN MODEL 334 CABINET.

**CONDUCTOR AND CONDUIT SCHEDULE**

CONDUCTOR	CONDUCTOR RUN	1	2	3	4	5	6	7	8	9	10	11	12	13	14
#14	FLASHING BEACON	-	-	-	4	-	-	-	-	-	-	4	4	-	-
	RAMP SIGNAL	-	-	-	-	6	6	-	-	-	-	-	6	-	-
	SPARES	-	-	-	-	3	3	-	-	-	-	-	3	-	-
DLC	QUEUE DETECTOR	-	-	-	-	-	-	-	-	-	1	3	3	-	-
	DEMAND DETECTOR	-	-	2	-	-	4	-	-	-	-	-	4	-	-
	PASSAGE DETECTOR	-	-	1	-	-	2	-	-	-	-	-	2	-	-
	COUNT DETECTOR	-	1	-	-	-	1	-	-	2	2	2	3	-	-
	SURVEILLANCE DETECTOR	12	-	12	-	-	12	-	-	-	-	-	12	-	-
4#18	TELEPHONE	-	-	-	-	-	-	-	-	-	-	1	1	1	
#10	SIGNAL COMMON	-	-	-	-	1	1	-	-	-	-	1	-	-	
#8	LUMINAIRE	-	-	-	-	2	2	2	2	2	2	2	-	-	
#6	SERVICE	-	-	-	-	-	-	2	2	2	2	2	-	-	
CONDUIT SIZE		2"(E)	2"(E)	2"(E)	2"(E)	3"	3"	2"(E)	3"(E)	3"(E)	2"(E)	3"	2-3"	2"(E)	2"

REMOVE ALL EXISTING CONDUCTORS AND INSTALL NEW CONDUCTORS UNLESS OTHERWISE NOTED  
(E) - EXISTING

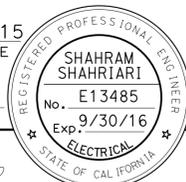
**STANDARD AND EQUIPMENT SCHEDULE**

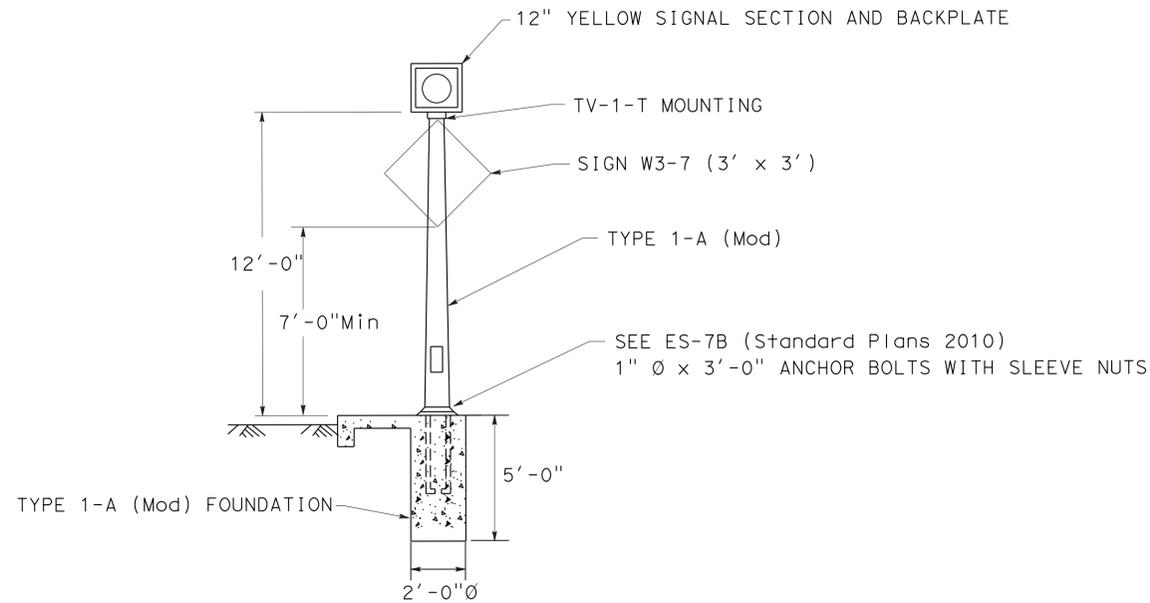
TYPE	STANDARD		VEH SIG MTG		LED
	SMA	LMA	MAST ARM		LUMINAIRE
A	29A-5-100	45'	15'	2 MAS	ROADWAY 2

**MODIFY RAMP METERING SYSTEM**

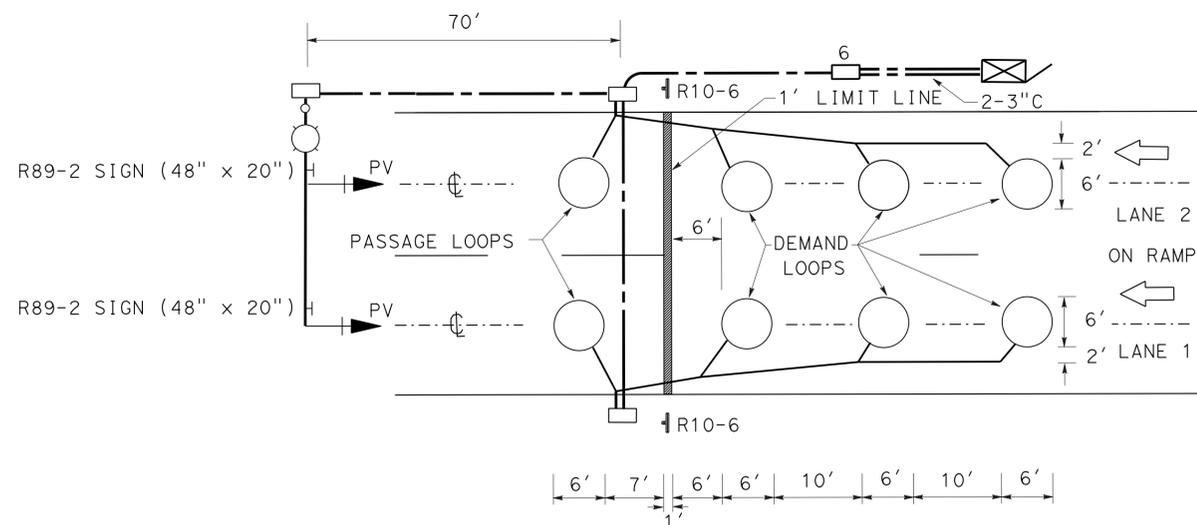
SCALE: 1" = 20'

APPROVED FOR ELECTRICAL WORK ONLY

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	23	45
			01/05/15		
REGISTERED ELECTRICAL ENGINEER			DATE		
02/23/15			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>					



**TYPE 1-A (Mod)**  
**FLASHING BEACON**  
**DETAIL A**



**TYPICAL 2-LANE RAMP**  
**METERING INSTALLATION**  
**DETAIL B**

**MODIFY RAMP METERING SYSTEM**  
NO SCALE

APPROVED FOR ELECTRICAL WORK ONLY

**E-11**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	REVISIONS	DATE
<b>Caltrans</b> ELECTRICAL DESIGN	SHAHRAM SHAHRIARI	BS	05/2011
CALCULATED/DESIGNED BY	CHECKED BY	FRANCIS M. ALVIAR	VANESSA V. TRUONG



**LEGEND:**

- 1 EXISTING CMS CONTROLLER IN MODEL 334-C CABINET.
- 2 EXISTING 120/240 V METERED SERVICE IN TYPE III-BF SERVICE EQUIPMENT ENCLOSURE.  
 RC EXISTING 4-80 A, 120 V, 1P CB. INSTALL 4-30 A, 120 V, 1P CB.  
 30 A CIRCUIT BREAKERS MUST BE GANGED-OPERATED. SEE NEW CIRCUIT BREAKER DETAIL ON SHEET E-12.
- 3 RC EXISTING 60 INCANDESCENT PIXEL MATRIX MODULES. INSTALL 60 LED PIXEL MATRIX MODULES.  
 CONNECT EXISTING CONNECTORS TO LED MODULES.
- 4 REMOVE EXISTING 4 WIRES FROM THE 4P MAIN DISCONNECT AND 30 1P-20 A CIRCUIT BREAKERS.  
 PROVIDE MOUNTING HARDWARE AND MOUNT 4 TRANSFORMERS. INSTALL TRANSFORMER PRIMARY WIRES (2#10 AWG) TO MAIN DISCONNECT THROUGH CURRENT SENSORS. RETAIN MOVs.

**NOTES**

- 1. CONTRACTOR MUST VERIFY THAT THE POWER FOR THE CMS HAS BEEN SHUT OFF BEFORE PERFORMING ANY WORK ON THE SYSTEM. THE CMS POWER MUST REMAIN OFF, UNLESS OTHERWISE ORDERED TO TURN IT ON DURING TESTING BY STATE FORCES.
- 2. CONTRACTOR MUST COMPLY WITH NATIONAL ELECTRICAL CODE AND CALTRANS STANDARD SPECIFICATIONS AND STANDARD PLANS
- 3. CONTRACTOR MUST LAY TARPULIN OR SAFETY NET OVER THE LENGTH OF THE CMS WALKWAY TO PREVENT ACCIDENTAL DROP OF TOOLS OR SMALL OBJECTS ONTO THE ROADWAY. THE TARPULIN OR SAFETY NET MUST BE SECURED.

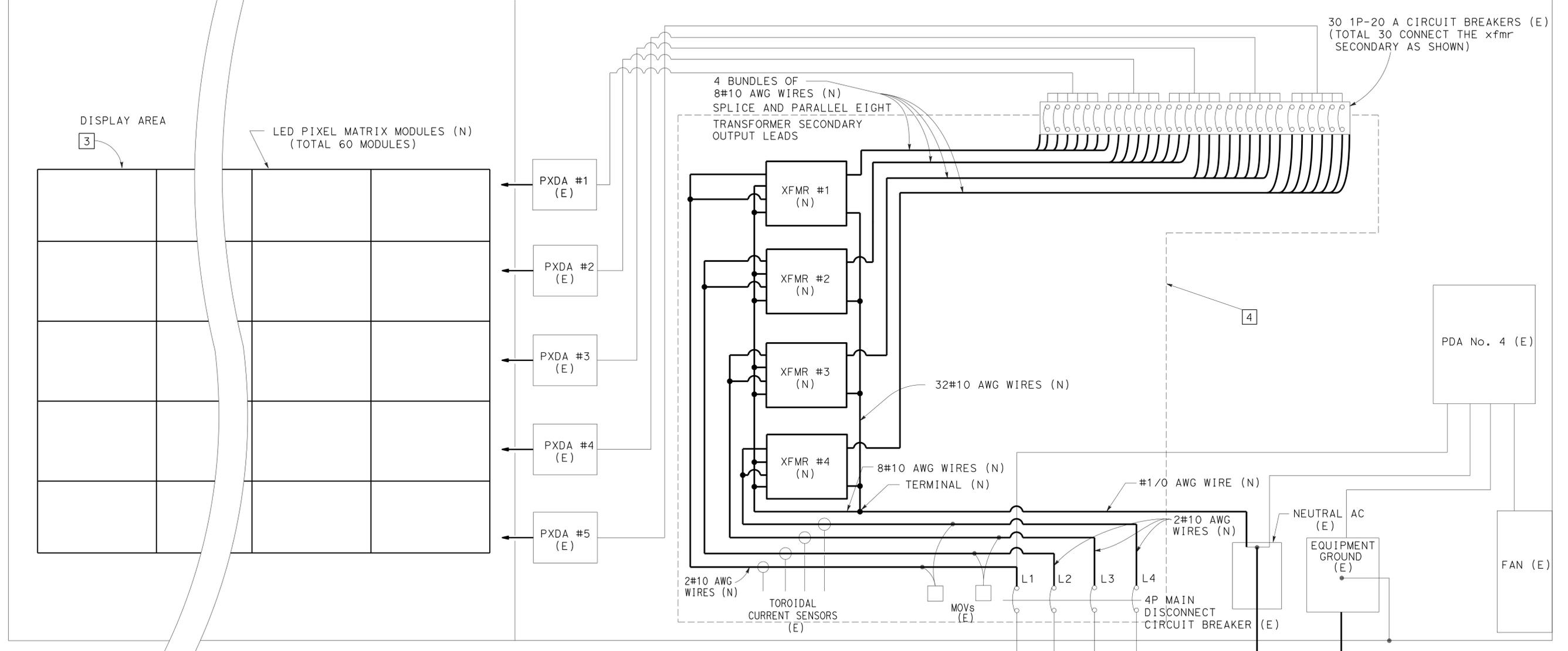
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	25	45

01/05/15  
 REGISTERED ELECTRICAL ENGINEER DATE

02/23/15  
 PLANS APPROVAL DATE

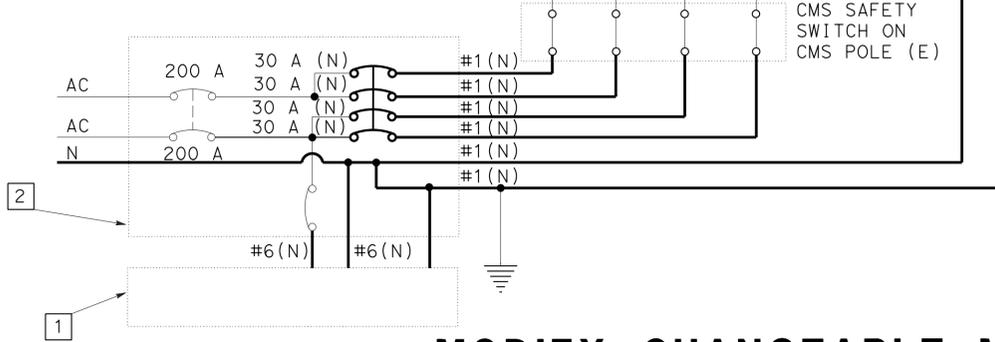
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER  
 SHAHRAM SHAHRIARI  
 No. E13485  
 Exp. 9/30/16  
 ELECTRICAL  
 STATE OF CALIFORNIA



**ABBREVIATIONS**

(E)	EXISTING
MOV	METAL-OXIDE VARISTOR
(N)	NEW
xfmr	TRANSFORMER
PDA	POWER DISTRIBUTION ASSEMBLY
PXDA	PIXEL DRIVER ASSEMBLY



TYPICAL CMS MODEL 500 (LED) SYSTEM WIRING DIAGRAM

**MODIFY CHANGEABLE MESSAGE SIGN SYSTEM**

NO SCALE

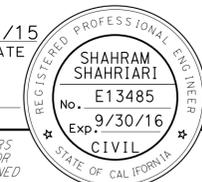
**E-13**

APPROVED FOR ELECTRICAL WORK ONLY

LAST REVISION DATE PLOTTED => 25-FEB-2015 01-21-15 TIME PLOTTED => 10:46

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	26	44

01/05/15  
 REGISTERED CIVIL ENGINEER DATE  
 02/23/15  
 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: (THIS SHEET)**

1. ELECTRICAL QUANTITY INFORMATION ON THIS SHEET IS FOR DESIGNER USE ONLY. DO NOT USE FOR BIDDING PURPOSES.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** ELECTRICAL DESIGN  
 FUNCTIONAL SUPERVISOR SHAHRAM SHAHRIARI  
 CALCULATED/DESIGNED BY CHECKED BY  
 FRANCIS M. ALVIAR VANESSA V. TRUONG  
 REVISED BY DATE REVISED

**MODIFY LIGHTING**

SHEET No.	TYPE 30 STANDARD / FOUNDATION EA	TYPE 32 STANDARD / FOUNDATION EA	LED LUMINAIRE ROADWAY 2 EA	2" C LF	No. 4 CONDUCTOR LF	No. 6 CONDUCTOR LF	No. 5 PULL BOX EA	RC TYPE 15 EA	RC TYPE 30 EA	RC No. 5 PULL BOX EA
E-1	3	5	8	2000		4000	13	4	3	13
E-2		4	4	750		1500	4		3	4
E-3	2	2	4	1400		2800	7		4	4
E-4	3	3	6	1250	800	5000	7	1	3	3
E-5	1	7	8	1100	1000	4000	10	5	3	11

**MODIFY RAMP METERING SYSTEM**

SHEET No.	29A-5-100 STANDARD / FOUNDATION EA	MODEL 334 CABINET / FOUNDATION EA	No. 5 PULL BOX EA	No. 5(T) PULL BOX EA	No. 6 PULL BOX EA	3-12" PV HEAD EA	LED LUMINAIRE ROADWAY 2 EA	2" C LF	3" C LF	No. 6 CONDUCTOR LF	No. 8 CONDUCTOR LF	No. 10 CONDUCTOR LF	No. 14 CONDUCTOR LF	4#18 CABLE LF	DLC LF	TYPE 1-A (Mod) / FOUNDATION EA	FLASHING BEACON EA	TYPE E LOOP EA	15 A CB EA	20 A CB EA	PEC EA	RC CONTROLLER EA
E-10	1	1	1	2	1	2	1	70	200	700	700	120	1400	1000	3500	2	2	2	1	1	1	1

**MODIFY CHANGEABLE MESSAGE SIGN SYSTEM**

SHEET No.	RC INCANDESCENT MODULE EA	LED PIXEL MATRIX MODULE EA	No. 5 PULL BOX EA	No. 1 CONDUCTOR LF	No. 2 CONDUCTOR LF	No. 6 CONDUCTOR LF	No. 10 CONDUCTOR LF	4" C LF	30 A CB EA	5 kVA TRANSFORMER EA	RC No. 5 PULL BOX EA	RC 80 A CB EA
E-12	60	60	2	7200	30	2400	100	50	4	4	7	4

**ELECTRICAL QUANTITIES**

**E-14**



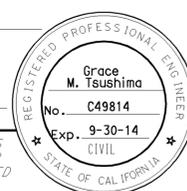
	<b>M</b>	
Maint	MAINTENANCE	
Max	MAXIMUM	
MB	METAL BEAM	
MBB	METAL BEAM BARRIER	
MBGR	METAL BEAM GUARD RAILING	
Med	MEDIAN	
MGS	MIDWEST GUARDRAIL SYSTEM	
MH	MANHOLE	
Min	MINIMUM	
Misc	MISCELLANEOUS	
Misc I & S	MISCELLANEOUS IRON AND STEEL	
Mkr	MARKER	
Mod	MODIFIED, MODIFY	
Mon	MONUMENT	
MP	METAL PLATE	
MPGR	METAL PLATE GUARD RAILING	
MR	MOVEMENT RATING	
MSE	MECHANICALLY STABILIZED EMBANKMENT	
Mt	MOUNTAIN, MOUNT	
MtI	MATERIAL	
MVP	MAINTENANCE VEHICLE PULLOUT	
	<b>N</b>	
N	NORTH	
NB	NORTHBOUND	
No.	NUMBER (MUST HAVE PERIOD)	
Nos.	NUMBERS (MUST HAVE PERIOD)	
NPS	NOMINAL PIPE SIZE	
NS	NEAR SIDE	
NSP	NEW STANDARD PLAN	
NTS	NOT TO SCALE	
	<b>O</b>	
Obir	OBLITERATE	
OC	OVERCROSSING	
OD	OUTSIDE DIAMETER	
OF	OUTSIDE FACE	
OG	ORIGINAL GROUND	
OGAC	OPEN GRADED ASPHALT CONCRETE	
OGFC	OPEN GRADED FRICTION COURSE	
OH	OVERHEAD	
OHWM	ORDINARY HIGH WATER MARK	
O-O	OUT TO OUT	
Opp	OPPOSITE	
OSD	OVERSIDE DRAIN	
	<b>P</b>	
p	PAGE	
PAP	PERFORATED ALUMINUM PIPE	
PB	PULL BOX	
PC	POINT OF CURVATURE, PRECAST	
PCC	POINT OF COMPOUND CURVE, PORTLAND CEMENT CONCRETE	
PCMS	PORTABLE CHANGEABLE MESSAGE SIGN	
PCP	PERFORATED CONCRETE PIPE, PRESTRESSED CONCRETE PIPE	
PCVC	POINT OF COMPOUND VERTICAL CURVE	
PEC	PERMIT TO ENTER AND CONSTRUCT	
Ped	PEDESTRIAN	
Ped OC	PEDESTRIAN OVERCROSSING	
Ped UC	PEDESTRIAN UNDERCROSSING	
Perm MtI	PERMEABLE MATERIAL	

	<b>P continued</b>	
PG	PROFILE GRADE	
PI	POINT OF INTERSECTION	
PJP	PARTIAL JOINT PENETRATION	
Pkwy	PARKWAY	
PL, PL	PLATE	
P/L	PROPERTY LINE	
PM	POST MILE, TIME FROM NOON TO MIDNIGHT	
PN	PAVING NOTCH	
POC	POINT OF HORIZONTAL CURVE	
POT	POINT OF TANGENT	
POVC	POINT OF VERTICAL CURVE	
PP	PIPE PILE, PLASTIC PIPE, POWER POLE	
PPL	PREFORMED PERMEABLE LINER	
PPP	PERFORATED PLASTIC PIPE	
PRC	POINT OF REVERSE CURVE	
PRF	PAVEMENT REINFORCING FABRIC	
PRVC	POINT OF REVERSE VERTICAL CURVE	
PS&E	PLANS, SPECIFICATIONS AND ESTIMATES	
PS, P/S	PRESTRESSED	
PSP	PERFORATED STEEL PIPE	
PT	POINT OF TANGENCY	
PVC	POLYVINYL CHLORIDE	
Pvmt	PAVEMENT	
	<b>Q</b>	
Qty	QUANTITY	
	<b>R</b>	
R	RADIUS	
R & D	REMOVE AND DISPOSE	
R & S	REMOVE AND SALVAGE	
R/C	RATE OF CHANGE	
RCA	REINFORCED CONCRETE ARCH	
RCB	REINFORCED CONCRETE BOX	
RCP	REINFORCED CONCRETE PIPE	
RCPA	REINFORCED CONCRETE PIPE ARCH	
Rd	ROAD	
Reinf	REINFORCED, REINFORCEMENT, REINFORCING	
Rel	RELOCATE	
Repl	REPLACEMENT	
Ret	RETAINING	
Rev	REVISED, REVISION	
Rdwy	ROADWAY	
RHMA	RUBBERIZED HOT MIX ASPHALT	
Riv	RIVER	
RM	ROAD-MIXED	
RP	RADIUS POINT, REFERENCE POINT	
RR	RAILROAD	
RSP	ROCK SLOPE PROTECTION, REVISED STANDARD PLAN	
Rt	RIGHT	
Rte	ROUTE	
RW	REDWOOD, RETAINING WALL	
R/W	RIGHT OF WAY	
Rwy	RAILWAY	

	<b>S</b>	
S	SOUTH, SUPPLEMENT	
SAE	STRUCTURE APPROACH EMBANKMENT	
Salv	SALVAGE	
SAPP	STRUCTURAL ALUMINUM PLATE PIPE	
SB	SOUTHBOUND	
SC	SAND CUSHION	
SCSP	SLOTTED CORRUGATED STEEL PIPE	
SD	STORM DRAIN	
Sec	SECOND, SECTION	
Sep	SEPARATION	
SG	SUBGRADE	
Shld	SHOULDER	
Sht	SHEET	
Sim	SIMILAR	
±	STATION LINE	
SM	SELECTED MATERIAL	
Spec	SPECIAL, SPECIFICATIONS	
SPP	SLOTTED PLASTIC PIPE	
SS	SLOPE STAKE	
SSBM	STRAP AND SADDLE BRACKET METHOD	
SSD	STRUCTURAL SECTION DRAIN	
SSPA	STRUCTURAL STEEL PLATE ARCH	
SSPP	STRUCTURAL STEEL PLATE PIPE	
SSPPA	STRUCTURAL STEEL PLATE PIPE ARCH	
SSRP	STEEL SPIRAL RIB PIPE	
St	STREET	
Sta	STATION	
STBB	SINGLE THRIE BEAM BARRIER	
Std	STANDARD	
Str	STRUCTURE	
Surf	SURFACING	
SW	SIDEWALK, SOUND WALL	
Swr	SEWER	
Sym	SYMMETRICAL	
S4S	SURFACE 4 SIDES	
	<b>T</b>	
T	SEMI-TANGENT	
Tan	TANGENT	
TBB	THRIE BEAM BARRIER	
Tbr	TIMBER	
TC	TOP OF CURB	
TCB	TRAFFIC CONTROL BOX	
TCE	TEMPORARY CONSTRUCTION EASEMENT	
TeI	TELEPHONE	
Temp	TEMPORARY	
TG	TOP OF GRADE	
Tot	TOTAL	
TP	TELEPHONE POLE	
TPB	TREATED PERMEABLE BASE	
TPM	TREATED PERMEABLE MATERIAL	
Trans	TRANSITION	

	<b>T continued</b>	
TS	TRANSVERSE, TRAFFIC SIGNAL, TUBULAR STEEL	
Typ	TYPICAL	<b>U</b>
UC	UNDERCROSSING	
UD	UNDERDRAIN	
UG	UNDERGROUND	
UON	UNLESS OTHERWISE NOTED	
UP	UNDERPASS	
	<b>V</b>	
V	VALVE, DESIGN SPEED	
Var	VARIABLE, VARIES	
VC	VERTICAL CURVE	
VCP	VITRIFIED CLAY PIPE	
Vert	VERTICAL	
Via	VIADUCT	
Vol	VOLUME	<b>W</b>
W	WEST, WIDTH	
WB	WESTBOUND	
WH	WEEP HOLE	
WM	WIRE MESH	
WS	WATER SURFACE	
WSP	WELDED STEEL PIPE	
Wt	WEIGHT	
WV	WATER VALVE	
WW	WINGWALL	
WWLOL	WINGWALL LAYOUT LINE	<b>X</b>
X Sec	CROSS SECTION	
Xing	CROSSING	<b>Y</b>
Yr	YEAR	
Yrs	YEARS	

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	27	45



*Grace M. Tsushima*  
 REGISTERED CIVIL ENGINEER  
 July 19, 2013  
 PLANS APPROVAL DATE

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TO ACCOMPANY PLANS DATED 02-23-15

**UNIT OF MEASUREMENT SYMBOLS:**

Some of the symbols used in the project plan quantity tables and in the Bid Item List are:

**TABLE A**

SYMBOL USED	DEFINITIONS
ACRE	ACRE
CF	CUBIC FOOT
CY	CUBIC YARD
EA	EACH
GAL	GALLON
LB	POUND
LF	LINEAR FOOT
SQFT	SQUARE FOOT
SQYD	SQUARE YARD
STA	100 FEET
TAB	TABLET
TON	2,000 POUNDS

Some of the symbols used in the plans other than in the project plan quantity tables are:

**TABLE B**

SYMBOL USED	DEFINITIONS
ksi	KIPS PER SQUARE INCH
ksf	KIPS PER SQUARE FOOT
psi	POUNDS PER SQUARE INCH
psf	POUNDS PER SQUARE FOOT
lb/ft <sup>3</sup> , pcf	POUNDS PER CUBIC FOOT
tsf	TONS PER SQUARE FOOT
mph, MPH *	MILES PER HOUR
∅	NOMINAL DIAMETER
oz	OUNCE
lb	POUND
kíp	1,000 POUNDS
cal	CALORIE
ft	FOOT OR FEET
gal	GALLON

\* For use on a sign panel only

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

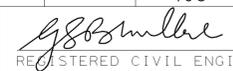
**ABBREVIATIONS  
(SHEET 2 OF 2)**

NO SCALE

RSP A10B DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN A10B  
DATED MAY 20, 2011 - PAGE 2 OF THE STANDARD PLANS BOOK DATED 2010.

2010 REVISED STANDARD PLAN RSP A10B

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	28	45

  
 REGISTERED CIVIL ENGINEER  
 July 19, 2013  
 PLANS APPROVAL DATE



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TO ACCOMPANY PLANS DATED 02-23-15

TABLE 1

TAPER LENGTH CRITERIA AND CHANNELIZING DEVICE SPACING							
SPEED (S)	MINIMUM TAPER LENGTH * FOR WIDTH OF OFFSET 12 FEET (W)				MAXIMUM CHANNELIZING DEVICE SPACING		
	TANGENT 2L	MERGING L	SHIFTING L/2	SHOULDER L/3	X	Y	Z **
					TAPER	TANGENT	CONFLICT
mph	ft	ft	ft	ft	ft	ft	ft
20	160	80	40	27	20	40	10
25	250	125	63	42	25	50	12
30	360	180	90	60	30	60	15
35	490	245	123	82	35	70	17
40	640	320	160	107	40	80	20
45	1080	540	270	180	45	90	22
50	1200	600	300	200	50	100	25
55	1320	660	330	220	55	110	27
60	1440	720	360	240	60	120	30
65	1560	780	390	260	65	130	32
70	1680	840	420	280	70	140	35

\* - For other offsets, use the following merging taper length formula for L:  
 For speed of 40 mph or less,  $L = WS^2/60$   
 For speed of 45 mph or more,  $L = WS$

Where: L = Taper length in feet  
 W = Width of offset in feet  
 S = Posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

\*\* - Use for taper and tangent sections where there are no pavement markings or where there is a conflict between existing pavement markings and channelizers (CA).

TABLE 2

LONGITUDINAL BUFFER SPACE AND FLAGGER STATION SPACING				
SPEED *	Min D **	DOWNGRADE Min D ***		
		-3%	-6%	-9%
		ft	ft	ft
mph	ft	ft	ft	ft
20	115	116	120	126
25	155	158	165	173
30	200	205	215	227
35	250	257	271	287
40	305	315	333	354
45	360	378	400	427
50	425	446	474	507
55	495	520	553	593
60	570	598	638	686
65	645	682	728	785
70	730	771	825	891

\* - Speed is posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph  
 \*\* - Longitudinal buffer space or flagger station spacing  
 \*\*\* - Use on sustained downgrade steeper than -3 percent and longer than 1 mile.

TABLE 3

ADVANCE WARNING SIGN SPACING			
ROAD TYPE	DISTANCE BETWEEN SIGNS *		
	A	B	C
	ft	ft	ft
URBAN - 25 mph OR LESS	100	100	100
URBAN - MORE THAN 25 mph TO 40 mph	250	250	250
URBAN - MORE THAN 40 mph	350	350	350
RURAL	500	500	500
EXPRESSWAY / FREEWAY	1000	1500	2640

\* - The distances are approximate, are intended for guidance purposes only, and should be applied with engineering judgment. These distances should be adjusted by the Engineer for field conditions, if necessary, by increasing or decreasing the recommended distances.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

**TRAFFIC CONTROL SYSTEM TABLES  
 FOR LANE AND RAMP CLOSURES**

NO SCALE

RSP T9 DATED JULY 19, 2013 SUPERSEDES RSP T9 DATED APRIL 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

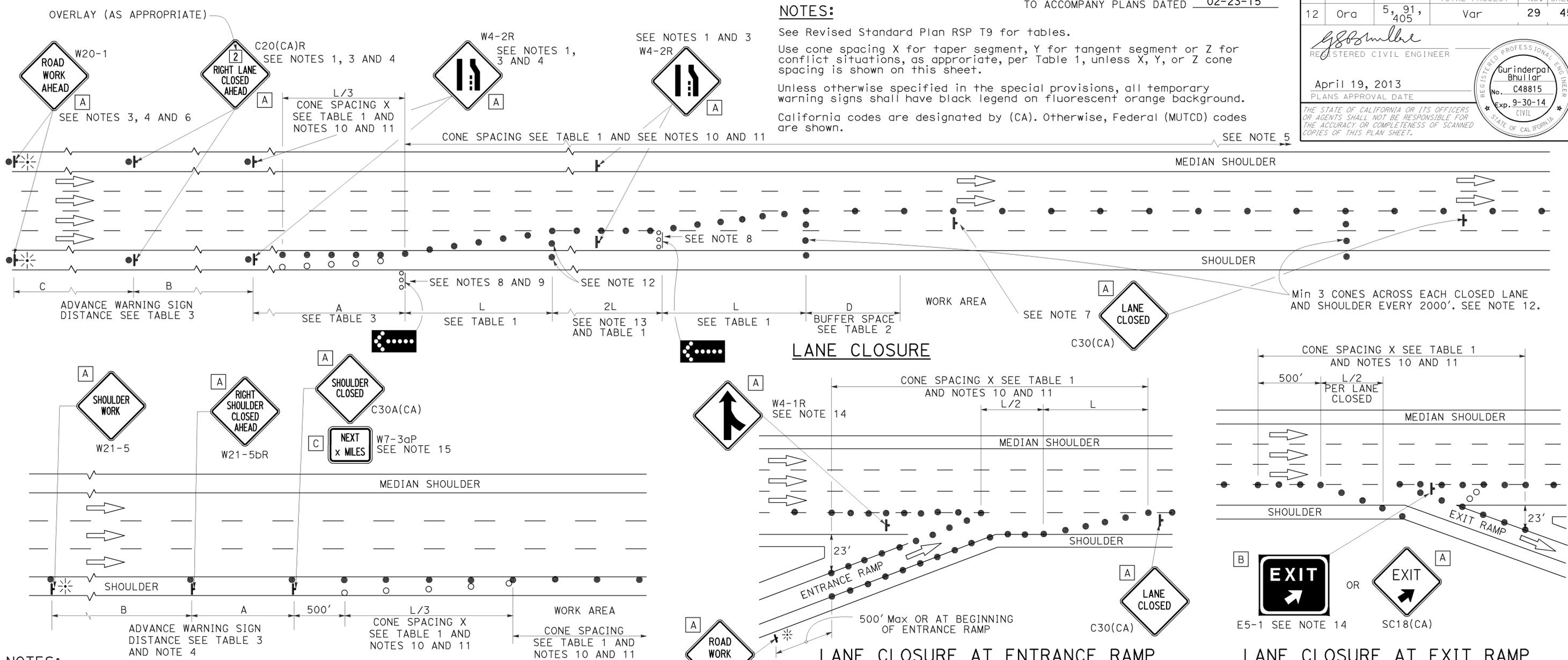
2010 REVISED STANDARD PLAN RSP T9

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	29	45

REGISTERED CIVIL ENGINEER  
 April 19, 2013  
 PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER  
 Gurinderpal Bhullar  
 No. C48815  
 Exp. 9-30-14  
 CIVIL  
 STATE OF CALIFORNIA



- NOTES:**
1. Median lane closures shall conform to the details as shown except that C20(CA)L and W4-2L signs shall be used.
  2. At least one person shall be assigned to provide full time maintenance of traffic control devices for lane closures.
  3. Duplicate sign installations are not required:
    - a) On opposite shoulder if at least one-half of the available lanes remain open to traffic.
    - b) In the median if the width of the median shoulder is less than 8' and the outside lanes are to be closed.
  4. Each advance warning sign on each side of the roadway shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
  5. A G20-2 "END ROAD WORK" sign, with minimum size of 48" x 24" as appropriate, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within a larger project's limits.

- SHOULDER CLOSURE**
6. If the W20-1 sign would follow within 2000' of a stationary W20-1 or G20-1 "ROAD WORK NEXT \_\_\_\_\_ MILES", use a C20(CA)L and W4-2L signs shall be used.
  7. Place a C30(CA) sign every 2000' throughout length of lane closure.
  8. One flashing arrow sign for each lane closed. The flashing arrow signs shall be Type I.
  9. A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at top of crest vertical curve or on a horizontal curve.
  10. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
  11. Portable delineators, placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.

- LANE CLOSURE AT ENTRANCE RAMP**
- LANE CLOSURE AT EXIT RAMP**
12. Unless otherwise specified in the special provisions, a minimum of 3 cones shall be placed transversely across each closed lane and shoulder at each location where a taper across a traffic lane ends and every 2000' as shown on the "Lane Closure" detail. Two Type II barricades may be used instead of the 3 cones. The transverse alignment of the cones or barricades on the closed shoulder may be shifted from the transverse alignment to provide access to the work.
  13. Unless otherwise specified in the special provisions, the 2L tangent shown along lane lines shall be used between the L tapers required for each closed traffic lane.
  14. Unless otherwise specified in the special provisions, the E5-1 or SC18(CA) and W4-1 signs shall be used as shown.
  15. A W7-3aP "NEXT \_\_\_\_\_ MILES" plaque must be used if the shoulder closure extends beyond the distance that can be perceived by road users.

**LEGEND**

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- † TEMPORARY TRAFFIC CONTROL SIGN
- ⬢ FLASHING ARROW SIGN (FAS)
- ⬢ FAS SUPPORT OR TRAILER
- ☼ PORTABLE FLASHING BEACON

**SIGN PANEL SIZE (Min)**

A	48" x 48"
B	72" x 60"
C	36" x 30"

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

**TRAFFIC CONTROL SYSTEM  
 FOR LANE CLOSURE ON  
 FREEWAYS AND EXPRESSWAYS**

NO SCALE

RSP T10 DATED APRIL 19, 2013 SUPERSEDES STANDARD PLAN T10 DATED MAY 20, 2011 - PAGE 237 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP T10**

2010 REVISED STANDARD PLAN RSP T10

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	30	45

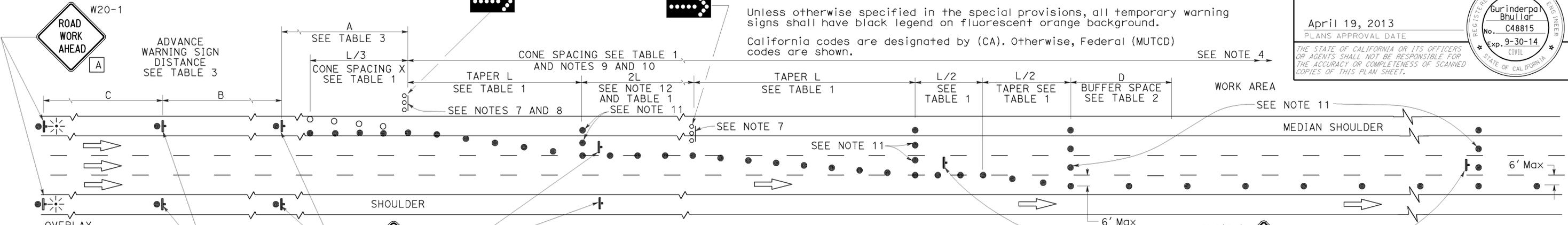
REGISTERED CIVIL ENGINEER  
 Gurinderpal Bhullar  
 No. C48815  
 Exp. 9-30-14  
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 STATE OF CALIFORNIA

April 19, 2013  
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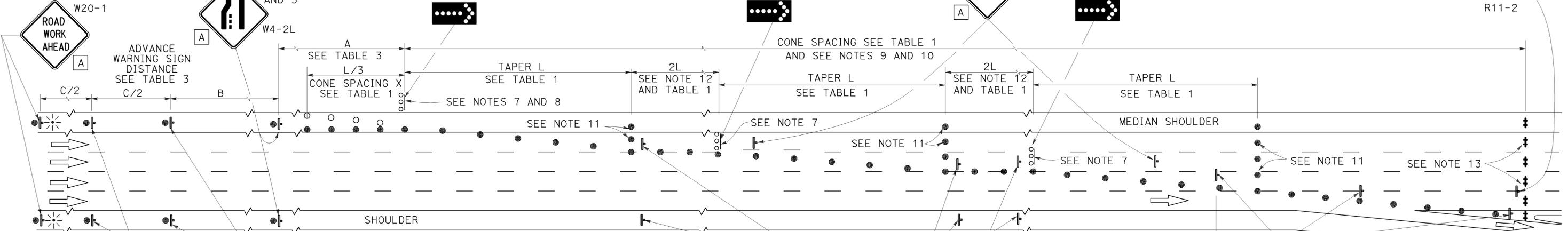
**NOTES:** See Revised Standard Plan RSP T9 for tables.  
 Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.  
 Unless otherwise specified in the special provisions, all temporary warning signs shall have black legend on fluorescent orange background.  
 California codes are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.

SEE NOTES 3 AND 5



**LANE CLOSURE WITH PARTIAL SHOULDER USE**

SEE NOTES 3 AND 5



**COMPLETE CLOSURE**

**NOTES:**

- Lane closures on the right side using partial median shoulder as a traffic lane shall conform to the details as shown except that C20(CA)R and W4-2R signs shall be used.
- At least one person shall be assigned to provide full time maintenance of traffic control devices for lane closures.
- Each advance warning sign on each side of the roadway shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" X 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
- A G20-2 "END ROAD WORK" sign, with minimum size of 48" x 24" as appropriate, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within a larger project's limits.
- If the W20-1 sign would follow within 2000' of a stationary W20-1 or G20-1 "ROAD WORK NEXT \_\_\_ MILES", use a C20(CA) sign for the first advance warning sign.
- Place a C30(CA) sign every 2000' throughout length of lane closure.
- One flashing arrow sign for each lane closed. The flashing arrow signs shall be Type I.
- A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.
- All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
- Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.
- Unless otherwise specified in the special provisions, a minimum of 3 cones shall be placed transversely across each closed lane and shoulder at each location where a taper across a traffic lane ends and every 2000' as shown on the "Lane Closure With Partial Shoulder Use" detail. Two Type II barricades may be used instead of the 3 cones. The transverse alignment of the cones or barricades on the closed shoulder may be shifted from the transverse alignment to provide access to the work.
- Unless otherwise specified in the special provisions, the 2L tangent shown along lane lines shall be used between the L tapers required for each closed traffic lane.
- A minimum of Two Type II or III barricades shall be placed across each closed lane and shoulder at the location shown and every 2000' within the complete closure area. Within the complete closure area, the transverse alignment of the barricades on the closed shoulder may be shifted from the transverse alignment to provide access to the work.
- When specified in the special provisions, a W20-2 "DETOUR AHEAD" sign is to be used in place of the W20-3 "FREEWAY CLOSED AHEAD" sign.

**SIGN PANEL SIZE (Min)**

- A 48" x 48"
- B 48" x 18"
- C 48" x 30"

**LEGEND**

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- † TEMPORARY TRAFFIC CONTROL SIGN
- FLASHING ARROW SIGN (FAS)
- FAS SUPPORT OR TRAILER
- ⚡ PORTABLE FLASHING BEACON

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
 FOR LANE CLOSURES ON  
 FREEWAYS AND EXPRESSWAYS**  
 NO SCALE

RSP T10A DATED APRIL 19, 2013 SUPERSEDES STANDARD PLAN T10A DATED MAY 20, 2011 - PAGE 238 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP T10A**

2010 REVISED STANDARD PLAN RSP T10A

# TYPICAL RAMP CLOSURES

## SIGN PANEL SIZE (Min)

- A 48" x 48"
- B 48" x 30"
- C 36" x 36"
- D 48" x 36"

## LEGEND

- TRAFFIC CONE
- † TEMPORARY TRAFFIC CONTROL SIGN
- ‡ BARRICADES
- ⚡ PORTABLE FLASHING BEACON

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	31	45

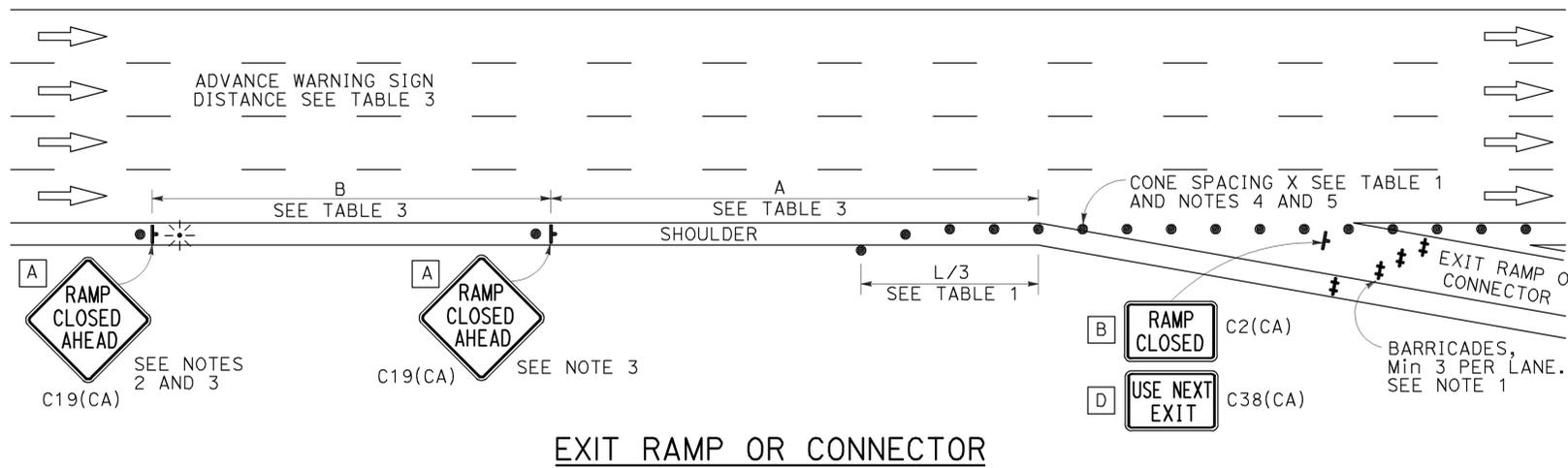
*Gurinderpal Bhullar*  
 REGISTERED CIVIL ENGINEER  
 April 19, 2013  
 PLANS APPROVAL DATE  
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REGISTERED PROFESSIONAL ENGINEER  
**Gurinderpal Bhullar**  
 No. C48815  
 Exp. 9-30-14  
 CIVIL  
 STATE OF CALIFORNIA

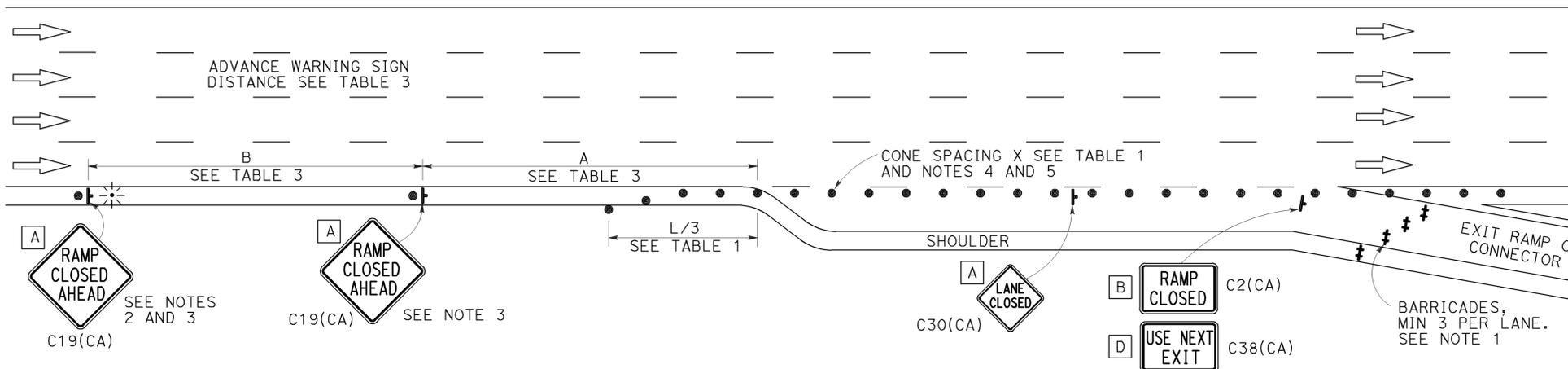
TO ACCOMPANY PLANS DATED 02-23-15

## NOTES:

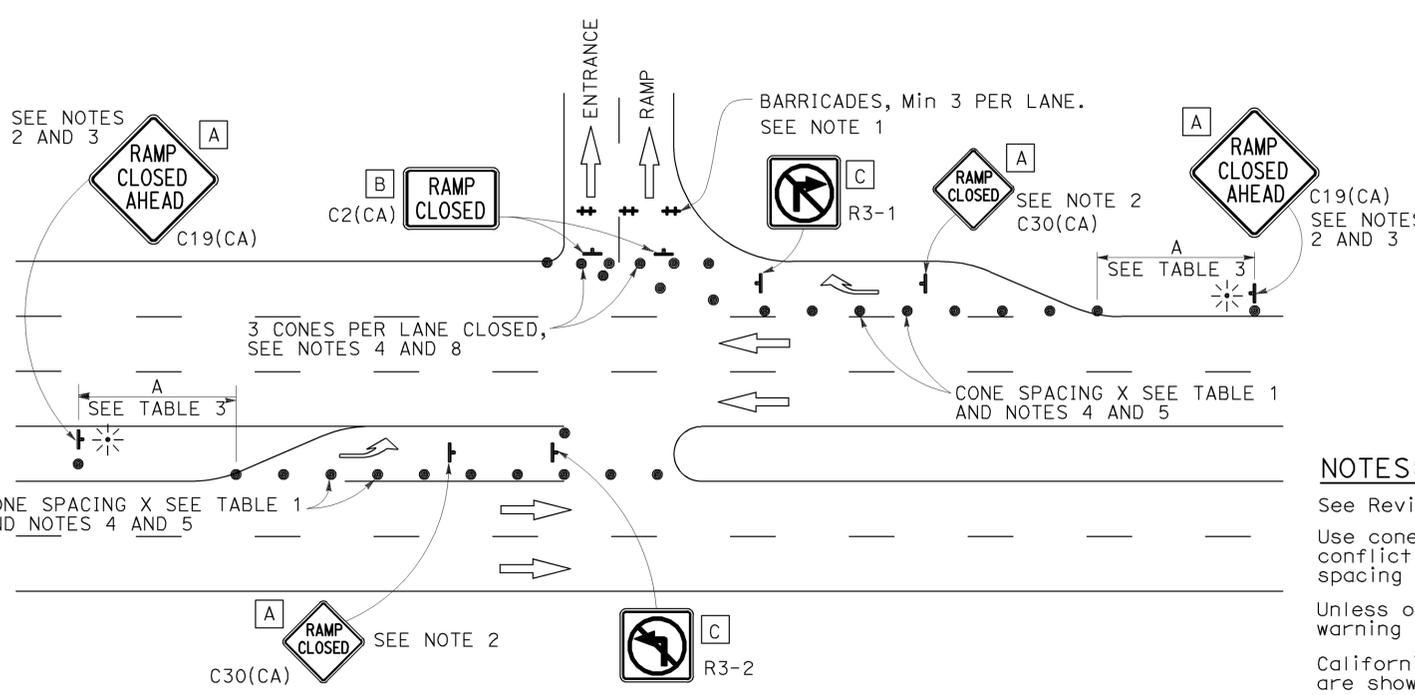
- Barricades shall be Type I, II, or III for closures lasting one week or less and Type III for closures lasting longer than one week.
- In addition to placing the C19(CA) "RAMP CLOSED AHEAD" and C30(CA) "RAMP CLOSED" signs, black on orange overlay plates with the word "CLOSED" may be mounted, as directed by the Engineer, on all guide signs that refer to the closed ramp. The letter size on the overlay shall be the same as the guide sign.
- Each advance C19(CA) "RAMP CLOSED AHEAD" sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. A flashing beacon shall be placed on top of the first C19(CA) sign during hours of darkness.
- All cones used for ramp closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
- Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime ramp closures only.
- At least one person shall be assigned to provide full time maintenance of traffic control devices, unless otherwise directed by the Engineer.
- The existing "EXIT" signs shall be covered during ramp closures.
- A minimum of 3 cones shall be placed transversely across each closed lane and shoulder.



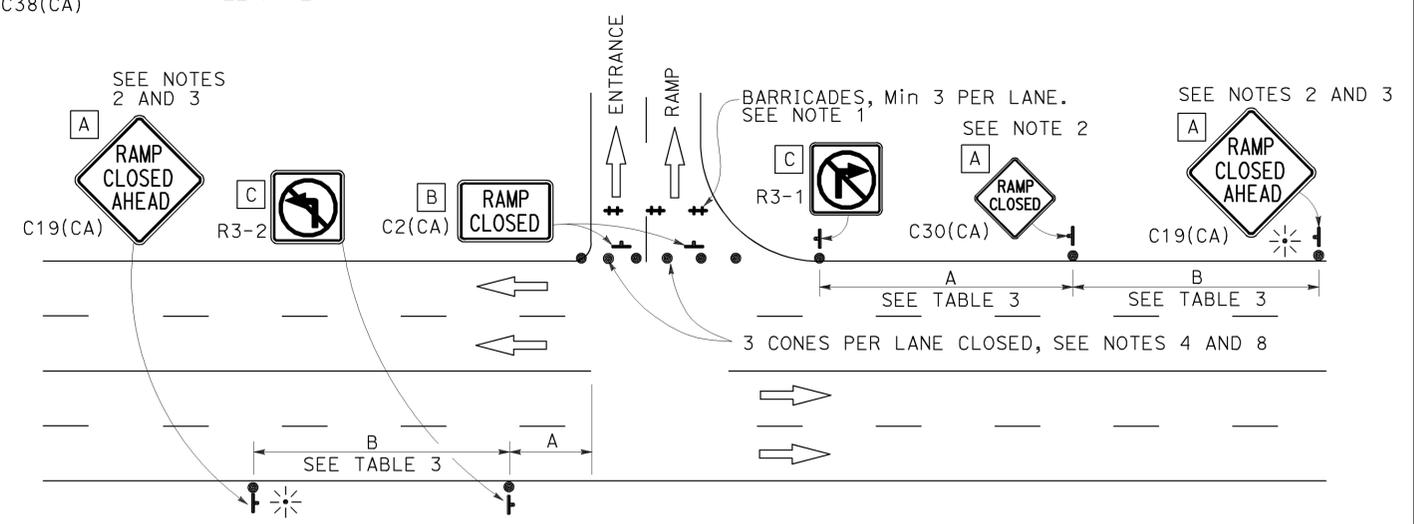
EXIT RAMP OR CONNECTOR



EXIT RAMP OR CONNECTOR WITH ADDITIONAL LANE



ENTRANCE RAMP WITH TURNING POCKETS



ENTRANCE RAMP WITHOUT TURNING POCKETS

## NOTES:

- See Revised Standard Plan RSP T9 for tables.
- Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.
- Unless otherwise specified in the special provisions, all temporary warning signs shall have black legend on fluorescent orange background.
- California codes are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
 FOR RAMP CLOSURE**  
 NO SCALE

RSP T14 DATED APRIL 19, 2013 SUPERSEDES STANDARD PLAN T14  
 DATED MAY 20, 2011 - PAGE 242 OF THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP T14**

2010 REVISED STANDARD PLAN RSP T14

**LEGEND:**

<b>AB</b>	ABANDON. IF APPLIED TO CONDUIT, REMOVE CONDUCTORS
<b>BC</b>	INSTALL PULL BOX IN EXISTING CONDUIT RUN
<b>BP</b>	PEDESTRIAN BARRICADE, TYPE AS INDICATED ON PLAN
<b>CB</b>	INSTALL CONDUIT INTO EXISTING PULL BOX
<b>CC</b>	CONNECT NEW AND EXISTING CONDUIT. REMOVE EXISTING CONDUCTORS AND INSTALL CONDUCTORS AS INDICATED
<b>CF</b>	CONDUIT TO REMAIN FOR FUTURE USE. REMOVE CONDUCTORS. INSTALL PULL TAPE
<b>DH</b>	DETECTOR HANDHOLE
<b>FA</b>	FOUNDATION TO BE ABANDONED
<b>IS</b>	INSTALL SIGN ON SIGNAL MAST ARM
<b>NS</b>	NO SLIP BASE ON STANDARD
<b>PEC</b>	PHOTOELECTRIC CONTROL
<b>PEU</b>	PHOTOELECTRIC UNIT
<b>RC</b>	EQUIPMENT OR MATERIAL TO BE REMOVED AND BECOME THE PROPERTY OF THE CONTRACTOR
<b>RE</b>	REMOVE ELECTROLIER, FUSES AND BALLAST. TAPE ENDS OF CONDUCTORS
<b>RL</b>	RELOCATE EQUIPMENT
<b>RR</b>	REMOVE AND REUSE EQUIPMENT
<b>RS</b>	REMOVE AND SALVAGE EQUIPMENT
<b>SC</b>	SPLICE NEW TO EXISTING CONDUCTORS
<b>SD</b>	SERVICE DISCONNECT
<b>TSP</b>	TELEPHONE SERVICE POINT

**ABBREVIATIONS**

APS	ACCESSIBLE PEDESTRIAN SIGNAL	M/M	MULTIPLE TO MULTIPLE TRANSFORMER
BBS	BATTERY BACKUP SYSTEM	Mtg	MOUNTING
BC	BOLT CIRCLE	MV	MERCURY VAPOR LIGHTING FIXTURE
BPB	BICYCLE PUSH BUTTON	MVDS	MICROWAVE VEHICLE DETECTION SYSTEM
C	CONDUIT	N	NEUTRAL (GROUNDED CONDUCTOR)
CB	CIRCUIT BREAKER	NB	NEUTRAL BUS
CCTV	CLOSED CIRCUIT TELEVISION	NC	NORMALLY CLOSE
Ck+	CIRCUIT	NO	NORMALLY OPEN
CMS	CHANGEABLE MESSAGE SIGN	P	CIRCUIT BREAKER'S POLE
Ctid	CALTRANS IDENTIFICATION	PB	PULL BOX
Comm	COMMUNICATION	PBA	PUSH BUTTON ASSEMBLY
DLC	LOOP DETECTOR LEAD-IN CABLE	PEC	PHOTOELECTRIC CONTROL
EMS	EXTINGUISHABLE MESSAGE SIGN	Ped	PEDESTRIAN
EVUC	EMERGENCY VEHICLE UNIT CABLE	PEU	PHOTOELECTRIC UNIT
EVUD	EMERGENCY VEHICLE UNIT DETECTOR	PT	CONDUIT WITH PULL TAPE
FB	FLASHING BEACON	RE	RELOCATED EQUIPMENT
FBCA	FLASHING BEACON CONTROL ASSEMBLY	RM	RAMP METERING
FBS	FLASHING BEACON WITH SLIP BASE	RWIS	ROADSIDE WEATHER INFORMATION SYSTEM
FO	FIBER OPTIC	SB	SLIP BASE
G	EQUIPMENT GROUNDING CONDUCTOR	SIC	SIGNAL INTERCONNECT CABLE
GB	GROUND BUS	Sig	SIGNAL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	SMA	SIGNAL MAST ARM
HAR	HIGHWAY ADVISORY RADIO	SNS	STREET NAME SIGN
Hex	HEXAGONAL	SP	SERVICE POINT
HPS	HIGH PRESSURE SODIUM	TDC	TELEPHONE DEMARCATION CABINET
IISNS	INTERNALLY ILLUMINATED STREET NAME SIGN	TMS	TRAFFIC MONITORING STATION
ISL	INDUCTION SIGN LIGHTING	TOS	TRAFFIC OPERATIONS SYSTEM
LED	LIGHT EMITTING DIODE	Veh	VEHICLE
LMA	LUMINAIRE MAST ARM	VIVDS	VIDEO IMAGE VEHICLE DETECTION SYSTEM
LPS	LOW PRESSURE SODIUM	WIM	WEIGH-IN-MOTION
Ltg	LIGHTING	Xfmr	TRANSFORMER
Lum	LUMINAIRE		
M	METERED		
MAT	MAST ARM MOUNTING TOP ATTACHMENT		
MAS	MAST ARM MOUNTING SIDE ATTACHMENT		

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	32	45

*Theresa Gabriel*  
REGISTERED ELECTRICAL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

Theresa  
Aziz Gabriel  
No. E15129  
Exp. 6-30-14  
ELECTRICAL  
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.

TO ACCOMPANY PLANS DATED 02-23-15

**SOFFIT AND WALL MOUNTED LUMINAIRES**

- PENDANT, 70 W HPS UNLESS OTHERWISE SPECIFIED
- FLUSH, 70 W HPS UNLESS OTHERWISE SPECIFIED
- WALL SURFACE, 70 W HPS UNLESS OTHERWISE SPECIFIED
- EXISTING SOFFIT OR WALL LUMINAIRE TO REMAIN UNMODIFIED
- EXISTING SOFFIT OR WALL LUMINAIRE TO BE MODIFIED AS SPECIFIED

**NOTE:**  
Arrow indicates "street side" of luminaire.

COMMONLY USED SYMBOLS FOR UNITED STATES CUSTOMARY UNITS OF MEASUREMENT:

SYMBOL USED	DEFINITIONS
$\Omega$	OHMS
min	MINUTE
s	SECOND
bps	BITS PER SECOND
Bps	BYTES PER SECOND
A	AMPERE
V	VOLT
V(dc)	VOLT (DIRECT CURRENT)
V(ac)	VOLT (ALTERNATING CURRENT)
FC	FOOT - CANDLE
W	WATTS
VA	VOLT-AMPERE
M	MEGA
k	KILO
m	MILLI
$\mu$	MICRO
P	PICO
HZ	HERTZ

**MISCELLANEOUS ELECTROLIERS**

NEW	EXISTING	
		LUMINAIRE ON WOOD POLE
		NON-STANDARD ELECTROLIER (SEE PROJECT NOTES OR PROJECT PLANS)
		CITY ELECTROLIER
		ELECTROLIER FOUNDATION (FUTURE INSTALLATION)

- NOTES:**
- HPS luminaires shall be 310 W HPS when installed on Type 21, 21D, 30, 31 and 32 Standards, unless otherwise specified. HPS luminaires shall be 200 W when installed on other type standards or poles, unless otherwise specified.
  - LED luminaires shall be 235 W when installed on Type 21, 21D, 30, 31 and 32 Standards, unless otherwise specified. LED luminaires shall be 165 W when installed on other type standards or poles, unless otherwise specified.
  - Luminaires shall be the cutoff type, ANSI Type III medium cutoff lighting distribution, unless otherwise specified.

**STANDARD ELECTROLIER**

NEW	EXISTING	STANDARD TYPE
		15
		15D
		15 STRUCTURE
		15D STRUCTURE
		21
		21D
		21 STRUCTURE
		21D STRUCTURE
		30
		31
		32

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(LEGEND AND ABBREVIATIONS)**

NO SCALE

RSP ES-1A DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-1A DATED MAY 20, 2011 - PAGE 425 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP ES-1A**

2010 REVISED STANDARD PLAN RSP ES-1A

TO ACCOMPANY PLANS DATED 02-23-15

**CONDUIT**

**SIGNAL EQUIPMENT**

NEW	EXISTING	
---	---	LIGHTING CONDUIT, UNLESS OTHERWISE INDICATED OR NOTED
---	---	TRAFFIC SIGNAL CONDUIT
---C---	---c---	COMMUNICATION CONDUIT
---T---	---t---	TELEPHONE CONDUIT
---F---	---f---	FIRE ALARM CONDUIT
---FO---	---fo---	FIBER OPTIC CONDUIT
---	---	CONDUIT TERMINATION
		CONDUIT RISER ATTACHED TO THE STRUCTURE OR SERVICE POLE

NEW	EXISTING	
		PEDESTRIAN SIGNAL HEAD "C" INDICATES COUNTDOWN PEDESTRIAN HEAD
		PUSH BUTTON ASSEMBLY POST
		PEDESTRIAN BARRICADE
		VEHICLE SIGNAL HEAD (WITH BACKPLATE AND 3-SECTIONS: RED, YELLOW AND GREEN)
		VEHICLE SIGNAL HEAD WITH ANGLE VISOR
		MODIFICATIONS OF BASIC SYMBOL: "L" INDICATES ALL NON-ARROW SECTIONS LOUVERED "LG" INDICATES LOUVERED GREEN SECTION ONLY "PV" INDICATES ALL 12" SECTIONS PROGRAMMED VISIBILITY "8" INDICATES ALL 8" SECTIONS (ONLY WHEN SPECIFIED)
		VEHICLE SIGNAL HEAD CONSISTING OF RED, YELLOW AND GREEN LEFT ARROW SECTIONS
		VEHICLE SIGNAL HEAD CONSISTING OF RED AND YELLOW SECTIONS WITH AN UP GREEN ARROW SECTION
		VEHICLE SIGNAL HEAD (5 SECTION) CONSISTING OF RED, YELLOW AND GREEN SECTIONS WITH YELLOW AND GREEN RIGHT ARROW SECTIONS
		TYPE 15TS STANDARD WITH VEHICLE SIGNAL HEAD AND LUMINAIRE
		TYPE 21TS STANDARD WITH VEHICLE SIGNAL HEAD AND LUMINAIRE
		STANDARD WITH LUMINAIRE AND SIGNAL MAST ARMS AND ATTACHED VEHICLE SIGNAL HEADS
		TYPE 1 STANDARD WITH ATTACHED VEHICLE SIGNAL HEADS
		STANDARD WITH A SIGNAL MAST ARM, ATTACHED VEHICLE SIGNAL HEADS AND INTERNALLY ILLUMINATED STREET NAME SIGN
		CONTROLLER ASSEMBLY. DOOR INDICATES FRONT OF CABINET

**SERVICE EQUIPMENT**

NEW	EXISTING	
---OH---	---oh---	OVERHEAD LINES
		WOOD POLE, "U" INDICATES UTILITY OWNED
		POLE GUY WITH ANCHOR
		UTILITY TRANSFORMER - GROUND MOUNTED
		SERVICE EQUIPMENT ENCLOSURE TYPE. DOOR INDICATES FRONT OF ENCLOSURE
		TELEPHONE DEMARCATION CABINET

**POLE-MOUNTED SERVICE DESIGNATION**

	TYPE H SERVICE, 28'-10"	TYPE OF INSTALLATION AND POLE HEIGHT ABOVE GRADE
--	-------------------------	--

**FLASHING BEACON**

NEW	EXISTING	
		FLASHING BEACON (ONE VEHICLE SIGNAL HEAD WITH BACKPLATE AND VISOR) "R" INDICATES RED INDICATION, "Y" INDICATES YELLOW INDICATION
		FLASHING BEACON WITH TYPE 15-FBS STANDARD AND A SIGN.
		FLASHING BEACON WITH TYPES 9, 9A OR 9B SIGN UNLESS OTHERWISE SPECIFIED OR INDICATED

**SIGNAL EQUIPMENT Cont**

NEW	EXISTING	
		GUARD POST
		TYPE 1 STANDARD WITH RAMP METERING SIGN
		OPTICAL DETECTOR FOR THE EMERGENCY VEHICLE DETECTION SYSTEM

**NOTES:**

- All signal sections shall be 12" unless shown otherwise.
- Signal heads shall be provided with backplates unless shown otherwise.

**ILLUMINATED OVERHEAD SIGN**

NEW	EXISTING	
		SINGLE POST, SINGLE ILLUMINATED SIGN, BALANCED BUTTERFLY
		SINGLE POST, DOUBLE ILLUMINATED SIGN, BALANCED BUTTERFLY
		SINGLE POST, SINGLE ILLUMINATED SIGN, FULL CANTILEVER
		DOUBLE POST, SINGLE ILLUMINATED SIGN
		SINGLE ILLUMINATED SIGN MOUNTED ON STRUCTURE
		DOUBLE POST, SINGLE ILLUMINATED SIGN WITH ELECTROLIER

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(LEGEND AND ABBREVIATIONS)**

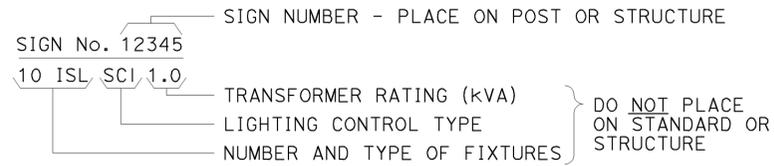
NO SCALE

RSP ES-1B DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-1B DATED MAY 20, 2011 - PAGE 426 OF THE STANDARD PLANS BOOK DATED 2010.

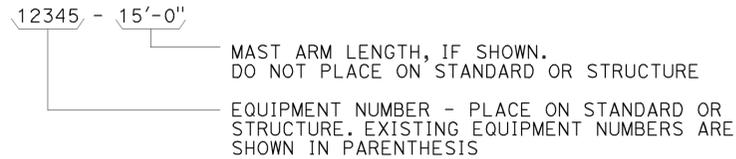
2010 REVISED STANDARD PLAN RSP ES-1B

### EQUIPMENT IDENTIFICATION

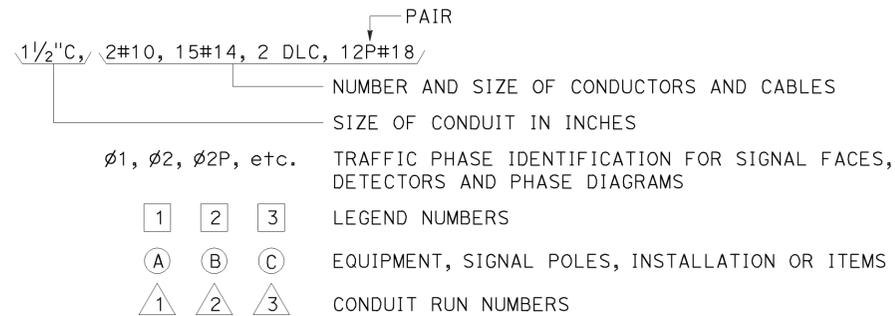
#### ILLUMINATED SIGN IDENTIFICATION NUMBER:



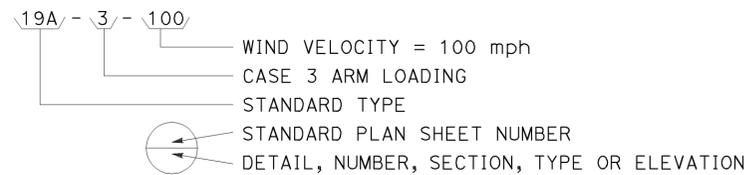
#### ELECTROLIER OR EQUIPMENT IDENTIFICATION NUMBER:



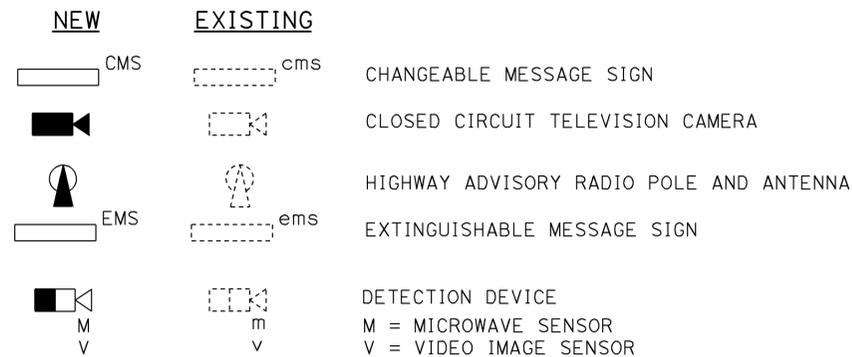
#### CONDUIT AND CONDUCTOR IDENTIFICATION:



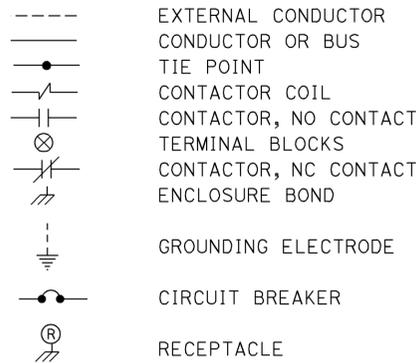
#### SIGNAL AND LIGHTING STANDARD (TYPICAL DESIGNATION):



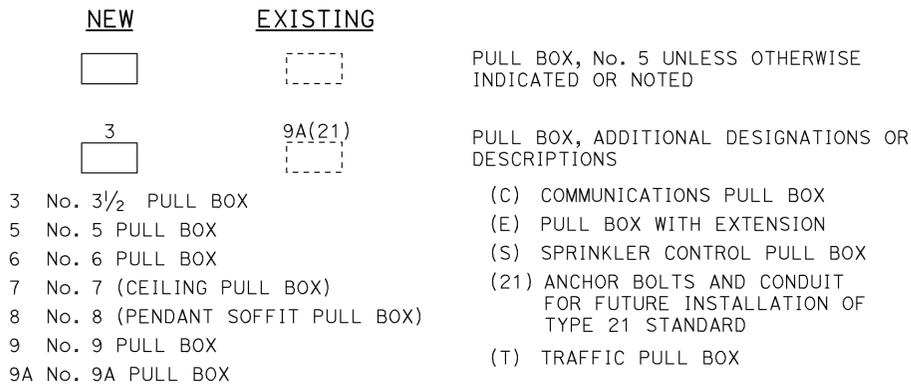
### MISCELLANEOUS EQUIPMENT



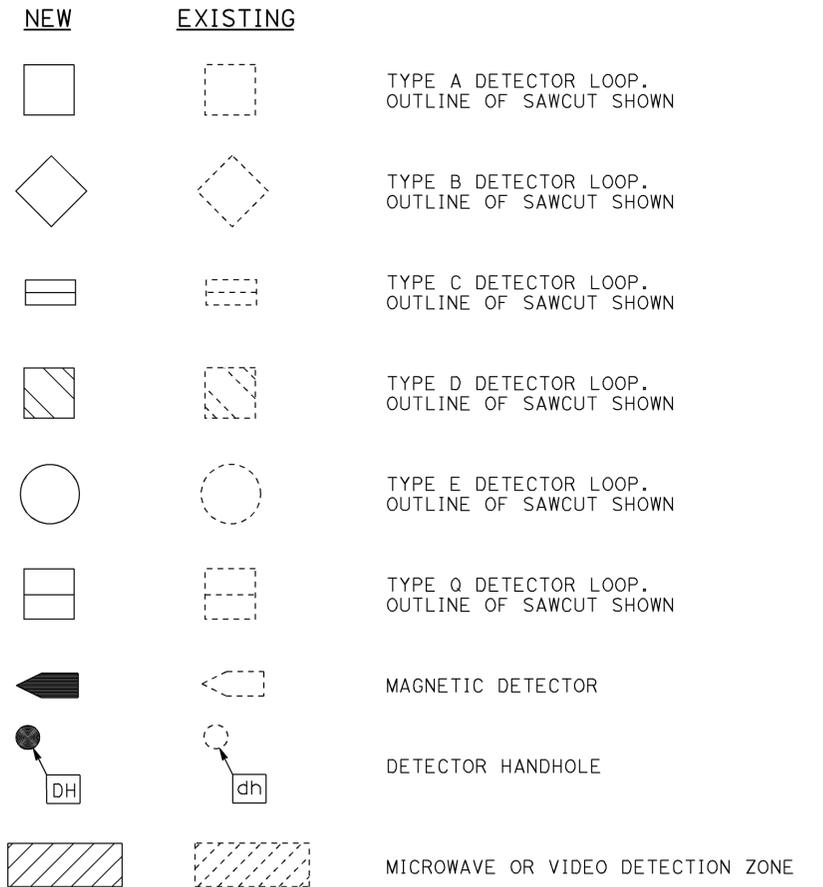
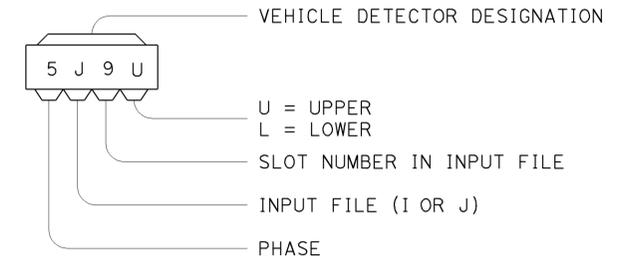
### WIRING DIAGRAM LEGEND



### PULL BOXES



### VEHICLE DETECTORS



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

## ELECTRICAL SYSTEMS (LEGEND AND ABBREVIATIONS)

NO SCALE

RSP ES-1C DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-1C  
DATED MAY 20, 2011 - PAGE 427 OF THE STANDARD PLANS BOOK DATED 2010.

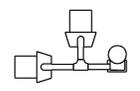
**REVISED STANDARD PLAN RSP ES-1C**

2010 REVISED STANDARD PLAN RSP ES-1C

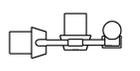
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	35	45
<i>Theresa Gabriel</i> REGISTERED ELECTRICAL ENGINEER No. E15129 Exp. 6-30-14 ELECTRICAL STATE OF CALIFORNIA					
July 19, 2013 PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

TO ACCOMPANY PLANS DATED 02-23-15

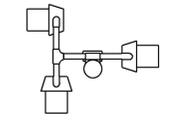
2010 REVISED STANDARD PLAN RSP ES-4A



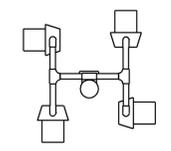
SV-2-TD



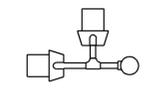
SV-2-TC



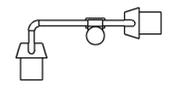
SV-3-TC



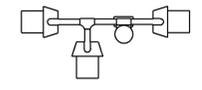
SV-4-TC



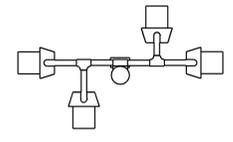
SV-2B



SV-2-TB

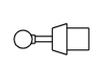


SV-3-TB

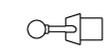


SV-4-TB

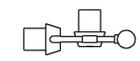
PLAN VIEW OF OTHER SIDE MOUNTINGS



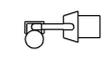
SV



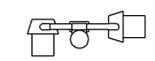
SV-1



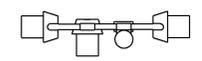
SV-2A



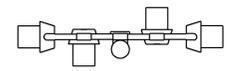
SV-1-T



SV-2-TA



SV-3-TA



SV-4-TA

SIDE MOUNTINGS

ABBREVIATIONS:

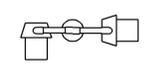
- SV SIDE MOUNTED VEHICLE SIGNALS
- T TERMINAL COMPARTMENT
- TV TOP MOUNTED VEHICLE SIGNALS
- 1, 2, 3, 4 NUMBER OF SIGNAL FACES  
(3 - SECTION, UNLESS OTHERWISE INDICATED)
- A, B, C, D CONFIGURATION OF SIGNALS

NOTES:

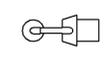
1. Mountings shall be oriented to provide maximum horizontal clearance to adjacent roadway.
2. Bracket arms shall be long enough to permit proper alignment of signals and backplate installation.
3. See Standard Plans ES-4D and ES-4E for attachment fitting details.



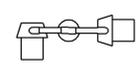
TV-1



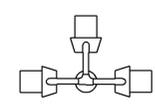
TV-2



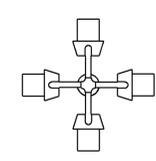
TV-1-T



TV-2-T



TV-3-T



TV-4-T

PLAN VIEW OF TOP MOUNTINGS

TOP MOUNTINGS

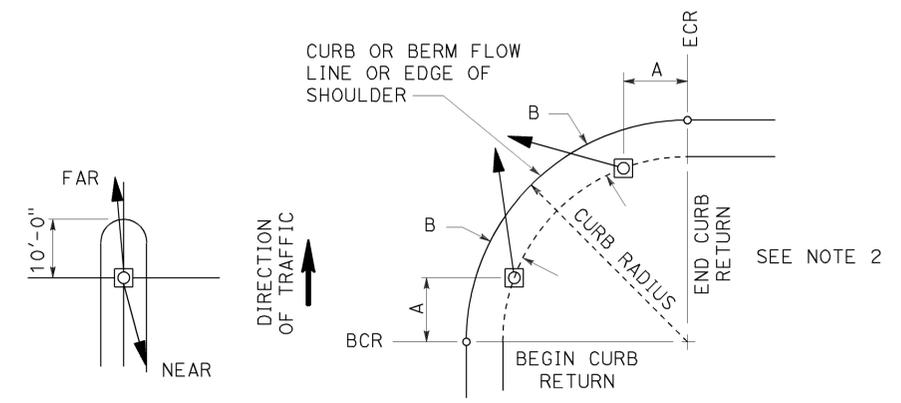
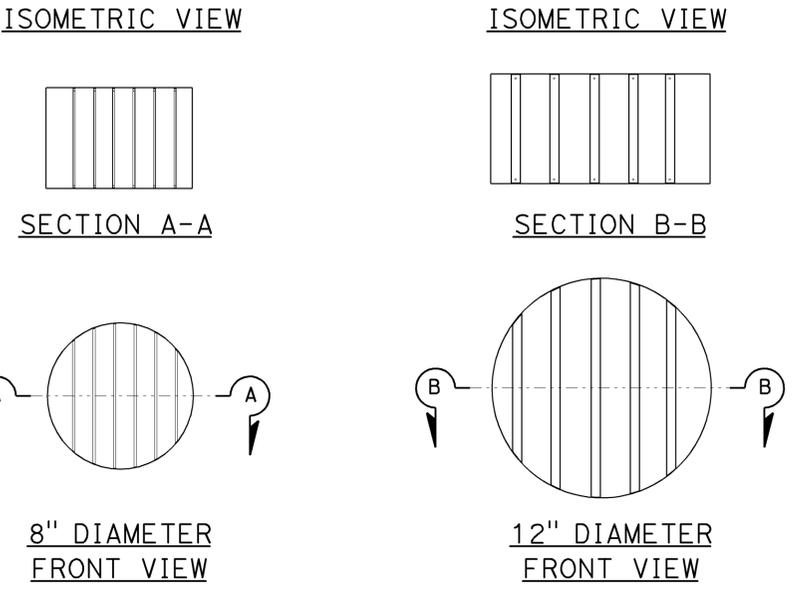
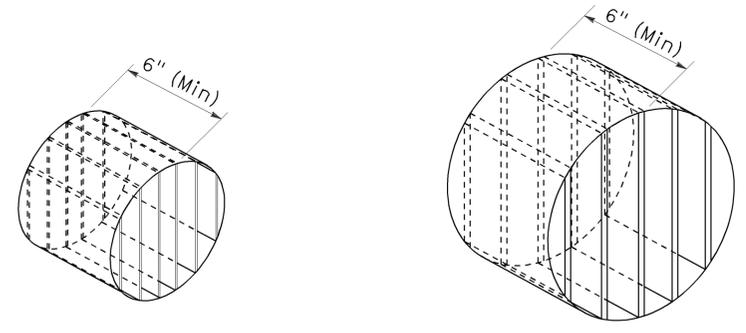
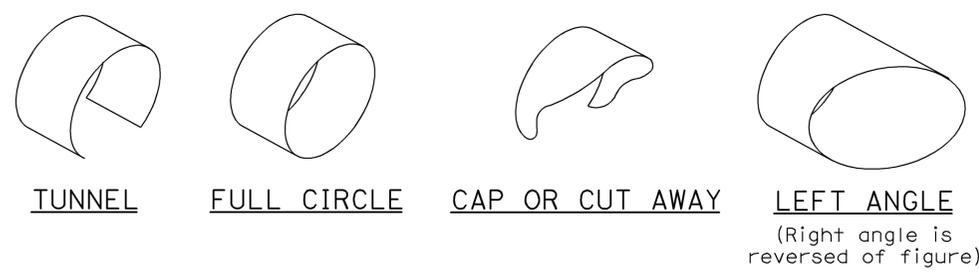
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (VEHICULAR SIGNAL HEADS  
 AND MOUNTINGS)**

NO SCALE

RSP ES-4A DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-4A DATED MAY 20, 2011 - PAGE 443 OF THE STANDARD PLANS BOOK DATED 2010.

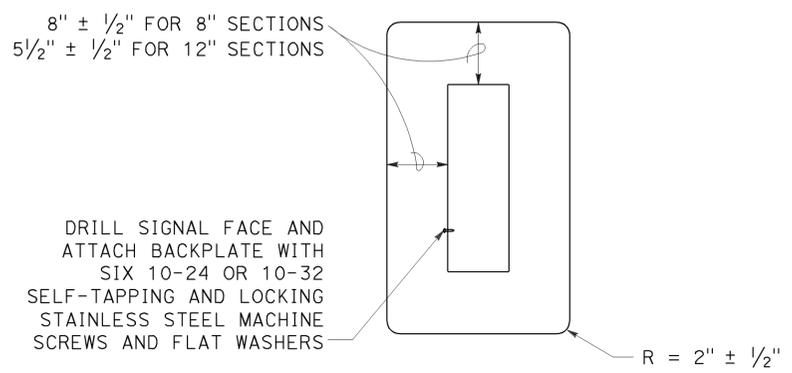
**REVISED STANDARD PLAN RSP ES-4A**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	36	45
<i>Theresa Gabriel</i> REGISTERED ELECTRICAL ENGINEER July 19, 2013 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>					
TO ACCOMPANY PLANS DATED <u>02-23-15</u>					



- NOTES:**
1. Typical signal pole placement unless dimensioned on plans.
  2. For A and B dimensions, see Pole Schedule, or as directed by the Engineer.

**VISORS**



**8" AND 12" SECTIONS**

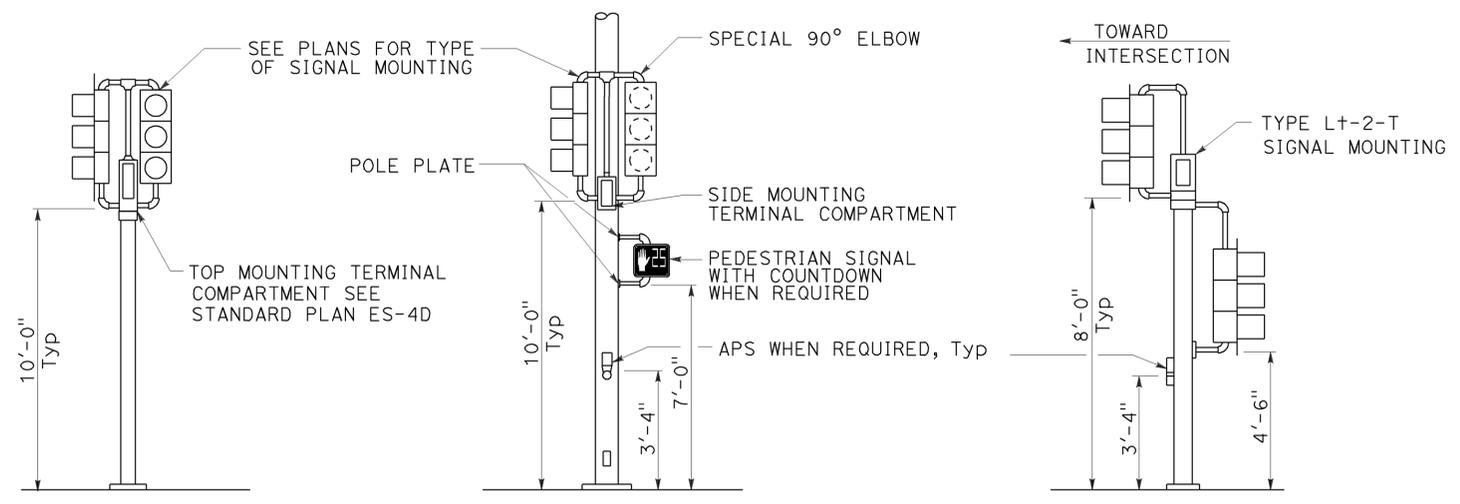
**BACKPLATE**

1/16" minimum thickness  
 3001-14 aluminum or plastic when specified

**DIRECTIONAL LOUVER**

Directional louvers shall be oriented as directed by the Engineer and secured in place with one plated brass machine screw and nut.

**SIGNAL STANDARD PLACEMENT DIMENSIONS AND EQUIPMENT LOCATIONS**



**TOP MOUNTED SIGNALS (TV)**

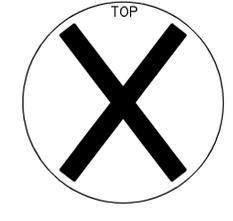
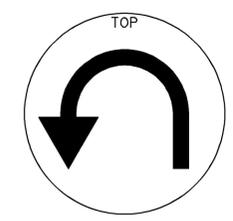
Type 1-A, 1-B, 1-C and 1-D standard as indicated on the plans

**SIDE MOUNTED SIGNALS (SV AND SP)**

Normally used on standards with luminaire or signal mast arm

**LEFT TURN LANE SIGNAL**

Type 1-A, 1-B, 1-C and 1-D standard as indicated on plans



**SIGNAL FACES**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS (VEHICULAR SIGNAL HEADS AND MOUNTINGS)**

NO SCALE

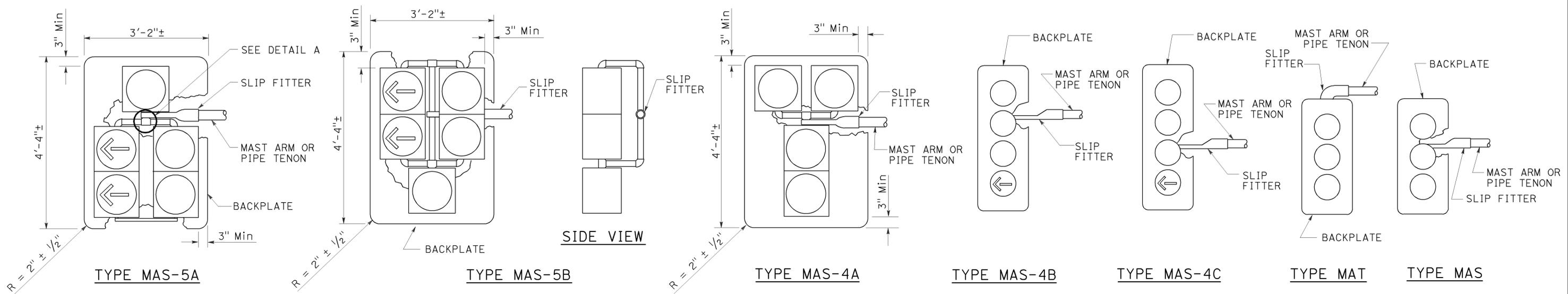
RSP ES-4C DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-04C DATED MAY 20, 2011 - PAGE 445 OF THE STANDARD PLANS BOOK DATED 2010.

2010 REVISED STANDARD PLAN RSP ES-4C

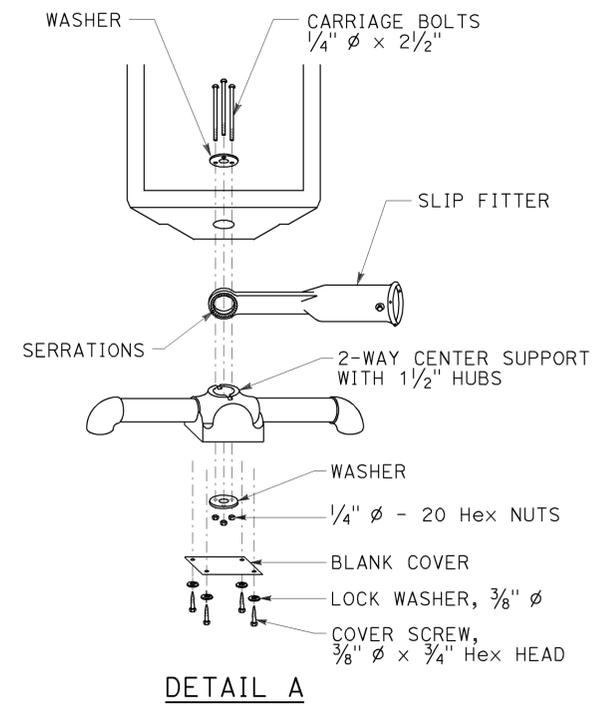
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	37	45
<i>Theresa Gabriel</i> REGISTERED ELECTRICAL ENGINEER July 19, 2013 PLANS APPROVAL DATE					
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					



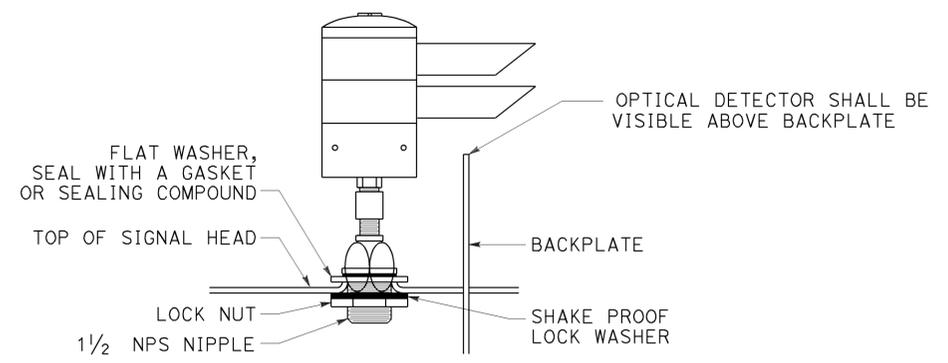
TO ACCOMPANY PLANS DATED 02-23-15



**MAST ARM MOUNTINGS**



**DETAIL A**



**DETAIL B**

**OPTICAL DETECTOR MOUNTING FOR EMERGENCY VEHICLE DETECTION SYSTEM**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (VEHICULAR SIGNAL HEADS AND  
 OPTICAL DETECTOR MOUNTING)**

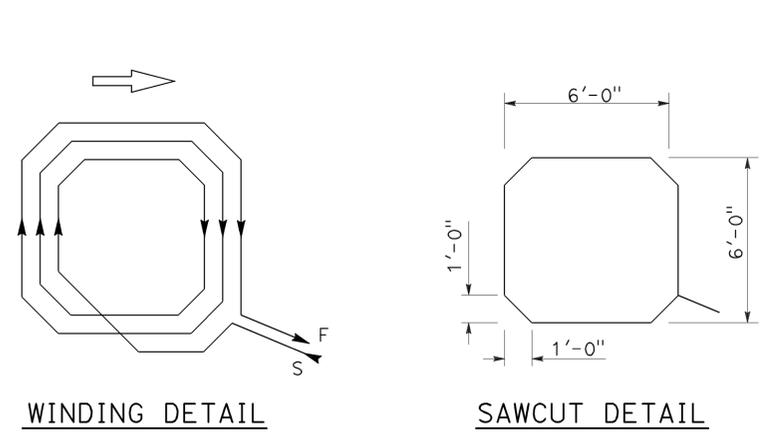
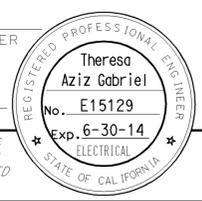
NO SCALE

RSP ES-4E DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-4E DATED MAY 20, 2011 - 447 OF THE STANDARD PLANS BOOK DATED 2010.

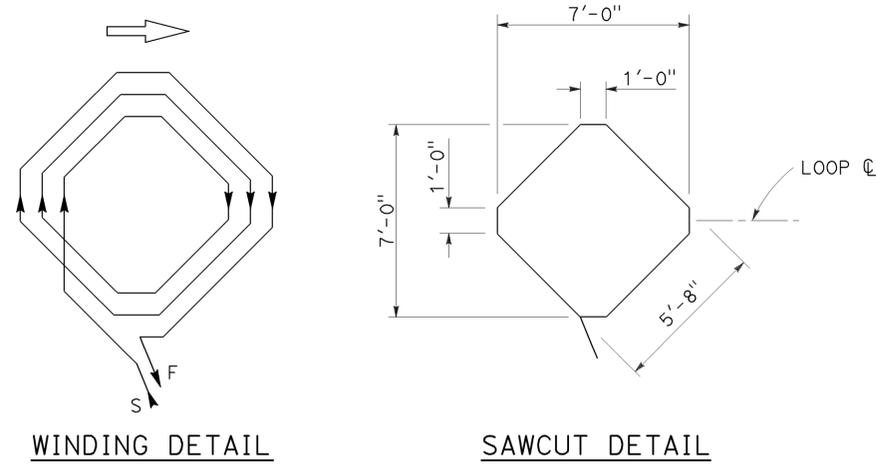
**REVISED STANDARD PLAN RSP ES-4E**

**2010 REVISED STANDARD PLAN RSP ES-4E**

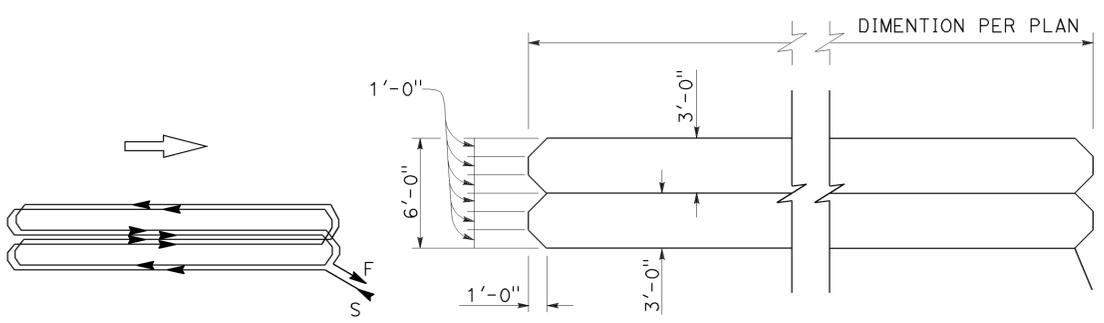
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	38	45
<i>Theresa Gabriel</i> REGISTERED ELECTRICAL ENGINEER July 19, 2013 PLANS APPROVAL DATE <small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					
TO ACCOMPANY PLANS DATED 02-23-15					



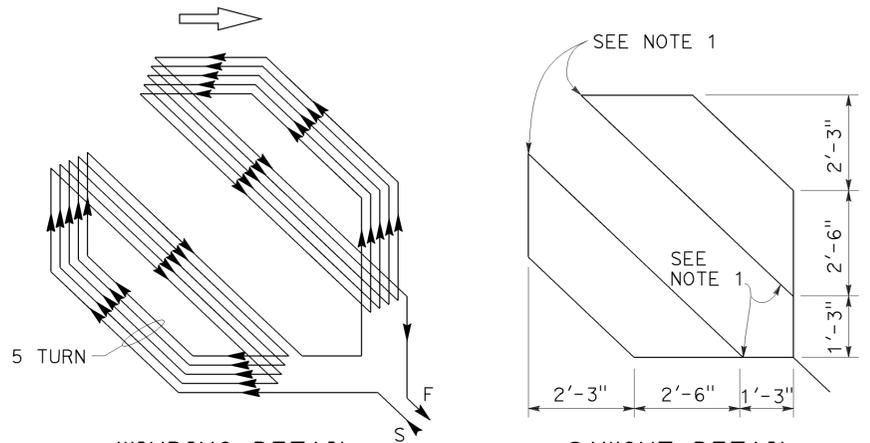
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE A LOOP DETECTOR CONFIGURATION**



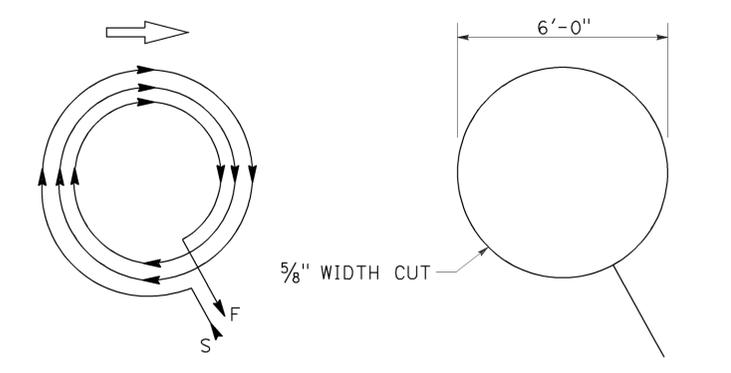
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE B LOOP DETECTOR CONFIGURATION**



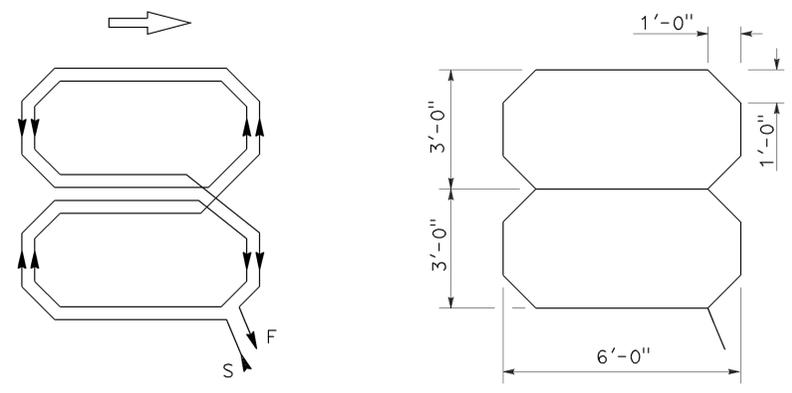
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE C LOOP DETECTOR CONFIGURATION**



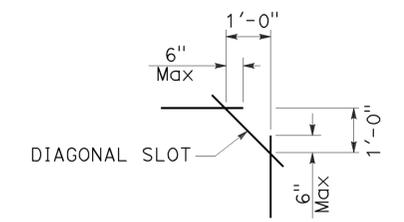
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE D LOOP DETECTOR CONFIGURATION**



WINDING DETAIL  
SAWCUT DETAIL  
**TYPE E LOOP DETECTOR CONFIGURATION**



WINDING DETAIL  
SAWCUT DETAIL  
**TYPE Q LOOP DETECTOR CONFIGURATION**



**PLAN VIEW OF DIAGONAL SLOT AT CORNERS**

- NOTES:**
1. Round corners of acute angle sawcuts to prevent damage to conductors.
  2. Typical distance separating loops from edge to edge is 10' for Type A, B, D and E installation in single lane.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS (DETECTORS)**  
NO SCALE

RSP ES-5B DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-5B DATED MAY 20, 2011 - PAGE 449 OF THE STANDARD PLANS BOOK DATED 2010.

**2010 REVISED STANDARD PLAN RSP ES-5B**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	39	45

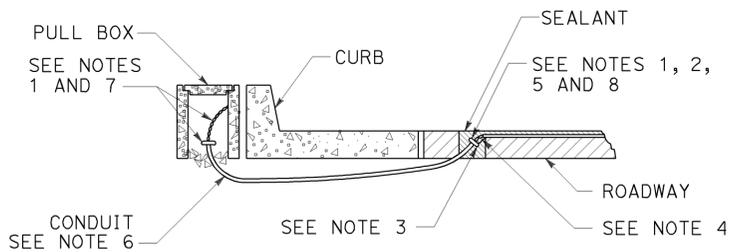
Theresa Gabriel  
REGISTERED ELECTRICAL ENGINEER

July 19, 2013  
PLANS APPROVAL DATE

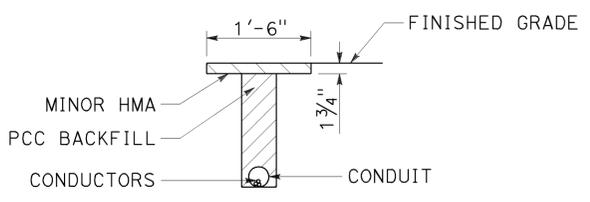
Theresa Aziz Gabriel  
No. E15129  
Exp. 6-30-14  
ELECTRICAL  
STATE OF CALIFORNIA

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.

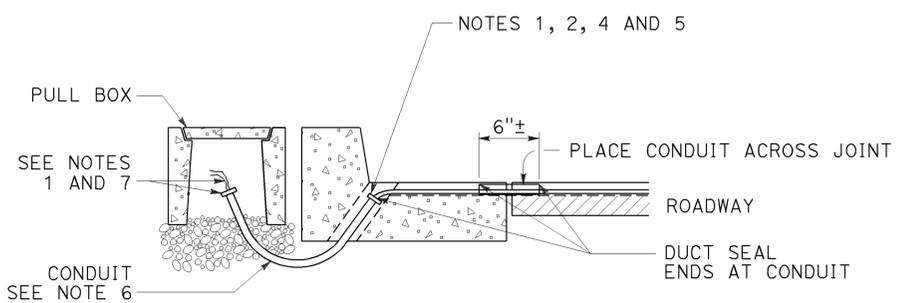
TO ACCOMPANY PLANS DATED 02-23-15



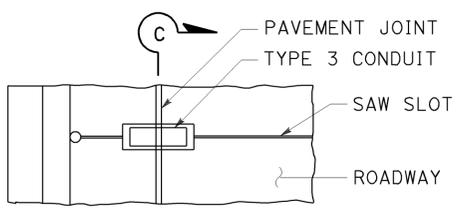
**TYPE A**  
**CURB TERMINATION DETAIL**



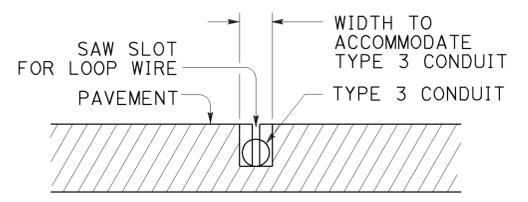
**"T" TRENCH**  
**DETAIL T**



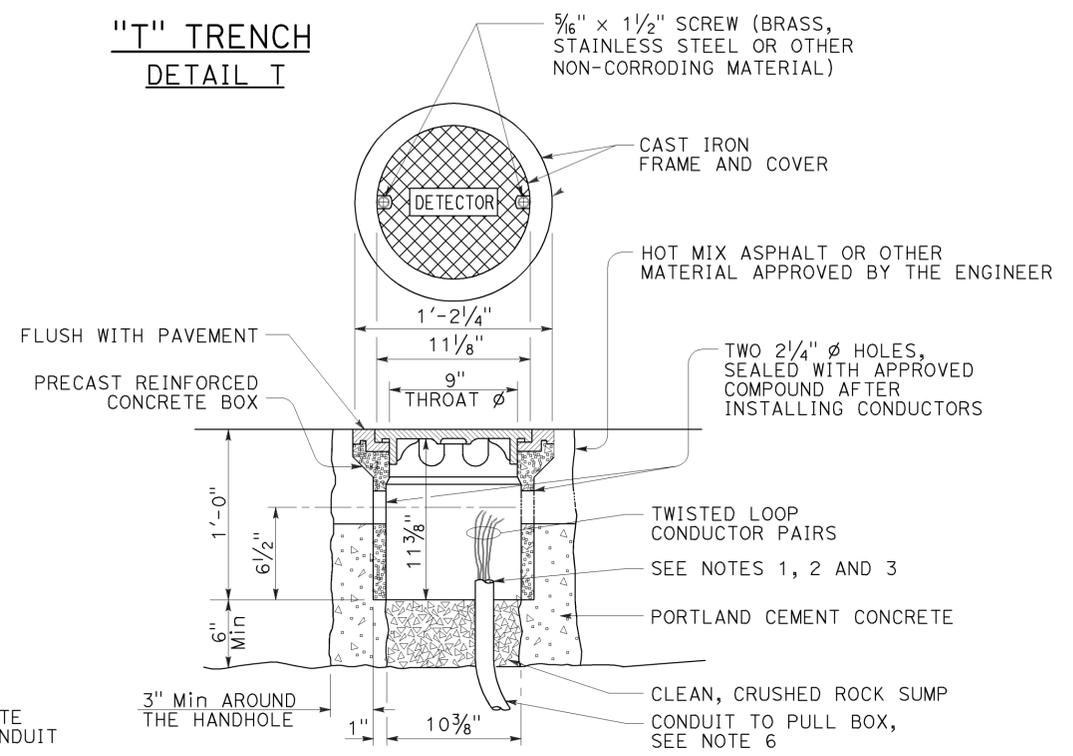
**CROSS SECTION**



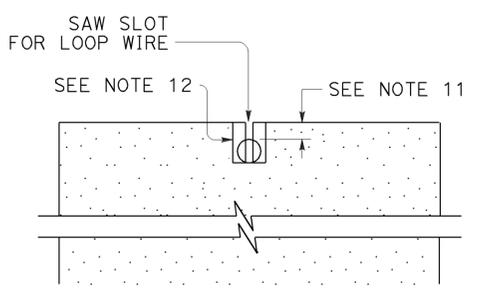
**PLAN VIEW**



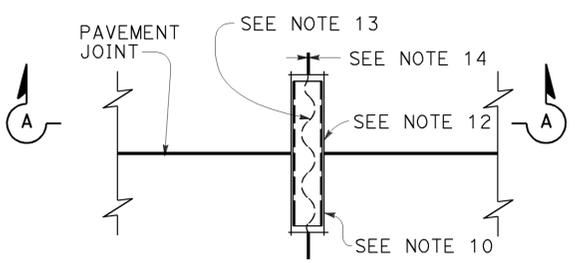
**SECTION C-C**



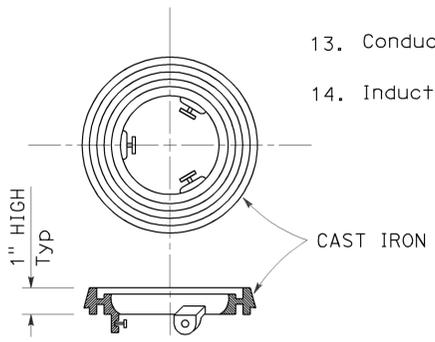
**DETECTOR HANDHOLE DETAIL**



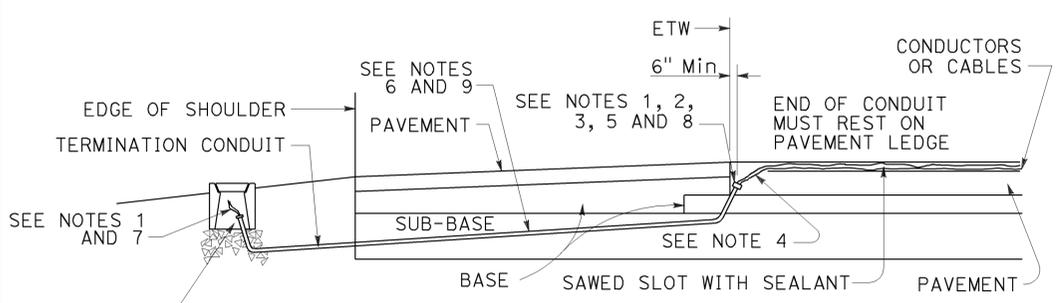
**SECTION A-A**



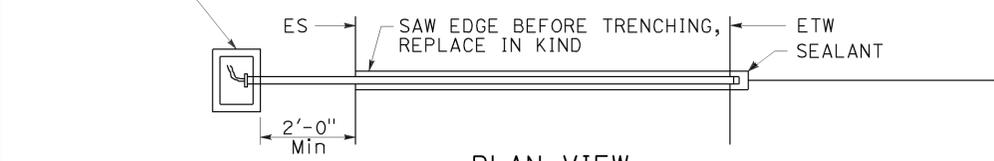
**PLAN VIEW**  
**TYPICAL LOOP LEAD-IN DETAIL**  
**AT PAVEMENT JOINT**



**LOCKING GRADE RING**



**CROSS SECTION**



**PLAN VIEW**  
**SHOULDER TERMINATION DETAILS**

**NOTES:**

- Bushing shall be used at end of conduit.
- Tape detector conductors or cables 3" each side of bushings.
- Install duct seal compound to each end of termination conduit before installing sealant.
- Round all sharp edges where detector conductors or cables have to pass.
- End of conduit shall be 3/8" below roadway surface.
- Conduit size      Loop conductors  
1"C minimum      1 to 2 pairs  
1 1/2"C minimum    3 to 4 pairs  
2"C minimum      5 or more pairs
- Splice detector conductors or cables to detector lead-in-cable.
- Location of detector handhole when shown on plans.
- When the shoulder and traveled way are paved with the same material and there is no joint between them, the conduit shall extend only 2'-0" into the shoulder pavement.
- 3/4"C, Type 3 conduit 6" long minimum, plug both ends with duct compound to keep out sealant.
- 1/2" Minimum between top of conduit and pavement surface.
- Sawcut shall not exceed 1" in width and 1/8" longer than conduit to be installed.
- Conductors with 1/2" minimum slack inside conduit.
- Inductive loop detector saw slot.

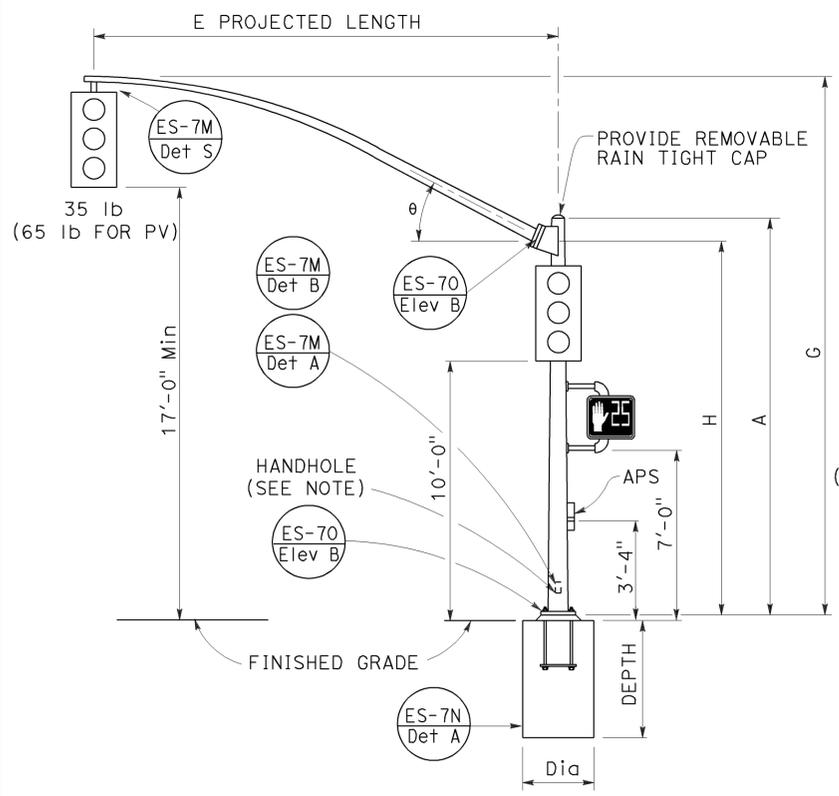
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS**  
**(CURB TERMINATION**  
**AND HANDHOLE)**  
NO SCALE

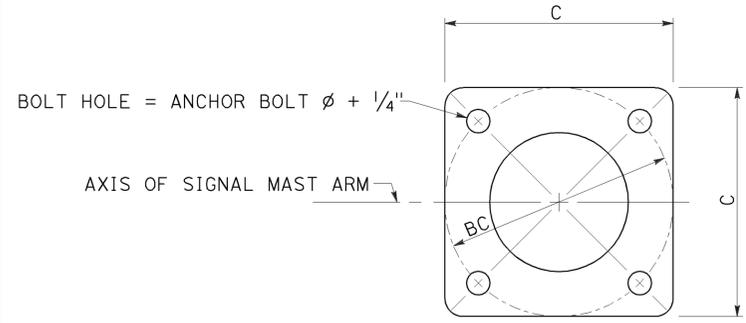
RSP ES-5D DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-5D DATED MAY 20, 2011 - PAGE 451 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP ES-5D**

2010 REVISED STANDARD PLAN RSP ES-5D

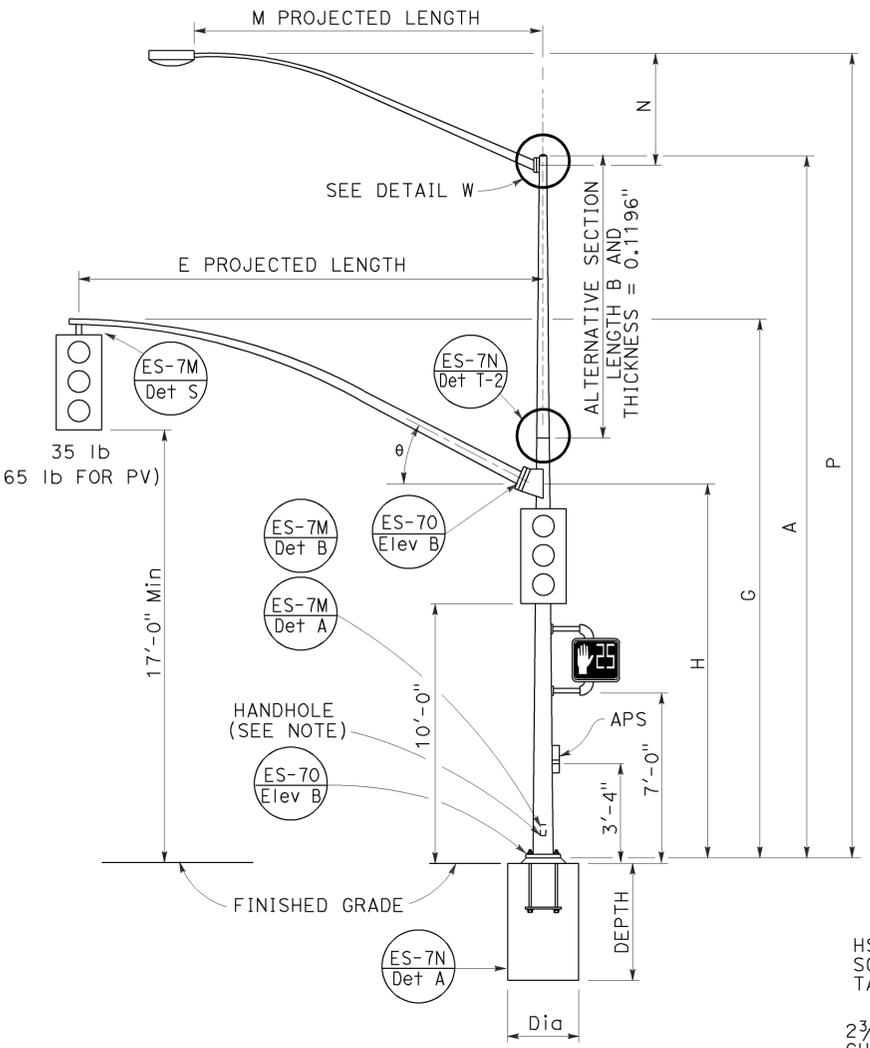


**TYPE 16-1-100, 18-1-100**  
ELEVATION A



**BASE PLATE**  
DETAIL D

E PROJECTED LENGTH	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	I BOLT CIRCLE	HS CAP SCREWS	J PLATE SIZE	K MAST ARM P THICKNESS	L POLE P THICKNESS	θ
15'-0"	21'-8"±	17'-6"	7 3/8"	0.1196"	12"	1 1/4"-7NC-3"	1'-0"	1 1/4"	1 1/2"	23°
20'-0"										
25'-0"	22'-8"±	16'-0"	8"	0.1196"	12"	1 1/4"-7NC-3"	1'-0"	1 1/4"	1 1/2"	23°
30'-0"										

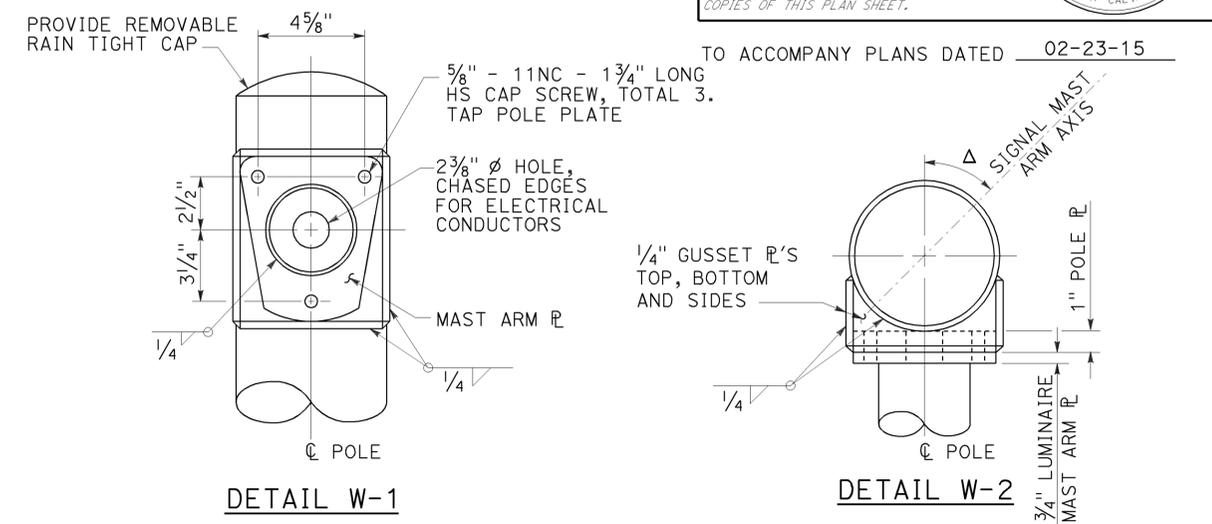


**TYPE 19-1-100, 19A-1-100**  
ELEVATION B

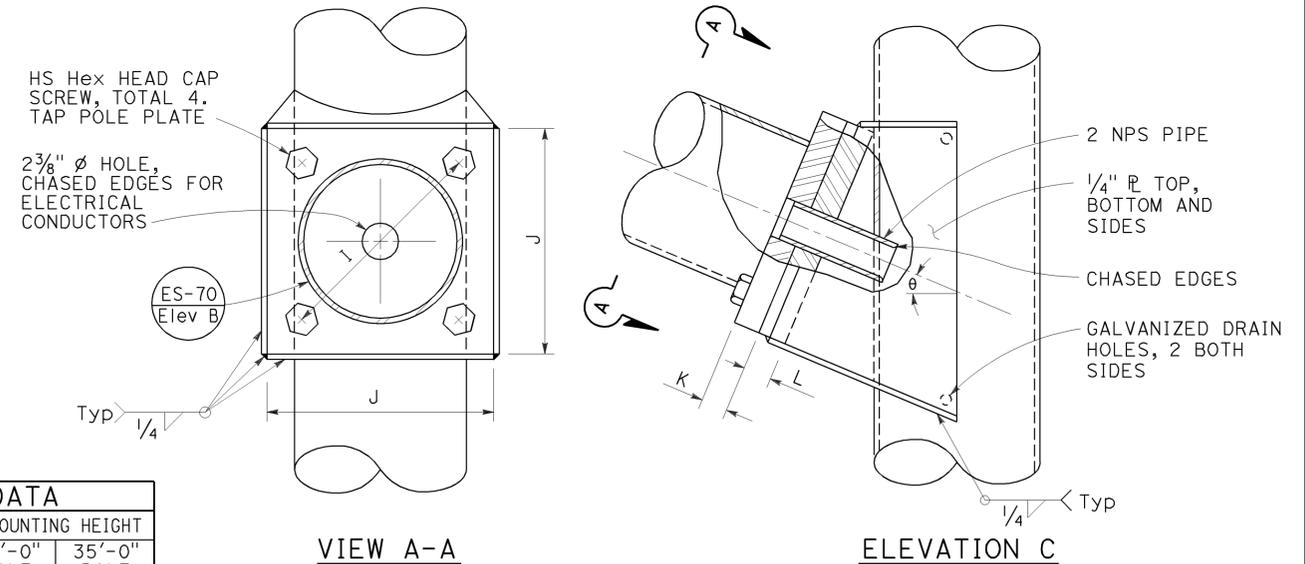
M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT
6'-0"	2'-0"±	3 1/4"	0.1196"	30'-0" POLE
8'-0"	2'-6"±	3 1/2"		35'-0" POLE
10'-0"	3'-3"±	3 7/8"	0.1196"	32'-9"±
12'-0"	4'-3"±	4"		37'-9"±
15'-0"	4'-9"±	4 1/4"	0.1196"	33'-9"±
				38'-9"±
				34'-3"±
				39'-3"±

Δ = LUMINAIRE MAST ARM SKEW -90° TO +90°  
DEFAULT 0°

**NOTE:**  
Handhole shall be located on the downstream side of traffic.



**DETAIL W-1**  
**DETAIL W-2**  
LUMINAIRE MAST ARM CONNECTION  
DETAIL W



**VIEW A-A**  
**ELEVATION C**  
SIGNAL MAST ARM CONNECTION  
DETAIL C

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA				BASE PLATE DATA				CIDH PILE FOUNDATION								
			A HEIGHT	Min OD		THICKNESS	ALTERNATIVE SECTION			C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	LUMINAIRE MAST ARM	SIGNAL MAST ARM	DIAMETER	DEPTH	REINFORCED	
				BASE	TOP		B	BOTTOM	TOP										
16-1-100	1	100	18'-6"	8 1/16"	0.1793"	None	7 7/8"	6 7/16"	1'-5 1/2"	1'-5 1/2"	3"	1 1/2" φ × 42"	NONE	15'-0", [20'-0"]	2'-6"	9'-0"	YES		
18-1-100			17'-0"	8 5/16"		None												10'-0"	6 7/16"
19-1-100			30'-0"	6 7/16"		10'-0"												6 7/16"	
19A-1-100			35'-0"	5 11/16"		15'-0"												5 11/16"	

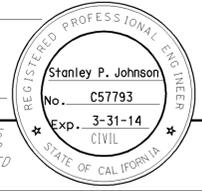
INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

**ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, CASE 1 SIGNAL MAST ARM LOADING, WIND VELOCITY = 100 MPH AND SIGNAL MAST ARM LENGTHS 15' TO 30')**  
NO SCALE

RSP ES-7C DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-7C DATED MAY 20, 2011 - PAGE 464 OF THE STANDARD PLANS BOOK DATED 2010.

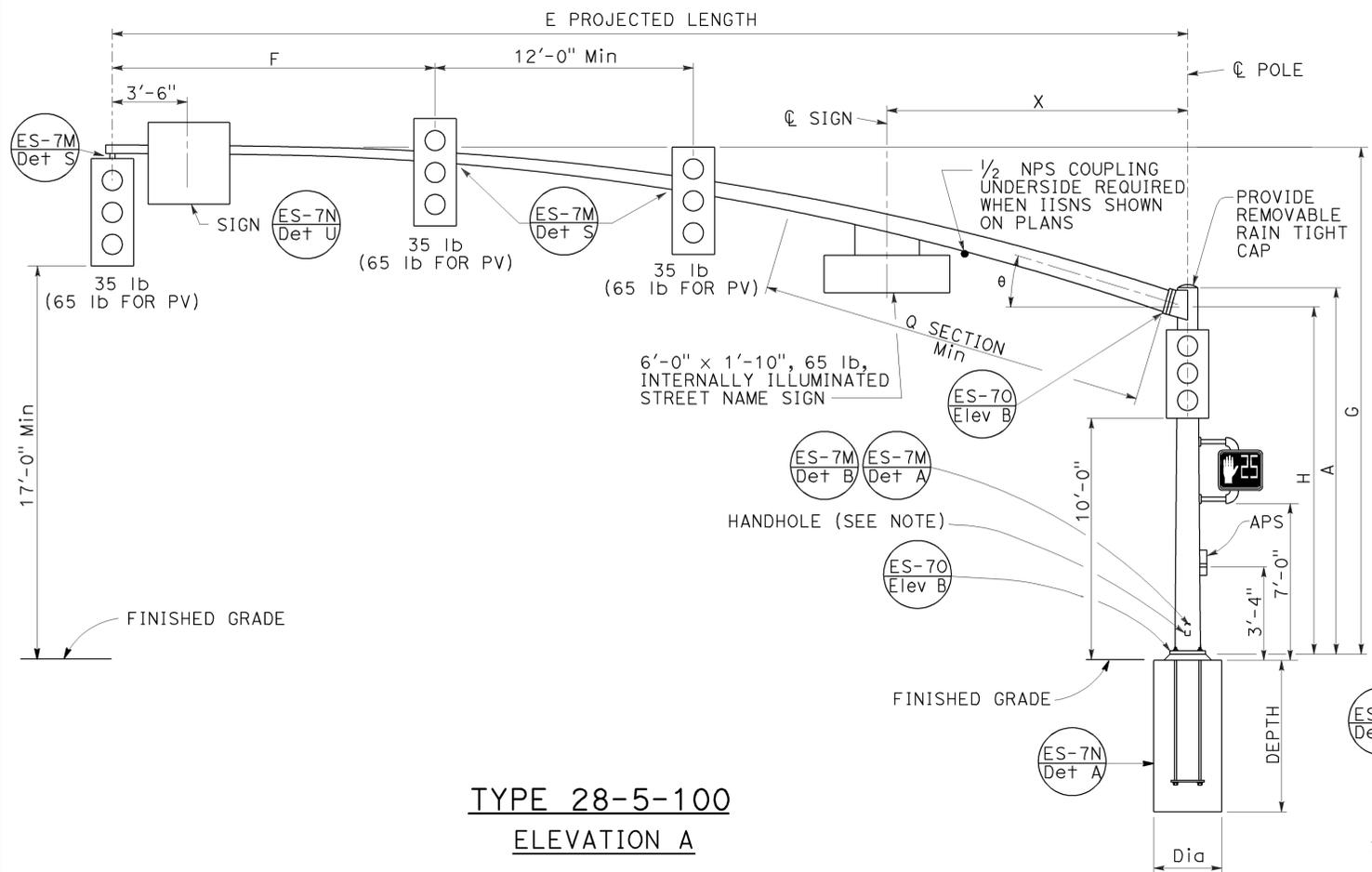
**REVISED STANDARD PLAN RSP ES-7C**

2010 REVISED STANDARD PLAN RSP ES-7C

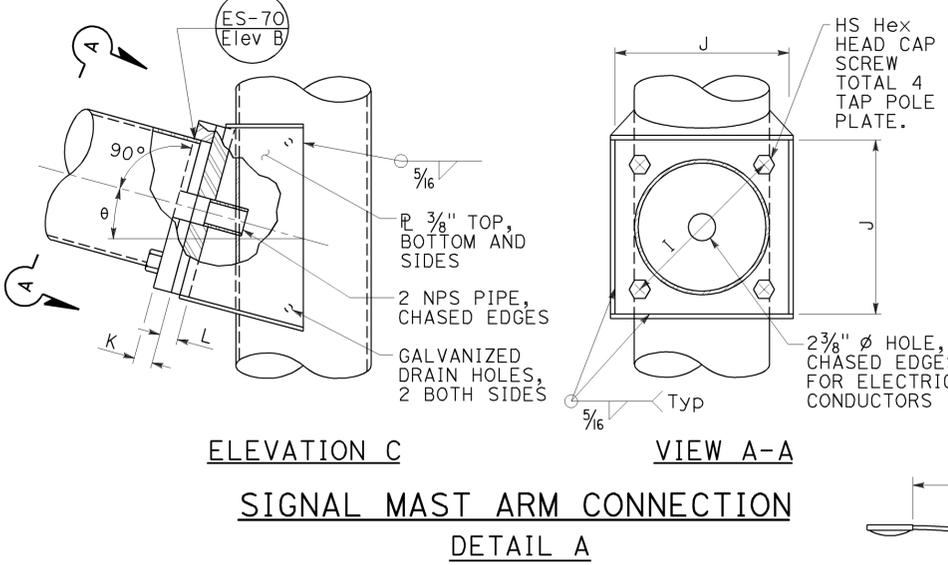


TO ACCOMPANY PLANS DATED 02-23-15

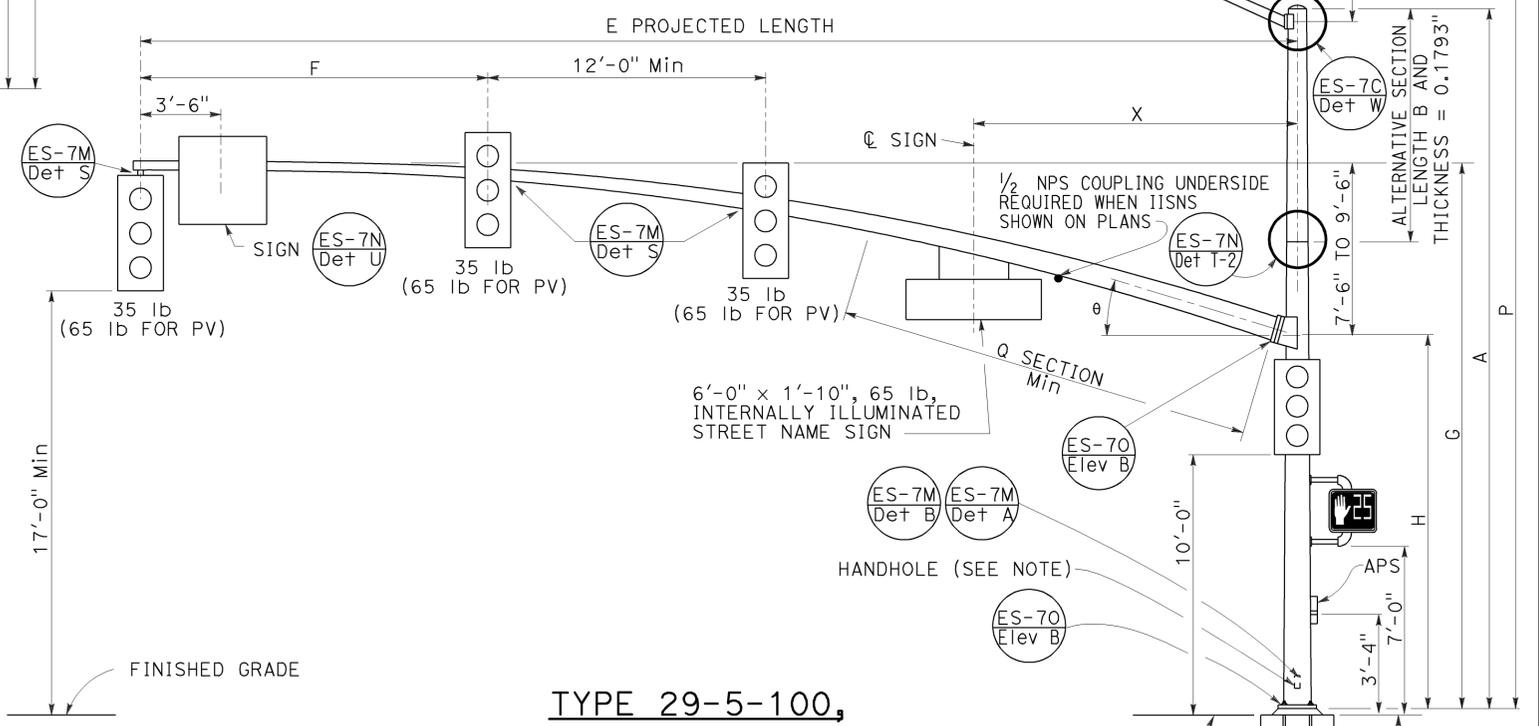
**NOTE:**  
Handhole shall be located on the downstream side of traffic.



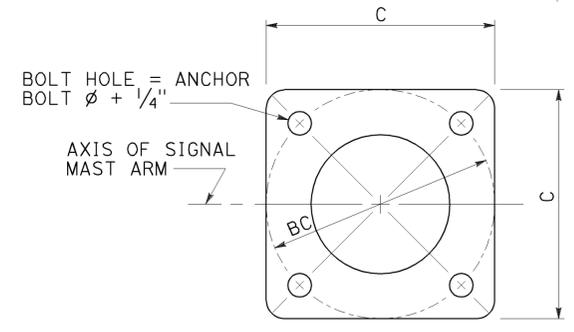
**TYPE 28-5-100**  
ELEVATION A



**ELEVATION C**  
**VIEW A-A**  
SIGNAL MAST ARM CONNECTION  
DETAIL A



**TYPE 29-5-100,**  
**29A-5-100**  
ELEVATION B



**BASE PLATE**  
DETAIL B

M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT	
				30'-0" POLE	35'-0" POLE
6'-0"	2'-0"±	3 3/4"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3 1/2"		32'-0"±	37'-0"±
10'-0"	3'-3"±	3 7/8"		32'-9"±	37'-9"±
12'-0"	4'-3"±	3 7/8"		33'-9"±	38'-9"±
15'-0"	4'-9"±	4 1/4"		34'-3"±	39'-3"±

E PROJECTED LENGTH	F Min SPACING	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	I BOLT CIRCLE	HS CAP SCREWS	J PLATE SIZE	K MAST ARM P THICKNESS	L POLE P THICKNESS	θ	Q SECTION		X Max
												LENGTH	THICKNESS	
50'-0" 55'-0"	15'-0"	23'-7"± TO 25'-7"±	16'-0"	11 1/16" 1'-1/4"	0.1793"	16"	1 1/2"-6NC-3 1/4"	1'-4"	1 3/4"	1 3/4"	15°	18'-0" 23'-0"	0.2391"	14'-0"

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA				BASE PLATE DATA				LUMINAIRE MAST ARM	SIGNAL MAST ARM	CIDH PILE FOUNDATION			
			A HEIGHT	Min OD BASE	Min OD TOP	THICKNESS	C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE			Dia	DEPTH	REINFORCED	
28-5-100	5	100	17'-0"	11 1/16"	NONE	23"	21"	3"	2 1/2" φ × 42"	NONE	50'-0", 55'-0"	3'-6"	12'-0"	YES		
29-5-100			30'-0"	14"	9 1/16"					10'-0"					11 1/8"	9 1/16"
29A-5-100			35'-0"	14"	8 5/16"					15'-0"					11 1/8"	8 5/16"

INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

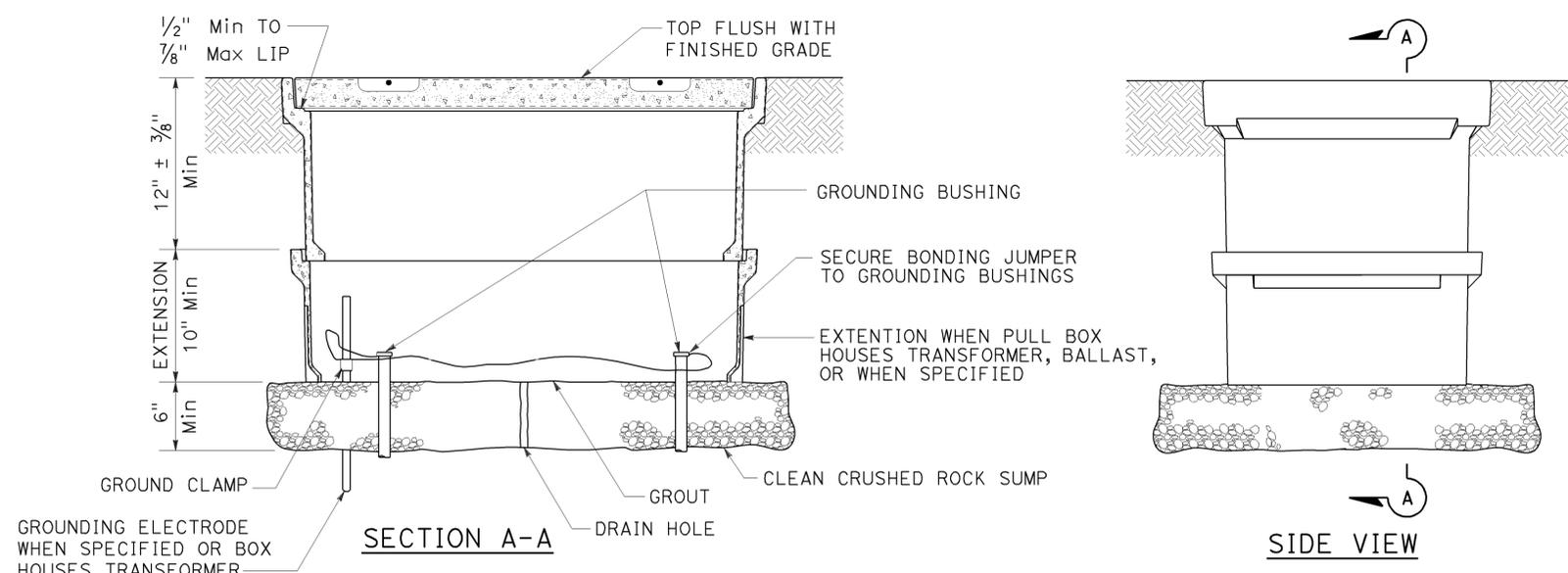
**ELECTRICAL SYSTEMS**  
**(SIGNAL AND LIGHTING STANDARD,**  
**CASE 5 SIGNAL MAST ARM LOADING,**  
**WIND VELOCITY=100 MPH AND SIGNAL**  
**MAST ARM LENGTHS 50' TO 55')**

NO SCALE  
RSP ES-7G DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-7G DATED MAY 20, 2011 - PAGE 468 OF THE STANDARD PLANS BOOK DATED 2010.

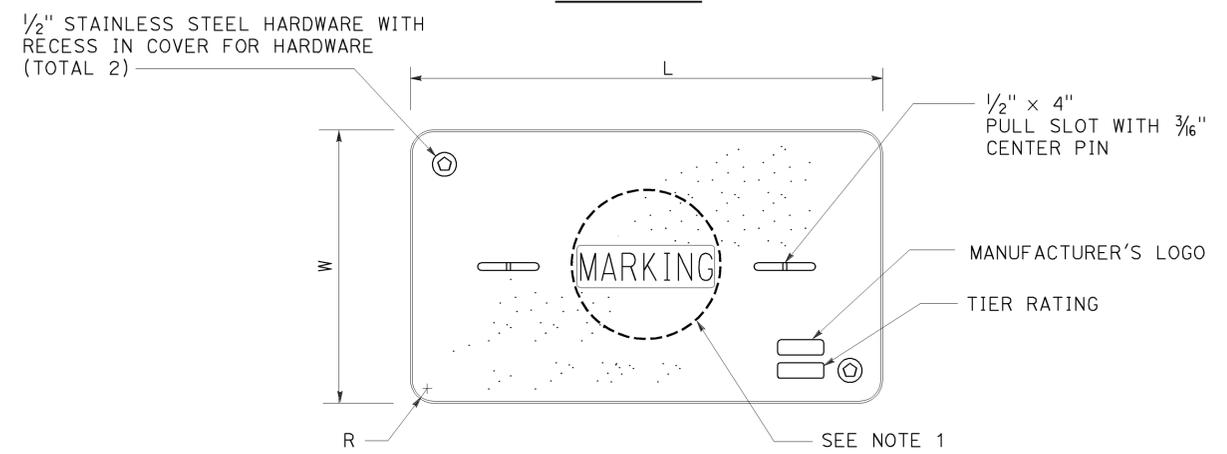
**REVISED STANDARD PLAN RSP ES-7G**

2010 REVISED STANDARD PLAN RSP ES-7G

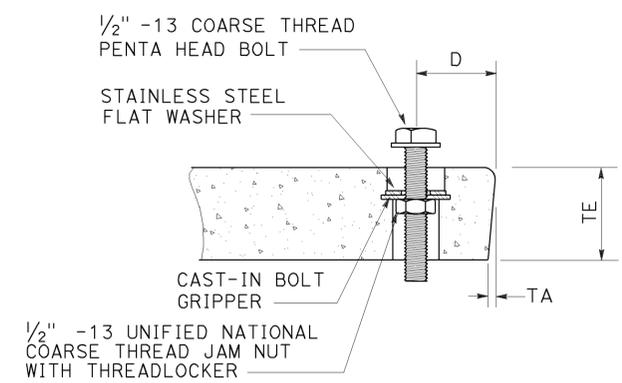
2010 REVISED STANDARD PLAN RSP ES-8A



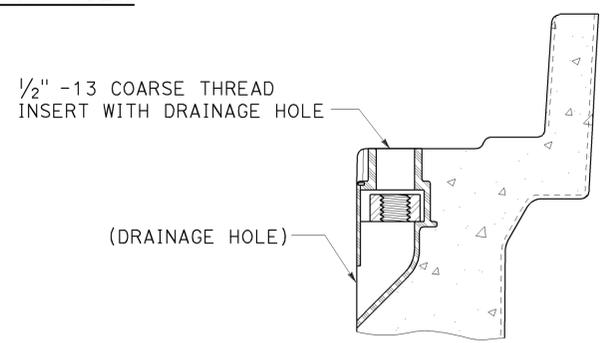
**INSTALLATION DETAILS**  
**DETAIL A**



**COVER TOP VIEW**



**TYPICAL COVER CAPTIVE BOLT**  
**OR SIMILAR**



**TYPICAL THREADED INSERT**  
**OR SIMILAR**

**NOTES:**

- Pull box covers shall be marked as follows: "SERVICE" Service circuits between service point and service disconnect; "SPRINKLER-CONTROL" sprinkler control circuits, 50 V or less; "CALTRANS" on all pull boxes, except pull boxes marked "SPRINKLER-CONTROL"; and "TELEPHONE" Telephone service;
  - No. 3 1/2 pull box.
    - "SIGNAL" - Traffic signal circuits with or without lighting or sign lighting circuits.
    - "LIGHTING" - Lighting or sign lighting circuits where voltage is under 600 V.
  - No. 5, 6, 9 or 9A pull box.
    - "TRAFFIC SIGNAL" - Traffic signal circuits with or without lighting or sign lighting circuits.
    - "LIGHTING" - Lighting or sign lighting circuits where voltage is under 600 V.
    - "LIGHTING-HIGH VOLTAGE" - Lighting or sign lighting circuits where voltage is above 600 V.
    - "IRRIGATION" - Circuits to irrigation controller 120 V or more.
    - "RAMP METER" - Ramp meter circuits.
    - "COUNT STATION" - Count or speed monitor circuits.
    - "COMMUNICATIONS" - Communication circuits.
    - "TOS COMMUNICATIONS" - TOS communication line.
    - "TOS POWER" - TOS power.
    - "TDC POWER" - Telephone demarcation cabinet power.
    - "CCTV" - Closed circuit television circuits.
    - "TMS" - Traffic monitoring station circuits.
    - "CMS" - Changeable message sign circuits.
    - "HAR" - Highway advisory radio circuits.
    - "BOOSTER PUMP" - Booster pump circuit.
- The nominal dimensions of the opening in which the cover sets shall be the same as the cover dimensions except the length and width dimensions shall be 1/8" greater.
- Covers and boxes shall be interchangeable with California standard male and female gages. When interchanged with a standard male or female gage, the top surfaces shall be flush within 1/8". Top outside radius of covers and pull boxes shall have a 1/8" radius.
- Pull box extension may be another pull box as long as the bottom edge of the pull box can fit into the cover opening.
- All dimensions for the cover for non-traffic pull box are nominal values.

TO ACCOMPANY PLANS DATED 02-23-15

DIMENSION TABLE										
PULL BOX	PULL BOX			COVER						
	MINIMUM DEPTH BOX	MINIMUM DEPTH EXTENSION	MAXIMUM WEIGHT	L	W	R	TE	TA	D	MAXIMUM WEIGHT
No. 3 1/2	12"	N/A	40 lb	1' - 3 3/8"	10 1/8"	1 3/8"	2"	1/8"	1 3/4"	30 lb
No. 5	12"	10"	55 lb	1' - 11 1/4"	1' - 1 3/4"	1 3/8"	2"	1/8"	1 3/4"	60 lb
No. 6	12"	10"	70 lb	2' - 6 1/2"	1' - 5 1/2"	1 3/8"	2"	1/8"	2"	85 lb

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(NON-TRAFFIC PULL BOX)**  
NO SCALE

RSP ES-8A DATED JULY 19, 2013 SUPERSEDES RSP ES-8A DATED JANUARY 20, 2012 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP ES-8A**

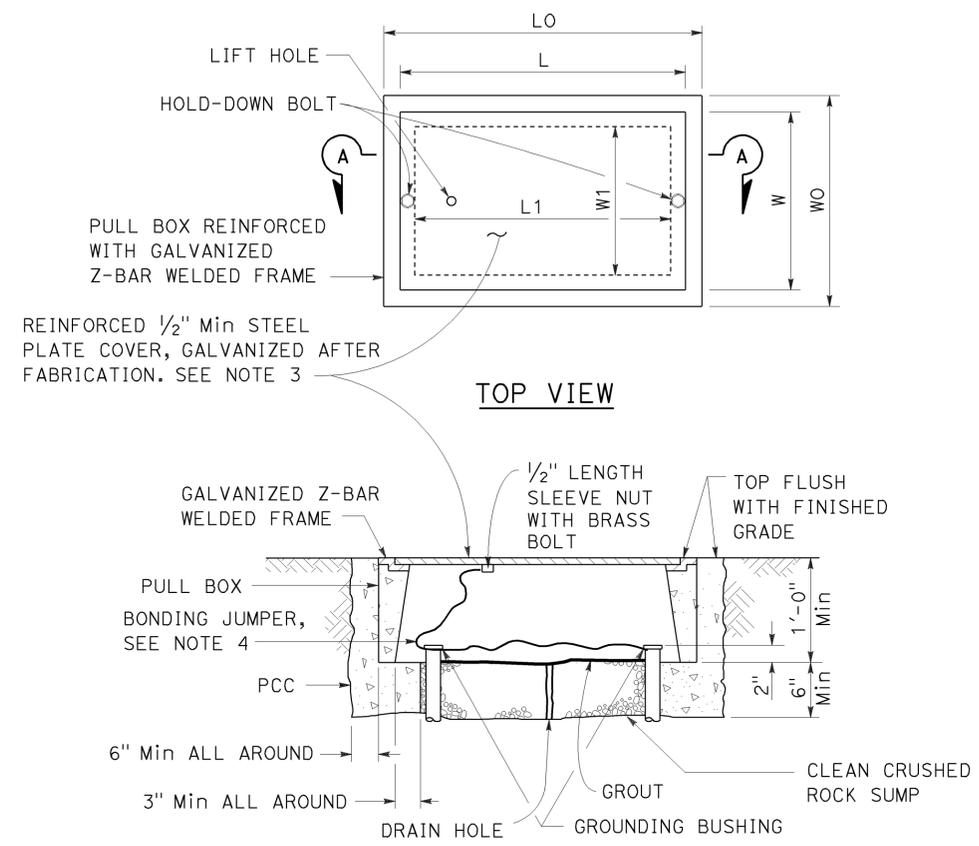
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	43	45

Theresa Gabriel  
 REGISTERED ELECTRICAL ENGINEER  
 July 19, 2013  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 Theresa Aziz Gabriel  
 No. E15129  
 Exp. 6-30-14  
 ELECTRICAL  
 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.

TO ACCOMPANY PLANS DATED 02-23-15



SECTION A-A  
**No. 3 1/2(T), No. 5(T) AND  
 No. 6(T) TRAFFIC PULL BOX**

**NOTES:**

- Traffic pull box shall be provided with steel cover and special concrete footing. Steel cover shall have embossed non-skid pattern.
- Steel reinforcing shall be as regularly used in the standard products of the respective manufacturer.
- Pull box covers shall be marked as follows: "SERVICE" Service circuits between service point and service disconnect; "SPRINKLER-CONTROL" Sprinkler control circuits, 50 V or less; "CALTRANS" On all pull boxes, except pull boxes marked "SPRINKLER-CONTROL"; and "TELEPHONE" Telephone service.
  - No. 3 1/2(T) pull box.
    - "SIGNAL" - Traffic signal circuits with or without lighting or sign lighting circuits.
    - "LIGHTING" - Lighting or sign lighting circuits where voltage is under 600 V.
  - No. 5(T) or 6(T) pull box.
    - "TRAFFIC SIGNAL" - Traffic signal circuits with or without lighting or sign lighting circuits.
    - "LIGHTING" - Lighting or sign lighting circuits where voltage is under 600 V.
    - "LIGHTING-HIGH VOLTAGE" - Lighting or sign lighting circuits where voltage is above 600 V.
    - "IRRIGATION" - Circuits to irrigation controller 120 V or more.
    - "RAMP METER" - Ramp meter circuits.
    - "COUNT STATION" - Count or speed monitor circuits.
    - "COMMUNICATION" - Communication circuits.
    - "TOS COMMUNICATIONS" - TOS communications line.
    - "TOS POWER" - TOS power.
    - "TDC POWER" - Telephone demarcation cabinet power.
    - "CCTV" - Closed circuit television circuits.
    - "TMS" - Traffic monitoring station circuits.
    - "CMS" - Changeable message sign circuits.
    - "HAR" - Highway advisory radio circuits.
    - "BOOSTER PUMP" - Booster pump circuit.
- Bonding jumper for metal covers shall be 3' long, minimum.
- The nominal dimensions of the opening in which the cover sets shall be the same as the cover dimensions except the length and width dimensions shall be 1/8" greater.
- Covers and boxes shall be interchangeable with California standard male and female gages. When interchanged with a standard male or female gage, the top surfaces shall be flush within 1/8".

PULL BOX	PULL BOX						COVER				
	MINIMUM * THICKNESS	MINIMUM DEPTH BOX AND EXTENSION	W0	L0	L1	W1	L **	W **	R	EDGE THICKNESS	EDGE TAPER
No. 3 1/2(T)	1 1/2"	1'-0"	1'-5"± 1"	1'-8 3/8"±	1'-2 1/2"±	10 5/8"± 1"	1'-8"±	1'-1 3/4"±	0"	1/2"	NONE
No. 5(T)	1 3/4"	1'-0"	1'-11 1/2"± 1"	2'-5 1/2"±	1'-7"±	1'-1"± 1"	2'-3"±	1'-4"±	0"	1/2"	NONE
No. 6(T)	2"	1'-0"	2'-6"± 1"	2'-11 1/2"±	1'-11 1/2"±	1'-5"± 1"	2'-9"±	1'-8"±	0"	1/2"	NONE

\* EXCLUDING CONDUIT WEB \*\* TOP DIMENSION

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (TRAFFIC PULL BOX)**  
 NO SCALE

RSP ES-8B DATED JULY 19, 2013 SUPERSEDES RSP ES-8B DATED JANUARY 20, 2012 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP ES-8B**

2010 REVISED STANDARD PLAN RSP ES-8B

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
12	Ora	5, 91, 405	Var	44	45

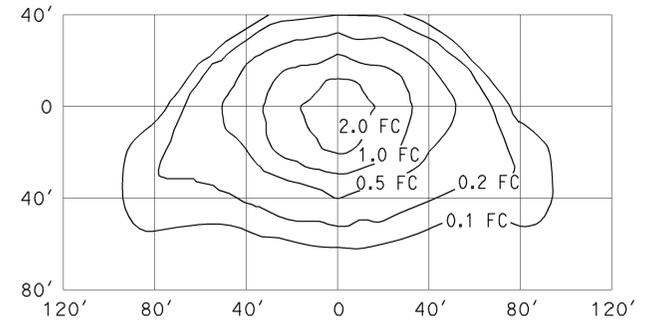
*Theresa Gabriel*  
 REGISTERED ELECTRICAL ENGINEER  
 Theresa Aziz Gabriel  
 No. E15129  
 Exp. 6-30-14  
 ELECTRICAL  
 STATE OF CALIFORNIA

July 19, 2013  
 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.

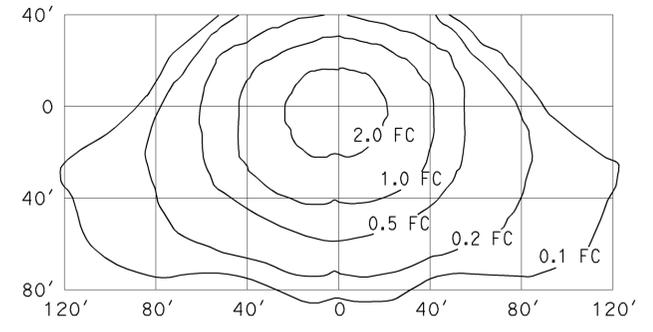
TO ACCOMPANY PLANS DATED 02-23-15

**ISOFOOTCANDLE CURVE - MINIMUM**



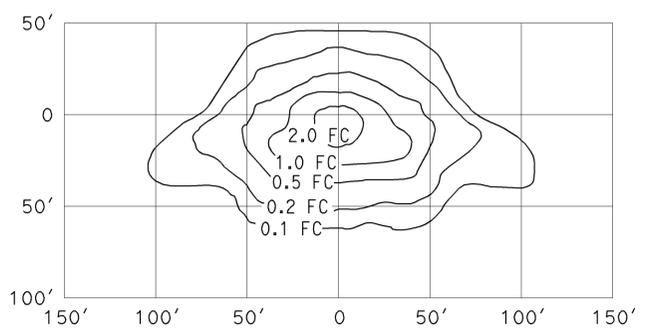
**TYPE III MEDIUM CUTOFF**  
 Cutoff Luminaire  
 34' Mounting Height  
 Lamp operated at 22,000 lm  
 200-W high pressure sodium lamp  
 ANSI Designation S66

**ISOFOOTCANDLE CURVE - MINIMUM**



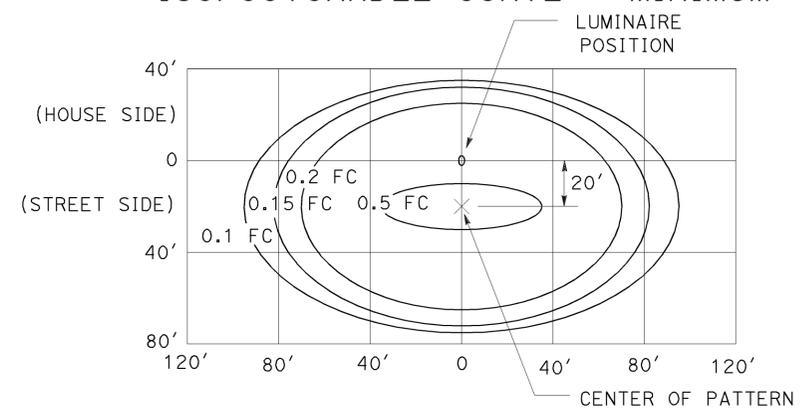
**TYPE III MEDIUM CUTOFF**  
 Cutoff Luminaire  
 40' Mounting Height  
 Lamp operated at 37,000 lm  
 310-W high pressure sodium lamp  
 ANSI Designation S67

**ISOFOOTCANDLE CURVE - MINIMUM**



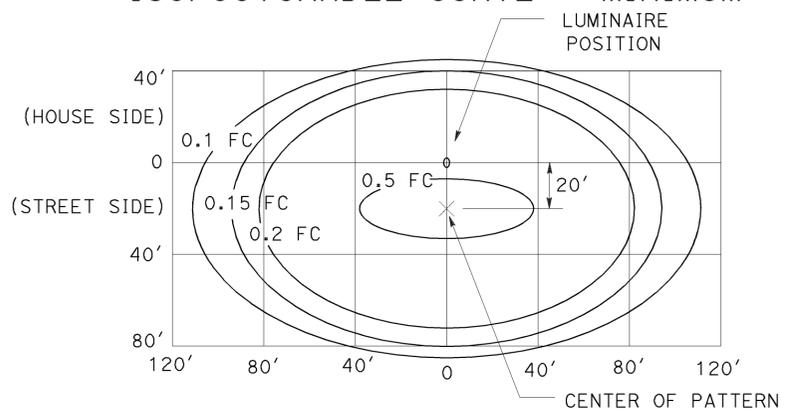
**TYPE III MEDIUM CUTOFF**  
 Cutoff Luminaire  
 30' Mounting Height  
 Lamp operated at 16,000 lm  
 150-W high pressure sodium lamp  
 ANSI Designation S55

**ISOFOOTCANDLE CURVE - MINIMUM**



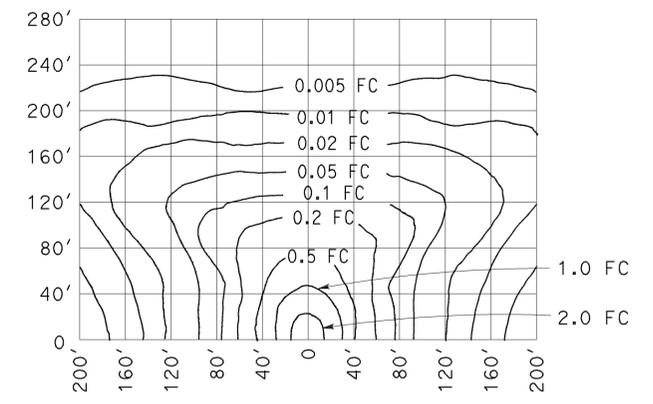
**LED LUMINAIRE ROADWAY 1**  
 165-W at 34' Mounting Height

**ISOFOOTCANDLE CURVE - MINIMUM**



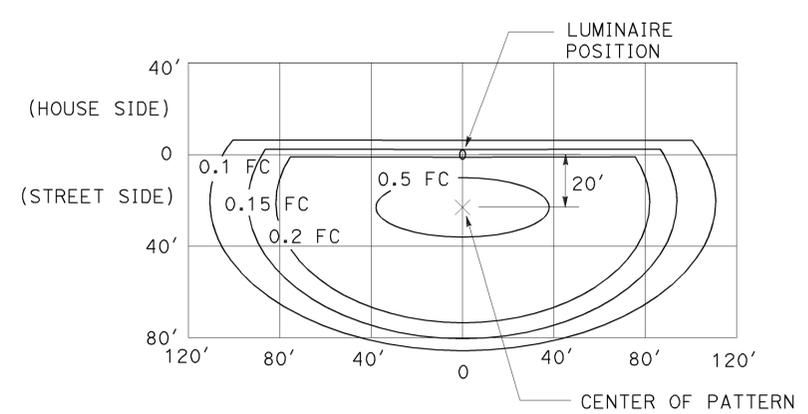
**LED LUMINAIRE ROADWAY 2**  
 235-W at 40' Mounting Height

**ISOFOOTCANDLE CURVE - MINIMUM**



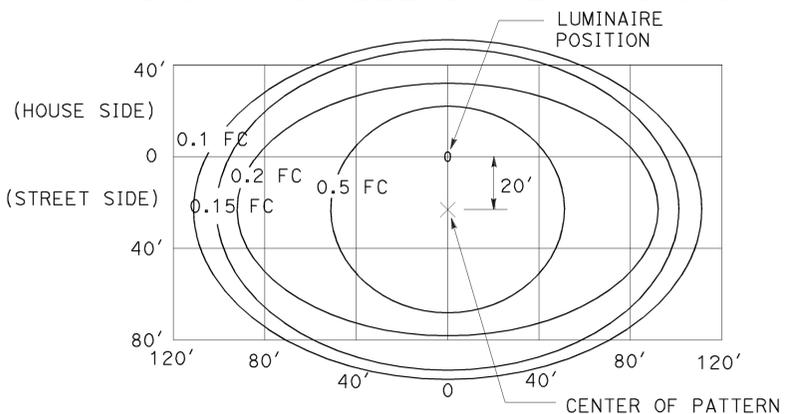
**LOW PRESSURE SODIUM LUMINAIRE**  
 40' Mounting Height  
 Lamp operated at 33,000 lm  
 180-W low pressure sodium lamp

**ISOFOOTCANDLE CURVE - MINIMUM**



**LED LUMINAIRE ROADWAY 3**  
 235-W at 40' Mounting Height  
 with back side control

**ISOFOOTCANDLE CURVE - MINIMUM**

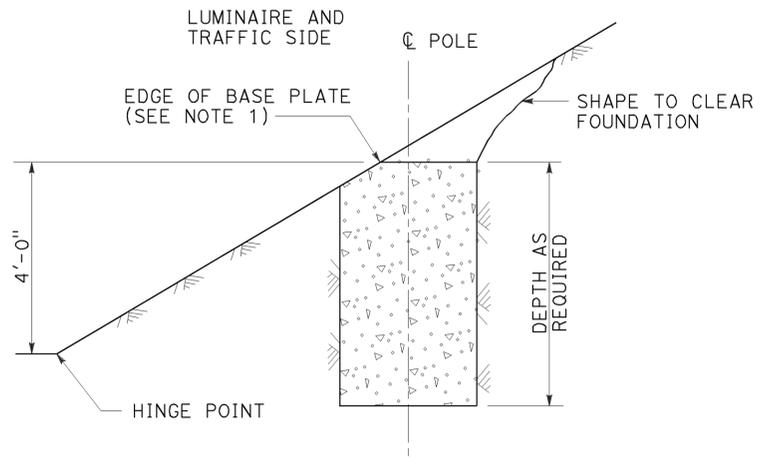


**LED LUMINAIRE ROADWAY 4**  
 300-W at 40' Mounting Height

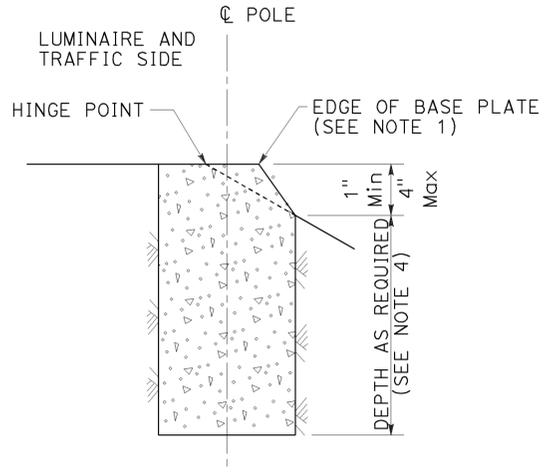
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (ISOFOOTCANDLE DIAGRAMS)**

NO SCALE  
 RSP ES-10A DATED JULY 19, 2013 SUPERSEDES RSP ES-10A DATED JULY 20, 2012  
 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

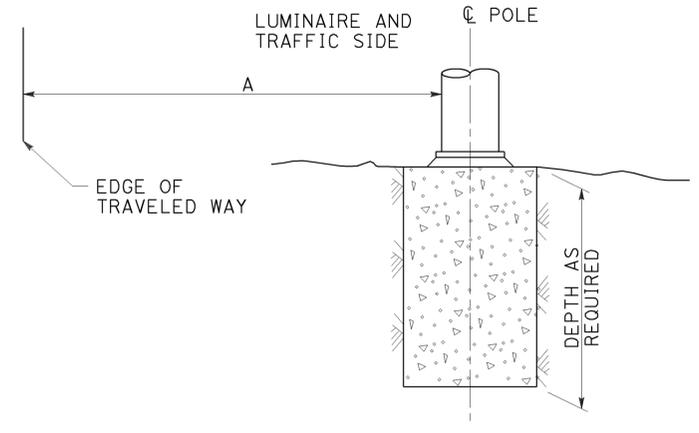
2010 REVISED STANDARD PLAN RSP ES-10A



CUT SLOPES  
STEEPER THAN 4:1,  
LESS THAN 2:1  
DETAIL A-1  
 See Note 2 and 3



FILL SLOPES  
STEEPER THAN 4:1,  
LESS THAN 2:1  
DETAIL A-2  
 See Note 2 and 3



FLAT SECTIONS, CUT OR FILL SLOPES  
4:1 OR FLATTER  
DETAIL A-3  
 See Note 2

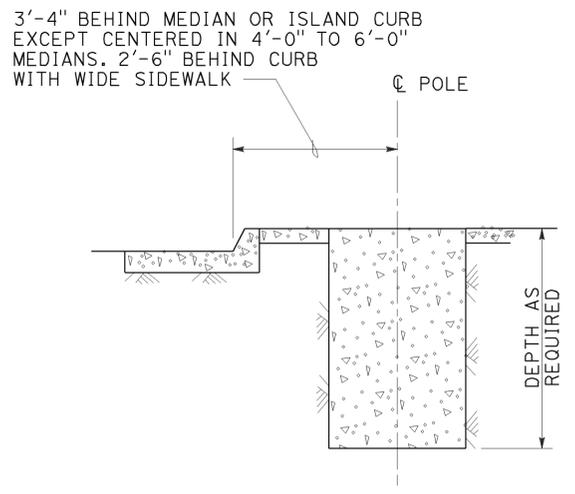
TO ACCOMPANY PLANS DATED **02-23-15**

STANDARD TYPE	SETBACK (DIMENSION A)
32	30'-0" (Min)
31	20'-0" (Min)
15, 15D, 15-SB, 21, 21D, 30	ARM LENGTH (Min)

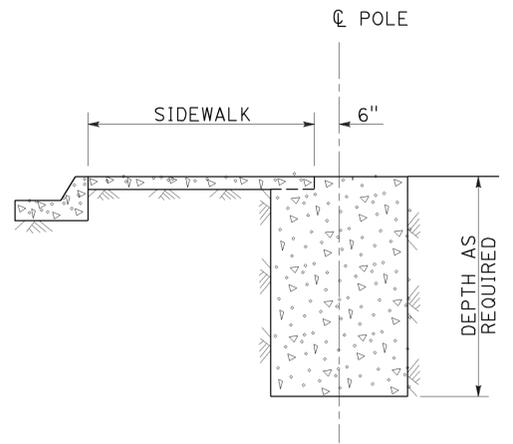
FOUNDATIONS ADJACENT TO ALL ROADWAYS EXCEPT  
IN SIDEWALK, MEDIAN AND ISLAND AREAS  
DETAIL A

NOTES:

1. Where a portion of the foundation is above grade, the top edges shall have a 1" chamfer.
2. Slopes shall be horizontal to vertical ratio (Horizontal : Vertical).
3. Horizontal setbacks on cut and fill slopes steeper than 4:1 shall not exceed the distance shown for flat sections.
4. CIDH embedment depth shall be increased beyond standard depths by the diameter of the CIDH.



MEDIAN, ISLAND  
OR WIDE SIDEWALK  
DETAIL B-1  
 7' Wide and wider



NARROW SIDEWALK  
DETAIL B-2  
 Less than 7' wide

FOUNDATIONS IN SIDEWALK, MEDIAN AND ISLAND AREAS  
DETAIL B

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(FOUNDATION INSTALLATIONS)**  
 NO SCALE

RSP ES-11 DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-11  
 DATED MAY 20, 2011 - PAGE 488 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP ES-11**

2010 REVISED STANDARD PLAN RSP ES-11