

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	1	76

**STATE OF CALIFORNIA ACSTP-47C5(004)E**  
**DEPARTMENT OF TRANSPORTATION**

**PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY**  
**IN VENTURA COUNTY**  
**NEAR SANTA PAULA**  
**AT 1.1 MILES WEST OF SISAR CREEK AND**  
**AT 0.8 MILE SOUTH OF SANTA PAULA CREEK**

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010



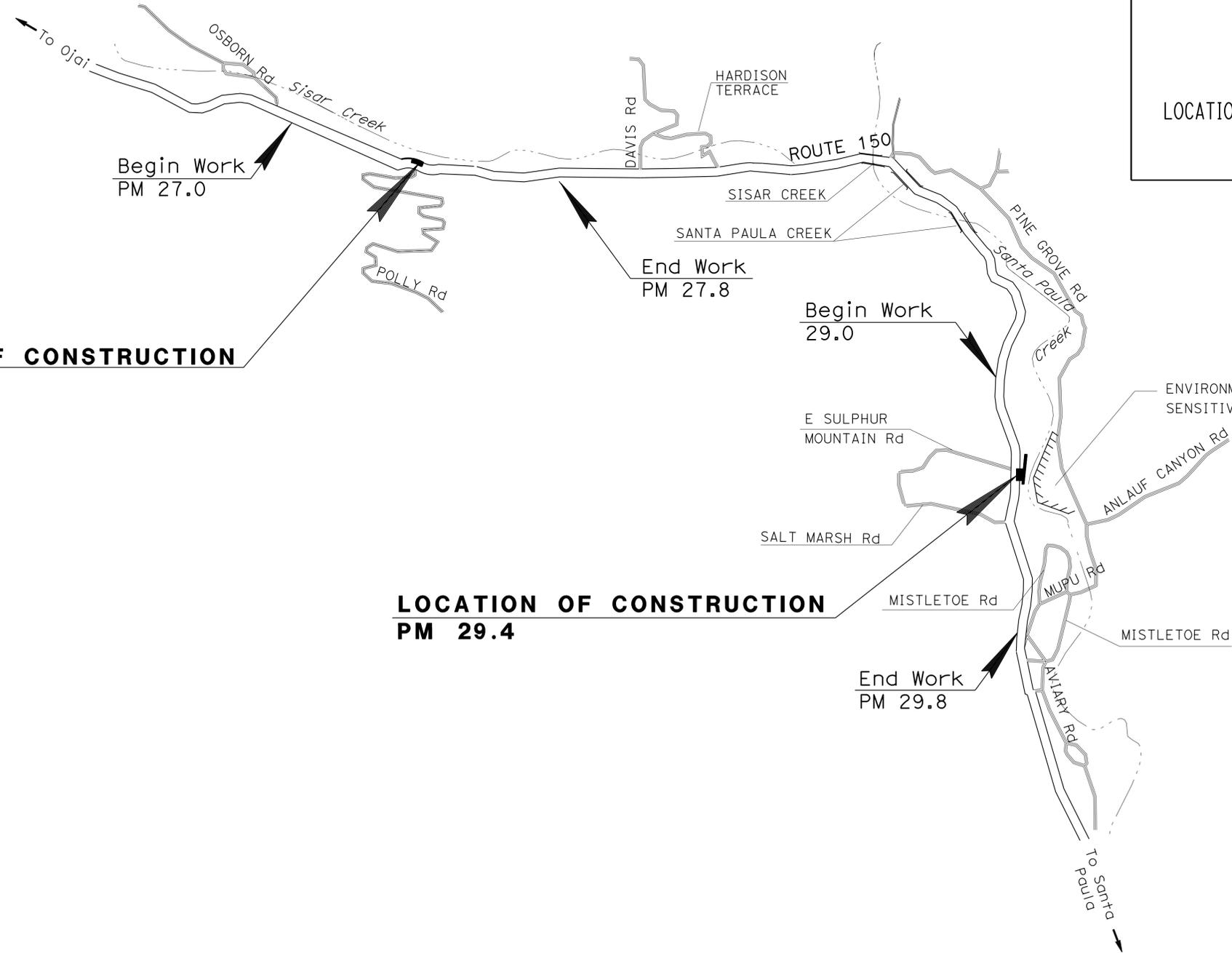
**INDEX OF PLANS**

SHEET No.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL CROSS SECTIONS
3-4	LAYOUTS
5-6	PROFILES
7-15	CONSTRUCTION DETAILS
16-19	DRAINAGE PLANS, PROFILES, DETAILS AND QUANTITIES
20-21	UTILITY PLANS
22	CONSTRUCTION AREA SIGNS
23-31	TRAFFIC HANDLING PLANS
32	SUMMARY OF QUANTITIES
33-34	PLANT LIST AND PLANTING PLANS
35-60	REVISED STANDARD PLANS

**STRUCTURE PLANS**

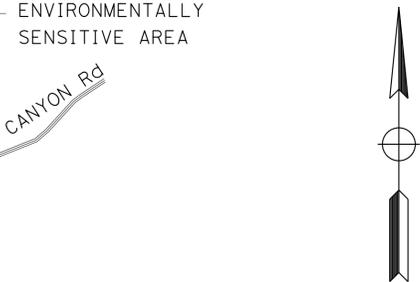
61-76 ROUTE 150 BARRIER REPLACEMENT

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



**LOCATION OF CONSTRUCTION**  
**PM 27.4**

**LOCATION OF CONSTRUCTION**  
**PM 29.4**



PROJECT MANAGER	DAVID MIRAANEY
DESIGN ENGINEER	RAHEL ADERA

*Rahel Adera* 1-26-15  
 PROJECT ENGINEER DATE  
 REGISTERED CIVIL ENGINEER

April 4, 2016  
 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>07-3X0214</b>
PROJECT ID	<b>0713000398</b>

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	2	76
<i>Rahel Adera</i> REGISTERED CIVIL ENGINEER DATE 1-26-15			RAHEL ADERA No. C72106 Exp. 6-30-16 CIVIL		
PLANS APPROVAL DATE			4-4-16		
<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:**

1. DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS
2. SUPERELEVATION AS SHOWN OR AS DIRECTED BY THE ENGINEER
3. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
4. EXPECT DIFFICULT PILE INSTALLATION DUE TO THE PRESENCE OF GRANULAR MATERIALS, COBBLES, AND BOULDERS.

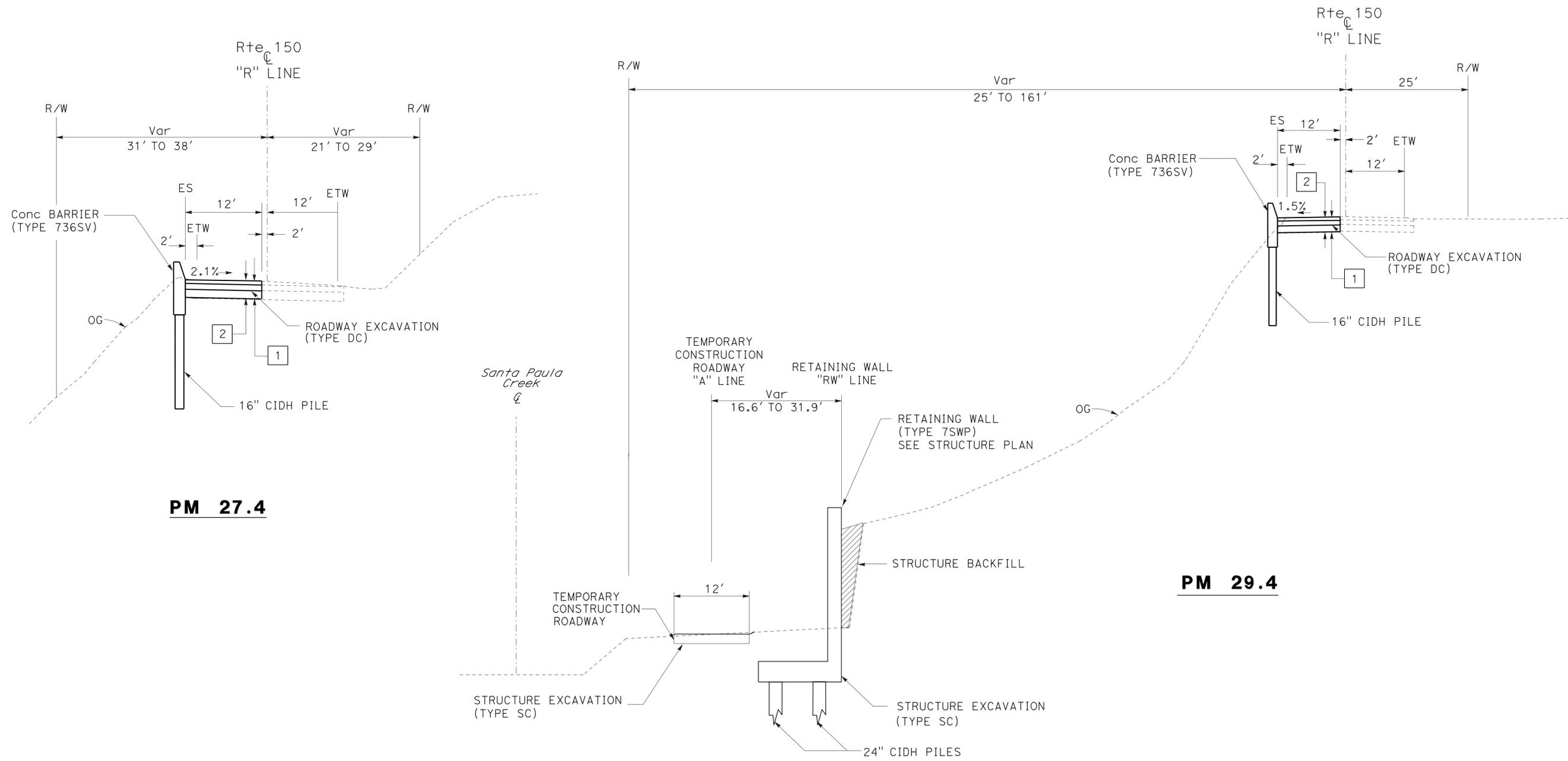
**TYPICAL STRUCTURAL SECTIONS:**

- 1
- EXISTING
  - 0.25' ASPHALT CONCRETE (TYPE B)
  - 0.50' CLASS 2 AGGREGATE BASE
  - 0.95' CLASS 4 AGGREGATE SUBBASE
- 2
- 0.45' HOT MIX ASPHALT (TYPE A)
  - 0.45' LEAN CONCRETE BASE
  - 0.80' CLASS 3 AGGREGATE BASE

**DESIGN DESIGNATION**

ADT(2013)	2950	D	66.2
ADT	11,800	T	3.8
DHV	190	V	45
ESAL	798,000	TI	9

**PAVEMENT CLIMATE REGION**  
SOUTH COAST



**PM 27.4**

**PM 29.4**

**TYPICAL CROSS SECTIONS**

NO SCALE

**X-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 DESIGN  
 OJI KALU  
 RAHEL ADERA  
 KENNY HA  
 REVISIONS BY DATE

USERNAME => s125624  
 DGN FILE => 73x020ca001.dgn

RELATIVE BORDER SCALE  
 15" IN INCHES  
 0 1 2 3

UNIT 1806

PROJECT NUMBER & PHASE

07130003981

LAST REVISION DATE PLOTTED => 05-APR-2016  
 12-15-14 TIME PLOTTED => 08:16

**NOTE:**

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

**CURVE DATA**

No. (X)	R	Δ	T	L
1	290.29'	37°38'19"	98.93'	190.70'
2	320.00'	32°43'28"	93.95'	182.77'
3	341.28'	30°5'49"	91.76'	179.27'
4	531.86'	26°50'25"	126.91'	249.15'
5	665.28'	8°59'23"	52.30'	104.38'
6	694.32'	8°22'01"	50.79'	101.39'



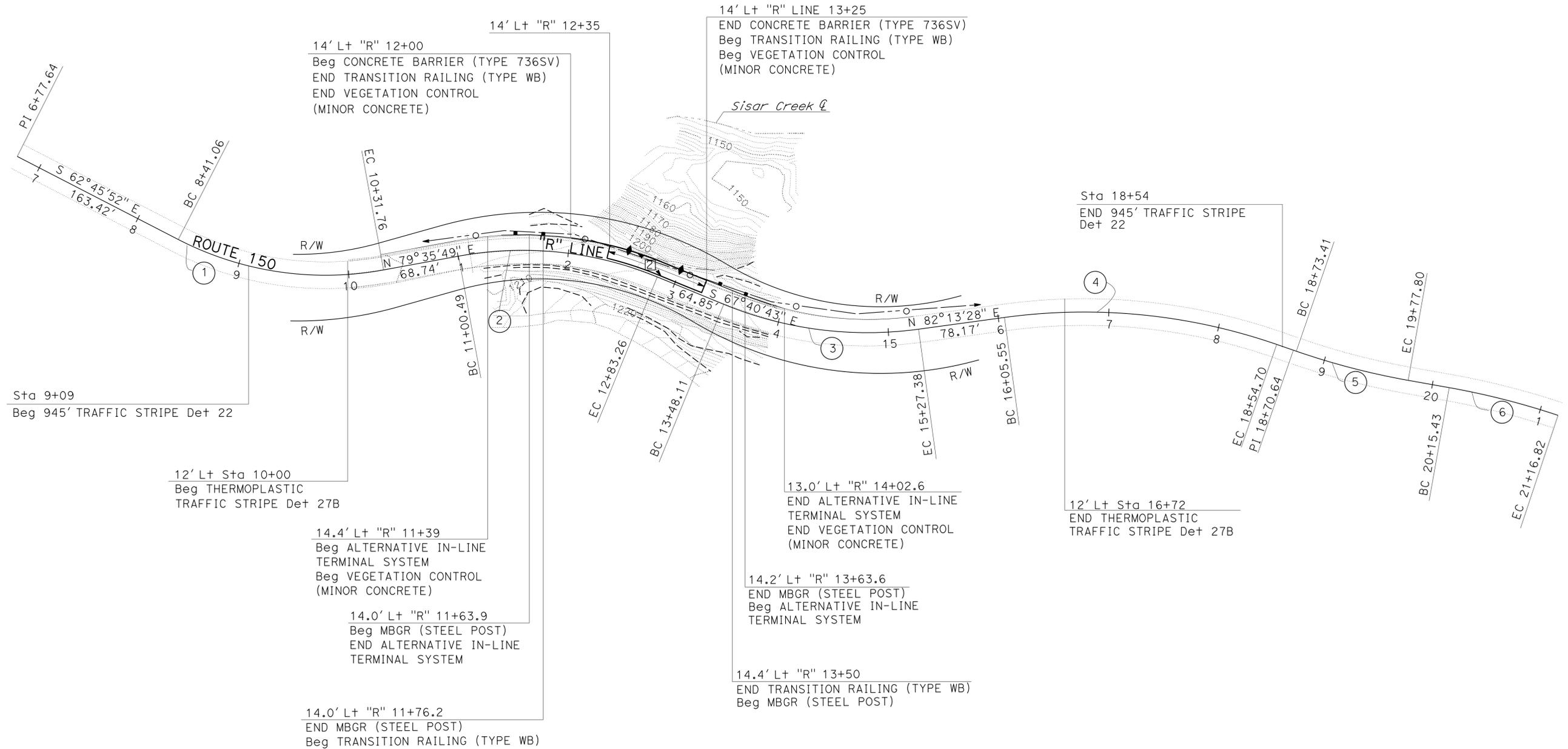
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	3	76

*Rahel Adera* 1-26-15  
REGISTERED CIVIL ENGINEER DATE

4-4-16  
PLANS APPROVAL DATE

RAHEL ADERA  
No. C72106  
Exp. 6-30-16  
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.



**PM 27.4**

**LAYOUT**  
SCALE: 1" = 50'

**L-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN
FUNCTIONAL SUPERVISOR	OUI KALU
CALCULATED/DESIGNED BY	RAHEL ADERA
CHECKED BY	KENNY HA
REVISOR	DATE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	4	76

RAHEL ADERA 1-26-15  
 REGISTERED CIVIL ENGINEER DATE  
 4-4-16  
 PLANS APPROVAL DATE

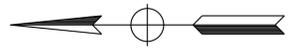
REGISTERED PROFESSIONAL ENGINEER  
 RAHEL ADERA  
 No. C72106  
 Exp. 6-30-16  
 CIVIL  
 STATE OF CALIFORNIA

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.

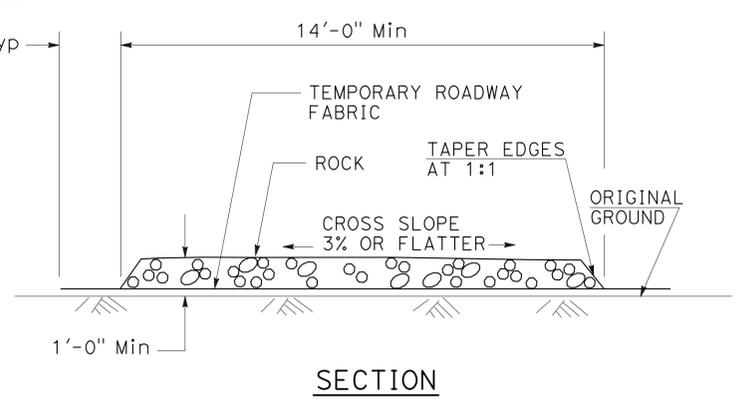
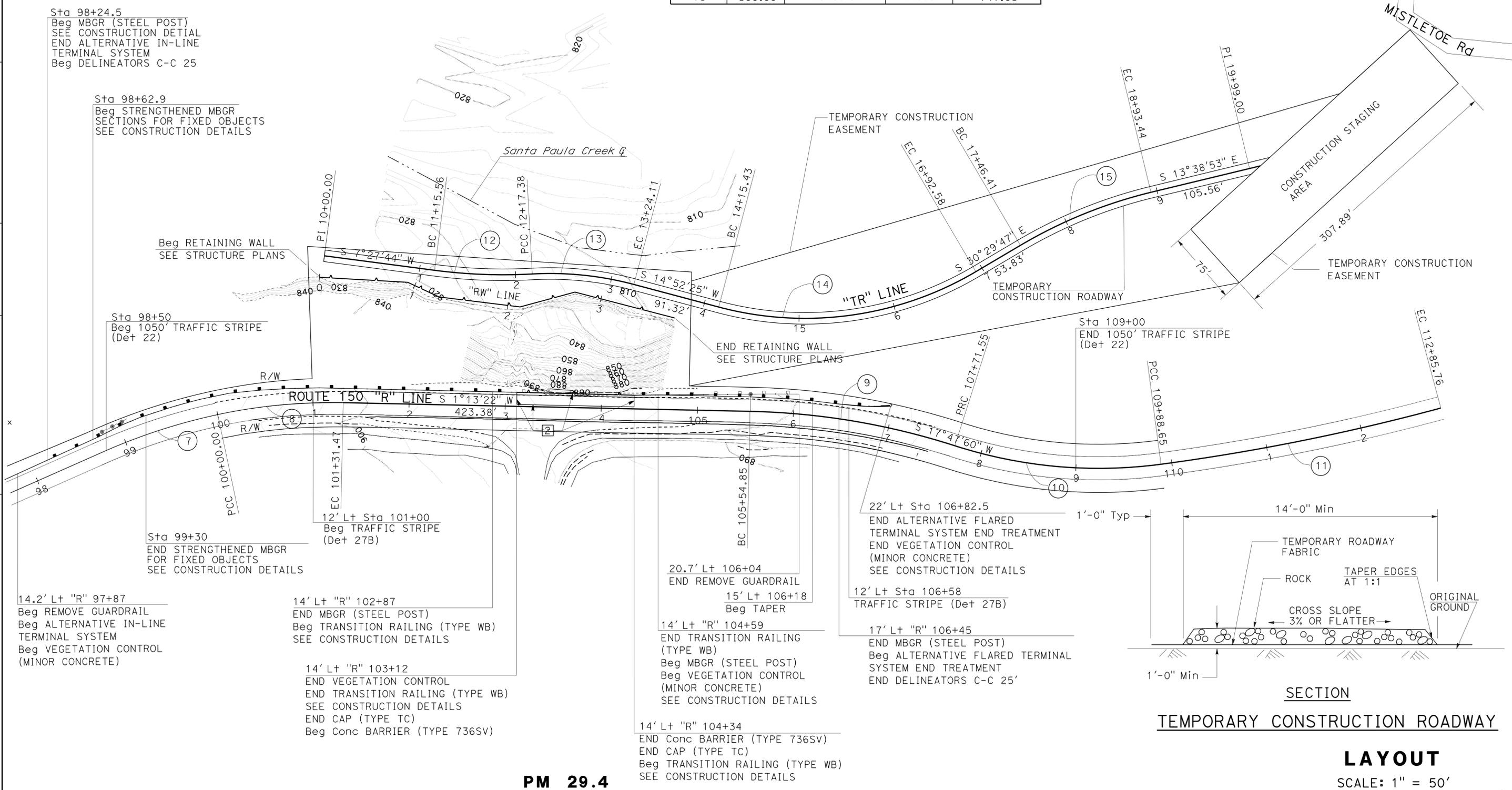
**NOTE:**  
 FOR ACCURATE RIGHT OF WAY DATA, CONTACT  
 RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

**CURVE DATA**

No. (X)	R	Δ	T	L
7	608.19'	12°29'34"	66.57'	132.61'
8	566.82'	13°17'21"	66.03'	131.47'
9	748.83'	16°34'27"	109.07'	216.61'
10	490.06'	25°22'57"	110.36'	217.10'
11	2270.79'	7°29'47"	148.77'	297.11'
12	550.00'	10°36'26"	51.06'	101.82'
13	339.37'	18°1'07"	53.81'	106.73'
14	350.00'	45°22'12"	146.30'	277.15'
15	500.00'	16°50'54"	74.05'	147.03'



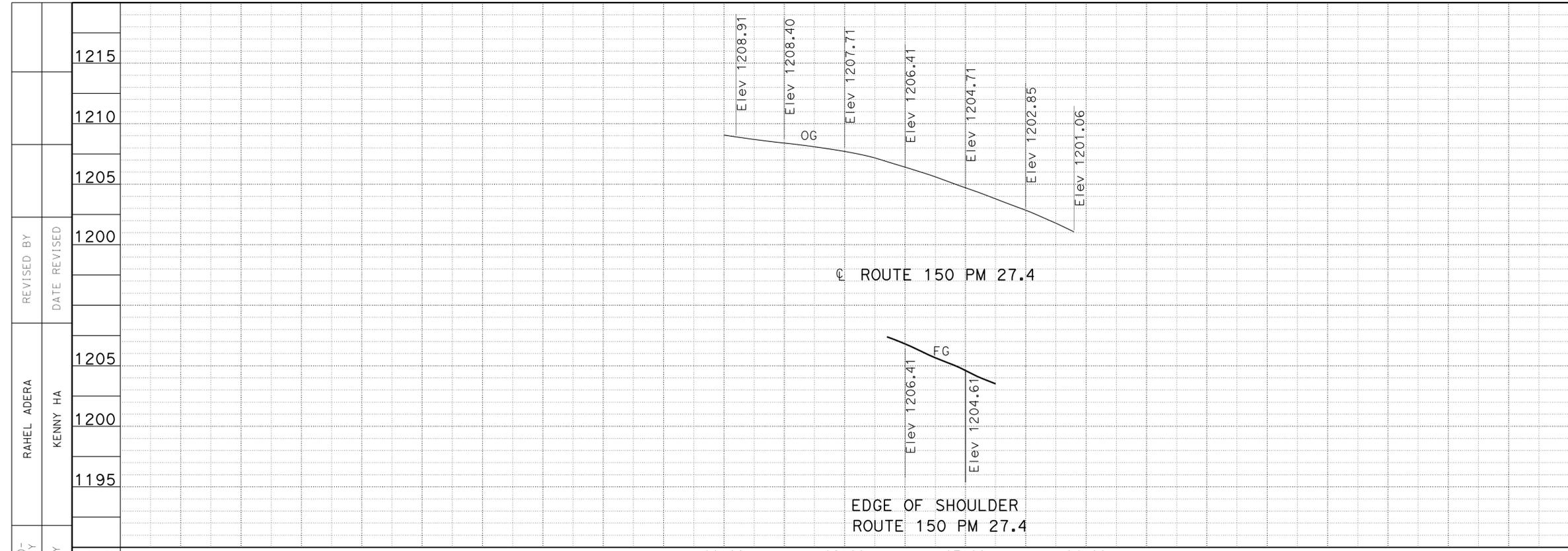
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 DESIGN  
 FUNCTIONAL SUPERVISOR: OJI KALU  
 CHECKED BY: KENNY HA  
 RAHEL ADERA  
 REVISED BY: RAHEL ADERA  
 DATE REVISED:



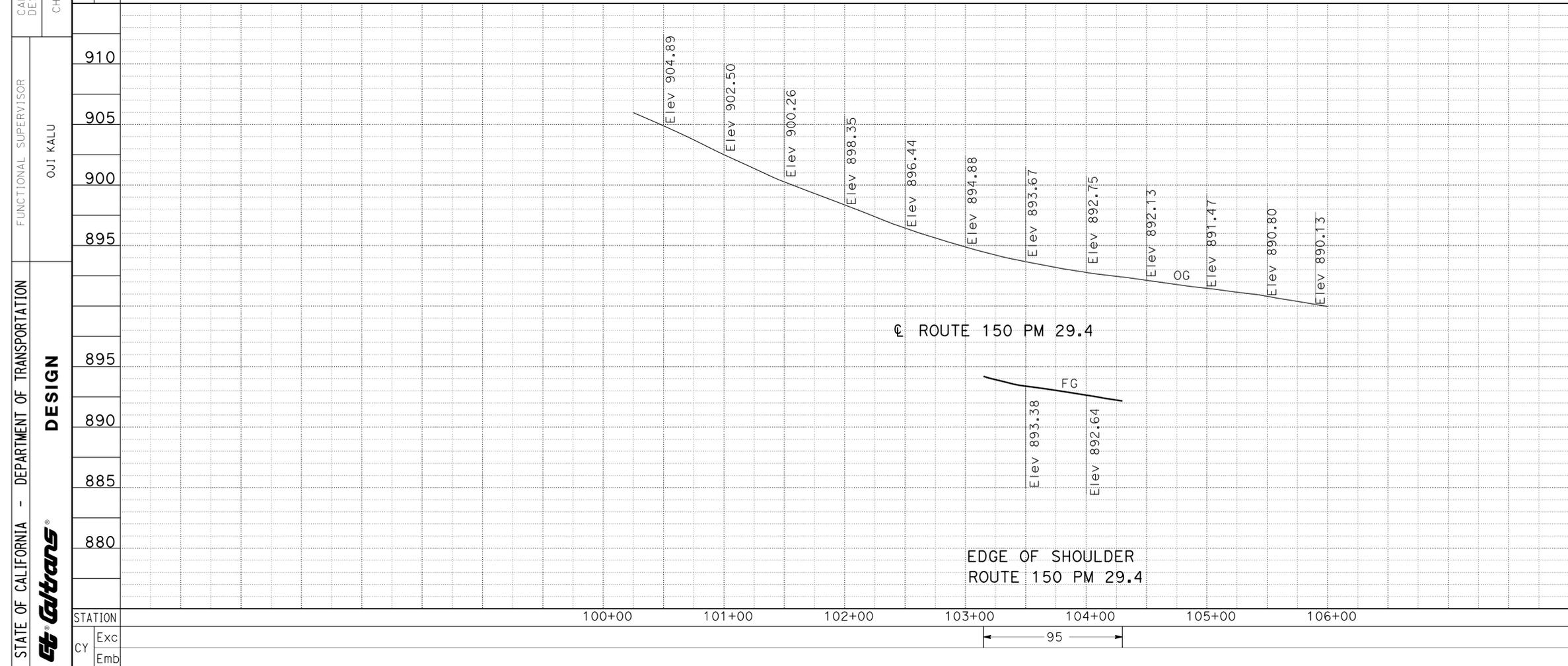
**PM 29.4**

**LAYOUT**  
 SCALE: 1" = 50'

**L-2**



STATION	Exc	Emb	TOTAL
11+00			
12+00			
13+00			
14+00			
TOTAL			



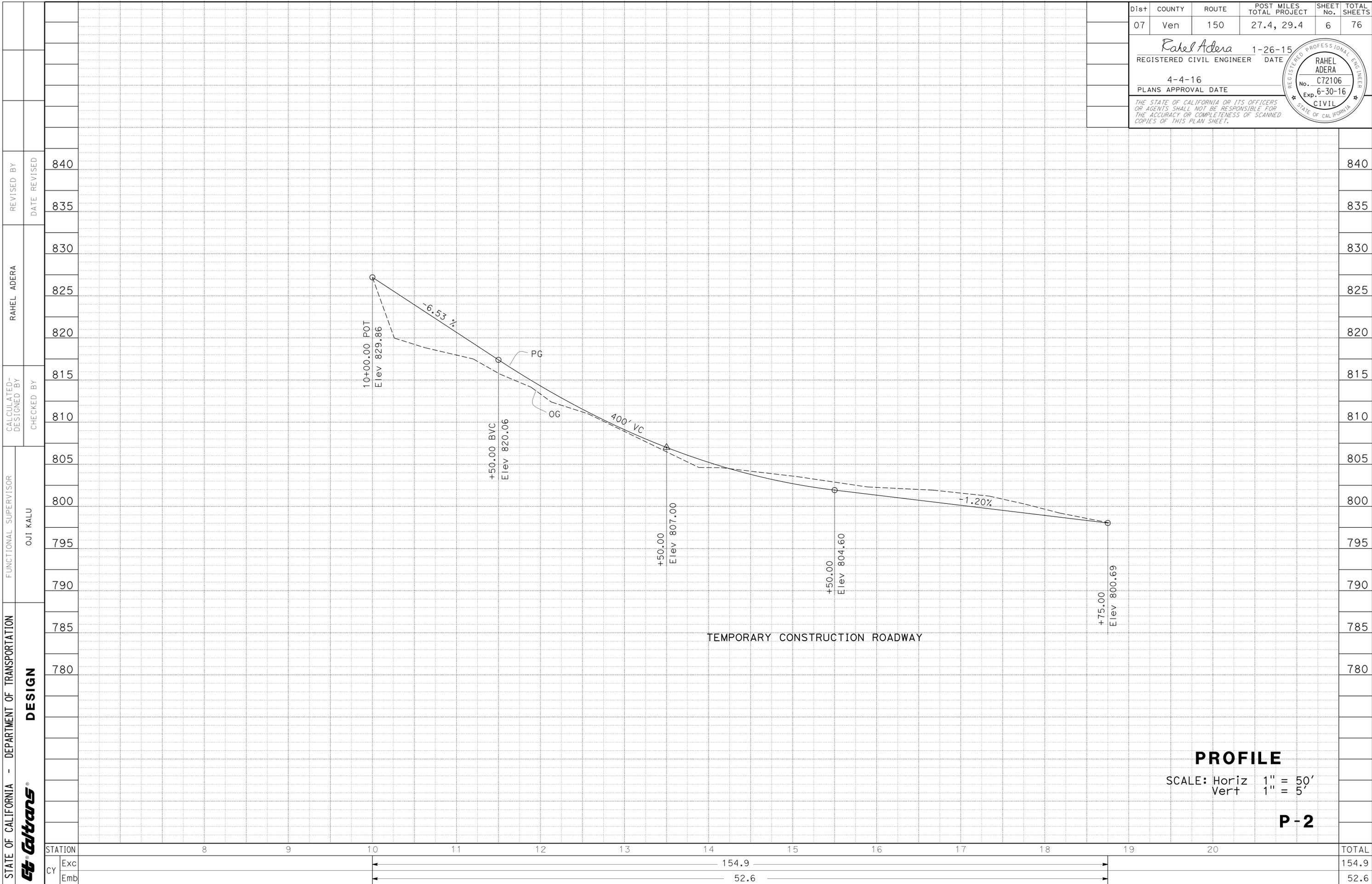
STATION	Exc	Emb	TOTAL
100+00			
101+00			
102+00			
103+00			
104+00			
105+00			
106+00			
TOTAL			95

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	5	76
1215	RAHEL ADERA		1-26-15	REGISTERED CIVIL ENGINEER DATE	
1210	4-4-16		PLANS APPROVAL DATE		
1205	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.				



**PROFILE**  
 SCALE: Horiz 1" = 50'  
 Vert 1" = 5'  
**P-1**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	6	76
<i>Rahel Adera</i> REGISTERED CIVIL ENGINEER			1-26-15 DATE		
4-4-16 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>					



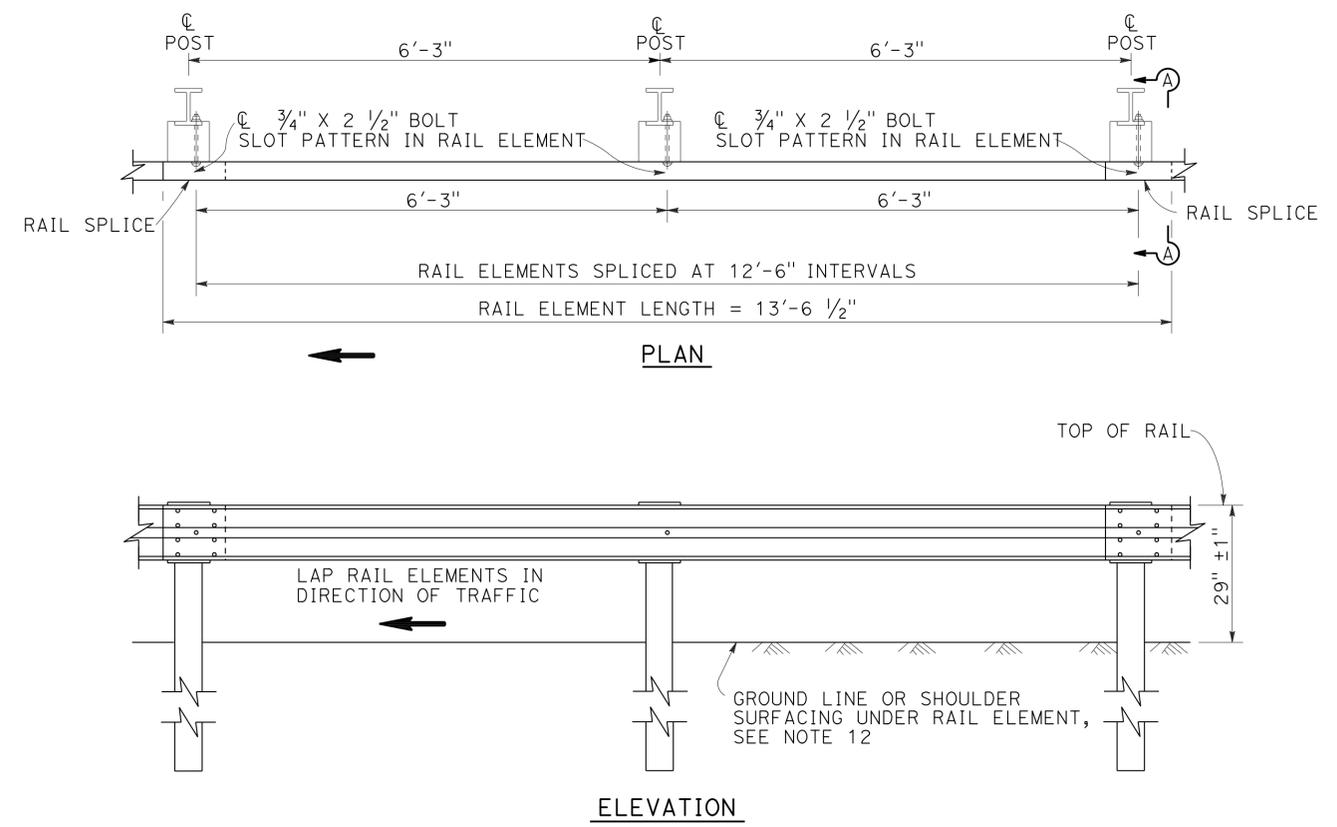
TEMPORARY CONSTRUCTION ROADWAY

**PROFILE**

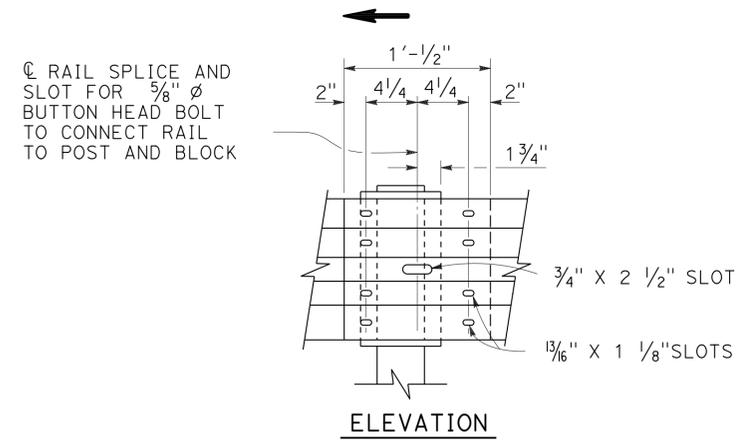
SCALE: Horiz 1" = 50'  
 Vert 1" = 5'

**P-2**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	7	76
<i>Rahel Adera</i> REGISTERED CIVIL ENGINEER		1-26-15 DATE			
4-4-16 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>			

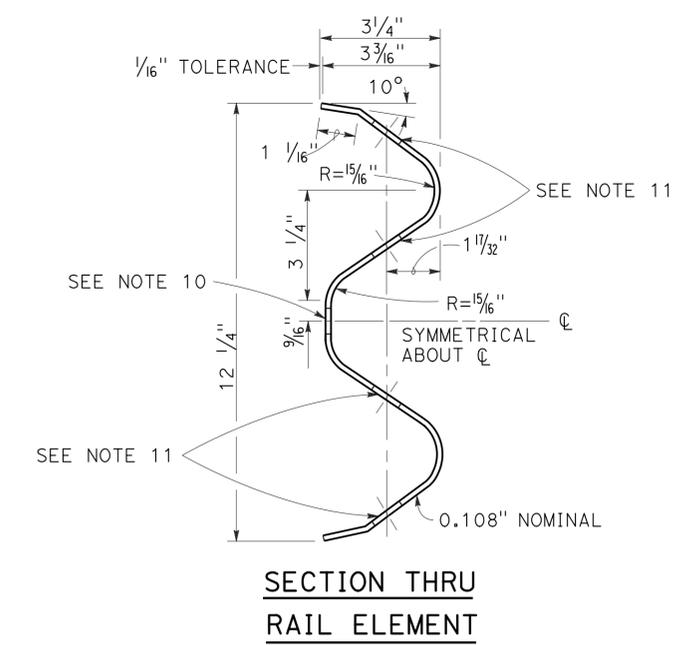


**METAL BEAM GUARD RAILING WITH STEEL POSTS AND NOTCHED WOOD**



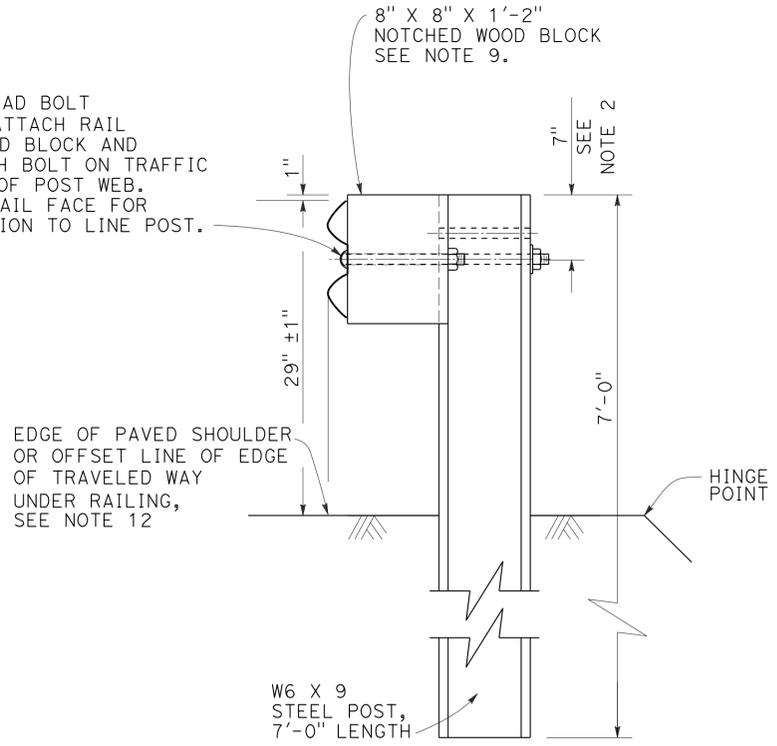
- CONNECT THE OVER LAPPED END OF THE RAIL ELEMENTS WITH  $\frac{5}{8}$ "  $\phi$  X  $1 \frac{3}{8}$ " BUTTON HEAD OVAL SHOULDER SPLICE BOLTS INSERTED INTO THE  $1 \frac{3}{8}$ " X  $1 \frac{1}{8}$ " SLOTS AND BOLTED TOGETHER WITH  $\frac{5}{8}$ "  $\phi$  RECESSED HEX NUTS. RECESS OF HEX NUT POINTS TOWARD RAIL ELEMENT. A TOTAL OF 8 BOLTS AND NUTS ARE TO BE USED AT EACH RAIL SPLICE CONNECTION.
- THE ENDS OF THE RAIL ELEMENTS ARE TO BE OVERLAPPED IN THE DIRECTION OF TRAFFIC (SEE DETAILS).
- WHERE END CAP IS TO BE ATTACHED TO THE END OF A RAIL ELEMENT, A TOTAL OF 4 OF THE ABOVE DESCRIBED SPLICE BOLTS AND NUTS ARE TO BE USED.

**METAL BEAM GUARD RAILING STANDARD RAILING SECTION (STEEL POST WITH NOTCHED WOOD OR NOTCHED RECYCLED PLASTIC BLOCK)**



**NOTES:**

- FOR DETAILS OF STANDARD HARDWARE USED TO CONSTRUCT GUARD RAILING, SEE C-2.
- FOR DETAILS OF STEEL POSTS AND NOTCHED WOOD BLOCKS USED TO CONSTRUCT GUARD RAILING, SEE C-3.
- FOR ADDITIONAL INSTALLATION DETAILS, SEE C-2.
- GUARD RAILING POST SPACING TO BE 6'-3" CENTER TO CENTER, EXCEPT AS OTHERWISE NOTED.
- FOR GUARD RAILING TYPICAL LAYOUT, SEE C-7
- FOR DETAILS OF GUARD RAILING TRANSITION TO BRIDGE RAILING, SEE C-9.
- FOR GUARD RAILING DELINEATION DETAILS, SEE C-2
- DIRECTION OF ADJACENT TRAFFIC INDICATED BY  $\rightarrow$ .
- NOTCHED FACE OF BLOCK FACES STEEL POST.
- SLOTTED HOLE FOR BOLTED CONNECTION OF RAIL ELEMENT TO BLOCK AND POST. SEE "SECTION THRU RAIL ELEMENT".
- SLOTTED HOLES FOR SPLICE BOLTS TO OVERLAP ENDS OF RAIL ELEMENT. SEE "SECTION THRU RAIL ELEMENT".
- INSTALL POSTS IN SOIL.



**CONSTRUCTION DETAILS**  
NO SCALE  
**C-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION DESIGN

RAHEL ADERA KENNY HA

FUNCTIONAL SUPERVISOR OJI KALU

REVISOR BY DATE

REVISOR BY DATE

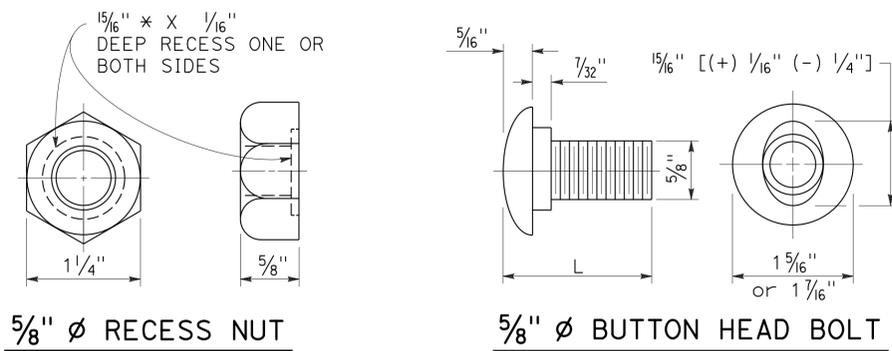
DESIGNED BY CHECKED BY

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	8	76

*Rahel Adera* 1-26-15  
 REGISTERED CIVIL ENGINEER DATE  
 4-4-16  
 PLANS APPROVAL DATE

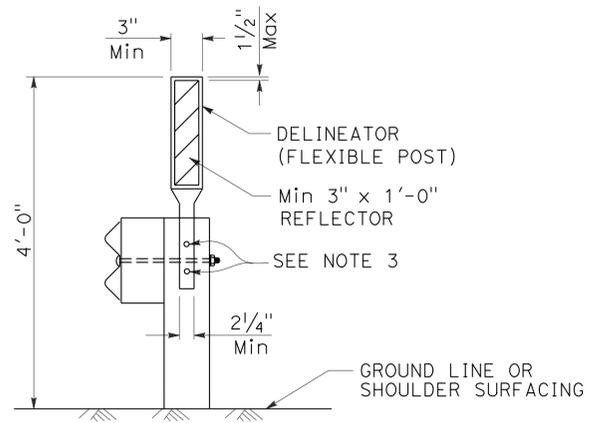
REGISTERED PROFESSIONAL ENGINEER  
**RAHEL ADERA**  
 No. C72106  
 Exp. 6-30-16  
 CIVIL  
 STATE OF CALIFORNIA

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L	THREAD LENGTH
$1\frac{3}{8}''$	FULL THREAD LENGTH
2"	FULL THREAD LENGTH
10"	4" Min THREAD LENGTH
1'-6"	4" Min THREAD LENGTH
** $2\frac{3}{4}''$	2" Min THREAD LENGTH
** 1'-7"	4" Min THREAD LENGTH

\*\* FOR NESTED RAIL APPLICATIONS.



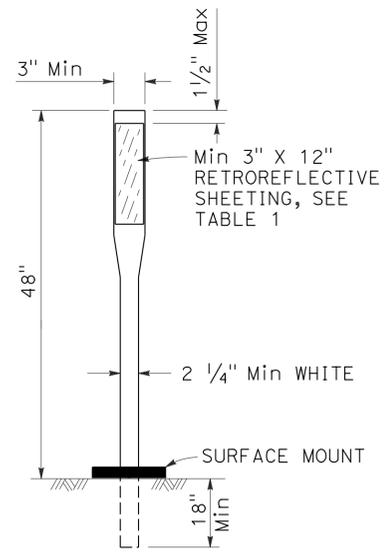
**GUARD RAILING DELINEATION**  
SEE NOTE 1

**NOTES:**

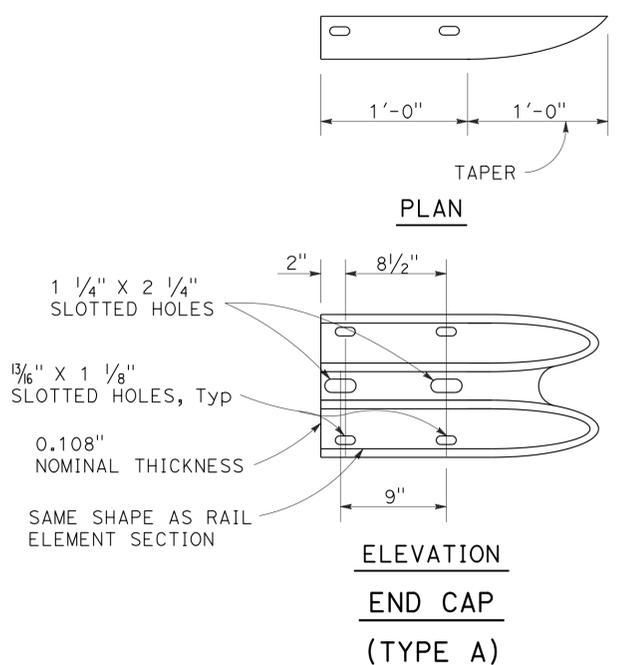
1. GUARD RAILING DELINEATION TO BE USED WHERE SHOWN ON THE LAYOUT PLANS.
2. THE RETROREFLECTIVE SHEETING USED ON THE BACK OF DELINEATOR SHALL BE A MINIMUM SIZE OF 3" X 3".
3. USE  $\frac{1}{4}$ -20 SELF TAPPING SCREWS IN 0.22" DIAMETER HOLES OR  $\frac{1}{4}$ " BOLTS IN  $\frac{9}{32}$ " DIAMETER HOLES.

**METAL BEAM GUARD RAILING TYPICAL RAILING DELINEATION**

TYPE	RETROREFLECTIVE SHEETING	
	FRONT	BACK
E	WHITE	WHITE (SEE NOTE 2)



**DELINEATORS**



**METAL BEAM GUARD RAILING STANDARD HARDWARE**

**CONSTRUCTION DETAILS**  
NO SCALE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 FUNCTIONAL SUPERVISOR: OJJI KALU  
 RAHEL ADERA  
 KENNY HA  
 REVISIONS: RAHEL ADERA, KENNY HA, OJJI KALU  
 REVISIONS: RAHEL ADERA, KENNY HA, OJJI KALU  
 REVISIONS: RAHEL ADERA, KENNY HA, OJJI KALU



LAST REVISION: DATE PLOTTED => 05-APR-2016  
 12-15-14 TIME PLOTTED => 08:16

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*Rahel Adera* 1-26-15  
 REGISTERED CIVIL ENGINEER DATE

4-4-16  
 PLANS APPROVAL DATE

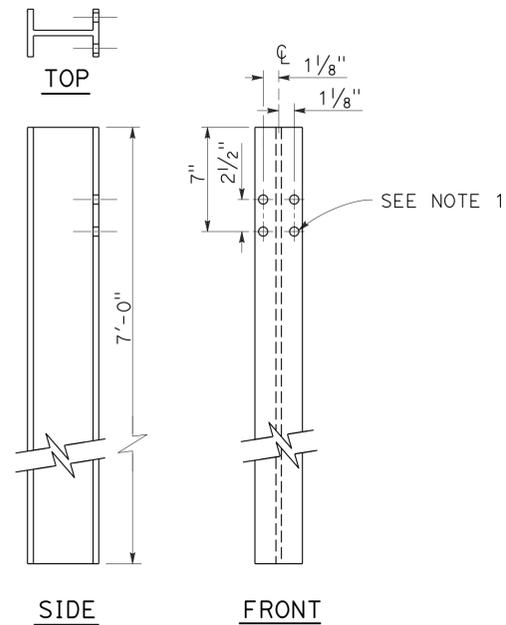
REGISTERED PROFESSIONAL ENGINEER

RAHEL ADERA

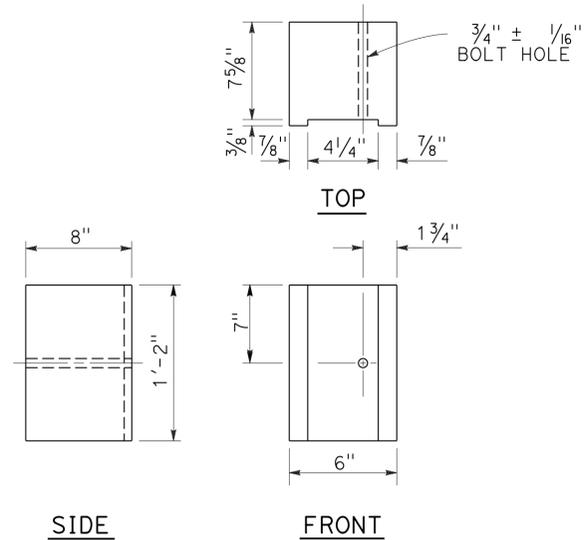
No. C72106  
Exp. 6-30-16  
CIVIL

STATE OF CALIFORNIA

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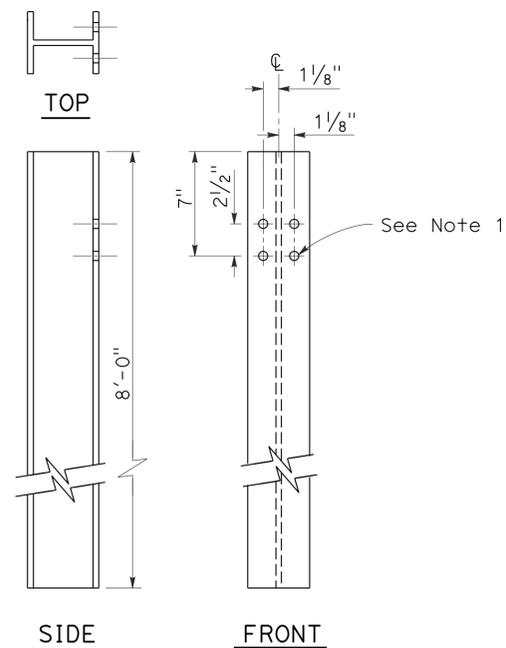
**W6 x 9  
STEEL POST**



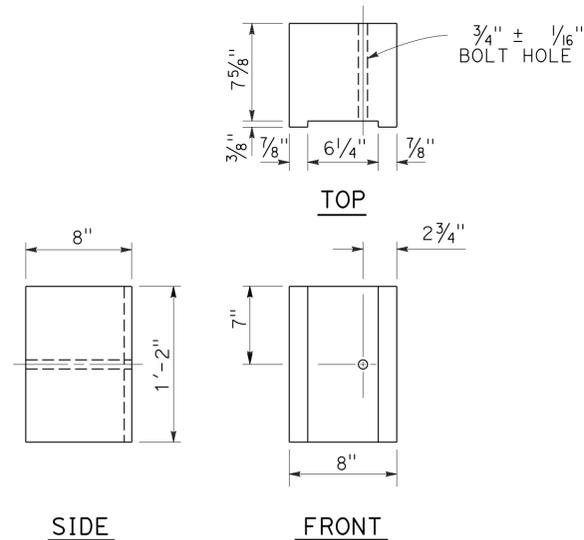
**6" x 8"  
NOTCHED WOOD BLOCK**  
SEE NOTES 2 AND 3

**NOTES:**

1. ALL HOLES IN STEEL POST SHALL BE 13/16" DIA MAXIMUM.
2. DIMENSIONS SHOWN FOR WOOD BLOCK ARE NOMINAL.
3. NOTCHED FACE OF BLOCK FACES STEEL POST.



**W6 x 15  
STEEL POST**

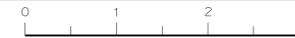


**8" x 8"  
NOTCHED WOOD BLOCK**  
SEE NOTES 2 AND 3

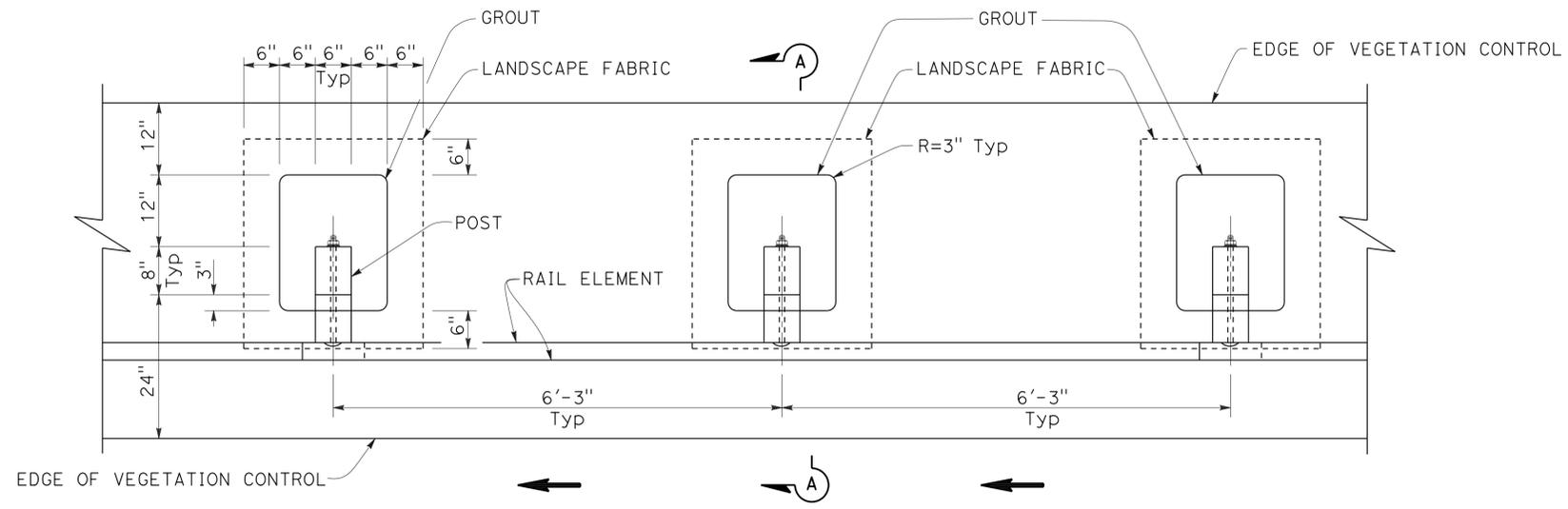
**METAL BEAM GUARD RAILING STEEL POST,  
NOTCHED WOOD BLOCK  
DETAILS**

**CONSTRUCTION DETAILS**  
NO SCALE

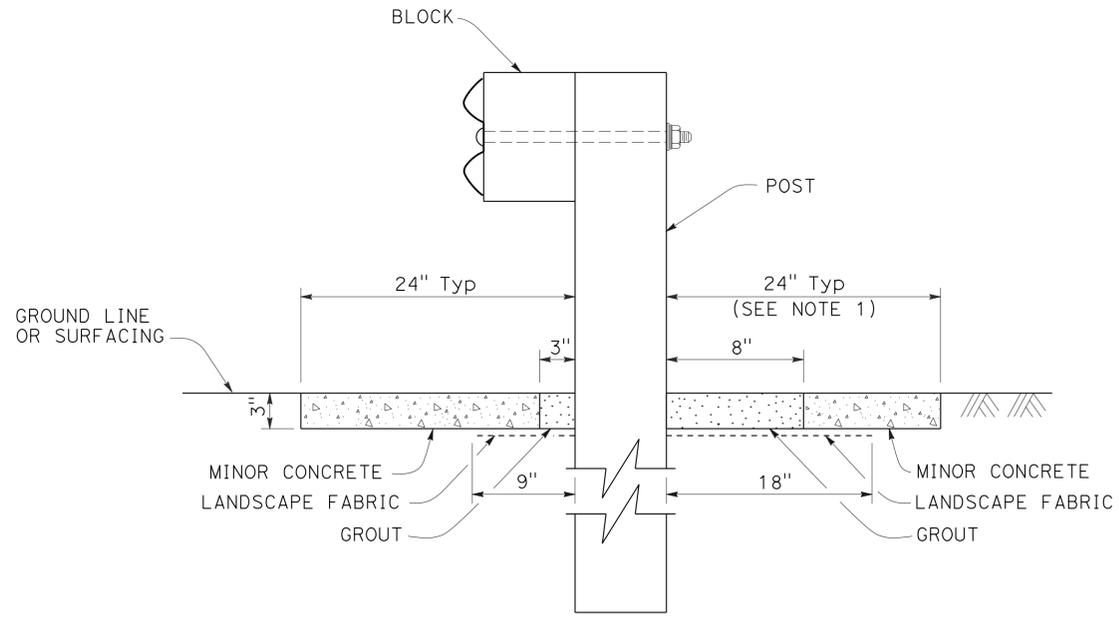
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	REVISOR	DATE
DESIGN	OUI KALU	RAHEL ADERA	KENNY HA
CALCULATED/DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED



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		4-4-16 PLANS APPROVAL DATE			
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**PLAN**



**SECTION A-A**

**METAL BEAM GUARD RAILING  
TYPICAL VEGETATION CONTROL  
STANDARD RAILING SECTION**

**NOTES:**

1. WHERE THE DISTANCE BETWEEN BACK OF POST AND HINGE POINT IS LESS THAN 24", VEGETATION CONTROL TO BE CONSTRUCTED FLUSH WITH THE BACK EDGE OF THE POST.
2. DIRECTION OF ADJACENT TRAFFIC INDICATED BY ← .

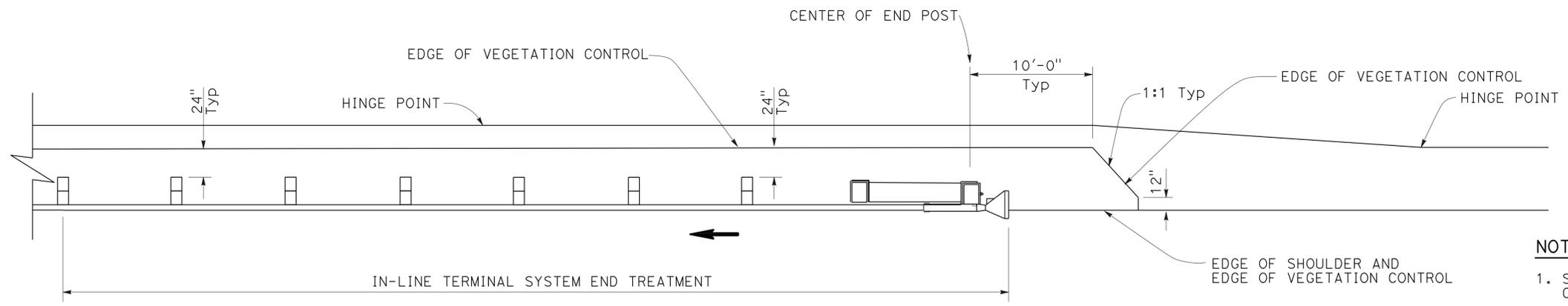
**CONSTRUCTION DETAILS**

NO SCALE

**C-4**

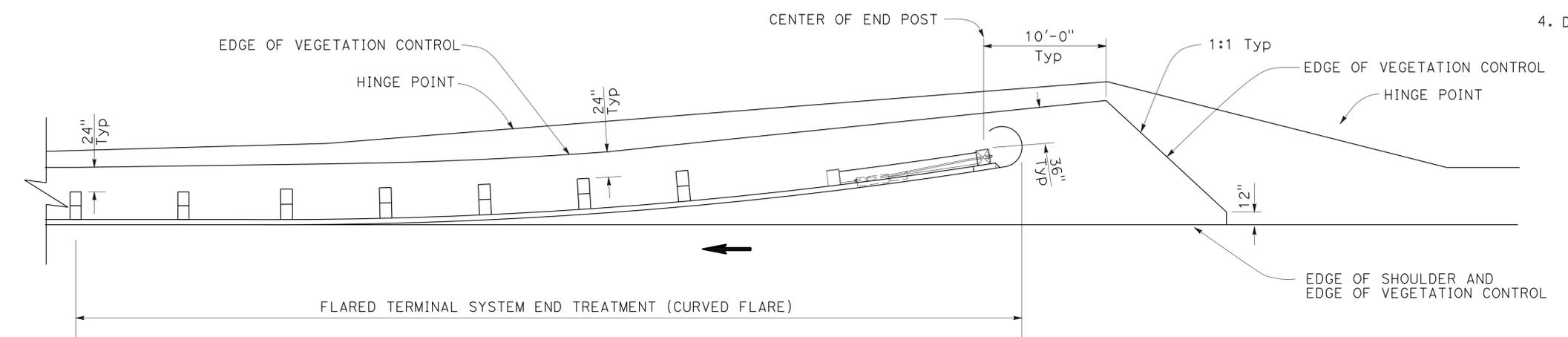
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN
FUNCTIONAL SUPERVISOR	OJJI KALU
CALCULATED/DESIGNED BY	CHECKED BY
RAHEL ADERA	KENNY HA
REVISOR	DATE
REVISOR	DATE

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4-4-16 PLANS APPROVAL DATE					
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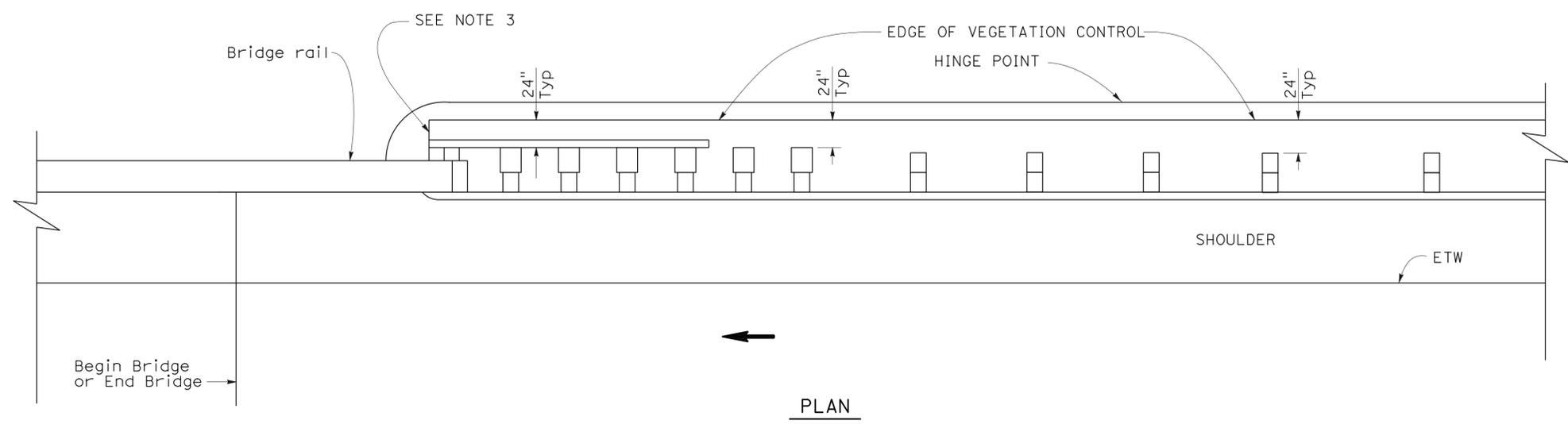


**NOTES:**

1. SEE C-4 FOR ADDITIONAL VEGETATION CONTROL DETAILS.
2. WHERE THE DISTANCE BETWEEN BACK OF POST AND HINGE POINT IS LESS THAN 24", VEGETATION CONTROL TO BE CONSTRUCTED FLUSH WITH THE BACK EDGE OF THE POST.
3. END VEGETATION CONTROL AT END OF BACKSIDE RAIL ELEMENT.
4. DIRECTION OF ADJACENT TRAFFIC INDICATED BY ←.



**METAL BEAM GUARD RAILING TYPICAL VEGETATION CONTROL FOR TERMINAL SYSTEM END TREATMENTS**



**METAL BEAM GUARD RAILING TYPICAL VEGETATION CONTROL AT STRUCTURE APPROACH AND DEPARTURE**

**CONSTRUCTION DETAILS**  
NO SCALE  
**C-5**

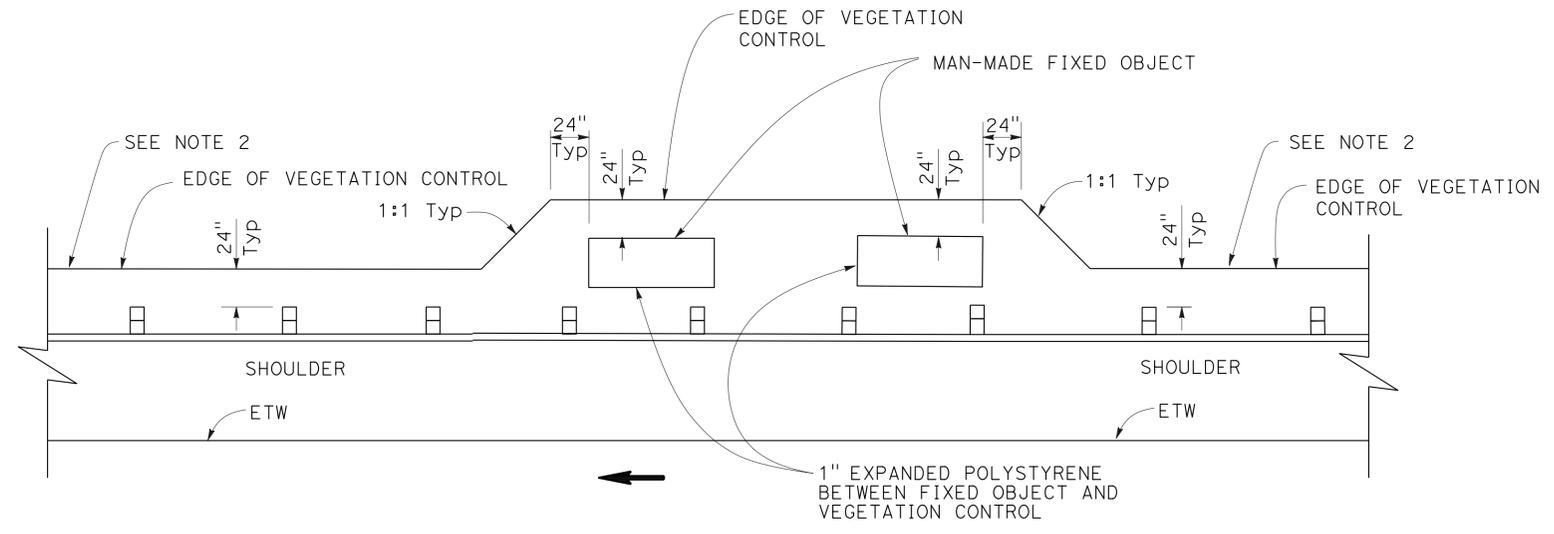
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 DESIGN  
 OUI KALU  
 FUNCTIONAL SUPERVISOR  
 CHECKED BY  
 RAHEL ADERA  
 KENNY HA  
 REVISIONS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	12	76
RAHEL ADERA		1-26-15		REGISTERED CIVIL ENGINEER DATE	
4-4-16		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>					

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN	FUNCTIONAL SUPERVISOR	CALCULATED/DESIGNED BY	RAHEL ADERA	REVISOR	RAHEL ADERA
Caltrans		OUI KALU	CHECKED BY	KENNY HA	DATE	

**NOTES:**

- SEE C-4 FOR ADDITIONAL VEGETATION CONTROL DETAILS.
- WHERE THE DISTANCE BETWEEN BACK OF POST AND HINGE POINT IS LESS THAN 24", VEGETATION CONTROL TO BE CONSTRUCTED FLUSH WITH THE BACK EDGE OF THE POST.
- DIRECTION OF ADJACENT TRAFFIC INDICATED BY ←.



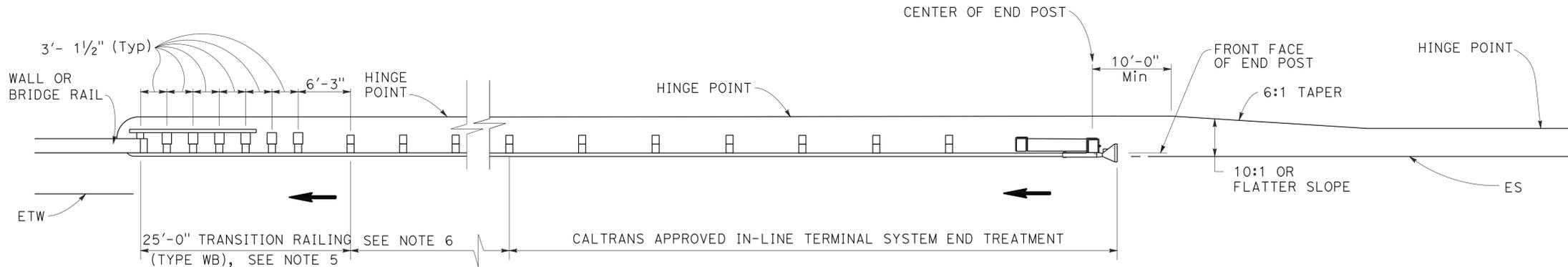
**PLAN**  
FIXED OBJECT(S) ON SHOULDER

**CONSTRUCTION DETAILS**  
**METAL BEAM GUARD RAILING TYPICAL**  
**VEGETATION CONTROL AT FIXED OBJECT**

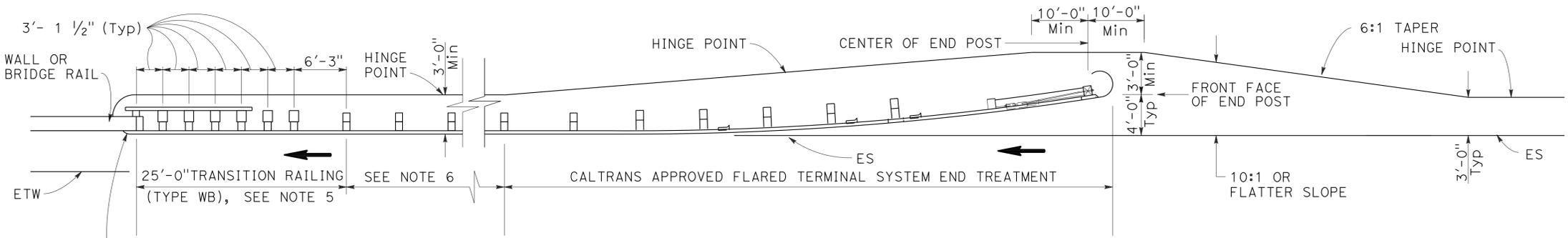
NO SCALE

**C-6**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	13	76
<i>Rahel Adera</i> REGISTERED CIVIL ENGINEER No. C72106 Exp. 6-30-16 CIVIL		1-26-15 DATE 4-4-16 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>					



(GUARD RAILING INSTALLATION AT STRUCTURE APPROACH WITH AN IN-LINE END TREATMENT AT TRAFFIC APPROACH END OF RAILING)



(GUARD RAILING INSTALLATION AT STRUCTURE APPROACH WITH A FLARED END TREATMENT AT TRAFFIC APPROACH END OF RAILING)

### METAL BEAM GUARD RAILING TYPICAL LAYOUTS FOR STRUCTURE APPROACH

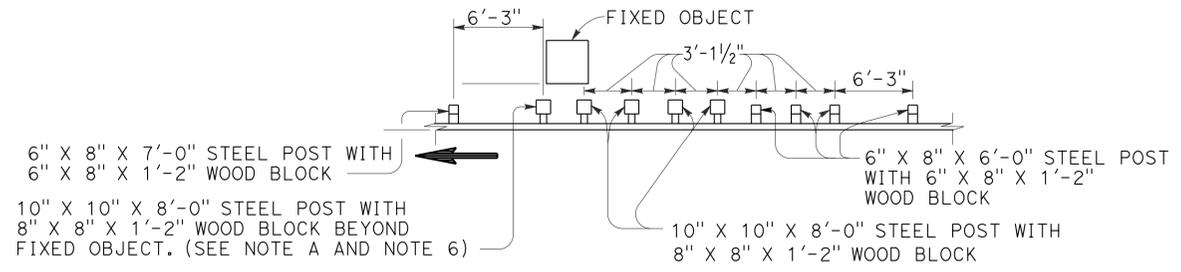
**NOTES:**

1. LINE POST, BLOCKS AND HARDWARE TO BE USED ARE SHOWN ON C-1, C-2 AND C-3.
2. GUARD RAIL POST SPACING TO BE 6'-3" CENTER TO CENTER, EXCEPT AS OTHERWISE NOTED.
3. EXCEPT AS NOTED, LINE POST ARE W6 X 9 STEEL POSTS, 7'-0" IN LENGTH, WITH 6" X 8" X 1'-2" NOTCHED WOOD BLOCKS.
4. DIRECTION OF ADJACENT TRAFFIC INDICATED BY → .
5. FOR TRANSITION RAILING (TYPE WB) DETAILS, SEE C-9
6. DETAIL SHOWN ON LAYOUT PLAN

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 FUNCTIONAL SUPERVISOR: OUI KALU  
 CALCULATED/DESIGNED BY: RAHEL ADERA  
 CHECKED BY: KENNY HA  
 REVISED BY: RAHEL ADERA  
 DATE REVISED: KENNY HA

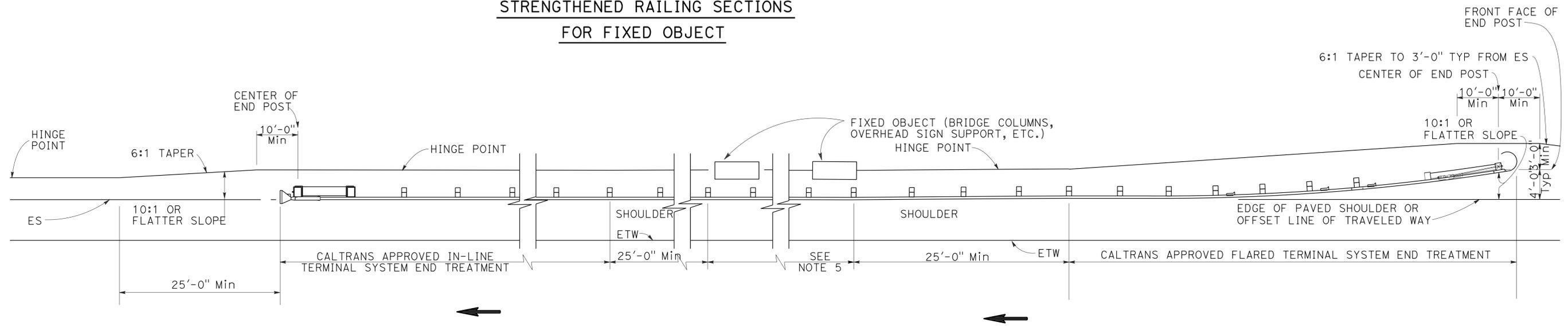
**CONSTRUCTION DETAILS**  
NO SCALE  
**C-7**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	14	76
<i>Rahel Adera</i> REGISTERED CIVIL ENGINEER			1-26-15 DATE		
4-4-16 PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					



**NOTE A:** FOR A SERIES OF FIXED OBJECTS (BRIDGE COLUMNS, OVERHEAD SIGN SUPPORTS, etc.) ADDITIONAL 10" X 10" X 8'-0" STEEL POST WITH 8" X 8" X 1'-2" WOOD BLOCKS AT 3'-1 1/2" CENTER TO CENTER SPACING ARE TO BE USED BETWEEN FIXED OBJECT(S).

**STRENGTHENED RAILING SECTIONS  
FOR FIXED OBJECT**



(GUARD RAILING INSTALLATION AT ROADSIDE FIXED OBJECT OR OBJECTS WITH A FLARED END TREATMENT AND AN IN-LINE TREATMENT AT THE ENDS OF RAILING)

**NOTES:**

1. LINE POST, BLOCKS AND HARDWARE TO BE USED ARE SHOWN ON C-1, C-2 AND C-3
2. GUARD RAILING POST SPACING TO BE 6'-3" CENTER TO CENTER, EXCEPT AS OTHERWISE NOTED.
3. W6 X 9 STEEL POSTS, 7'-0" IN LENGTH, WITH 6" X 8" X 1'-2" NOTCHED WOOD BLOCKS.
4. DIRECTION OF ADJACENT TRAFFIC INDICATED BY → .
5. AS SITE CONDITIONS DICTATE, CONSTRUCT ADDITIONAL GUARD RAILING TO SHIELD FIXED OBJECT(S). ADDITIONAL GUARD RAILING LENGTH EQUAL TO MULTIPLES OF 12'-6". POST SPACING AT 6'-3",
6. W6 X 15 STEEL POST, 8'-0" IN LENGTH, WITH 8" X 8" X 1'-2" NOTCHED WOOD BLOCK MAY BE USED IN PLACE OF THE 10" X 10" X 8'-0" WOOD POST WITH 8" X 8" X 1'-2" WOOD BLOCK SHOWN IN THE "STRENGTHENED RAILING SECTIONS DETAIL."

**METAL BEAM GUARD RAILING  
TYPICAL LAYOUTS FOR  
ROADSIDE FIXED OBJECTS**

**CONSTRUCTION DETAILS**

NO SCALE

**C-8**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 FUNCTIONAL SUPERVISOR: OJI KALU  
 CALCULATED/DESIGNED BY: RAHEL ADERA  
 CHECKED BY: KENNY HA  
 REVISED BY: RAHEL ADERA  
 DATE REVISED:

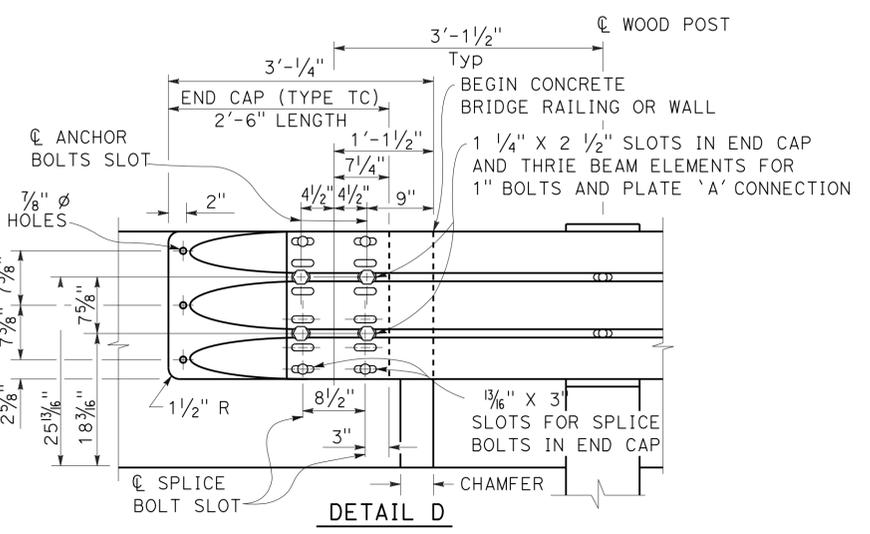
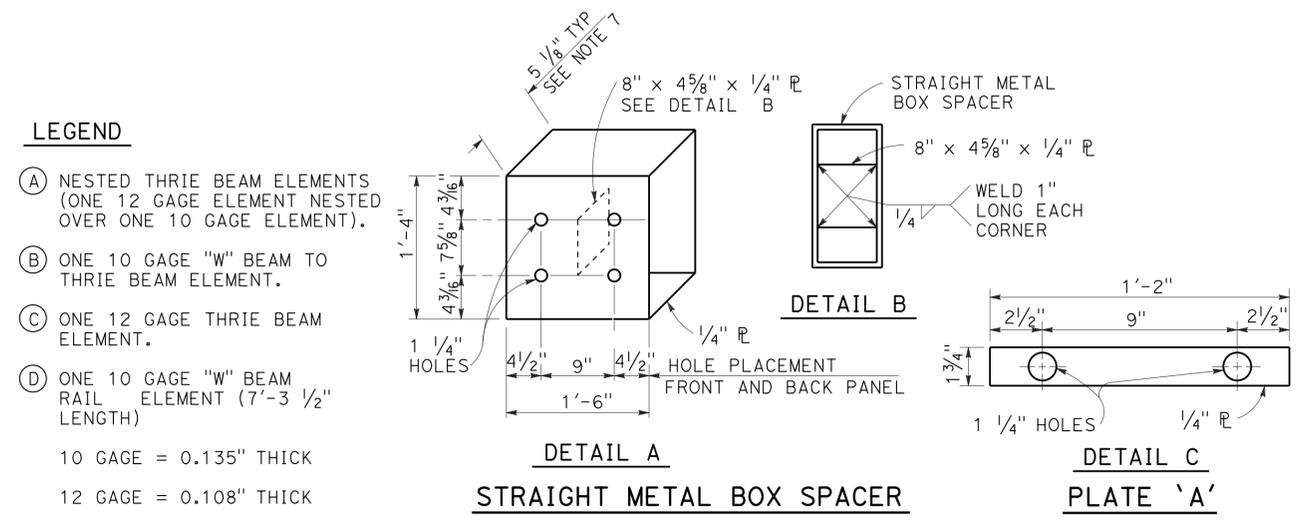
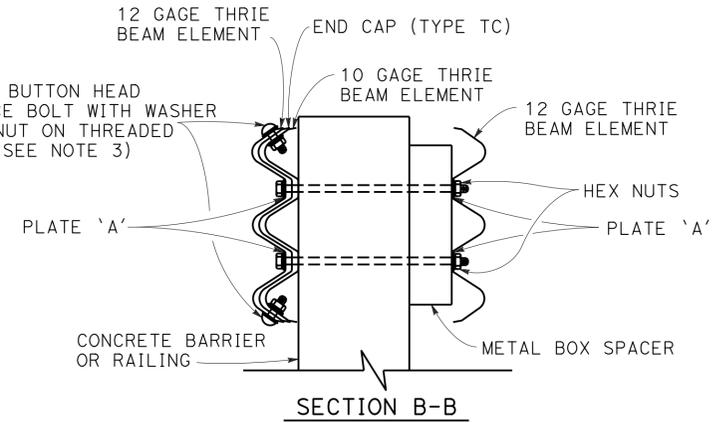
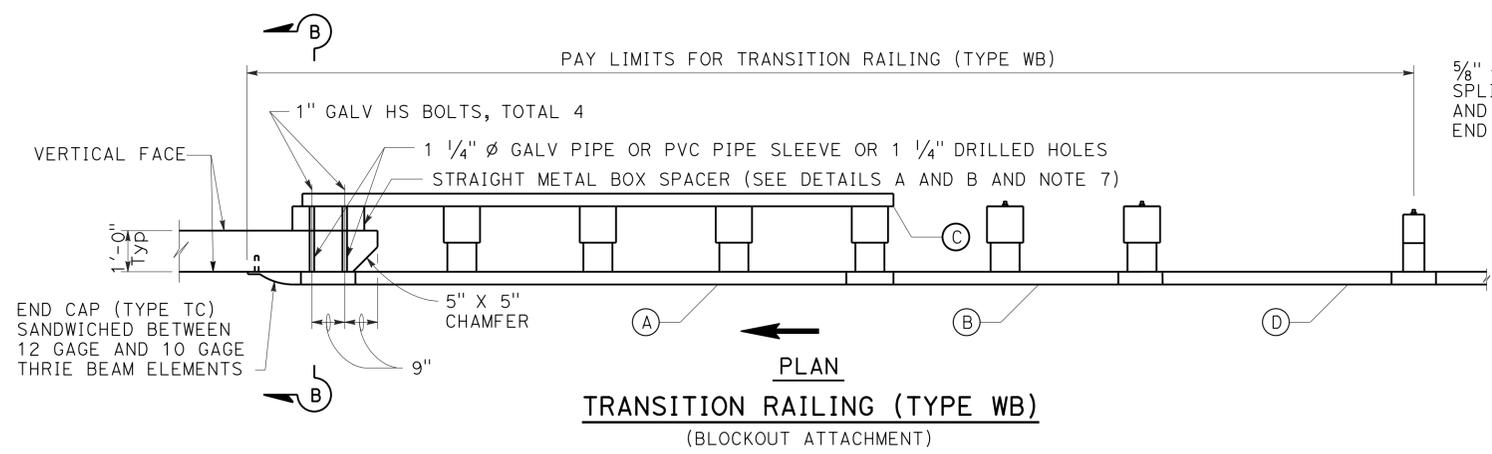
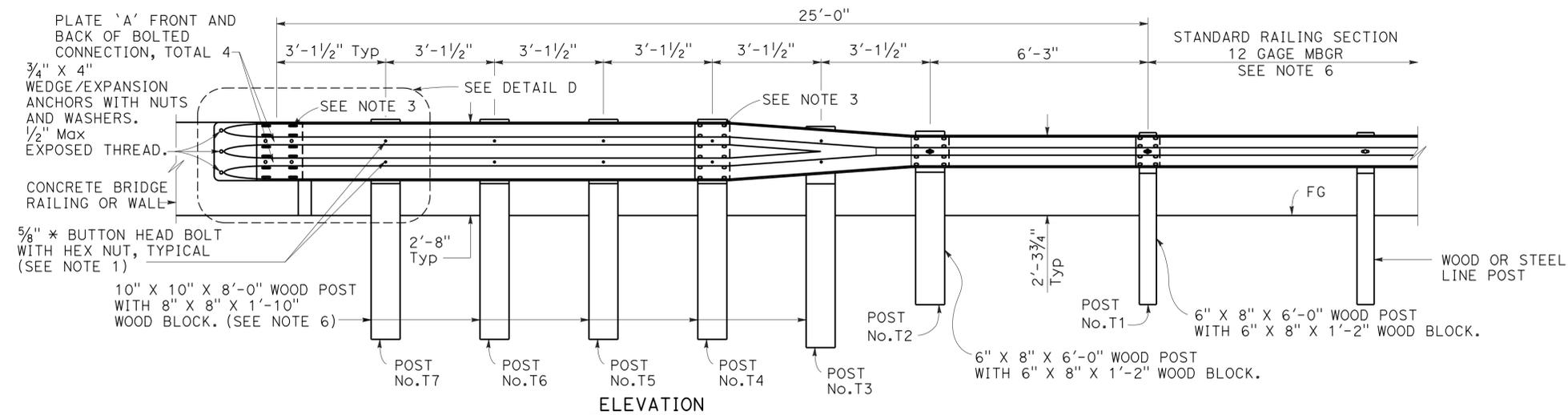
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	15	76

**Rahel Adera** 1-26-15  
 REGISTERED CIVIL ENGINEER DATE

4-4-16  
 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  
**RAHEL ADERA**  
 No. C72106  
 Exp. 6-30-16  
 CIVIL  
 STATE OF CALIFORNIA



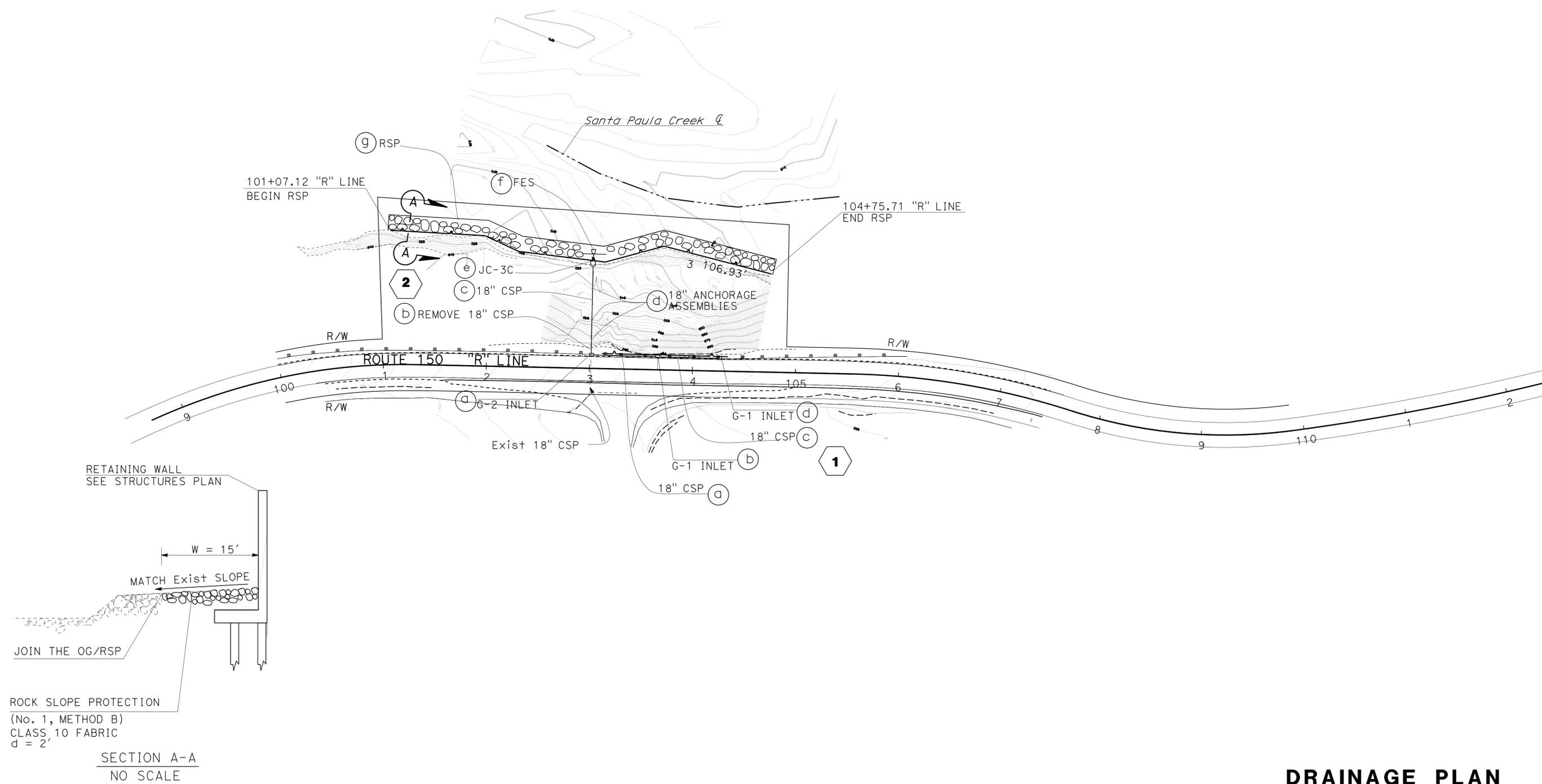
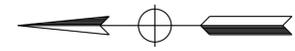
- NOTES:**
- USE 5/8" \* BUTTON HEAD BOLTS AND HEX NUTS FOR CONNECTIONS TO POSTS. NO WASHER ON RAIL FACE FOR BOLTED CONNECTIONS TO POST.
  - THE NESTED RAIL ELEMENTS, END CAP, AND "W" BEAM TO THRIE BEAM ELEMENT MAY BE SPLICED TOGETHER PRIOR TO BOLTING THE ELEMENTS TO THE WOOD POST AND CONCRETE BARRIER OR RAILING.
  - EXTERIOR SPLICE BOLT HOLES FOR RAIL ELEMENT SPLICES AT POST No.T4 AND THE CONNECTION TO THE CONCRETE BARRIER OR RAILING SHALL BE THE STANDARD 9/16" X 1 1/8" SLOT SIZE. INTERIOR SPLICE BOLT HOLES AT THESE LOCATIONS MAY BE INCREASED UP TO 1 1/4" \*. ONLY THE TOP 2 AND THE BOTTOM 2 SPLICE BOLTS WITH WASHERS AND NUTS ARE REQUIRED FOR RAIL SPLICES AT POST NO.T4 AND THE CONNECTION TO THE CONCRETE BARRIER OR RAILING.
  - DIRECTION OF ADJACENT TRAFFIC INDICATED BY →
  - THE TOP ELEVATION OF POST No.T2 THROUGH T7 SHALL NOT PROJECT MORE THAN 1" ABOVE THE TOP ELEVATION OF THE RAIL ELEMENT.
  - TYPICALLY, THE RAILING CONNECTED TO TRANSITION RAILING (TYPE WB) WILL BE EITHER STANDARD RAILING SECTION OF METAL BEAM GUARD RAILING OR AN APPROVED CALTRANS END TREATMENT ATTACHED TO POST No.T1.
  - THE DEPTH OF THE METAL BOX SPACER VARIES FROM THE 5 1/8" TO 1 1/2" AND IS DEPENDENT ON THE WIDTH OF THE CONCRETE RAILING OR WALL. THE COMBINED DIMENSION FOR THE DEPTH OF THE METAL BOX SPACER PLUS THE WIDTH OF RAILING OR WALL IS TYPICALLY 17 1/8". WHERE THE SPACE BETWEEN THE BACKSIDE OF THE CONCRETE RAILING OR WALL AND THE REAR THRIE BEAM ELEMENT IS LESS THAN 1 1/2", METAL PLATES SIMILAR TO PLATE 'A' ARE TO BE USED AS SPACERS.
  - WHERE THE WIDTH OF THE CONCRETE RAILING OR WALL IS GREATER THAN 17 1/8", WOOD BLOCKS ARE TO BE USED TO FILL THE SPACE CREATED BETWEEN THE BACKSIDE OF POSTS No.4 THROUGH No.7 AND THE REAR THRIE BEAM ELEMENT. THESE WOOD BLOCKS SHALL BE 8" IN WIDTH AND 1'-2" IN LENGTH. THE DIMENSION BETWEEN THE FRONT THRIE BEAM ELEMENT AND THE REAR THRIE BEAM ELEMENT IS TO MATCH THE WIDTH OF THE CONCRETE RAILING OR WALL.

**CONSTRUCTION DETAILS**  
**METAL BEAM GUARD RAILING**  
**TRANSITION RAILING (TYPE WB)**  
 NO SCALE  
**C-9**

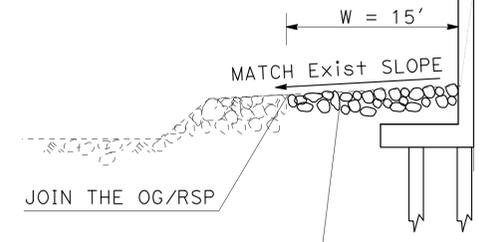
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 OJI KALU  
 FUNCTIONAL SUPERVISOR  
 RAHEL ADERA  
 RAHEL ADERA  
 KENNY HA  
 REVISED BY  
 DATE REVISED  
 CALCULATED/DESIGNED BY  
 CHECKED BY

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	16	76
			1-26-15	DATE	
			4-4-16	PLANS APPROVAL DATE	
			REGISTERED CIVIL ENGINEER BALDEV K. BHALLA No. 34350 Exp. 9/30/15 CIVIL		
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

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



RETAINING WALL  
 SEE STRUCTURES PLAN



ROCK SLOPE PROTECTION  
 (No. 1, METHOD B)  
 CLASS 10 FABRIC  
 d = 2'

APPROVED FOR DRAINAGE WORK ONLY

**DRAINAGE PLAN**  
 SCALE: 1" = 50'  
**D-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	HYDRAULICS
FUNCTIONAL SUPERVISOR	DAVE BHALLA
CALCULATED-DESIGNED BY	CHECKED BY
TAN HOANG	DAVE BHALLA
REVISOR	DATE
REVISOR	DATE
REVISOR	DATE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 HYDRAULICS  
 FUNCTIONAL SUPERVISOR: DAVE BHALLA  
 REVISIONS: TAN HOANG, DAVE BHALLA, REVISED BY, DATE  
 CALCULATED/DESIGNED BY: DAVE BHALLA, CHECKED BY

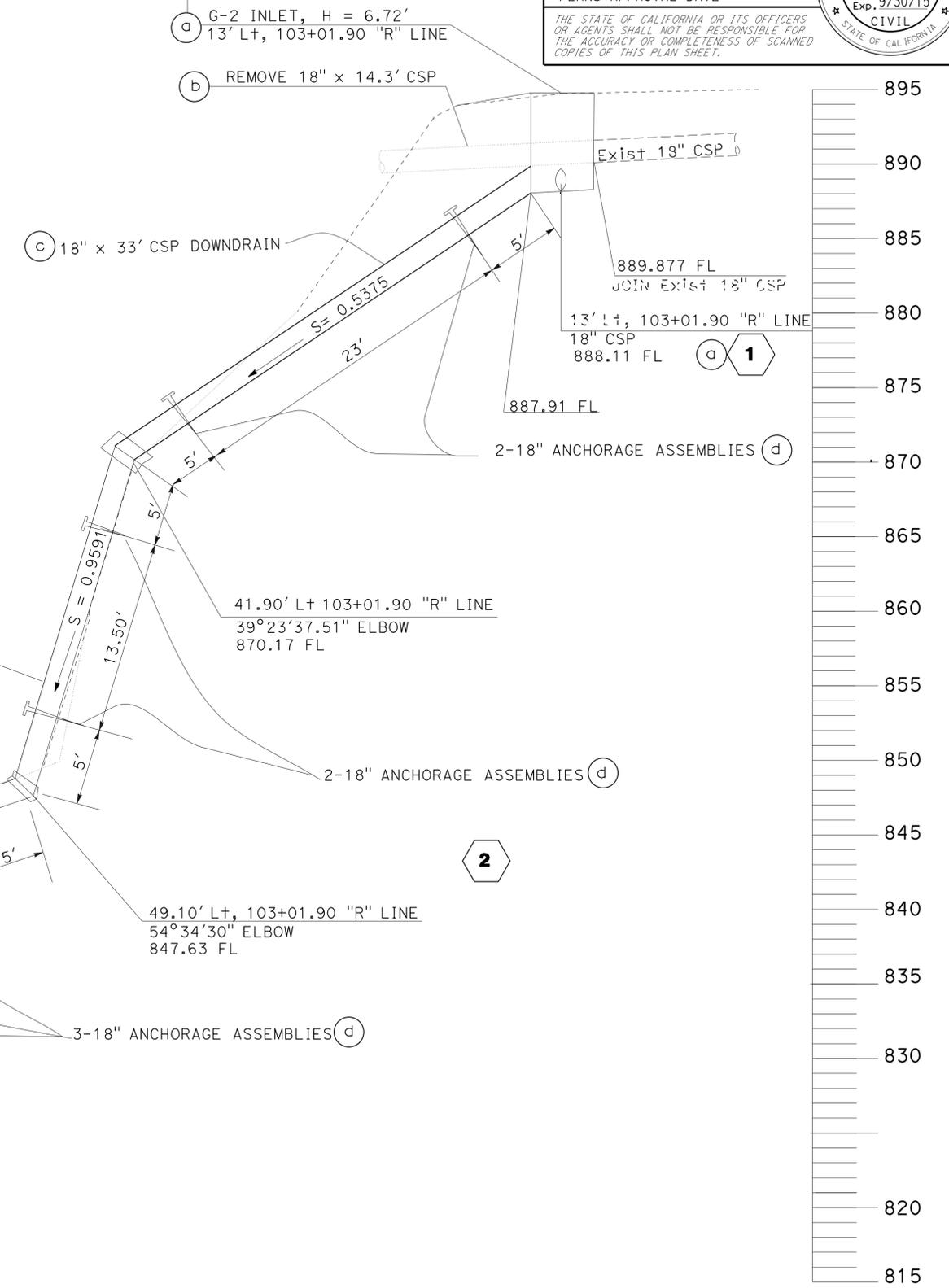
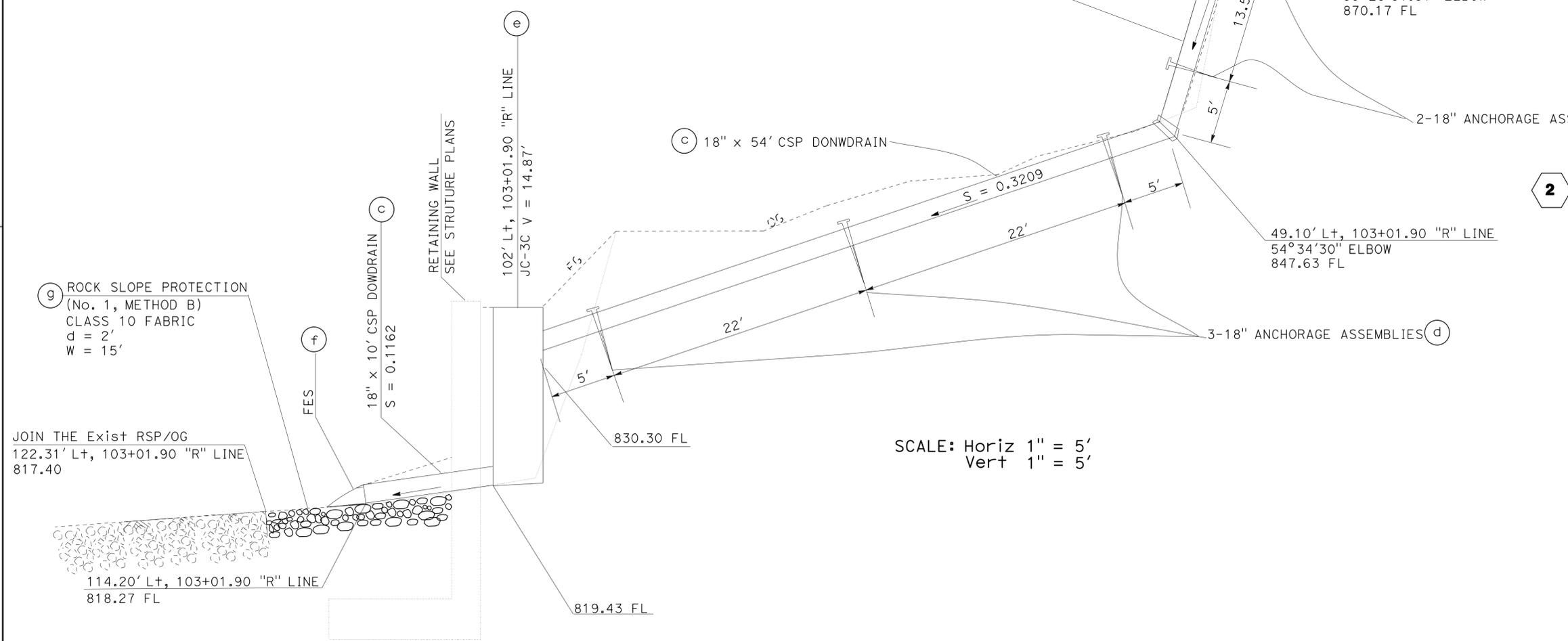
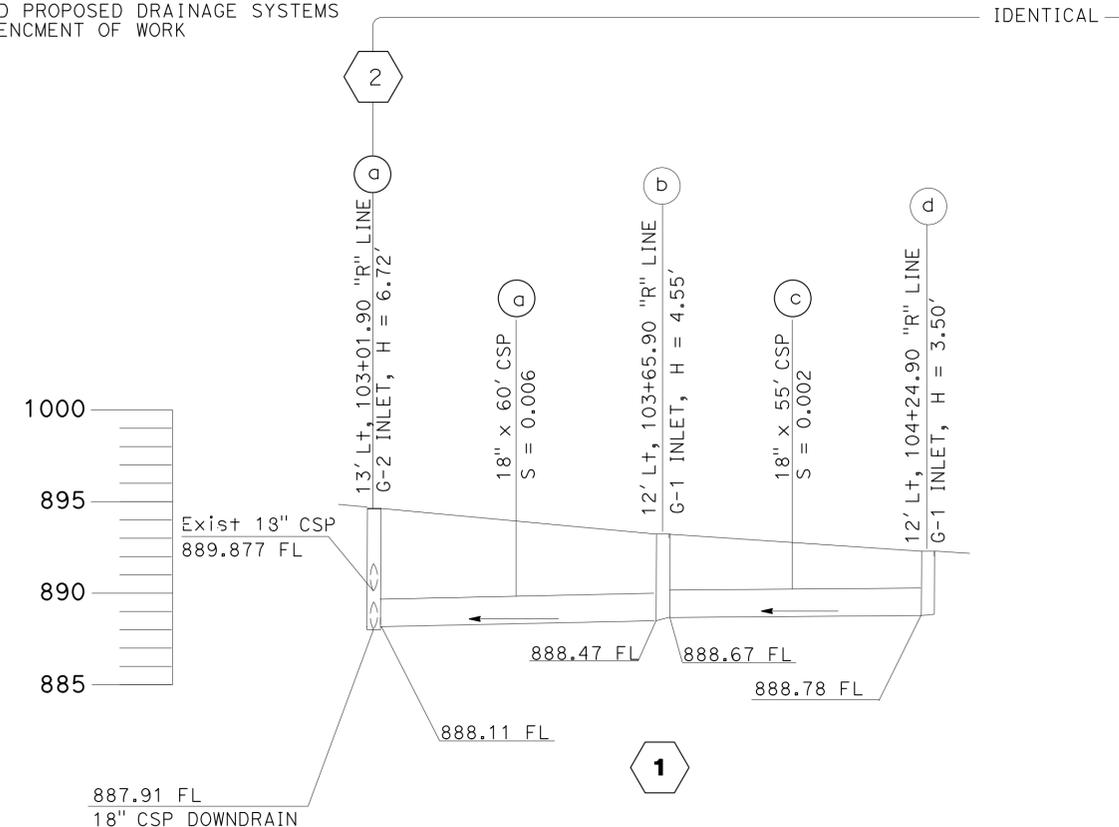
**NOTE:**  
 CONTRACTOR MUST VERIFY ELEVATIONS OF EXISTING AND PROPOSED DRAINAGE SYSTEMS BEFORE COMMENCEMENT OF WORK

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	17	76

1-26-15  
 REGISTERED CIVIL ENGINEER DATE  
 4-4-16  
 PLANS APPROVAL DATE

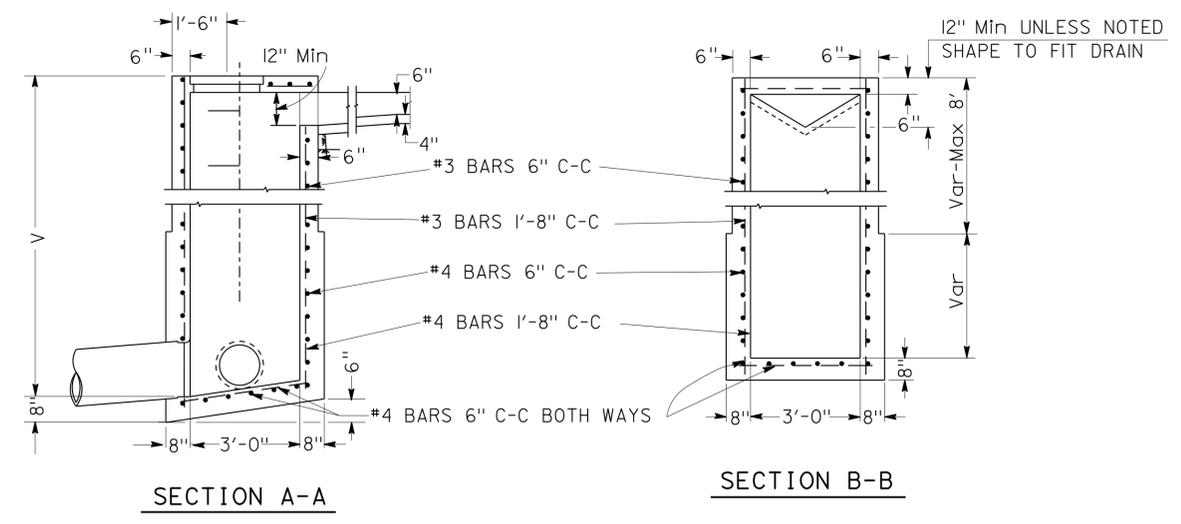
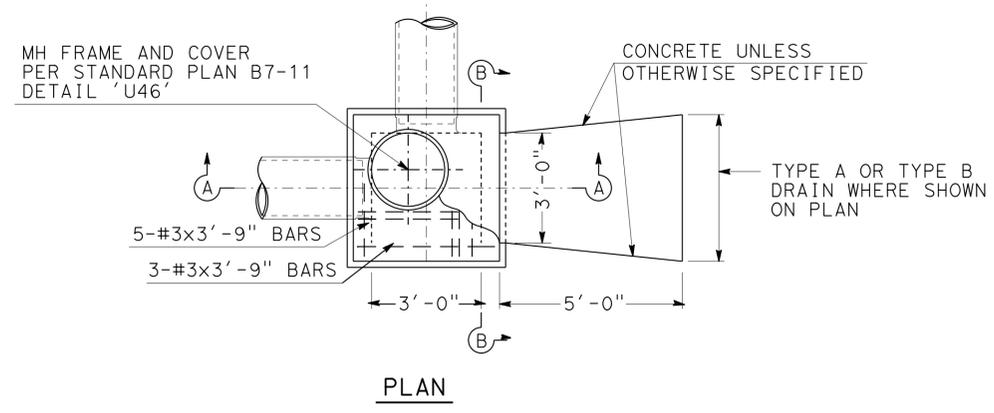
BALDEV K. BHALLA  
 No. 34350  
 Exp. 9/30/15  
 CIVIL

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.

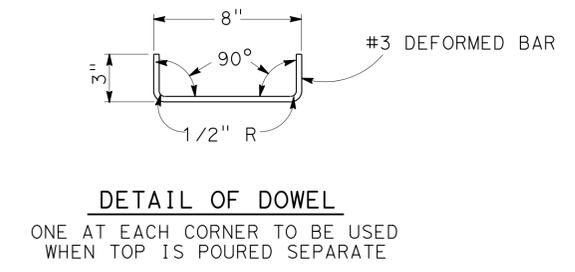
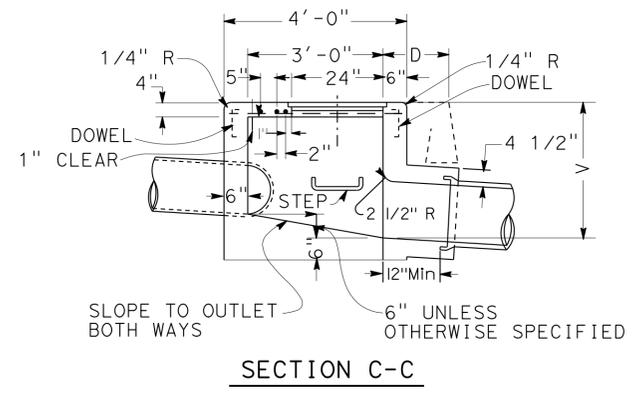
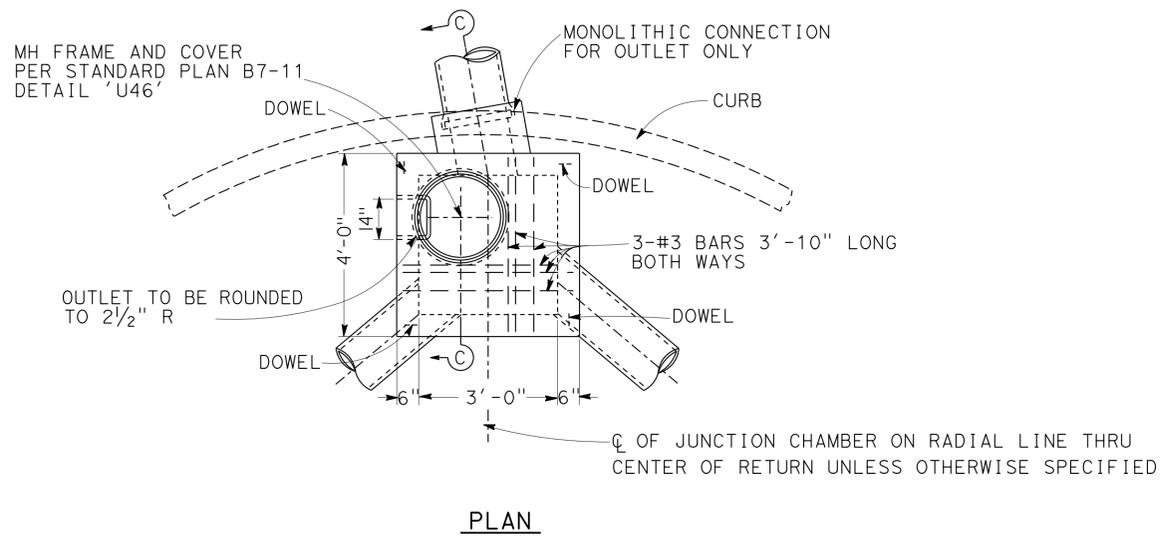


**DRAINAGE PROFILE**  
 SCALE AS SHOWN  
**DP-1**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	18	76
			1-26-15	DATE	
			4-4-16	PLANS APPROVAL DATE	
REGISTERED CIVIL ENGINEER No. 34350 Exp. 9/30/15 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.					



**JUNCTION CHAMBER No 3-C (JC 3-C)**



**JUNCTION CHAMBER No 3 (JC 3)**

**NOTES:**

1. CONNECTION PIPES MAY BE PLACED IN ANY POSITION AROUND THE WALLS PROVIDED THEY POINT IN THE PROPER DIRECTION AND THE POSITION IS OTHERWISE CONSISTENT WITH THE DRAINAGE PLAN.
2. DIMENSIONS: D=18" UNLESS OTHERWISE SPECIFIED.  
V=3'-6" UNLESS OTHERWISE SPECIFIED.
3. EXPOSED SURFACE OF THE JUNCTION CHAMBER SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH AND SCORING TO EXISTING SIDEWALK ADJACENT TO THE JUNCTION CHAMBER. WHERE NO SIDEWALK EXISTS, THE TOP SHALL BE FINISHED TO CONFORM TO STANDARD SIDEWALK SLOPE AND FINISHED, AND SCORING LINES SHALL CONFORM AS NEARLY AS POSSIBLE TO 20" SQUARES.
4. FLOOR OF CHAMBER SHALL BE GIVEN A STEEL-TROWELED FINISH AND SHALL SLOPE FROM ALL DIRECTIONS TO OULET.
5. MANHOLE SHALL BE PLACED IN CORNER NEAREST OULET.
6. OULET PIPE SHALL BE CONNECTED TO JUNCTION CHAMBER WITH MONOLITHIC CONNECTION.
7. REINFORCING STEEL IS NOT REQUIRED IN WALLS WHEN V=6' OR LESS.
8. STEPS: NONE REQUIRED WHERE V=3'-6" OR LESS.  
INSTALL ONE STEP 16"± ABOVE FLOOR WHEN V IS MORE THAN 3'-6" AND LESS THAN 5'-0".  
WHERE V IS MORE THAN 5'-0" STEPS SHALL BE EVENLY SPACED AT 12"± INTERVALS FROM 16"± ABOVE FLOOR TO WITHIN 12"± OF THE TOP OF THE BOX.

**DRAINAGE DETAILS**  
NO SCALE  
**DD-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 Caltrans®  
 FUNCTIONAL SUPERVISOR: DAVE BHALLA  
 CALCULATED/DESIGNED BY: DAVE BHALLA  
 CHECKED BY: DAVE BHALLA  
 TAN HOANG  
 DAVE BHALLA  
 REVISOR: DAVE BHALLA  
 DATE: 1-26-15  
 REVISION: 4-4-16  
 PROJECT NUMBER & PHASE: 07130003981

USERNAME => s125624  
DGN FILE =>

RELATIVE BORDER SCALE IS IN INCHES  
 0 1 2 3

UNIT 0314

PROJECT NUMBER & PHASE

07130003981

LAST REVISION DATE PLOTTED => 05-APR-2016  
00-00-00 TIME PLOTTED => 08:16

FUNCTIONAL SUPERVISOR  
 DAVE BHALLA

CALCULATED/DESIGNED BY  
 CHECKED BY

TAN HOANG  
 DAVE BHALLA

REVISED BY  
 DATE REVISED

DRAINAGE SHEET No.	DRAINAGE SYSTEM No.	DRAINAGE UNIT No.	"H" HEIGHT OF INLET		MISCELLANEOUS IRON AND STEEL	REMOVE PIPE	18" CORRUGATED STEEL PIPE (.109" THICK)	18" CORRUGATED STEEL PIPE DOWNDRAIN (.109" THICK)	18" ANCHOR ASSEMBLY	18" STEEL FLARED END SECTION	ROCK SLOPE PROTECTION (No.1, METHOD B)	ROCK SLOPE PROTECTION FABRIC (CLASS 10)	TYPE 24-12 FRAME AND GRATE	MAXIMUM COVER
			F+	CY										
D-1	1	a					60							5.22
		b	4.55	1.30	326								1	
		c					55						2	
		d	3.50	1.06	326								1	
	2	a	6.72	2.26	326								1	
		b				14.3								
		c					120.5							
		d						7						
		e	14.87	6.50	130									
		f							1					
		g								410	614			
GRAND TOTAL			11.1	1,108	*14.3	115	120.5	7	1	410	614			

\* SEE Q-1 FOR GRAND TOTAL  
 (N) NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.

**NOTE:**  
 PIPE JOINTS ARE STANDARD  
 OR AS NOTED ON PLANS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	19	76

1-26-15  
 REGISTERED CIVIL ENGINEER DATE

4-4-16  
 PLANS APPROVAL DATE

BALDEV K. BHALLA  
 No. 34350  
 Exp. 9/30/15  
 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.

DESCRIPTION	STATION	DRAINAGE SYSTEM No.	DRAINAGE UNIT No.
18" CSP	13' Lt, 103+01.90-103+65.90 "R" LINE	1	a
G-1 INLET	12' Lt, 103+65.90 "R" LINE		b
18" CSP	12' Lt 103+65.90-104+24.90 "R" LINE		c
G-1 INLET	12' Lt, 104+24.90 "R" LINE		d
G-2 INLET	13' Lt, 103+01.90 "R" LINE	2	a
REMOVE 18" CSP	11.5' Lt 103+01.90 "R" LINE		b
18" CSP DOWNDRAIN	Lt, 103+01.90 "R" LINE		c
18" ANCHORAGE ASSEMBLIES	Lt 103+01.90 "R" LINE		d
JC-3C	102.41' Lt, 103+01.90 "R" LINE		e
FES	114.20 Lt 103+01.90 "R" LINE		f
RSP	Lt 101+07.12 - 104+75.71 "R" LINE		g

**DRAINAGE QUANTITIES**  
**DQ-1**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	20	76

*Parviz Yeganeh* 1-26-15  
 REGISTERED CIVIL ENGINEER DATE  
 4-4-16  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
**PARVIZ YEGANEH**  
 No. C53797  
 Exp. 6-30-15  
 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.

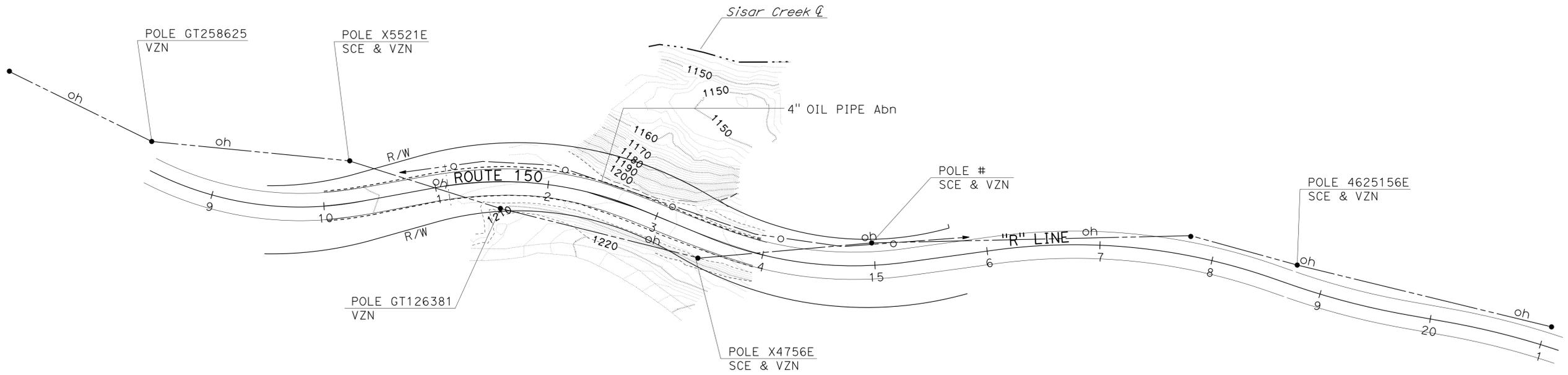
**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- UTILITY OWNERSHIP ON THIS PROJECT

**LEGEND:**

- ELECTRIC- SOUTHERN CALIFORNIA EDISON (SCE)
- COMMUNICATION- VERIZON (VZN)
- OIL- CONOCO PHILLIPS OIL LINE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	RAHEL ADERA	REVISOR	DATE
<b>Caltrans</b>	KENNY HA	REVISOR	DATE
FUNCTIONAL SUPERVISOR		CHECKED BY	
OJ KALU		DESIGNED BY	



**PM 27.4**

APPROVED FOR UTILITY INFORMATION ONLY

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

**U-1**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	21	76

*Parviz Yeganeh* 1-26-15  
 REGISTERED CIVIL ENGINEER DATE  
 4-4-16  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
**PARVIZ YEGANEH**  
 No. C53797  
 Exp. 6-30-15  
 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.

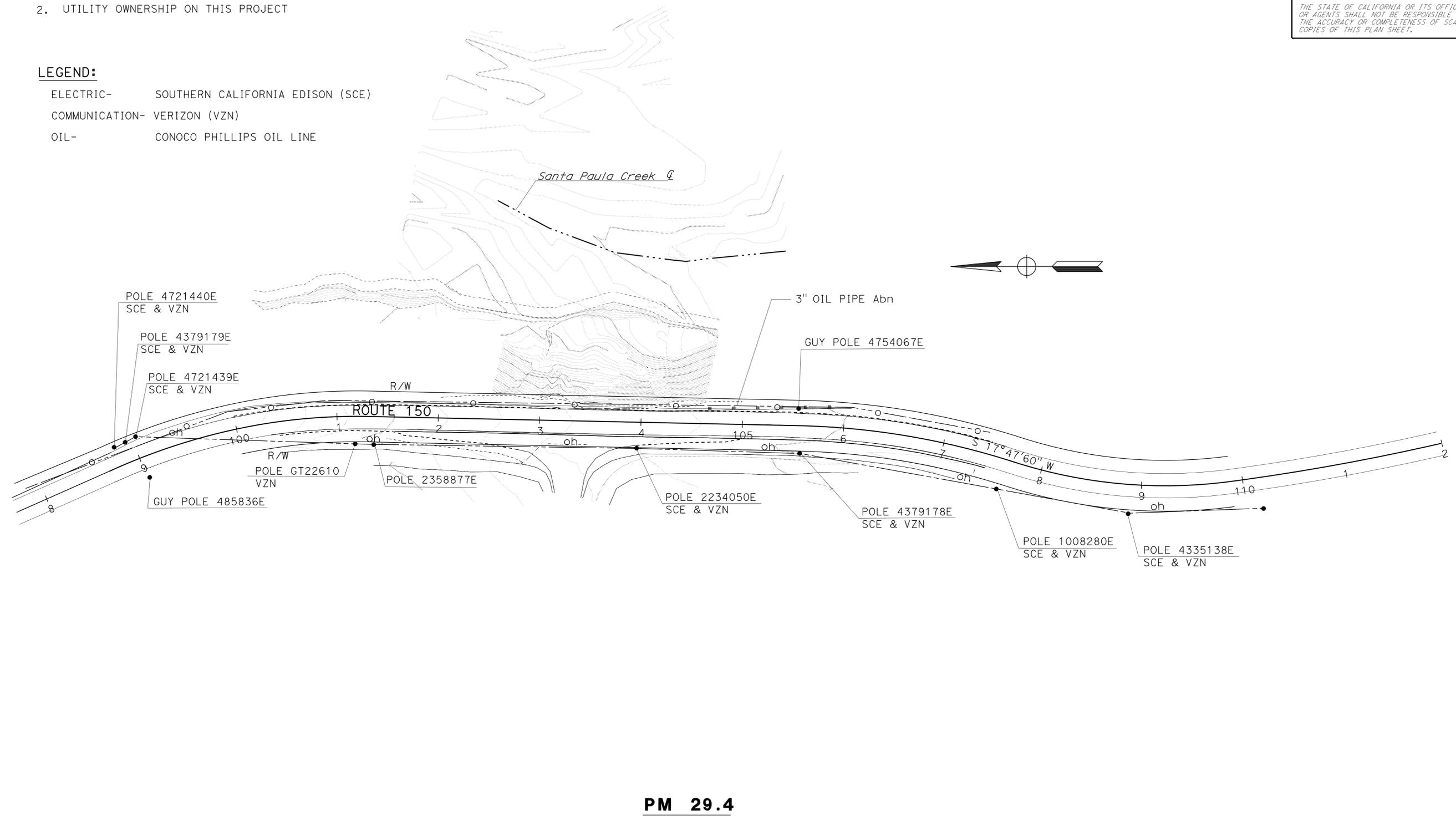
**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- UTILITY OWNERSHIP ON THIS PROJECT

**LEGEND:**

- ELECTRIC- SOUTHERN CALIFORNIA EDISON (SCE)
- COMMUNICATION- VERIZON (VZN)
- OIL- CONOCO PHILLIPS OIL LINE

RAHEL ADERA	REVISOR
KENNY HA	DATE REVISOR
CALCULATED-DESIGNED BY	CHECKED BY
OJI KALU	FUNCTIONAL SUPERVISOR
DESIGN	DEPARTMENT OF TRANSPORTATION
Caltrans	STATE OF CALIFORNIA



**PM 29.4**

APPROVED FOR UTILITY INFORMATION ONLY

**UTILITY PLAN**

SCALE: 1" = 50'

**U-2**

LAST REVISION | DATE PLOTTED => 05-APR-2016 | TIME PLOTTED => 08:16

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	22	76

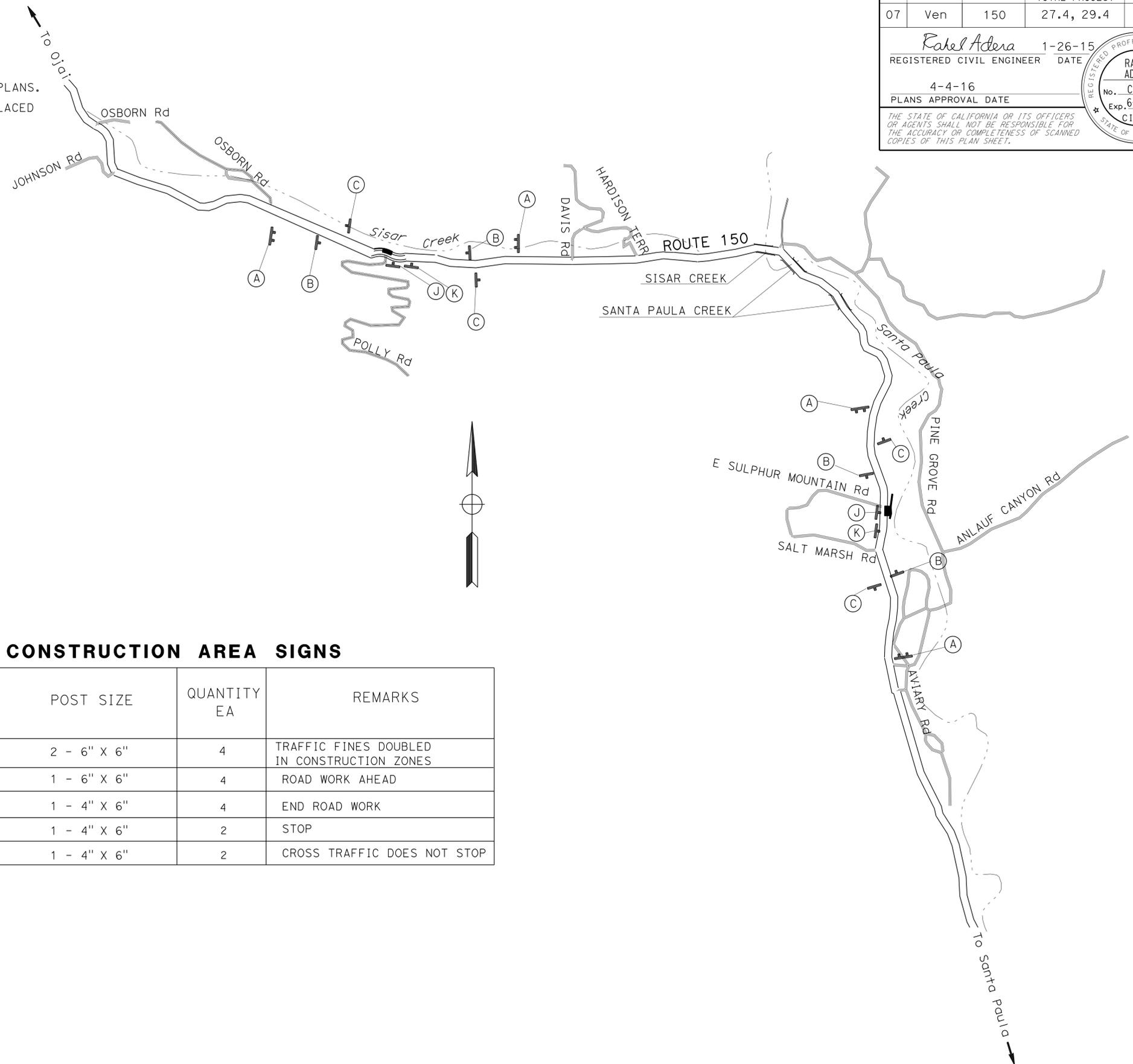
*Rahel Adera* 1-26-15  
 REGISTERED CIVIL ENGINEER DATE  
 4-4-16  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 RAHEL ADERA  
 No. C72106  
 Exp. 6-30-16  
 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.

**NOTES:**

1. LOCATIONS OF CONSTRUCTION AREA SIGNS ARE APPROXIMATE. EXACT SIGN LOCATIONS WILL BE DETERMINED BY THE ENGINEER.
2. FOR ADDITIONAL CONSTRUCTION AREA SIGNS, SEE TRAFFIC HANDLING PLANS.
3. "TRAFFIC FINES DOUBLED IN CONSTRUCTION ZONES" SIGNS MUST BE PLACED APPROXIMATELY 500 FEET IN ADVANCE OF "ROAD WORK AHEAD" OR AS DETERMINED BY THE ENGINEER.



**STATIONARY MOUNTED CONSTRUCTION AREA SIGNS**

SIGN (X)	SIGN CODE		PANEL SIZE	POST SIZE	QUANTITY EA	REMARKS
	FEDERAL	CALIFORNIA				
A		C40 (CA)	108" x 42"	2 - 6" X 6"	4	TRAFFIC FINES DOUBLED IN CONSTRUCTION ZONES
B	W20-1		36" X 36"	1 - 6" X 6"	4	ROAD WORK AHEAD
C	G20-2		36" X 18"	1 - 4" X 6"	4	END ROAD WORK
J	R1-1		30" X 30"	1 - 4" X 6"	2	STOP
K	W4-4P		24" X 12"	1 - 4" X 6"	2	CROSS TRAFFIC DOES NOT STOP

**CONSTRUCTION AREA SIGNS**

NO SCALE

**CS-1**

APPROVED FOR CONSTRUCTION AREA SIGN WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION DESIGN  
 OUI KALU  
 RAHEL ADERA  
 KENNY HA  
 REVISIONS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	23	76

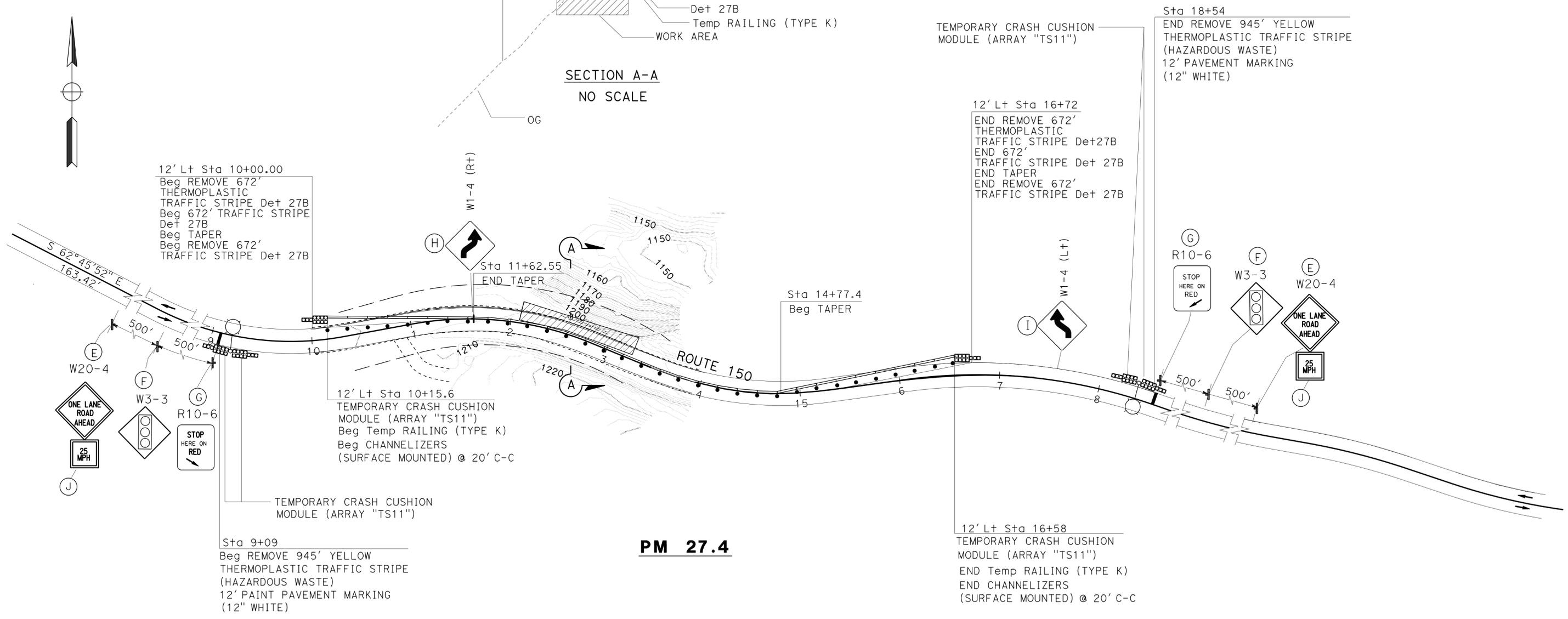
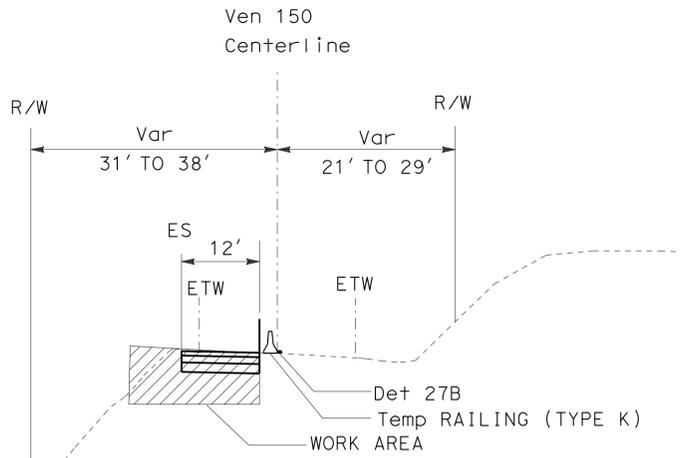
*Rahel Adera* 1-26-15  
 REGISTERED CIVIL ENGINEER DATE  
 4-4-16  
 PLANS APPROVAL DATE

RAHEL ADERA  
 No. C72106  
 Exp. 6-30-16  
 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.

**NOTE:**  
SEE CONSTRUCTION AREA SIGN PLAN FOR ADDITIONAL CONSTRUCTION AREA SIGN

**LEGEND:**  
 WORK AREA

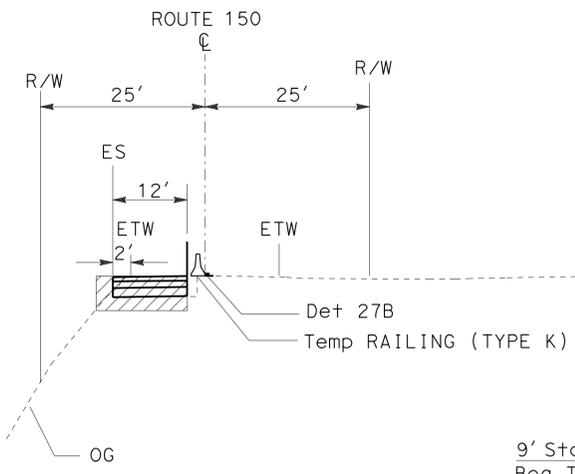


STATIONARY MOUNTED TRAFFIC HANDLING SIGNS					
SIGN #	CODE	PANEL SIZE	POST SIZE	QUANTITY EA	REMARKS
E	W20-4	36" X 36"	1 - 4" X 6"	2	ONE LANE ROAD AHEAD
F	W3-3	36" X 36"	1 - 4" X 6"	2	SIGNAL AHEAD
G	R10-6	24" X 36"	1 - 4" X 4"	2	STOP HERE ON RED
H	W1-4 (R+)	30" X 30"	1 - 4" X 6"	1	TURN AND CURVE SIGN
I	W1-4 (L+)	30" X 30"	1 - 4" X 6"	1	TURN AND CURVE SIGN
J	W13-1	24" X 24"		2	25 MPH (ADVISORY SPEED PLATE)

**TRAFFIC HANDLING PLANS**  
SCALE: 1" = 50'  
**TH-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 FUNCTIONAL SUPERVISOR: OJT KALU  
 CALCULATED/DESIGNED BY: RAHEL ADERA  
 CHECKED BY: KENNY HA  
 REVISIONS: RAHEL ADERA, KENNY HA, DATE, REVISIONS

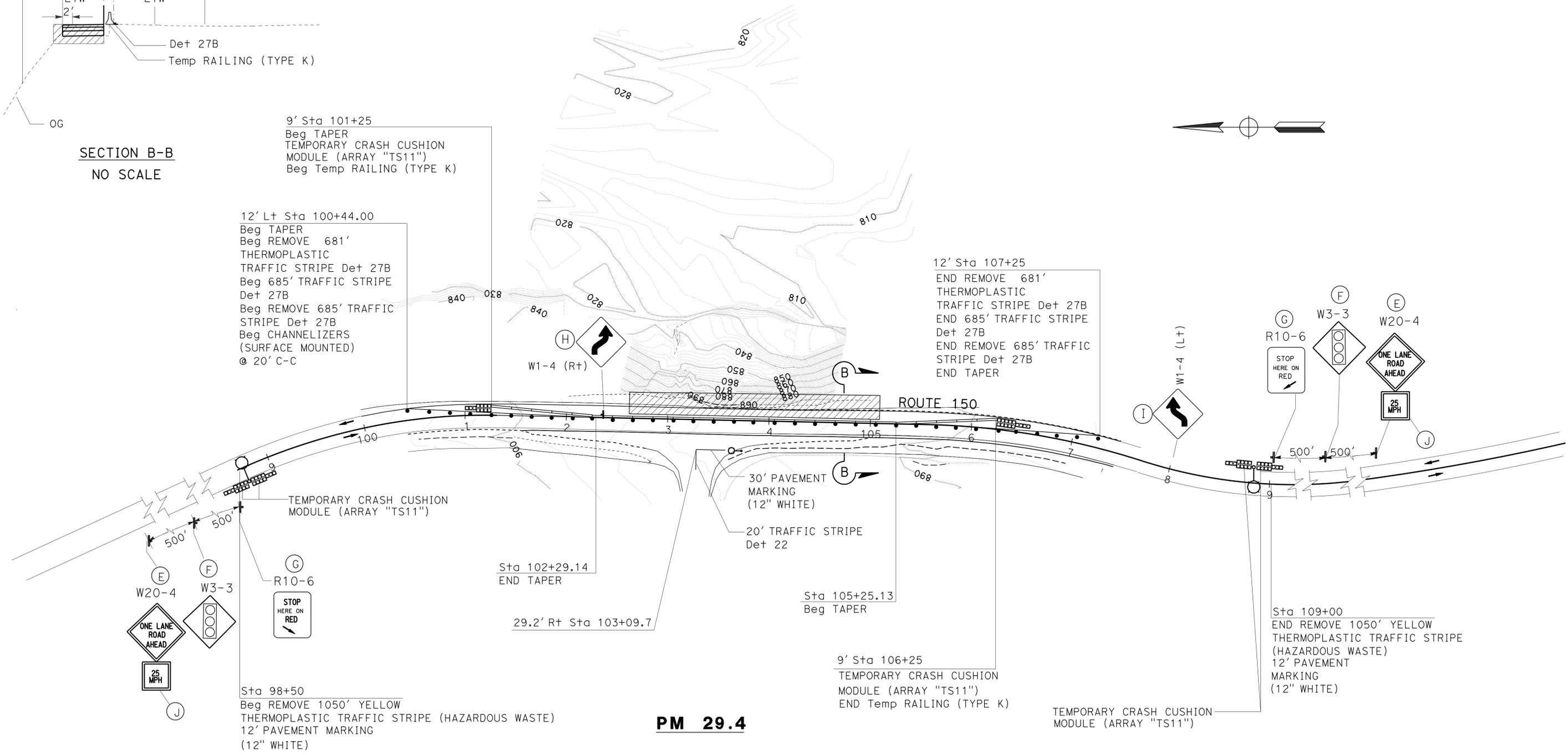
STATIONARY MOUNTED TRAFFIC HANDLING SIGNS					
SIGN #	CODE	PANEL SIZE	POST SIZE	QUANTITY EA	REMARKS
E	W20-4	36" x 36"	1 - 4" X 6"	2	ONE LANE ROAD AHEAD
F	W3-3	36" x 36"	1 - 4" X 6"	2	SIGNAL AHEAD
G	R10-6	24" x 36"	1 - 4" X 4"	2	STOP HERE ON RED
H	W1-4 (Rt)	30" x 30"	1 - 4" X 6"	1	TURN AND CURVE SIGN
I	W1-4 (Lt)	30" x 30"	1 - 4" X 6"	1	TURN AND CURVE SIGN
J	W13-1	24" x 24"		2	25 MPH (ADVISORY SPEED PLATE)



9' Sta 101+25  
 Beg TAPER  
 TEMPORARY CRASH CUSHION  
 MODULE (ARRAY "TS11")  
 Beg Temp RAILING (TYPE K)

12' Lt Sta 100+44.00  
 Beg TAPER  
 Beg REMOVE 681'  
 THERMOPLASTIC  
 TRAFFIC STRIPE Det+ 27B  
 Beg 685' TRAFFIC STRIPE  
 Det+ 27B  
 Beg REMOVE 685' TRAFFIC  
 STRIPE Det+ 27B  
 Beg CHANNELIZERS  
 (SURFACE MOUNTED)  
 @ 20' C-C

12' Sta 107+25  
 END REMOVE 681'  
 THERMOPLASTIC  
 TRAFFIC STRIPE Det+ 27B  
 END 685' TRAFFIC STRIPE  
 Det+ 27B  
 END REMOVE 685' TRAFFIC  
 STRIPE Det+ 27B  
 END TAPER



**PM 29.4**

**TRAFFIC HANDLING PLANS**

SCALE: 1" = 50'

**TH-2**

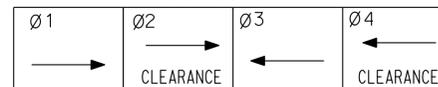
APPROVED FOR TRAFFIC HANDLING WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 RAHEL ADERA  
 KENNY HA  
 OJI KALU

**LEGEND: (THIS SHEET ONLY)**

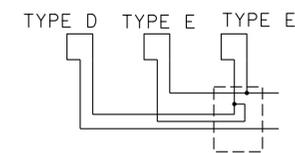
- 1 INSTALL FLASHING BEACON SYSTEM ON WOODEN POLE. SEE SPECIAL ELECTRICAL STRUCTURES SHEET.
  - 2 SEE SPECIAL ELECTRICAL STRUCTURES SHEET.
  - 3 INSTALL DEPARTMENT-FURNISHED MODEL 2070 CONTROLLER ASSEMBLY.
  - 4 INSTALL 1/2"C, 1-9 CSC, 1#8 (G), 2 DLC.
  - 5 INSTALL 2-2"C, 2#8 (SIG), 3-9 CSC, 1# 8 (G), 4 DLC.
  - 6 INSTALL PORTABLE GENERATOR. THE CAPACITY MUST BE SIZED TO PROVIDE POWER TO TEMPORARY SIGNAL SYSTEM. PROVIDE BACKUP GENERATOR.
  - 7 2"C, 6#10 (LIGHTING & FLASHING BEACON), 2#8 (SIG), 1#8 (G) TO GENERATOR.
  - 8 INSTALL 1/2"C, 2#10 (FLASHING BEACON), 1#8 (G).
  - 9 INSTALL 1/2"C, 1-9 CSC, 1#8 (G), 2 DLC BY JACKING METHOD.
  - 10 INSTALL 1/2"C, 1-9 CSC, 2#10 (LTG), 1#8 (G) BY JACKING METHOD.
  - 11 INSTALL 2"C, 2-9 CSC, 2#10 (LTG), 1#8 (G), 2 DLC.
  - 12 INSTALL PER SPECIAL ELECTRICAL STRUCTURES SHEET-2, SIGNAL POLE WITH LUMINAIRE, EXCEPT INSTALL ONLY ONE SIGNAL INDICATION (DETAIL D).
  - 13 SEE CONSTRUCTION AREA SIGNS FOR SIGN DETAIL.
- Ⓜ GENERATOR

**PHASE DIAGRAM**

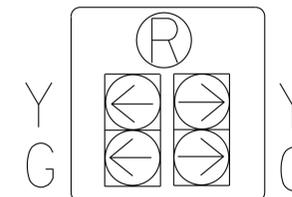


**NOTES: (THIS SHEET ONLY)**

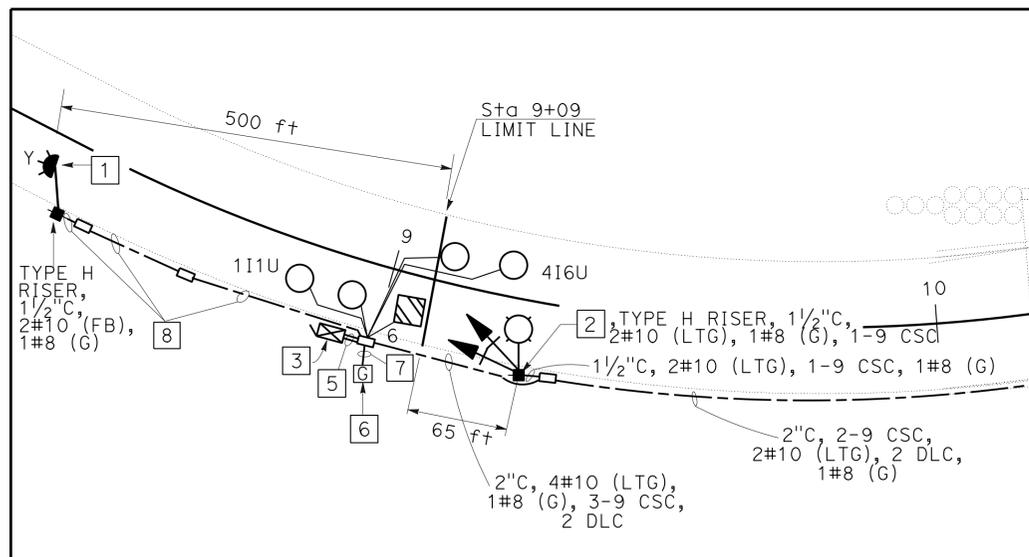
1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. CONDUCTORS FOR LOOP DLC MUST BE 2#12.
3. SEE WIRING CONNECTION DETAIL C THIS SHEET FOR TYPE "D" LOOP WITH TWO TYPE "E" LOOPS.
4. REMOVE THE TEMPORARY EQUIPMENT WHEN IS NO LONGER NEEDED AS DIRECTED BY THE ENGINEER.



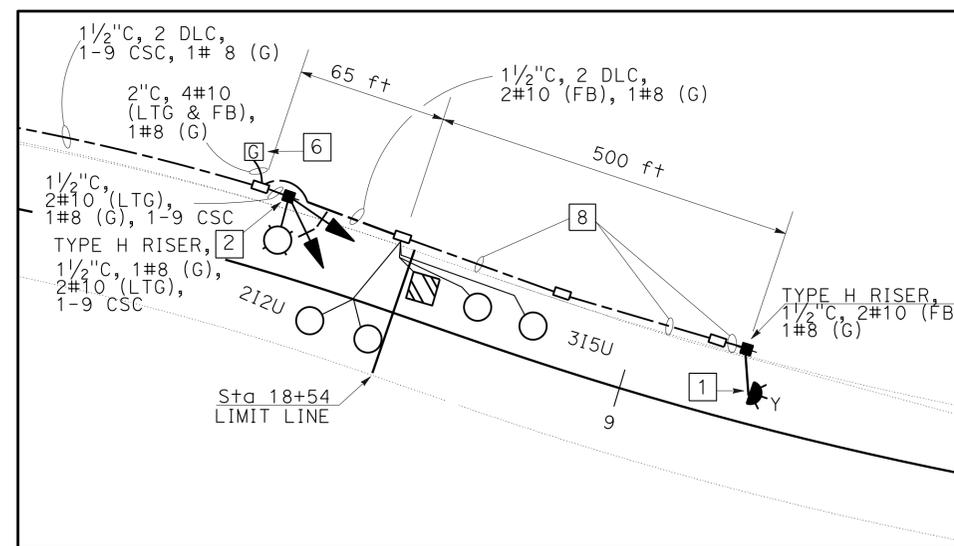
**DETAIL C**  
NO SCALE



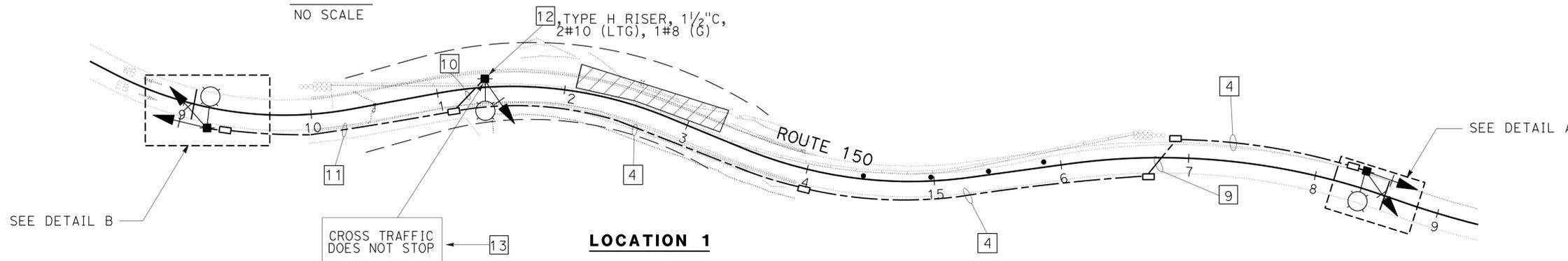
**DETAIL D**  
NO SCALE



**DETAIL B**  
NO SCALE



**DETAIL A**  
NO SCALE



**LOCATION 1**

**TEMPORARY SIGNAL SYSTEM**  
NO SCALE  
**TH-3**

APPROVED FOR TRAFFIC HANDLING WORK ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	REVISOR	DATE
<b>Caltrans</b>	HASSAN MANNA	XOCHILT NARANJO	1-26-15
TRAFFIC DESIGN	CHECKED BY	CESAR HERNANDEZ	4-4-16
	DESIGNED BY		

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	25	76
			REGISTERED ELECTRICAL ENGINEER	DATE	
			CESAR HERNANDEZ	1-26-15	
			No. E15805		
			Exp. 12/31/16		
			PLANS APPROVAL DATE		
			4-4-16		
<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>					

**LEGEND: (THIS SHEET ONLY)**

- 1 INSTALL FLASHING BEACON SYSTEM ON WOODEN POLE. SEE SPECIAL ELECTRICAL STRUCTURES SHEET.
  - 2 SEE SPECIAL ELECTRICAL STRUCTURES SHEET.
  - 3 INSTALL DEPARTMENT-FURNISHED MODEL 2070 CONTROLLER ASSEMBLY.
  - 4 INSTALL 1 1/2" C, 1-9 CSC, 1#8 (G), 2 DLC.
  - 5 INSTALL 2-2" C, 2#8 (SIG), 3-9 CSC, 4 DLC, 1#8 (G).
  - 6 INSTALL PORTABLE GENERATOR. THE CAPACITY MUST BE SIZED TO PROVIDE POWER TO TEMPORARY SIGNAL SYSTEM. PROVIDE BACKUP GENERATOR.
  - 7 INSTALL 1 1/2" C, 2#10 (FLASHING BEACON), 1#8 (G).
  - 8 INSTALL 1 1/2" C, 1-9 CSC, 1#8 (G), 2 DLC, BY JACKING METHOD.
  - 9 INSTALL 2" C, 2-9 CSC, 1#8 (G), 2#10 (LTG), 2 DLC, BY JACKING METHOD.
  - 10 INSTALL 2" C, 2-9 CSC, 2#10 (LTG), 1#8 (G), 2 DLC.
  - 11 INSTALL PER SPECIAL ELECTRICAL STRUCTURES SHEET-2, SIGNAL POLE WITH LUMINAIRE EXCEPT INSTALL ONLY ONE SIGNAL INDICATION (DETAIL D).
  - 12 SEE CONSTRUCTION AREA SIGNS FOR SIGN DETAIL.
- ⓐ GENERATOR

**NOTES: (THIS SHEET ONLY)**

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. CONDUCTORS FOR LOOP DLC MUST BE 2#12.
3. SEE WIRING CONNECTION DETAIL C THIS SHEET FOR TYPE "D" LOOP WITH TWO TYPE "E" LOOPS.
4. REMOVE THE TEMPORARY EQUIPMENT WHEN IS NO LONGER NEEDED AS DIRECTED BY THE ENGINEER.

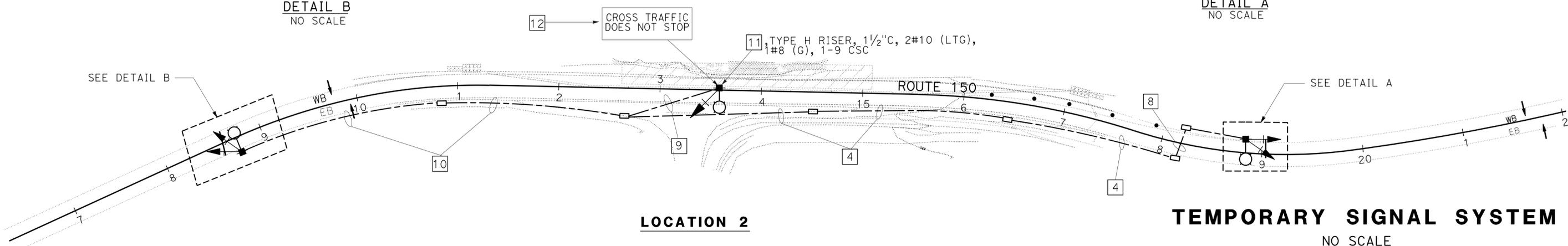
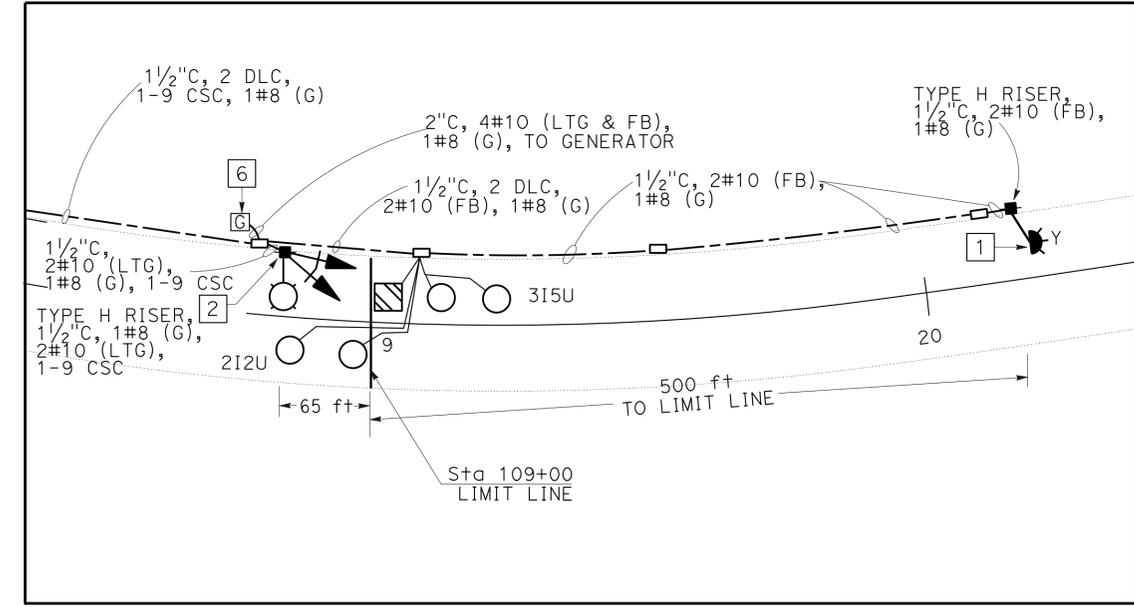
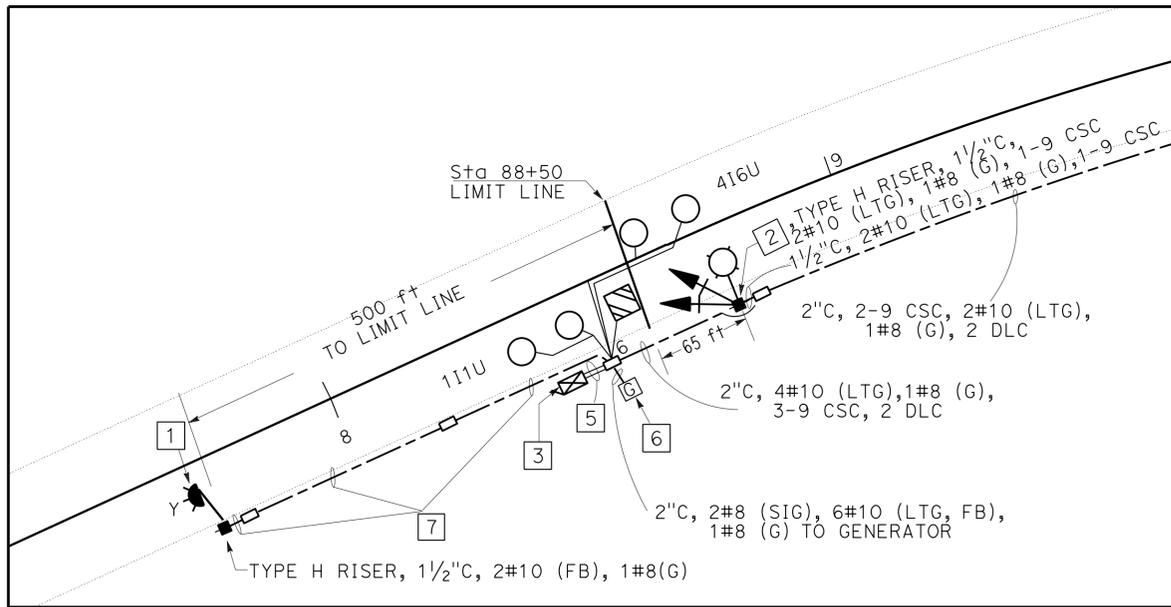
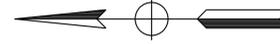
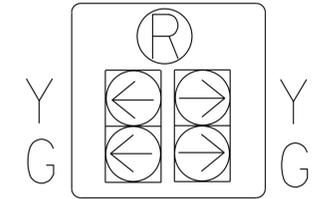
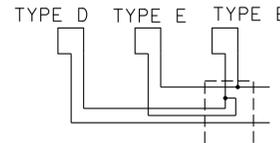
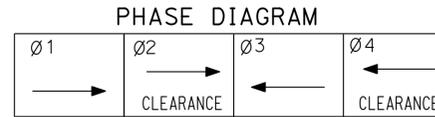
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	26	76

1-26-15  
REGISTERED ELECTRICAL ENGINEER DATE

4-4-16  
PLANS APPROVAL DATE

CESAR HERNANDEZ  
No. E15805  
Exp. 12/31/16  
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.

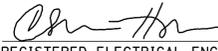


APPROVED FOR TRAFFIC HANDLING WORK ONLY

TH-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
TRAFFIC DESIGN  
FUNCTIONAL SUPERVISOR: HASSAN MANNA  
CALCULATED/DESIGNED BY: XOXHILT NARANJO  
CHECKED BY: CESAR HERNANDEZ  
REVISOR: XOXHILT NARANJO  
DATE REVISOR: CESAR HERNANDEZ

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	27	76

 1-26-15  
 REGISTERED ELECTRICAL ENGINEER DATE  
 4-4-16  
 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.

### TEMPORARY SIGNAL SYSTEM

SHEET No.	(N) ELECTROLIER STANDARD [T15S]	(N) LOOP DETECTOR	(N) FLASHING BEACON SYSTEM	(N) (WIRE) CONDUCTOR 2#10	(N) CONDUCTOR 2#8	(N) (WIRE GROUND) CONDUCTOR [1#8 (G)]	(N) PULL BOX #5	(N) MODEL 2070 CONTROLLER ASSEMBLY	(N) SIZE 1 1/2" CONDUIT	(N) SIZE 2" CONDUIT	(N) WOOD POLE	(N) GENERATOR	(N) PULL BOX #6
	EA	EA	EA	LF	LF	LF	EA	EA	LF	LF	EA	EA	EA
TH-3	3	10	2	1,707	410	2,262	11	1	1,920	375	5	4	1
TH-4	3	10	2	2,862	1,595	3,770	13	1	1,810	1,600	5	4	1
<b>TOTAL</b>	<b>6</b>	<b>20</b>	<b>4</b>	<b>4,569</b>	<b>2,005</b>	<b>6,032</b>	<b>24</b>	<b>2</b>	<b>3,730</b>	<b>1,975</b>	<b>10</b>	<b>8</b>	<b>2</b>

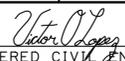
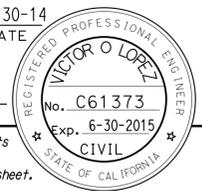
(N) - NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY

XOCHILT NARANJO	REVISOR	DESIGNED BY	CHECKED BY	FUNCTIONAL SUPERVISOR
CESAR HERNANDEZ	DATE	DATE	DATE	HASSAN MANNA
<b>STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION</b>				
<b>Caltrans® TRAFFIC DESIGN</b>				

## ELECTRICAL QUANTITIES

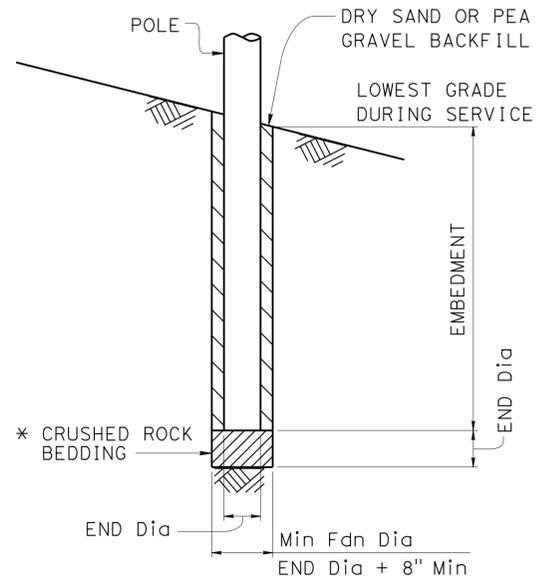
**TH-5**

LAST REVISION    DATE PLOTTED => 05-APR-2016  
 00-00-00    TIME PLOTTED => 08:16

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	28	76
 REGISTERED CIVIL ENGINEER			10-30-14	DATE	
4-4-16 PLANS APPROVAL DATE					
					
<small>The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.</small>					

INDEX

- SES-1 GENERAL AND DESIGN NOTES
- SES-2 WITHOUT CONDUCTORS
- SES-3 MISCELLANEOUS DETAILS 1
- SES-4 MISCELLANEOUS DETAILS 2



**POLE FOUNDATION DETAIL**

NO SCALE

\* Crushed rock shall comply with requirements for pervious backfill material with grading specified for 1 1/2" x 3/4" primary aggregate meeting the course aggregate grading specifications.

GENERAL NOTES:

1. Attach luminaire arm and/or combination of attachments as specified at locations where indicated on "Electrical Plans".
2. All attachments shall be mounted with stainless steel straps or other manufacturers methods without drilling holes in pole, except as shown on these SES sheets. Any other drilling into pole will require the Engineer's approval.
3. For additional details, see All SES Sheets

NOTE:  
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

DESIGN NOTES:

Design: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, Fifth Edition (LTS-5).

GROUP LOAD COMBINATIONS:

- I Dead Load
- II Dead Load + Wind Load
- III Dead Load + 0.5 (Wind Load) + Ice Load
- IV Fatigue: Not used

LOADING

Wind Loadings: 85 mph (3-second gust)  
Wind Recurrence interval: 10 years  
Combined height, exposure, and elevated terrain factor = 1.05  
(Exposure C, structure is located on or over the top half of a 30' Maximum tall ridge, hill or escarpment)

BASIC DESIGN VALUES:

Timber Poles: Fb = 1850 psi  
Fv = 110 psi  
Fcp = 230 psi  
Fc = 950 psi  
E = 1500 x 10<sup>3</sup> psi

TREATMENT

To conform with Section 86 of the Standard Specifications

SPECIFICATIONS

Caltrans Standard Specifications 2006  
ANSI 05.1-1992 Wood Poles  
ASTM A475, Utilities Grade, 7 strand wires  
Termination efficiency factor 0.80

FOUNDATION DESIGN NOTES:

1. Pole embedment depth design is based on Broms' approximate procedure as described in Article 13.6 of AASHTO LTS-5.
2. Standard embedment depth is calculated based on level ground assumption (slope inclination is flatter than 4H:1V).
3. Embedment depth is calculated based on following:  
Cohesionless Soil:  
 $\phi = 30 \text{ deg}$ ,  $\gamma = 120 \text{ pcf}$ .
4. An overload factor of 2.0 and an undercapacity factor of 0.7 were used for safety factor of 2.86.
5. If pole is located on or near a steep slope (up to 2H:1V) add 2 feet extra embedment.
6. Allowable vertical soil bearing pressure at the end bearing of poles is 3,000 psf at 6 feet or more embedment.
7. The contractor to field verify the soil conditions indicated on FOUNDATION DESIGN NOTES 3 and 6.

BRANCH CHIEF	DAVID NEUMANN	
	DESIGN	BY BRYAN NAGID
	DETAILS	BY SHUMEI JIANG/BOB EDWARDS

CHECKED	LANCE WARREN/V. LOPEZ
CHECKED	LANCE WARREN/V. LOPEZ
CHECKED	X

**STATE OF CALIFORNIA**  
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES  
STRUCTURE DESIGN  
**SPECIAL DESIGN BRANCH**

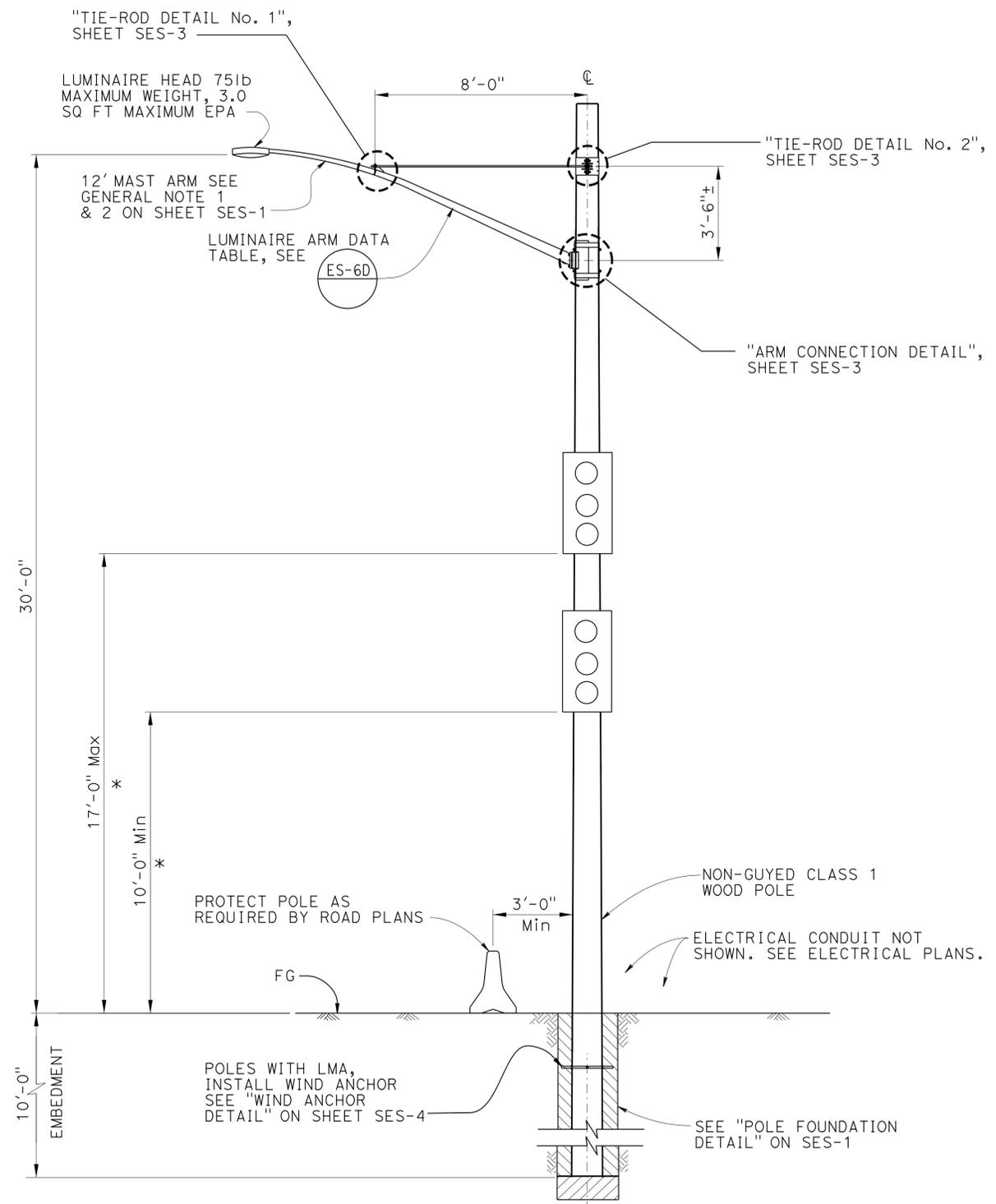
BRIDGE NO.	N/A
POST MILE	27.4/29.4

**TEMPORARY WOOD POLE**  
**NOTES AND POLE I.D.**

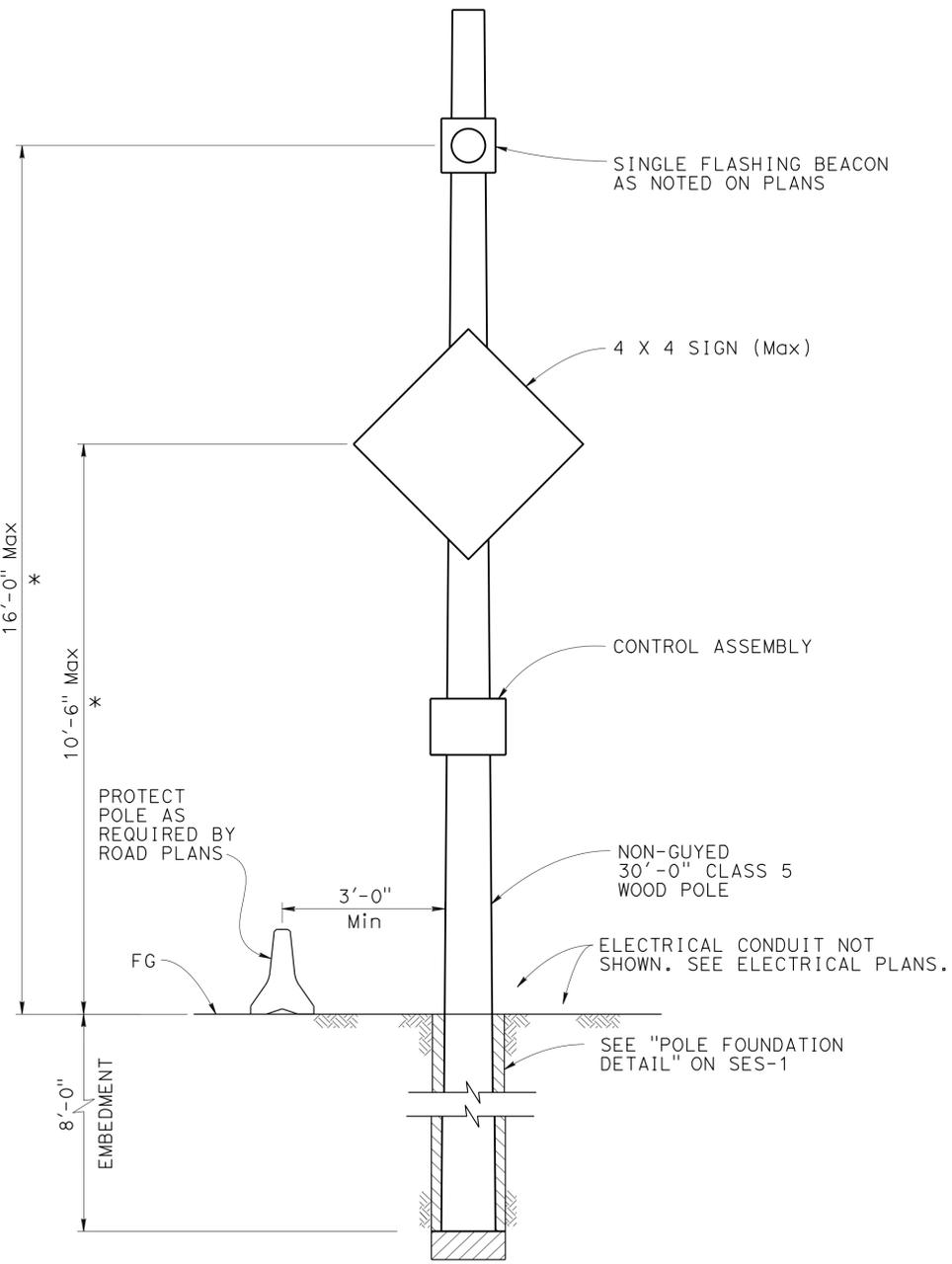
**SES-1**

USERNAME => s125624 DATE PLOTTED => 05-APR-2016 TIME PLOTTED => 09:14

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	29	76
			REGISTERED CIVIL ENGINEER	DATE	
			10-30-14		
			PLANS APPROVAL DATE		
			4-4-16		
			REGISTERED PROFESSIONAL ENGINEER		
			No. C61373		
			Exp. 6-30-2015		
			CIVIL		
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**SIGNAL POLE WITH LUMINAIRE**  
NO SCALE



**WOOD POLE WITH FLASHING BEACON AND SIGN**  
NO SCALE

NOTE:  
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

\* Refer to notes on SES - 1 and "ELECTRICAL PLANS" for additional information

BRANCH CHIEF	DAVID NEUMANN
--------------	---------------

DESIGN	BY BRYAN NAGID	CHECKED LANCE WARREN/V. LOPEZ
DETAILS	BY SHUMEI JIANG/BOB EDWARDS	CHECKED LANCE WARREN/V. LOPEZ
QUANTITIES	BY X	CHECKED X

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES  
STRUCTURE DESIGN  
SPECIAL DESIGN BRANCH

BRIDGE NO.	N/A
POST MILE	27.4/29.4

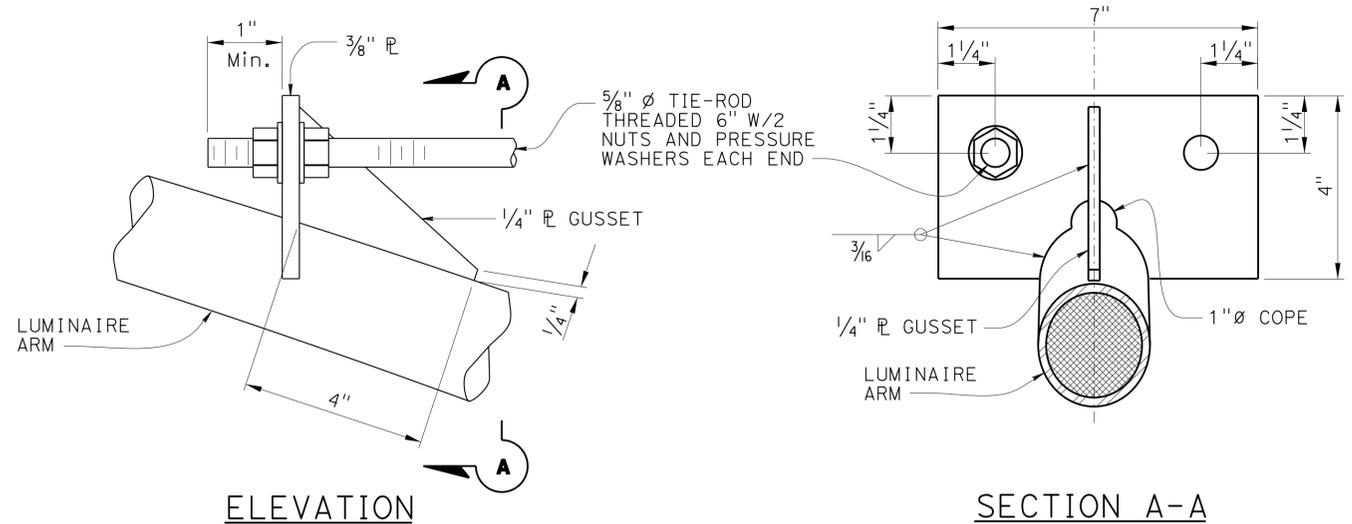
**TEMPORARY WOOD POLE WITHOUT CONDUCTORS**

**SES-2**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	30	76
			10-30-14	DATE	
REGISTERED CIVIL ENGINEER			4-4-16	PLANS APPROVAL DATE	
<small>The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.</small>					

**NOTES:**

- All hardware and steel shall be galvanized after fabrication.
- Arm Base connection details shall be in compliance with Standard Plans Detail Sheet ES-6D with noted modifications.
- 2000 lb Min capacity strap system shall be used for top and bottom of plate.
- The Contractor to verify pole dimensions at Tie-Rod attachment height. Fabricate 8" flat bar with "L" Dimension to maintain an open gap between encasement in finished installation.

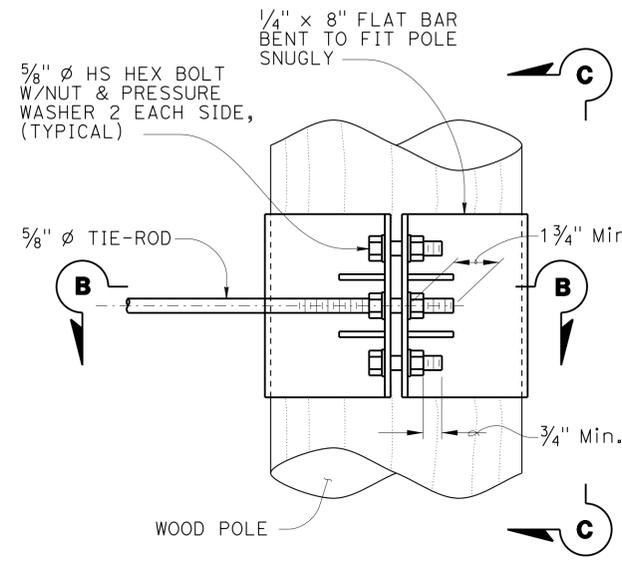


**ELEVATION**

**SECTION A-A**

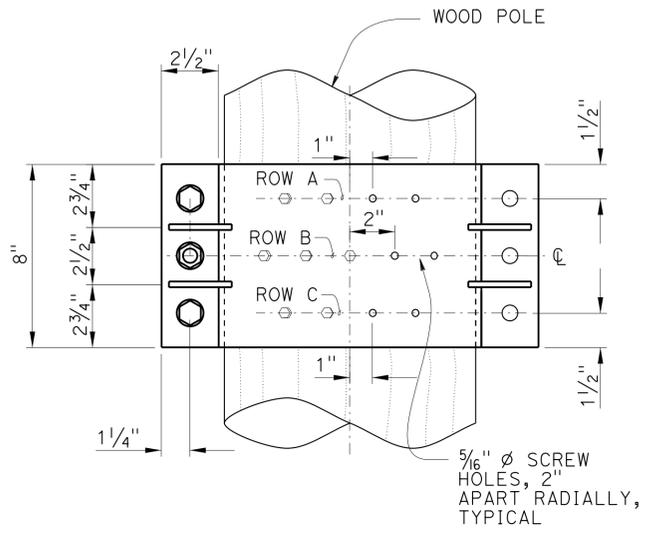
**TIE-ROD DETAIL No. 1**

NO SCALE

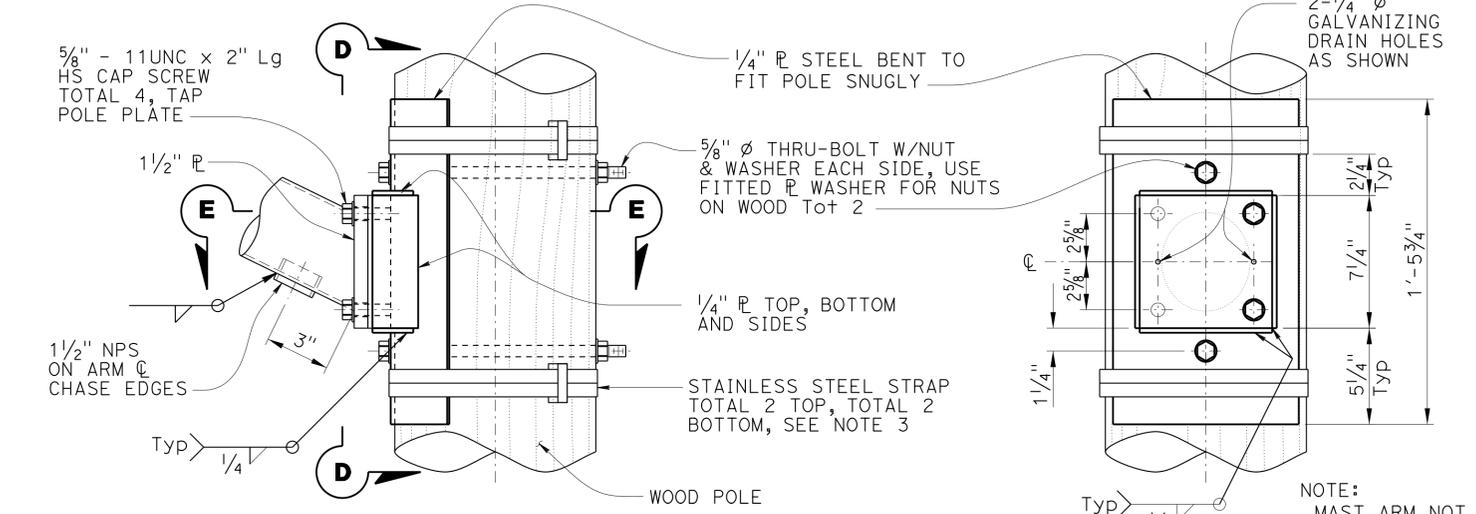


**ELEVATION**

NOTE:  
Not all screw and bolt heads shown for clarity.



**VIEW C-C**

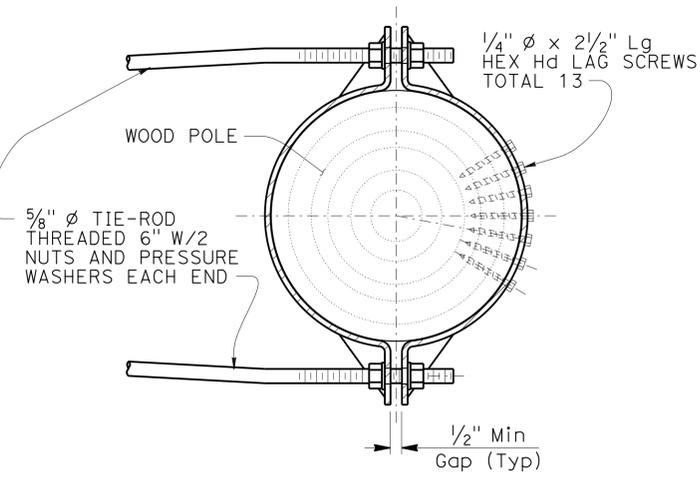


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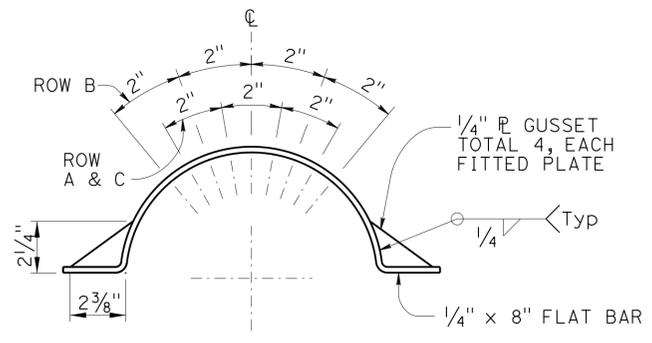
**VIEW D-D**

**ARM CONNECTION DETAILS**

NO SCALE



**SECTION B-B**



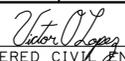
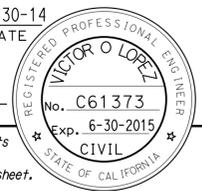
**LAG SCREW AND GUSSET PLATE LAYOUT**

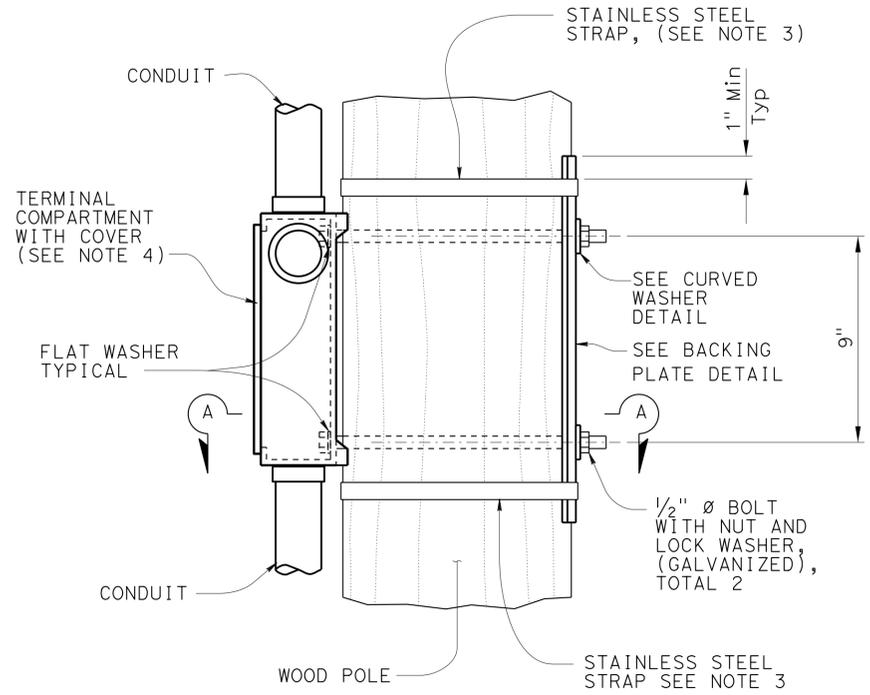
**TIE-ROD DETAILS No. 2**

NO SCALE

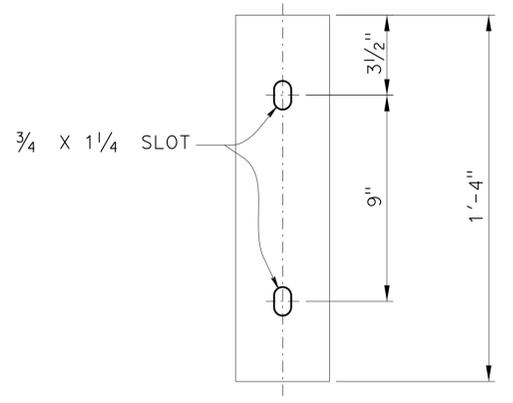
NOTE:  
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

BRANCH CHIEF <u>DAVID NEUMANN</u>	DESIGN	BY BRYAN NAGID	CHECKED LANCE WARREN/V. LOPEZ	<b>STATE OF CALIFORNIA</b> DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN <b>SPECIAL DESIGN BRANCH</b>	BRIDGE NO.	<b>TEMPORARY WOOD POLE</b> <b>MISCELLANEOUS DETAILS 1</b>	<b>SES-3</b>
	DETAILS	BY SHUMEI JIANG/BOB EDWARDS	CHECKED LANCE WARREN/V. LOPEZ			N/A		
	QUANTITIES	BY X	CHECKED X			POST MILE		
						27.4/29.4		

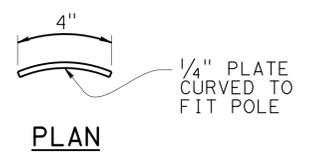
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	31	76
 REGISTERED CIVIL ENGINEER			10-30-14 DATE		
4-4-16 PLANS APPROVAL DATE					
<small>The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.</small>					



**ELEVATION**  
NO SCALE

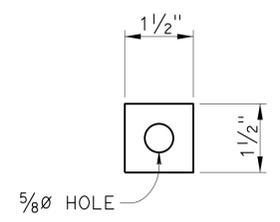


**ELEVATION**

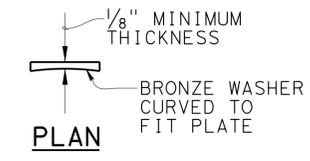


**PLAN**

**BACKING PLATE  
DETAIL**  
NO SCALE



**ELEVATION**

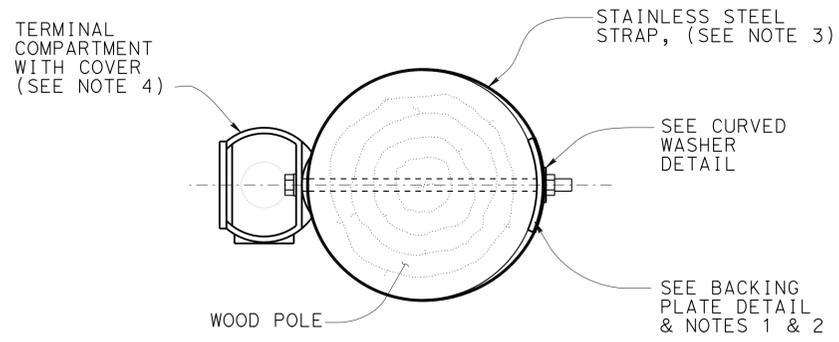


**PLAN**

**CURVED WASHER  
DETAIL**  
NO SCALE

**NOTES:**

1. The contractor to verify pole dimensions at terminal compartment for fabrication of backing plate and curved washer.
2. Backing plate to be galvanized after fabrication.
3. 3/4" x 0.044" minimum, rounded edge stainless steel straps, double wrapped with 2" long bend under stainless steel strap buckle.
4. For details not shown see STANDARD PLAN ES-4D

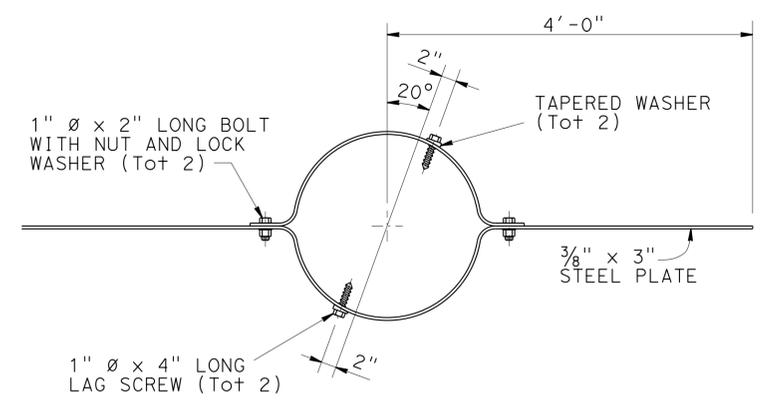


**SECTION A-A**  
NO SCALE

**SIDE MOUNTING  
TERMINAL COMPARTMENT**

For Details Not Shown See RSP-ES-4D Sheet

NOTE:  
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.



**WIND ANCHOR**

To be installed perpendicular to mast arms and 2'-0" Min below grade  
NO SCALE

BRANCH CHIEF	DAVID NEUMANN	
	DESIGN	BY BRYAN NAGID
	DETAILS	BY SHUMEI JIANG/BOB EDWARDS
QUANTITIES	BY X	

CHECKED	LANCE WARREN/V. LOPEZ
CHECKED	LANCE WARREN/V. LOPEZ
CHECKED	X

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES  
STRUCTURE DESIGN  
SPECIAL DESIGN BRANCH

BRIDGE NO.	N/A
POST MILE	27.4/29.4

TEMPORARY WOOD POLE  
MISCELLANEOUS DETAILS 2

SES-4

USERNAME => s125624 DATE PLOTTED => 05-APR-2016 TIME PLOTTED => 09:14

**TRAFFIC HANDLING QUANTITIES**

SHEET NUMBER	LINE DESIGNATION	STATION	DIRECTION	REMOVE									
				TEMPORARY RAILING (TYPE K)	TEMPORARY CRASH CUSHION MODULE	CHANNELIZER (SURFACE MOUNTED)	PAINT TRAFFIC STRIPE (2-COAT)	PAINT PAVEMENT MARKING (2-COAT)	PAINTED TRAFFIC STRIPE	PAINT PAVEMENT MARKING (2-COAT)	THERMOPLASTIC TRAFFIC STRIPE	YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE)	PAVEMENT MARKER
				LF	EA	EA	LF	SQFT	LF	SQFT	LF	LF	SQFT
TH-1	"R"	9+09 TO 18+54	EB		22			24		24		1,890	80
TH-1	"R"	10+00 TO 16+72	EB		22		672		672		672		
TH-1	"R"	10+18 TO 17+19	EB	640	22	33							
TH-2	"R"	98+50 TO 109+00	WB		44			24		24		2,100	172
TH-2	"R"	100+44 TO 107+25	WB			35	681		681		681		
TH-2	"R"	101+25 TO 106+25	WB	500	22			30					
<b>TOTAL</b>				1,140	132	68	1,353	78	1,353	48	1,353	3,990	252

**PAVEMENT DELINEATION QUANTITIES**

SHEET NUMBER	LINE DESIGNATION	STATION	DIRECTION	THERMOPLASTIC TRAFFIC STRIPE		PAVEMENT MARKER (RETROREFLECTIVE)
				4" YELLOW	WHITE	
				DETAIL 22	DETAIL 27B	TYPE D
				LF	LF	EA
L-1	"R"	9+09 TO 18+54	WB	1,890	672	80
L-2	"R"	98+50 TO 109+00	WB	2,140	681	172
<b>TOTAL</b>				4,030	1,353	252
<b>GRAND TOTAL</b>				5,383		252

**WATER POLLUTION CONTROL QUANTITIES**

SHEET NUMBER	TEMPORARY FIBER ROLL	TEMPORARY SILT FENCE	TEMPORARY CONSTRUCTION ENTRANCE	TEMPORARY COVER	TEMPORARY FENCE (TYPE ESA)
	LF	LF	EA	SQYD	LF
L-1			1		
L-2	1,040	1,040	2	3,800	1,100
<b>TOTAL</b>	1,040	1,040	3	3,800	1,100

**METAL BEAM GUARD RAILING QUANTITIES**

SHEET NUMBER	LINE DESIGNATION	STATION	DIRECTION	METAL BEAM GUARD RAILING QUANTITIES							
				METAL BEAM GUARD RAILING (STEEL POST) (7' POST)	TRANSITION RAILING (TYPE WB)	ALTERNATIVE IN-LINE TERMINAL SYSTEM	ALTERNATIVE FLARE TERMINAL SYSTEM	END CAP (TYPE TC)	REMOVE GUARDRAIL	VEGETATION CONTROL (MINOR CONCRETE)	TREATED WOOD WASTE
				LF	EA	EA	EA	EA	LF	SQYD	LB
L-1	"R"	97+84 TO 103+12	WB	25	2	2		2			61.6
L-2	"R"	97+84 TO 103+12	WB	450	1	1		1			200
L-2	"R"	104+34 TO 106+83	WB	220	1		1	1			94
L-2	"R"	97+87 TO 106+04	WB						820		8,828
<b>TOTAL</b>				695	4	3	1	4	820	355.6	8,828

**ROADWAY QUANTITIES**

SHEET NUMBER	LINE DESIGNATION	STATION	DIRECTION	ROADWAY QUANTITIES								
				ROADWAY EXCAVATION (TYPE DC)	ROADWAY EXCAVATION (TYPE SC)	LEAN CONCRETE BASE	CLASS 3 AGGREGATE BASE	HOT MIX ASPHALT (TYPE A)	TEMPORARY CONSTRUCTION ROADWAY	DEWATERING (TYPE GC)	REMOVE PIPE	
				CY	CY	CY	CY	TON	SQYD	GAL	LF	
L-1	"R"	11+35 TO 13+45	WB									150
L-1	"R"	11+00 TO 13+25	WB	70		18.4	32.6	0.4				
L-2	"R"	103+12 TO 104+34	WB	95		25	44.7	0.6				
L-2	"RW"	0+00 TO 3+78.92	WB									
L-2	"TR"	10+00 TO 19+99	WB		155				1,560	144,000		
<b>TOTAL FROM DQ-1</b>												14.3
<b>GRAND TOTAL</b>				165	155	43.4	77.3	1.0	1,560	144,000		164.3

**SUMMARY OF QUANTITIES Q-1**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	32	76

Rahel Adera 4-9-13  
REGISTERED CIVIL ENGINEER DATE

4-4-16  
PLANS APPROVAL DATE

RAHEL ADERA  
No. C72106  
Exp. 6-30-14  
CIVIL  
STATE OF CALIFORNIA

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	33	76

8-22-14  
LISCENSED LANDSCAPE ARCHITECT

4-4-16  
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:**

UNDERLINED PORTIONS OF BOTANICAL NAME INDICATE ABBREVIATIONS USED ON PLANTING PLANS.

**ABBREVIATIONS:**

- S - SPHAGNUM PEAT MOSS
- N - NITROLIZED FIR BARK
- V - VERMICULITE
- P - PERLITE
- TB - TREE BARK
- WC - WOOD CHIP
- SB - SHREDDED BARK
- TT - TREE TRIMMING

**PLANTING LEGEND**

PLANT GROUP	PLANT No.	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY EACH	HOLE SIZE (INCH)		BASIN TYPE ⑤	SOIL AMENDMENT		IRON SULFATE RATE	COMMERCIAL FERTILIZER ①		BASIN MULCH ①		STAKING	PLANTING LIMITS							REMARKS
							Dia	DEPTH		TYPE	RATE		PLANTING	PLT ESTB	TYPE	CY		MINIMUM DISTANCE (ft) FROM					ON CENTER (ft)		
												ETW	Pvmt	FENCE	WALL	PAVED DITCH		EARTH DITCH							
A	1		<u>PLATANUS RACEMOSA</u>	CALIFORNIA SYCAMORE	No. 1	50	③	③	II	--	--	--	1 Pkt	--	TB	0.05	--	--	--	--	--	--	--	--	TREE ⑥
	2		<u>POPULUS BALSAMIFERA TRICHOCARPA</u>	BLACK COTTONWOOD	No. 1	150	③	③	II	--	--	--	1 Pkt	--	TB	0.05	--	--	--	--	--	--	--	--	TREE ⑥
H	3		<u>SALIX LASIOPEPIS</u>	ARROYO WILLOW	CUTTING	200	④	④	④	--	--	--	1 Pkt	--		--	--	--	--	--	--	--	--	--	TREE ④ ⑥
	4		<u>SALIX NIGRA</u>	BLACK WILLOW	CUTTING	200	④	④	④	--	--	--	1 Pkt	--		--	--	--	--	--	--	--	--	--	TREE ④ ⑥
	5		<u>SALIX EXIGUA</u>	SANDBAR WILLOW	CUTTING	200	④	④	④	--	--	--	1 Pkt	--		--	--	--	--	--	--	--	--	--	TREE ④ ⑥

**EROSION CONTROL QUANTITIES**

**APPLICABLE WHEN CIRCLED:**

- ① - QUANTITIES SHOWN ARE "PER PLANT" UNLESS SHOWN AS SQFT OR SOYD APPLICATION RATES
- 2 - BASIN MULCH IS INCLUDED WITH MULCH QUANTITIES SHOWN ON PLANTING PLAN
- ③ - SUFFICIENT TO RECEIVE ROOT BALL AND AMENDMENTS IF REQUIRED
- ④ - SEE DETAIL
- ⑤ - SEE STANDARD PLAN
- ⑥ - TREES MUST BE PLANTED IN GROUP OF 4 TO 6 PER GROUP PER 100 SQFT. DO NOT MIX SPECIES WITHIN A GROUP. PLANT GROUP MUST BE ALTERNATE AND UNIFORMLY SPACED THROUGHOUT THE PROJECT LIMIT.

SHEET	EROSION CONTROL LOCATION NUMBER	DESCRIPTION	COMPOST	HYDROSEED	HYDROMULCH
			SQFT	SQFT	SQFT
PP-1	1	EC TYPE 1	6,000	6,000	6,000
	2	EC TYPE 1	18,000	18,000	18,000
	3	EC TYPE 1	8,000	8,000	8,000
TOTAL			32,000	32,000	32,000

**EROSTION CONTROL TYPE 1**

SEQUENCE	ITEM	MATERIAL		APPLICATION RATE
		DESCRIPTION	TYPE	
STEP 1	COMPOST	COMPOST	MEDIUM	130 CY/ACRE
STEP 2	HYDROSEED	SEED	MIX 1	15 LB/ACRE
		FIBER	WOOD	500 LB/ACRE
STEP 3	HYDROMULCH	FIBER	WOOD	1500 LB/ACRE
		TACKIFIER	GUAR	125 LB/ACRE

**SEED MIX**

SEED	BOTANICAL NAME (COMMON NAME)	PERCENT GERMINATION (MINIMUM)	POUNDS PURE LIVE SEED PER ACRE (SLOPE MEASUREMENT)
MIX 1	ARTEMISIA DOUGLASIANA <sup>1</sup> (MUGWORT)	50	.75
	ARTEMISIA CALIFORNICA <sup>1</sup> (CALIFORNIA SAGEBRUSH)	50	1
	ERIOGONUM FASCICULATUM <sup>1</sup> (CALIFORNIA BUCKWHEAT)	5	1.5
	HETEROMELES ARBUTIFOLIA <sup>1</sup> (TOYON)	40	3
	SAMBUCUS MEXICANA <sup>1</sup> (MEXICAN ELDERBERRY)	20	.75
	MUHLENBERGIA RIGENS <sup>1</sup> (DEER GRASS)	60	8

<sup>1</sup>SEED PRODUCED IN CALIFORNIA ONLY.

**WOOD MULCH QUANTITIES**

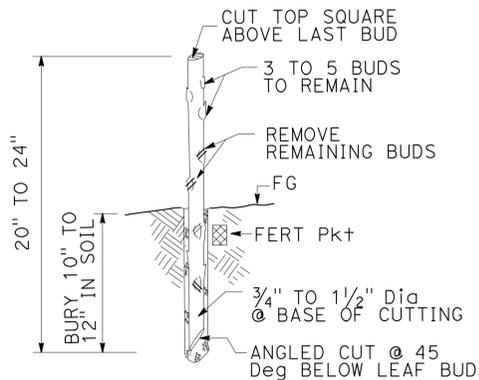
SHEET	BASIN MULCH (TREE BARK)
	CY
PL-1	10
TOTAL	10

**PLANT QUANTITIES**

ITEM	UNIT	QUANTITY
PLANT (GROUP A)	EA	200
PLANT (GROUP H)	EA	600

**PLANT LEGEND**

**PL-1**



SECTION  
**WILLOW CUTTING**  
NO SCALE



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	34	76

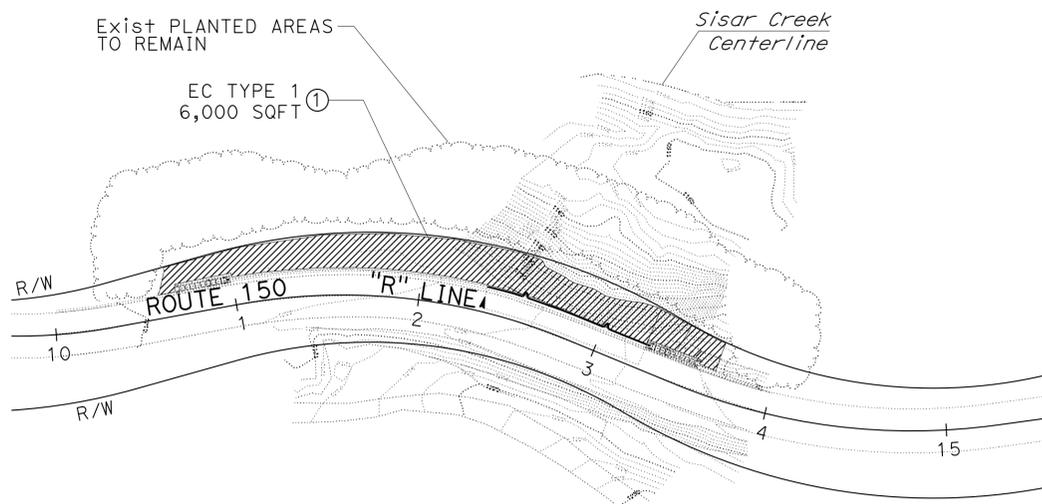
8-22-14  
 LICENSED LANDSCAPE ARCHITECT  
 4-4-16  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

**NOTES:**

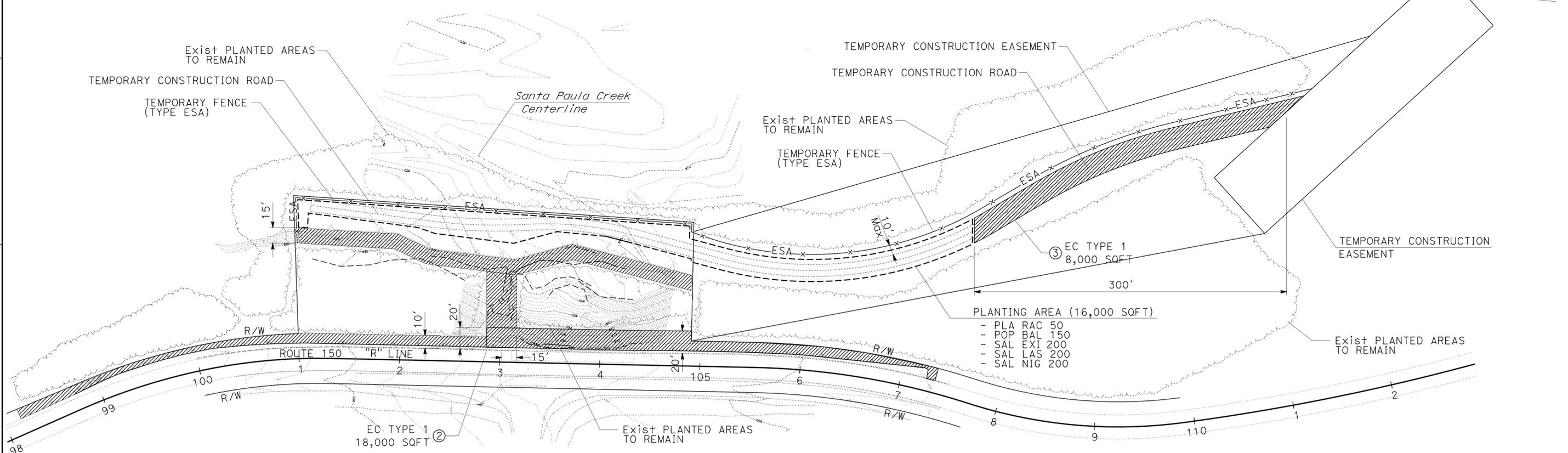
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- EXISTING UTILITY FACILITIES ARE NOT SHOWN ON THESE PLANS.

**LEGEND:**

-  EROSION CONTROL (EC) TYPE 1
-  PLANTING AREA TEMPORARY IRRIGATION SYSTEMS
-  TEMPORARY FENCE (TYPE ESA)
-  Exist PLANTED AREAS TO REMAIN



**LOCATION 1 (PM 27.4)**



**LOCATION 2 (PM 29.4)**

**PLANTING PLANS**

SCALE: 1" = 50'

**PP-1**

APPROVED FOR PLANTING WORK ONLY



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans** LANDSCAPE ARCHITECTURE  
 SENIOR LANDSCAPE ARCHITECT  
 DUC T. TRINH  
 REVISOR  
 PATTY WATANABE  
 CHECKED BY  
 PATTY WATANABE  
 DATE REVISOR

LAST REVISION => 05-APR-2016  
 DATE PLOTTED => 08:17  
 12-15-14 TIME PLOTTED => 08:17

	<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
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
Tel	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
WWLLOL	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
07	Ven	150	27.4, 29.4	35	76
 REGISTERED CIVIL 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 4-4-16

**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
kip	1,000 POUNDS
cal	CALORIE
ft	FOOT OR FEET
gal	GALLON

\* For use on a sign panel only

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**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.

**REVISED STANDARD PLAN RSP A10B**

2010 REVISED STANDARD PLAN RSP A10B

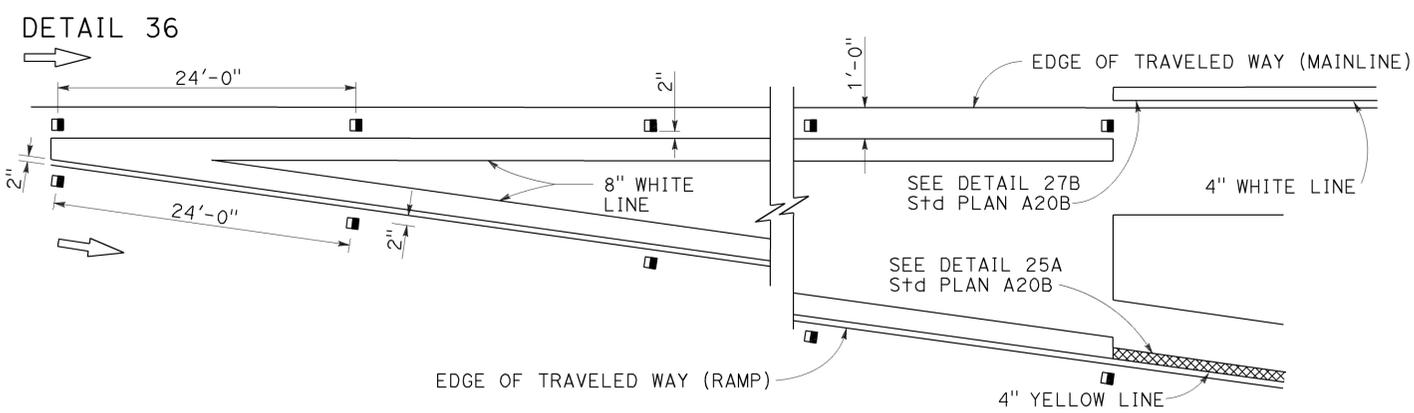
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	36	76

REGISTERED CIVIL ENGINEER  
 Roberta L. McLaughlin  
 No. C40375  
 Exp. 3-31-15  
 CIVIL  
 STATE OF CALIFORNIA

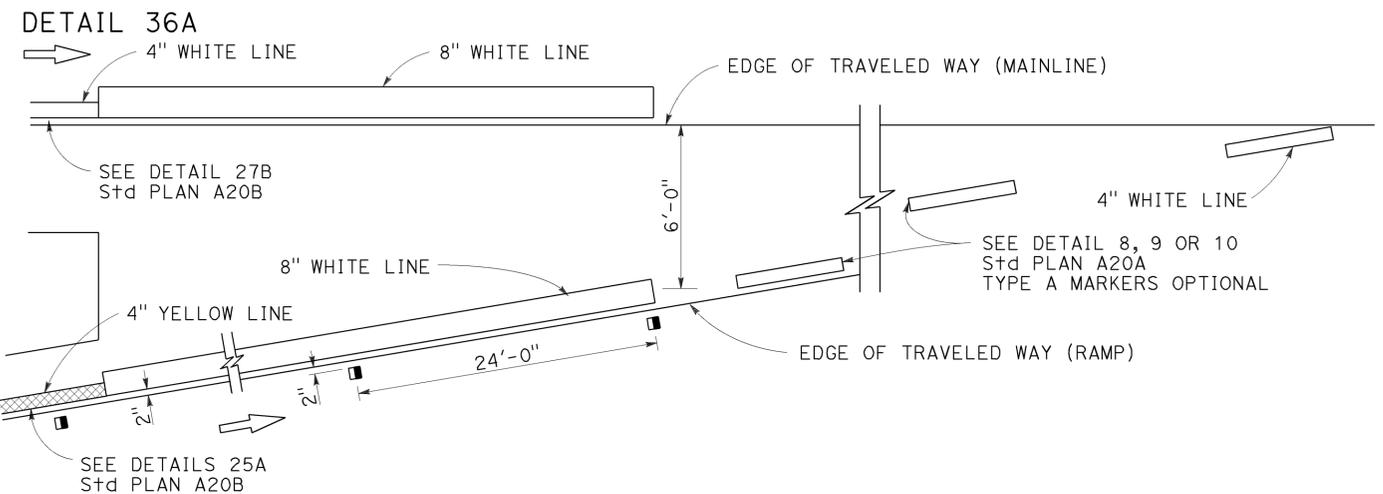
July 19, 2013  
 PLANS APPROVAL DATE

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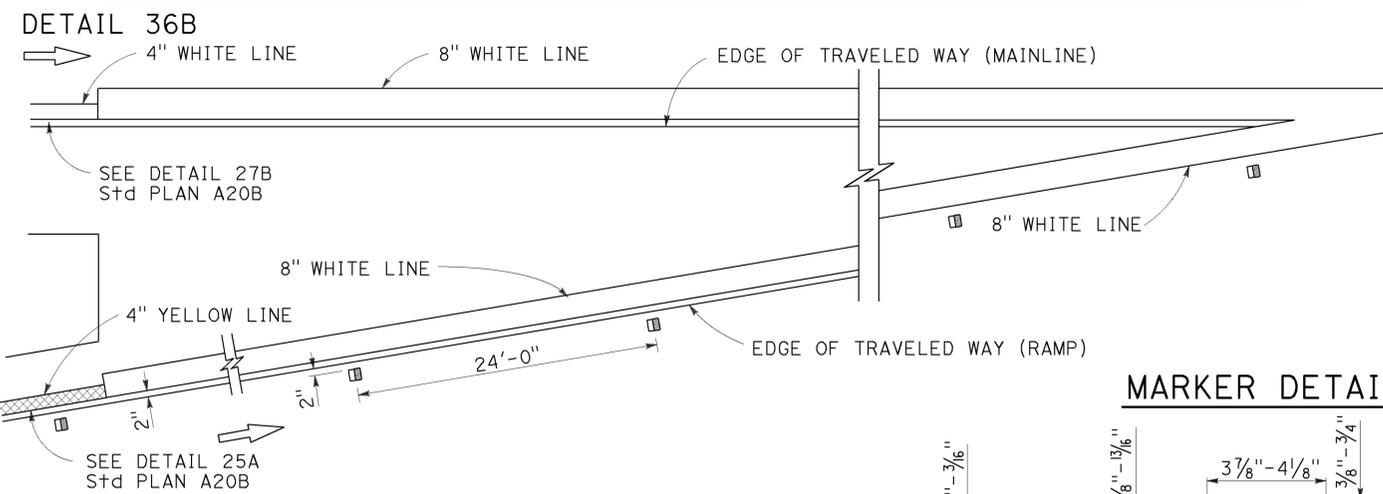
### EXIT RAMP NEUTRAL AREA (GORE) TREATMENT



### ENTRANCE RAMP NEUTRAL AREA (MERGE) TREATMENT

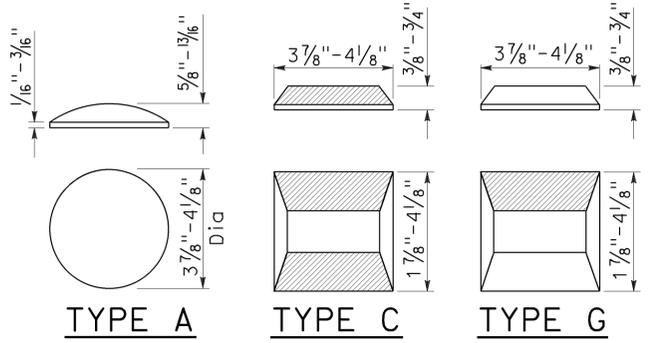


### ENTRANCE RAMP NEUTRAL AREA (ACCELERATION LANE) TREATMENT



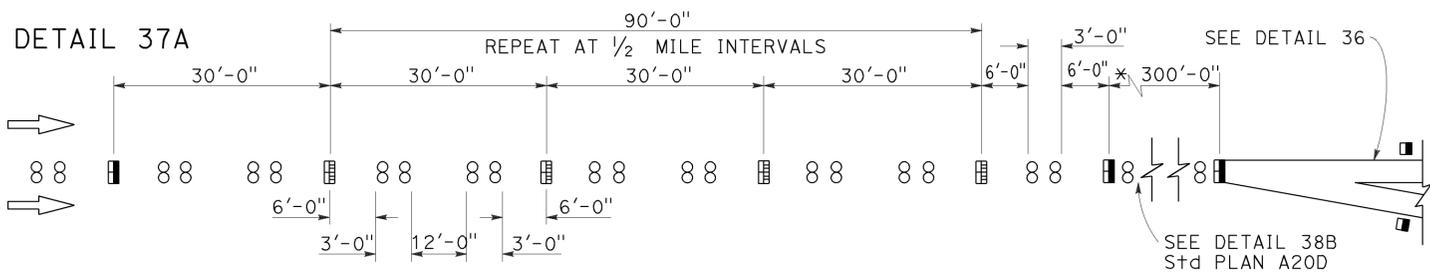
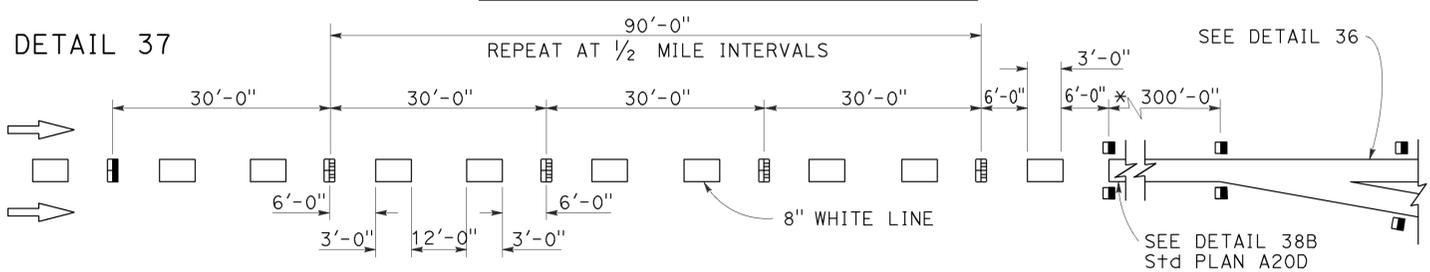
### MARKER DETAILS

- LEGEND:**
- MARKERS**
- TYPE A WHITE NON-REFLECTIVE
  - ◻ TYPE C RED-CLEAR RETROREFLECTIVE
  - TYPE G ONE-WAY CLEAR RETROREFLECTIVE



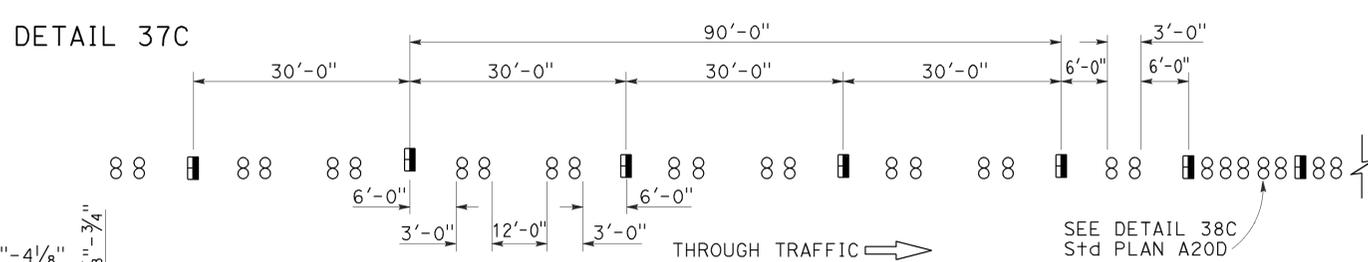
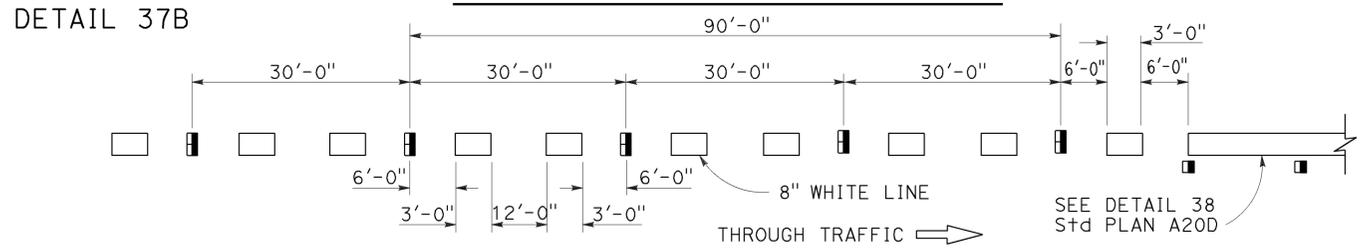
RETROREFLECTIVE FACE

### LANE DROP AT EXIT RAMP



\* The solid channelizing line shown may be omitted on short auxiliary lanes where weaving length is critical.

### LANE DROP AT INTERSECTIONS



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## PAVEMENT MARKERS AND TRAFFIC LINE TYPICAL DETAILS

NO SCALE

RSP A20C DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN A20C DATED MAY 20, 2011 - PAGE 11 OF THE STANDARD PLANS BOOK DATED 2010.

## REVISED STANDARD PLAN RSP A20C

2010 REVISED STANDARD PLAN RSP A20C

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	37	76

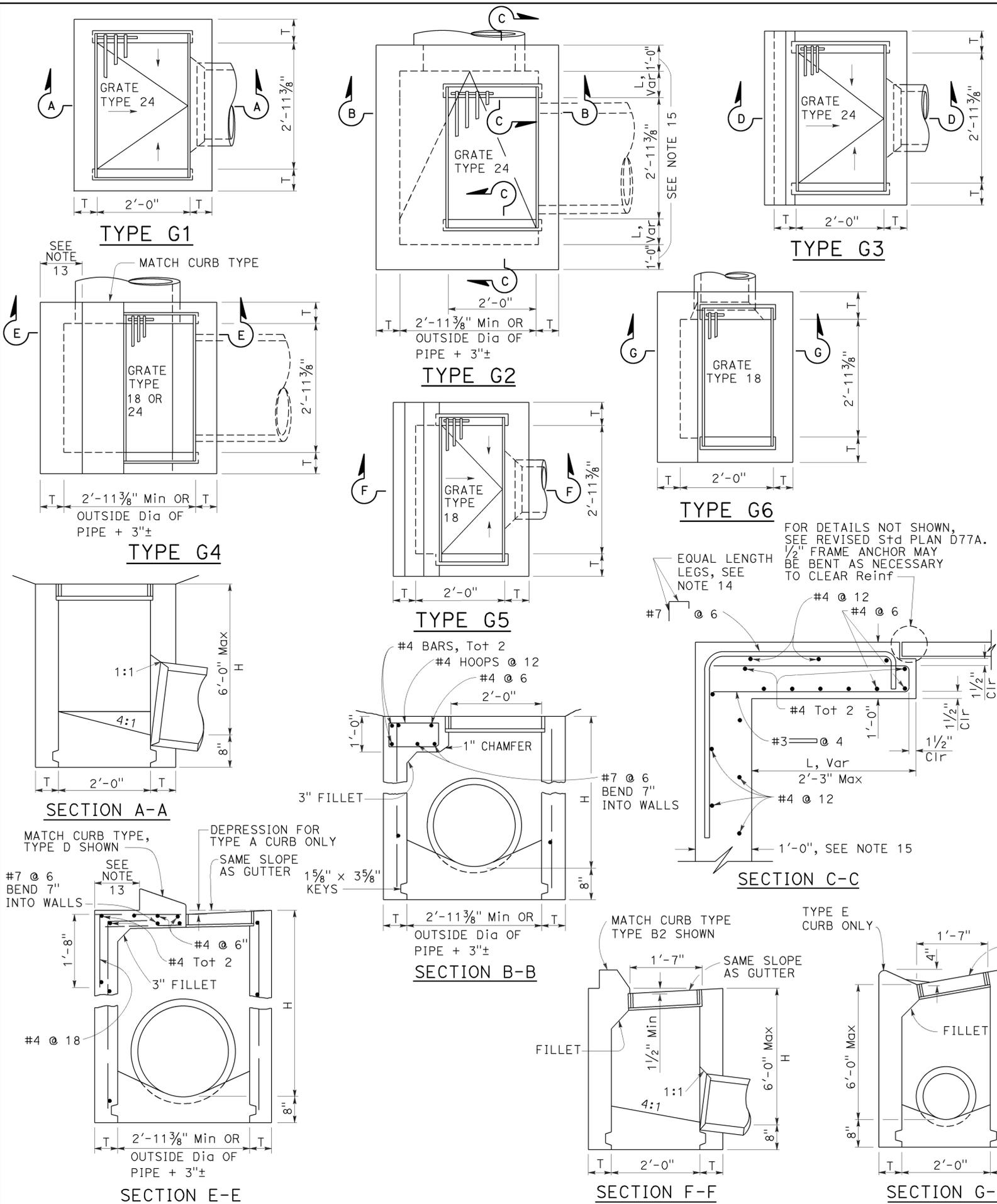
Glenn DeCou  
REGISTERED CIVIL ENGINEER

October 19, 2012  
PLANS APPROVAL DATE

Glenn DeCou  
No. C34547  
Exp. 9-30-13  
CIVIL  
STATE OF CALIFORNIA

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2010 REVISED STANDARD PLAN RSP D73



- NOTES:**
- "H" is the difference in elevation between the outlet pipe flow line and the normal gutter grade line undepressed.
  - For "T" wall thickness, see Table A below.
  - Wall reinforcing not required when "H" is 8'-0" or less and the unsupported width or length is 7'-0" or less. Walls exceeding these limits shall be reinforced with #4 bars @ 1'-6" ± centers placed 1 1/2" clear to inside of box unless otherwise shown.
  - Inlet bottom reinforcing not required. See Standard Plan D74C for alternative reinforced bottom and alternative half round bottom.
  - Steps-None required where "H" is less than 2'-6". Where "H" is 2'-6" or more, install steps with lowest rung 1'-0" above the floor and highest rung not more than 6" below top of inlet. The distance between steps shall not exceed 1'-0" and shall be uniform throughout the length of the wall. Place steps in the wall without an opening. Steps inserts may be substituted for the bar steps. Step inserts shall comply with State Industrial Safety requirements. See Standard Plan D74C for step details.
  - Details shown apply to both metal and concrete pipe.
  - Pipe(s) can be placed in any wall.
  - Curb section shall match adjacent curb.
  - Basin floors shall have wood trowel finish and a minimum slope of 12:3 from all directions toward outlet pipe.
  - Set inlet so that grate bars are parallel to direction of principal surface flow.
  - See Revised Standard Plans D77A and D77B for grate and frame details and weights of miscellaneous iron and steel.
  - See Standard Plan D78A for gutter depression details.
  - This dimension will vary with different grates, curbs types, box width and wall thickness.
  - Bar may be rotated as necessary to clear opening. Where "L" is 6" or less, bar may be omitted.
  - Where "L" is 6" or less, wall thickness shall be as shown in Table A.
  - Cast-in-place inlets to be formed around all pipes/stubs intersecting the inlet, and concrete poured in one continuous operation. Precast inlets shall have mortared connections conforming to details for Type GCP Inlet shown on Standard Plan D75B. See Standard Specifications for mortar composition.

**TABLE A**

**CONCRETE QUANTITIES**

TYPE	H=3'-0" TO 8'-0" (T=6")		H=8'-1" TO 20'-0" (T=8")	
	H=3'-0" (CY)	ADDITIONAL PCC PER FOOT (CY)	H=8'-1" (CY)	ADDITIONAL PCC PER FOOT (CY)
G-1	0.95	0.220	See Note A	SEE NOTE A
G-2*	1.31	0.255	3.50	0.357
G-3	1.03	0.220	See Note A	SEE NOTE A
G-4* (TYPE 24)	1.27	0.255	3.48	0.357
G-4* (TYPE 18)	1.30	0.255	3.50	0.357
G-5	1.02	0.220	SEE NOTE A	SEE NOTE A
G-6	1.04	0.220	SEE NOTE A	SEE NOTE A

TABLE BASED ON 8" FLOOR SLAB. NO DEDUCTIONS ARE TO BE MADE TO THESE QUANTITIES BECAUSE OF PIPE OPENINGS, DIFFERENT FLOOR ALTERNATIVES OR DIFFERENT CURB TYPES. \* QUANTITIES FOR TYPE G-2 AND G-4 INLETS BASED ON THE MINIMUM INTERIOR DIMENSIONS.

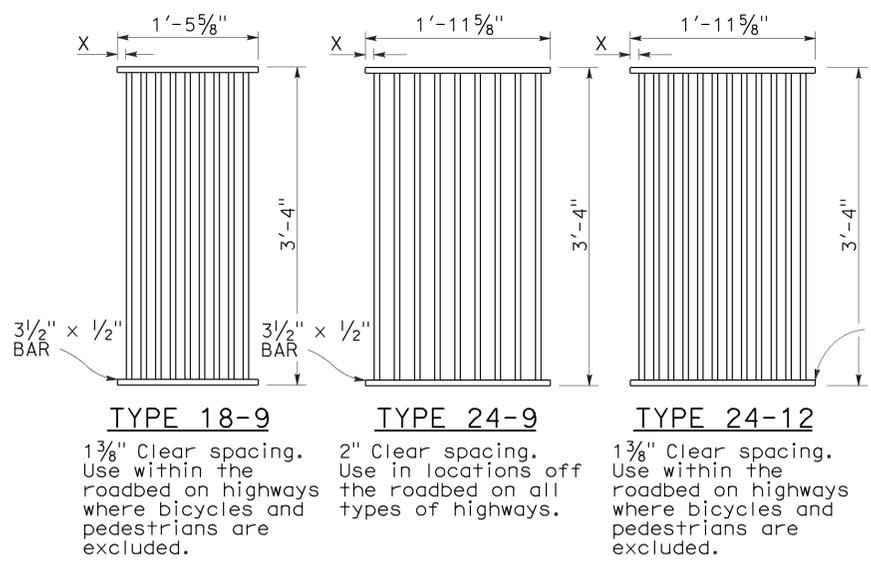
**NOTE A:**  
Maximum allowable height 6'-0".

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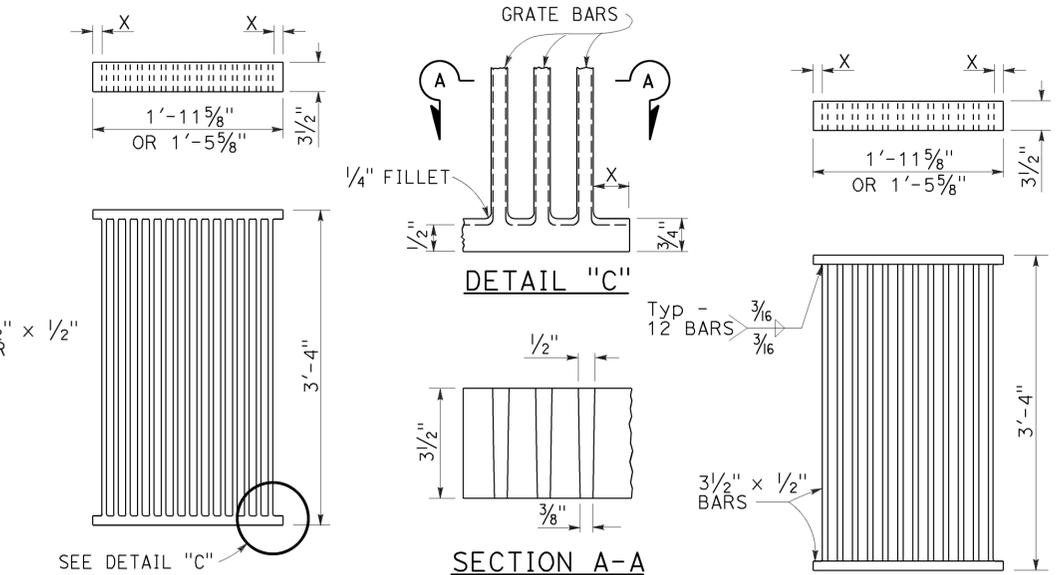
**DRAINAGE INLETS**  
NO SCALE

RSP D73 DATED OCTOBER 19, 2012 SUPERSEDES STANDARD PLAN D73 DATED MAY 20, 2011 - PAGE 156 OF THE STANDARD PLANS BOOK DATED 2010.

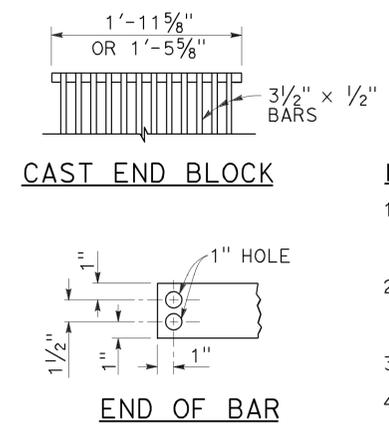
**REVISED STANDARD PLAN RSP D73**



**RECTANGULAR GRATE DETAILS**  
(See table below)

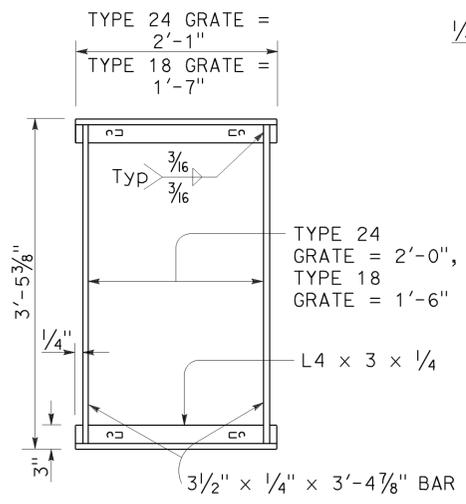


**ALTERNATIVE CAST DUCTILE IRON GRATE OR CAST CARBON STEEL GRATE**  
**ALTERNATIVE WELDED GRATE**

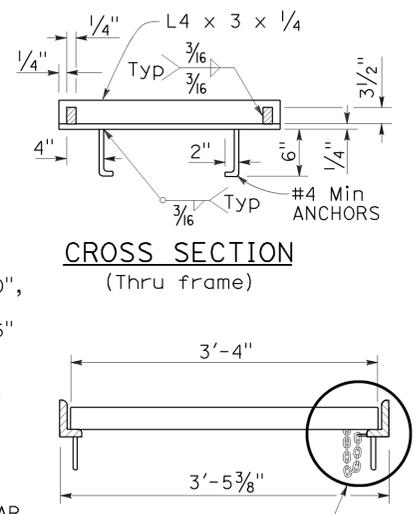


**CAST END BLOCK**  
**END OF BAR**

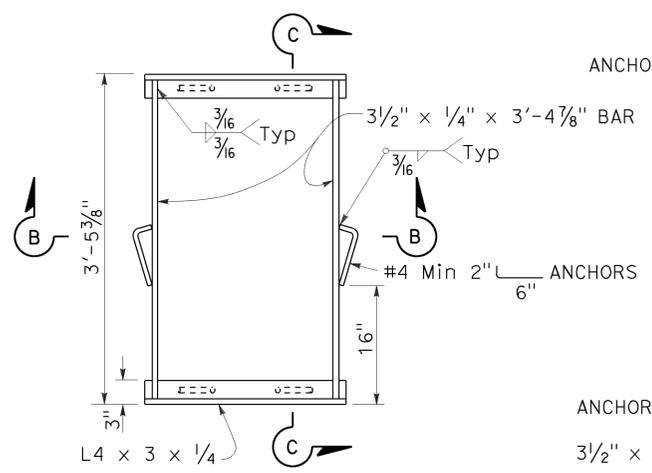
- NOTES:**
1. Grate type numbers refer to approximate width of grate in inches and number of bars, respectively.
  2. Contractor has the option of using cast ductile iron, cast carbon steel, welded, bolted, or cast end block grate.
  3. Rounded top of bars optional on all grates.
  4. Pipe inlets with a grate shall be placed so that bars parallel direction of principle surface flow.
  5. Complete joint penetration butt welds may be substituted for the fillet welds on all anchors.
  6. Standard square, hexagon, round or equivalent headed anchors may be substituted for the right angle hooks on the anchors shown on this plan.
  7. Grate and frame weights are based on welded grates (weights of face angles, steps, protection bars, etc. are not included).
  8. Connect chain to grate and frame only at locations shown on the plans. When chain is required, do not use cast ductile iron grates.



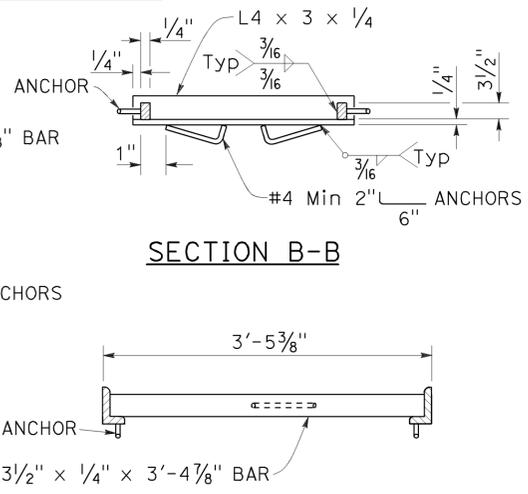
**TYPICAL FRAME**



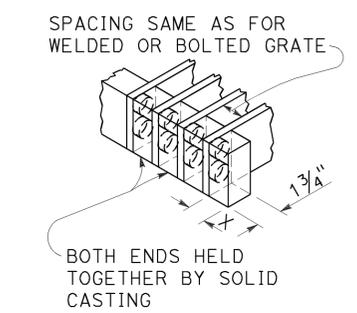
**CROSS SECTION (Thru frame)**  
**LONGITUDINAL SECTION (Thru frame and grate)**



**TYPICAL FRAME**  
**ALTERNATIVE ANCHOR FOR RECTANGULAR FRAME**  
(For details not shown, See Rectangular Frame Details)



**SECTION B-B**  
**SECTION C-C**



**ALTERNATIVE CAST DUCTILE IRON OR CAST CARBON STEEL END BLOCK GRATE**

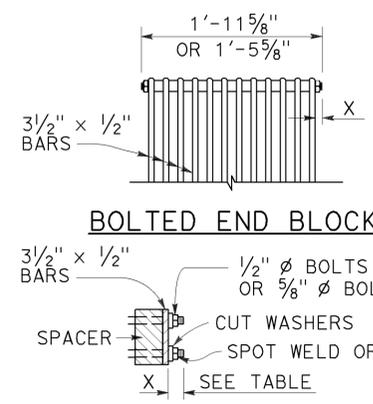
**RECTANGULAR FRAME DETAILS**  
(For all rectangular grates)

**GRATE BAR SPACING TABLE**

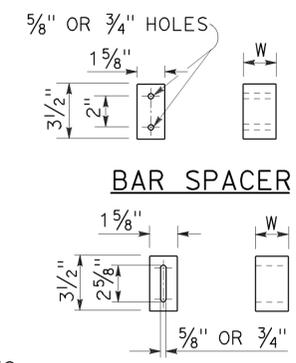
TYPE	NO. OF BARS	CLEAR BAR SPACING	X
18-9	9	1 3/8"	1 1/16"
24-9	9	2"	1 9/16"
24-12	12	1 3/8"	1 1/4"

INLET TYPE	COVER TYPE	WEIGHT LB
OS	PLATE	174
OL-7	PLATE	170
OL-10	PLATE	170
OL-14	PLATE	170
OL-21	PLATE	170
OCPI	PLATE	112
OCPI	PLATE	112
OCPI	REDWOOD	42
OMP	PLATE	177
OMPI	PLATE	177

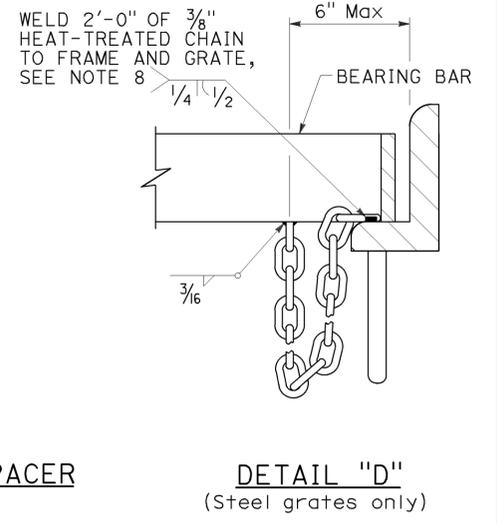
INLET TYPE	GRATE TYPE	NO. OF GRATES	WEIGHT LB
GDO	24-12	2	634
GOL-7	24-12	1	326
GOL-10	24-12	1	326
G0,G1,G2,G3,G4 (TYPE 24)	24-9	1	263
	24-12	1	326
G4 (TYPE 18),G5,G6	18-9	1	249
GT1	18-9	2	498
GT2	18-9	2	498
GT3	24-12	2	652
GT4	24-12	2	652
TRASH RACK			22
GRATE CHAIN			3



**BOLTED END BLOCK**  
**BOLTING DETAIL**  
**ALTERNATIVE BOLTED GRATE**



**ALTERNATIVE SPACER**  
W = 1 3/8" or 2"



**DETAIL "D"**  
(Steel grates only)

**GRATE DETAILS No. 1**  
NO SCALE

**BASIS FOR MISC IRON & STEEL FINAL PAY WEIGHTS FOR DRAINAGE INLETS**  
(See Note 7)

RSP D77A DATED APRIL 19, 2013 SUPERSEDES RSP D77A DATED JULY 20, 2012 AND STANDARD PLAN D77A DATED MAY 20, 2011 - PAGE 164 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP D77A**

2010 REVISED STANDARD PLAN RSP D77A

*Gregory A. Balzer*  
 LICENSED LANDSCAPE ARCHITECT

July 19, 2013  
 PLANS APPROVAL DATE

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TO ACCOMPANY PLANS DATED 4-4-16

2010 REVISED STANDARD PLAN RSP H1

**A**

AB AGGREGATE BASE  
 ABS ACRYLONITRILE-BUTADIENE-STYRENE  
 AC ASPHALT CONCRETE  
 ACC ARMOR-CLAD CONDUCTORS  
 Adj ADJACENT/ADJUSTABLE  
 AIC AUXILIARY IRRIGATION CONTROLLER  
 Alt ALTERNATIVE  
 AMEND AMENDMENT  
 ARV AIR RELEASE VALVE  
 AUTO AUTOMATIC  
 AUX AUXILIARY  
 AVB ATMOSPHERIC VACUUM BREAKER

**B**

B&B BALLED AND BURLAPPED  
 B/B BRASS/BRONZE  
 B/B/PL BRASS/BRONZE/PLASTIC  
 B/PL BRASS/PLASTIC  
 BFM BONDED FIBER MATRIX  
 Bit Ctd BITUMINOUS COATED  
 BP BOOSTER PUMP  
 BPA BACKFLOW PREVENTER ASSEMBLY  
 BPE BACKFLOW PREVENTER ENCLOSURE  
 BV BALL VALVE

**C**

C CONDUIT  
 CAP CORRUGATED ALUMINUM PIPE  
 CARV COMBINATION AIR RELEASE VALVE  
 CB COUPLING BAND  
 CCA CAM COUPLER ASSEMBLY  
 CEC CONTROLLER ENCLOSURE CABINET  
 CHDPE CORRUGATED HIGH DENSITY POLYETHYLENE  
 CL CHAIN LINK  
 CNC CONTROL AND NEUTRAL CONDUCTORS  
 Conc CONCRETE  
 CP COPPER PIPE  
 CS COMPOST SOCK  
 CSP CORRUGATED STEEL PIPE  
 CST CENTER STRIP  
 CV CHECK VALVE

**D**

Dia DIAMETER  
 DIP DUCTILE IRON PIPE  
 DIT DRIP IRRIGATION TUBING  
 DG DECOMPOSED GRANITE  
 DN DIAMETER NOMINAL  
 DVA DRIP VALVE ASSEMBLY

**E**

EC EROSION CONTROL  
 ECTC EROSION CONTROL TECHNOLOGY COUNCIL  
 Elect ELECTRIC/ELECTRICAL  
 Elev ELEVATION  
 ELL ELBOW  
 ENCL ENCLOSURE  
 EP EDGE OF PAVEMENT  
 ES EDGE OF SHOULDER  
 EST END STRIP  
 ESTB ESTABLISHMENT  
 ETW EDGE OF TRAVELED WAY

**F**

F FULL CIRCLE  
 F/P FULL/PART CIRCLE  
 FCV FLOW CONTROL VALVE  
 FERT FERTILIZER  
 FG FINISHED GRADE  
 FH FLEXIBLE HOSE  
 FIPT FEMALE IRON PIPE THREAD  
 FIS FERTILIZER INJECTOR SYSTEM  
 FL FLOW LINE  
 FR FIBER ROLL  
 FS FLOW SENSOR  
 FSC FLOW SENSOR CABLE  
 FV FLUSH VALVE

**G**

Galv GALVANIZED  
 GARV GARDEN VALVE  
 GARVA GARDEN VALVE ASSEMBLY  
 GM GRAVEL MULCH  
 GPH GALLONS PER HOUR  
 GPM GALLONS PER MINUTE  
 GSP GALVANIZED STEEL PIPE  
 GV GATE VALVE

**H**

H HALF CIRCLE  
 HDPE HIGH DENSITY POLYETHYLENE  
 HP HORSEPOWER/HINGE POINT  
 HPL HIGH PRESSURE LINE  
 Hwy HIGHWAY

**I**

IC IRRIGATION CONTROLLER  
 ICC IRRIGATION CONTROLLER(S) IN CONTROLLER ENCLOSURE CABINET  
 ID INSIDE DIAMETER  
 IFS IRRIGATION FILTRATION SYSTEM  
 IPS IRON PIPE SIZE  
 IPT IRON PIPE THREAD  
 Irr IRRIGATION

**L**

L LENGTH

**M**

Max MAXIMUM  
 MBGR METAL BEAM GUARD RAILING  
 MCV MANUAL CONTROL VALVE  
 MIC MASTER IRRIGATION CONTROLLER  
 Min MINIMUM  
 MIPT MALE IRON PIPE THREAD  
 Misc MISCELLANEOUS  
 MtI MATERIAL  
 MVP MAINTENANCE VEHICLE PULLOUT

**N**

NCN NO COMMON NAME  
 NL NOZZLE LINE  
 No. NUMBER  
 NPT NATIONAL PIPE THREAD

**O**

O/C ON CENTER  
 OD OUTSIDE DIAMETER  
 OL OVERLAP

**P**

P PART CIRCLE  
 PB PULL BOX  
 PCC PORTLAND CEMENT CONCRETE  
 PE POLYETHYLENE  
 Pkt+ PACKET  
 PL PLASTIC  
 PLS PURE LIVE SEED  
 PLT PLANT/PLANTING  
 PLT ESTB PLANT ESTABLISHMENT  
 PM POST MILE  
 PR PRESSURE RATED  
 PRLV PRESSURE RELIEF VALVE  
 PRV PRESSURE REGULATING VALVE  
 PVC POLYVINYL CHLORIDE  
 Pvm+ PAVEMENT

**Q**

Q QUARTER CIRCLE  
 QCV QUICK COUPLING VALVE

**NOTE:**  
 For additional abbreviations, see Standard Plans A10A and A10B.

**R**

R RADIUS  
 RCP REINFORCED CONCRETE PIPE  
 RCV REMOTE CONTROL VALVE  
 RCVM REMOTE CONTROL VALVE (MASTER)  
 RCVMF REMOTE CONTROL VALVE (MASTER) W/FLOW SENSOR  
 RCVP REMOTE CONTROL VALVE W/PRESSURE REGULATOR  
 RCW RECYCLED WATER  
 RECP ROLLED EROSION CONTROL PRODUCT  
 REQ REQUIRED  
 RICS REMOTE IRRIGATION CONTROL SYSTEM  
 R/W RIGHT OF WAY

**S**

S SLIP  
 SCH SCHEDULE  
 SF STATE-FURNISHED  
 Shld SHOULDER  
 Sq SQUARE  
 SST SIDE STRIP  
 Sta STATION  
 Std STANDARD  
 SW SIDEWALK/SOUND WALL

**T**

T THIRD CIRCLE/THREAD  
 TLS TRUCK LOADING STANDPIPE  
 TQ THREE QUARTER CIRCLE  
 TRM TURF REINFORCEMENT MAT  
 TT TWO-THIRDS CIRCLE  
 TWSA TREE WELL SPRINKLER ASSEMBLY  
 Typ TYPICAL

**U**

UG UNDERGROUND

**W**

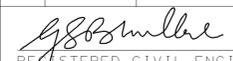
W WIDTH  
 W/ WITH  
 WM WATER METER  
 WS WYE STRAINER  
 WSA WYE STRAINER ASSEMBLY  
 WSP WELDED STEEL PIPE  
 WWM WELDED WIRE MESH

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE AND EROSION CONTROL ABBREVIATIONS**  
 NO SCALE

RSP H1 DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN H1 DATED MAY 20, 2011 - PAGE 218 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP H1**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	40	76

  
 REGISTERED CIVIL 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 4-4-16

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
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

**NOTES:**

See Revised Standard Plan RSP T9 for tables.

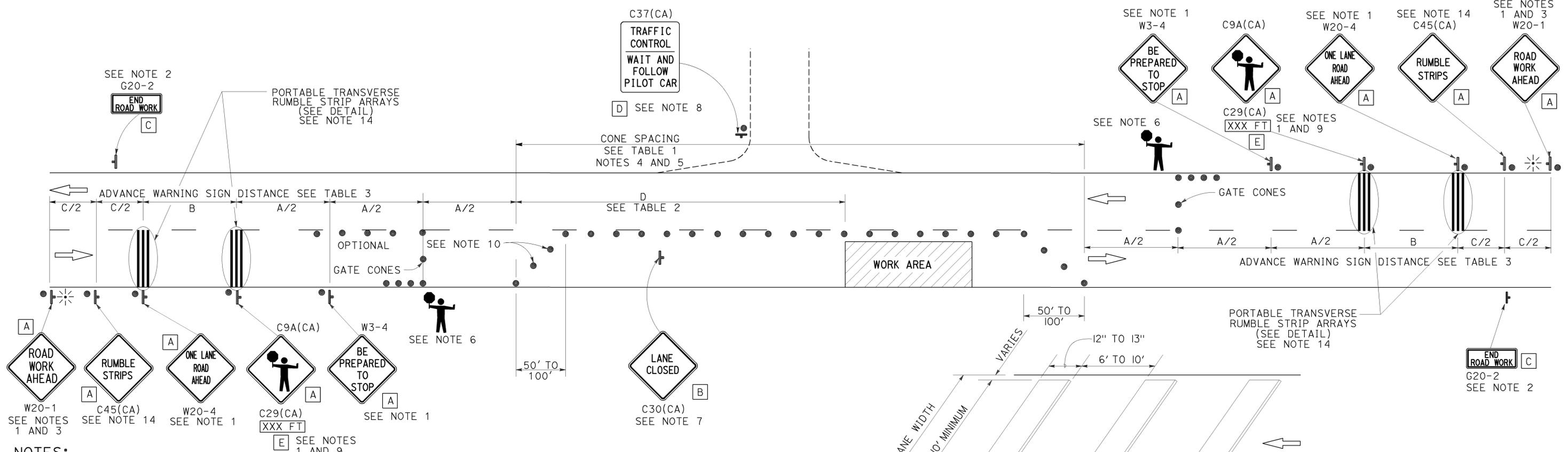
Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

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.

**TYPICAL LANE CLOSURE WITH REVERSIBLE CONTROL**

TO ACCOMPANY PLANS DATED 4-4-16



- NOTES:**
- Each advance warning sign in each direction of travel 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, as appropriate, shall be placed at the end of the lane control 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 W20-4 sign for the first advance warning sign.
  - 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.
  - Additional advance flaggers may be required. Flagger should stand in a conspicuous place, be visible to approaching traffic as well as approaching vehicles after the first vehicle has stopped. During the hours of darkness, the flagging-station and flagger shall be illuminated and clearly visible to approaching traffic. The illumination footprint of the lighting on the ground shall be at least 20' in diameter. Place a minimum of four cones at 50' intervals in advance of flagger station as shown.

- Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work areas. They are optional if the work area is visible from the flagger station.
- When a pilot car is used, place a C37(CA) "TRAFFIC CONTROL-WAIT AND FOLLOW PILOT CAR" sign with black legend on white background at all intersections, driveways and alleys without a flagger within traffic control area. Signs shall be clean and visible at all times. Where traffic can not be effectively self-regulated, at least one flagger shall be used at each intersection within traffic control area.
- An optional C29(CA) sign may be placed below the C9A(CA) sign.
- Either traffic cones or barricades shall be placed on the taper. Barricades shall be Type I, II, or III.
- The color of the portable transverse rumble strips shall be black or orange. Use 2 arrays, each array shall consist of 3 rumble strips.
- Portable transverse rumble strips shall not be placed on sharp horizontal or vertical curves nor shall they be placed through pedestrian crossings.
- If the portable transverse rumble strips become out of alignment (skewed) by more than 6 inches, measured from one end to the other, they shall be readjusted to bring the placement back to the original location.
- Portable transverse rumble strips are not required if any one of the following conditions is satisfied:
  - Work duration occupies a location for four hours or less
  - Posted speed limit is below 45 MPH
  - Work is of emergency nature
  - Work zone is in snow or icy weather conditions

**LEGEND**

- TRAFFIC CONE
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⚡ PORTABLE FLASHING BEACON
- 🚧 FLAGGER

**PORTABLE TRANSVERSE RUMBLE STRIP ARRAY DETAIL**

LANE WIDTH 10' MINIMUM

VARIES

50' TO 100'

12" TO 13"

6' TO 10'

5/8" TO 3/4"

**SIGN PANEL SIZE (Min)**

A	48" x 48"
B	30" x 30"
C	36" x 18"
D	36" x 42"
E	20" x 7"

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TRAFFIC CONTROL SYSTEM  
FOR LANE CLOSURE ON  
TWO LANE CONVENTIONAL  
HIGHWAYS**

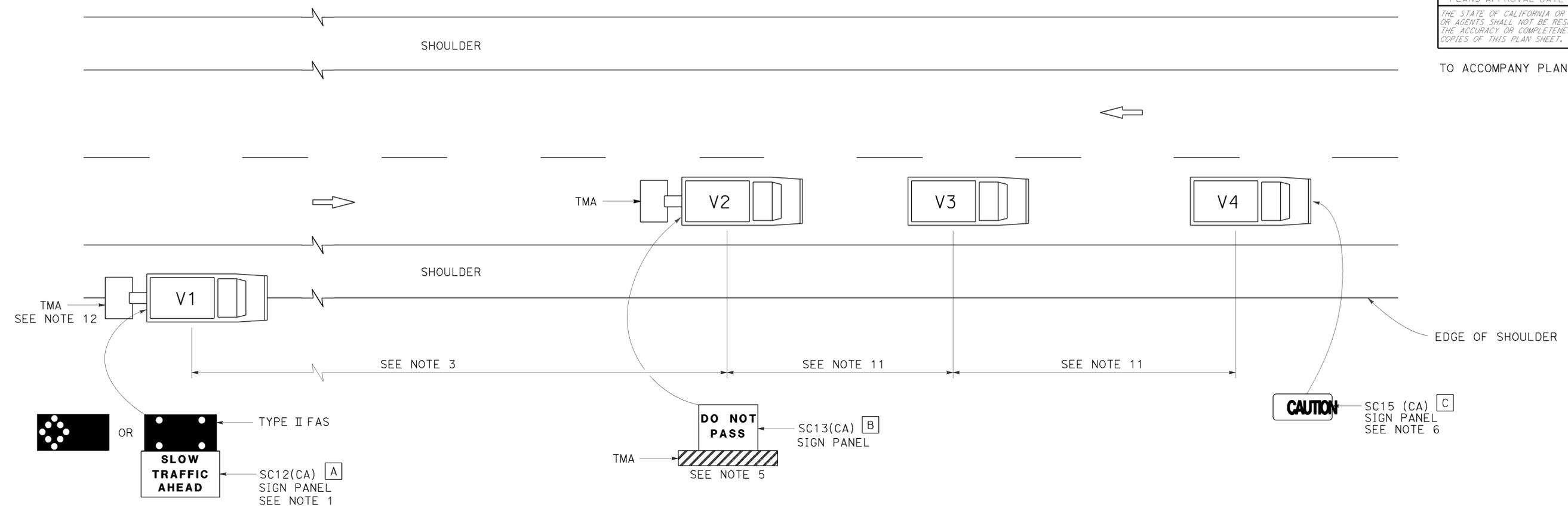
NO SCALE

RSP T13 DATED OCTOBER 30, 2015 SUPERSEDES  
RSP T13 DATED OCTOBER 17, 2014, RSP T13 DATED JULY 18, 2014  
AND RSP T13 DATED APRIL 19, 2013 AND STANDARD PLAN T13 DATED  
MAY 20, 2011 - PAGE 241 OF THE STANDARD PLANS BOOK DATED 2010.

2010 REVISED STANDARD PLAN RSP T13



TO ACCOMPANY PLANS DATED 4-4-16



**NOTES:**

1. Either a changeable message sign or a SC12(CA) "SLOW TRAFFIC AHEAD" sign shall be mounted on the rear of sign vehicle V1. The changeable message sign shall be sequenced to show the "CAUTION" message first, follow by the "SLOW TRAFFIC AHEAD" message. A Type II flashing arrow sign may be used with the SC12(CA) sign panel.
2. Sign vehicle V1 should be positioned where highly visible when shoulders are not available.
3. If traffic queues develop, sign vehicle V1 should be positioned upstream from the end of queue.
4. Vehicle-mounted sign panels shall have Type III or above retroreflective sheeting, black on white, or black on fluorescent orange, with 6" minimum series D letters per Caltrans sign specifications.
5. Shadow vehicle shall be equipped with a truck-mounted attenuator. The sign panel shown shall be mounted on the rear of shadow vehicle V2. The message "LANE CLOSED" may be used in place of the "DO NOT PASS" message.
6. The sign panel shown shall be mounted on the front of sign vehicle V4, facing opposing traffic.

7. All vehicles shall be equipped with flashing or rotating amber lights.
8. Sign vehicle V4 will not be required when the work and vehicles V2 and V3 are 2' or more from the centerline of the highway during the work or application operations.
9. All vehicles used for lane closures shall be equipped with two-way radios and the vehicle operators shall maintain communication during the work or application operation.
10. This plan shall not be used where workers would be on foot in the work area. Use a stationary type lane closure (Revised Standard Plan T13) for this condition.
11. Minimize spacing between vehicles V2 and V3 and vehicles V3 and V4 to deter road users from driving in between them.
12. If sign vehicle V1 encroaches into the traffic lane due to insufficient shoulder width, sign vehicle V1 shall be equipped with a truck-mounted attenuator. Sign vehicle V1 shall stay as close to the edge of shoulder as practicable.

**LEGEND**

- V1 SIGN VEHICLE
- V2 SHADOW VEHICLE
- V3 WORK/APPLICATION VEHICLE
- V4 SIGN VEHICLE
- TMA TRUCK-MOUNTED ATTENUATOR
-  FLASHING ARROW SIGN (FAS) IN FLASHING CAUTION MODE
-  FLASHING ARROW SIGN (FAS) IN ALTERNATING DIAMOND CAUTION

**SIGN PANEL SIZE (Min)**

- A** 72" x 42"
- B** 54" x 42"
- C** 54" x 24"

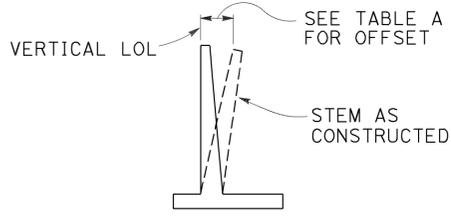
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
 FOR MOVING LANE CLOSURE  
 ON TWO LANE HIGHWAYS**  
 NO SCALE

RSP T17 DATED APRIL 19, 2013 SUPERSEDES STANDARD PLAN T17  
 DATED MAY 20, 2011 - PAGE 245 OF THE STANDARD PLANS BOOK DATED 2010.

2010 REVISED STANDARD PLAN RSP T17

TO ACCOMPANY PLANS DATED 4-4-16

2010 REVISED STANDARD PLAN RSP B3-5

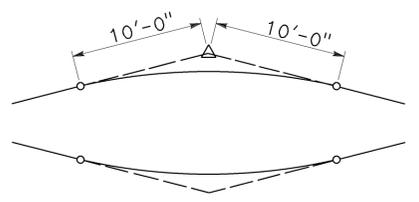


**TABLE A**

H	OFFSET
4'-12'	H/200
14'-16'	H/160
18'-20'	H/140
22'-24'	H/130
26'-36'	2 1/2"

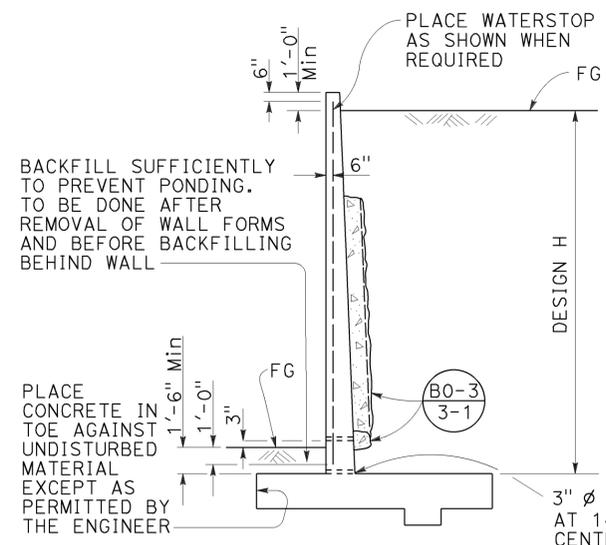
**APPROXIMATE WALL OFFSET VALUES**

Values for offsetting forms to be determined by the Engineer.



**20'-0" VC AT TOP OF WALL SLOPE CHANGE**

Where shown on the plans

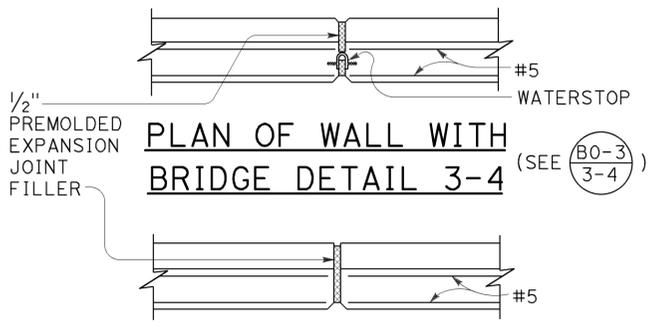


**DESIGN AND DRAINAGE**

BACKFILL SUFFICIENTLY TO PREVENT PONDING. TO BE DONE AFTER REMOVAL OF WALL FORMS AND BEFORE BACKFILLING BEHIND WALL.

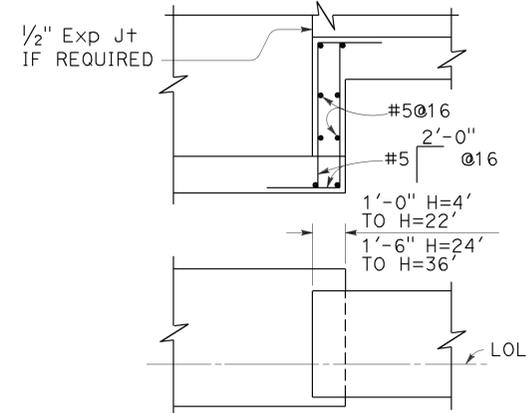
PLACE CONCRETE IN TOE AGAINST UNDISTURBED MATERIAL EXCEPT AS PERMITTED BY THE ENGINEER

PLACE WATERSTOP AS SHOWN WHEN REQUIRED

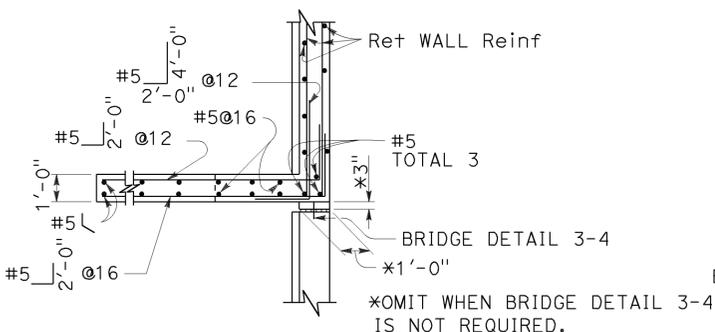


**PLAN OF WALL WITH BRIDGE DETAIL 3-4**

**PLAN OF WALL WITH EXPANSION JOINT ONLY**

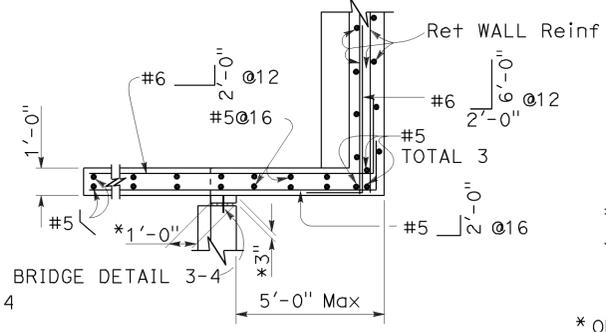


**FOOTING STEP**



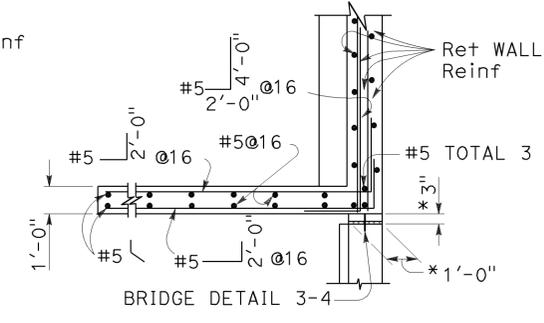
**PLAN**

(For return wall Type "A")



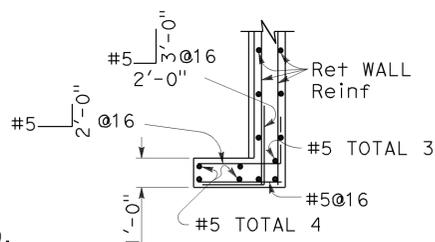
**PLAN**

(For return wall Type "B")



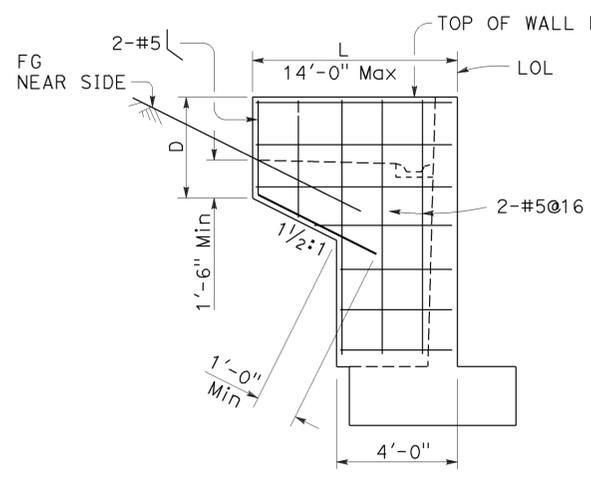
**PLAN**

(For return wall Type "C")



**PLAN**

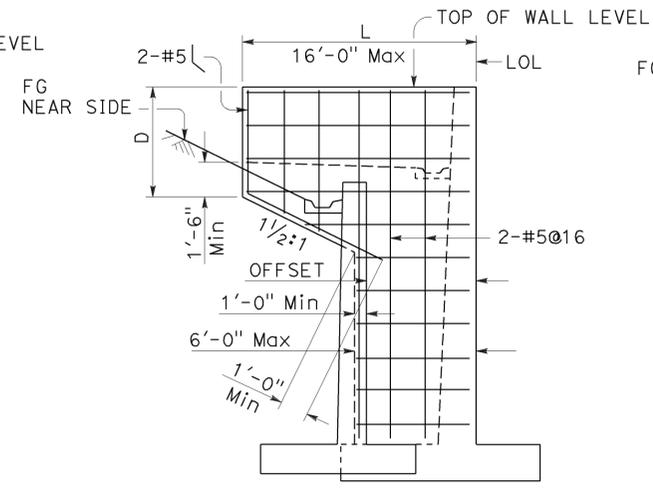
(For return wall Type "D")



**ELEVATION**

**RETURN WALL TYPE "A"**

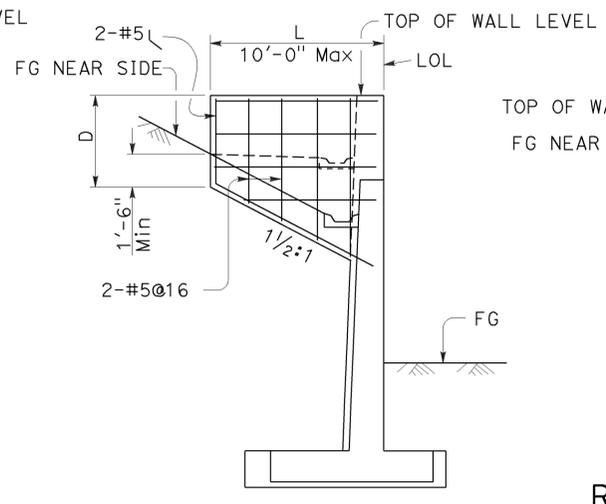
Use where H=8' or less



**ELEVATION**

**RETURN WALL TYPE "B"**

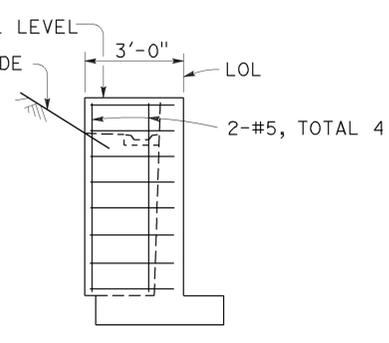
Use where H=10' or more on offset walls



**ELEVATION**

**RETURN WALL TYPE "C"**

Use where H=10' or more on straight walls



**ELEVATION**

**RETURN WALL TYPE "D"**

Use where H=6' or less

**DESIGN CONDITIONS:**

Design "H" may be exceeded by 6" before going to the next size. Special footing design is required where foundation material is incapable of supporting bearing stress listed in table

Return wall not required unless shown elsewhere

**DESIGN NOTES:**

DESIGN: AASHTO LRFD Bridge Design Specifications, 4th edition with California Amendments

LIVE LOAD: Surcharge on level ground surface

SOIL:  $\phi = 34^\circ$   
 $\gamma = 120$  pcf

REINFORCED CONCRETE:  $f_y = 60,000$  psi  
 $f_c' = 3,600$  psi

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**RETAINING WALL DETAILS No. 1**

NO SCALE

RSP B3-5 DATED APRIL 20, 2012 SUPERSEDES STANDARD PLAN B3-5 DATED MAY 20, 2011 - PAGE 277 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP B3-5**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	44	76

REGISTERED CIVIL ENGINEER

November 15, 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.

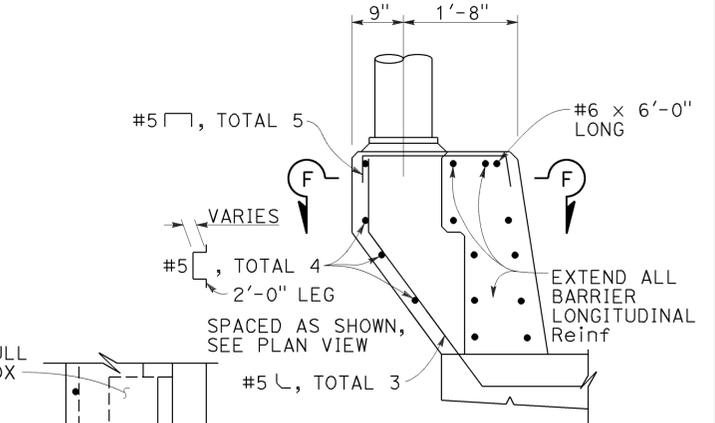
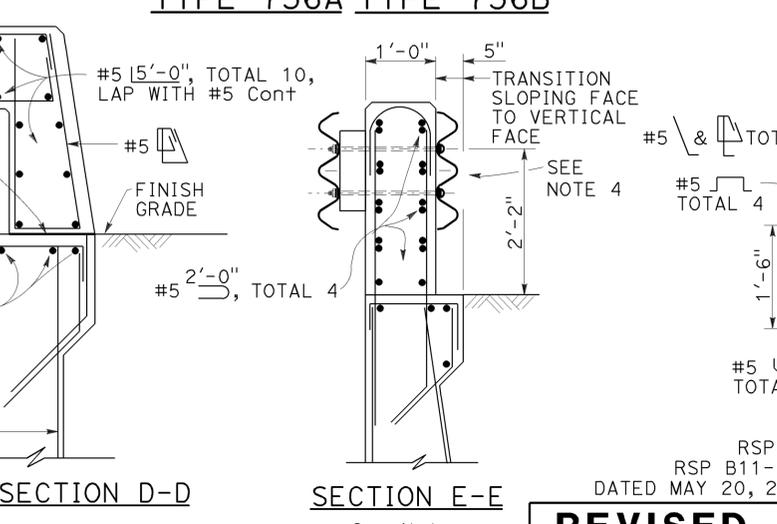
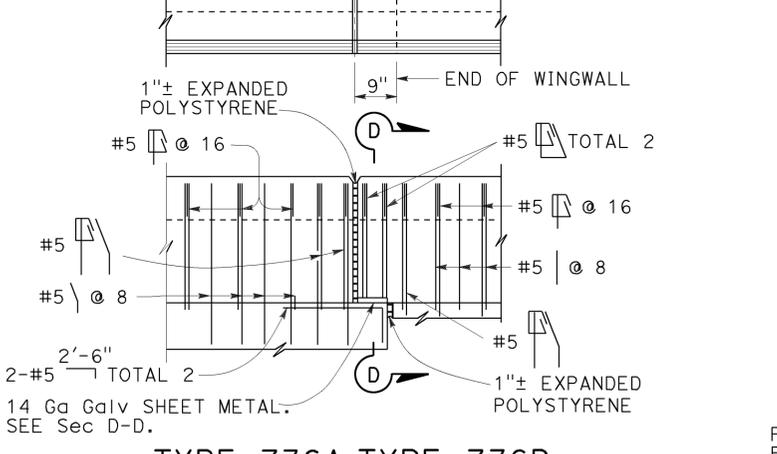
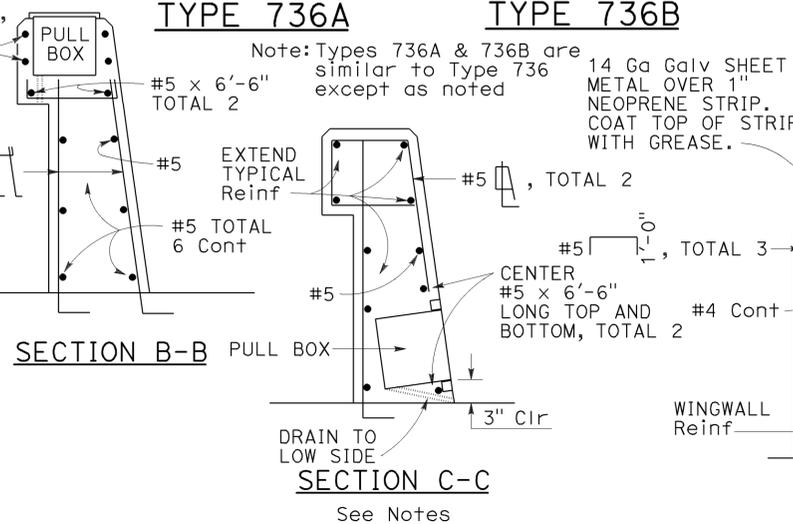
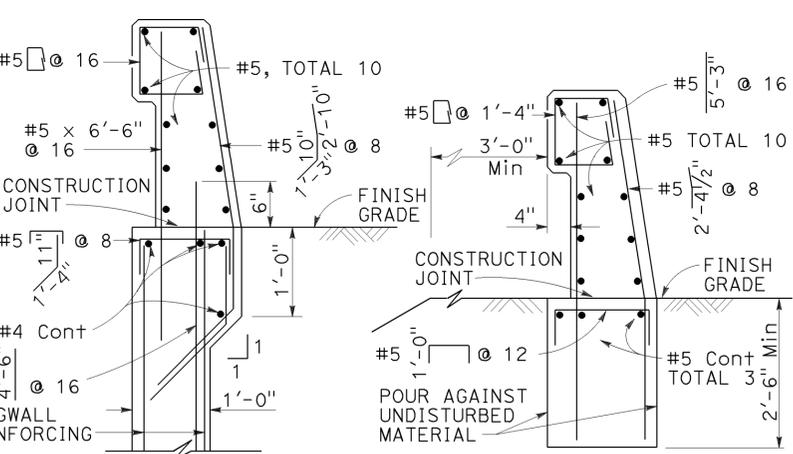
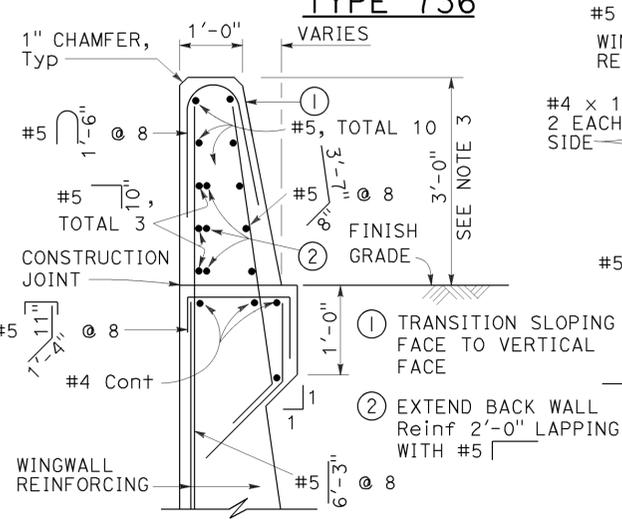
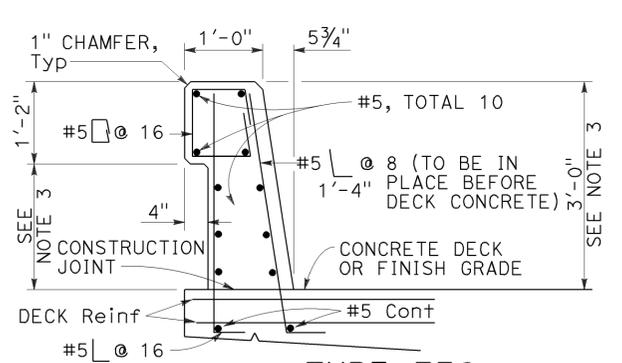
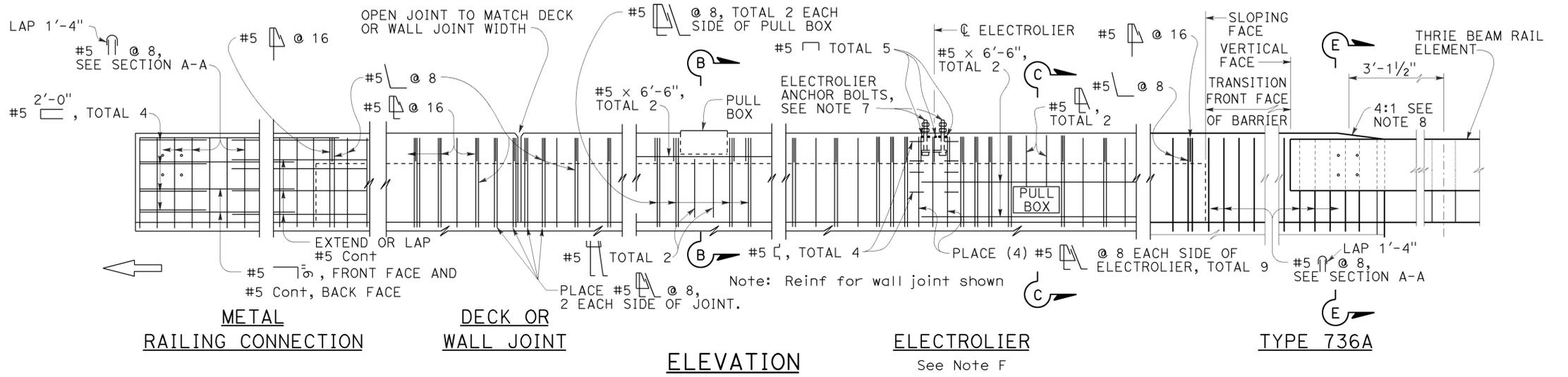
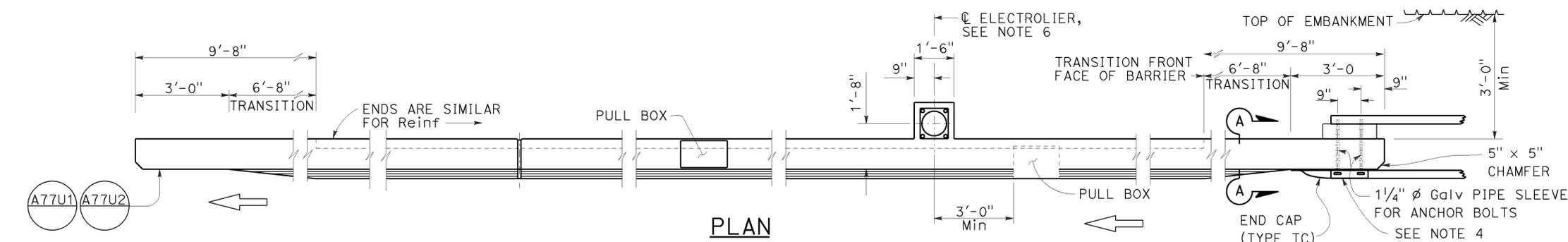
REGISTERED PROFESSIONAL ENGINEER  
Tillat Satter  
No. C42892  
Exp. 3-31-14  
CIVIL  
STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED 4-4-16

**NOTES:**

1. Walls are to be backfilled before barrier is placed.
2. Clearance to reinforcing steel in barrier to be 1", except as noted. Longitudinal reinforcement to stop at all expansion joints.
3. Dimensions may vary with roadway cross slope and with certain thickness of surfacing. See Project Plans.
4. For typical metal railing connection details not shown, see Revised Standard Plans RSP A77U1 and RSP A77U2.
5. See Standard Plans ES-9A, ES-9B, ES-9C, ES-9D and ES-9E for electrical details. The maximum number of conduits in the barrier is limited to two 2" conduits along with one 3" conduit. When a 3" conduit is used, it is restricted to the base of the barrier.
6. For electrolier mounting details, See Standard Plans ES-6A and ES-6B.
7. Minimum concrete edge distance, to the reinforcing shown, shall be maintained. Edge distance may be adjusted to accommodate increase in concrete cover for architectural treatment.
8. Taper the top of the end of the bridge railing at 4:1 to match the top elevation of the thrie beam rail element.

2010 REVISED STANDARD PLAN RSP B11-56



**CONCRETE BARRIER TYPE 736**

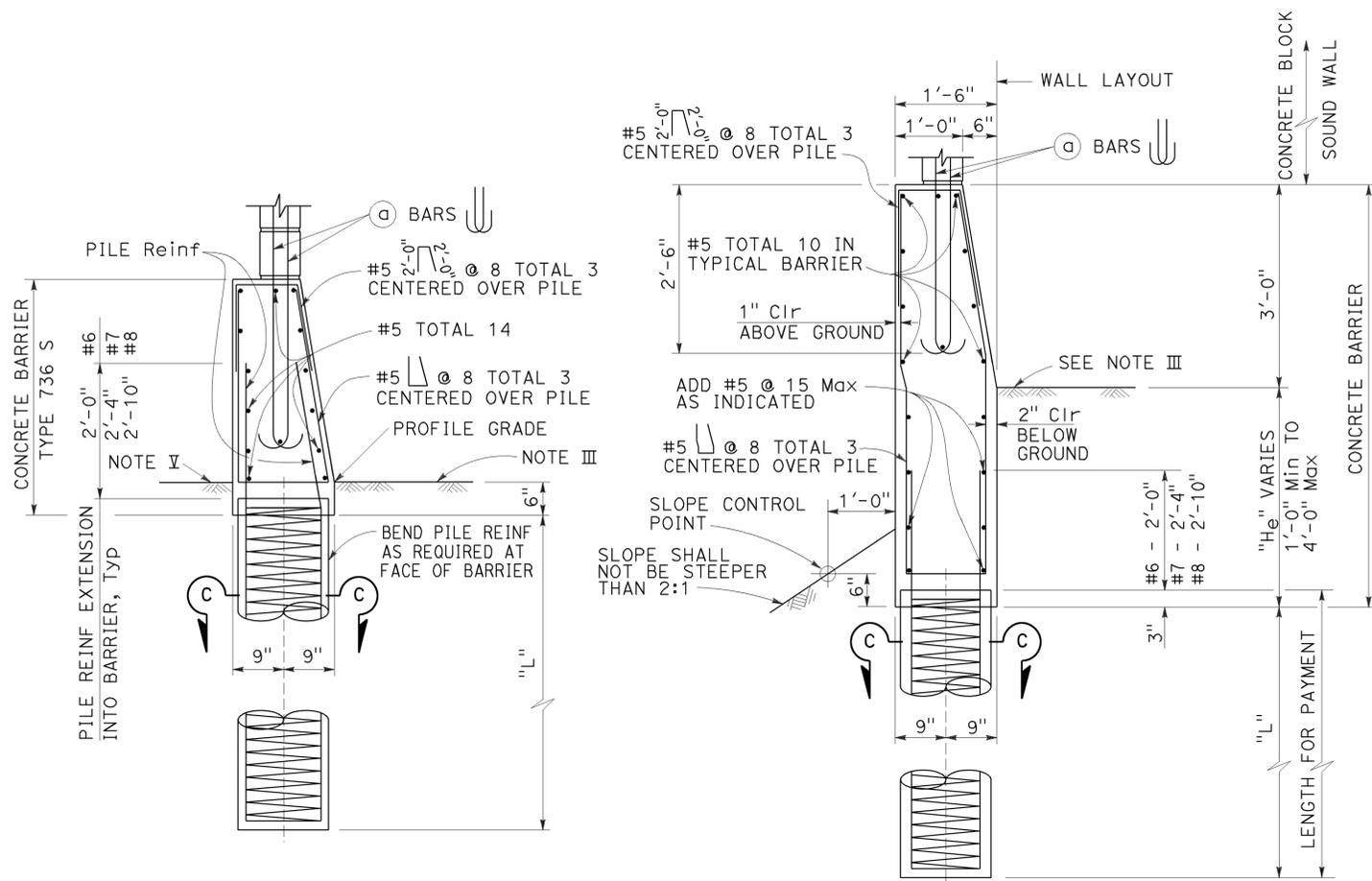
NO SCALE

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

Details shown for barrier anchorage to Type 736A. Anchorage for barrier Types 736 and 736B are similar to their respective details.

RSP B11-56 DATED NOVEMBER 15, 2013 SUPERSEDES RSP B11-56 DATED JULY 19, 2013 AND STANDARD PLAN B11-56 DATED MAY 20, 2011 - PAGE 298 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP B11-56**



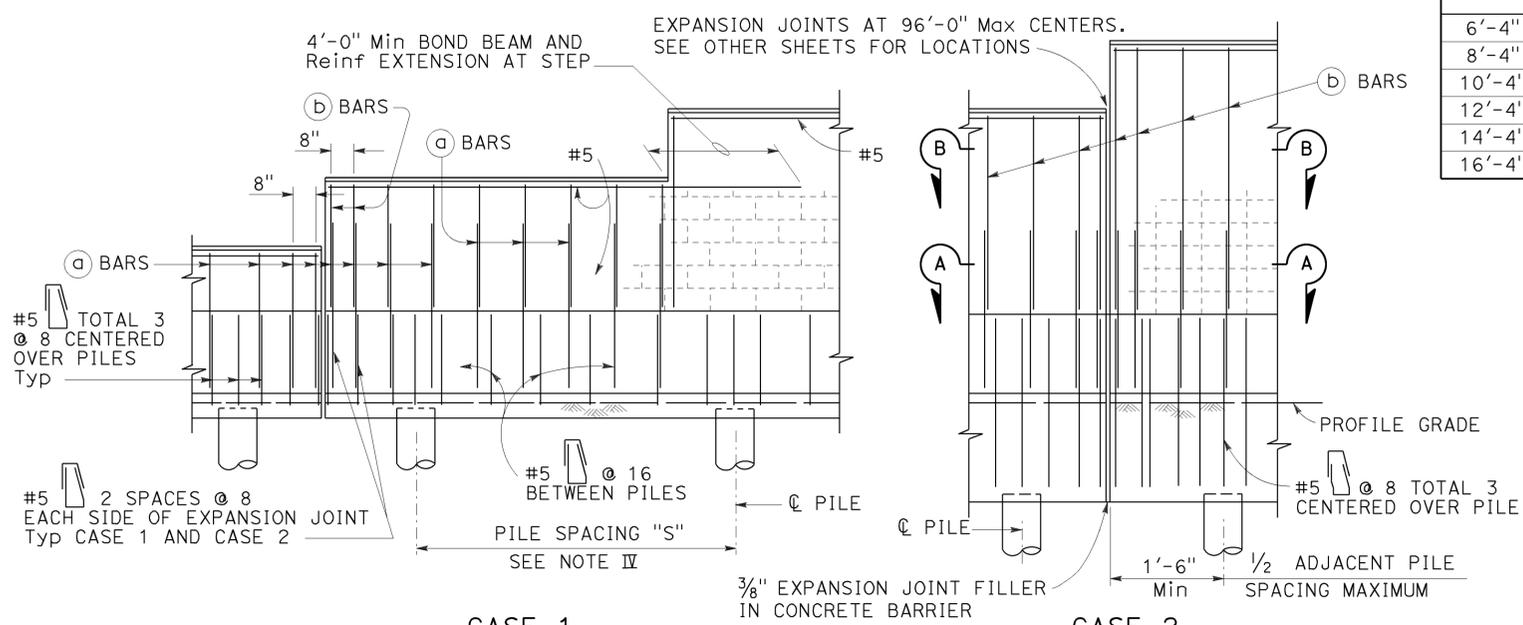
**CASE 1**

For details not shown, See Case 2.  
 Level ground ±10% on both sides of barrier.

**CASE 2**

For details not shown, See Case 1.  
 Level ground ±10% at the traffic side of barrier and sloping ground on the opposite side.

**BARRIER SECTIONS**



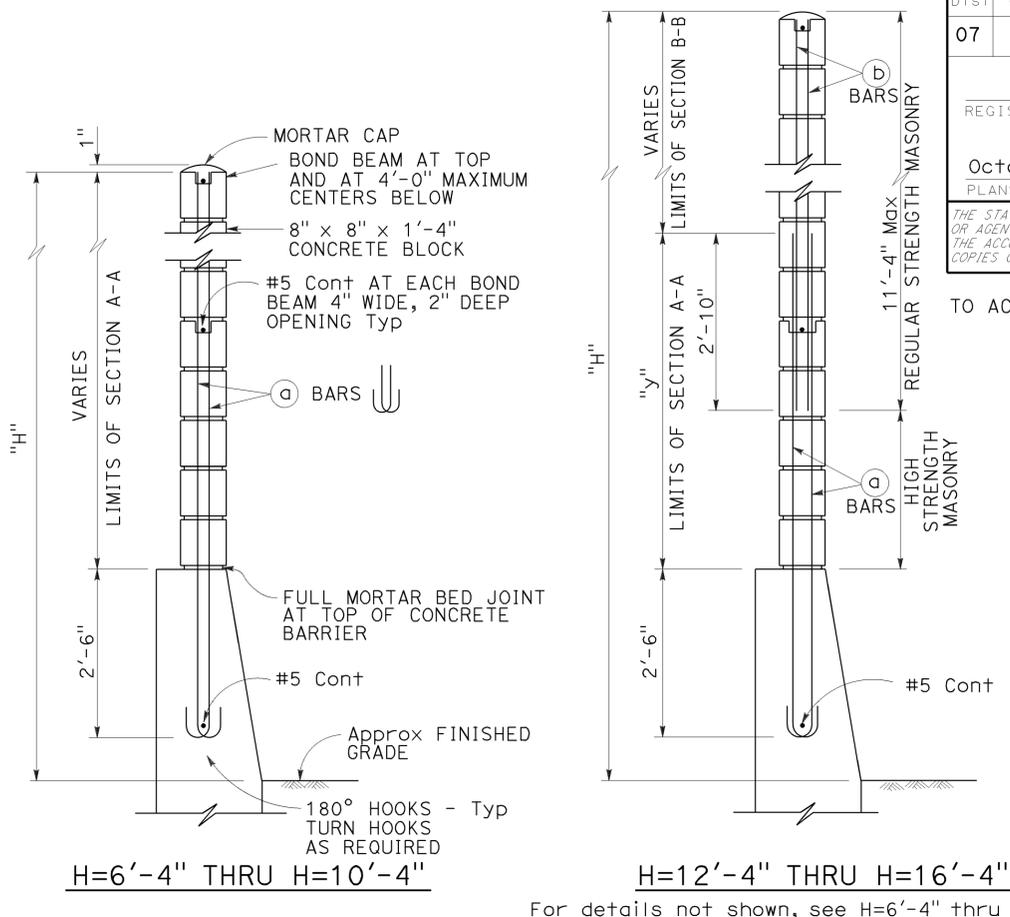
**CASE 1**

For details not shown, See Case 2.

**CASE 2**

For details not shown, See Case 1.

**PARTIAL ELEVATIONS**



**TYPICAL SECTIONS**

See Standard Plan B15-8 for pile details.

**SOUND WALL REINFORCEMENT TABLE**

MAXIMUM H	(a) BARS @ 1'-4" Max	(b) BARS @ 1'-4" Max	"y"	f'm (psi)	COMPRESSIVE STRENGTH OF CMU (psi)	H
6'-4"	#4	---	---	1500	1900	6'-4"
8'-4"	#4	---	---	1500	1900	8'-4"
10'-4"	#4	---	---	1500	1900	10'-4"
12'-4"	#5	#4	5'-0"	1500	1900	12'-4"
14'-4"	#6	#4	7'-0"	1500	1900	14'-4"
16'-4"	#6	#4	9'-0"	2500	3750	16'-4"

**NOTES I THROUGH VI:**

- I. Details shown are primarily to conform design of sound walls to Type 736S and Type 736 SV Concrete Barriers. For sound wall details conforming with barriers see Standard Plans B15-7 and B15-8.
- II. For details and sections not shown, see Standard Plans B15-7 and B15-8.
- III. Slope ground at traffic side of barrier to drain. Maximum slope ±10%. See Std Plan B11-56, Note 3.
- IV. Pile spacing may be varied, but shall not exceed the tabular values. See Standard Plan B15-8.
- V. For Case 1 - ground line to be at the same elevation on both sides of the barrier. Barrier shall not be used to retain earth.
- VI. See Standard Plan B15-9 for other details.

**NOTES A THROUGH F:**

- A. For type of block, type of block bond, and joint finish, see other sheets.
- B. When blocks are laid in stacked bond, ladder type, galvanized joint reinforcement shall be provided. A minimum of 2-9 gauge wires continuous at 4'-0" maximum to be used. Locate reinforcement in joints that are at the approximate midpoint between bond beams.
- C. Horizontal joints shall be tooled concave or may be weathered. Vertical joints shall be tooled concave or may be raked.
- D. For intermediate wall heights (H), or barrier depths (H<sub>e</sub>), that are between the values given, use the tabular information for the next higher (H) or (H<sub>e</sub>).
- E. Concrete to be used for the barrier shall contain not less than 590 pounds of cementitious material per cubic yard.
- F. Masonry strengths are listed in the "SOUND WALL REINFORCEMENT TABLE".

**SOUND WALL MASONRY BLOCK ON TYPE 736S/SV BARRIER DETAILS (1)**

NO SCALE

RSP B15-6 DATED OCTOBER 19, 2012 SUPERSEDES STANDARD PLAN B15-6 DATED MAY 20, 2011 - PAGE 320 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP B15-6**

2010 REVISED STANDARD PLAN RSP B15-6

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	46	76

*Theresa Gabriel*  
REGISTERED ELECTRICAL ENGINEER

October 30, 2015  
PLANS APPROVAL DATE

Theresa  
Aziz Gabriel  
No. E15129  
Exp. 6-30-16  
ELECTRICAL  
STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED 4-4-16

**LEGEND:**

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

**ABBREVIATIONS**

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

**SOFFIT AND WALL-MOUNTED LUMINAIRES**

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

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

COMMONLY USED SYMBOLS FOR UNITED STATES CUSTOMARY UNITS OF MEASUREMENT:

SYMBOL	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 LEGEND)
		CITY ELECTROLIER
		ELECTROLIER FOUNDATION (FUTURE INSTALLATION)

- NOTES:**
- 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 OCTOBER 30, 2015 SUPERSEDES RSP ES-1A DATED JULY 19, 2013 AND 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

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	47	76

*Theresa Gabriel*  
 REGISTERED ELECTRICAL ENGINEER  
 October 30, 2015  
 PLANS APPROVAL DATE



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TO ACCOMPANY PLANS DATED 4-4-16

### CONDUIT

### SIGNAL EQUIPMENT

NEW	EXISTING	
		LIGHTING CONDUIT, UNLESS OTHERWISE INDICATED OR NOTED
		TRAFFIC SIGNAL CONDUIT
		COMMUNICATION CONDUIT
		TELEPHONE CONDUIT
		FIRE ALARM CONDUIT
		FIBER OPTIC CONDUIT
		CONDUIT TERMINATION
		CONDUIT RISER ATTACHED TO THE STRUCTURE OR SERVICE POLE

NEW	EXISTING	
		PEDESTRIAN SIGNAL 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)

### SIGNAL EQUIPMENT Cont

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

### SERVICE EQUIPMENT

NEW	EXISTING	
		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

		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

### NOTES:

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

### 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

### 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

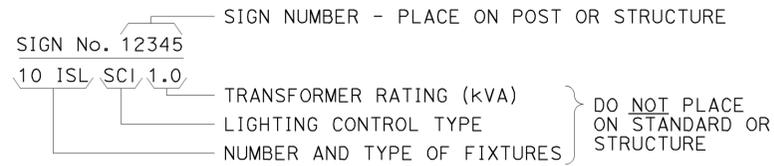
RSP ES-1B DATED OCTOBER 30, 2015 SUPERSEDES RSP ES-1B DATED JULY 19, 2013 AND STANDARD PLAN ES-1B DATED MAY 20, 2011 - PAGE 426 OF THE STANDARD PLANS BOOK DATED 2010.

## REVISED STANDARD PLAN RSP ES-1B

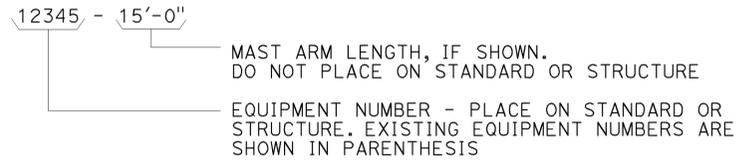
2010 REVISED STANDARD PLAN RSP ES-1B

### EQUIPMENT IDENTIFICATION

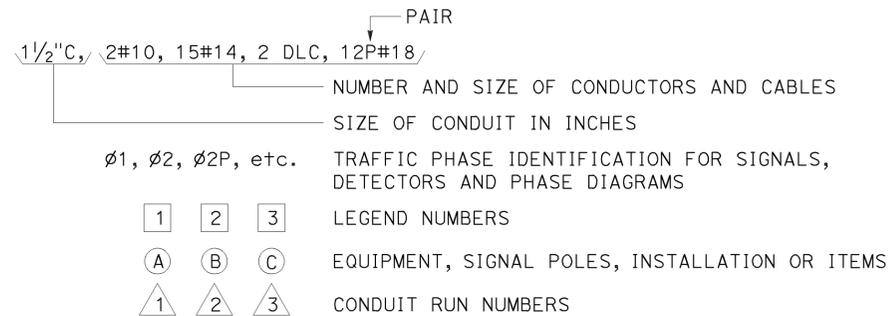
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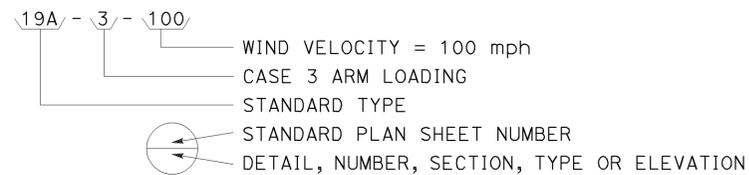
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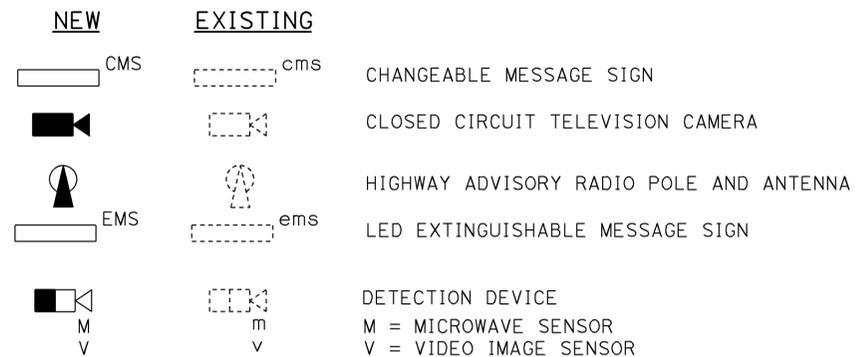
#### CONDUIT AND CONDUCTOR IDENTIFICATION:



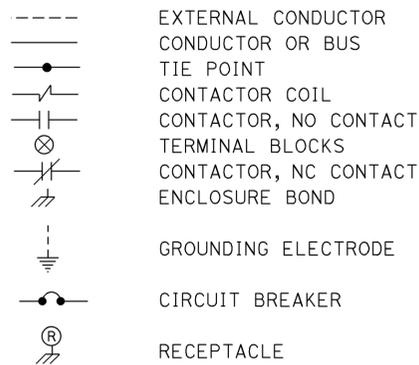
#### SIGNAL AND LIGHTING STANDARD (TYPICAL DESIGNATION):



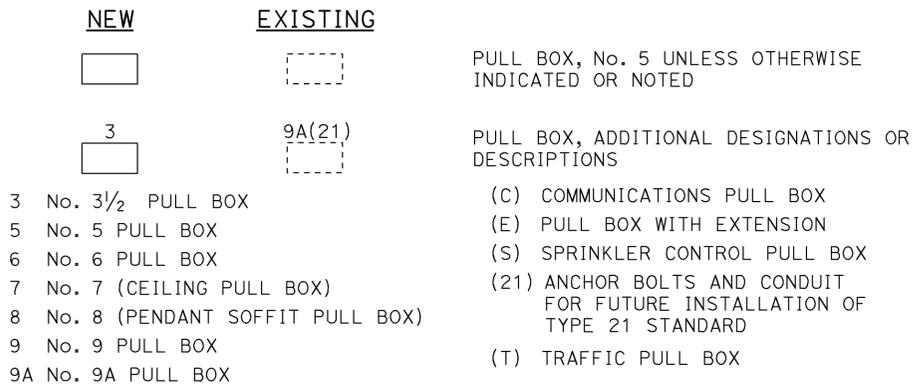
### MISCELLANEOUS EQUIPMENT



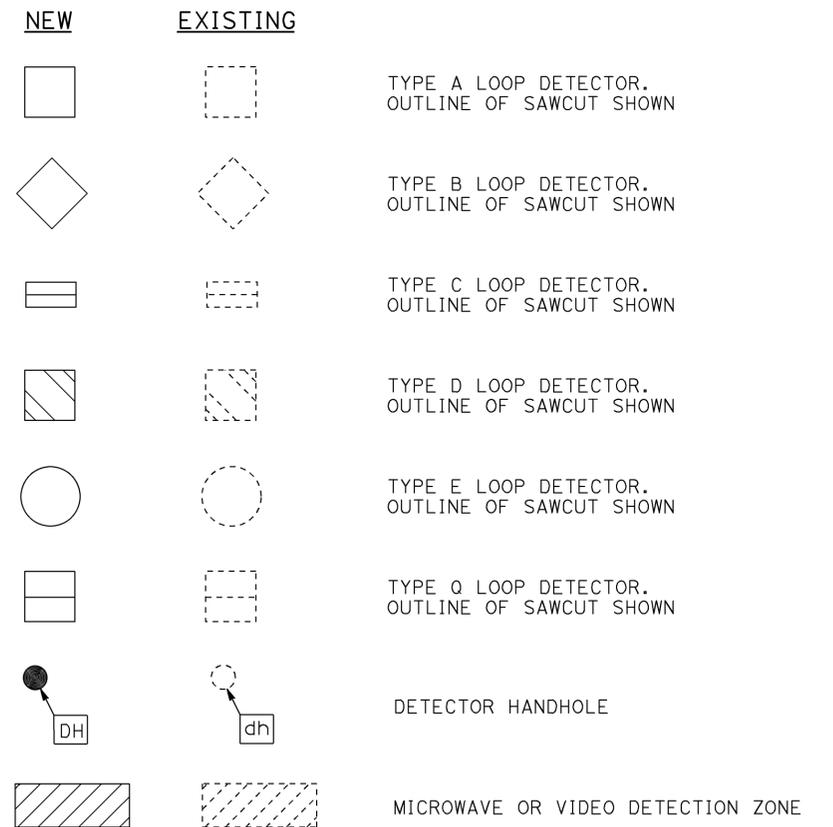
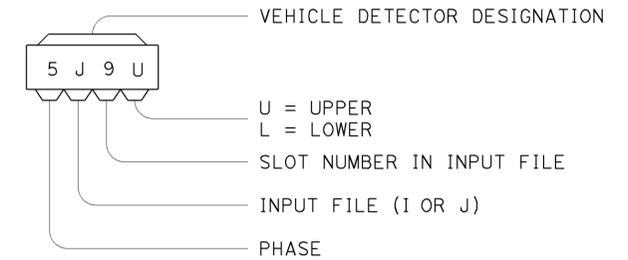
### WIRING DIAGRAM LEGEND



### PULL BOXES



### VEHICLE DETECTORS



STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

## ELECTRICAL SYSTEMS (LEGEND AND ABBREVIATIONS)

NO SCALE

RSP ES-1C DATED OCTOBER 30, 2015 SUPERSEDES RSP ES-1C DATED JULY 19, 2013 AND STANDARD PLAN ES-1C DATED MAY 20, 2011 - PAGE 427 OF THE STANDARD PLANS BOOK DATED 2010.

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

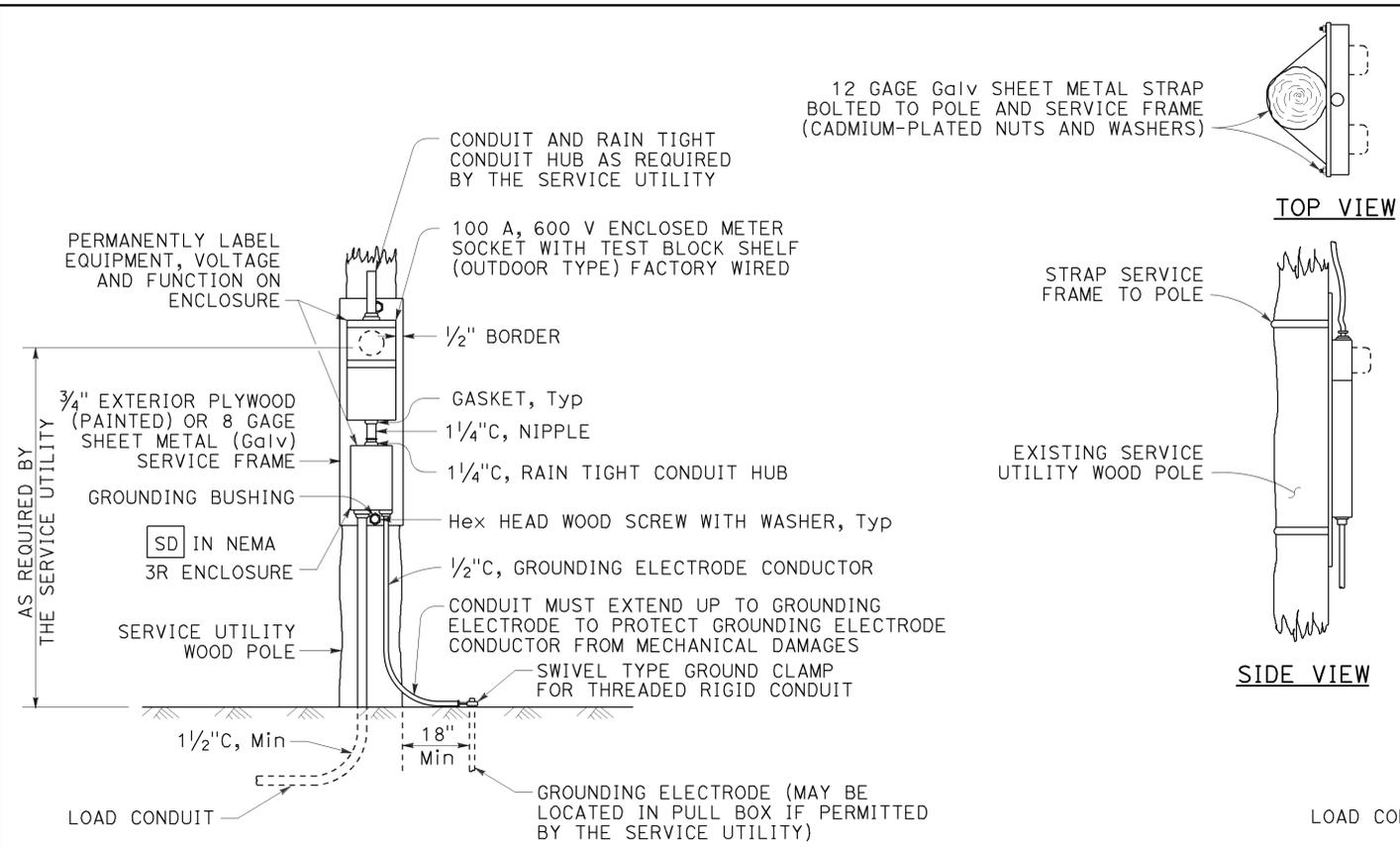
2010 REVISED STANDARD PLAN RSP ES-1C

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	49	76

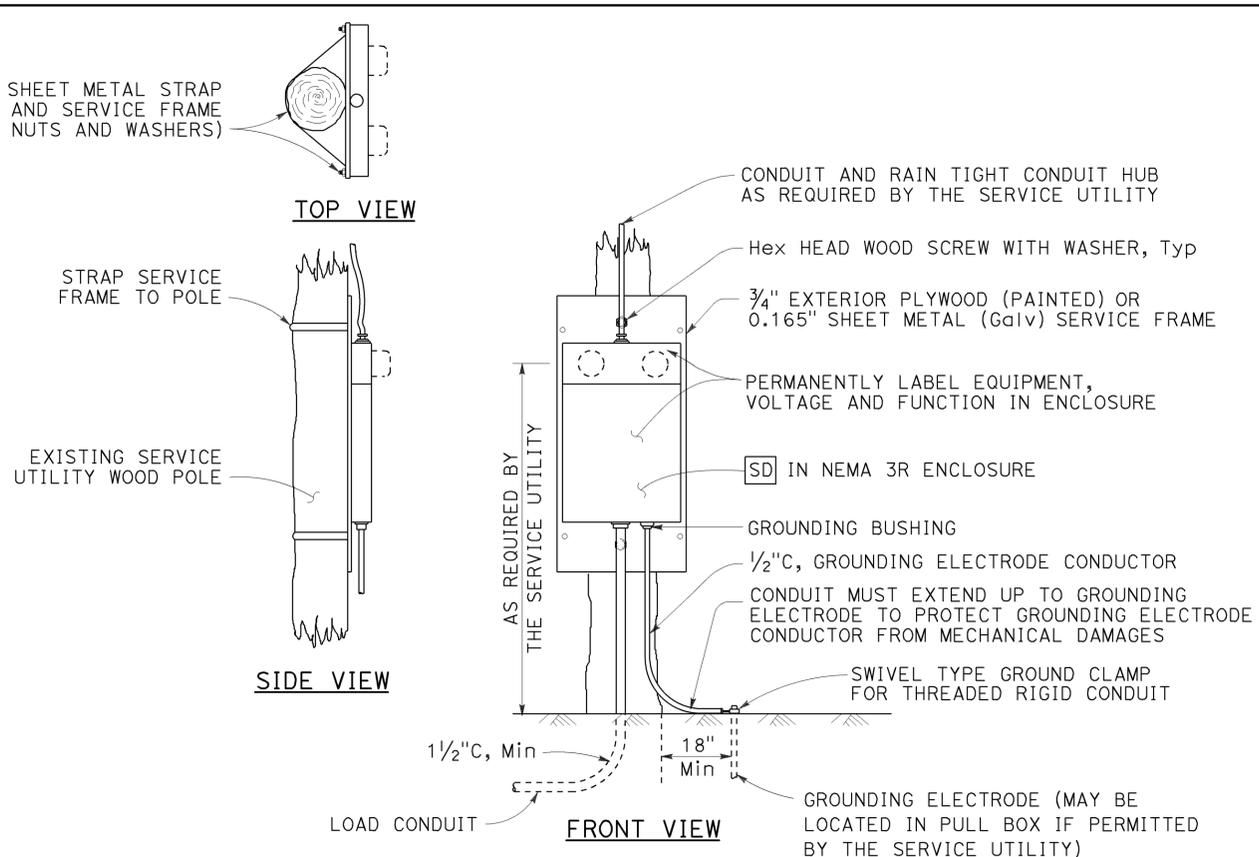
Theresa Gabriel  
 REGISTERED ELECTRICAL ENGINEER  
 October 30, 2015  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



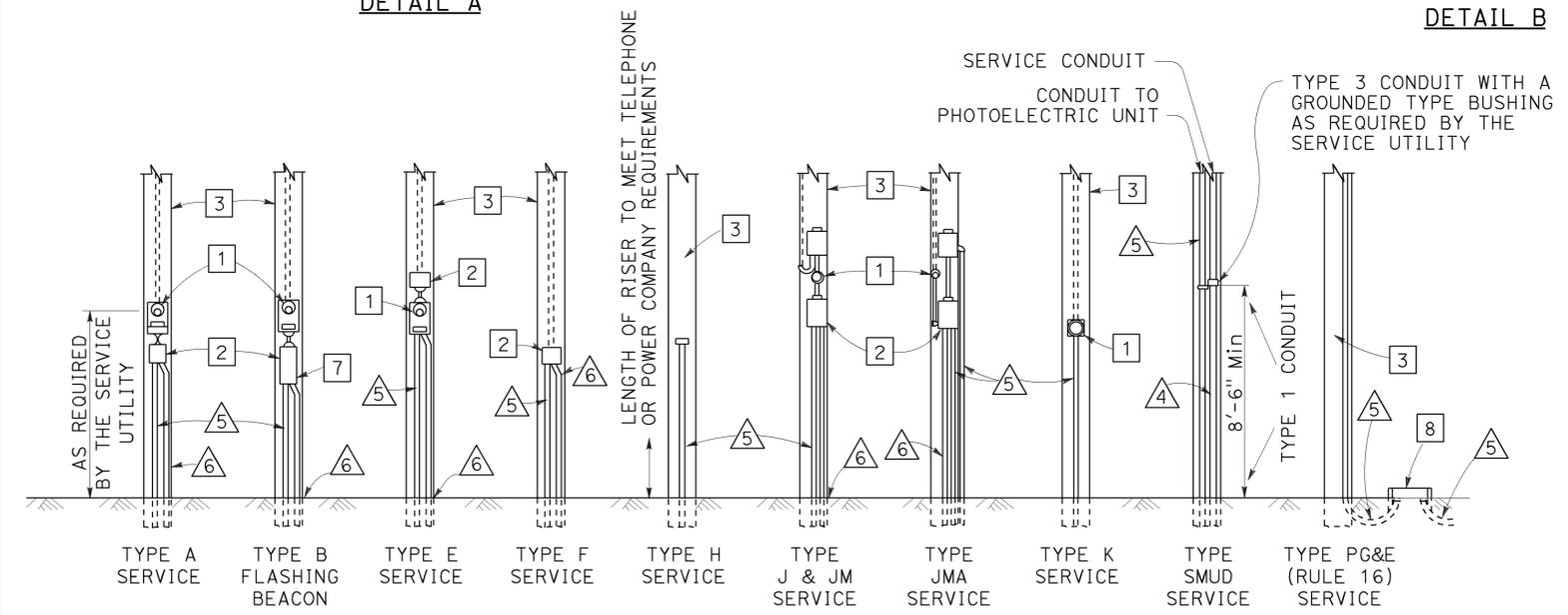
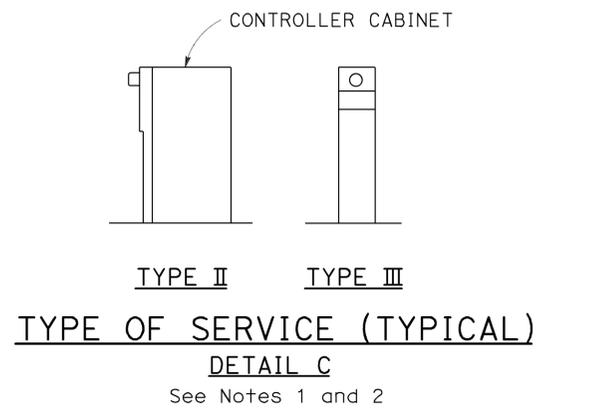
TO ACCOMPANY PLANS DATED 4-4-16



**TYPE SCE-1**  
DETAIL A

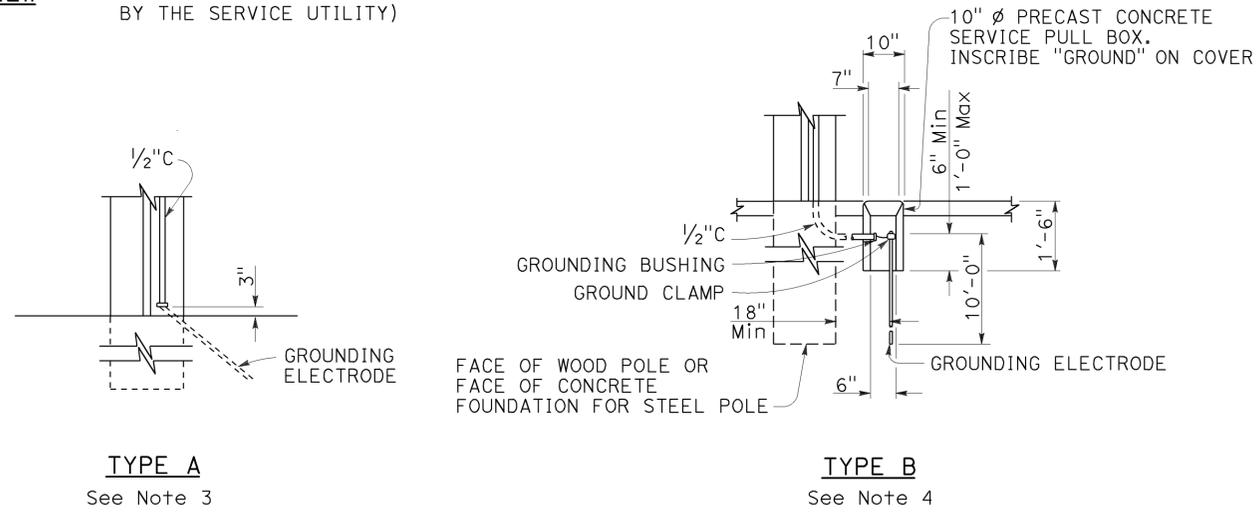


**TYPE SCE-2**  
DETAIL B



**POLE MOUNTED SERVICE INSTALLATIONS**  
DETAIL D

- LEGEND:**
- 1 METER SOCKET.
  - 2 SERVICE ENCLOSURE WITH A MINIMUM 60 A RATED MAIN CIRCUIT BREAKER, UNLESS OTHERWISE SHOWN.
  - 3 A. UTILITY OWNED POLE. THE SERVICE UTILITY WILL FURNISH AND INSTALL REQUIRED SERVICE RISER, PEU WITH CONDUCTORS AND OTHER EQUIPMENT AS NEEDED.  
B. STATE OWNED POLE. THE CONTRACTOR SHALL FURNISH AND INSTALL REQUIRED SERVICE RISER AND EQUIPMENT.
  - 4 2" C, SERVICE CONDUIT MUST HAVE A GROUNDED TYPE BUSHING INSTALLED AT UPPER END OF THE METALLIC POLE RISER CONDUIT. A GROUNDING CONDUCTOR MUST BE ATTACHED TO THE BUSHING, CARRIED THROUGH THE CONDUIT RUN AND ATTACHED TO THE SERVICE EQUIPMENT ENCLOSURE'S GROUNDING ELECTRODE.
  - 5 CONDUIT, LENGTH AND SIZE AS REQUIRED.
  - 6 1/2" C, 1#6. SEE DETAIL E.
  - 7 FLASHING BEACON CONTROL ASSEMBLY.
  - 8 SERVICE PULL BOX, No. 5 UNLESS OTHERWISE NOTED, FURNISHED AND INSTALLED BY THE CONTRACTOR. SERVICE UTILITY SHALL DETERMINE THE EXACT LOCATION.



- NOTES:**
- Type II service equipment enclosure mounted on the side of a controller cabinet.
  - Type III complete free-standing service equipment enclosure.
  - Ground clamp and required fittings must be accessible. Conduit must extend to protect grounding electrode conductor from mechanical damage.
  - Use where service utility requires 18" clearance between grounding electrode and the pole or service equipment enclosure. Installation shown is for sidewalk or paved areas. In unpaved areas, omit special service pull box and locate ground clamp above ground or locate ground clamp in nearest pull box.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS**  
**(SERVICE EQUIPMENT)**

NO SCALE

RSP ES-2A DATED OCTOBER 30, 2015 SUPERSEDES STANDARD PLAN ES-2A DATED MAY 20, 2011 - PAGE 428 OF THE STANDARD PLANS BOOK DATED 2010.

2010 REVISED STANDARD PLAN RSP ES-2A

**NOTES:**

1. Foundation shall be located to provide 2'-0" minimum clearance between face of curb and any portion of cabinet.
2. Controller units, plug-mounted equipment, shelf-mounted equipment and wall-mounted equipment shall be located to permit safe and easy removal or replacement without removing any other piece of equipment.
3. Cabinet fan may be installed at an alternate location near the top of the cabinet when approved by the Engineer.
4. Where telephone interconnect is required, a minimum of 5" clear vertical space shall be provided inside the cabinet for the equipment.
5. Telephone interconnect conductors shall be enclosed in a 3/4" or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	50	76

Theresa Gabriel  
REGISTERED ELECTRICAL ENGINEER

October 30, 2015  
PLANS APPROVAL DATE

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TO ACCOMPANY PLANS DATED 4-4-16

REGISTERED PROFESSIONAL ENGINEER

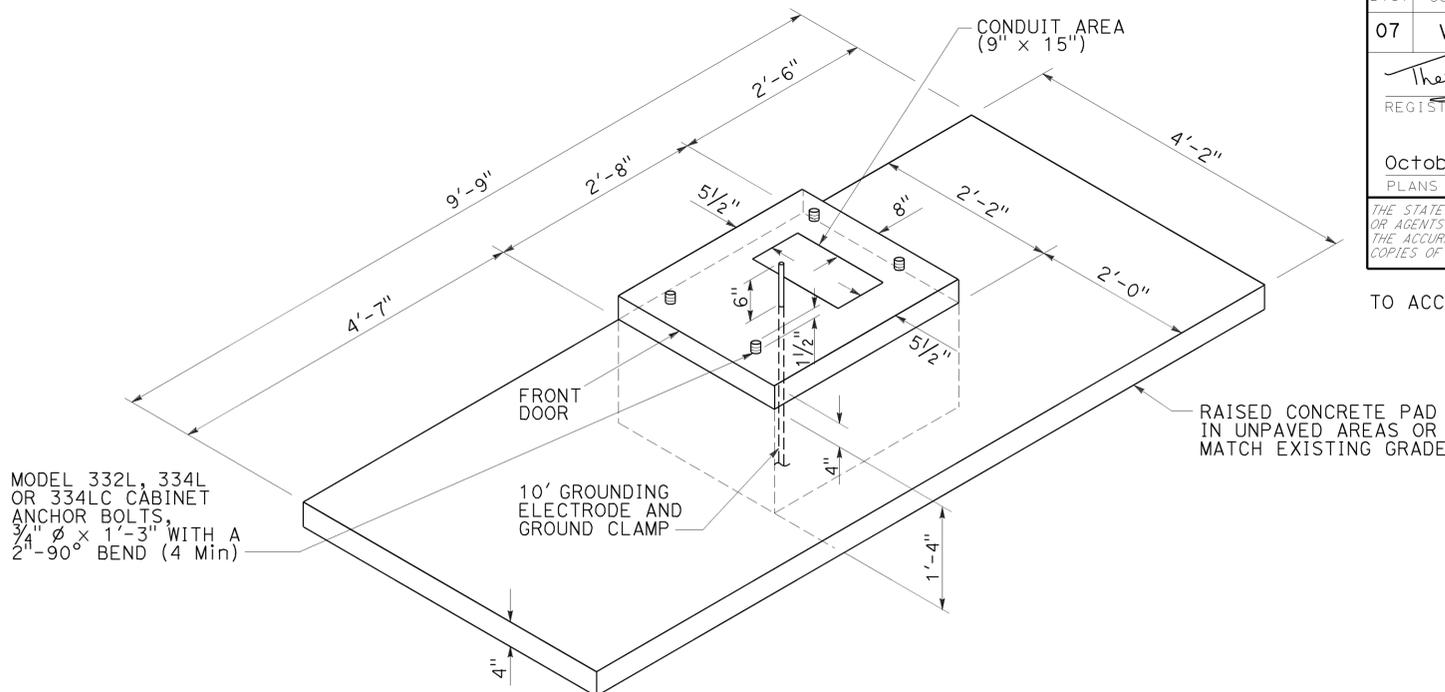
Theresa Aziz Gabriel

No. E15129

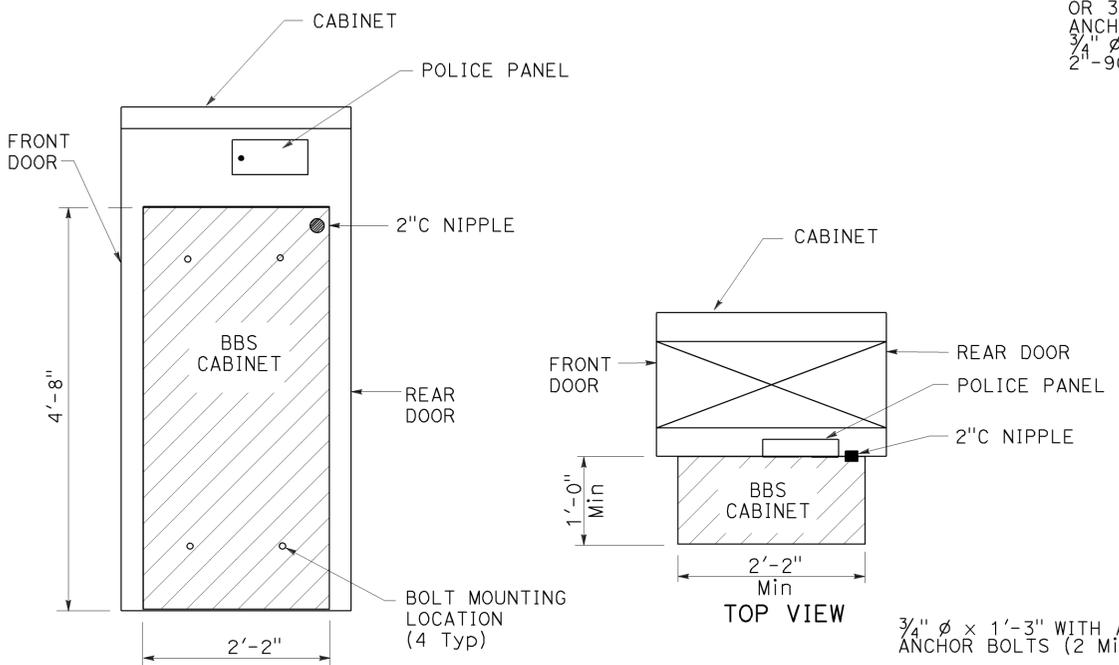
Exp. 6-30-16

ELECTRICAL

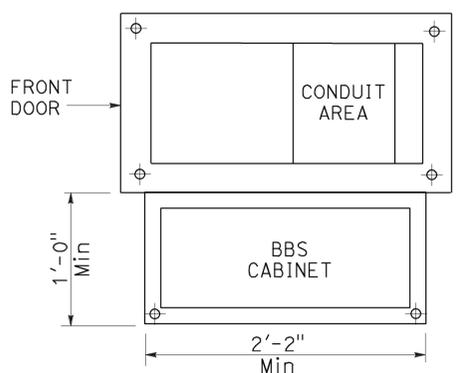
STATE OF CALIFORNIA



**FOUNDATION AND PAD DETAIL**  
Model 332L, 334L and 334LC

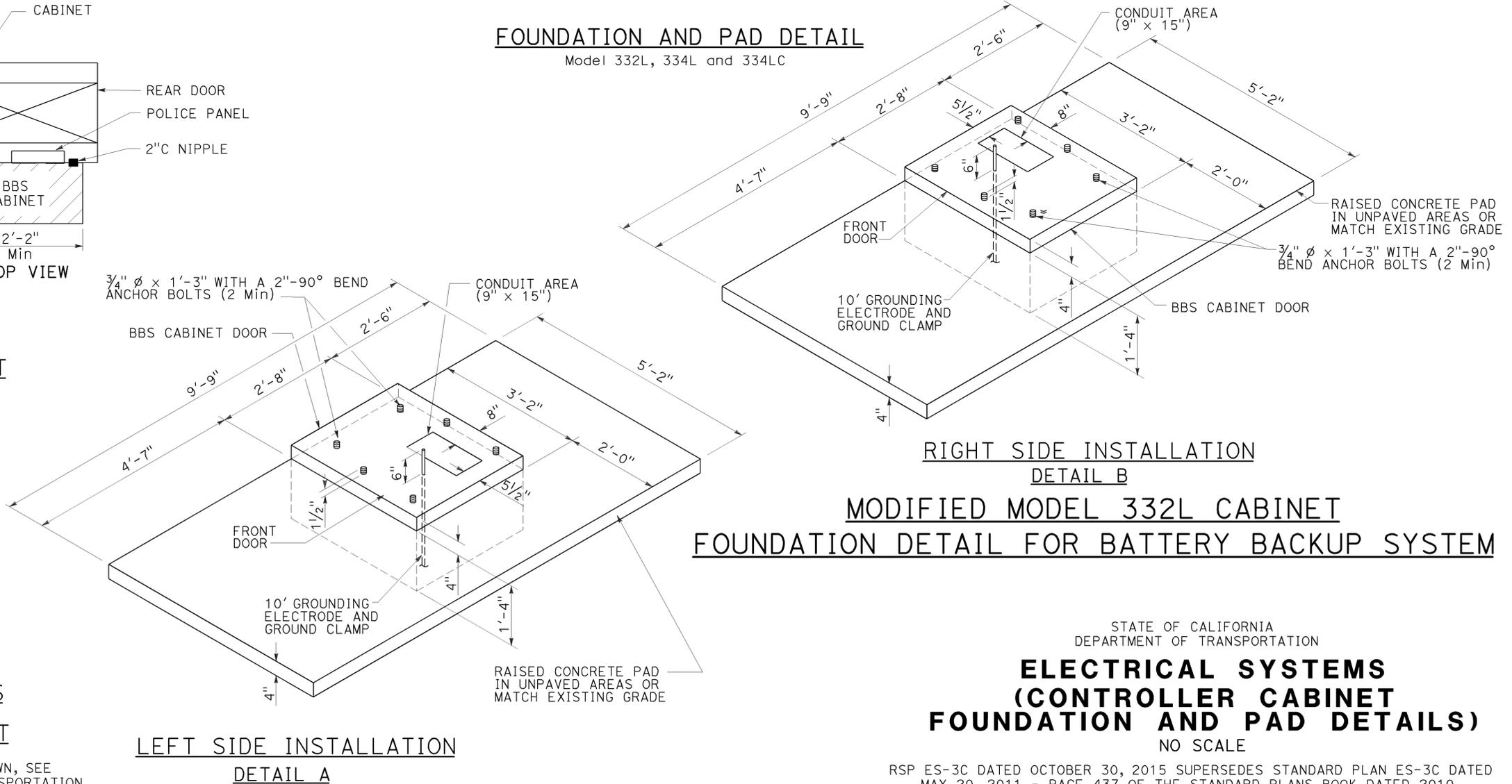


**BBS CABINET MOUNTED TO THE MODEL 332L CABINET**



**BASE PLAN FOR BBS MOUNTED TO THE MODEL 332L CABINET**

(FOR DIMENSIONS AND DETAILS NOT SHOWN, SEE CABINET HOUSING DETAILS OF THE TRANSPORTATION ELECTRICAL EQUIPMENT SPECIFICATION (TEES))



**MODIFIED MODEL 332L CABINET FOUNDATION DETAIL FOR BATTERY BACKUP SYSTEM**

**RIGHT SIDE INSTALLATION DETAIL B**

**LEFT SIDE INSTALLATION DETAIL A**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS (CONTROLLER CABINET FOUNDATION AND PAD DETAILS)**

NO SCALE

RSP ES-3C DATED OCTOBER 30, 2015 SUPERSEDES STANDARD PLAN ES-3C DATED MAY 20, 2011 - PAGE 437 OF THE STANDARD PLANS BOOK DATED 2010.

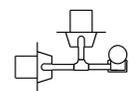
**REVISED STANDARD PLAN RSP ES-3C**

2010 REVISED STANDARD PLAN RSP ES-3C

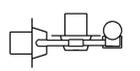
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	51	76
<i>Theresa Gabriel</i> REGISTERED ELECTRICAL ENGINEER					
October 30, 2015 PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

TO ACCOMPANY PLANS DATED 4-4-16

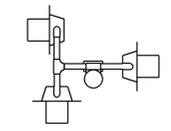
2010 REVISED STANDARD PLAN RSP ES-4A



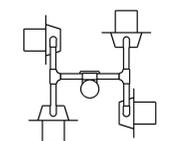
SV-2-TD



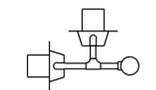
SV-2-TC



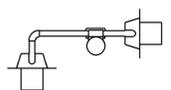
SV-3-TC



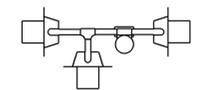
SV-4-TC



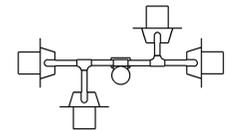
SV-2B



SV-2-TB

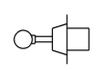


SV-3-TB



SV-4-TB

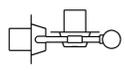
PLAN VIEW OF OTHER  
SIDE MOUNTINGS



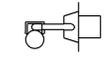
SV



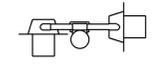
SV-1



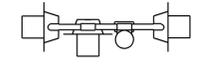
SV-2A



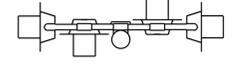
SV-1-T



SV-2-TA



SV-3-TA



SV-4-TA

SIDE MOUNTINGS

ABBREVIATIONS:

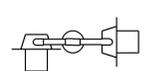
- SV SIDE MOUNTED SIGNAL HEADS
- T TERMINAL COMPARTMENT
- TV TOP MOUNTED SIGNAL HEADS
- 1, 2, 3, 4 NUMBER OF SIGNAL FACES  
(3 - SECTION, UNLESS OTHERWISE INDICATED)
- A, B, C, D CONFIGURATION OF SIGNALS

NOTES:

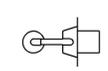
1. Mountings shall be oriented to provide maximum horizontal clearance to adjacent roadway.
2. Bracket arms shall be long enough to permit proper alignment of signals and backplate installation.
3. See Revised Standard Plans RSP ES-4D and RSP ES-4E for attachment fitting details.



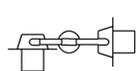
TV-1



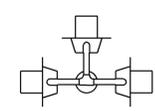
TV-2



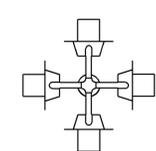
TV-1-T



TV-2-T



TV-3-T



TV-4-T

PLAN VIEW OF  
TOP MOUNTINGS

TOP MOUNTINGS

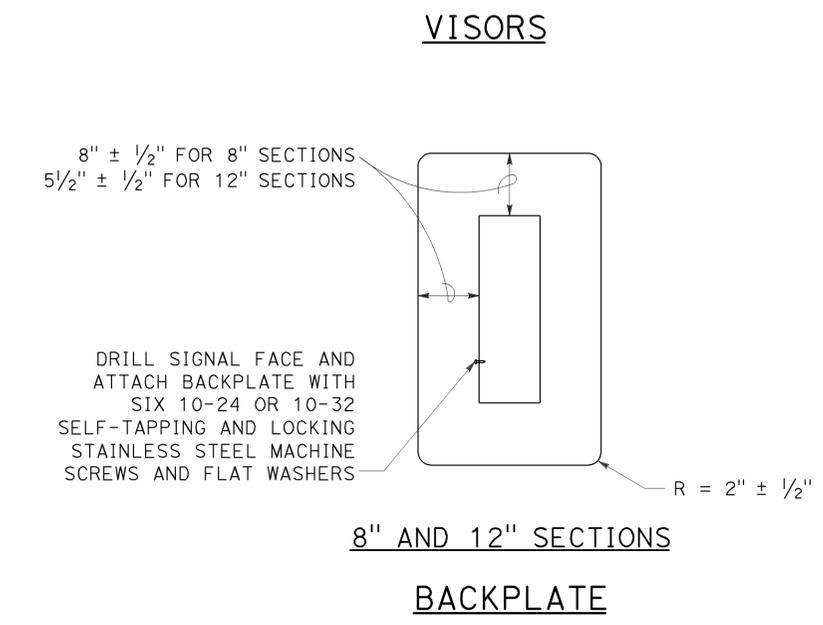
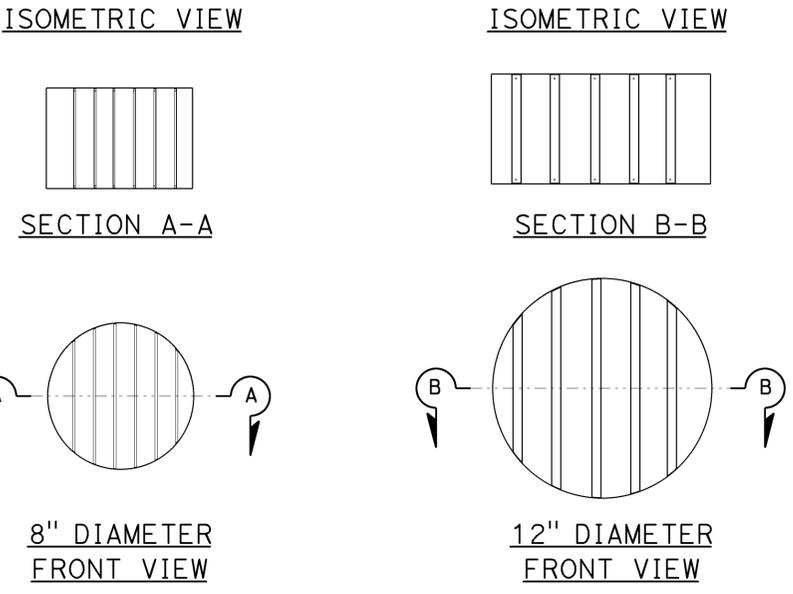
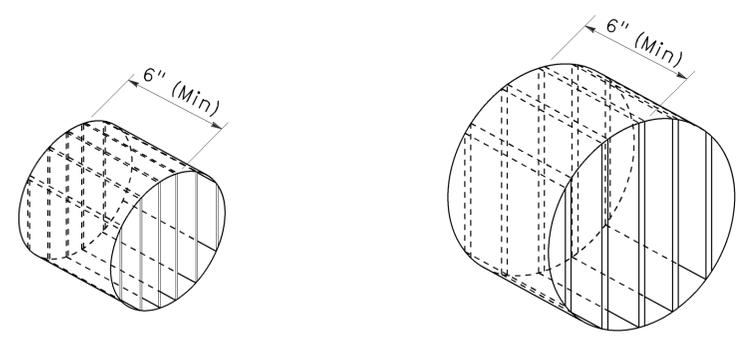
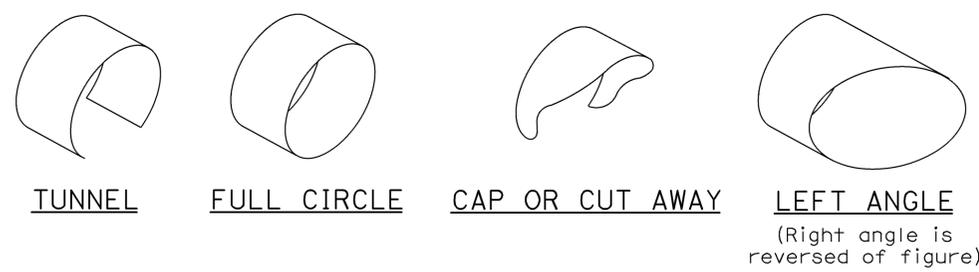
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
(SIGNAL HEADS AND MOUNTINGS)**  
NO SCALE

RSP ES-4A DATED OCTOBER 30, 2015 SUPERSEDES RSP ES-4A DATED JULY 19, 2013 AND  
STANDARD PLAN ES-4A DATED MAY 20, 2011 - PAGE 443 OF THE STANDARD PLANS BOOK DATED 2010.

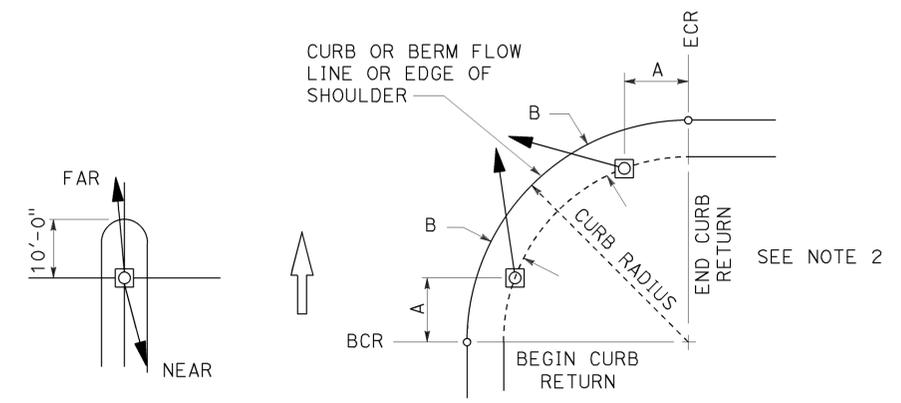
**REVISED STANDARD PLAN RSP ES-4A**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	52	76

Theresa Gabriel  
 REGISTERED ELECTRICAL ENGINEER  
 October 30, 2015  
 PLANS APPROVAL DATE  
 Theresa Aziz Gabriel  
 No. E15129  
 Exp. 6-30-16  
 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.

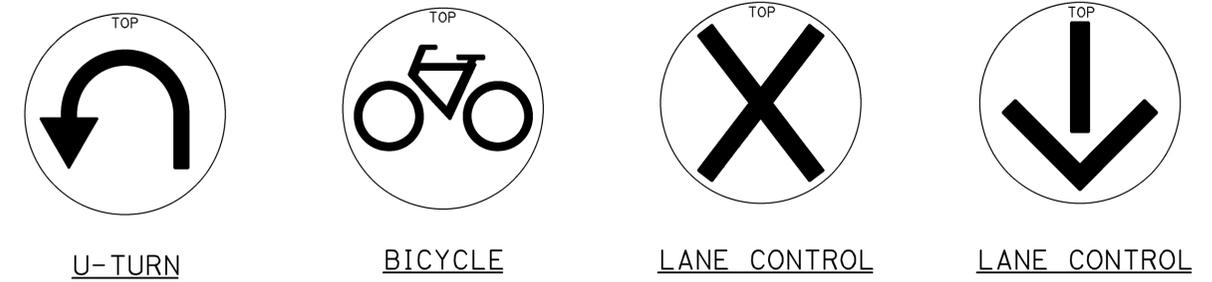
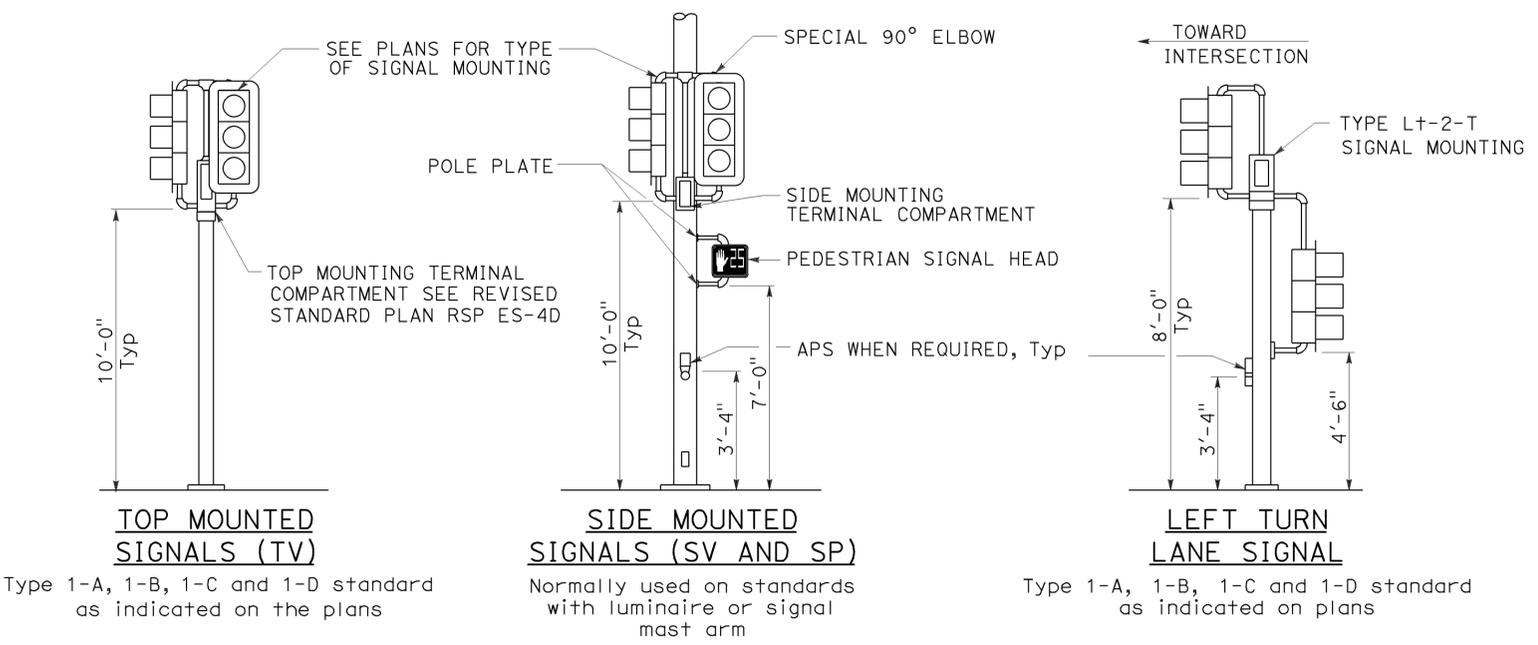


**DIRECTIONAL LOUVER**  
 Directional louvers shall be oriented and secured in place with one plated brass machine screw and nut.



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

**SIGNAL STANDARD PLACEMENT DIMENSIONS AND EQUIPMENT LOCATIONS**



**SIGNAL FACES**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS (SIGNAL HEADS AND MOUNTINGS)**  
 NO SCALE

**TYPICAL SIGNAL HEAD INSTALLATIONS**

RSP ES-4C DATED OCTOBER 30, 2015 SUPERSEDES RSP ES-4C DATED JULY 19, 2013 AND STANDARD PLAN ES-4C DATED MAY 20, 2011 - PAGE 445 OF THE STANDARD PLANS BOOK DATED 2010.

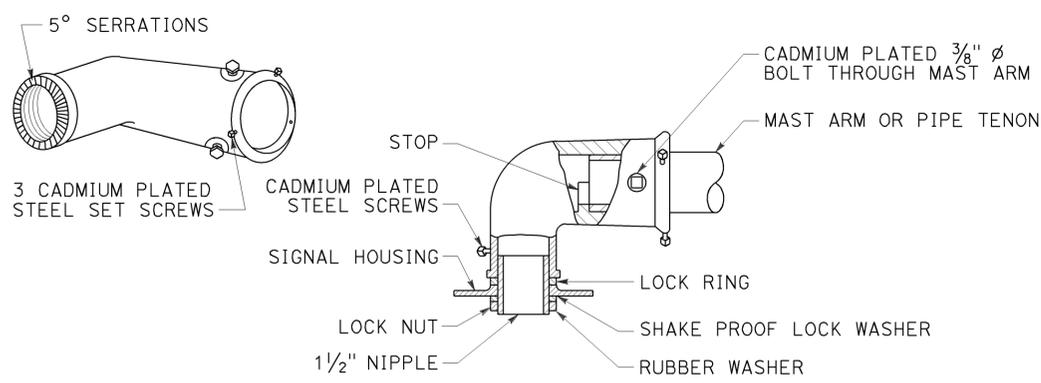
**REVISED STANDARD PLAN RSP ES-4C**

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

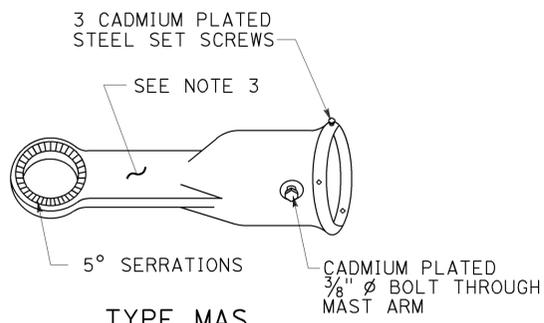
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	53	76

Theresa Gabriel  
 REGISTERED ELECTRICAL ENGINEER  
 October 30, 2015  
 PLANS APPROVAL DATE  
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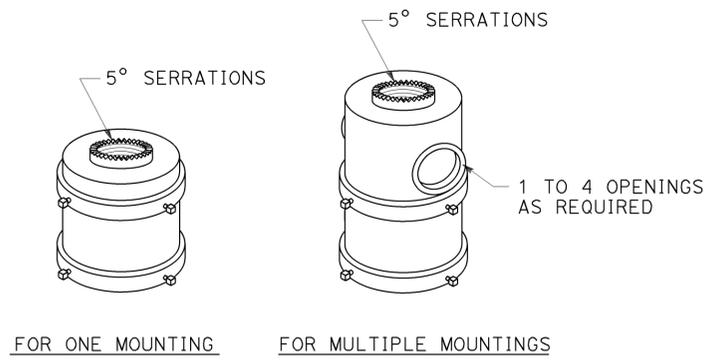
2010 REVISED STANDARD PLAN RSP ES-4D



**TYPE MAT**  
**MAST ARM MOUNTING**  
For 2 NPS pipe, see Note 1.

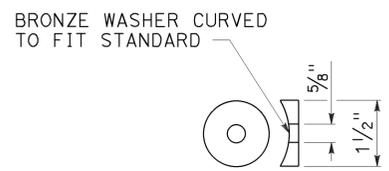


**TYPE MAS**  
**MAST ARM MOUNTING**  
For 2 NPS pipe, see Note 1.

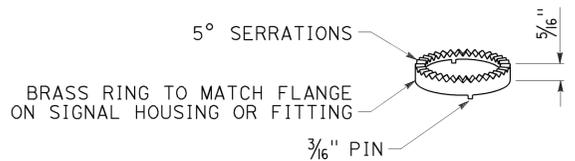


**TOP MOUNTINGS**  
For 4 NPS pipe, see Note 2.

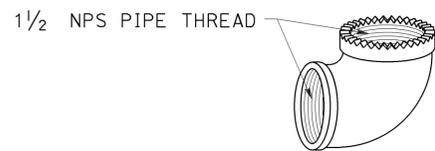
**SIGNAL SLIP FITTERS**



**DETAIL C**



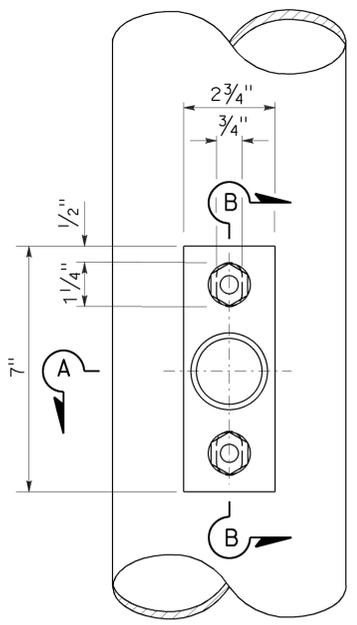
**LOCK RING**  
Use where locking ring is not integral with signal housing or fitting.



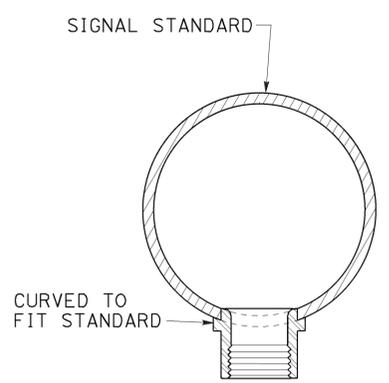
**SPECIAL 90° ELBOW**  
One for each signal head, except those with special slip fitter mounting

- NOTES:**
- After mast arm signal has been plumbed and secured, drill  $\frac{1}{16}$ " hole through mast arm tenon in line with slip fitter hole. Place a cadmium plated  $\frac{3}{8}$ "  $\phi$  galvanized bolt with washer under bolt head through hole and secure with washer, nut, and locknut. Seal openings between mast arm mountings and mast arm with mastic.
  - (A) Threaded top mounted slip fitter openings shall be  $1\frac{1}{2}$  NPS.  
(B) Serrations in fittings shall match those on bottom of signal heads or in lock ring.  
(C) Top opening shall be offset when backplate is used.
  - Wireway shall have a cross section area of 0.95 square inch minimum. Minimum width of  $\frac{1}{2}$ ".

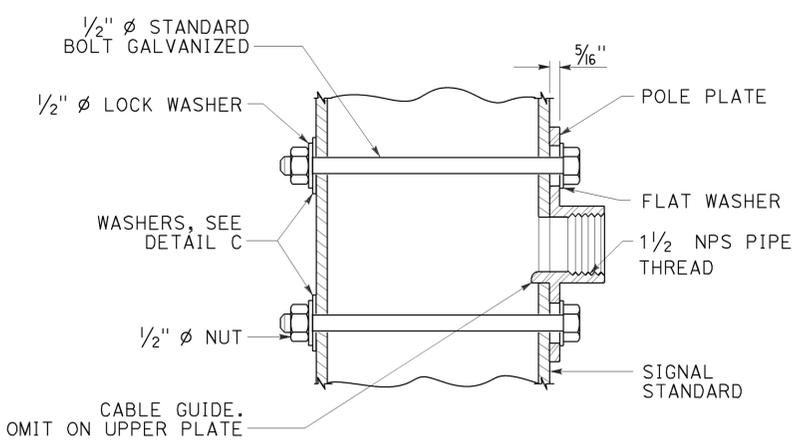
**MISCELLANEOUS MOUNTING HARDWARE**



**TOP VIEW**

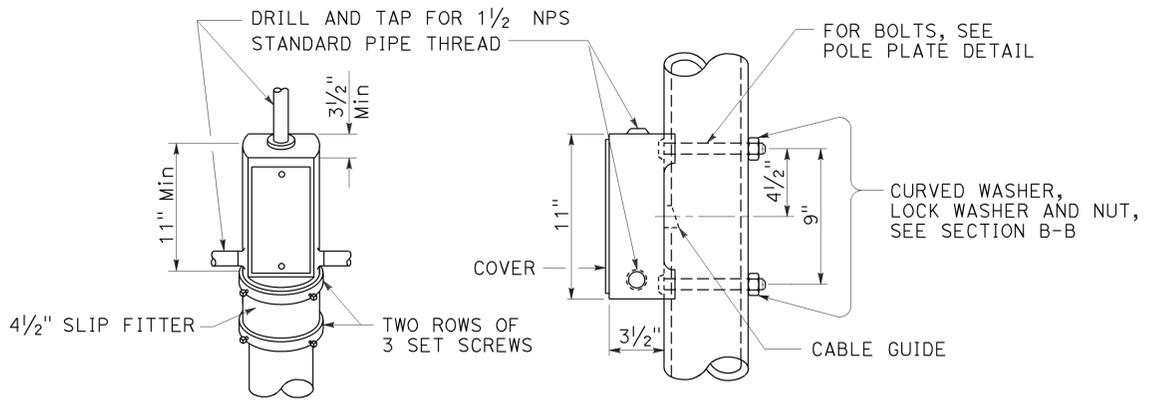


**SECTION A-A**



**SECTION B-B**

**POLE PLATE FOR SIDE MOUNTED SIGNAL HEAD WITHOUT TERMINAL COMPARTMENT**



**TOP MOUNTING**  
**SIDE MOUNTING**  
**TERMINAL COMPARTMENT**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(SIGNAL HEAD MOUNTING)**

NO SCALE  
RSP ES-4D DATED OCTOBER 30, 2015 SUPERSEDES STANDARD PLAN ES-4D DATED MAY 20, 2011 - PAGE 446 OF THE STANDARD PLANS BOOK DATED 2010.

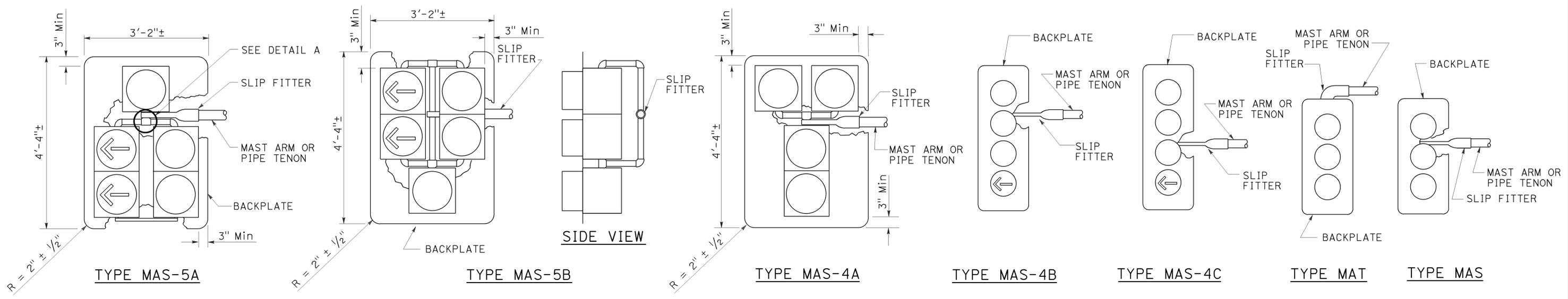
**REVISED STANDARD PLAN RSP ES-4D**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	54	76

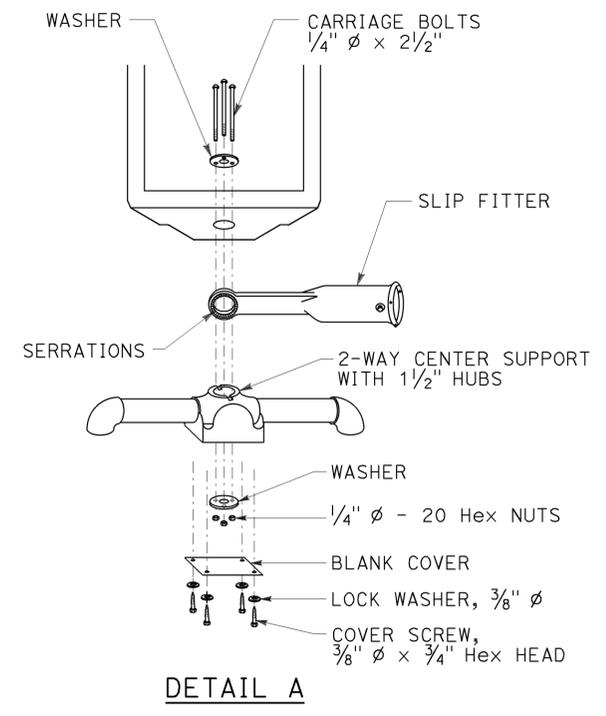
*Theresa Gabriel*  
 REGISTERED ELECTRICAL ENGINEER  
 October 30, 2015  
 PLANS APPROVAL DATE

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 OR AGENTS SHALL NOT BE RESPONSIBLE FOR  
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 COPIES OF THIS PLAN SHEET.

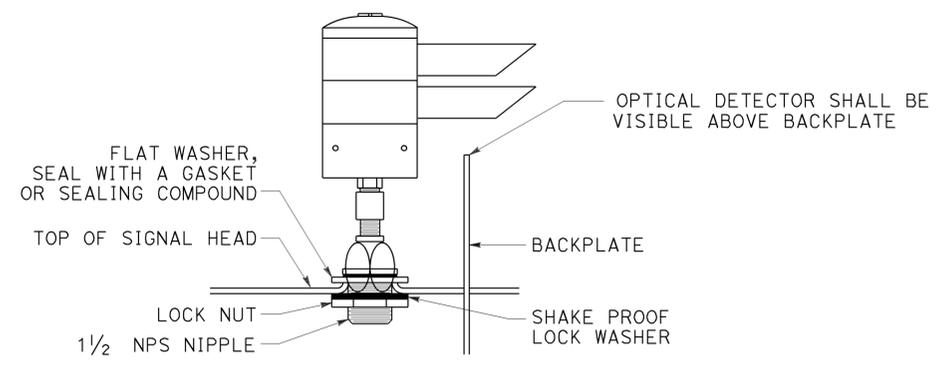
TO ACCOMPANY PLANS DATED 4-4-16



**MAST ARM MOUNTINGS**



**DETAIL A**



**OPTICAL DETECTOR MOUNTING FOR  
EMERGENCY VEHICLE DETECTION**

**DETAIL B**

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

NO SCALE

RSP ES-4E DATED OCTOBER 30, 2015 SUPERSEDES RSP ES-4E DATED JULY 19, 2013 AND STANDARD PLAN ES-4E DATED MAY 20, 2011 - PAGE 447 OF THE STANDARD PLANS BOOK DATED 2010.

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

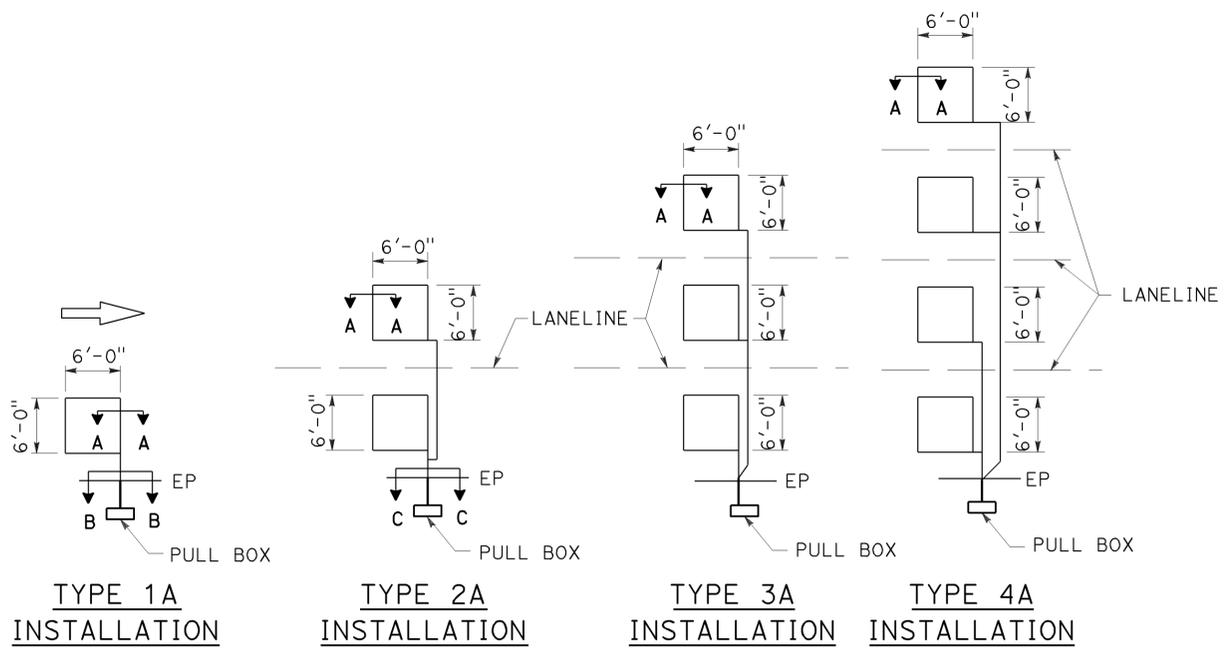
2010 REVISED STANDARD PLAN RSP ES-4E

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	55	76

Theresa Gabriel  
 REGISTERED ELECTRICAL ENGINEER  
 October 30, 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.

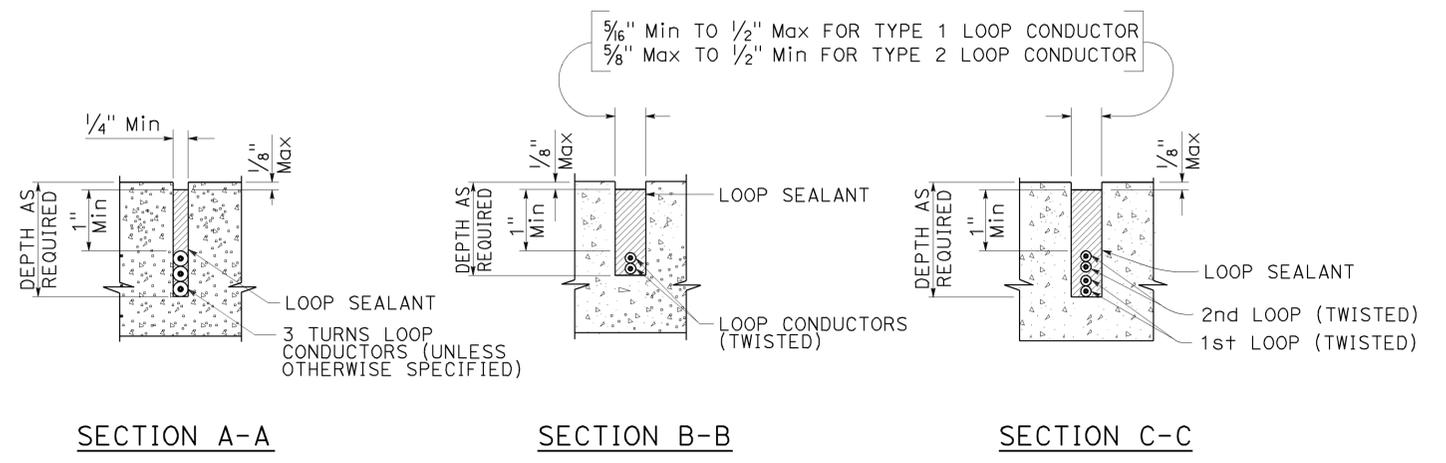


TO ACCOMPANY PLANS DATED 4-4-16

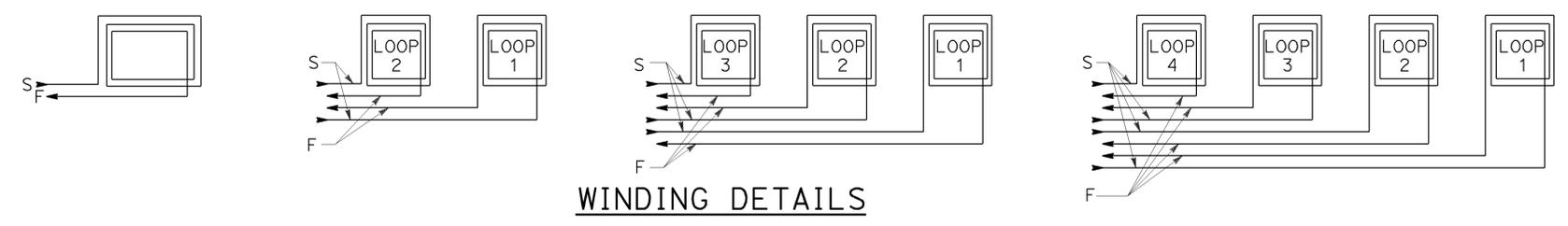


**SAWCUT DETAILS**

- Type A loop detector configurations illustrated
- 1A thru 4A = 1 Type A loop configuration in each lane.
  - 1B thru 4B = 1 Type B loop configuration in each lane.
  - 1C = 1 Type C loop configuration entering lanes as required.
  - 1D thru 4D = 1 Type D loop configuration in each lane.
  - 1E thru 4E = 1 Type E loop configuration in each lane.
  - 1Q thru 4Q = 1 Type Q loop configuration in each lane.
- Use Type A, B, C, D, E or Q loop detector configurations only when specified or shown on plans.

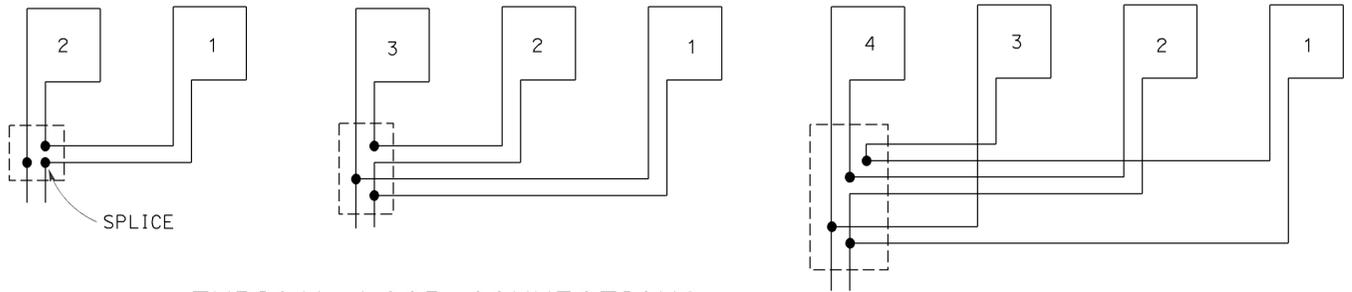


**SLOT DETAILS - TYPE 1 AND TYPE 2 LOOP CONDUCTOR**



**WINDING DETAILS**

**ABBREVIATIONS:**  
 S - START  
 F - FINISH



**TYPICAL LOOP CONNECTIONS**  
 Dashed lines represent the pull box

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

RSP ES-5A DATED OCTOBER 30, 2015 SUPERSEDES STANDARD PLAN ES-5A DATED MAY 20, 2011 - PAGE 448 OF THE STANDARD PLANS BOOK DATED 2010.

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

2010 REVISED STANDARD PLAN RSP ES-5A

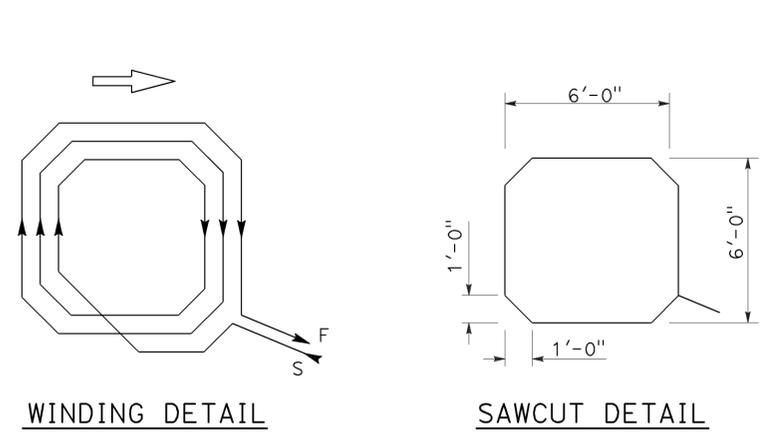
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	56	76

*Theresa Gabriel*  
 REGISTERED ELECTRICAL ENGINEER  
 Theresa  
 Aziz Gabriel  
 No. E15129  
 Exp. 6-30-16  
 ELECTRICAL  
 STATE OF CALIFORNIA

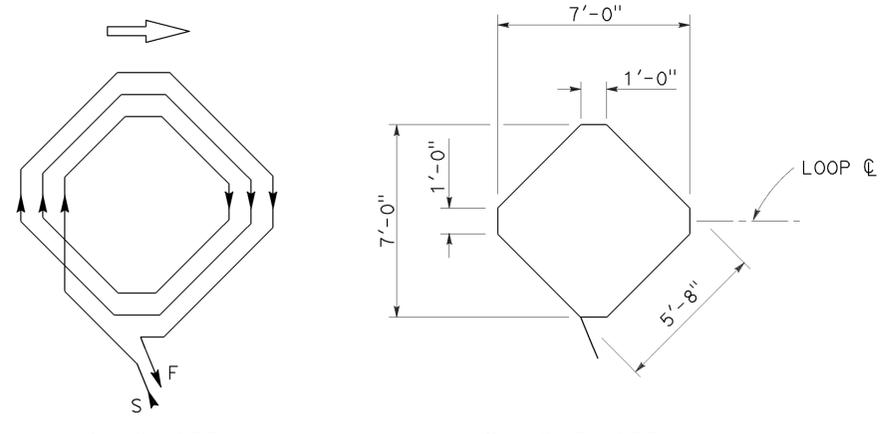
October 30, 2015  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED 4-4-16

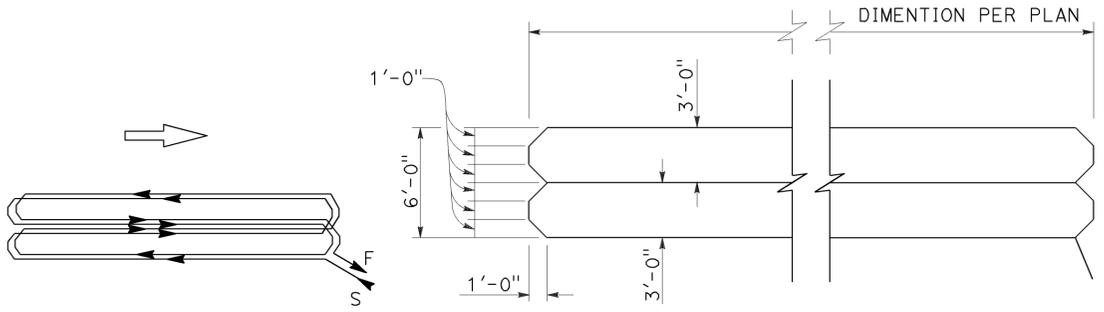
2010 REVISED STANDARD PLAN RSP ES-5B



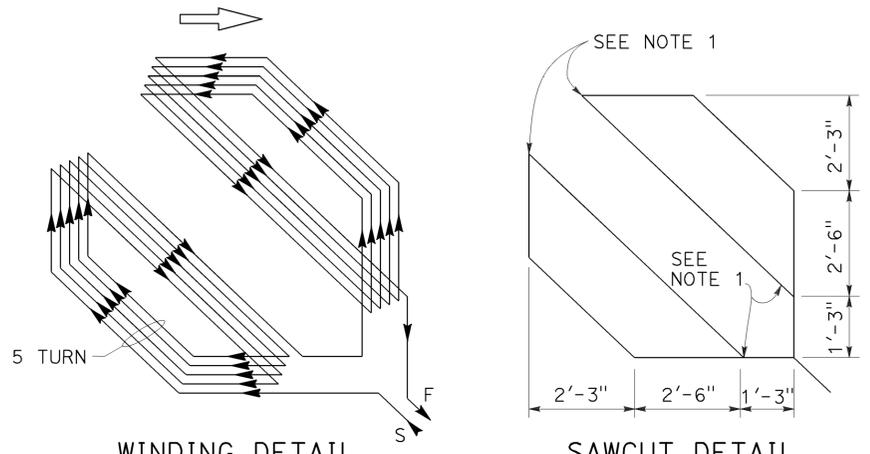
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE A LOOP DETECTOR CONFIGURATION**



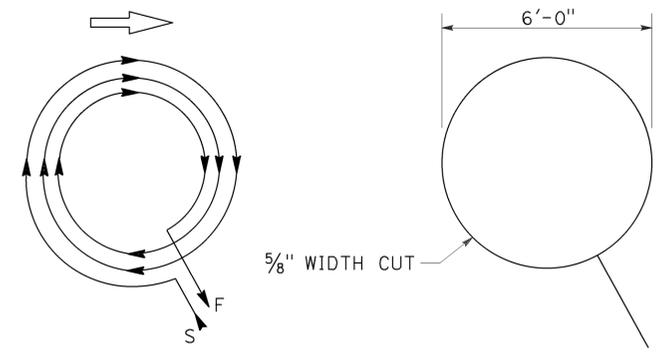
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE B LOOP DETECTOR CONFIGURATION**



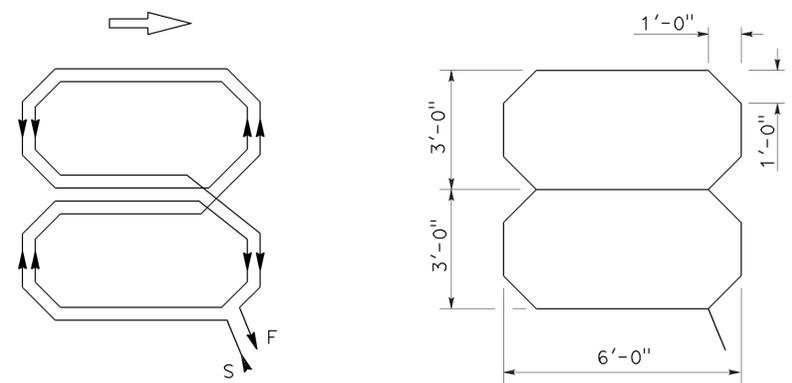
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE C LOOP DETECTOR CONFIGURATION**



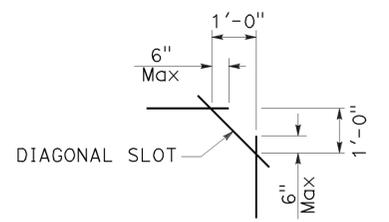
WINDING DETAIL  
SAWCUT DETAIL  
**TYPE D LOOP DETECTOR CONFIGURATION**



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.
  3. Use Type D loops for limit line detector installations in left turn and bicycle lanes.

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

RSP ES-5B DATED OCTOBER 30, 2015 SUPERSEDES RSP ES-5B DATED JULY 19, 2013 AND STANDARD PLAN ES-5B DATED MAY 20, 2011 - PAGE 449 OF THE STANDARD PLANS BOOK DATED 2010.

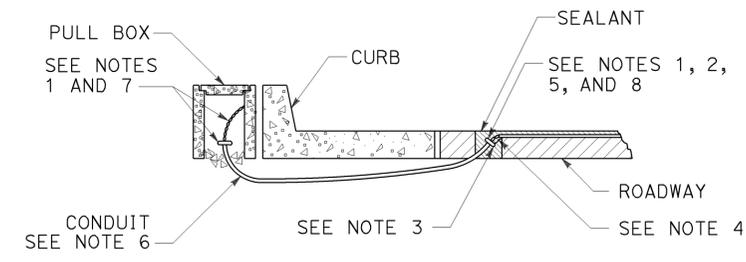
**REVISED STANDARD PLAN RSP ES-5B**

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	57	76

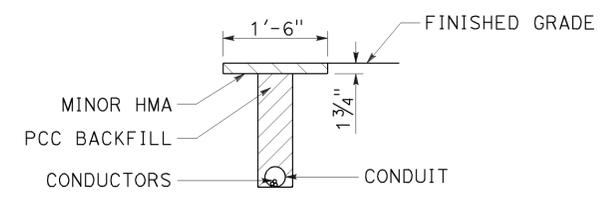
Theresa Gabriel  
 REGISTERED ELECTRICAL ENGINEER  
 October 30, 2015  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED 4-4-16

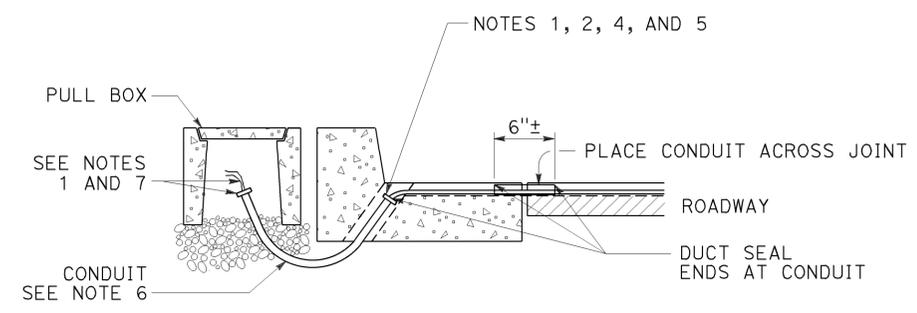
2010 REVISED STANDARD PLAN RSP ES-5D



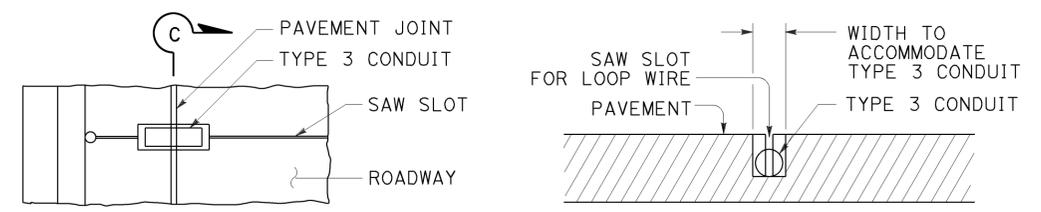
**TYPE A  
CURB TERMINATION DETAIL**



**"T" TRENCH  
DETAIL T**



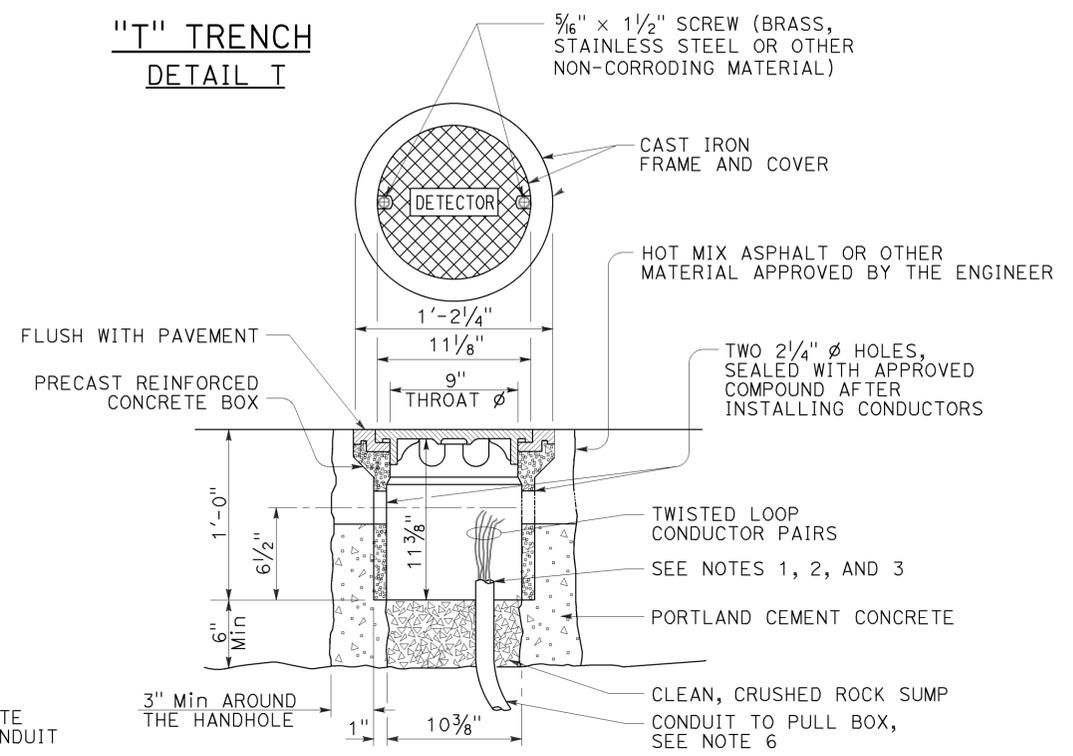
**CROSS SECTION  
TYPE B  
CURB TERMINATION DETAIL**



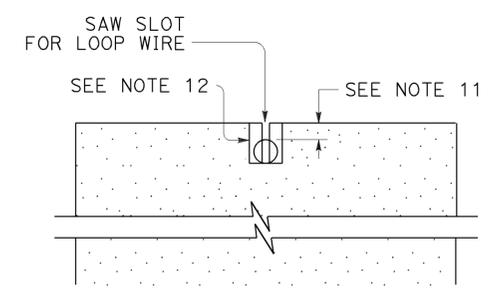
**PLAN VIEW**

**SECTION C-C**

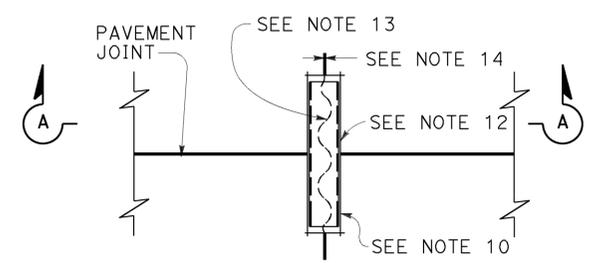
**TYPE B  
CURB TERMINATION DETAIL**



**DETECTOR HANDHOLE DETAIL**

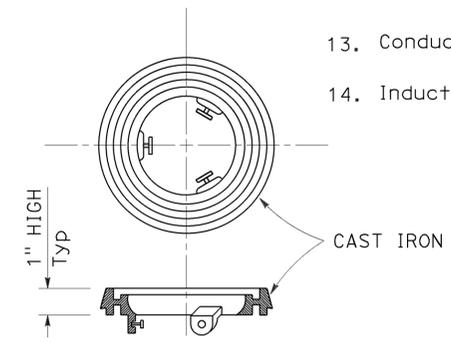


**SECTION A-A**



**PLAN VIEW**

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



**LOCKING GRADE RING**

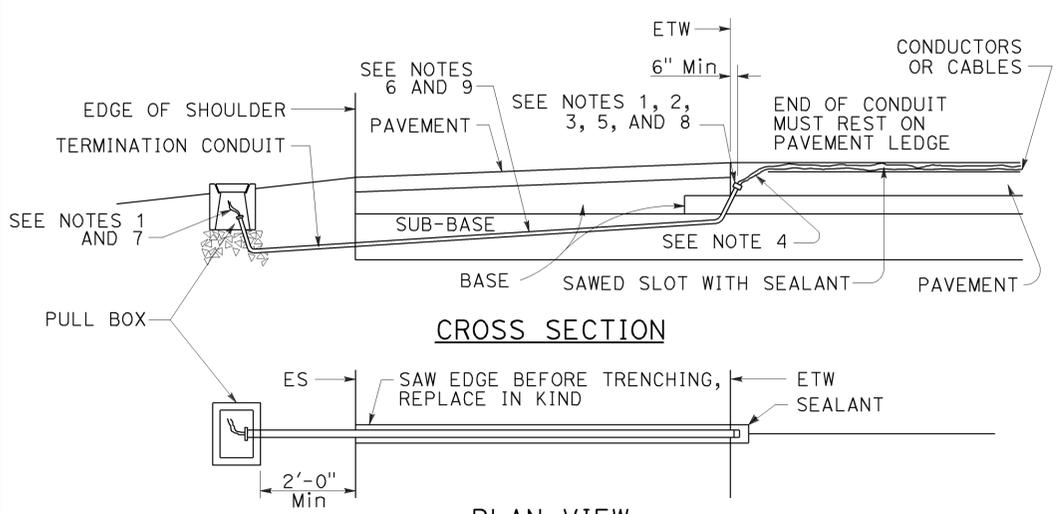
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(CURB AND SHOULDER TERMINATION,  
TRENCH, AND HANDHOLE DETAILS)**

NO SCALE

RSP ES-5D DATED OCTOBER 30, 2015 SUPERSEDES RSP ES-5D DATED JULY 19, 2013 AND STANDARD PLAN ES-5D DATED MAY 20, 2011 - PAGE 451 OF THE STANDARD PLANS BOOK DATED 2010.

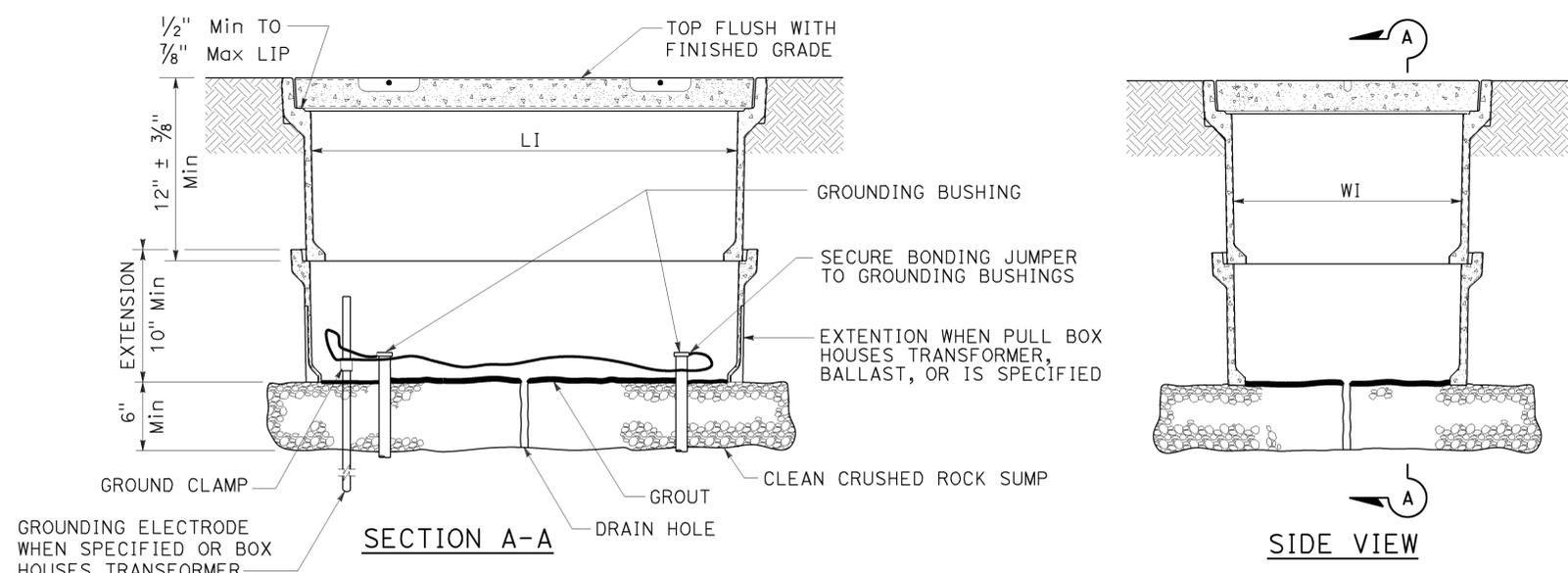
**REVISED STANDARD PLAN RSP ES-5D**



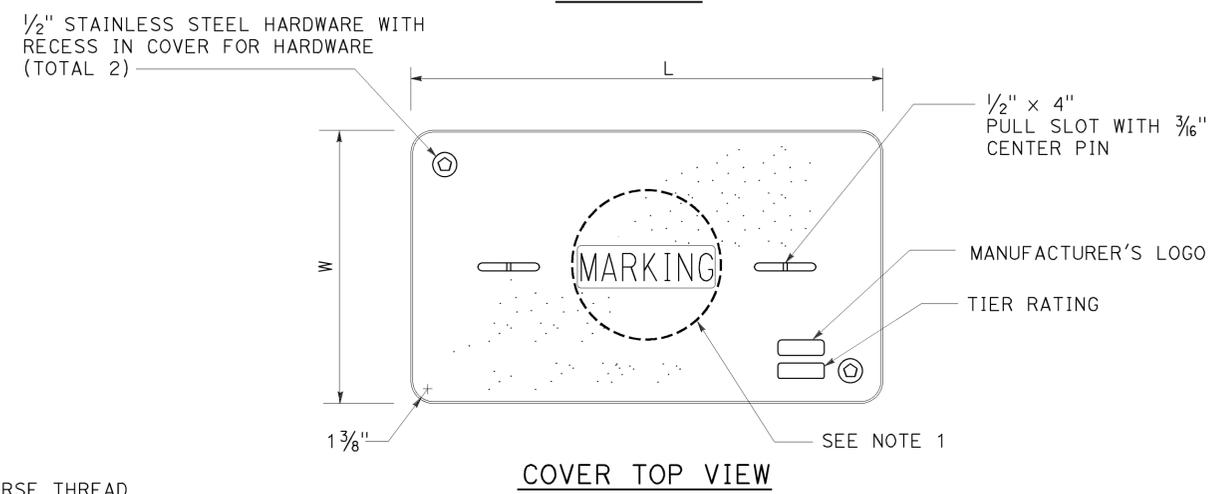
**CROSS SECTION**

**PLAN VIEW  
SHOULDER TERMINATION DETAILS**

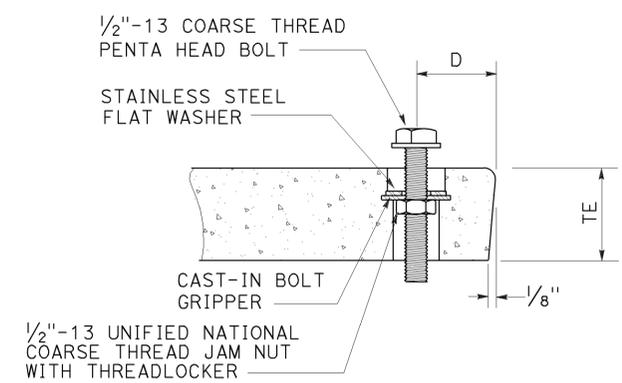
TO ACCOMPANY PLANS DATED 4-4-16



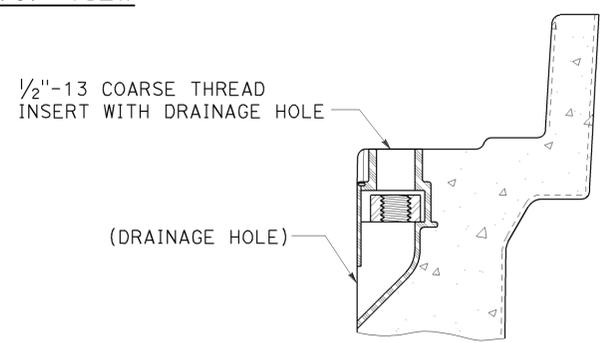
**INSTALLATION DETAILS**  
**DETAIL A**



**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.
- Dimensions for the cover for non-traffic pull box are nominal values.

DIMENSION TABLE										
PULL BOX	PULL BOX			COVER						
	MINIMUM DEPTH BOX	MINIMUM DEPTH EXTENSION	MINIMUM WEIGHT	LI Min	WI Min	TE	D	L	W	MINIMUM WEIGHT
No. 3 1/2	12"	N/A	40 lb	1' - 3"	9"	1 3/4"	1 3/4"	1'-3 1/4" - 1'-3 3/8"	10" - 10 1/8"	30 lb
No. 5	12"	10"	55 lb	1' - 8"	11"	2"	1 3/4"	1'-11 1/4"	1'-1 3/4"	60 lb
No. 6	12"	10"	70 lb	2' - 4 1/4"	1' - 3 1/4"	2"	2"	2'-6 1/2"	1'-5 1/2"	85 lb

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

RSP ES-8A DATED OCTOBER 30, 2015 SUPERSEDES RSP ES-8A DATED JULY 19, 2013 AND RSP ES-8A DATED JANUARY 20, 2012 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

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

2010 REVISED STANDARD PLAN RSP ES-8A

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	59	76

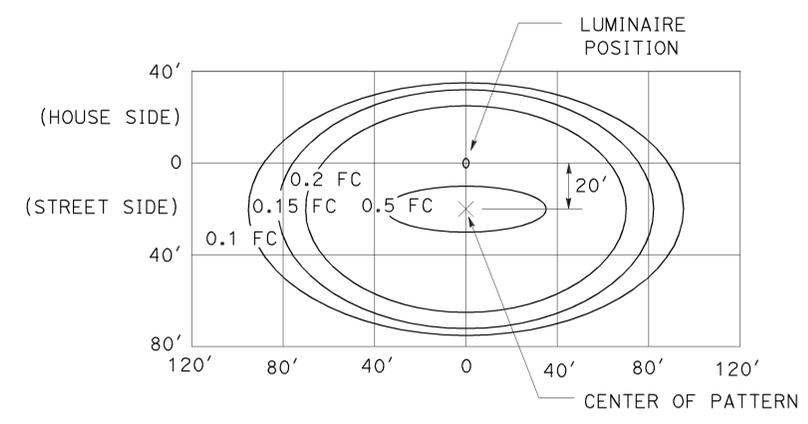
*Theresa Gabriel*  
 REGISTERED ELECTRICAL ENGINEER  
 Theresa Aziz Gabriel  
 No. E15129  
 Exp. 6-30-16  
 ELECTRICAL  
 STATE OF CALIFORNIA

October 30, 2015  
 PLANS APPROVAL DATE

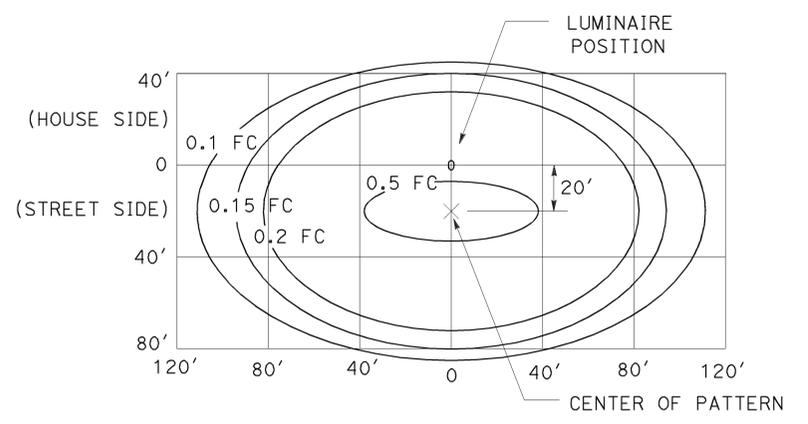
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED 4-4-16

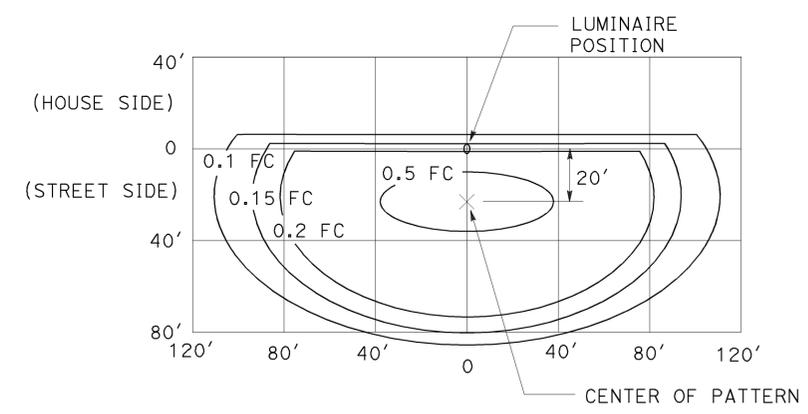
**NOTE:**  
Curves represent the minimum footcandle (FC).



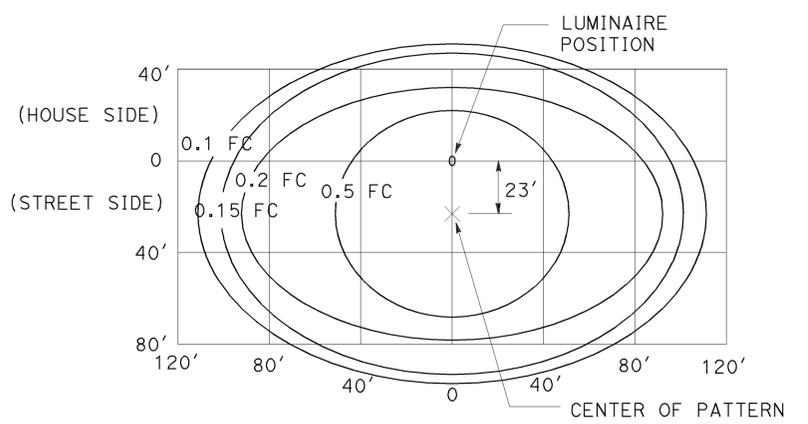
**LED LUMINAIRE 165 W**  
34' Mounting Height



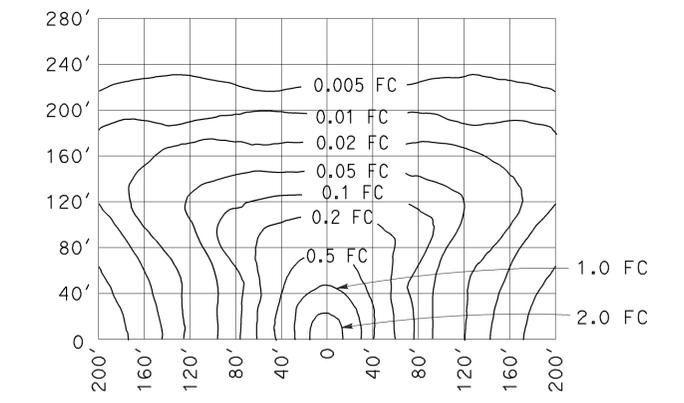
**LED LUMINAIRE 235 W**  
40' Mounting Height



**LED LUMINAIRE 235 W**  
40' Mounting Height  
with back side control



**LED LUMINAIRE 300 W**  
40' Mounting Height



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

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(ISOFOOTCANDLE CURVES)**

NO SCALE

RSP ES-10A DATED OCTOBER 30, 2015 SUPERSEDES RSP ES-10A DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP ES-10A**

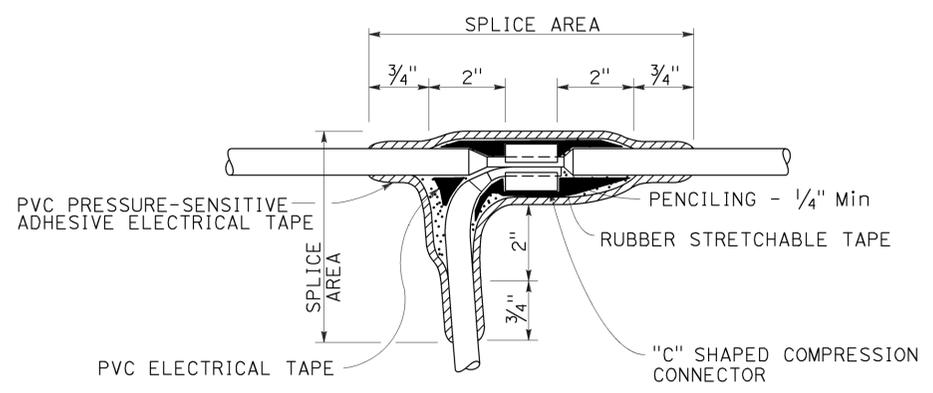
2010 REVISED STANDARD PLAN RSP ES-10A

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	60	76

*Theresa Gabriel*  
 REGISTERED ELECTRICAL ENGINEER  
 Theresa  
 Aziz Gabriel  
 No. E15129  
 Exp. 6-30-16  
 ELECTRICAL  
 STATE OF CALIFORNIA

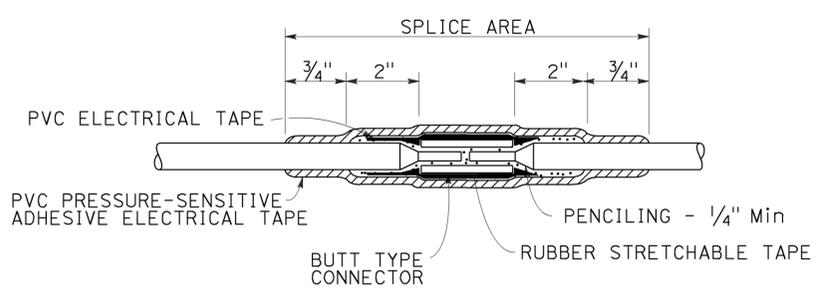
October 30, 2015  
 PLANS APPROVAL DATE  
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TO ACCOMPANY PLANS DATED 4-4-16



**TYPE C SPLICE**

See Note 3

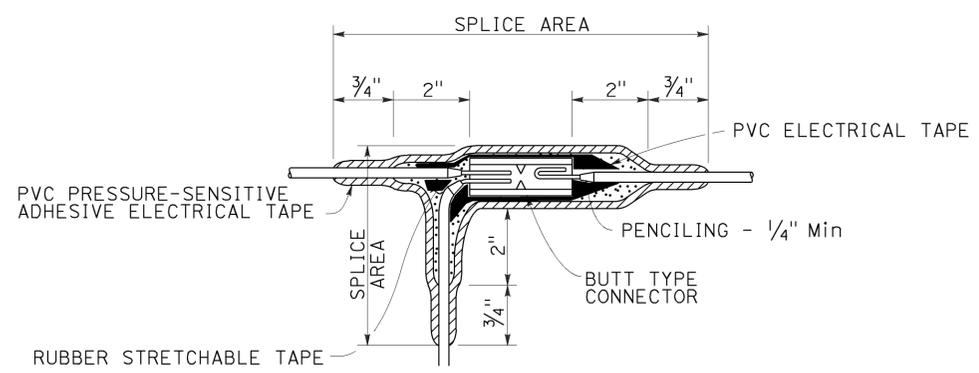


**TYPE S SPLICE**

See Note 4

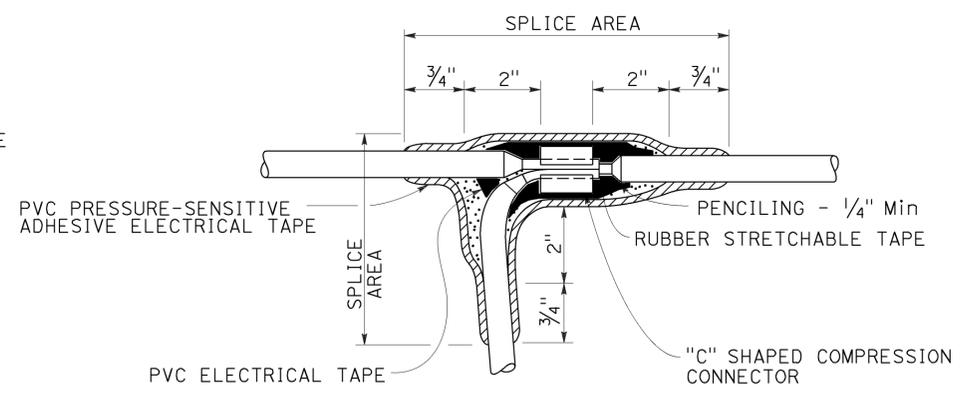
**NOTES:**

1. Dimensions are minimum.
2. Rubber tapes shall be rolled after application.
3. Between 1 free-end and 1 through conductor.
4. Between 2 free-end conductors.
5. Between 3 free-end conductors.



**TYPE ST SPLICE**

See Note 5



**TYPE T SPLICE**

See Note 5

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (SPlicing DETAILS)**

NO SCALE

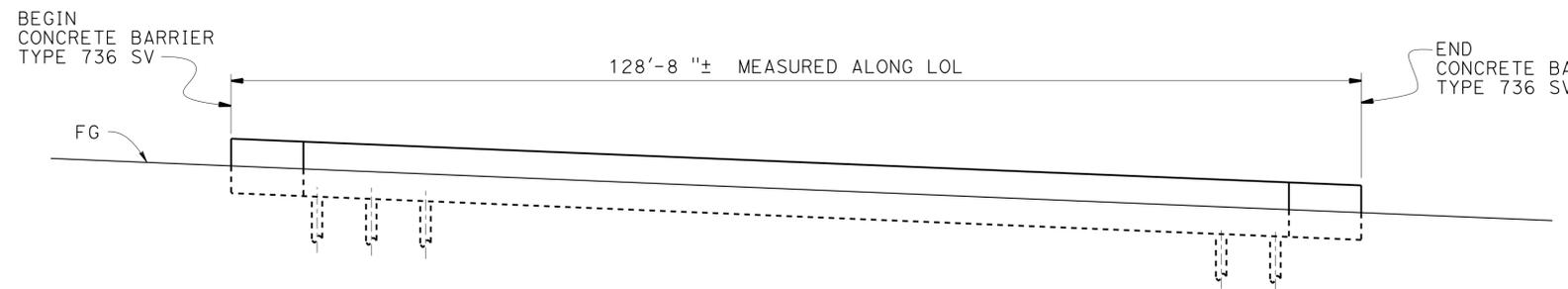
RSP ES-13A DATED OCTOBER 30, 2015 SUPERSEDES STANDARD PLAN ES-13A DATED MAY 20, 2011 - PAGE 491 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP ES-13A**

2010 REVISED STANDARD PLAN RSP ES-13A

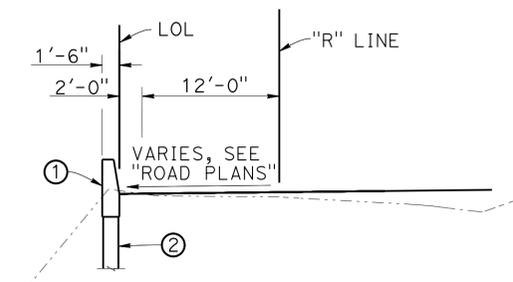
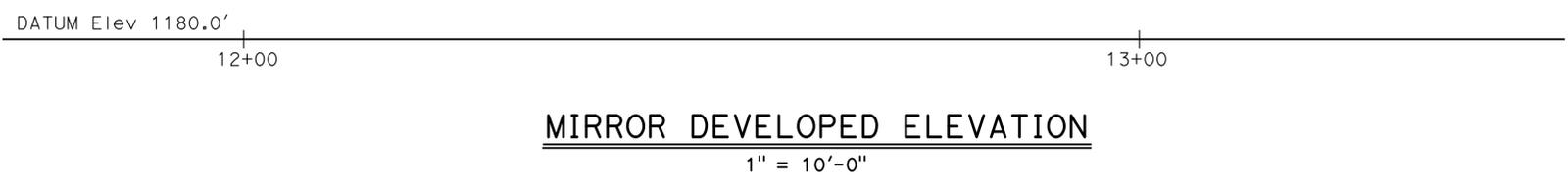
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	61	76

REGISTERED CIVIL ENGINEER: *Lihua Han* 12-18-14  
 PLANS APPROVAL DATE: 4-4-16  
 No. C61320  
 Exp. 06-30-15  
 CIVIL  
 STATE OF CALIFORNIA  
 The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

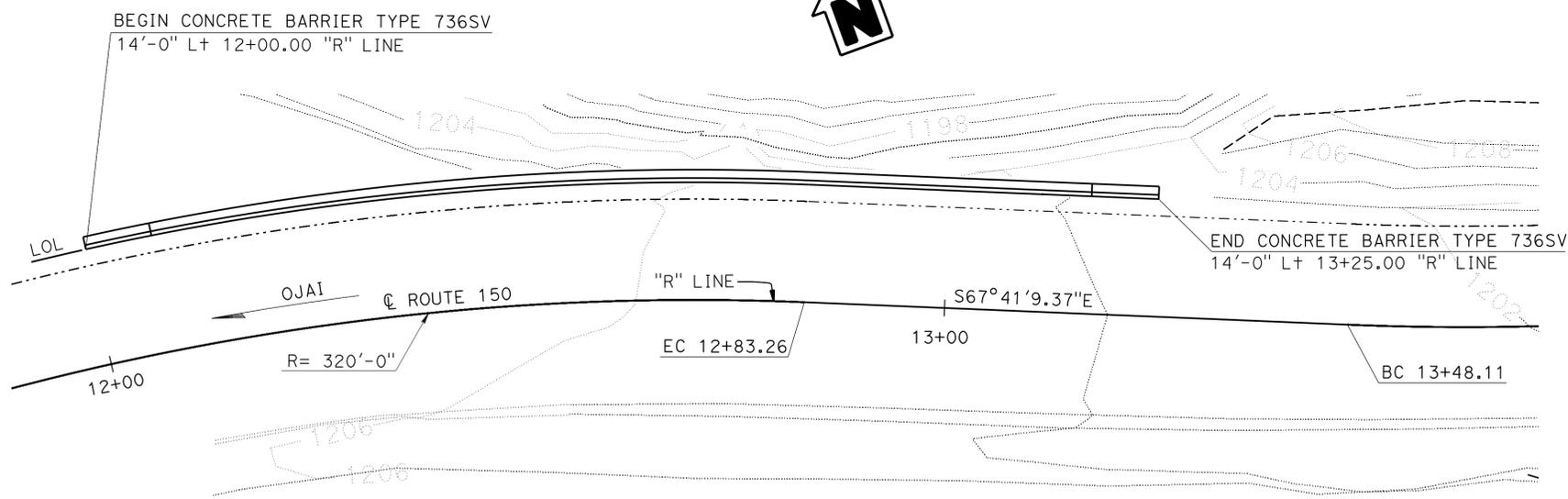


QUANTITIES

16" CAST-IN-DRILLED-HOLE CONCRETE PILING	358	LF
CONCRETE BARRIER (TYPE 736SV)	129	LF



**TYPICAL SECTION**  
1/8" = 1'-0"



**CURVE DATA**

"VEN-150" LINE

R = 320.00'  
 Δ = 23°46'14"  
 L = 132.76'  
 T = 67.35'

**PLAN**  
1" = 10'-0"

- NOTES:
- ① Concrete Barrier Type 736SV
  - ② 16"Ø CIDH Concrete Pile

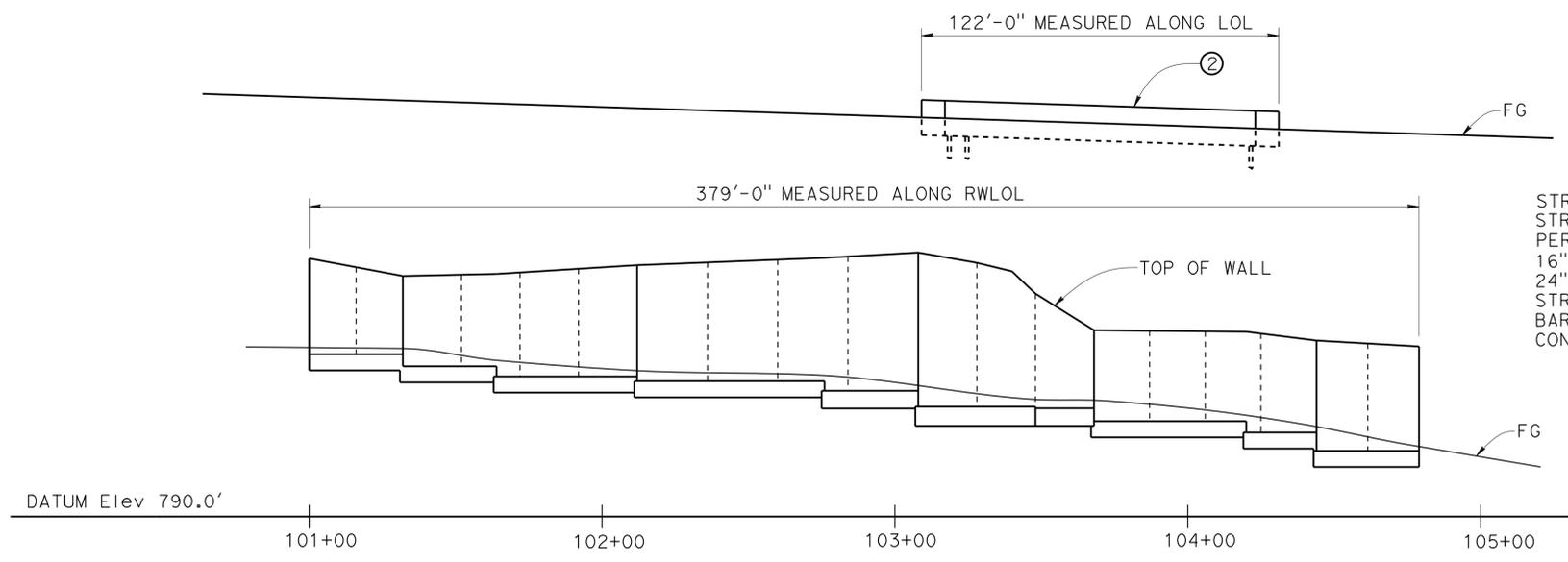
NOTE:  
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

 DESIGN ENGINEER	DESIGN	BY J. Han	CHECKED D. Dunrud	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 W/"LOW-BOY"; PERMIT DESIGN VEHICLE	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN <b>DESIGN BRANCH 14</b>	BRIDGE NO.	<b>ROUTE 150 BARRIER REPLACEMENT</b> <b>GENERAL PLAN AT PM 27.4</b>
	DETAILS	BY L. Xiong	CHECKED J. Han	LAYOUT	BY J. Han			CHECKED J. Lane	
QUANTITIES	BY J. Han	CHECKED V. Ramankrishnan	SPECIFICATIONS	BY V. Renganathan	PLANS AND SPECS COMPARED	V. Renganathan	POST MILE	27.4	

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS  
 0 1 2 3  
 UNIT: 3613  
 PROJECT NUMBER & PHASE: 07130003981  
 CONTRACT NO.: 07-3X0211  
 DISREGARD PRINTS BEARING EARLIER REVISION DATES  
 REVISION DATES: 10-21-14, 10-23-14, 11-03-14, 11-05-14  
 SHEET 1 OF 16

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	62	76

REGISTERED CIVIL ENGINEER *Lihua Han* DATE 12-18-14  
 PLANS APPROVAL DATE 4-4-16  
 REGISTERED PROFESSIONAL ENGINEER  
 LIHUA HAN  
 No. C61320  
 Exp. 06-30-15  
 CIVIL  
 STATE OF CALIFORNIA  
 The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

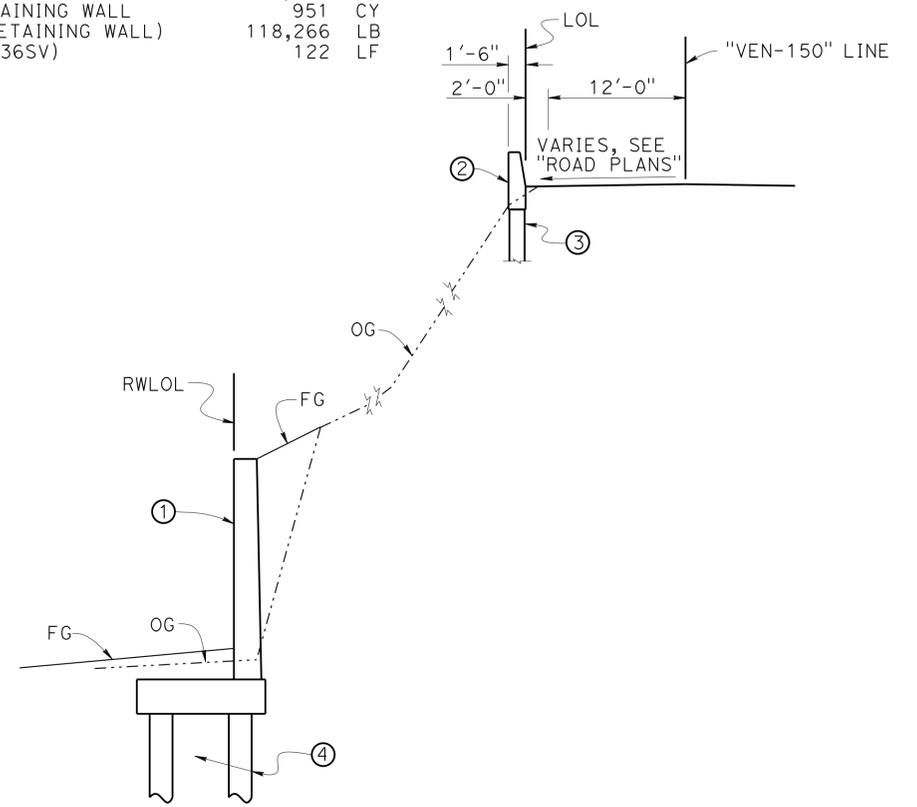


**MIRROR DEVELOPED RETAINING WALL ELEVATION**

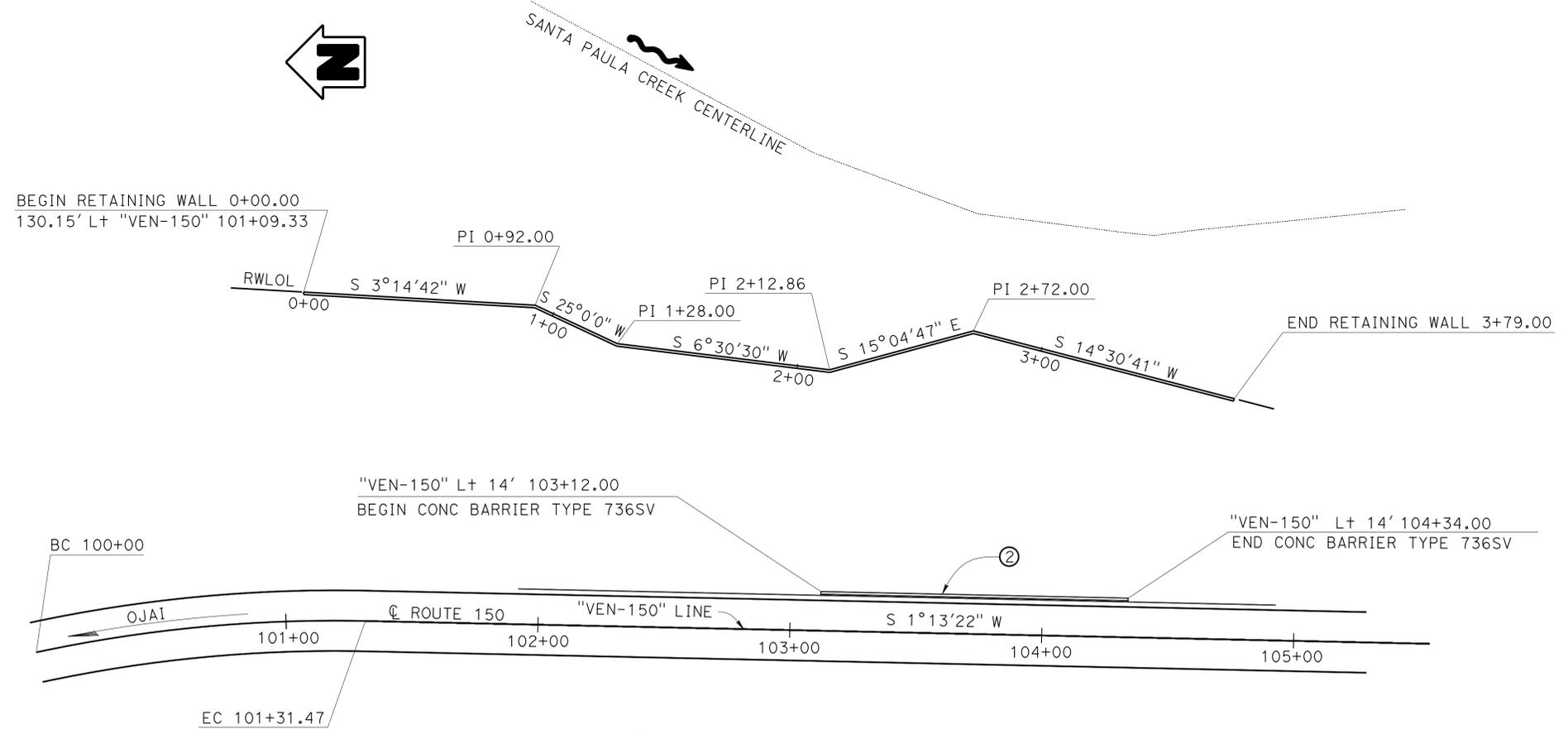
V: 1" = 15'-0"  
H: 1" = 30'-0"

**QUANTITIES**

STRUCTURE EXCAVATION (TYPE SC)	1,761	CY
STRUCTURE BACKFILL (RETAINING WALL)	2622	CY
PERVIOUS BACKFILL MATERIAL (RETAINING WALL)	190	CY
16" CAST-IN-DRILLED-HOLE CONCRETE PILING	352	LF
24" CAST-IN-DRILLED-HOLE CONCRETE PILING	1,380	LF
STRUCTURAL CONCRETE, RETAINING WALL	951	CY
BAR REINFORCING STEEL (RETAINING WALL)	118,266	LB
CONCRETE BARRIER (TYPE 736SV)	122	LF



**TYPICAL SECTION**  
1/8" = 1'-0"



**PLAN**  
1" = 30'-0"

- NOTE:**
- ① Retaining Wall Type 7SWP
  - ② Concrete Barrier Type 736SV
  - ③ 16"  $\phi$  CIDH Concrete Pile
  - ④ 24"  $\phi$  CIDH Concrete Pile

**NOTE:**  
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

DESIGN ENGINEER

DESIGN	BY J. Han	CHECKED D. Dunrud	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 W/"LOW-BOY"; PERMIT DESIGN VEHICLE
DETAILS	BY L. Xiong	CHECKED J. Han	LAYOUT	BY J. Han
QUANTITIES	BY J. Han	CHECKED D. Dunrud	SPECIFICATIONS	BY V. Renganathan

**STATE OF CALIFORNIA**  
 DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES  
 STRUCTURE DESIGN  
**DESIGN BRANCH 14**

BRIDGE NO.	53E0334
POST MILE	29.4

**ROUTE 150 BARRIER REPLACEMENT**  
**GENERAL PLAN AT PM 29.4**

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	63	76
			12-18-14	REGISTERED CIVIL ENGINEER DATE	
			4-4-16	PLANS APPROVAL DATE	

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

## INDEX TO PLANS

SHEET	TITLE
1.	GENERAL PLAN AT PM 27.3
2.	GENERAL PLAN AT PM 29.4
3.	INDEX TO PLANS
4.	FOUNDATION PLAN
5.	RETAINING WALL LAYOUT
6.	BARRIER TYPE 736SV AND PILE DETAILS
7.	RETAINING WALL TYPE 7SWP - DETAILS NO. 1
8.	RETAINING WALL TYPE 7SWP - DETAILS NO. 2
9.	LOG OF TEST BORINGS AT PM 27.3 1 OF 4
10.	LOG OF TEST BORINGS AT PM 27.3 2 OF 4
11.	LOG OF TEST BORINGS AT PM 27.3 3 OF 4
12.	LOG OF TEST BORINGS AT PM 27.3 4 OF 4
13.	LOG OF TEST BORINGS AT PM 29.4 1 OF 4
14.	LOG OF TEST BORINGS AT PM 29.4 2 OF 4
15.	LOG OF TEST BORINGS AT PM 29.4 3 OF 4
16.	LOG OF TEST BORINGS AT PM 29.4 4 OF 4

## DESIGN NOTES

### DESIGN

Uniform Building Code, 1997 Edition and the AASHTO LRFD Bridge Design Specifications, 4th Edition 2007 with California Amendments

### DESIGN WIND LOAD

27 psf

### DESIGN SEISMIC LOAD

0.57 Dead load

### REINFORCED CONCRETE

$f'_c = 3.6$  ksi  
 $f_y = 60$  ksi

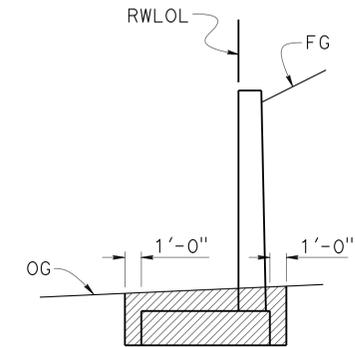
### LOAD FACTORS AND LOAD COMBINATIONS

Working Stress Design ( WSD ) Percentage of unit stress

Group 1: D + E + SC	100%
Group 2: D + W + SC + E	100%
Group 3: D + 0.71 EQD + E	100%

Where:

D	= Dead load
E	= Lateral earth pressure
SC	= Live load surcharge
W	= Wind load
EQD	= Seismic dead load



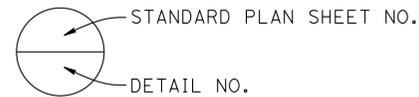
INDICATES LIMITS OF TYPE SC EXCAVATION

## RETAINING WALL EXCAVATION LIMITS

NO SCALE

## STANDARD PLANS DATED 2010

A10A	ACRONYMS AND ABBREVIATIONS (SHEET 1 OF 2)
A10B	ACRONYMS AND ABBREVIATIONS (SHEET 2 OF 2)
A10C	LINE AND SYMBOLS (SHEET 1 OF 3)
A10D	LINE AND SYMBOLS (SHEET 2 OF 3)
A10E	LINE AND SYMBOLS (SHEET 3 OF 3)
B0-3	BRIDGE DETAILS
RSP B3-5	RETAINING WALL DETAILS NO. 1
B3-6	RETAINING WALL DETAILS NO. 2
RSP B11-56	CONCRETE BARRIER TYPE 736
RSP B15-6	SOUND WALL MASONRY BLOCK ON TYPE 736S/SV BARRIER DETAILS (1)



### STRENGTH REDUCTION FACTORS, $\phi$

Reinforced Concrete :

For flexure _____	$\phi = 0.90$
For shear _____	$\phi = 0.85$
For axial compression _____	$\phi = 0.70$
For bearing _____	$\phi = 0.70$

Note 1: Piles designed for flexure and shear (Internal stability) by the Strength Design Method.

Note 2: Pile embedment lengths ( External stability ) were determined using the Sheet Pile Procedure with Service Loads and a Factor of Safety for overturning of 2.0. Allowable net lateral soil were considered based on the Coulomb Method with an angle of shearing resistance (  $\phi$  ) of 39° and a unit weight of soil (  $\gamma$  ) of 125 pcf. An Isolation Factor of 2.0 was used.

NOTE:  
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

DESIGN	BY J. Han	CHECKED D. Dunrud
DETAILS	BY L. Xiong	CHECKED J. Han
QUANTITIES	BY J. Han	CHECKED D. Dunrud

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES  
STRUCTURE DESIGN  
DESIGN BRANCH 14

BRIDGE NO.	53E0334
POST MILE	27.4, 29.4

ROUTE 150 BARRIER REPLACEMENT  
INDEX TO PLANS

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

0 1 2 3

UNIT: 3613

PROJECT NUMBER & PHASE: 07130003981

CONTRACT NO.: 07-3X0211

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES	SHEET	OF
11-09-14 01-13-15 10-21-14 11-04-14	3	16

FILE => 3x0211-b-1tp.dgn

USERNAME => s125624 DATE PLOTTED => 05-APR-2016 TIME PLOTTED => 08:17

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	64	76

*Lihua Han* 12-18-14  
REGISTERED CIVIL ENGINEER DATE

4-4-16  
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER

LIHUA HAN

No. C61320

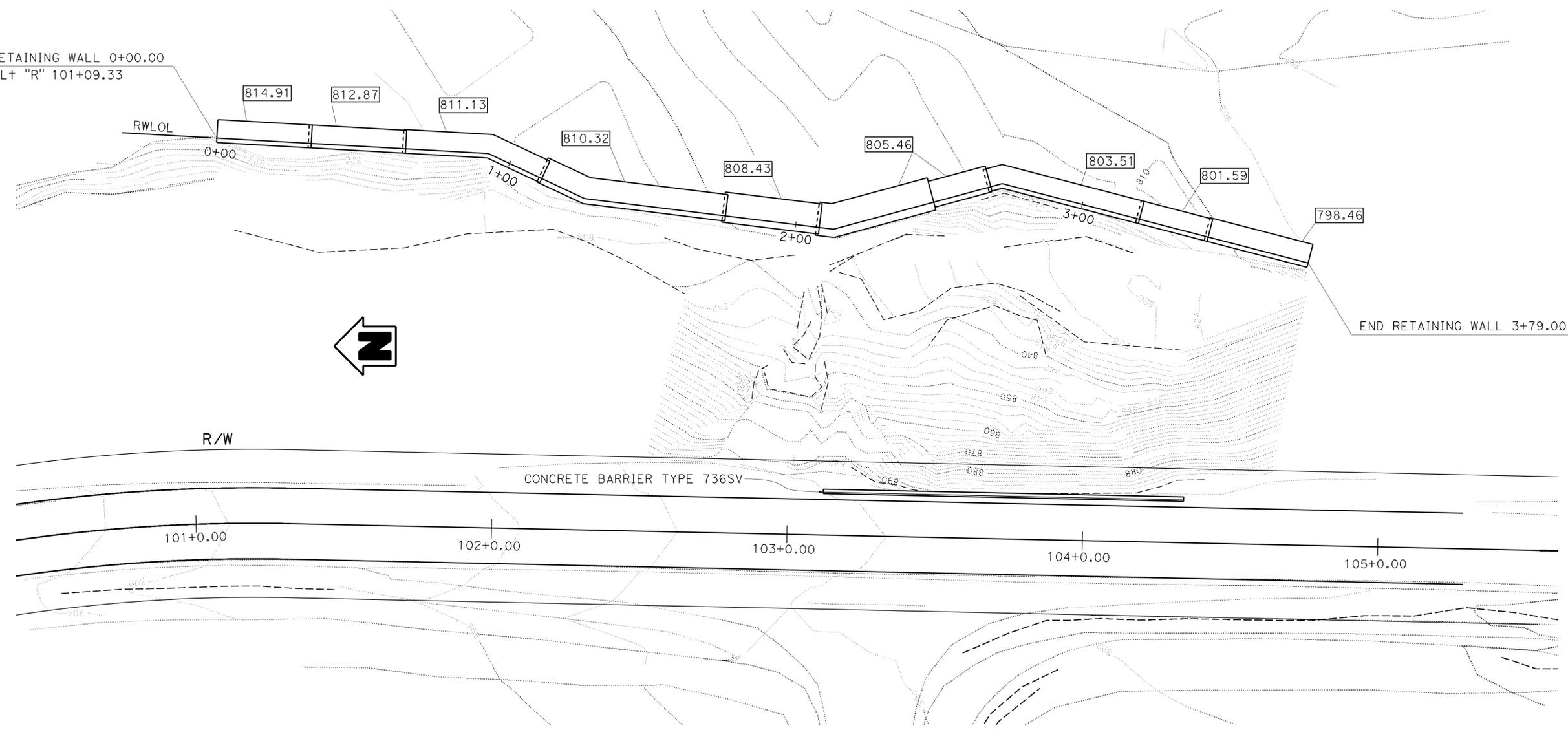
Exp. 06-30-15

CIVIL

STATE OF CALIFORNIA

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BEGIN RETAINING WALL 0+00.00  
130.15' Lt "R" 101+09.33



**FOOTING PLAN**  
1" = 20'-0"

**NOTE:**  
Use Finish Grade of new Roadway to determine Bottom of Concrete Barrier Type 736SV, see "Road Plans"

**LEGEND:**  
[Box] Indicate Footing Bottom Elevation

**NOTE:**  
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

DESIGN	BY J. Han	CHECKED D. Dunrud
DETAILS	BY L. Xiong	CHECKED J. Han
QUANTITIES	BY J. Han	CHECKED D. Dunrud

**STATE OF CALIFORNIA**  
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES  
STRUCTURE DESIGN  
**DESIGN BRANCH 14**

BRIDGE NO.	53E0334
POST MILE	29.4

**ROUTE 150 BARRIER REPLACEMENT  
FOUNDATION PLAN**

USERNAME => s125624 DATE PLOTTED => 05-APR-2016 TIME PLOTTED => 08:17

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	65	76

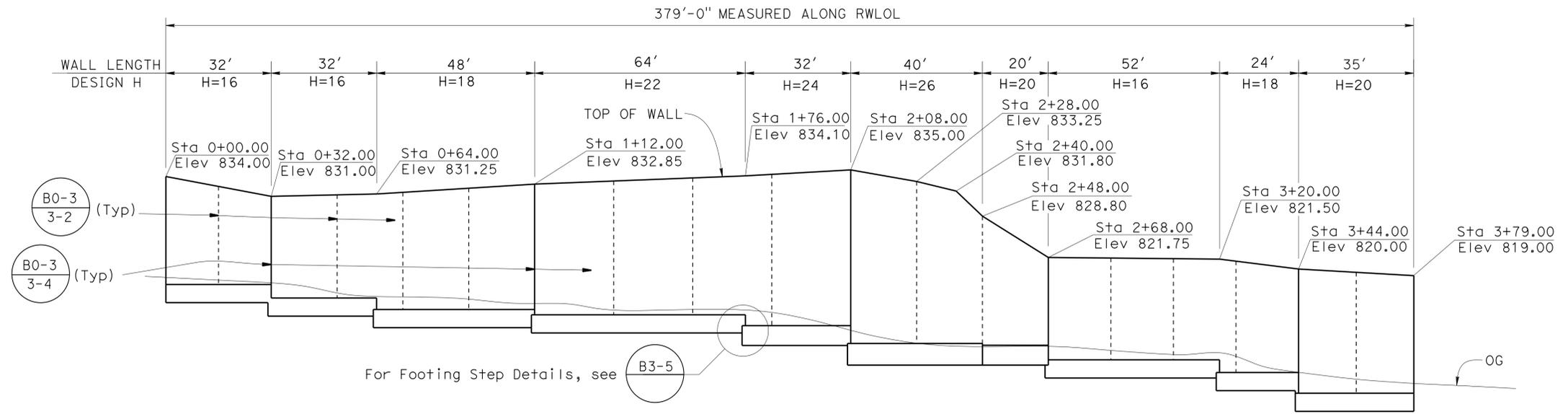
12-18-14  
DATE

REGISTERED CIVIL ENGINEER

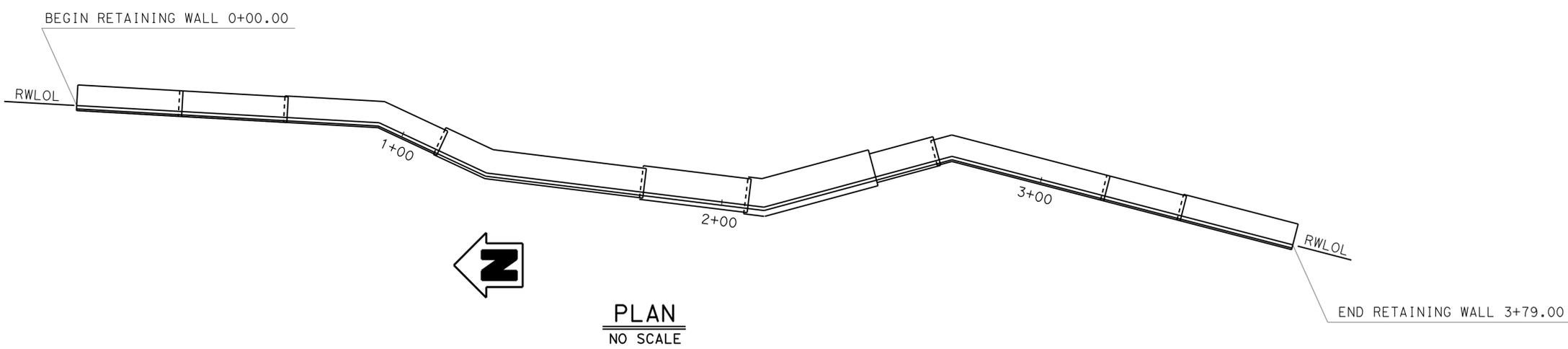
4-4-16  
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 LIHUA HAN  
 No. C61320  
 Exp. 06-30-15  
 CIVIL  
 STATE OF CALIFORNIA

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**MIRROR DEVELOPED RETAINING WALL ELEVATION** (B0-3)  
 V: 1" = 10'-0"  
 H: 1" = 20'-0"



**NOTE:**  
 THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

DESIGN	BY J. Han	CHECKED D. Dunrud
DETAILS	BY L. Xiong	CHECKED J. Han
QUANTITIES	BY J. Lane	CHECKED D. Dunrud

**STATE OF CALIFORNIA**  
 DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES  
 STRUCTURE DESIGN  
**DESIGN BRANCH 14**

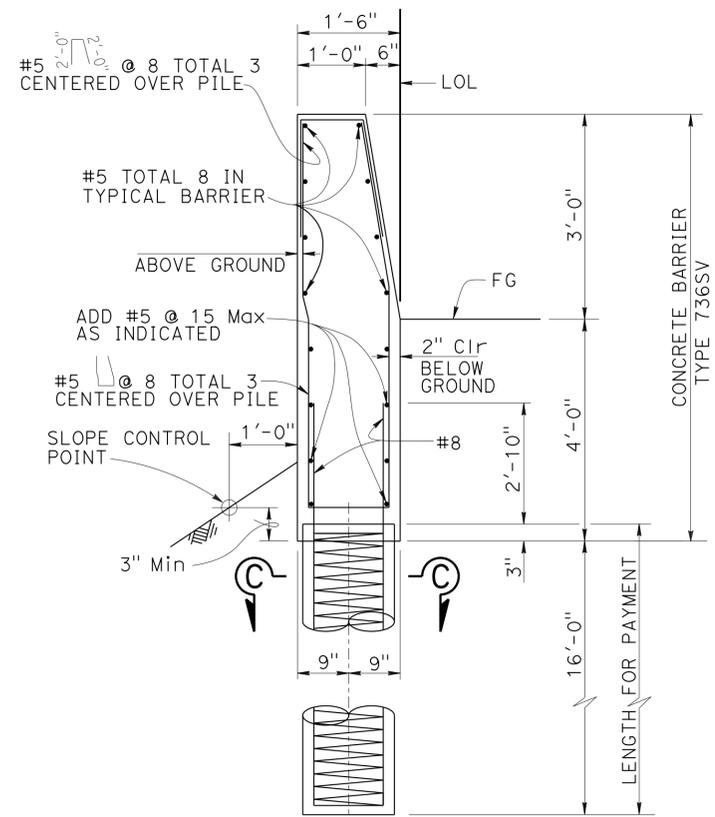
BRIDGE NO.	53E0334
POST MILE	29.4

**ROUTE 150 BARRIER REPLACEMENT**  
**RETAINING WALL LAYOUT**

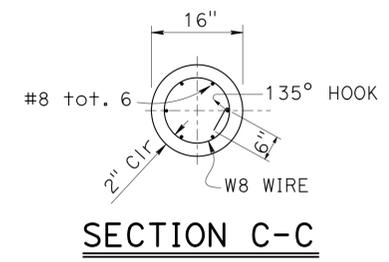


REVISION DATES	SHEET	OF
10-27-14 11-04-14 11-05-14 03-27-15	5	16

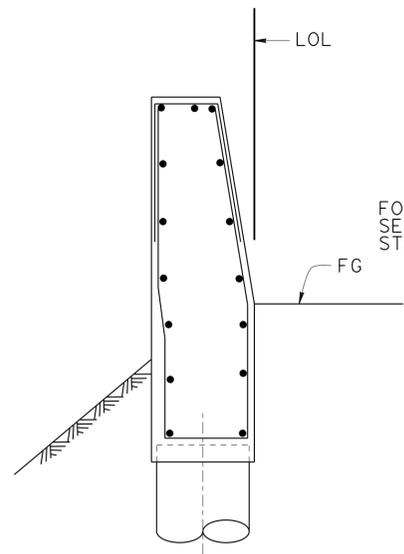
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	66	76
			12-18-14		
			REGISTERED CIVIL ENGINEER		
			DATE		
			4-4-16		
			PLANS APPROVAL DATE		
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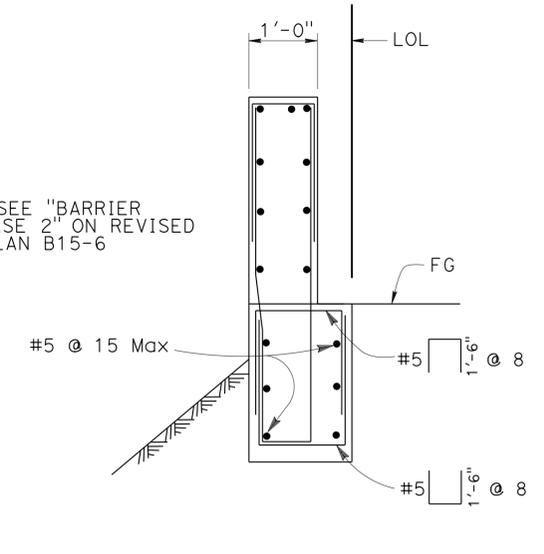
**TYPICAL SECTION**



**SECTION C-C**

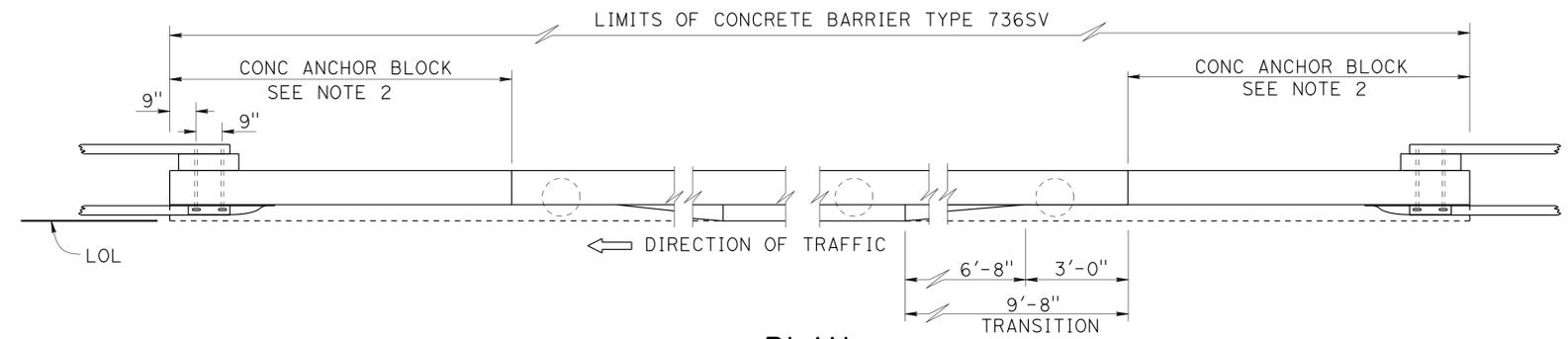


**SECTION D-D**

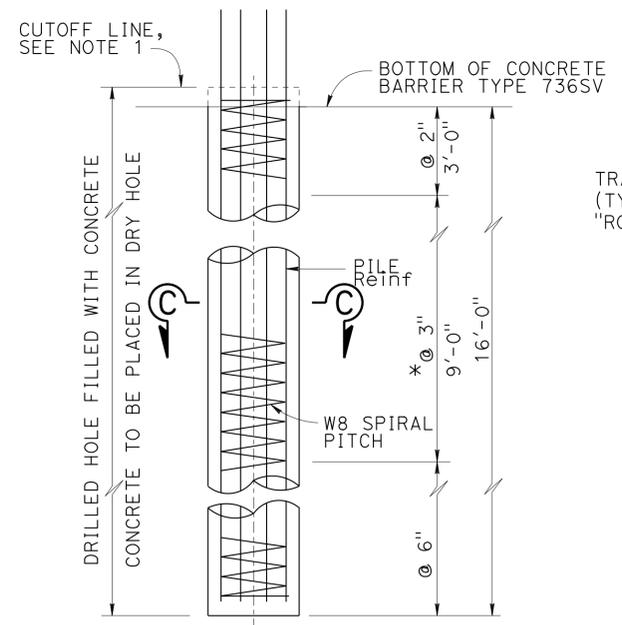


**SECTION E-E**

FOR Reinf, SEE "BARRIER SECTIONS CASE 2" ON REVISED STANDARD PLAN B15-6



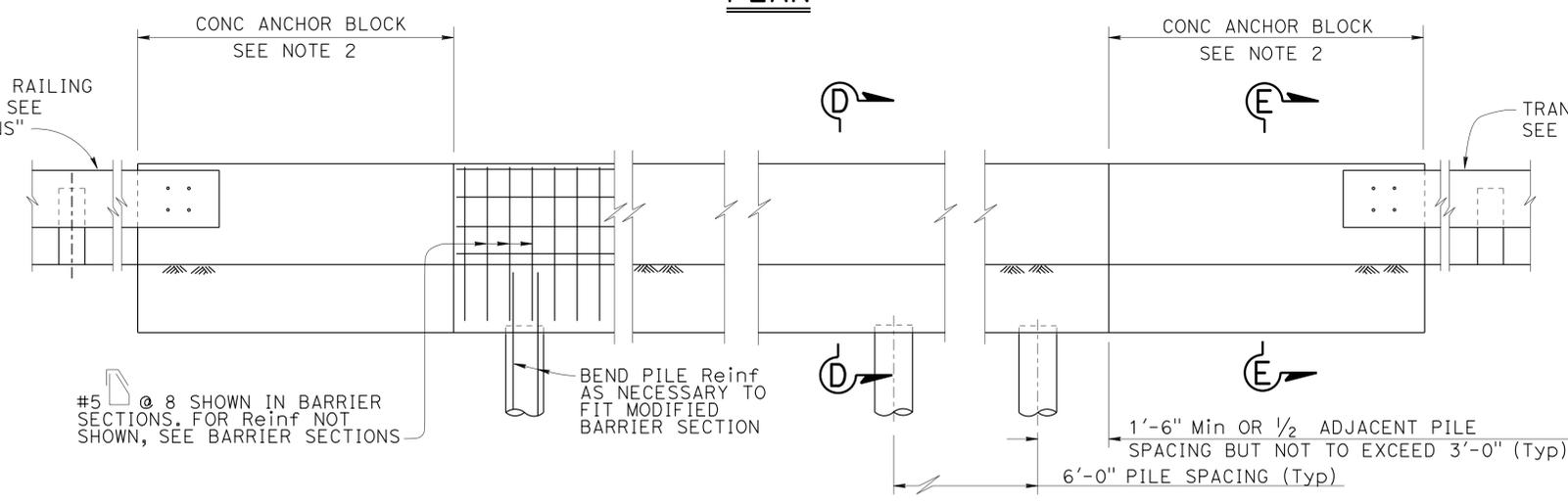
**PLAN**



**PILE ELEVATION**

\* @ 2" at option of Contractor.

TRANSITION RAILING (TYPE WB), SEE "ROAD PLANS"



**ELEVATION**

**METAL BEAM GUARDRAIL SYSTEM ANCHORAGE**

For details not shown, see Revised Standard Plan B11-56

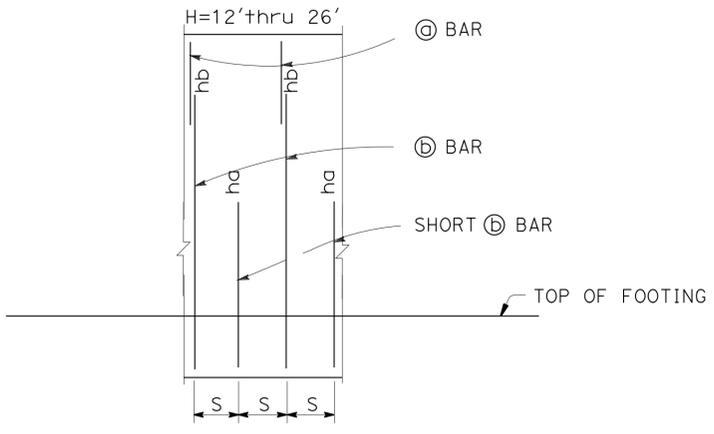
**NOTES:**

1. Use Finish Grade of the new Roadway to determine Pile Cutoff elevation, see "Road Plans"
2. For Concrete Anchor Block and connection details, see "Road Plans"

**NO SCALE**

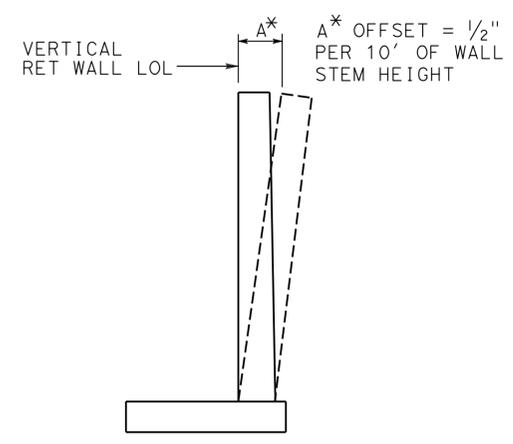
STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)	DESIGN	BY J. Han	CHECKED D. Dunrud	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 14	BRIDGE NO.	ROUTE 150 BARRIER REPLACEMENT	
	DETAILS	BY L. Xiong	CHECKED J. Han			VARIOUS		BARRIER TYPE 736SV AND PILE DETAILS
	QUANTITIES	BY J. Han	CHECKED D. Dunrud			POST MILE		
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS				UNIT: 3613	PROJECT NUMBER & PHASE: 07130003981	CONTRACT NO.: 07-3X0211	REVISION DATES	SHEET 6 OF 16

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	67	76
			12-18-14	DATE	
			4-4-16	DATE	
REGISTERED CIVIL ENGINEER LIHUA HAN No. C61320 Exp. 06-30-15 CIVIL STATE OF CALIFORNIA					



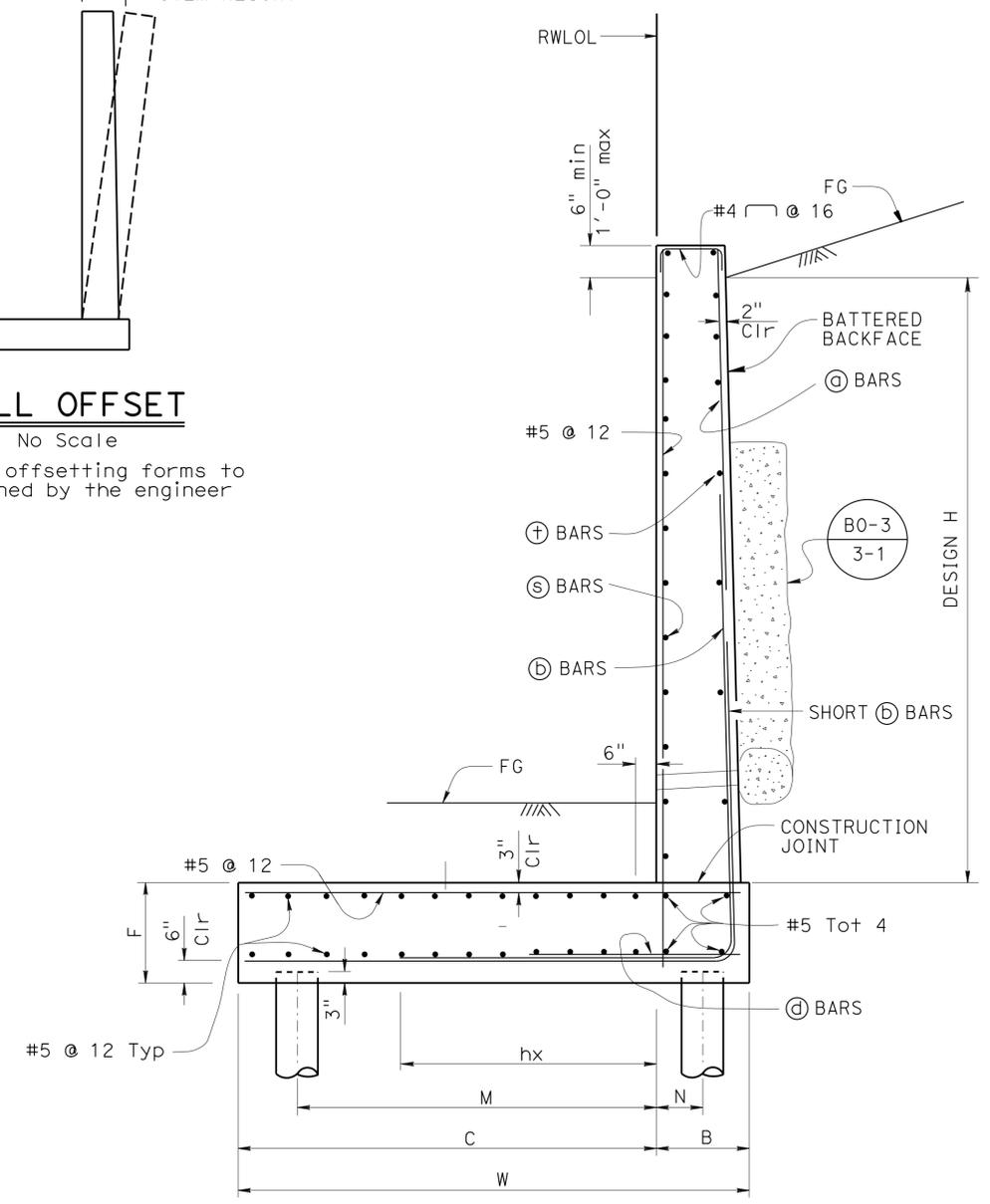
**ELEVATION**  
No Scale

NOTE:  
 "hd", "hd'" above ⊙ bars indicate distance from top of footing to upper end of ⊙ bars, see table.  
 "S" is ⊙ bar spacing, see table.



**WALL OFFSET**  
No Scale

Values for offsetting forms to be determined by the engineer



**TYPICAL SECTION**  
No Scale

**DESIGN DATA**

Design: AASHTO LRFD Bridge Design Specifications, 4th edition 2007 with California Amendments  
 LS: Varied surcharge on level ground surface  
 EQE: Mononabe-Okabe Method  
 $K_h = 0.3$   
 $K_v = 0.0$   
 Soil:  $\phi = 34^\circ$   
 $\gamma = 120$  pcf  
 Reinforced Concrete:  $f'_c = 3600$  psi  
 $f_y = 60,000$  psi  
 Load Combinations and Limit States  
 Service I  $Q=1.00DC+1.00EV+1.00EH+1.00LS+0.30WS$   
 Service II  $Q=1.00DC+1.00EV+1.00EH+1.00WS$   
 Strength I  $Q=aDC+\beta EV+1.50EH+1.75LS$   
 Strength III  $Q=aDC+\beta EV+1.50EH+1.40WS$   
 Strength V  $Q=aDC+\beta EV+1.50EH+1.35LS+0.40WS$   
 Extreme I  $Q=1.00DC+1.00EV+1.00EH+1.00EQD+1.00EQE$   
 Where: Q: Force Effects  
 a: 1.25 or 0.90, Which ever Controls Design  
 B: 1.35 or 1.00, which ever Controls Design  
 DC: Dead Load of Structure Components  
 EV: Vertical Earth Fill Pressure  
 LS: Live Load Surcharge  
 EQE: Seismic Earth Pressure  
 EQD: Soil and Structure Components Inertia  
 Soil inertia ignored for stem design  
 WS: Wind Load on Sound wall

**NOTES:**

- All piles are 24" CIDH concrete piles.
- All pile depth is 10'-0"
- Minimum distance between center pile and edge of footing is 1'-6".
- Lateral resistance of each pile:  
 30 kip for strength limit states.  
 40 kip for extreme limit states.
- Maximum spacing between piles is shown in the table. Reduce to suit the length of footing.
- Minimum distance between any two piles is 4'-0". Reduce to suit the length of footing.
- For details not shown, see RSP (B3-5) and (B3-6)
- Footing cover, 2'-0" minimum.
- Excavation for the Footing is Type SC.

NOTE:  
 THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

DESIGN	BY J. Han	CHECKED D. Dunrud
DETAILS	BY L. Xiong	CHECKED J. Han
QUANTITIES	BY J. Han	CHECKED D. Dunrud

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES  
 STRUCTURE DESIGN  
 DESIGN BRANCH 14

BRIDGE NO.	53E0334
POST MILE	29.4

**ROUTE 150 BARRIER REPLACEMENT**  
**RETAINING WALL TYPE 7SWP - DETAILS NO.1**

TIME PLOTTED => 08:18  
 05-APR-2016  
 DATE PLOTTED =>

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	68	76

*Lihua Han* 12-18-14  
REGISTERED CIVIL ENGINEER DATE

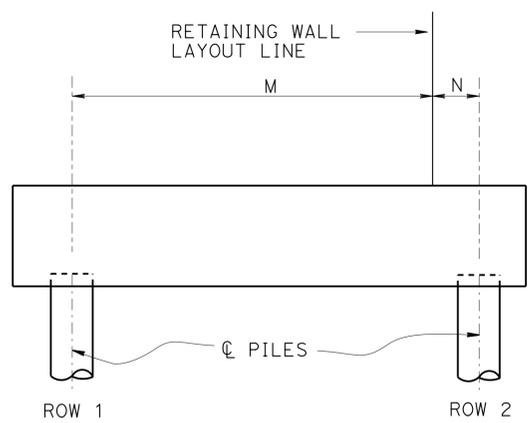
4-4-16  
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
LIHUA HAN  
No. C61320  
Exp. 06-30-15  
CIVIL  
STATE OF CALIFORNIA

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DESIGN H	12'	14'	16'	18'	20'	22'	24'	26'
W	7'-9"	8'-0"	9'-0"	9'-3"	10'-3"	11'-3"	12'-3"	13'-0"
C	6'-3"	6'-6"	7'-3"	7'-3"	8'-0"	8'-6"	9'-6"	10'-0"
B	1'-6"	1'-6"	1'-9"	2'-0"	2'-3"	2'-9"	2'-9"	3'-0"
F	2'-9"	2'-9"	2'-9"	2'-9"	3'-0"	3'-0"	3'-3"	3'-6"
STEM THICKNESS AT TOP	1'-3"	1'-3"	1'-7"	1'-11"	2'-0"	2'-0"	2'-0"	2'-0"
BATTER	0	0	0	0	0	1/4:12	1/4:12	1/4:12
M	4'-9"	5'-0"	5'-9"	5'-9"	6'-6"	7'-0"	8'-0"	8'-6"
N	0'-0"	0'-0"	0'-3"	0'-6"	0'-9"	1'-3"	1'-3"	1'-6"
ROW 1 SPACING	10'-0"	9'-6"	8'-0"	7'-0"	6'-0"	4'-0"	4'-0"	4'-0"
ROW 2 SPACING	16'-0"	14'-0"	14'-0"	12'-0"	10'-0"	10'-0"	8'-0"	4'-0"
⊙ BARS			#5 @ 14	#6 @ 14	#6 @ 13	#6 @ 13	#6 @ 11	#7 @ 12
⊕ BARS	#5 @ 4.5	#6 @ 5	#8 @ 7	#9 @ 7	#9 @ 6.5	#9 @ 6.5	#9 @ 5.5	#10 @ 6
ha	11'-10"	13'-10"	6'-3"	7'-3"	7'-6"	9'-0"	9'-9"	10'-6"
hb			12'-0"	12'-9"	13'-0"	14'-6"	15'-6"	18'-6"
hx	6'-0"	6'-3"	7'-0"	7'-0"	7'-9"	8'-3"	8'-9"	9'-6"
⊙ BARS	#5 @ 9	#5 @ 10	#5 @ 14	#5 @ 14	#5 @ 13	#5 @ 13	#5 @ 11	#5 @ 12
⊙ BAR LENGTH	4'-6"	6'-0"	7'-0"	7'-0"	7'-9"	10'-9"	11'-9"	12'-6"
⊙ bar	#5 @ 15	#5 @ 15	#5 @ 12	#5 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12
⊕ bar	#4 @ 18	#4 @ 18	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#5 @ 12
H <sub>b</sub> (k/ft), SVC	4.2	5.1	6.2	7.4	9.0	10.4	12.5	14.5
H <sub>b</sub> (k/ft), Str	6.6	8.0	9.4	11.1	13.4	16.0	18.8	21.8
H <sub>b</sub> (k/ft), ext	8.6	10.5	13.0	15.7	19.0	22.5	26.3	30.5

LEGEND:  
 ⊙ : 2 bar bundle  
 H<sub>b</sub> : Factored Horizontal Driving Force  
 SVC : Service Limit State  
 Str : Strength Limit State  
 ext : Extreme Event Limit State



**H = 12' THROUGH 26'**  
**PILE PATTERN**  
 No Scale

NOTE:  
 THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">DESIGN</td> <td style="width: 33%;">BY J. Han</td> <td style="width: 33%;">CHECKED D. Dunrud</td> </tr> <tr> <td>DETAILS</td> <td>BY L. Xiong</td> <td>CHECKED J. Han</td> </tr> <tr> <td>QUANTITIES</td> <td>BY J. Han</td> <td>CHECKED D. Dunrud</td> </tr> </table>	DESIGN	BY J. Han	CHECKED D. Dunrud	DETAILS	BY L. Xiong	CHECKED J. Han	QUANTITIES	BY J. Han	CHECKED D. Dunrud	<b>STATE OF CALIFORNIA</b> DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN <b>DESIGN BRANCH 14</b>	BRIDGE NO. 53E0334 POST MILE 29.4	<b>ROUTE 150 BARRIER REPLACEMENT</b> <b>RETAINING WALL TYPE 7SWP - DETAILS NO. 2</b>
DESIGN	BY J. Han	CHECKED D. Dunrud											
DETAILS	BY L. Xiong	CHECKED J. Han											
QUANTITIES	BY J. Han	CHECKED D. Dunrud											
STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 09-01-10)	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS	UNIT: 3613 PROJECT NUMBER & PHASE: 07130003981	CONTRACT NO.: 07-3X0211	DISREGARD PRINTS BEARING EARLIER REVISION DATES									
				REVISION DATES: 05-31-12, 10-21-14, 11-04-14, 11-05-14 SHEET 8 OF 16									

USERNAME => s125624 DATE PLOTTED => 05-APR-2016 TIME PLOTTED => 08:18

**BENCH MARK**

"S 1099" (NGS PID EW 5364)  
 SP on 1/2 iron pipes with  
 plastic plugs stamped "P&S CTRL"  
 N= 2002646.6516  
 E= 616287.332  
 Elev= 1135.02

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	69	76

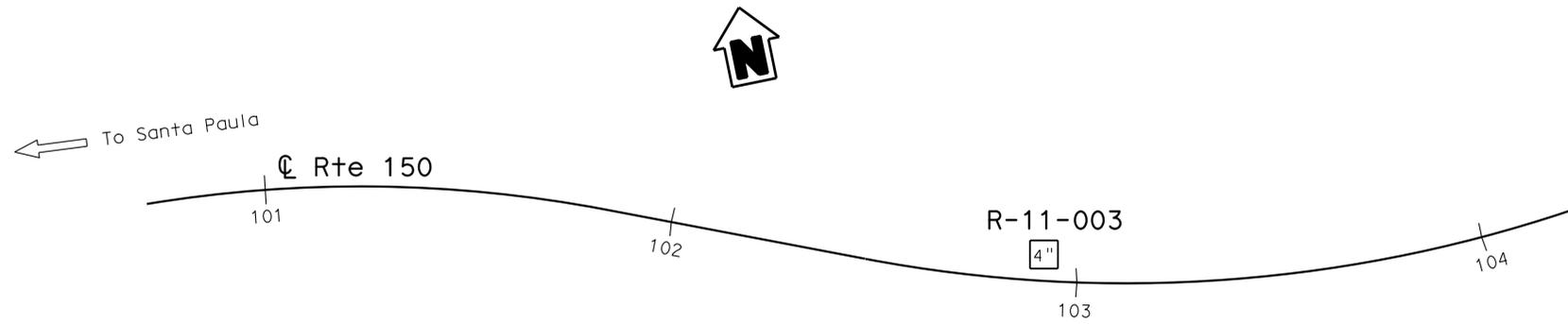
REGISTERED CIVIL ENGINEER DATE 02-26-12

4-4-16 PLANS APPROVAL DATE

Seungwoon Han  
 No. 73527  
 Exp. 12-31-15  
 CIVIL

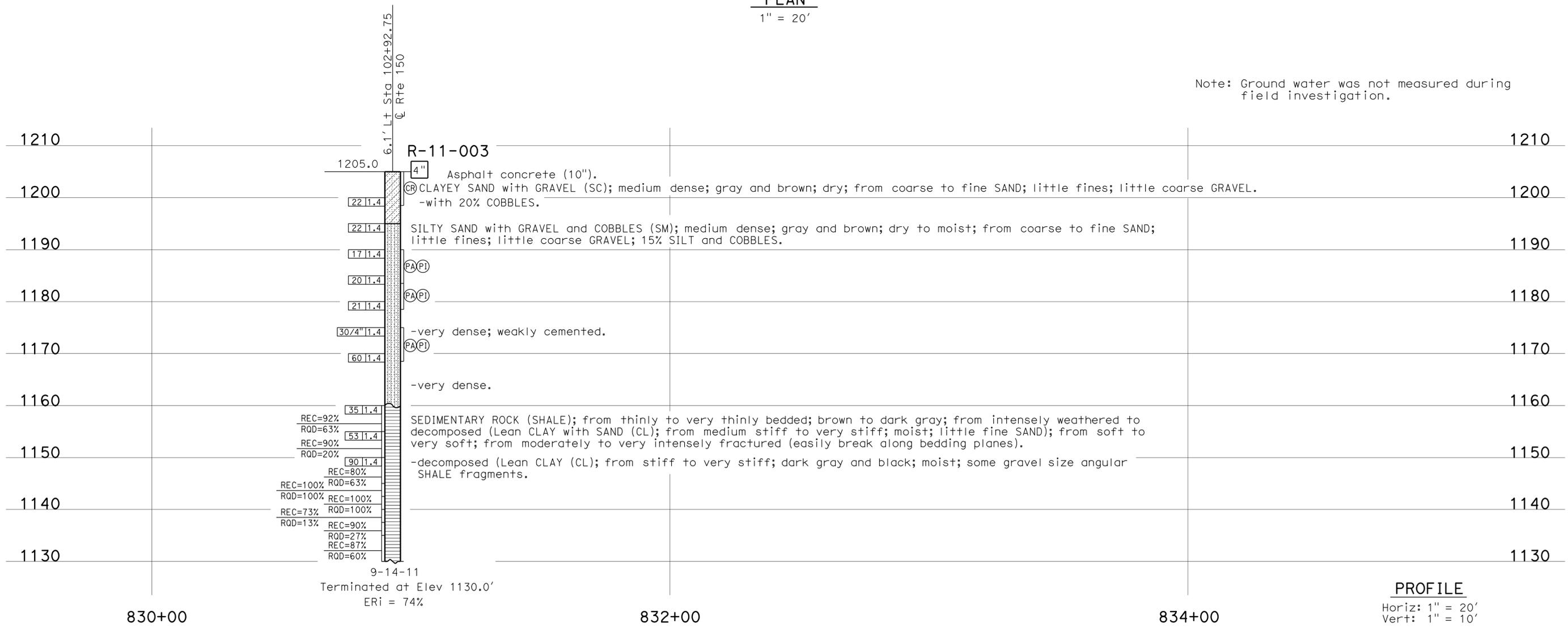
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This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).



**PLAN**  
 1" = 20'

Note: Ground water was not measured during field investigation.



<b>ENGINEERING SERVICES</b>		<b>MATERIALS AND GEOTECHNICAL SERVICES</b>		<b>STATE OF CALIFORNIA</b>		<b>DIVISION OF ENGINEERING SERVICES</b>		<b>BRIDGE NO.</b>		<b>ROUTE 150 BARRIER REPLACEMENT</b>	
FUNCTIONAL SUPERVISOR		DRAWN BY: F. Nguyen		FIELD INVESTIGATION BY:		DEPARTMENT OF TRANSPORTATION		53E0334		<b>LOG OF TEST BORINGS AT PM 27.4 1 OF 4</b>	
NAME: D. Jang		CHECKED BY: H. Liu		S. Han		<b>DESIGN BRANCH 14</b>		POST MILE		REVISION DATES	
06S CIVIL LOG OF TEST BORINGS SHEET		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		0 1 2 3		UNIT: 3643		27.4		11-09-14 1-10-15 10-21-14 11-04-14	
						PROJECT NUMBER & PHASE: 07130003981		CONTRACT NO.: 07-3X021		SHEET OF	
						DISREGARD PRINTS BEARING EARLIER REVISION DATES				9 16	

USERNAME => s125624 DATE PLOTTED => 05-APR-2016 TIME PLOTTED => 08:18  
 FILE => 3x0211-z-1ofb27-1of4.dgn

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	70	76

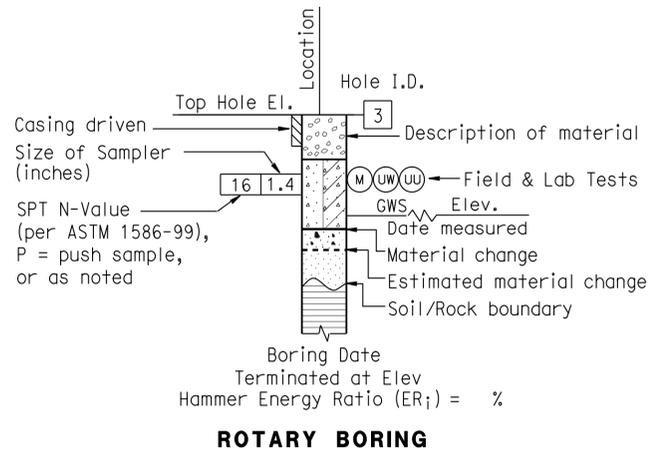
REGISTERED CIVIL ENGINEER DATE 02-26-12  
 PLANS APPROVAL DATE 4-4-16  
 Seungwoon Han  
 No. 73527  
 Exp. 12-31-15  
 CIVIL  
 STATE OF CALIFORNIA  
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CEMENTATION	
Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

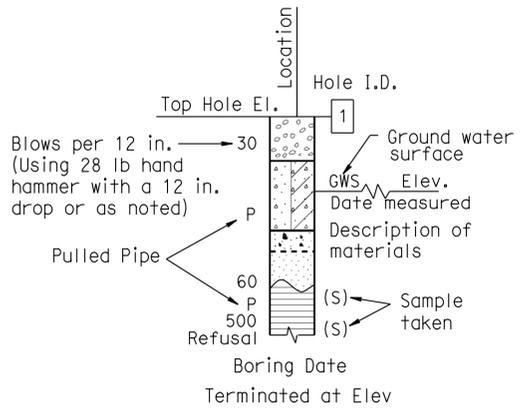
BOREHOLE IDENTIFICATION		
Symbol	Hole Type	Description
	A	Auger Boring (hollow or solid stem bucket)
	R	Rotary drilled boring (conventional)
	RW	Rotary drilled with self-casing wire-line
	RC	Rotary core with continuously-sampled, self-casing wire-line
	P	Rotary percussion boring (air)
	R	Rotary drilled diamond core
	RC	Rotary drilled rock core
	HD	Hand driven (1-inch soil tube)
	HA	Hand Auger
	D	Dynamic Cone Penetration Boring
	CPT	Cone Penetration Test (ASTM D 5778)
	O	Other (note on LOTB)

Note: Size in inches.

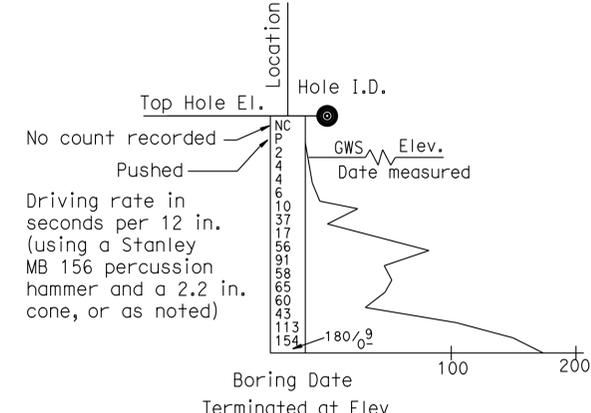
CONSISTENCY OF COHESIVE SOILS				
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



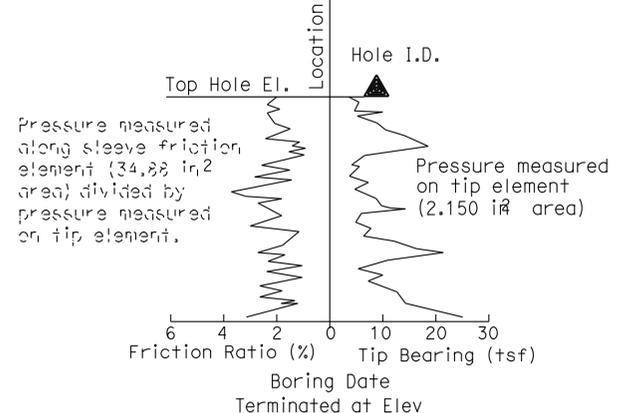
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO. 53E0334	ROUTE 150 BARRIER REPLACEMENT LOG OF TEST BORINGS AT PM 27.4 2 OF 4
	PREPARED BY: F. Nguyen		DESIGN BRANCH 14	POST MILE 27.4	
GS LOTB SOIL LEGEND	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS	UNIT: 3643 PROJECT NUMBER & PHASE: 07130003981	CONTRACT NO.: 07-3X021	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES 10-21-14 11-04-14 11-05-14 05-31-12
				SHEET 10	OF 16

FILE => 3x0211-z-1otb27-2of4.dgn

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	71	76

02-26-12  
DATE

REGISTERED CIVIL ENGINEER

4-4-16  
PLANS APPROVAL DATE

Seungwoon Han  
No. 73527  
Exp. 12-31-15  
CIVIL  
STATE OF CALIFORNIA

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GROUP SYMBOLS AND NAMES					
Graphic/Symbol	Group Names	Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
	GW		CL		Lean CLAY
	GW				Well-graded GRAVEL with SAND
	GP		CL		Lean CLAY with GRAVEL
	GP				Poorly-graded GRAVEL with SAND
	GW-GM		CL-ML		SILTY CLAY
	GW-GM				Well-graded GRAVEL with SILT
	GW-GC		CL-ML		SILTY CLAY with GRAVEL
	GW-GC				Well-graded GRAVEL with CLAY (or SILTY CLAY)
	GW-GC		CL-ML		SANDY SILTY CLAY with GRAVEL
	GW-GC				Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
	GP-GM		ML		SILT
	GP-GM				Poorly-graded GRAVEL with SILT
	GP-GC		ML		SILT with GRAVEL
	GP-GC				Poorly-graded GRAVEL with SILT and SAND
	GP-GC		ML		SANDY SILT with GRAVEL
	GP-GC				Poorly-graded GRAVEL with CLAY (or SILTY CLAY)
	GP-GC		ML		GRAVELLY SILT with SAND
	GP-GC				Poorly-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
	GM		OL		ORGANIC lean CLAY
	GM				SILTY GRAVEL
	GC		OL		ORGANIC lean CLAY with GRAVEL
	GC				CLAYEY GRAVEL
	GC		OL		SANDY ORGANIC lean CLAY with GRAVEL
	GC				CLAYEY GRAVEL with SAND
	GC-GM		OL		ORGANIC SILT
	GC-GM				SILTY, CLAYEY GRAVEL
	GC-GM		OL		ORGANIC SILT with GRAVEL
	GC-GM				SILTY, CLAYEY GRAVEL with SAND
	SW		CH		Fat CLAY
	SW				Well-graded SAND
	SW		CH		Fat CLAY with GRAVEL
	SW				Well-graded SAND with GRAVEL
	SW-SM		CH		SANDY fat CLAY with GRAVEL
	SW-SM				Well-graded SAND with SILT
	SW-SM		CH		GRAVELLY fat CLAY with SAND
	SW-SM				Well-graded SAND with SILT and GRAVEL
	SW-SC		MH		Elastic SILT
	SW-SC				Well-graded SAND with CLAY (or SILTY CLAY)
	SW-SC		MH		Elastic SILT with GRAVEL
	SW-SC				Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
	SP-SM		MH		SANDY elastic SILT with GRAVEL
	SP-SM				Poorly-graded SAND with SILT
	SP-SM		MH		GRAVELLY elastic SILT with SAND
	SP-SM				Poorly-graded SAND with SILT and GRAVEL
	SP-SC		OH		ORGANIC fat CLAY
	SP-SC				Poorly-graded SAND with CLAY (or SILTY CLAY)
	SP-SC		OH		ORGANIC fat CLAY with GRAVEL
	SP-SC				Poorly-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
	SM		OH		SANDY ORGANIC fat CLAY with GRAVEL
	SM				SILTY SAND
	SM		OH		GRAVELLY ORGANIC fat CLAY with SAND
	SM				SILTY SAND with GRAVEL
	SC		OH		ORGANIC elastic SILT
	SC				CLAYEY SAND
	SC		OH		ORGANIC elastic SILT with GRAVEL
	SC				CLAYEY SAND with GRAVEL
	SC-SM		OH		SANDY ORGANIC elastic SILT with GRAVEL
	SC-SM				SILTY, CLAYEY SAND
	SC-SM		OH		GRAVELLY ORGANIC elastic SILT with SAND
	SC-SM				SILTY, CLAYEY SAND with GRAVEL
	PT		OL/OH		ORGANIC SOIL
	PT				PEAT
	PT		OL/OH		ORGANIC SOIL with GRAVEL
	PT				COBBLES
	PT		OL/OH		SANDY ORGANIC SOIL with GRAVEL
	PT				COBBLES and BOULDERS
	PT		OL/OH		GRAVELLY ORGANIC SOIL with SAND
	PT				BOULDERS

FIELD AND LABORATORY TESTING	
(C)	Consolidation (ASTM D 2435)
(CL)	Collapse Potential (ASTM D 51503)
(CP)	Compaction Curve (CTM 216)
(CR)	Corrosivity Testing (CTM 643, CTM 422, CTM 417)
(CU)	Consolidated Undrained Triaxial (ASTM D 4767)
(DS)	Direct Shear (ASTM D 3080)
(EI)	Expansion Index (ASTM D 4829)
(M)	Moisture Content (ASTM D 2216)
(OC)	Organic Content-% (ASTM D 2974)
(P)	Permeability (CTM 220)
(PA)	Particle Size Analysis (ASTM D 422)
(PI)	Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
(PL)	Point Load Index (ASTM D 5731)
(PM)	Pressure Meter
(R)	R-Value (CTM 301)
(SE)	Sand Equivalent (CTM 217)
(SG)	Specific Gravity (AASHTO T 100)
(SL)	Shrinkage Limit (ASTM D 427)
(SW)	Swell Potential (ASTM D 4546)
(UC)	Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
(UU)	Unconsolidated Undrained Triaxial (ASTM D 2850)
(UW)	Unit Weight (ASTM D 4767)

APPARENT DENSITY OF COHESIONLESS SOILS	
Description	SPT N <sub>60</sub> (Blows / 12 in.)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Greater than 50

MOISTURE	
Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS	
Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5% - 10%
Little	15% - 25%
Some	30% - 45%
Mostly	50% - 100%

PARTICLE SIZE		
Description	Size (in.)	
Boulder	Greater than 12	
Cobble	3 - 12	
Gravel	Coarse	3/4 - 3
	Fine	1/5 - 3/4
Sand	Coarse	1/16 - 1/5
	Medium	1/64 - 1/16
	Fine	1/300 - 1/64
Silt and Clay	Less than 1/300	

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 14	BRIDGE NO. 53E0334	ROUTE 150 BARRIER REPLACEMENT
				POST MILE 27.4	
PREPARED BY: F. Nguyen	UNIT: 3643 PROJECT NUMBER & PHASE: 07130003981	CONTRACT NO.: 07-3X021	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES	SHEET 11 OF 16

GS LOTB SOIL LEGEND ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

FILE => 3x0211-z-1ofb27-3of4.dgn

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	72	76

02-26-12  
DATE

REGISTERED CIVIL ENGINEER

4-4-16  
PLANS APPROVAL DATE

Seungwoon Han  
No. 73527  
Exp. 12-31-15  
CIVIL  
STATE OF CALIFORNIA

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

**PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)**

$$REC = \frac{\sum \text{Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 4 \text{ in.}}{\text{Total length of core run (in.)}} \times 100\%$$

RQD\* Indicates soundness criteria not met.

**BEDDING SPACING**

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very Thickly Bedded	3 ft - 10 ft
Thickly Bedded	1 ft - 3 ft
Moderately Bedded	4 in. - 1 ft
Thinly Bedded	1 in. - 4 in.
Very Thinly Bedded	1/4 in. - 1 in.
Laminated	Less than 1/4 in.

**LEGEND OF ROCK MATERIALS**

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

**ROCK HARDNESS**

Description	Criteria
Extremely Hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very Hard	Cannot be scratched with a pocketknife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with a pocketknife or sharp pick with difficulty (heavy pressure). Breaks with heavy hammer blows.
Moderately Hard	Can be scratched with pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately Soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily by a pocketknife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Can be readily indented, grooved or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

**WEATHERING DESCRIPTORS FOR INTACT ROCK**

Description	Diagnostic Features					General Characteristics
	Chemical Weathering-Discoloration and/or Oxidation		Mechanical Weathering-Grain Boundary Conditions (Disaggregation) Primarily for Granitics and Some Coarse-Grained Sediments	Texture and Leaching		
	Body of Rock	Fracture Surfaces		Texture	Leaching	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change	No leaching	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved	Minor leaching of some soluble minerals.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

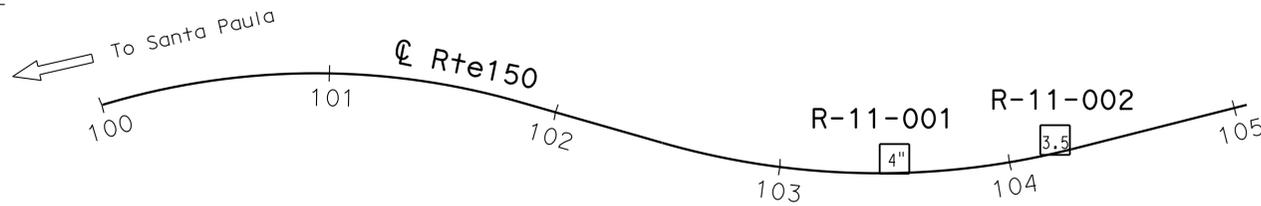
**FRACTURE DENSITY**

Description	Observed Fracture Density
Unfractured	No fractures.
Very Slightly Fractured	Core lengths greater than 3 ft.
Slightly Fractured	Core lengths mostly from 1 to 3 ft.
Moderately Fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely Fractured	Core lengths mostly from 1 to 4 in.
Very Intensely Fractured	Mostly chips and fragments.

<b>ENGINEERING SERVICES</b>	<b>MATERIALS AND GEOTECHNICAL SERVICES</b>	<b>STATE OF CALIFORNIA</b> DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN <b>DESIGN BRANCH 14</b>	BRIDGE NO. 53E0334 POST MILE 27.4	<b>ROUTE 150 BARRIER REPLACEMENT</b> <b>LOG OF TEST BORINGS AT PM 27.4 4 OF 4</b>
PREPARED BY: F. Nguyen		UNIT: 3643 PROJECT NUMBER & PHASE: 07130003981	CONTRACT NO.: 07-3X021	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES 10-27-14 11-04-14 11-05-14 05-31-15
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3		FILE => 3x0211-z-1otb27-4of4.dgn			SHEET 12 OF 16

**BENCH MARK**

"S 1099" (NGS PID EW 5364)  
 SP on 1/2 iron pipes with  
 plastic plugs stamped "P&S CTRL"  
 N= 2002646.6516  
 E= 616287.332  
 Elev= 1135.02



**PLAN**  
 1" = 40'

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	73	76

02-26-12  
 REGISTERED CIVIL ENGINEER DATE

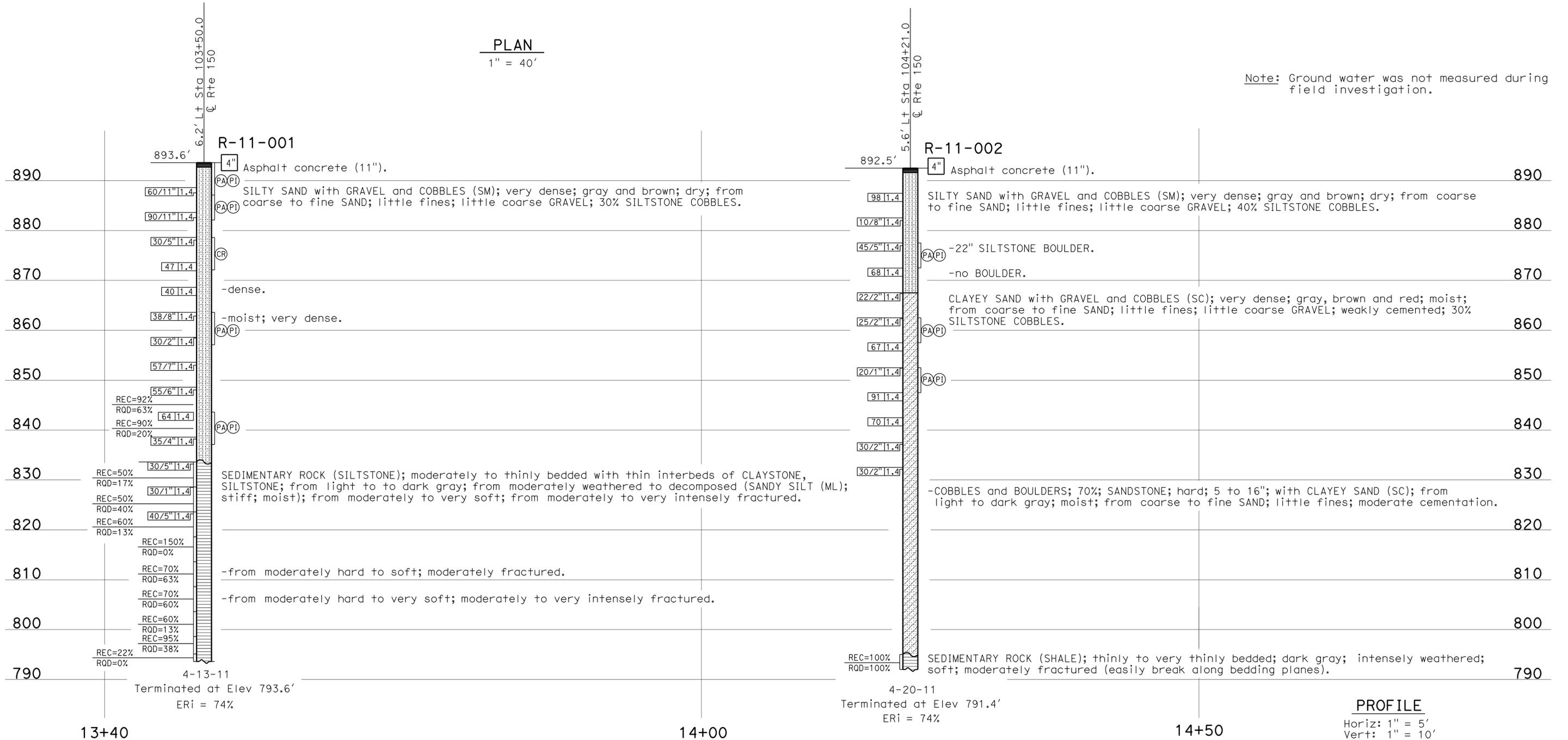
4-4-16  
 PLANS APPROVAL DATE

Seungwoon Han  
 No. 73527  
 Exp. 12-31-15  
 CIVIL  
 STATE OF CALIFORNIA

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This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

Note: Ground water was not measured during field investigation.



**PROFILE**  
 Horiz: 1" = 5'  
 Vert: 1" = 10'

<b>ENGINEERING SERVICES</b>		<b>MATERIALS AND GEOTECHNICAL SERVICES</b>		<b>STATE OF CALIFORNIA</b>		<b>DIVISION OF ENGINEERING SERVICES</b>		<b>BRIDGE NO.</b>		<b>ROUTE 150 BARRIER REPLACEMENT</b>	
FUNCTIONAL SUPERVISOR		DRAWN BY: F. Nguyen		FIELD INVESTIGATION BY:		PROJECT NUMBER & PHASE: 07130003981		53E0334		LOG OF TEST BORINGS AT PM 29.4 1 OF 4	
NAME: D. Jang		CHECKED BY: H. Liu		S. Han		CONTRACT NO.: 07-3X021		POST MILE		SHEET OF	
06S CIVIL LOG OF TEST BORINGS SHEET		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		0 1 2 3		UNIT: 3643		29.4		13 16	

USERNAME => s125624 DATE PLOTTED => 05-APR-2016 TIME PLOTTED => 08:18

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	74	76

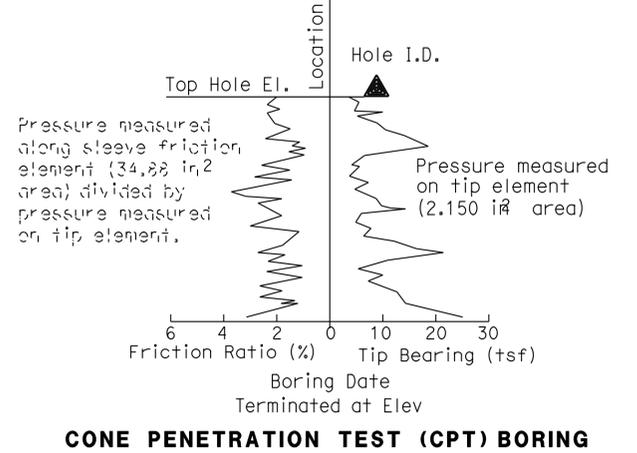
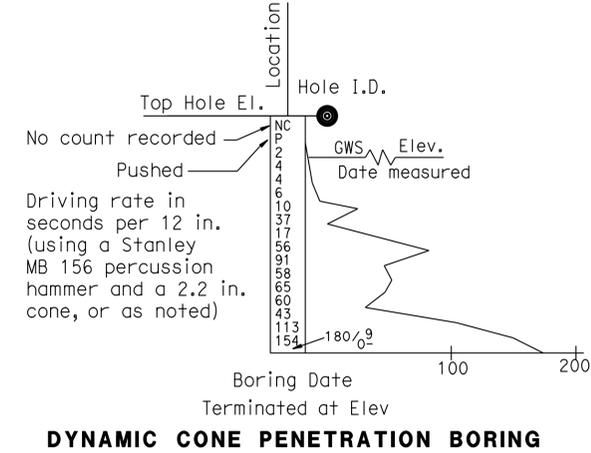
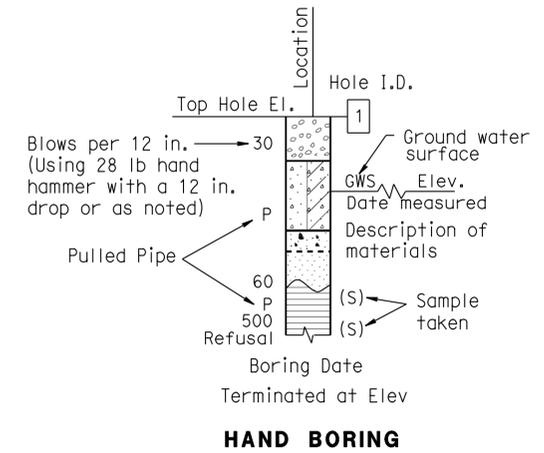
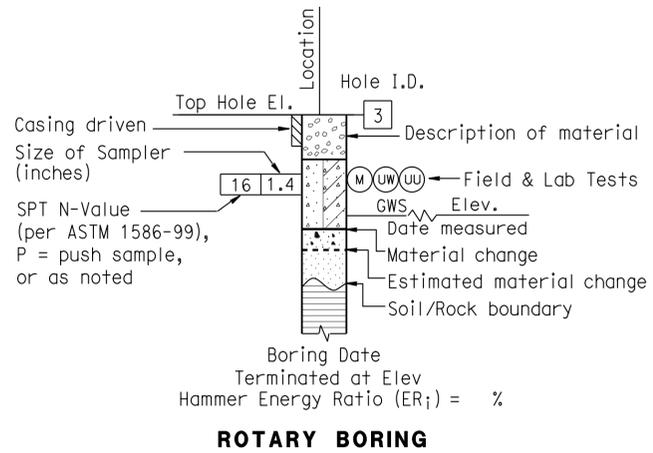
REGISTERED CIVIL ENGINEER *Seungwoon Han* DATE 02-26-12  
 PLANS APPROVAL DATE 4-4-16  
 No. 73527 Exp. 12-31-15  
 CIVIL  
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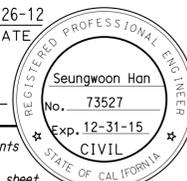
CEMENTATION	
Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

BOREHOLE IDENTIFICATION		
Symbol	Hole Type	Description
	A	Auger Boring (hollow or solid stem bucket)
	R	Rotary drilled boring (conventional)
	RW	Rotary drilled with self-casing wire-line
	RC	Rotary core with continuously-sampled, self-casing wire-line
	P	Rotary percussion boring (air)
	R	Rotary drilled diamond core
	RC	Rotary drilled rock core
	HD	Hand driven (1-inch soil tube)
	HA	Hand Auger
	D	Dynamic Cone Penetration Boring
	CPT	Cone Penetration Test (ASTM D 5778)
	O	Other (note on LOTB)

Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS				
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2




 02-26-12  
 DATE  
 REGISTERED CIVIL ENGINEER  
 4-4-16  
 PLANS APPROVAL DATE  
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GROUP SYMBOLS AND NAMES					
Graphic/Symbol	Group Names	Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
	GW		CL		Lean CLAY
	GW				Well-graded GRAVEL with SAND
	GP		CL		Lean CLAY with GRAVEL
	GP				Poorly-graded GRAVEL with SAND
	GW-GM		CL-ML		SILTY CLAY
	GW-GM				Well-graded GRAVEL with SILT
	GW-GC		CL-ML		SILTY CLAY with GRAVEL
	GW-GC				Well-graded GRAVEL with CLAY (or SILTY CLAY)
	GW-GC		CL-ML		SANDY SILTY CLAY with GRAVEL
	GW-GC				Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
	GP-GM		ML		SILT
	GP-GM				Poorly-graded GRAVEL with SILT
	GP-GC		ML		SILT with GRAVEL
	GP-GC				Poorly-graded GRAVEL with SILT and SAND
	GP-GC		ML		SANDY SILT with GRAVEL
	GP-GC				Poorly-graded GRAVEL with CLAY (or SILTY CLAY)
	GP-GC		ML		GRAVELLY SILT with SAND
	GP-GC				Poorly-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
	GM		OL		ORGANIC lean CLAY
	GM				SILTY GRAVEL
	GC		OL		ORGANIC lean CLAY with GRAVEL
	GC				CLAYEY GRAVEL
	GC		OL		SANDY ORGANIC lean CLAY with GRAVEL
	GC				CLAYEY GRAVEL with SAND
	GC-GM		OL		ORGANIC SILT
	GC-GM				SILTY, CLAYEY GRAVEL
	GC-GM		OL		ORGANIC SILT with GRAVEL
	GC-GM				SILTY, CLAYEY GRAVEL with SAND
	SW		CH		Fat CLAY
	SW				Well-graded SAND
	SW		CH		Fat CLAY with GRAVEL
	SW				Well-graded SAND with GRAVEL
	SW-SM		CH		SANDY fat CLAY with GRAVEL
	SW-SM				Well-graded SAND with SILT
	SW-SM		CH		GRAVELLY fat CLAY with SAND
	SW-SM				Well-graded SAND with SILT and GRAVEL
	SW-SC		MH		Elastic SILT
	SW-SC				Well-graded SAND with CLAY (or SILTY CLAY)
	SW-SC		MH		Elastic SILT with GRAVEL
	SW-SC				Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
	SP-SM		MH		SANDY elastic SILT with GRAVEL
	SP-SM				Poorly-graded SAND with SILT
	SP-SM		MH		GRAVELLY elastic SILT with SAND
	SP-SM				Poorly-graded SAND with SILT and GRAVEL
	SP-SC		OH		ORGANIC fat CLAY
	SP-SC				Poorly-graded SAND with CLAY (or SILTY CLAY)
	SP-SC		OH		ORGANIC fat CLAY with GRAVEL
	SP-SC				Poorly-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
	SM		OH		SANDY ORGANIC fat CLAY with GRAVEL
	SM				SILTY SAND
	SM		OH		GRAVELLY ORGANIC fat CLAY with SAND
	SM				SILTY SAND with GRAVEL
	SC		OH		ORGANIC elastic SILT
	SC				CLAYEY SAND
	SC		OH		ORGANIC elastic SILT with GRAVEL
	SC				CLAYEY SAND with GRAVEL
	SC-SM		OH		SANDY ORGANIC elastic SILT with GRAVEL
	SC-SM				SILTY, CLAYEY SAND
	SC-SM		OH		GRAVELLY ORGANIC elastic SILT with SAND
	SC-SM				SILTY, CLAYEY SAND with GRAVEL
	PT		OL/OH		ORGANIC SOIL
	PT				PEAT
			OL/OH		ORGANIC SOIL with GRAVEL
					COBBLES
			OL/OH		SANDY ORGANIC SOIL with GRAVEL
					COBBLES and BOULDERS
			OL/OH		GRAVELLY ORGANIC SOIL with SAND
					BOULDERS

FIELD AND LABORATORY TESTING	
(C)	Consolidation (ASTM D 2435)
(CL)	Collapse Potential (ASTM D 51503)
(CP)	Compaction Curve (CTM 216)
(CR)	Corrosivity Testing (CTM 643, CTM 422, CTM 417)
(CU)	Consolidated Undrained Triaxial (ASTM D 4767)
(DS)	Direct Shear (ASTM D 3080)
(EI)	Expansion Index (ASTM D 4829)
(M)	Moisture Content (ASTM D 2216)
(OC)	Organic Content-% (ASTM D 2974)
(P)	Permeability (CTM 220)
(PA)	Particle Size Analysis (ASTM D 422)
(PI)	Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
(PL)	Point Load Index (ASTM D 5731)
(PM)	Pressure Meter
(R)	R-Value (CTM 301)
(SE)	Sand Equivalent (CTM 217)
(SG)	Specific Gravity (AASHTO T 100)
(SL)	Shrinkage Limit (ASTM D 427)
(SW)	Swell Potential (ASTM D 4546)
(UC)	Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
(UU)	Unconsolidated Undrained Triaxial (ASTM D 2850)
(UW)	Unit Weight (ASTM D 4767)

APPARENT DENSITY OF COHESIONLESS SOILS	
Description	SPT N <sub>60</sub> (Blows / 12 in.)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Greater than 50

MOISTURE	
Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS	
Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5% - 10%
Little	15% - 25%
Some	30% - 45%
Mostly	50% - 100%

PARTICLE SIZE		
Description	Size (in.)	
Boulder	Greater than 12	
Cobble	3 - 12	
Gravel	Coarse	3/4 - 3
	Fine	1/5 - 3/4
Sand	Coarse	1/16 - 1/5
	Medium	1/64 - 1/16
	Fine	1/300 - 1/64
Silt and Clay	Less than 1/300	

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH 14	BRIDGE NO.	ROUTE 150 BARRIER REPLACEMENT
				VARIOUS	
	PREPARED BY: F. Nguyen		UNIT: 3643 PROJECT NUMBER & PHASE: 07130003981	POST MILE 29.4	CONTRACT NO.: 07-3X021
GS LOTB SOIL LEGEND	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS	0 1 2 3	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES	SHEET 15 OF 16

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	Ven	150	27.4, 29.4	76	76

02-26-12  
DATE

REGISTERED CIVIL ENGINEER

Seungwoon Han  
No. 73527  
Exp. 12-31-15  
CIVIL

4-4-16  
PLANS APPROVAL DATE

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**PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)**

REC =  $\frac{\sum \text{Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100\%$

RQD =  $\frac{\sum \text{Length of intact core pieces} \geq 4 \text{ in.}}{\text{Total length of core run (in.)}} \times 100\%$

RQD\* Indicates soundness criteria not met.

**BEDDING SPACING**

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very Thickly Bedded	3 ft - 10 ft
Thickly Bedded	1 ft - 3 ft
Moderately Bedded	4 in. - 1 ft
Thinly Bedded	1 in. - 4 in.
Very Thinly Bedded	1/4 in. - 1 in.
Laminated	Less than 1/4 in.

**LEGEND OF ROCK MATERIALS**

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

**ROCK HARDNESS**

Description	Criteria
Extremely Hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very Hard	Cannot be scratched with a pocketknife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with a pocketknife or sharp pick with difficulty (heavy pressure). Breaks with heavy hammer blows.
Moderately Hard	Can be scratched with pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately Soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily by a pocketknife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Can be readily indented, grooved or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

**WEATHERING DESCRIPTORS FOR INTACT ROCK**

Description	Diagnostic Features					General Characteristics
	Chemical Weathering-Discoloration and/or Oxidation		Mechanical Weathering-Grain Boundary Conditions (Disaggregation) Primarily for Granitics and Some Coarse-Grained Sediments	Texture and Leaching		
	Body of Rock	Fracture Surfaces		Texture	Leaching	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change	No leaching	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved	Minor leaching of some soluble minerals.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

**FRACTURE DENSITY**

Description	Observed Fracture Density
Unfractured	No fractures.
Very Slightly Fractured	Core lengths greater than 3 ft.
Slightly Fractured	Core lengths mostly from 1 to 3 ft.
Moderately Fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely Fractured	Core lengths mostly from 1 to 4 in.
Very Intensely Fractured	Mostly chips and fragments.

<b>ENGINEERING SERVICES</b>	<b>MATERIALS AND GEOTECHNICAL SERVICES</b>	<b>STATE OF CALIFORNIA</b> DEPARTMENT OF TRANSPORTATION	<b>DIVISION OF ENGINEERING SERVICES</b> STRUCTURE DESIGN <b>DESIGN BRANCH 14</b>	BRIDGE NO. VARIOUS POST MILE 29.4	<b>ROUTE 150 BARRIER REPLACEMENT</b> <b>LOG OF TEST BORINGS AT PM 29.4 4 OF 4</b>
PREPARED BY: F. Nguyen		UNIT: 3643 PROJECT NUMBER & PHASE: 07130003981	CONTRACT NO.: 07-3X021	DISREGARD PRINTS BEARING EARLIER REVISION DATES	
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		0 1 2 3	REVISION DATES	SHEET 16	OF 16

GS LOTB SOIL LEGEND

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