

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON  
STATE HIGHWAY  
IN HUMBOLDT COUNTY  
NEAR WILLOW CREEK AT 2.3 MILES  
NORTH OF PG&E SERVICE CENTER ROAD AND  
FROM 0.9 MILE TO 0.6 MILE SOUTH OF  
TISH TANG SIDEHILL VIADUCT No. 1

TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	1	44

LOCATION MAP

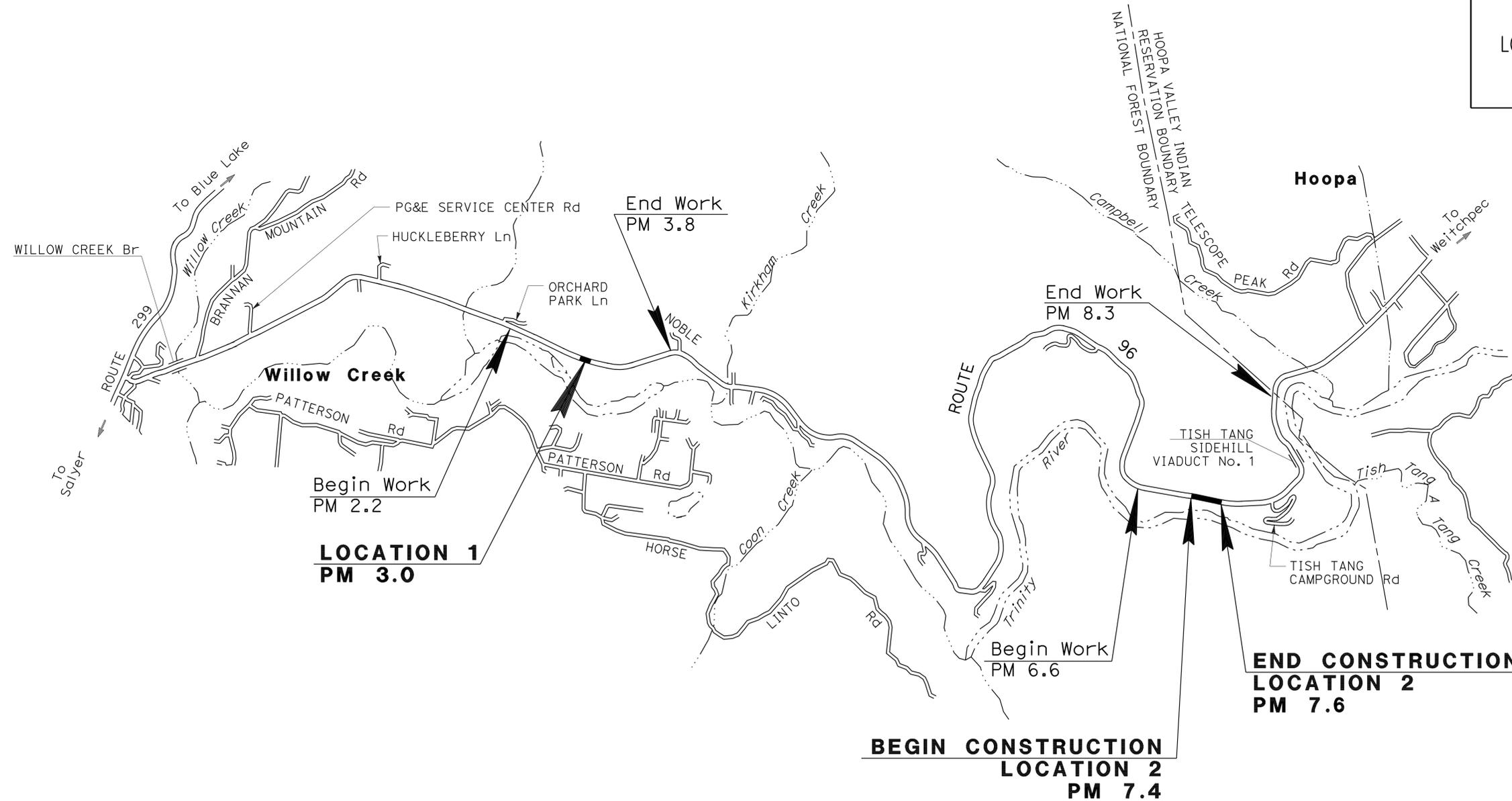
INDEX OF SHEETS

SHEET No.	DESCRIPTION
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STRUCTURE PLANS

32-44	SOLDIER PILE RW LOCATION 1 Br No. 04E0027
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THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.



PROJECT MANAGER  
FRANK DEMLING

DESIGN ENGINEER  
ROB BURNETT

PROJECT ENGINEER DATE 09-15-10  
 REGISTERED CIVIL ENGINEER  
 REGISTERED PROFESSIONAL ENGINEER  
 APOLINARIO W. VIVIT  
 No. C66046  
 Exp. 6-30-12  
 CIVIL  
 STATE OF CALIFORNIA

September 20, 2010  
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.	01-472204
PROJECT ID	0100000310

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

NO SCALE



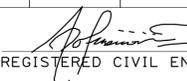
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DATE PLOTTED => 01-DEC-2010  
TIME PLOTTED => 09:45

LAST REVISION  
09-15-10

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	2	44

		09-15-10
REGISTERED CIVIL ENGINEER	DATE	
09-20-10 PLANS APPROVAL DATE		

REGISTERED PROFESSIONAL ENGINEER APOLINARIO W. VIVIT No. C66046 Exp. 6-30-12 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:**

- DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
- SUPERELEVATIONS AS SHOWN OR AS DETERMINED BY THE ENGINEER.

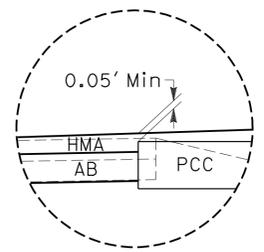
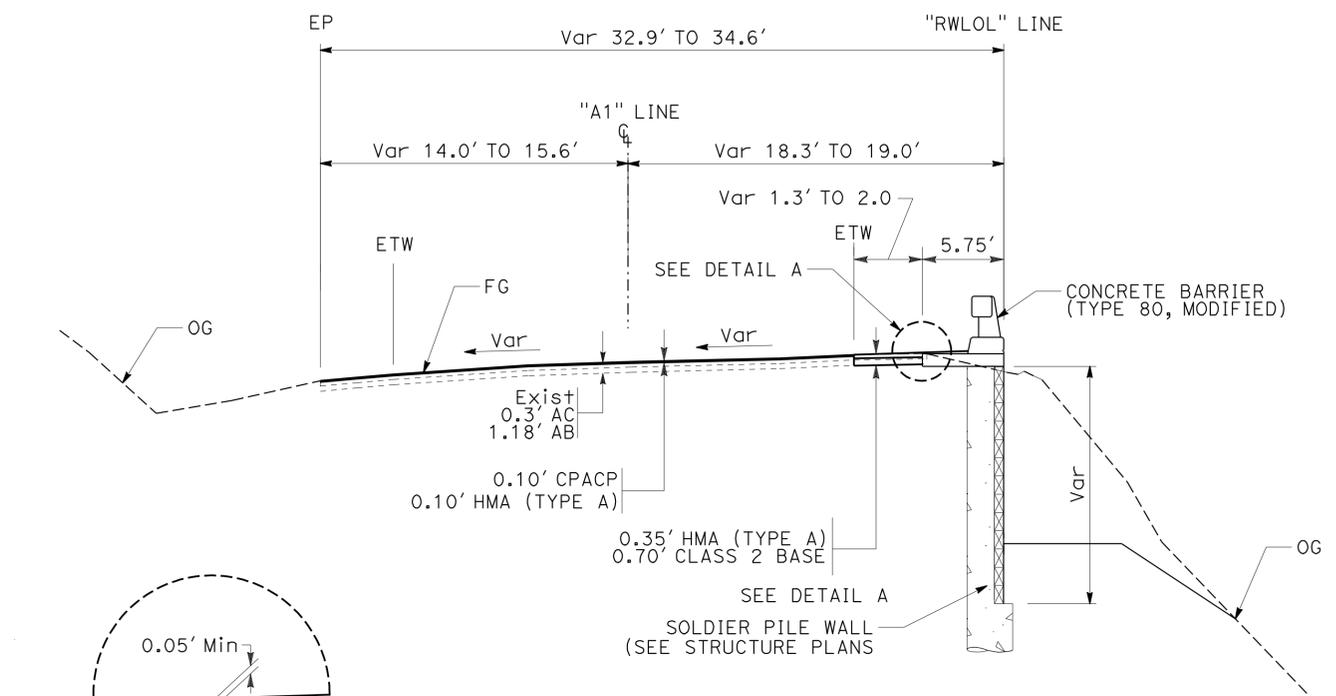
**DESIGN DESIGNATION:**

2009 ADT = 1870    D = 60%  
 2029 ADT = 2230    T = 4%  
 DHV = 220        V = 50 mph  
 ESAL = 286,000    T<sub>20</sub> = 7.5

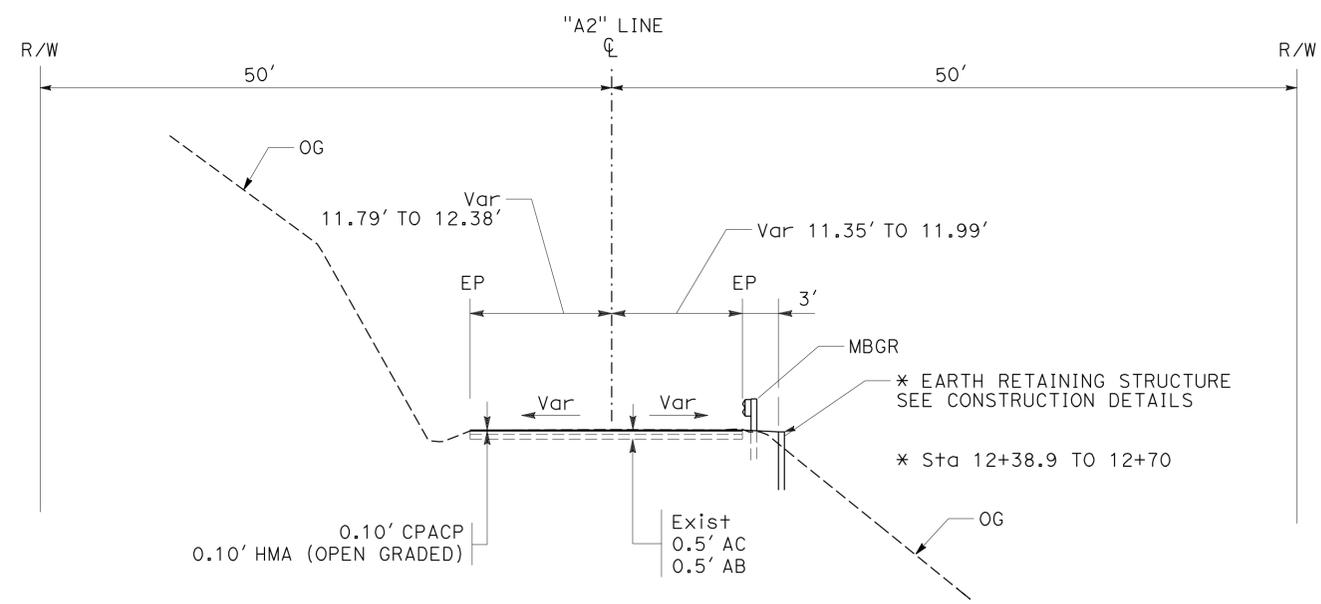
**ABBREVIATIONS:**

CPACP COLD PLANE ASPHALT CONCRETE PAVEMENT

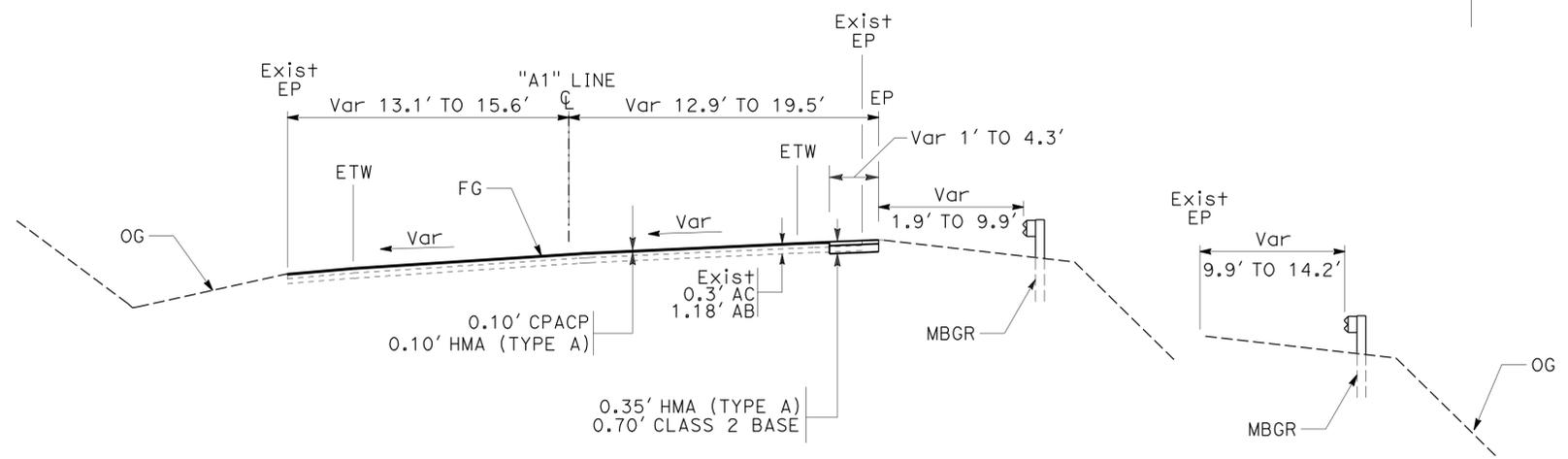
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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 FUNCTIONAL SUPERVISOR: ROB BURNETT  
 CALCULATED/DESIGNED BY: APOLINARIO VIVIT  
 CHECKED BY: BRIAN STEINER  
 REVISIONS: (None)  
 REVISOR: (None)  
 DATE: (None)  
 REVISOR: (None)  
 DATE: (None)



**LOCATION 1**  
 "A1" 15+49 TO 16+11.5



**LOCATION 2**  
 Sta "A2" 12+38.90 TO 12+88.90



**LOCATION 1**  
 "A1" 15+12.3 TO 15+49  
 "A1" 16+11.5 TO 16+51.8

"A1" 14+88.4 TO 15+12.3  
 "A1" 16+51.8 TO 16+71.4

**TYPICAL CROSS SECTIONS**  
 NO SCALE  
**X-1**

LAST REVISION | DATE PLOTTED => 20-SEP-2010  
 09-15-10 TIME PLOTTED => 14:56

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	3	44

09-15-10  
 REGISTERED CIVIL ENGINEER DATE  
 09-20-10  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 APOLINARIO W. VIVIT  
 No. C66046  
 Exp. 6-30-12  
 CIVIL  
 STATE OF CALIFORNIA

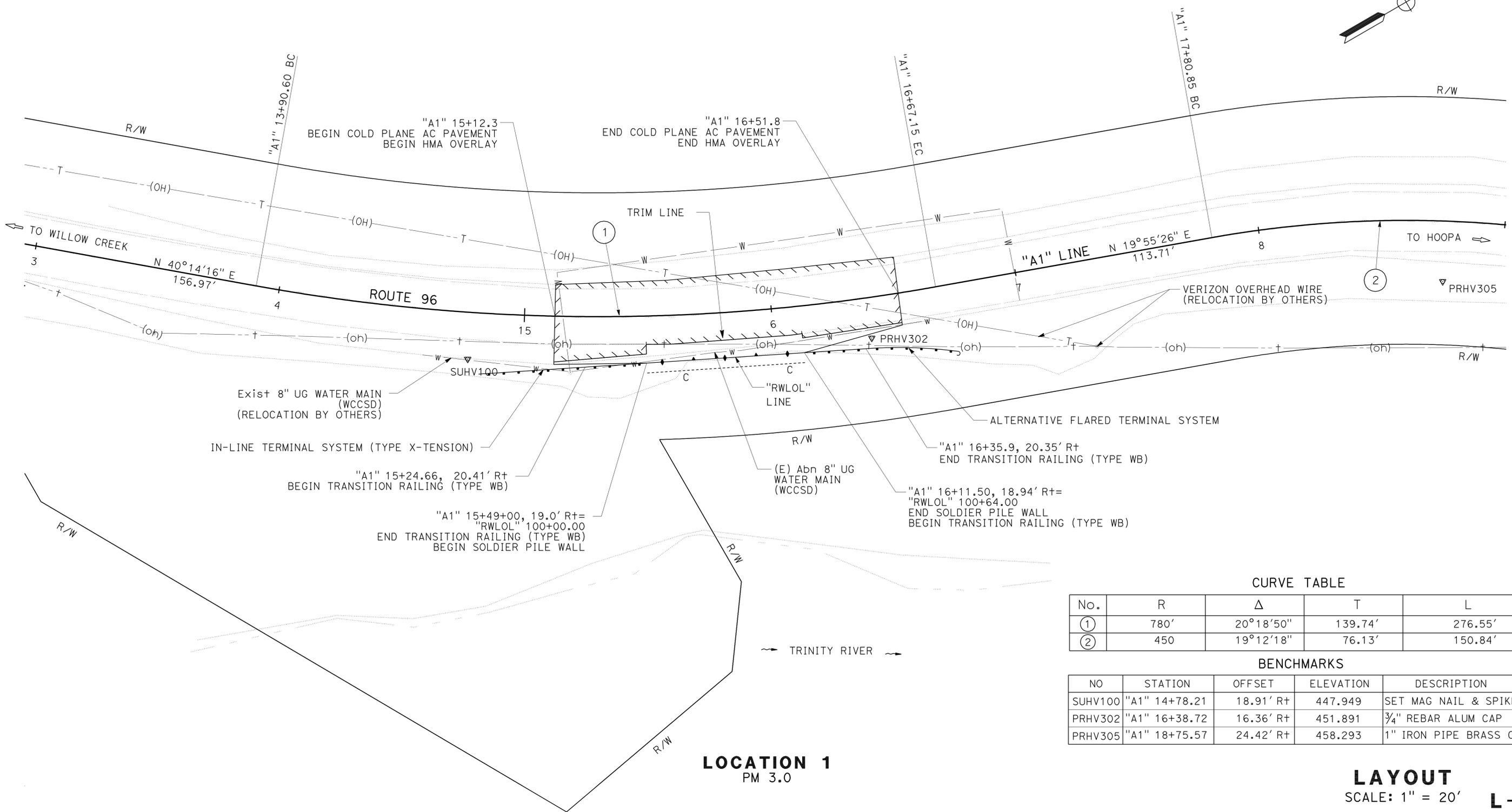
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

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

- LEGEND:**
-  DRAINAGE SYSTEM No.
  -  DRAINAGE UNIT No.
  -  RSP
  -  COLD PLANE AC PAVEMENT LIMITS

**ABBREVIATIONS:**  
 WCCSD WILLOW CREEK COMMUNITY SERVICE DISTRICT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 APOLINARIO VIVIT  
 BRIAN STEINER  
 ROB BURNETT  
 REVISIONS: 1, 2, 3, 4, 6, 7, 8, 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



**CURVE TABLE**

No.	R	Δ	T	L
①	780'	20°18'50"	139.74'	276.55'
②	450	19°12'18"	76.13'	150.84'

**BENCHMARKS**

NO	STATION	OFFSET	ELEVATION	DESCRIPTION
SUHV100	"A1" 14+78.21	18.91' Rt	447.949	SET MAG NAIL & SPIKE
PRHV302	"A1" 16+38.72	16.36' Rt	451.891	3/4" REBAR ALUM CAP
PRHV305	"A1" 18+75.57	24.42' Rt	458.293	1" IRON PIPE BRASS CAP

**LOCATION 1**  
 PM 3.0

**LAYOUT**  
 SCALE: 1" = 20' L-1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	4	44

REGISTERED CIVIL ENGINEER	DATE
<i>Apollinario</i>	09-15-10
PLANS APPROVAL DATE	
	09-20-10

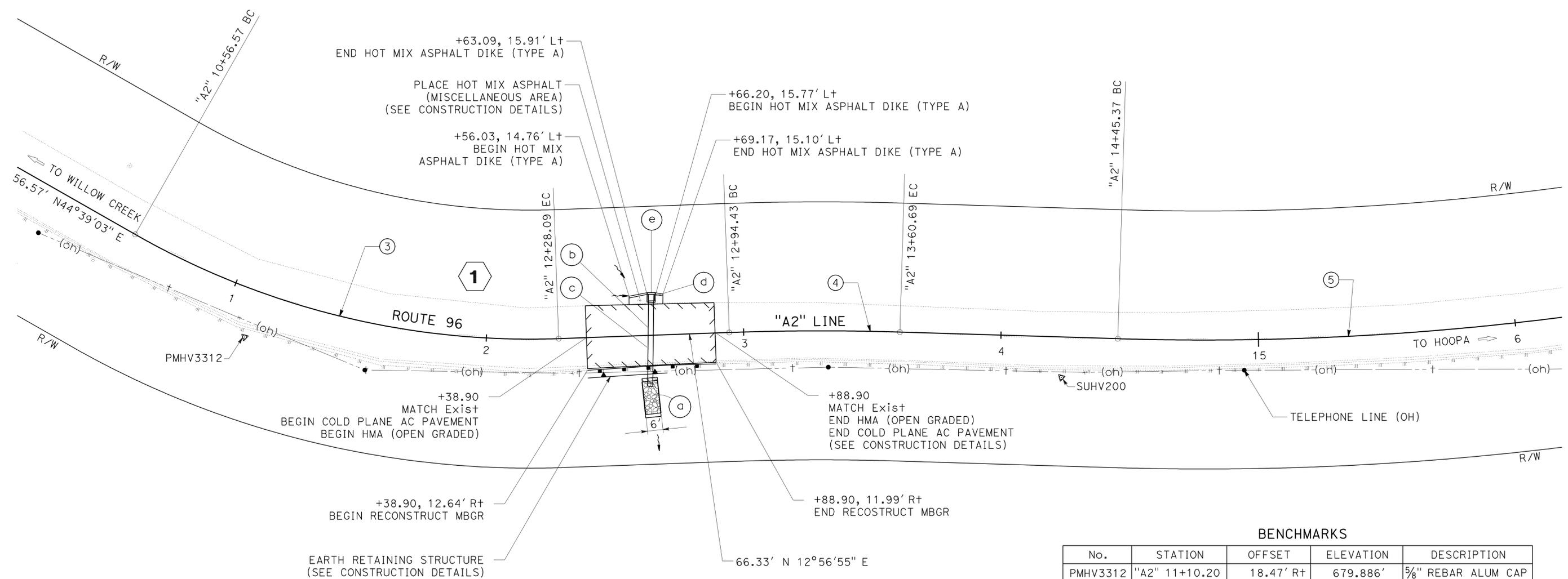
  

REGISTERED PROFESSIONAL ENGINEER
APOLLINARIO W. VIVIT
No. C66046
Exp. 6-30-12
CIVIL

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

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

- LEGEND:**
- (a) RSP
  - (b) REMOVE 24" CMP
  - (c) 24" CSP (.109" THICKNESS)
  - (d) REMOVE INLET
  - (e) DRAINAGE INLET (TYPE GO)



**LOCATION 2**  
 PM 7.54

**BENCHMARKS**

No.	STATION	OFFSET	ELEVATION	DESCRIPTION
PMHV3312	"A2" 11+10.20	18.47' R+	679.886'	5/8" REBAR ALUM CAP
SUHV200	"A2" 14+23.91	15.67' R+	669.211'	SET 60D SPIKE

**CURVE TABLE**

No.	R	Δ	T	L
③	310'	31°42'08"	88.02'	171.53'
④	1000'	3°47'53"	33.16'	66.29'
⑤	1100'	9°20'15"	89.83'	179.27'

**LAYOUT**  
 SCALE: 1" = 20'  
**L-2**

P:\proj\2\01\47220\plans\pse\147220ea002.dgn  
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 APOLLINARIO VIVIT  
 BRIAN STEINER  
 ROB BURNETT  
 DESIGN

USERNAME => s123119  
 DGN FILE => 147220ea002.dgn

RELATIVE BORDER SCALE IS IN INCHES

UNIT 0317

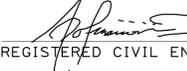
PROJECT NUMBER & PHASE

0100003101

LAST REVISION | DATE PLOTTED => 20-SEP-2010  
 09-15-10 TIME PLOTTED => 14:56

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	5	44

	09-15-10
REGISTERED CIVIL ENGINEER	DATE
09-20-10	
PLANS APPROVAL DATE	

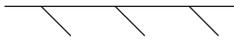
REGISTERED PROFESSIONAL ENGINEER
APOLINARIO W. VIVIT
No. C66046
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CIVIL

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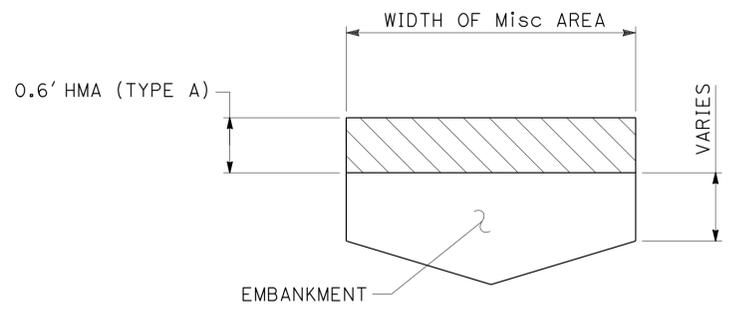
**LEGEND**



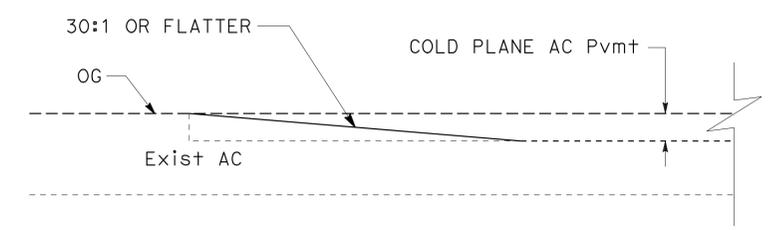
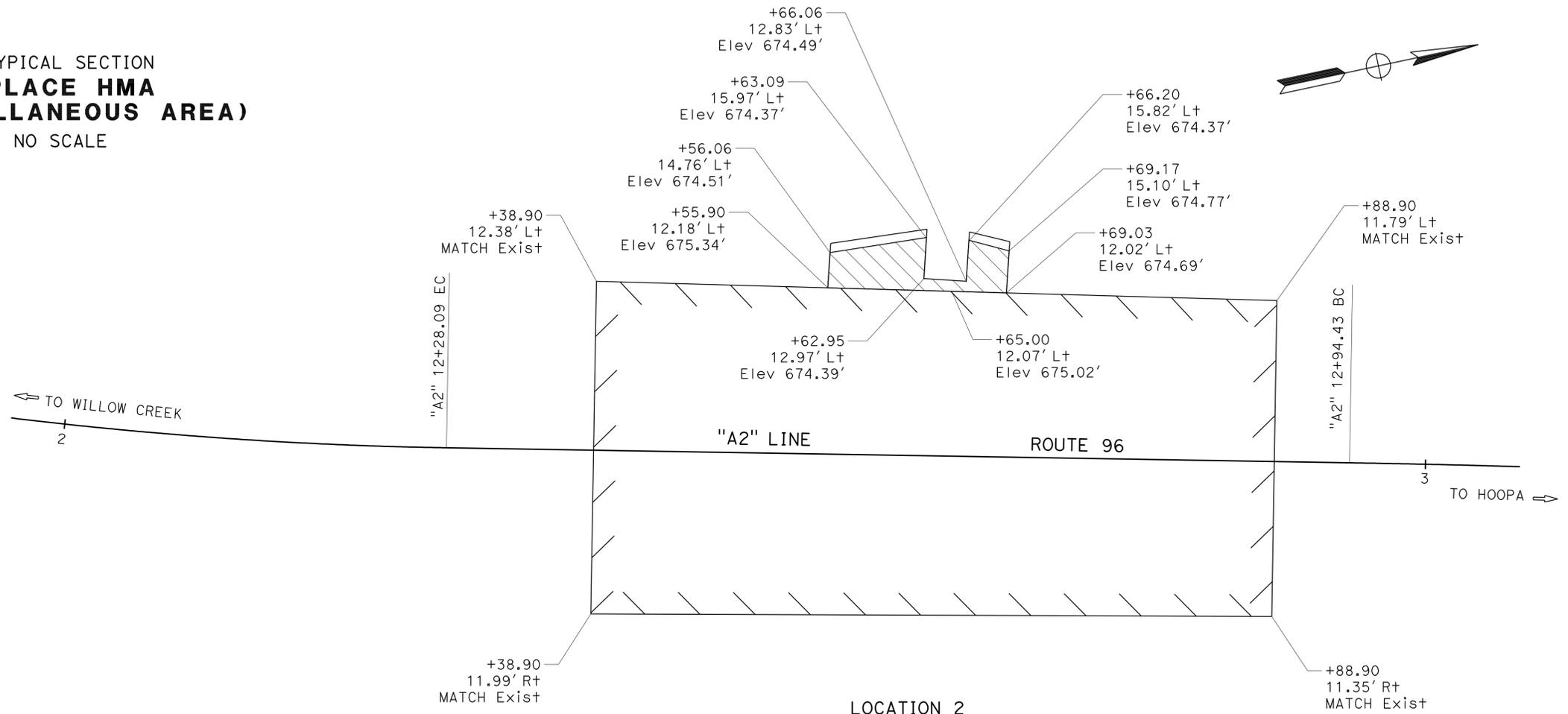
PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)



COLD PLANE AC PAVEMENT LIMITS AND HMA (TYPE A)



**TYPICAL SECTION  
PLACE HMA  
(MISCELLANEOUS AREA)**  
NO SCALE



**PROFILE  
TEMPORARY PAVEMENT CONFORM DETAIL**  
NO SCALE

**CONSTRUCTION DETAILS**  
SCALE: AS SHOWN

**C-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 APOLINARIO VIVIT  
 BRIAN STEINER  
 ROB BURNETT  
 REVISIONS: 01, 02, 03, 04, 05, 06, 07, 08, 09, 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.

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x

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STATE OF CALIFORNIA <b>Caltrans</b>	DEPARTMENT OF TRANSPORTATION <b>DESIGN</b>	FUNCTIONAL SUPERVISOR ROB BURNETT	CALCULATED-DESIGNED BY CHECKED BY	APOLINARIO VIVIT BRIAN STEINER	REVISED BY DATE REVISED
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**ABBREVIATIONS:**

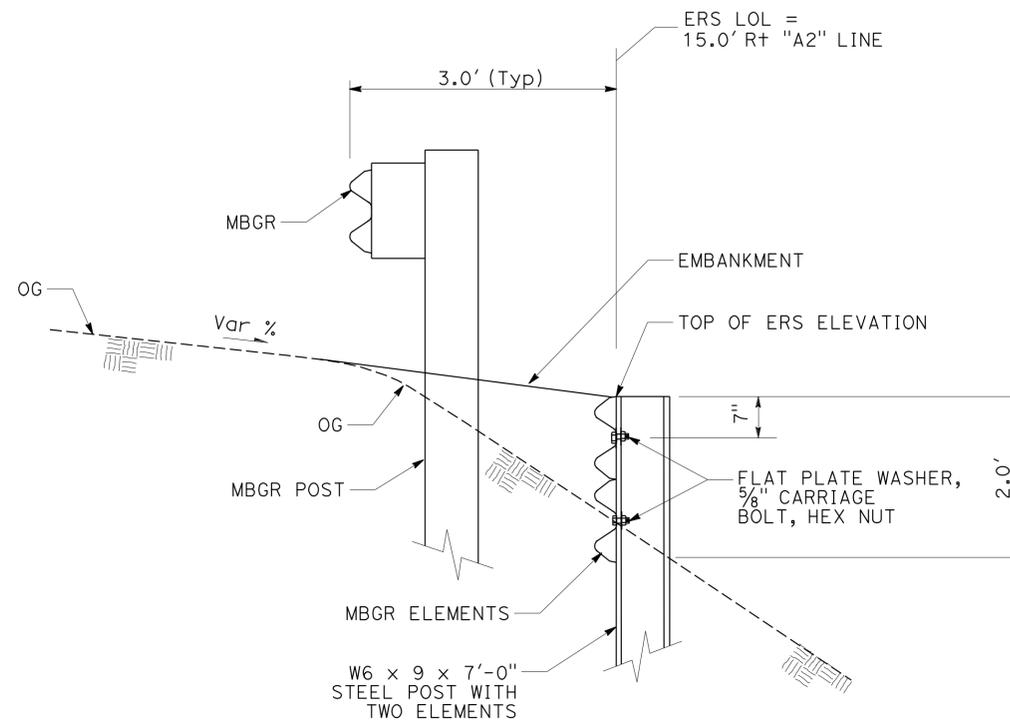
ERS EARTH RETAINING STRUCTURE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	6	44

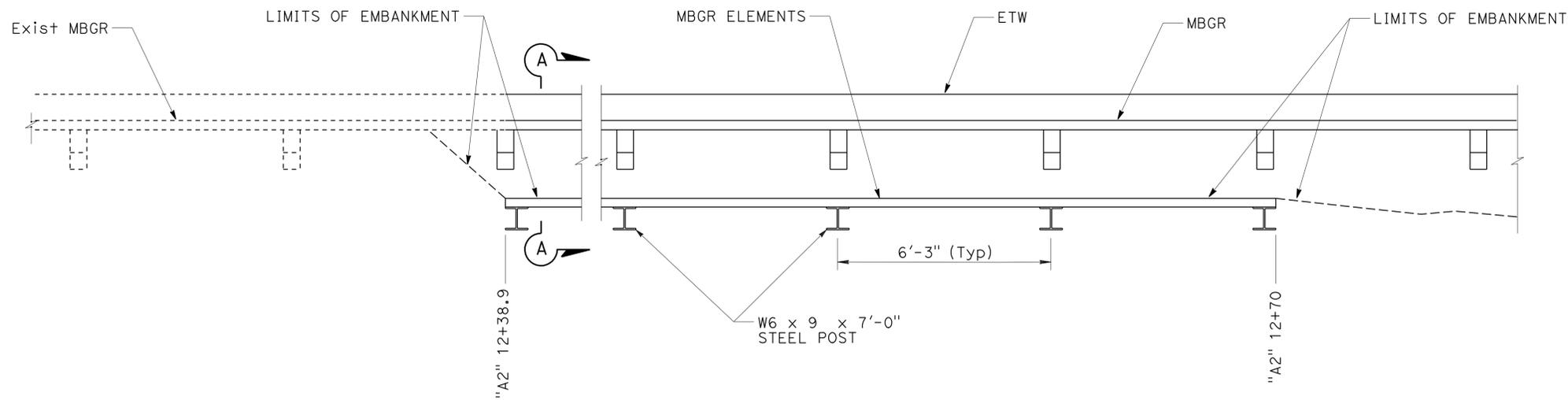
09-15-10  
REGISTERED CIVIL ENGINEER DATE

09-20-10  
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.



**SECTION A-A**

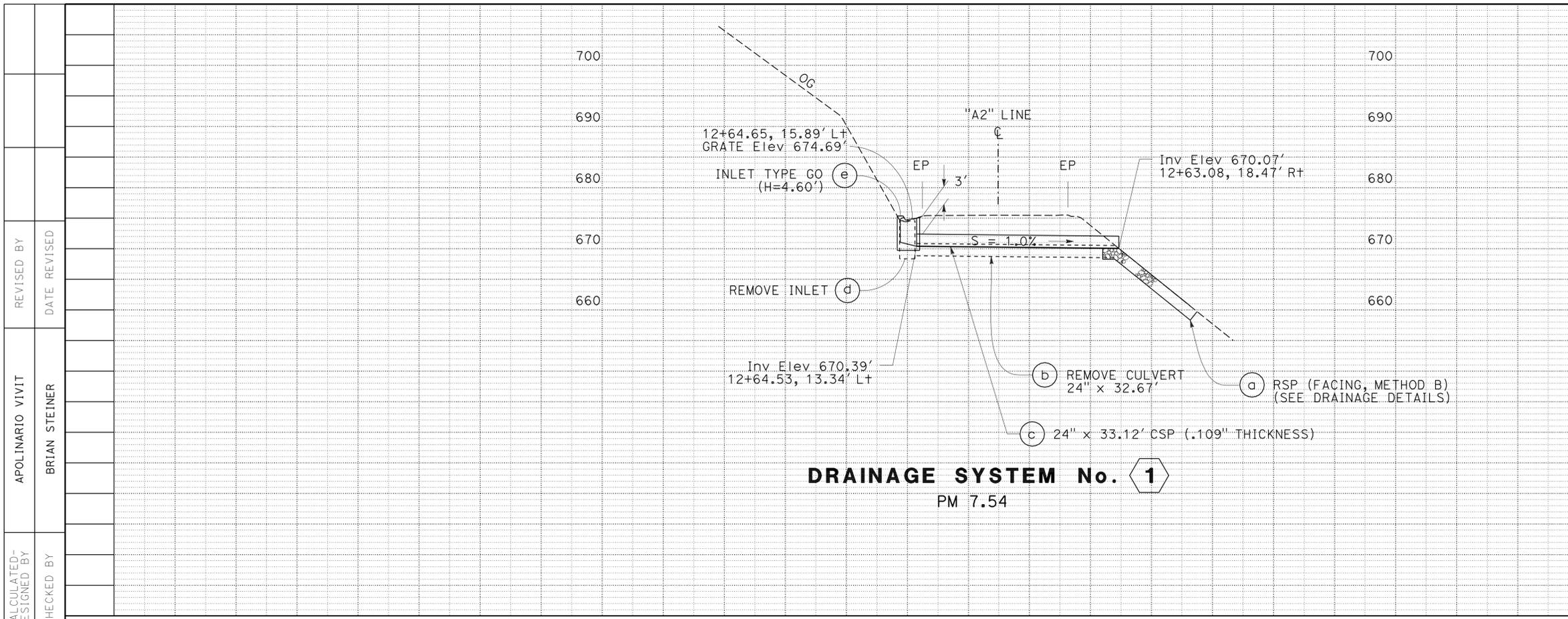


**PLAN**  
**EARTH RETAINING STRUCTURE (GUARD RAILING)**  
LOCATION 2  
PM 7.54

**CONSTRUCTION DETAILS**  
NO SCALE  
**C-2**



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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 Et Caltrans®  
 DESIGN  
 FUNCTIONAL SUPERVISOR  
 ROB BURNETT  
 CALCULATED/DESIGNED BY  
 CHECKED BY  
 APOLINARIO VIVIT  
 BRIAN STEINER  
 REVISED BY  
 DATE REVISED  
 APOLINARIO VIVIT  
 BRIAN STEINER  
 REVISED BY  
 DATE REVISED  
 APOLINARIO VIVIT  
 BRIAN STEINER  
 REVISED BY  
 DATE REVISED

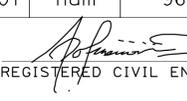


**DRAINAGE SYSTEM No. 1**  
PM 7.54

**DRAINAGE QUANTITIES**

DRAINAGE SYSTEM No.	DRAINAGE UNIT No.								H = HEIGHT OF INLET FT	(N)	INLET GRATE (TYPE 24-12X) EA	DESCRIPTION	STATION	DRAINAGE SYSTEM No.	DRAINAGE UNIT No.
		REMOVE CULVERT EA	REMOVE INLET EA	MINOR CONCRETE (MINOR STRUCTURE) CY	24" CSP (.109" THICKNESS) LF	RSP (FACING, METHOD B) CY	RSP FABRIC SQYD	MISCELLANEOUS IRON AND STEEL LB							
1	a					7.7	14.0				RSP	"A2" 12+63.4, 24' Rt	1	a	
	b	1									24" x 33' CMP	"A2" 12+63.9		b	
	c				33						24" CMP	"A2" 12+63.9		c	
	d		1								REMOVE INLET (Conc BOX)	"A2" 12+64.5, 14.5' Lt		d	
	e			1.63				239	4.6	1	DRAINAGE INLET (TYPE GO)	"A2" 12+64.5, 14.5' Lt		e	
TOTAL		1	1	1.63	33	7.7	14.0	239							

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

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	7	44
 REGISTERED CIVIL ENGINEER			09-15-10	DATE	
PLANS APPROVAL DATE			09-20-10	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>					

REGISTERED PROFESSIONAL ENGINEER  
 APOLINARIO  
 W. VIVIT  
 No. C66046  
 Exp. 6-30-12  
 CIVIL  
 STATE OF CALIFORNIA

**DRAINAGE PROFILES  
 AND QUANTITIES**  
 SCALE: 1" = 10'  
**DP-1**

THIS PLAN ACCURATE FOR DRAINAGE ONLY

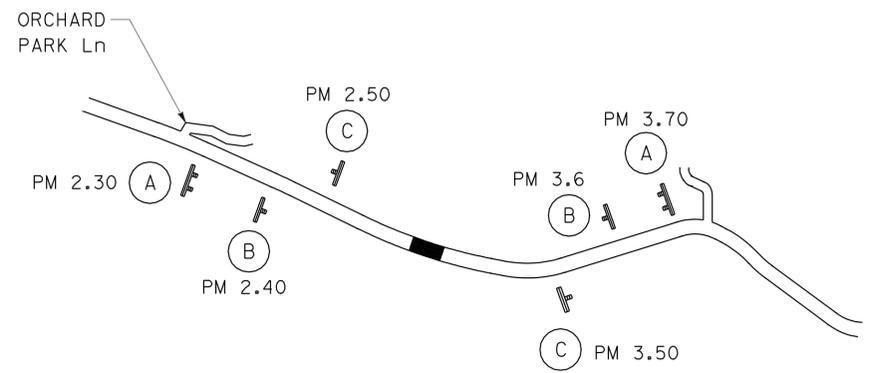
LAST REVISION | DATE PLOTTED => 20-SEP-2010  
 09-15-10      TIME PLOTTED => 14:56



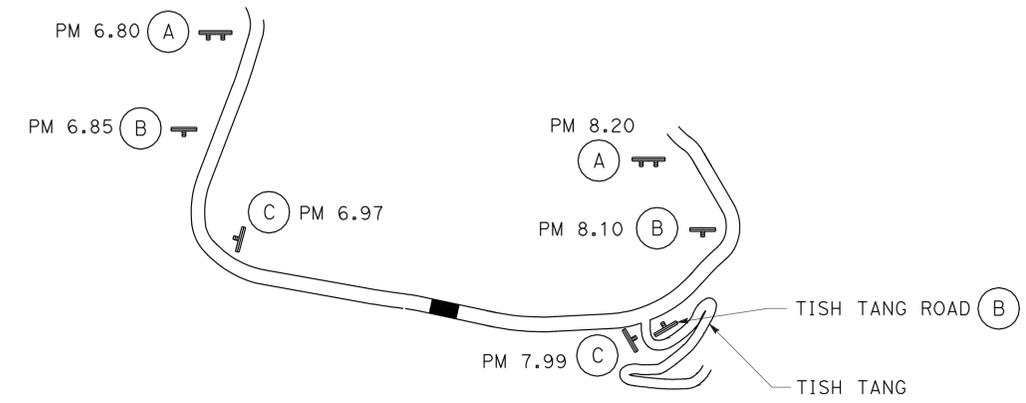
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	9	44
			09-15-10	DATE	
REGISTERED CIVIL ENGINEER			APOLINARIO W. VIVIT		
PLANS APPROVAL DATE			09-20-10	No. C66046	
			Exp. 6-30-12		
			CIVIL		
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

**NOTE:**

- EXACT SIGN LOCATION TO BE DETERMINED BY THE ENGINEER.
- SIGNS SHOWN WITH (CA) INDICATE CALIFORNIA MUTCD SIGN CODE, OTHERWISE FEDERAL SIGN CODES ARE SHOWN



**LOCATION 1**  
PM 3.0



**LOCATION 2**  
PM 7.5



**C23B(CA) SIGN PANEL DETAIL**

**CONSTRUCTION AREA SIGNS (STATIONARY MOUNTED)**

TYPE	CODE	PANEL SIZE	SIGN MESSAGE	NUMBER AND SIZE OF POST	No. OF SIGNS
(A)	W20-1 C23B(CA)	36" x 36" 36" x 24"	ROAD WORK AHEAD HIGHWAY REPAIR	2 - 4" x 6"	5
(B)	W11-1 W16-1	24" x 24" 18" x 24"	(PICTURE OF BICYCLE) SHARE THE ROAD	1 - 4" x 6"	4
(C)	G20-2	36" x 18"	END ROAD WORK	1 - 4" x 4"	4

**CONSTRUCTION AREA SIGNS**  
NO SCALE  
**CS-1**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 APOLINARIO VIVIT  
 BRIAN STEINER  
 ROB BURNETT  
 REVISIONS: 01, 02, 03, 04, 05, 06, 07, 08, 09, 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

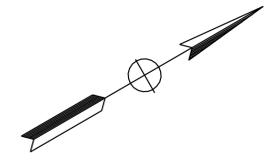
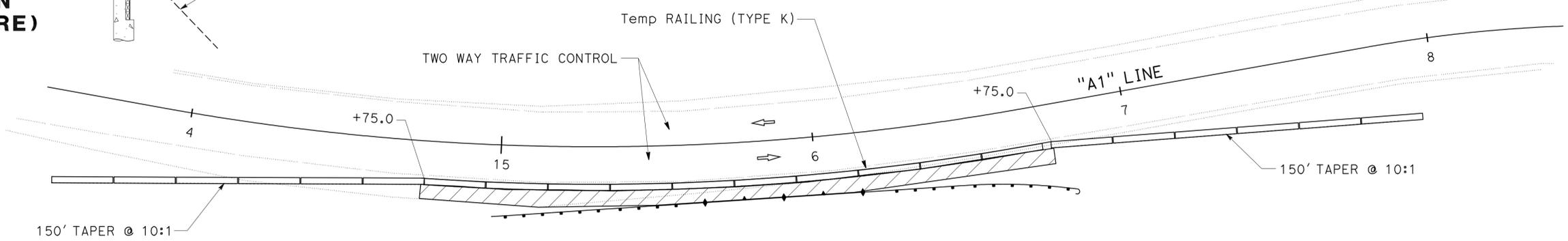
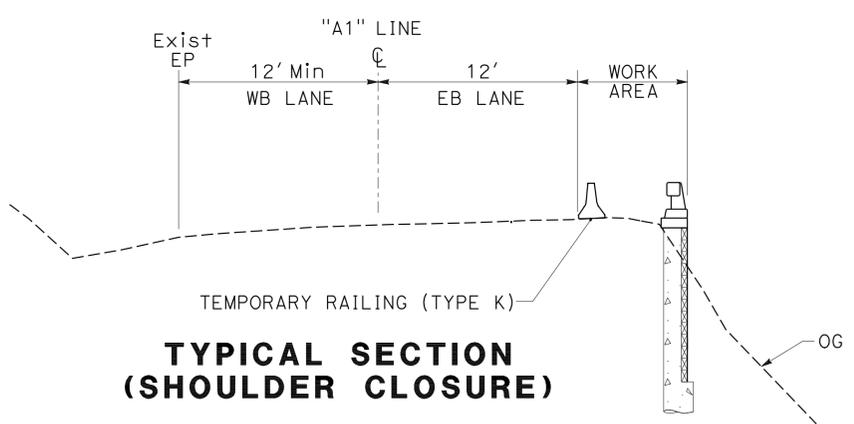
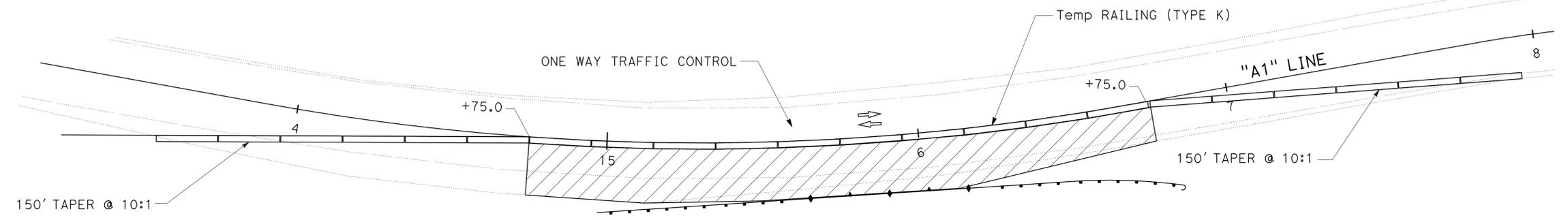
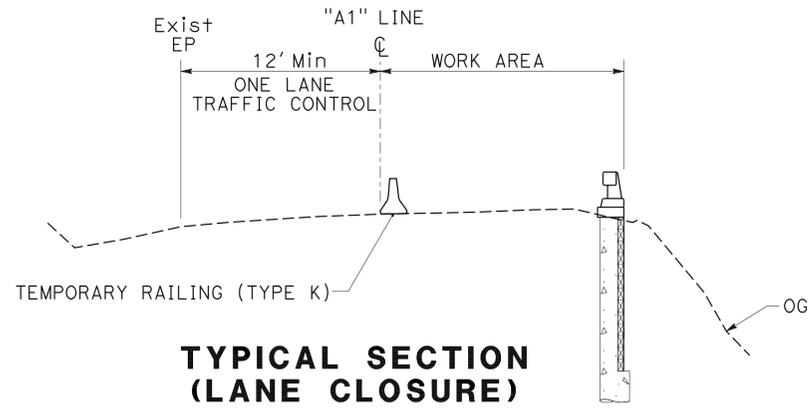
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	10	44
			09-15-10	DATE	
			09-20-10	PLANS APPROVAL DATE	
REGISTERED CIVIL ENGINEER APOLINARIO W. VIVIT No. C66046 Exp. 6-30-12 CIVIL STATE OF CALIFORNIA					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

**NOTES:**

1. USE LANE CLOSURE TRAFFIC HANDLING WHEN A FULL LANE CLOSURE IS NEEDED WHILE WORK IS IN PROGRESS.
2. USE SHOULDER CLOSURE TRAFFIC HANDLING WHEN A SHOULDER CLOSURE IS NEEDED WHILE WORK IN PROGRESS.
3. USE SHOULDER CLOSURE TRAFFIC HANDLING WHEN WORK IS NOT IN PROGRESS.

**LEGEND**

	WORK AREA
	Temp RAILING (TYPE K)
	DIRECTION OF TRAFFIC



**LOCATION 1**  
PM 3.0

**TRAFFIC HANDLING PLAN**  
NO SCALE  
**TH-1**

THIS PLAN ACCURATE FOR TRAFFIC HANDLING ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 DESIGN  
 FUNCTIONAL SUPERVISOR: ROB BURNETT  
 CALCULATED/DESIGNED BY: APOLINARIO VIVIT  
 CHECKED BY: BRIAN STEINER  
 REVISOR: APOLINARIO VIVIT  
 DATE REVISOR: BRIAN STEINER

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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 DESIGN  
 FUNCTIONAL SUPERVISOR: ROB BURNETT  
 CALCULATED/DESIGNED BY: APOLINARIO VIVIT  
 CHECKED BY: BRIAN STEINER  
 REVISED BY: APOLINARIO VIVIT  
 DATE REVISED:

**NOTES:**

1. GUARD RAILING DELINEATOR TO BE MBGR-MOUNTED.
2. 40' ADDED TO THERMOPLASTIC TRAFFIC STRIPE QUANTITY FOR TRANSITION TO EXISTING

**LEGEND:**

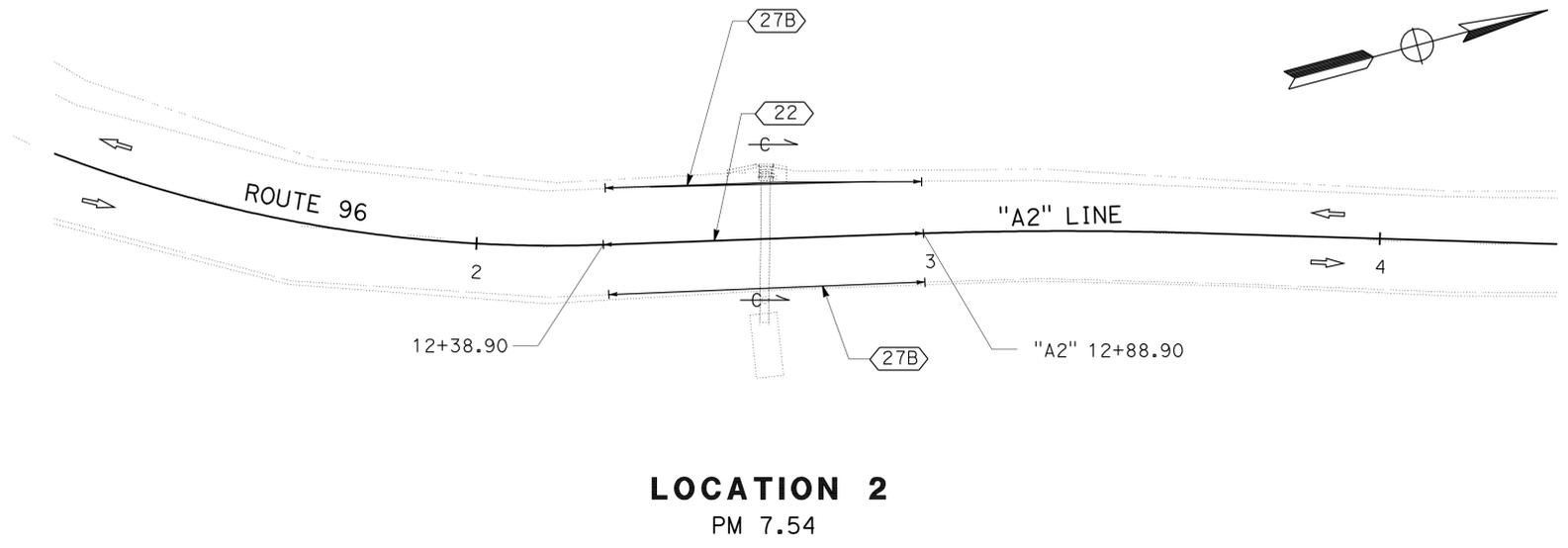
- (XX) TRAFFIC STRIPE DETAIL NO.
- ✂ STRIPE CHANGE LOCATION
- ⊖ MARKER (CULVERT)
- GUARD RAIL DELINEATOR

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	11	44

09-15-10  
 REGISTERED CIVIL ENGINEER DATE  
 09-20-10  
 PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
 APOLINARIO W. VIVIT  
 No. C66046  
 Exp. 6-30-12  
 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.

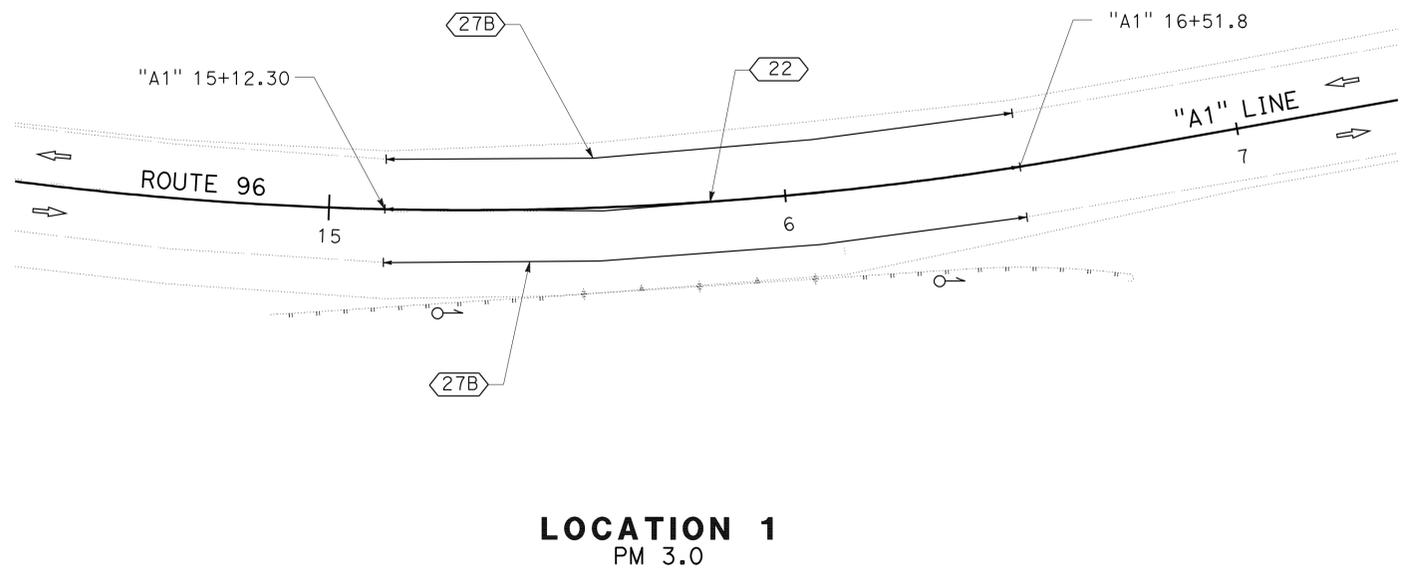


**MARKERS AND DELINEATORS**

SYMBOL	MARKER (CULVERT)	GUARD RAIL DELINEATOR
	⊖	EA
○	2	2
TOTAL	2	2

**PAVEMENT MARKER (RETROREFLECTIVE-RECESSED)**

STA TO STA	DETAIL No.	TYPE	EA
"A1" 15+12.3 TO 16+51.8	22	D	14
"A2" 12+38.90 TO 12+88.90	22	D	6
TOTAL			20



**THERMOPLASTIC TRAFFIC STRIPE**

STA TO STA	(SEE NOTE 2)	
	DETAIL 22	DETAIL 27B
	LF	LF
"A1" 15+12.3 TO 16+51.8	320	320
"A2" 12+38.90 TO 12+88.90	140	140
TOTAL	460	460

**PAVEMENT DELINEATION PLAN AND QUANTITIES**

SCALE: 1" = 20'

**PD-1**

THIS PLAN ACCURATE FOR PAVEMENT DELINEATION WORK ONLY.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	12	44

REGISTERED CIVIL ENGINEER DATE: 09-15-10  
 PLANS APPROVAL DATE: 09-20-10  
 No. C66046  
 Exp. 6-30-12  
 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.

**NOTES:**

- (N) - NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.
- EROSION CONTROL (COMPOST BLANKET) TO BE PLACED ON DISTURBED SOIL.

**ROADWAY QUANTITIES**

STATION	POST MILE	LOCATION	ROADWAY EXCAVATION	TEMPORARY RAILING (TYPE K)	COLD PLANE ASPHALT CONCRETE PAVEMENT	CLASS 2 AGGREGATE BASE	HOT MIX ASPHALT (OPEN-GRADED)	HOT MIX ASPHALT (TYPE A)	PLACE HMA DIKE (TYPE A)	PLACE HMA (Misc AREA)	TACK COAT	EARTH RETAINING STRUCTURE (GUARD RAILING)
			CY	LF	SQYD	CY	TON	TON	LF	SQYD	TON	SQFT
"A1" 15+12.3 TO 16+51.8	3.0	1	37.5	460	430	7.33		36.5			0.19	
"A2" 12+38.9 TO 12+88.9	7.5	2			132		8.9	1.9	10.2	3.9	0.06	62.2
<b>TOTAL</b>			37.5	460	562	7.33	8.9	38.4	10.2	3.9	0.25	62.2

**METAL BEAM GUARD RAILING**

POST MILE	LOCATION	STATION	RECONSTRUCT MBGR	TRANSITION RAILING (TYPE WB)	INLINE TERMINAL SYSTEM (TYPE X-TENSION)	ALTERNATIVE FLARED TERMINAL SYSTEM	ADJUST MBGR
			LF	EA	EA	EA	LF
3.0	1	"A1" 14+88.4 TO 16+71.4		2	1	1	
7.5	2	"A2" 12+38.9 TO 12+88.9	50				
7.5	2	"A2" 9+46.30 TO 20+02.30					1000
<b>TOTAL</b>			50	2	1	1	1000

**TEMPORARY WATER POLLUTION CONTROL**

POST MILE	LOCATION	TEMPORARY SILT FENCE	TEMPORARY REINFORCED SILT FENCE	TEMPORARY CONSTRUCTION ENTRANCE	TEMPORARY CHECKDAM	TEMPORARY DRAINAGE INLET PROTECTION
		LF	LF	EA	LF	EA
3.0	1		100	1	25	
7.5	2	30			10	1
<b>TOTAL</b>		30	100	1	35	1

**EROSION CONTROL**

POST MILE	LOCATION	EROSION CONTROL (COMPOST BLANKET)			REMARKS
		THICKNESS (N)	AREA (N)	VOLUME	
		IN	SQFT	CY	
3.0	1	3	756	7	SEE NOTE 2
7.5	2	3	756	7	SEE NOTE 2
<b>TOTAL</b>				14	

**SUMMARY OF QUANTITIES**  
Q-1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	13	44

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

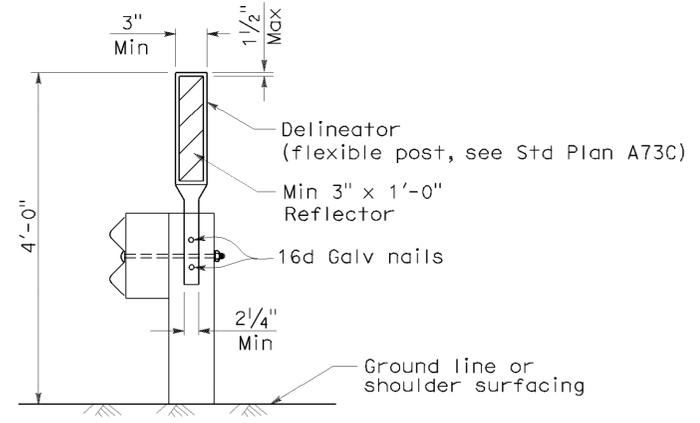
*Randell D. Hiatt*  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

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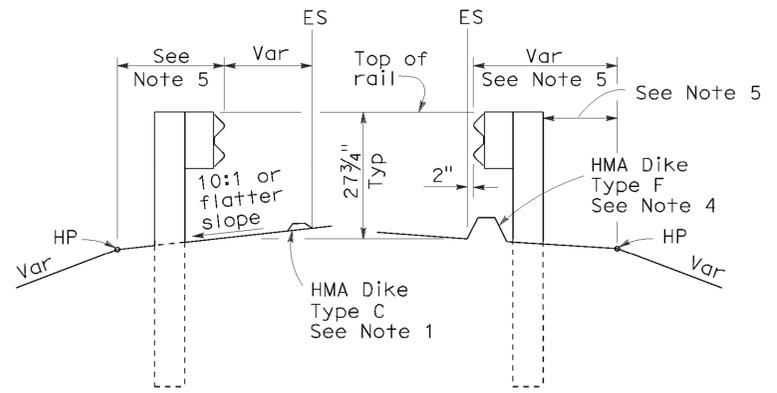
To accompany plans dated 09-20-10

**NOTES:**

1. When necessary to place dike in front of face of guard railing, only Type C dike may be used. For dike details, see Standard Plan A87B.
2. For standard railing post embedment, see Standard Plans A77C3.
3. Guard railing delineation to be used where shown on the Project Plans.
4. When dike or curb is placed under guard railing, the maximum height of the dike or curb shall be 4". Mountable dike should not be used. For dike and curb details, see Revised Standard Plans RSP A87A and Standard Plan A87B.
5. For details of typical distance between the face of rail and hinge point, see Standard Plan A77C3.



**GUARD RAILING DELINEATION**  
See Note 3



**DIKE POSITIONING**  
See Note 1

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING  
TYPICAL RAILING DELINEATION  
AND DIKE POSITIONING DETAILS**

NO SCALE

RSP A77C4 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77C4  
DATED MAY 1, 2006 - PAGE 47 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77C4**

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2006 REVISED STANDARD PLAN RSP A77C4

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	14	44

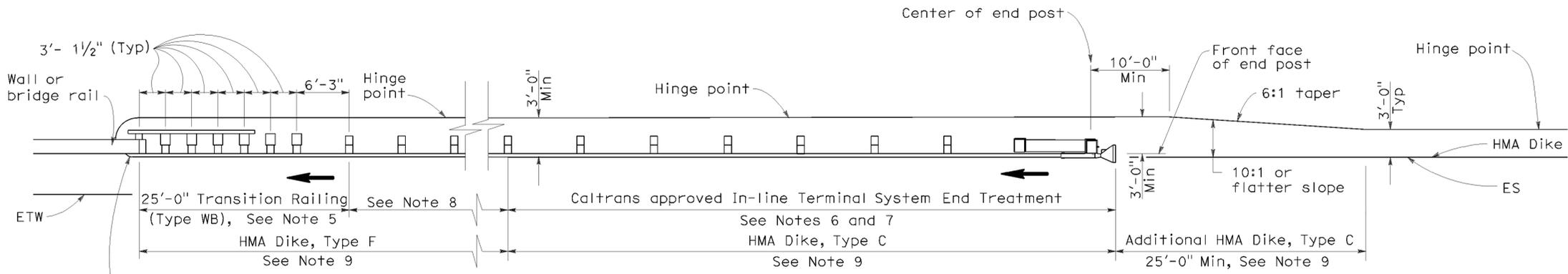
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

*Randell D. Hiatt*  
REGISTERED PROFESSIONAL ENGINEER  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

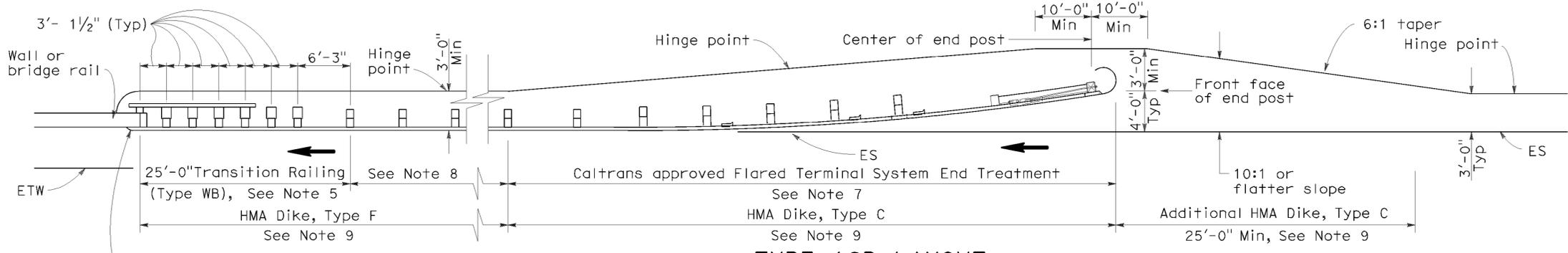
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To accompany plans dated 09-20-10



**TYPE 12A LAYOUT**

(GUARD RAILING INSTALLATION AT STRUCTURE APPROACH WITH AN IN-LINE END TREATMENT AT TRAFFIC APPROACH END OF RAILING)  
See Notes 10



**TYPE 12B LAYOUT**

(GUARD RAILING INSTALLATION AT STRUCTURE APPROACH WITH A FLARED END TREATMENT AT TRAFFIC APPROACH END OF RAILING)  
See Notes 10

**NOTES:**

- Line post, blocks and hardware to be used are shown on Standard Plans A77A1, A77A2, A77B1, A77C1 and A77C2.
- Guard rail post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- Direction of adjacent traffic indicated by  $\rightarrow$ .
- For Transition Railing (Type WB) details for Types 12A and 12B Layouts, see Standard Plan A77J4.
- In-line Terminal System End Treatments are used where site conditions will not accommodate a flared end treatment.
- The type of terminal system end treatment to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height, side slopes, or other fixed objects), it may be advisable to construct additional guard railing (a length equal to multiples of 12'-6" with 6'-3" post spacing) between the transition railing and end treatment.

- Where placement of dike is required with guard railing installations, see Revised Standard Plan RSP A77C4 for dike positioning details.
- Type 12A or Type 12B Layouts are typically used:
  - To the right of approaching traffic, at the end of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
  - To the left of approaching traffic, at the end of a structure, on two-lane conventional highway where the roadbed width across the structure is less than 40 feet.
  - To the right of approaching traffic at the end of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.
  - To the right of approaching traffic at the end of the structure on multilane freeways or expressways with decked median on the bridge.
- See Revised Standard Plan RSP A77F3 for typical layout used left of approaching traffic at the ends of each structure on multilane freeways or expressways with separate adjacent or parallel bridges.

- For additional details of typical connections to bridge rail, see Connection Detail AA on Revised Standard Plans RSP A77J1 and RSP A77J2 and Connection Detail FF on Standard Plans A77K1 and A77K2.
- For additional details of a typical connection to walls or abutments, see Standard Plan A77J3.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

RSP A77F1 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77F1  
DATED MAY 1, 2006 - PAGE 54 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77F1**

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2006 REVISED STANDARD PLAN RSP A77F1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	15	44

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

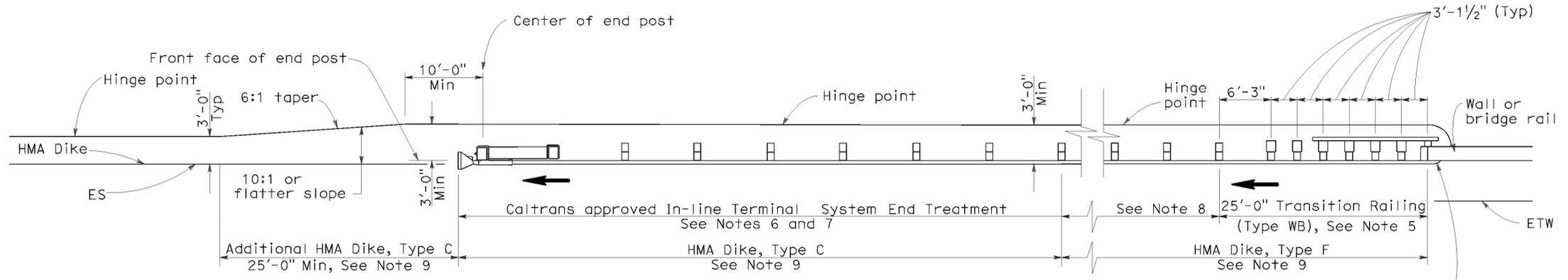
June 6, 2008  
PLANS APPROVAL DATE

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Randell D. Hiatt  
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Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

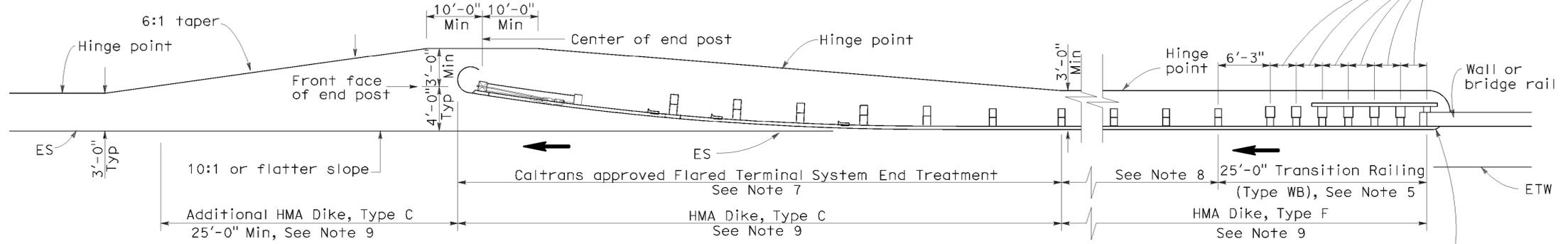
To accompany plans dated 09-20-10

2006 REVISED STANDARD PLAN RSP A77F4



**TYPE 12AA LAYOUT**

(GUARD RAILING INSTALLATION AT STRUCTURE DEPARTURE WITH AN IN-LINE END TREATMENT AT TRAILING END OF RAILING)  
See Notes 9 and 10



**TYPE 12BB LAYOUT**

(GUARD RAILING INSTALLATION AT STRUCTURE DEPARTURE WITH A FLARED END TREATMENT AT TRAILING END OF RAILING)  
See Notes 9 and 10

**NOTES:**

- Line post, blocks and hardware to be used are shown on Standard Plans A77A1, A77A2, A77B1, A77C1 and A77C2.
- Guard rail post spacing to be 6'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 6" x 8" x 6'-0" wood with 6" x 8" x 1'-2" wood blocks. W6 x 9 steel posts, 6'-0" in length, with 6" x 8" x 1'-2" notched wood blocks or notched recycled plastic blocks may be used for 6" x 8" x 6'-0" wood posts with 6" x 8" x 1'-2" wood blocks where applicable and when specified.
- Direction of adjacent traffic indicated by  $\rightarrow$ .
- For Transition Railing (Type WB) details for Types 12AA and 12BB Layouts, see Standard Plan A77J4.
- In-line Terminal System Treatments are used where site conditions will not accommodate a flared end treatment.
- The type of terminal system to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height, side slopes, other fixed objects), it may be advisable to construct additional guard railing (a length equal to multiples of 12'-6" with 6'-3" post spacing) between the transition railing and end treatments.
- Where placement of dike is required with guard railing installations, see Revised Standard Plan RSP A77C4 for dike positioning details.
- Type 12AA or Type 12BB Layouts are typically used to the right of traffic departing a structure on two-way conventional highways where the roadbed width across the structure is less than 40 feet.
- For additional details of typical connections to bridge rail, see Connection Detail CC on Revised Standard Plan RSP A77J2 and Connection Detail HH on Standard Plans A77K2.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**METAL BEAM GUARD RAILING  
TYPICAL LAYOUTS FOR  
STRUCTURE DEPARTURE**  
NO SCALE

RSP A77F4 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77F4  
DATED MAY 1, 2006 - PAGE 57 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77F4**

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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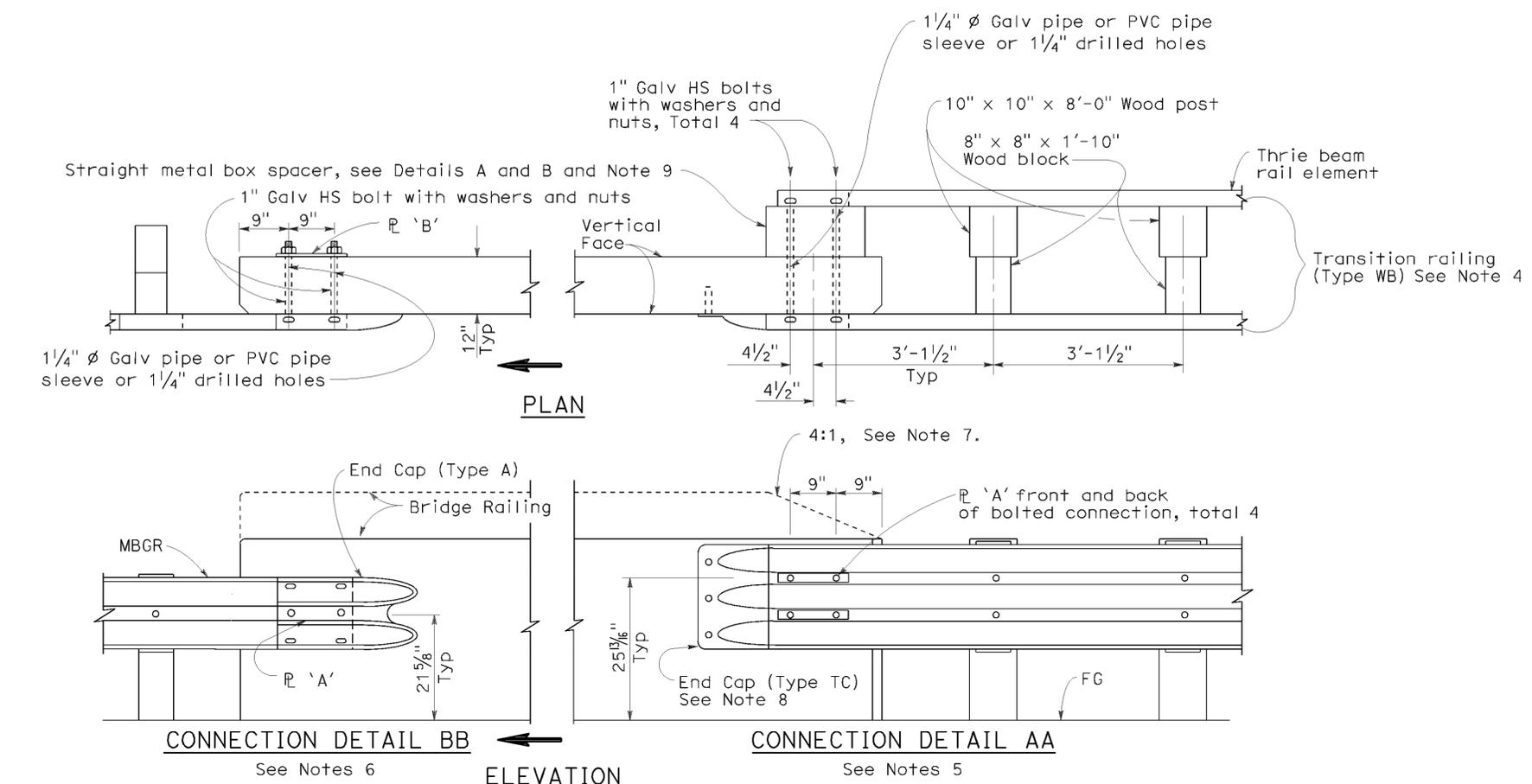
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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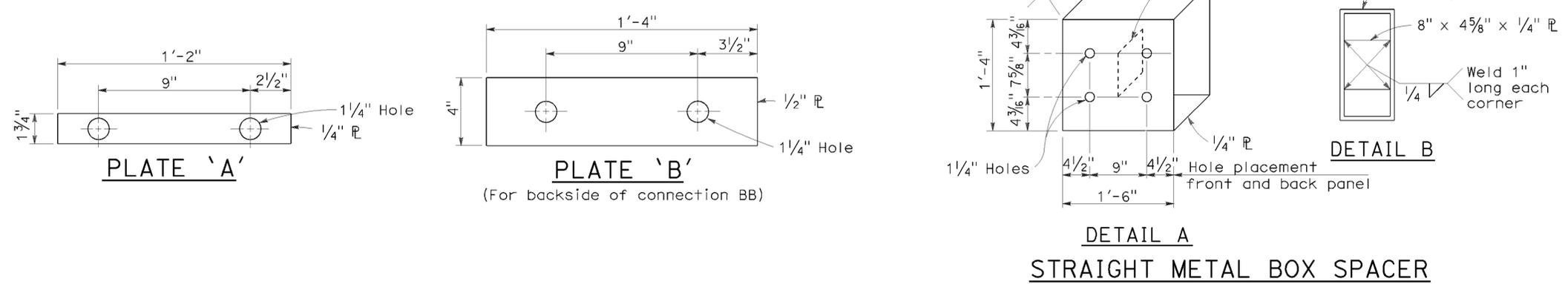
To accompany plans dated 09-20-10



**GUARD RAILING CONNECTION TO BRIDGE RAILING WITHOUT SIDEWALK**

**NOTES:**

1. See Revised Standard Plan RSP A77J2 for additional connection details to bridges without sidewalks.
2. Additional details of posts, blocks and hardware are shown on Standard Plan A77B1, A77C1 and A77C2.
3. Direction of adjacent traffic indicated by  $\rightarrow$ .
4. For additional details of Transition Railing (Type WB), see Standard Plan A77J4. Transition Railing (Type WB) transitions the 12 gage w-beam standard railing section of guard railing to a heavier gage nested thrie beam railing section which is connected to the concrete bridge railing.
5. For typical use of Connection Detail AA, see Layout Types 12A and 12B on Revised Standard Plan RSP A77F1, Layout Types 12C and 12D on Standard Plan A77F2, and Layout Type 12E on Revised Standard Plan RSP A77F3.
6. For typical use of Connection Detail BB, see Layout Type 12D (structure departure railing connection) on Standard Plan A77F2 and Layout Type 12DD on Standard Plan A77F5.
7. Where the height of the bridge railing exceeds the height of the thrie beam railing by more than 1" at Connection Detail AA, taper the top of the end of the bridge railing at 4:1 to match the top elevation of the thrie beam rail.
8. For details of End Cap (Type TC), see Standard Plan A77J4.
9. See Standard Plan A77J4 for additional details regarding depth dimension for straight metal box spacer.



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**METAL BEAM GUARD RAILING CONNECTIONS TO BRIDGE RAILINGS WITHOUT SIDEWALKS DETAILS No.1**

NO SCALE

RSP A77J1 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77J1 DATED MAY 1, 2006 - PAGE 72 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77J1**

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2006 REVISED STANDARD PLAN RSP A77J1

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	17	44

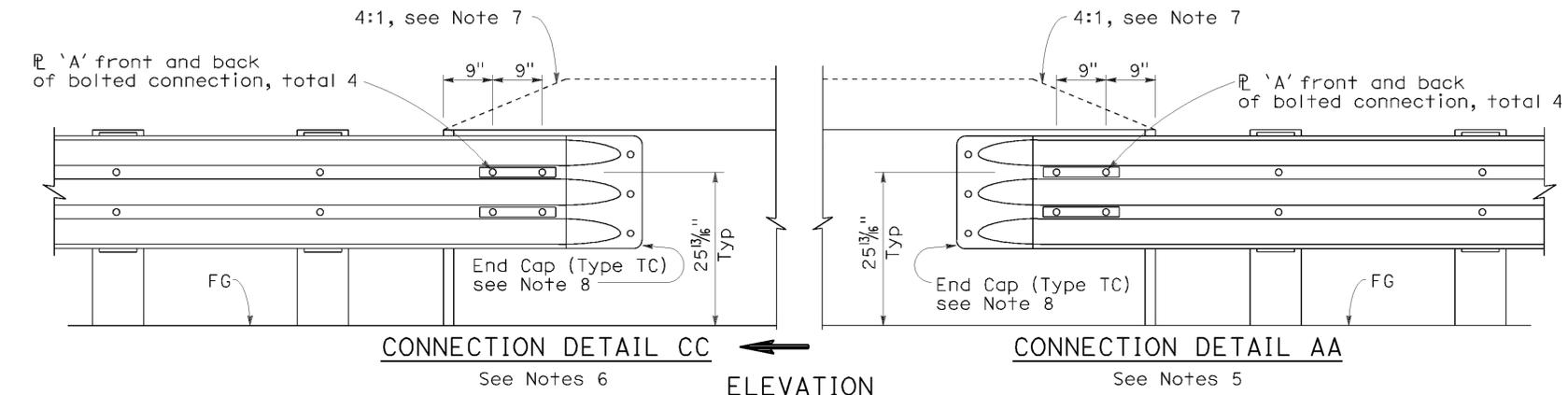
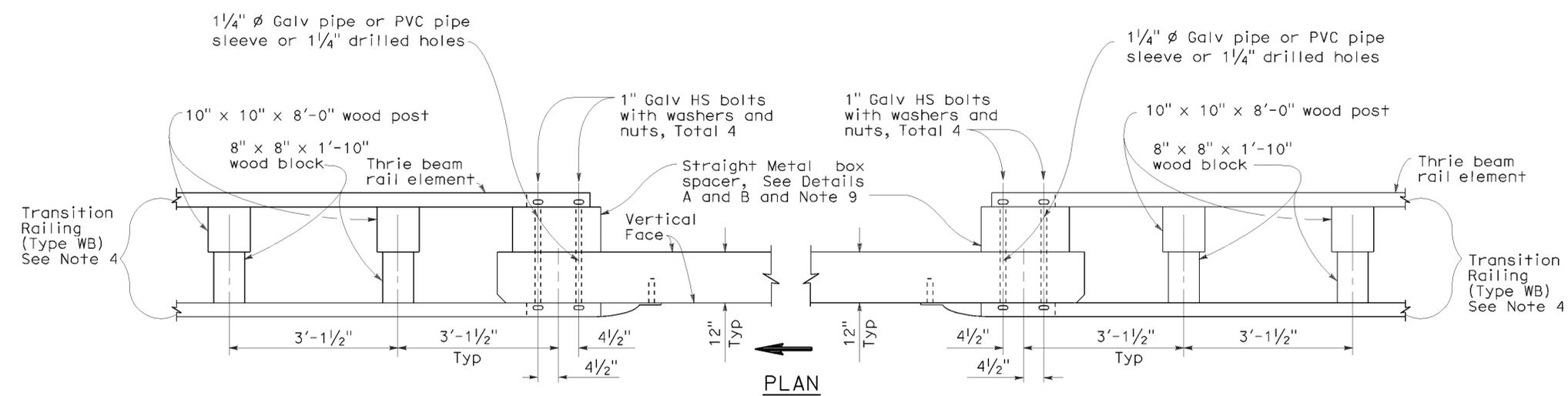
*Randell D. Hiatt*  
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June 6, 2008  
PLANS APPROVAL DATE

*Randell D. Hiatt*  
REGISTERED PROFESSIONAL ENGINEER  
No. C50200  
Exp. 6-30-09  
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STATE OF CALIFORNIA

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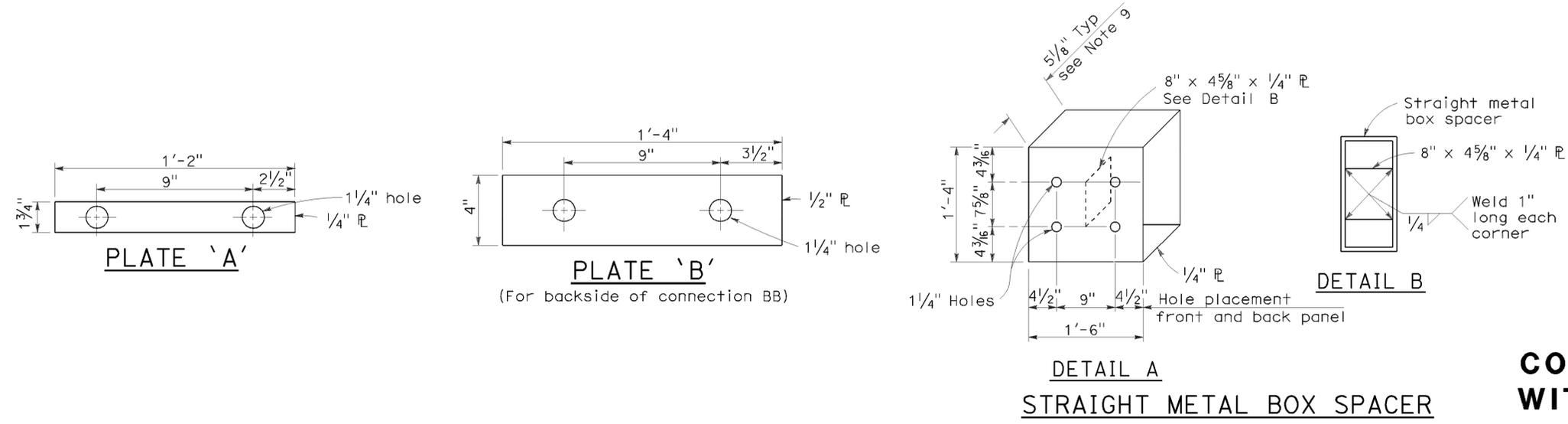
To accompany plans dated 09-20-10



**GUARD RAILING CONNECTION TO BRIDGE RAILING WITHOUT SIDEWALK**

**NOTES:**

- See Revised Standard Plan RSP A77J1 for additional connection details to bridges without sidewalks.
- Additional details of posts, blocks and hardware are shown on Standard Plan A77B1, A77C1 and A77C2.
- Direction of adjacent traffic indicated by →.
- For additional details of Transition Railing (Type WB), see Standard Plan A77J4. Transition Railing (Type WB) transitions the 12 gage w-beam standard railing section of guard railing to a heavier gage nested thrie beam railing section which is connected to the concrete bridge railing.
- For typical use of Connection Detail AA, see Layout Types 12A and 12B on Revised Standard Plan RSP A77F1, Layout Types 12C and 12D on Standard Plan A77F2, and Layout Type 12E on Revised Standard Plan RSP A77F3.
- For typical use of Connection Detail CC, see Layout Types 12AA and 12BB on Standard Plan A77F4 and Layout Type 12CC on Standard Plan A77F5.
- Where the height of the bridge railing exceeds the height of the thrie beam railing by more than 1" at Connection Detail AA and connection Detail CC, taper the top of the end of the bridge railing at 4:1 to match the top elevation of the thrie beam railing.
- For details of End Cap (Type TC), see Standard Plans A77J4.
- See Standard Plans A77J4 for additional details regarding depth dimension for straight metal box spacer.



**METAL BEAM GUARD RAILING CONNECTIONS TO BRIDGE RAILINGS WITHOUT SIDEWALKS DETAILS No.2**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

NO SCALE  
RSP A77J2 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN A77J2  
DATED MAY 1, 2006 - PAGE 73 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77J2**

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2006 REVISED STANDARD PLAN RSP A77J2

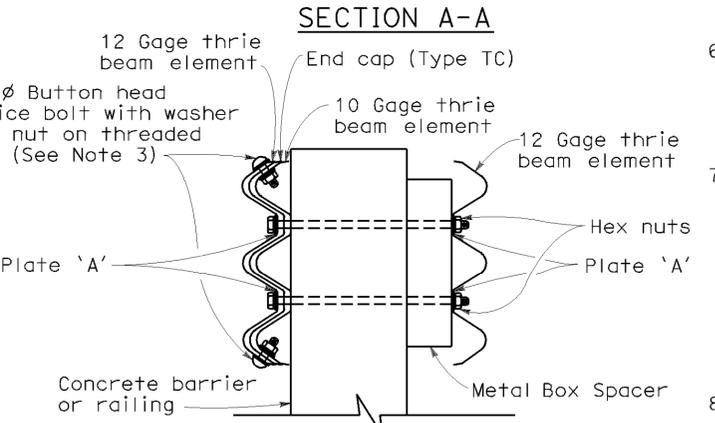
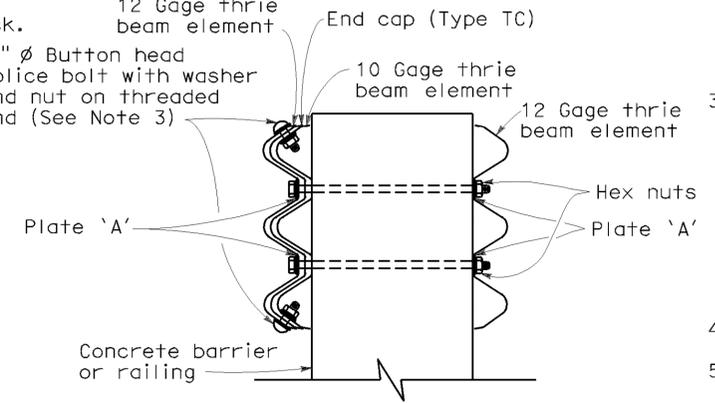
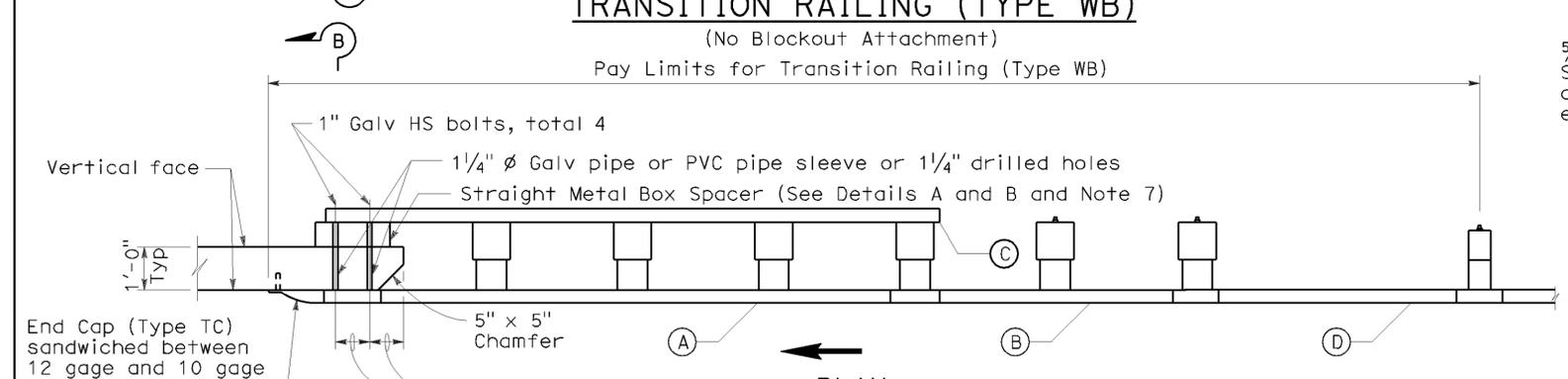
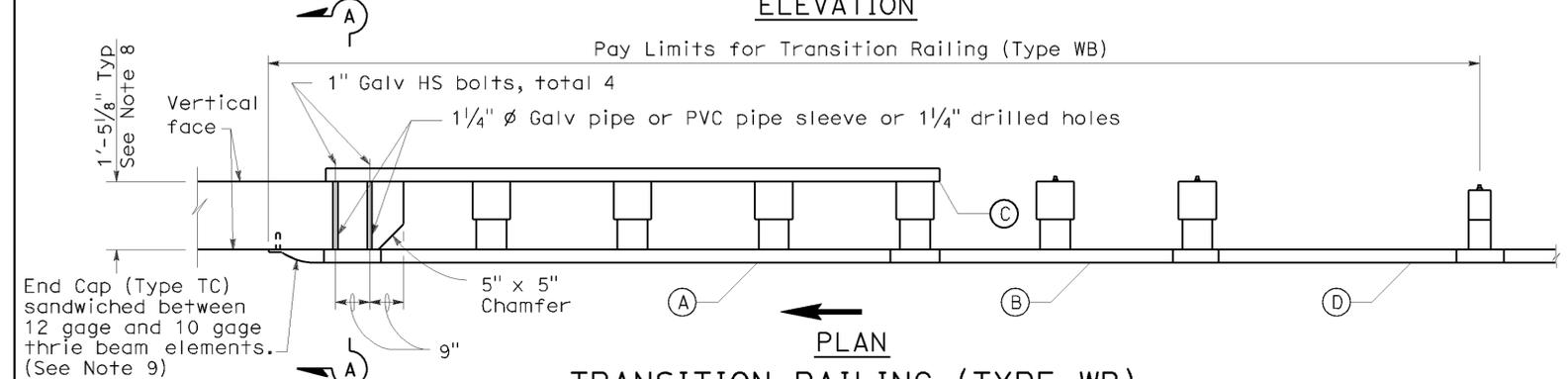
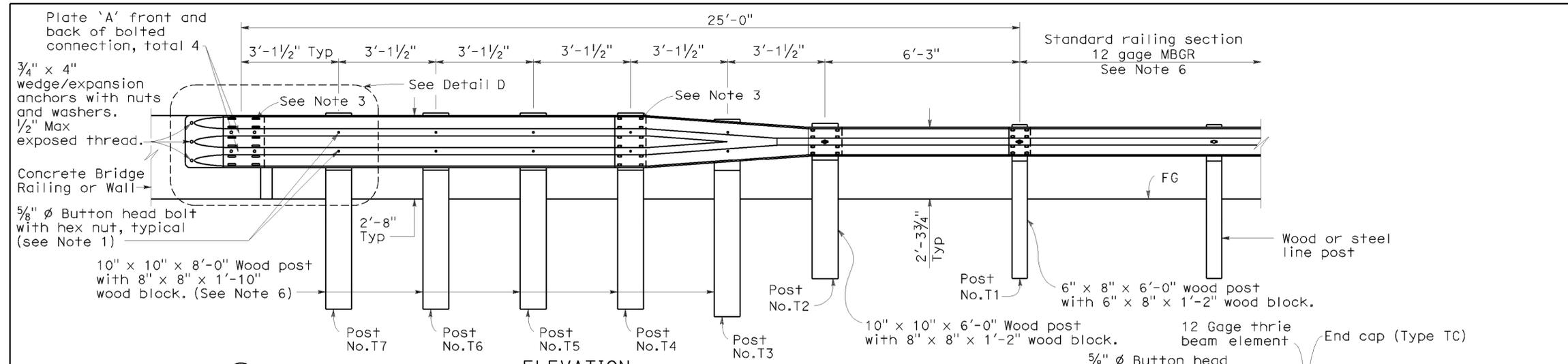
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	18	44

**Randell D. Hiatt**  
REGISTERED CIVIL ENGINEER

June 5, 2009  
PLANS APPROVAL DATE

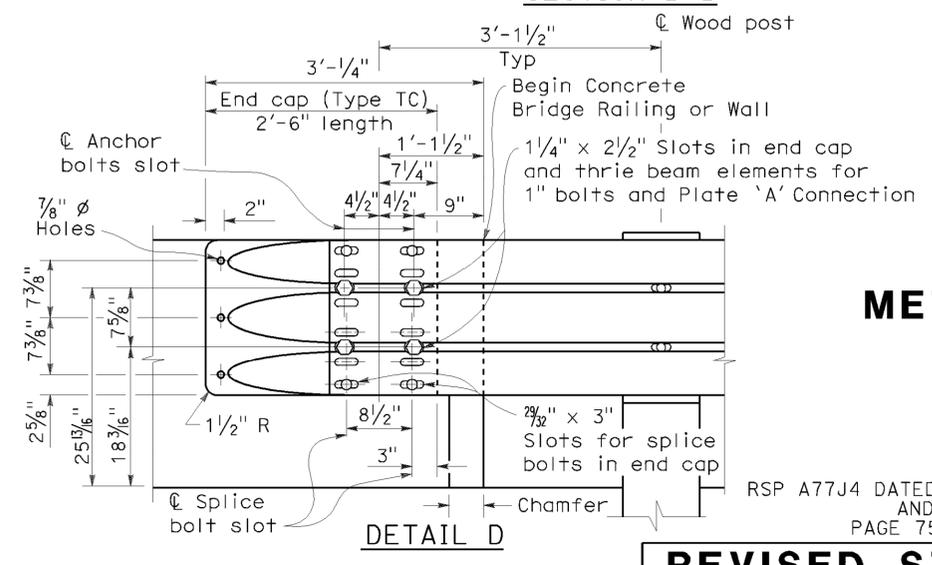
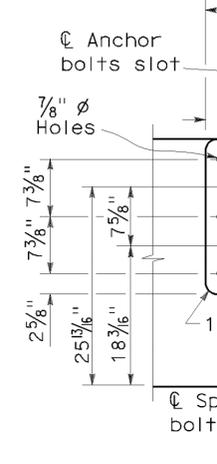
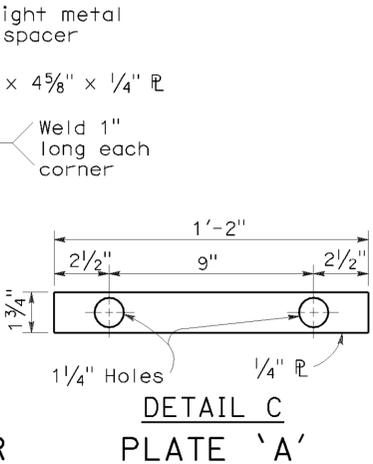
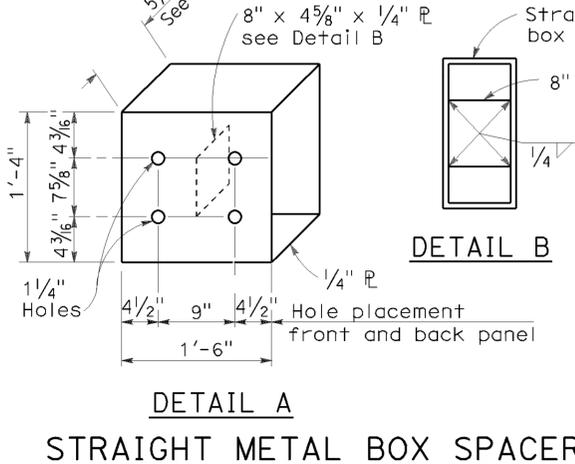
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REGISTERED PROFESSIONAL ENGINEER  
Randell D. Hiatt  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA



- NOTES:** To accompany plans dated 09-20-10
- Use 5/8 "  $\phi$  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 29/32 " x 1 1/8 " slot size. Interior splice bolt holes at these locations may be increased up to 1 1/4 "  $\phi$ . 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  $\rightarrow$ .
  - The top elevation of Post Nos.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.
  - End cap may be installed over 12 gage and 10 gage thrie beam elements where transition railing is installed on the departure end of bridge railing.

- LEGEND**
- (A) Nested thrie beam elements (one 12 gage element nested over one 10 gage element).
  - (B) One 10 gage "W" beam to thrie beam element.
  - (C) One 12 gage thrie beam element.
  - (D) One 10 gage "W" beam rail element (7'-3 1/2" length)
- 10 gage = 0.135" thick  
12 gage = 0.108" thick



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

## METAL BEAM GUARD RAILING TRANSITION RAILING (TYPE WB)

NO SCALE

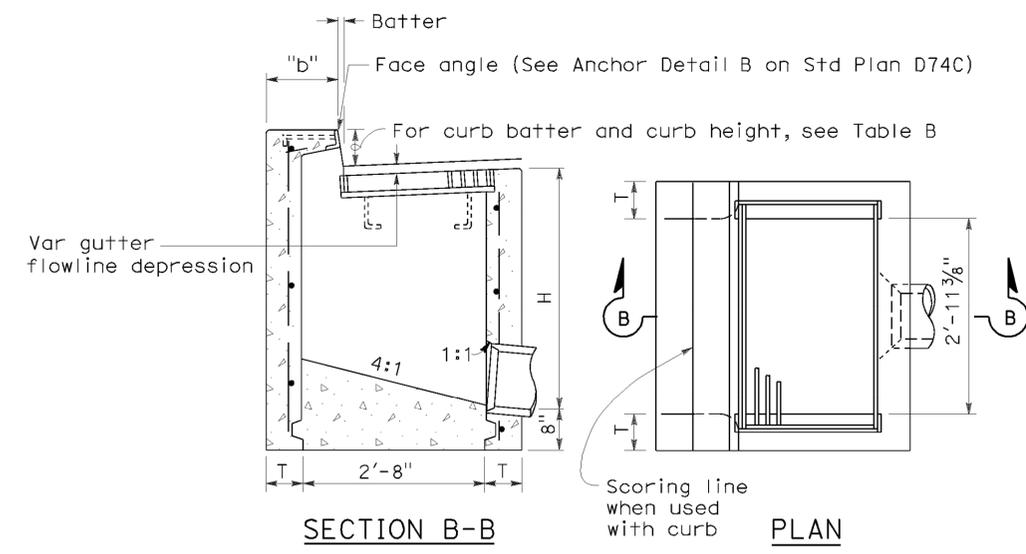
RSP A77J4 DATED JUNE 5, 2009 SUPERSEDES RSP A77J4 DATED JUNE 6, 2008 AND STANDARD PLAN A77J4 DATED MAY 1, 2006 - PAGE 75 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP A77J4**

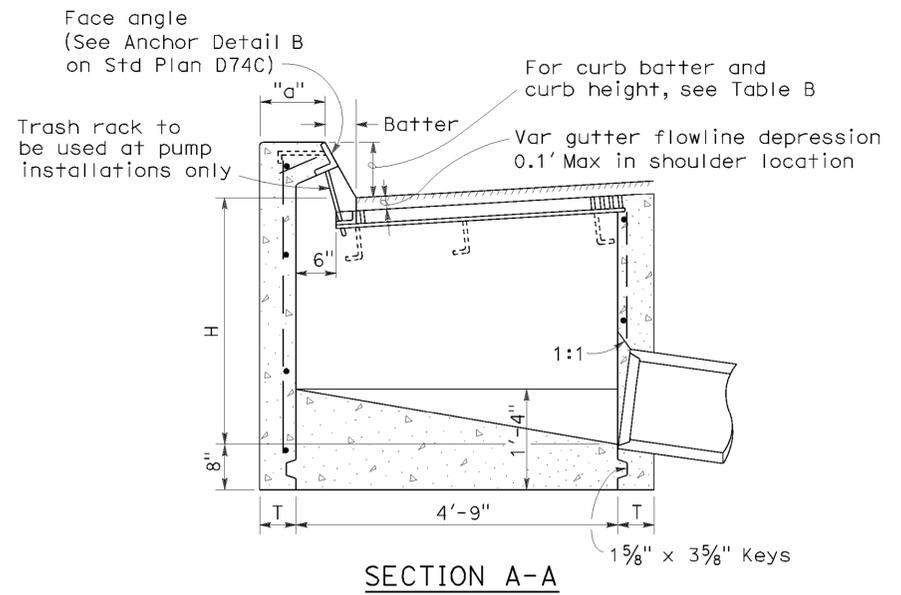
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2006 REVISED STANDARD PLAN RSP A77J4

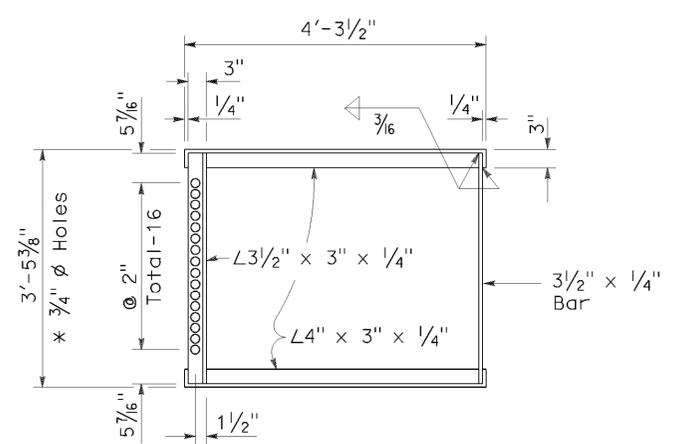
To accompany plans dated 09-20-10



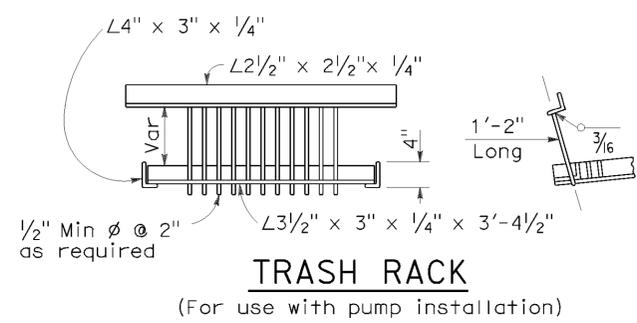
TYPE GO



SECTION A-A



GRATE FRAME FOR TYPE GDO INLET



TRASH RACK

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)
GO	1.24	0.245	3.39	0.346
GDO	1.62	0.322	4.36	0.446

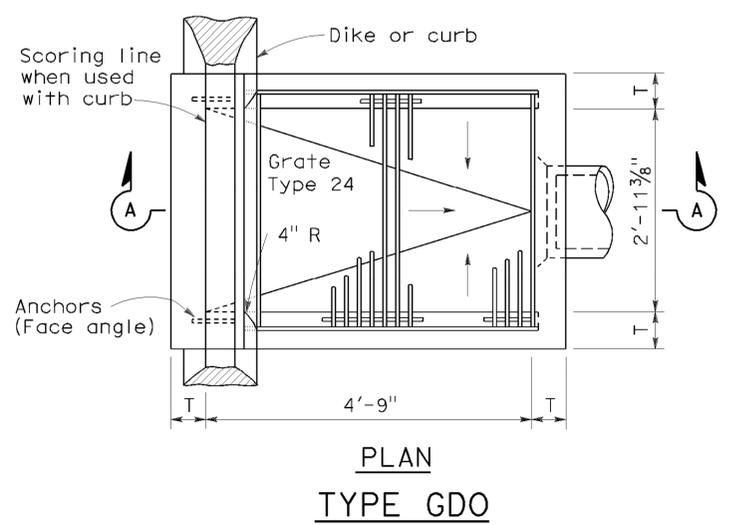
Table based on 8" floor slab, no deduction for pipe openings, and curb type giving highest quantity of concrete. No deductions or adjustments are to be made to these quantities because of pipe openings, different floor alternatives or different curb type.

TABLE B

CURB TYPE	NORMAL CURB HEIGHT	CURB BATTER	"a" DIMENSION	"b" DIMENSION
A1-6	6"	1 1/2"	T+7 1/2"	T+6 1/2"
A1-8	8"	2"	T+7"	T+6"
B1-6	6"	4"	T+5"	T+4"
Type A Dike	6"	3"	T+6"	T+5"

NOTES:

- "H" is the difference in elevation between the outlet pipe flow line and the normal gutter grade line undeepressed.
- 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 @ 18"± centers placed 1/2" clear to inside of box unless otherwise shown.
- Inlet bottom reinforcing not required. See Standard Plan D74C for alternative reinforced 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. Step inserts may be substituted for the bar steps. Step Inserts shall comply with State Industrial Safety requirements. See Standard Plan D74C for step details.
- When shown on the project plans, place a 3/4" plain round protection bar horizontally across the length of the opening and bend 4" into the inlet wall on each side.
- Pipe(s) can be placed in any wall.
- Curb section shall match adjacent curb.
- Basin floors shall have wood trowel finish and shall slope toward the outlet pipe as shown.
- Galvanizing - See Standard Specifications or Special Provisions.
- See Standard Plan D77A and D77B for grate and frame details and weights of miscellaneous iron and Steel.
- See Standard Plan D78A for gutter depression details.
- Full penetration butt welds may be substituted for the fillet welds on all anchors.
- Standard square, hexagon, round or equivalent headed anchors may be substituted for the right angle hooks on the anchors shown on this plan.
- Cast-in-place or precast alternative is optional with contractor. See Standard Specifications.
- 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 pipe connections conforming to details for Type GCP inlets on Standard Plan D75B. See Standard Specifications for mortar composition.



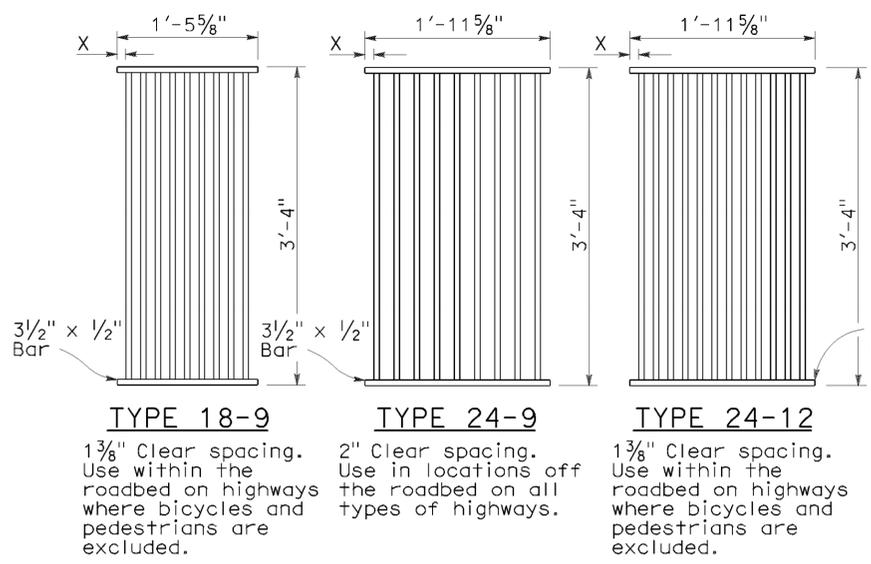
PLAN  
TYPE GDO

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**DRAINAGE INLETS**  
NO SCALE

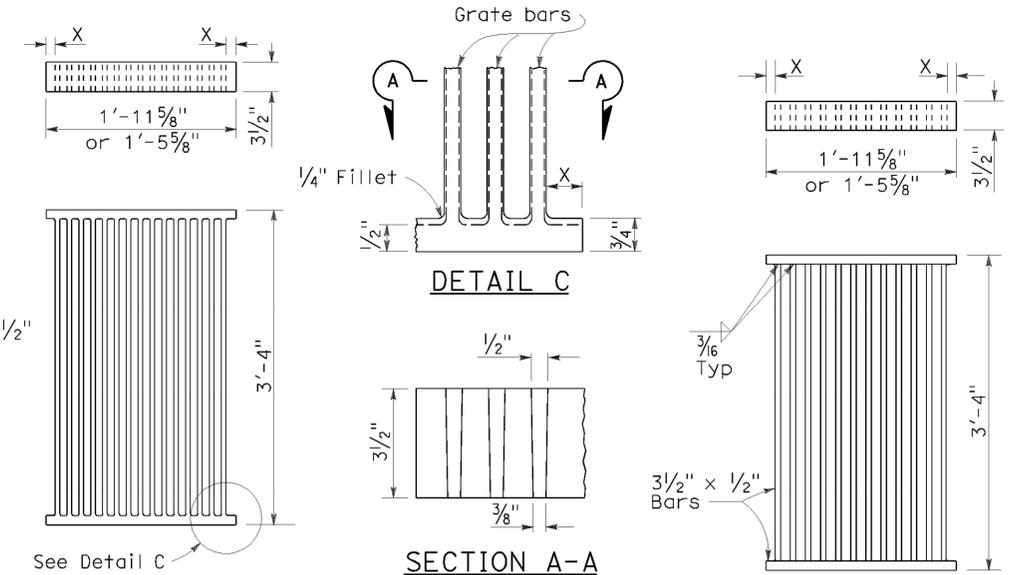
RSP D74B DATED JUNE 15, 2007 SUPERSEDES STANDARD PLAN D74B  
DATED MAY 1, 2006 - PAGE 150 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP D74B**

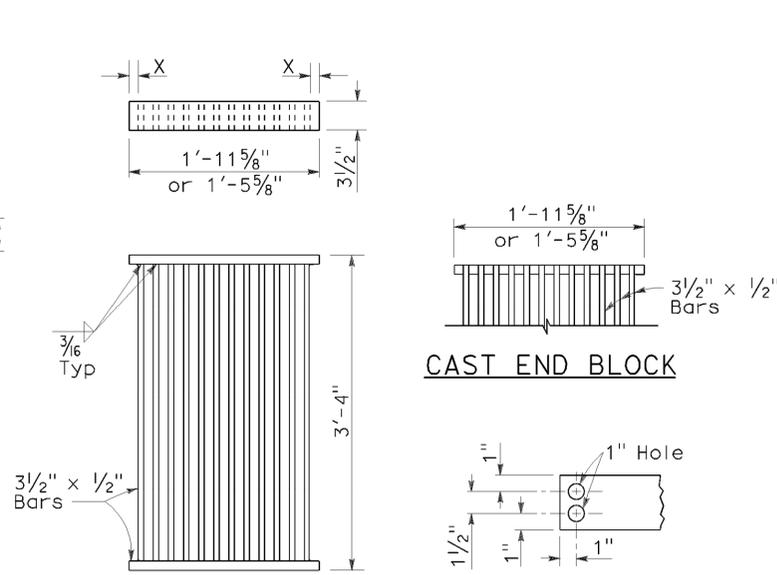
2006 REVISED STANDARD PLAN RSP D74B



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

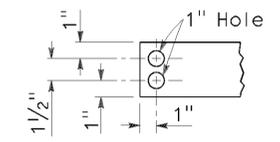


**ALTERNATIVE CAST NODULAR IRON GRATE OR CAST STEEL GRATE**



**ALTERNATIVE WELDED GRATE**

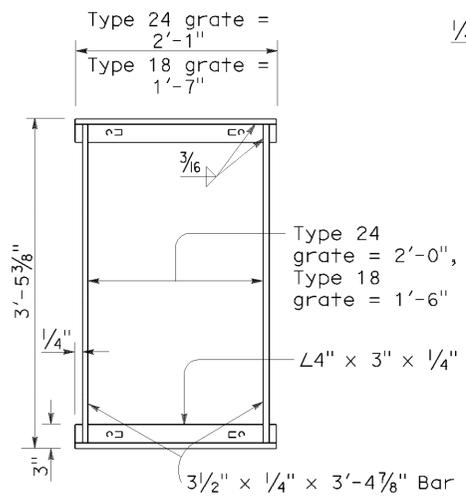
**CAST END BLOCK**



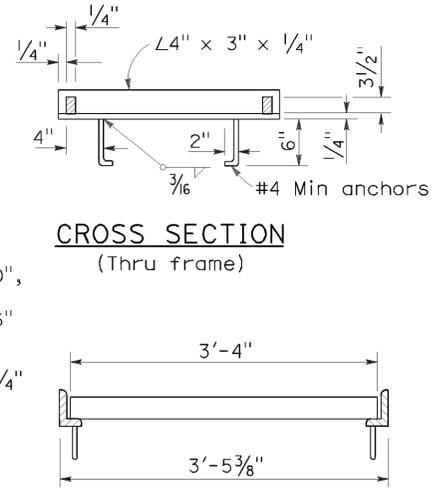
**END OF BAR**

**NOTES:**

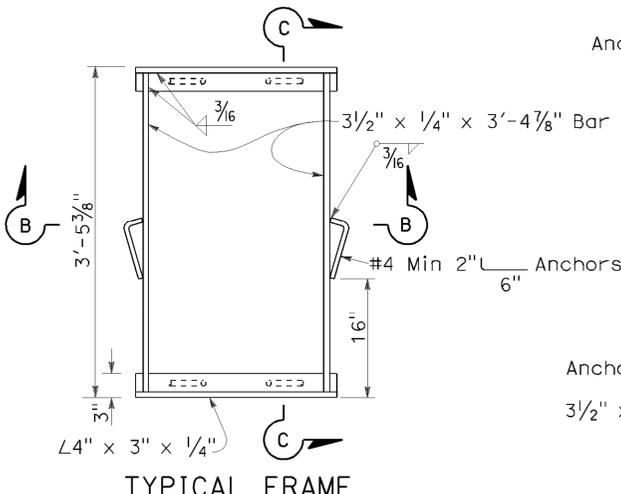
1. Grate type numbers refer to approximate width of grate in inches and number of bars, respectively.
2. Contractor has the option of using cast nodular iron, cast steel, welded, bolted, or cast end block grate.
3. See Special Provisions for requirements pertaining to galvanizing or asphalt dipping of grates and frames.
4. Rounded top of bars optional on all grates.
5. Pipe inlets with a grate shall be placed so that bars parallel direction of principle surface flow.
6. Full penetration butt welds may be substituted for the fillet welds on all anchors.
7. Standard square, hexagon, round or equivalent headed anchors may be substituted for the right angle hooks on the anchors shown on this plan.
8. Grate and frame weights are based on welded grates (weights of face angles, steps, protection bars, etc. are not included).



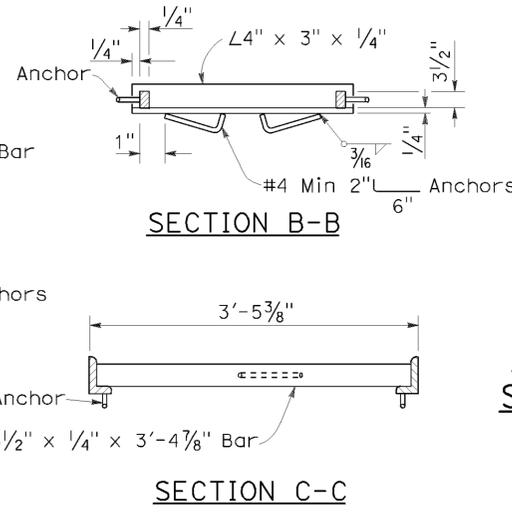
**TYPICAL FRAME**



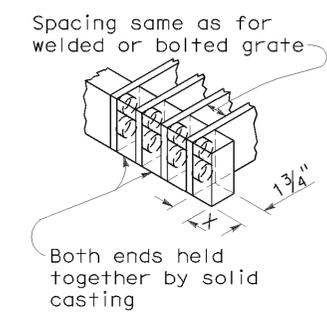
**LONGITUDINAL SECTION**  
(Thru frame and grate)



**TYPICAL FRAME**



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



**ALTERNATIVE CAST NODULAR IRON OR CAST STEEL END BLOCK GRATE**

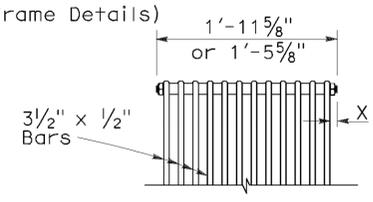
**RECTANGULAR FRAME DETAILS**  
(For all rectangular grates)

**GRATE BAR SPACING TABLE**

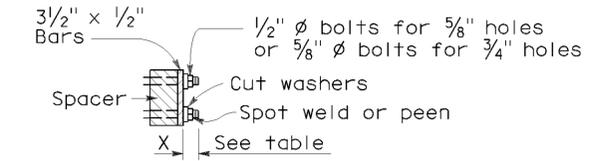
TYPE	NO. OF BARS	CLEAR BAR SPACING	X
18-9	9	1 3/8"	1 1/16"
24-9	9	2"	1 9/16"
24-12	12	1 3/8"	1 1/4"

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
	18-9	2	498
	18-9	2	498
	24-12	2	652
GT4	24-12	2	652
TRASH RACK			22

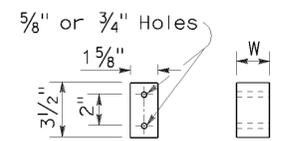


**BOLTED END BLOCK**

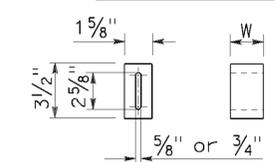


**BOLTING DETAIL**

**ALTERNATIVE BOLTED GRATE**



**BAR SPACER**



**ALTERNATIVE SPACER**

W = 1 3/8" or 2"

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**GRATE DETAILS**  
NO SCALE

**BASIS FOR MISC IRON & STEEL FINAL PAY WEIGHTS FOR DRAINAGE INLETS**

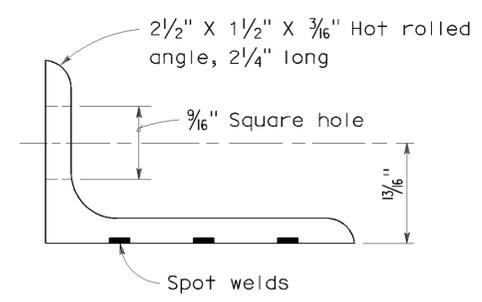
(See General Notes, No 8)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	21	44

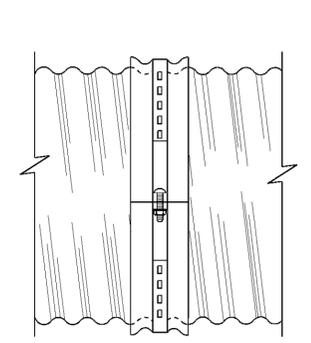
Raymond Don Tsztoo  
 REGISTERED CIVIL ENGINEER  
 June 6, 2008  
 PLANS APPROVAL DATE  
 No. C37332  
 Exp. 6-30-08  
 CIVIL  
 STATE OF CALIFORNIA

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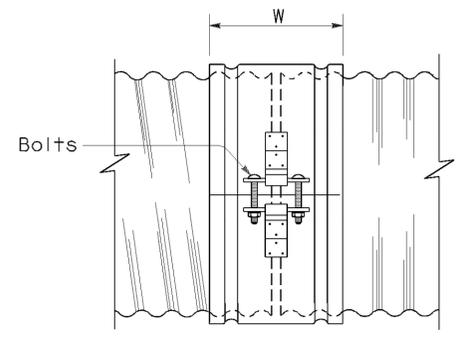
To accompany plans dated 09-20-10



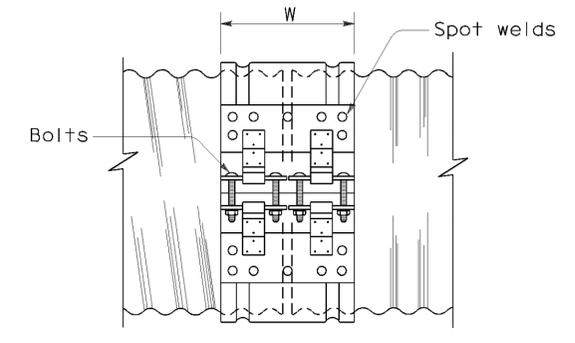
ANGLE



SIDE VIEW ANGLE



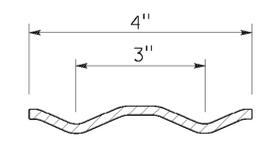
SIDE VIEW SINGLE BAR AND STRAP



SIDE VIEW DOUBLE BAR AND STRAP

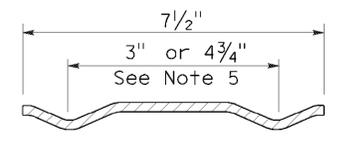
NOTES:

1. All ferrous metal coupling band connection hardware shall be galvanized or electroplated in accordance with the Standard Specifications.
2. Dimensions and thicknesses shown are minimum.
3. Spot welds shall develop minimum required strength of strap.
4. Fillet welds of equivalent strength may be substituted for spot welds or rivets.
5. Dimension depends upon whether end condition is lips up or lips down.



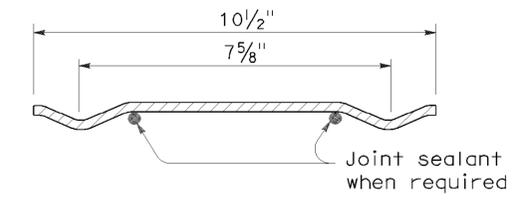
SECTION

H-4 HUGGER BAND



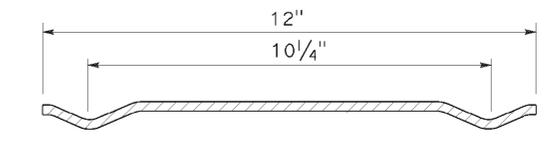
SECTION

H-7 HUGGER BAND



SECTION

H-10 HUGGER BAND



SECTION

H-12 HUGGER BAND

HUGGER COUPLING BANDS

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**CORRUGATED METAL PIPE  
COUPLING DETAILS No. 4  
HUGGER COUPLING BANDS**

NO SCALE

RSP D97D DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN D97D  
DATED MAY 1, 2006 - PAGE 186 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP D97D**

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2006 REVISED STANDARD PLAN RSP D97D

ANNULAR AND HELICAL PROFILE

COUPLING TYPE	PIPE CORRUGATION	PIPE SIZE	W OR A	PIPE WALL THICKNESS				BAR AND STRAP (CSP ONLY)				ANGLE								
				CSP		CAP		STRAP THICKNESS	BOLTS Dia	BAR Dia	BAR YIELD STRENGTH	DIMENSIONS		BOLTS (No.- Dia)		RIVETS ANGLE TO BAND		SPOT WELDS ANGLE TO BAND		
				CSP	CAP	CSP	CAP					CSP	CAP	CSP	CAP	CSP	CAP	CSP		
TWO PIECE INTEGRAL FLANGE	1 1/2' x 1/4"	6"-10"	7"	0.052"-0.079"	0.048"-0.060"	0.052"	0.060"							2-3/8"	2-3/8"					
				12"-18"	7"	0.052"-0.079"										2-1/2"				
				2 2/3" x 1/2"	12"-24"	7"	0.052"-0.079"	0.060"-0.105"	0.064"	0.060"							2-1/2"	2-1/2"		
UNIVERSAL	2 2/3" x 1/2"	THROUGH 36"	12"	0.052"-0.138"	0.060"-0.135"	0.052"	0.060"						2" x 2" x 3/16"	2" x 2" x 3/16"	3-1/2"	3-1/2"	3-3/8"	3-3/8"	3-1/2"	
		42"-60"	12"	0.052"-0.168"	0.075"-0.164"	0.052"	0.060"							2" x 2" x 3/16"	2" x 2" x 3/16"	3-1/2"	3-1/2"	3-3/8"	3-3/8"	5-1/2"
		THROUGH 72"	12"	0.052"-0.168"	0.164"	0.052"	0.105"	0.079"	1/2"	7/8"	32 ksi	2" x 2" x 3/16"	2" x 2" x 3/16"	3-1/2"	3-1/2"	3-3/8"	3-3/8"	5-1/2"		
ANNULAR	2 2/3" x 1/2"	THROUGH 36"	7"	0.064"-0.138"	0.060"-0.135"	0.052"	0.060"	0.079"	1/2"	7/8"	32 ksi	2" x 2" x 3/16"	2" x 2" x 3/16"	2-1/2"	2-1/2"	3-3/8"	3-3/8"	3-1/2"		
		42"-72"	12"	0.064"-0.168"	0.075"-0.164"	0.052"	0.105"	0.079"	1/2"	7/8"	32 ksi	2" x 2" x 3/16"	2" x 2" x 3/16"	3-1/2"	3-1/2"	3-3/8"	3-3/8"	5-1/2"		
		78"-84"	12"	0.168"		0.079"		0.109"	1/2"	7/8"	45 ksi	2" x 2" x 3/16"		3-1/2"		3-3/8"		5-1/2"		
		48"-90"	14"	0.064"-0.109"		0.052"		0.079"	1/2"	7/8"	32 ksi	2" x 2" x 3/16"		3-1/2"		3-3/8"		5-1/2"		
		96"-120"	14"	0.079"-0.109"		0.052"		0.109"	1/2"	7/8"	45 ksi	2" x 2" x 3/16"		3-1/2"		4-3/8"				
HELICAL	2 2/3" x 1/2"	THROUGH 36"	12"	0.052"-0.138"	0.060"-0.135"	0.052"	0.060"	0.079"	1/2"	7/8"	32 ksi	2" x 2" x 3/16"	2" x 2" x 3/16"	3-1/2"	3-1/2"	3-3/8"	3-3/8"	3-1/2"		
		42"-72"	12"	0.052"-0.168"	0.075"-0.164"	0.052"	0.060"	0.079"	1/2"	7/8"	32 ksi	2" x 2" x 3/16"	2" x 2" x 3/16"	3-1/2"	3-1/2"	3-3/8"	3-3/8"	5-1/2"		
		78"-84"	12"	0.168"		0.079"		0.109"	1/2"	7/8"	45 ksi	2" x 2" x 3/16"		3-1/2"		3-3/8"		5-1/2"		
		48"-90"	14"	0.064"-0.109"		0.052"		0.079"	1/2"	7/8"	32 ksi	2" x 2" x 3/16"		3-1/2"		3-3/8"		5-1/2"		
		96"-120"	14"	0.079"-0.109"		0.052"		0.109"	1/2"	7/8"	45 ksi	2" x 2" x 3/16"		3-1/2"		4-3/8"				
HUGGER	2 2/3" x 1/2"	12"-54"	4"	0.052"-0.109"		0.052"						2 1/2" x 1 1/2" x 3/16"	2 1/2" x 1 1/2" x 3/16"	1-1/2"				3-1/2"		
		60"-66"	4"	0.109"		0.064"							2 1/2" x 1 1/2" x 3/16"	2 1/2" x 1 1/2" x 3/16"	1-1/2"				3-1/2"	
		36"-48"	4"	0.138"		0.064"							2 1/2" x 1 1/2" x 3/16"	2 1/2" x 1 1/2" x 3/16"	1-1/2"				3-1/2"	
		THROUGH 72"	10 1/2"	0.052"-0.168"		0.052"		0.079"	1/2"	7/8"	32 ksi									
		78"-84"	10 1/2"	0.168"		0.079"		0.109"	1/2"	7/8"	45 ksi									
	3" x 1"	48"-90"	10 1/2"	0.064"-0.109"		0.052"		0.079"	1/2"	7/8"	32 ksi									
		96"-120"	10 1/2"	0.079"-0.109"		0.052"		0.109"	1/2"	7/8"	45 ksi									
		48"-66"	7 1/2"	0.064"-0.109"		0.064"		0.079"	1/2"	7/8"	32 ksi	2 1/2" x 1 1/2" x 3/16"	2 1/2" x 1 1/2" x 3/16"	1-1/2"					3-1/2"	
		72"-90"	7 1/2"	0.064"-0.079"		0.064"		0.079"	1/2"	7/8"	32 ksi	2 1/2" x 1 1/2" x 3/16"	2 1/2" x 1 1/2" x 3/16"	1-1/2"					3-1/2"	
		48"-90"	7 1/2"	0.064"-0.138"		0.064"		0.079"	1/2"	7/8"	32 ksi									
5" x 1"	REROLLED END	48"-120"	12" SEE	0.064"-0.109"		0.064"		0.079"	1/2"	7/8"	32 ksi									
		48"-84"	12" NOTE	0.138"		0.064"		0.079"	1/2"	7/8"	32 ksi									
		90"-120"	12" 11	0.138"		0.064"		DOUBLE 0.079"	1/2"	7/8"	32 ksi									

SPIRAL RIB PROFILE

COUPLING TYPE	PIPE CORRUGATION	PIPE SIZE	W	PIPE WALL THICKNESS				BAR AND STRAP (SSRP ONLY)				ANGLE						
				SSRP		ASRP		STRAP THICKNESS	BOLTS Dia	BAR Dia	BAR YIELD STRENGTH	DIMENSIONS		BOLTS (No.- Dia)		RIVETS ANGLE TO BAND		SPOT WELDS ANGLE TO BAND
				SSRP	ASRP	SSRP	ASRP					SSRP	ASRP	SSRP	ASRP	SSRP	ASRP	SSRP
ANNULAR	2 2/3" x 1/2" * REROLLED END	24"-36"	12"	0.064"-0.109"	0.060"-0.105"	0.052"	0.060"	0.079"	1/2"	7/8"	32 ksi	2" x 2" x 3/16"	2" x 2" x 3/16"	3-1/2"	3-1/2"	3-3/8"	3-3/8"	5-1/2"
		42"-60"	12"	0.064"-0.109"	0.075"-0.105"	0.052"	0.105"	0.079"	1/2"	7/8"	32 ksi	2" x 2" x 3/16"	2" x 2" x 3/16"	3-1/2"	3-1/2"	3-3/8"	3-3/8"	5-1/2"
		66"-72"	12"	0.064"-0.109"		0.052"		0.079"	1/2"	7/8"	32 ksi	2" x 2" x 3/16"	2" x 2" x 3/16"	3-1/2"	3-1/2"	3-3/8"	3-3/8"	5-1/2"
		78"-114"	12"	0.079"-0.109"		0.079"		0.109"	1/2"	7/8"	45 ksi	2" x 2" x 3/16"	2" x 2" x 3/16"	3-1/2"	3-1/2"	3-3/8"	3-3/8"	5-1/2"
HUGGER	2 2/3" x 1/2" * REROLLED END	24"-72"	10 1/2"	0.064"-0.109"		0.052"		0.079"	1/2"	7/8"	32 ksi							
		78"-84"	10 1/2"	0.109"		0.079"		0.109"	1/2"	7/8"	45 ksi							

\* See Note 14.

14. All profiles of Spiral Rib Pipe (3/4" x 3/4" ribs at 7 1/2" pitch and 3/4" x 1" ribs at 11 1/2" pitch in both steel and aluminum and 3/4" x 1" ribs at 8 1/2" pitch in steel only) shall be manufactured with rerolled ends. Corrugation profile of the rerolled ends shall be 2 2/3" x 1/2" annual corrugations with a minimum of two full corrugations at each end.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	22	44

Raymond Don Tsztou  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER  
Raymond Don Tsztou  
No. C37332  
Exp. 6-30-08  
CIVIL  
STATE OF CALIFORNIA

- NOTES: To accompany plans dated 09-20-10
- All ferrous metal coupling band connection hardware shall be galvanized or electroplated in accordance with the Standard Specifications.
  - For helically corrugated coupling bands, the connection angles may be oriented parallel to the pipe axis, provided connecting holes are slotted lengthwise sufficiently to allow adjustment for the helix angle.
  - Tension strap may be connected to band with either spot welds or fillet welds that develop minimum required strength of strap.
  - Use 1 1/4" gage line dimension on attached angle leg for rivets and spot welds.
  - Band thickness shall not be less than:
    - 3 standard thicknesses lighter than the thickness of the pipe for Corrugated Steel Pipe.
    - 2 standard thicknesses lighter than the thickness of the pipe and in no case lighter than 0.060" for Corrugated Aluminum Pipe.
  - Dimensions, thicknesses and strengths shown are minimum.
  - For pipe arches use same width band as for round pipe of equal periphery.
  - Fillet welds of equivalent strenght may be substituted for spot welds or rivets.
  - Spot welds shall develop minimum required strength of strap.
  - Pipe with rerolled ends having at least two 2 2/3" x 1/2" annular corrugations at each end with or without an upturned flange may be connected with any of the annular coupling bands shown for pipe of the same diameter and wall thickness and having 2 2/3" x 1/2" corrugations.
  - In the case of H-12 huggerbands, two piece bands are required for diameters through 96" and three piece bands are required for diameters 102" through 120".
  - Two piece bands are required for pipes greater than 42" diameter.
  - The 2 1/4" x 2" x 0.109" thick galvanized die-formed angle connector may be used in lieu of the 2" x 2" x 3/16" angle connector for standard joints only on pipes through 72" diameter.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CORRUGATED METAL PIPE  
COUPLING DETAILS No. 5  
STANDARD JOINT**  
NO SCALE

RSP D97E DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN D97E  
DATED MAY 1, 2006 - PAGE 187 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP D97E**

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2006 REVISED STANDARD PLAN RSP D97E

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	23	44

*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

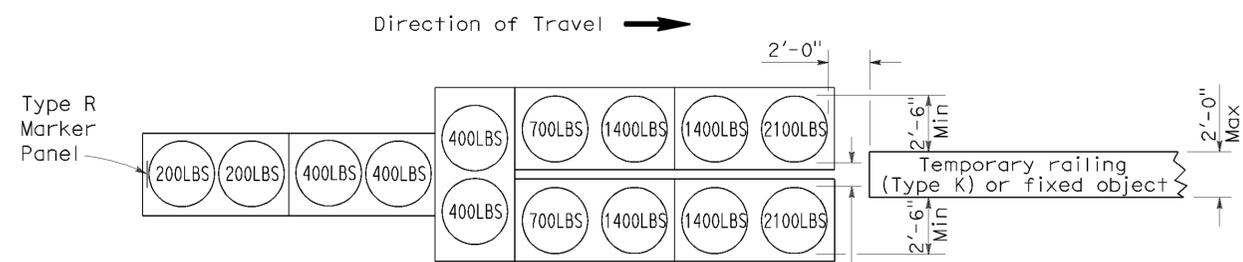
June 6, 2008  
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

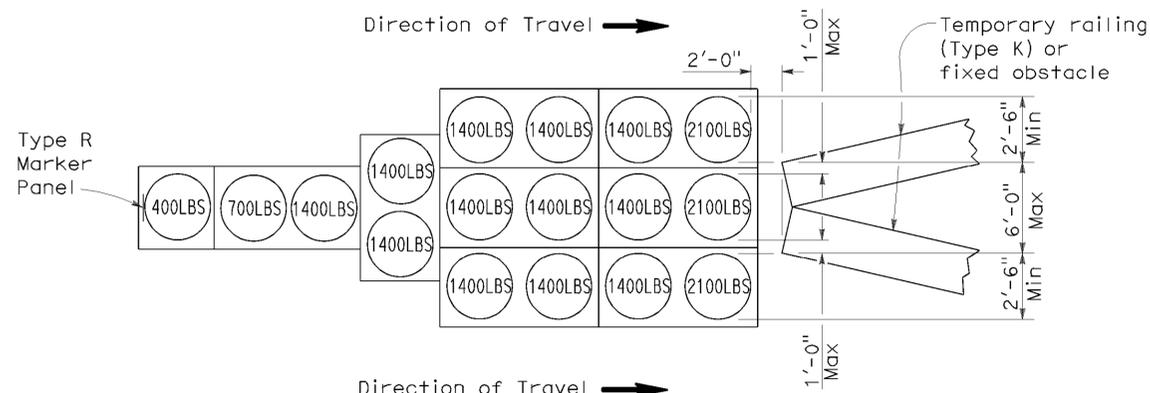
To accompany plans dated 09-20-10

2006 REVISED STANDARD PLAN RSP T1A



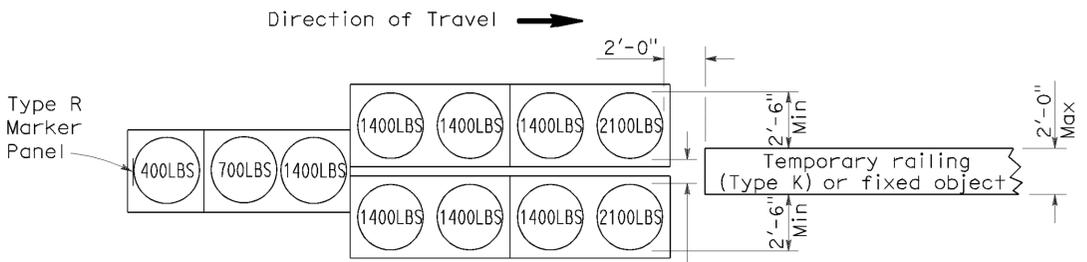
**ARRAY 'TU14'**

Approach speed 45 mph or more



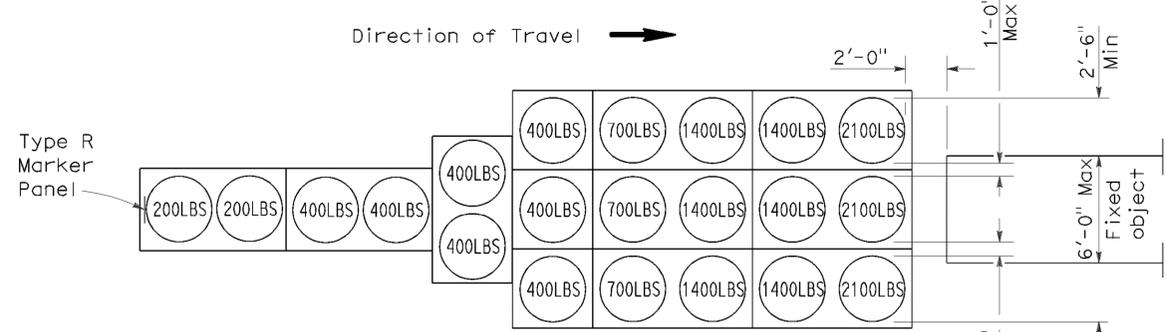
**ARRAY 'TU17'**

Approach speed less than 45 mph



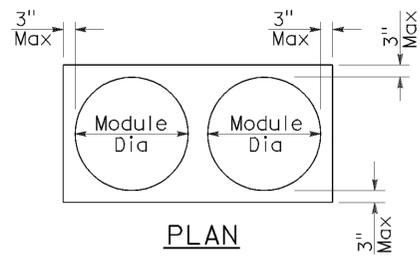
**ARRAY 'TU11'**

Approach speed less than 45 mph

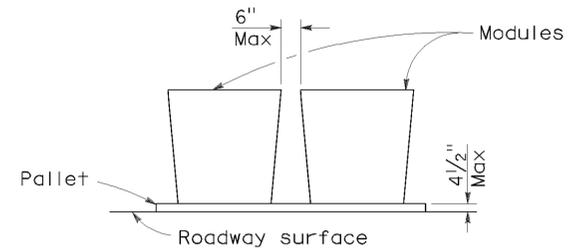


**ARRAY 'TU21'**

Approach speed 45 mph or more



**PLAN**



**ELEVATION**

**CRASH CUSHION PALLET DETAIL**

See Note 7

**NOTES:**

1. (XXX) Indicates sand filled module location and weight of sand in pounds for each module. Module spacing is based on the greater diameter of the module.
2. All sand weights are nominal.
3. Temporary crash cushion arrays shall not encroach on the traveled way.
4. Place the top of Type R marker panel 1" below the module lid.
5. Refer to Standard Plan A73B for marker details.
6. Approach speeds indicated conform to NCHRP 350 Report criteria.
7. Use of pallets is optional.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY CRASH CUSHION,  
SAND FILLED  
(UNIDIRECTIONAL)**

NO SCALE

RSP T1A DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN T1A  
DATED MAY 1, 2006 - PAGE 211 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP T1A**

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	24	44

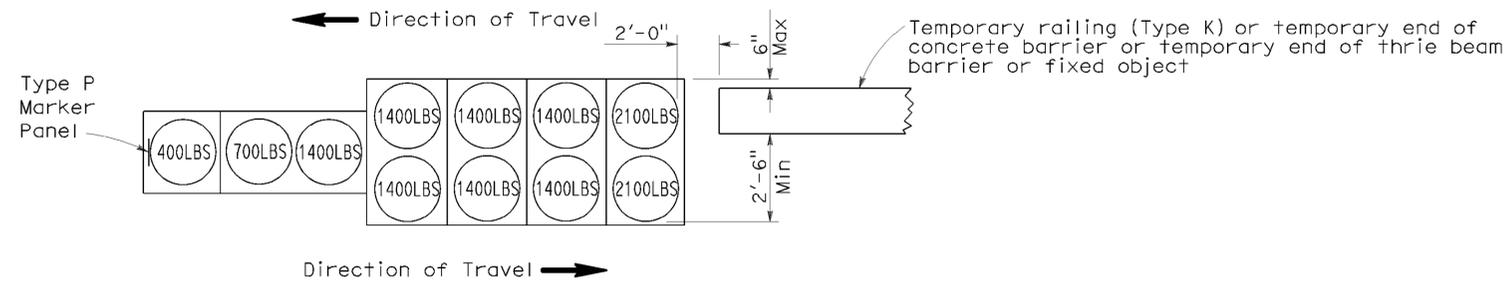
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

*Randell D. Hiatt*  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

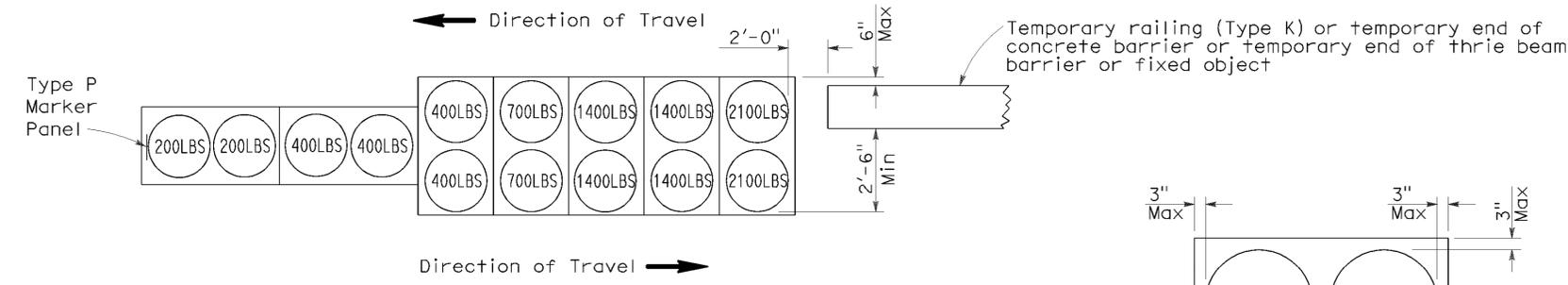
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

To accompany plans dated 09-20-10



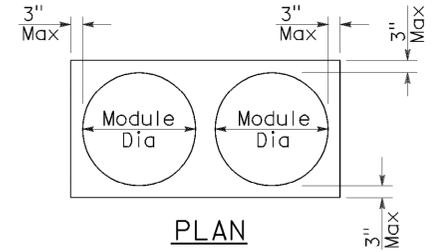
**ARRAY 'TB11'**

Approach speed less than 45 mph

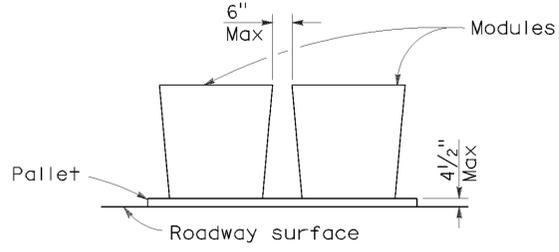


**ARRAY 'TB14'**

Approach speed 45 mph or more



PLAN



ELEVATION

**CRASH CUSHION PALLET DETAIL**

See Note 7

**NOTES:**

1. (XXX) Indicates sand filled module location and weight of sand in pounds for each module. Module spacing is based on the greater diameter of the module.
2. All sand weights are nominal.
3. Temporary crash cushion arrays shall not encroach on the traveled way.
4. Place the Type P marker panel so that the bottom of the panel rests upon the pallet.
5. Refer to Standard Plan A73B for marker details.
6. Approach speeds indicated conform to NCHRP 350 Report criteria.
7. Use of pallets is optional.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY CRASH CUSHION,  
SAND FILLED  
(BIDIRECTIONAL)**

NO SCALE

RSP T1B DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN T1B  
DATED MAY 1, 2006 - PAGE 212 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP T1B**

P:\proj\2\01\47220\plans\pse\147220va024.dgn

2006 REVISED STANDARD PLAN RSP T1B

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	25	44

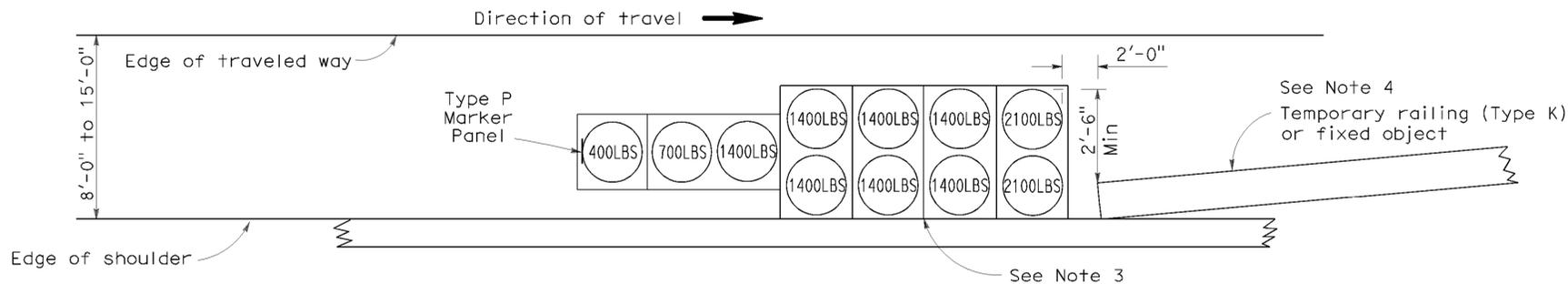
*Randell D. Hiatt*  
REGISTERED CIVIL ENGINEER

June 6, 2008  
PLANS APPROVAL DATE

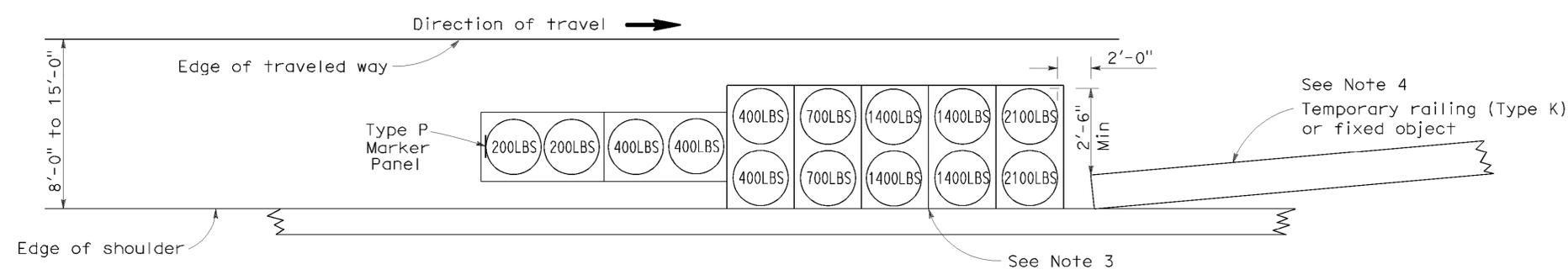
*The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.*

REGISTERED PROFESSIONAL ENGINEER  
Randell D. Hiatt  
No. C50200  
Exp. 6-30-09  
CIVIL  
STATE OF CALIFORNIA

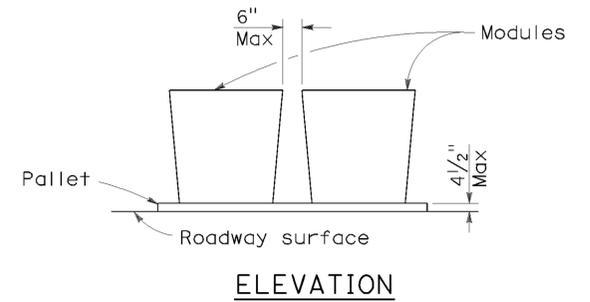
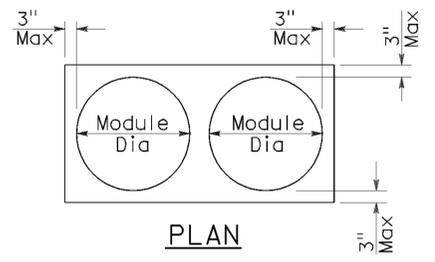
To accompany plans dated 09-20-10



**ARRAY 'TS11'**  
Approach speed less than 45 mph  
See Note 9



**ARRAY 'TS14'**  
Approach speed 45 mph or more  
See Note 9



**CRASH CUSHION PALLET DETAIL**  
See Note 11

**NOTES:**

- (XXX) Indicates sand filled module location and weight of sand in pounds for each module. Module spacing is based on the greater diameter of the module.
- All sand weights are nominal.
- The temporary crash cushion arrays shown on this plan shall be used only in locations where there will be traffic on one side of the temporary crash cushion array.
- If the fixed object or approach end of the temporary railing is less than 15'-0" from the edge of traveled way, a temporary crash cushion is required in a construction or work zone.
- Temporary crash cushion arrays shall not encroach on the traveled way.
- Arrays for median shoulders shall conform to details shown on this plan for outside shoulders.
- Place the Type P marker panel so that the bottom of the panel rests upon the pallet and faces traffic.
- Refer to Standard Plan A73B for marker details.
- For shoulder widths less than 8'-0", appropriate approved crash cushion protection, other than sand filled modules, shall be provided at fixed objects and at approach ends of temporary railing. The specific type of crash cushion shall be as shown on the project plans or as specified in the Special Provisions, or if not shown on the project plans or specified in the Special Provisions, shall be as approved by the Engineer.
- Approach speeds indicated conform to NCHRP 350 Report criteria.
- Use of pallets is optional.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY CRASH CUSHION,  
SAND FILLED  
(SHOULDER INSTALLATIONS)**

NO SCALE  
RSP T2 DATED JUNE 6, 2008 SUPERSEDES STANDARD PLAN T2  
DATED MAY 1, 2006 - PAGE 213 OF THE STANDARD PLANS BOOK DATED MAY 2006.

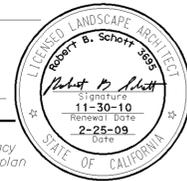
**REVISED STANDARD PLAN RSP T2**

2006 REVISED STANDARD PLAN RSP T2

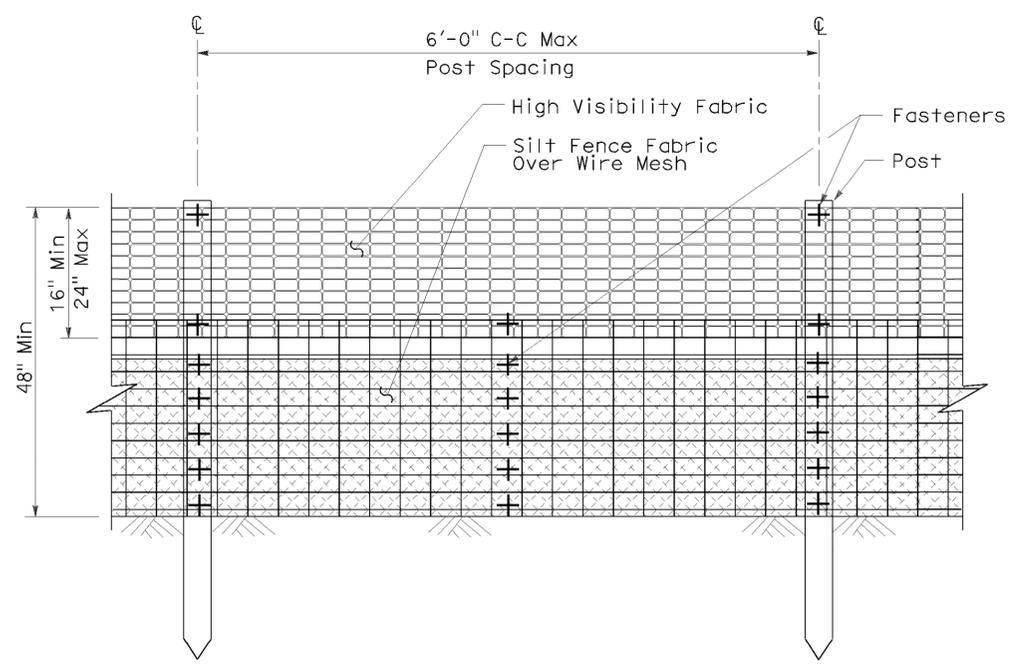
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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	26	44

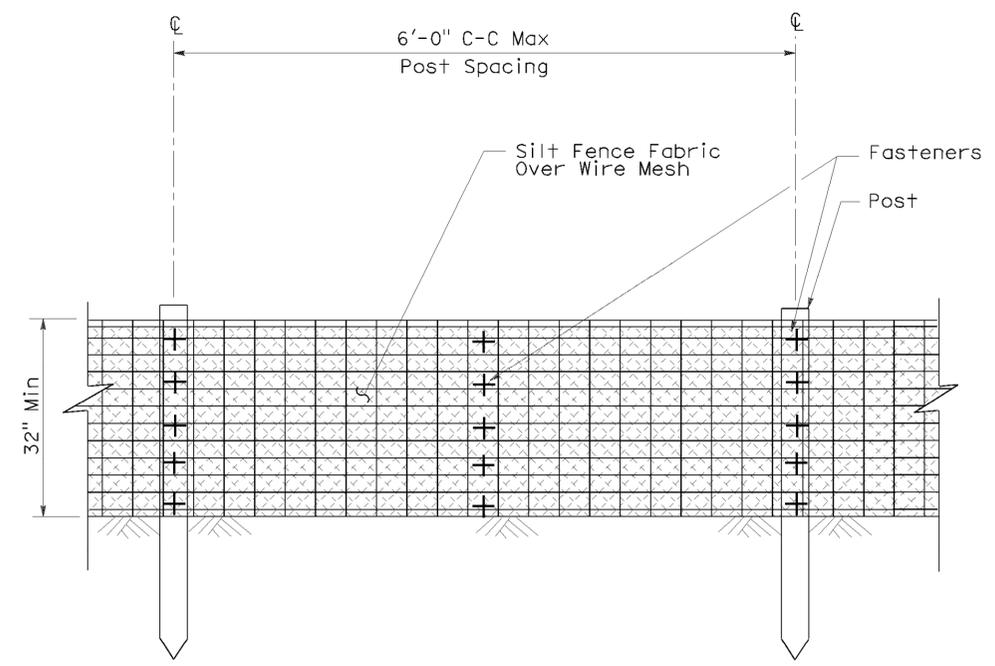
*Robert B. Schott*  
 LICENSED LANDSCAPE ARCHITECT  
 April 3, 2009  
 PLANS APPROVAL DATE  
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.



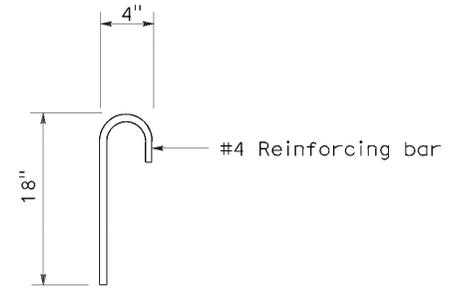
To accompany plans dated 09-20-10



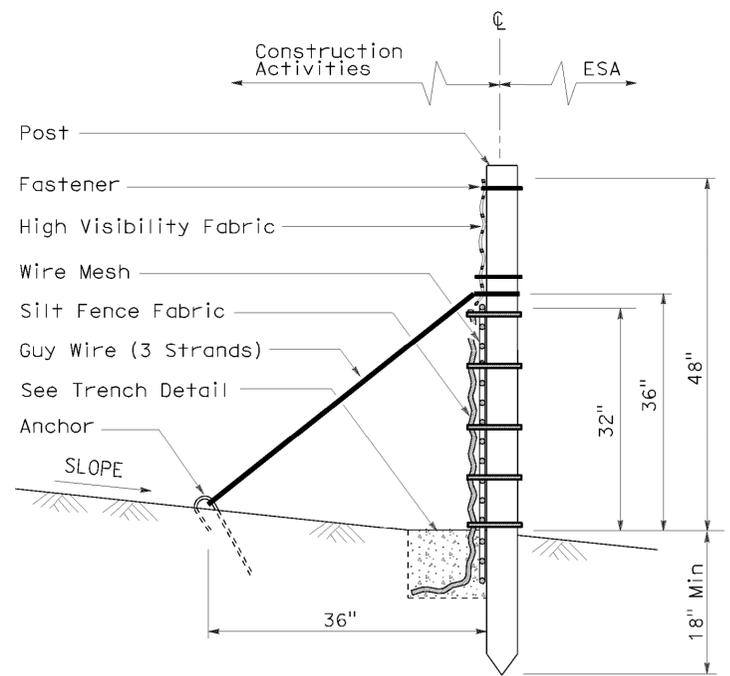
ELEVATION



ELEVATION

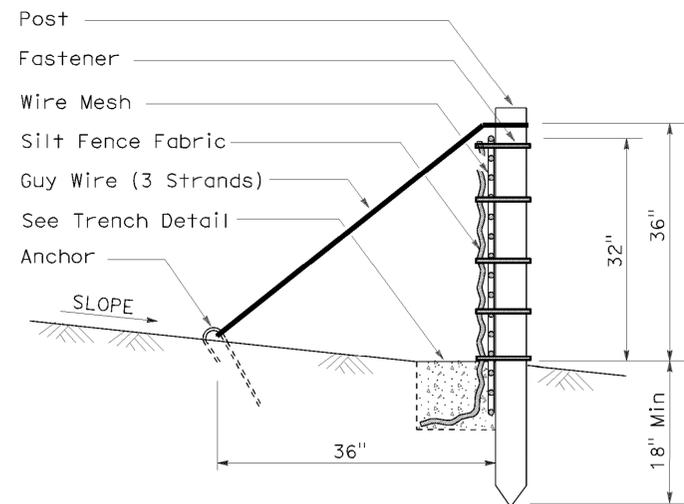


ANCHOR



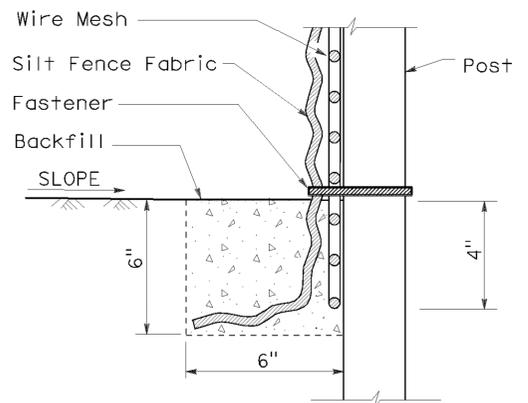
SECTION

TEMPORARY REINFORCED SILT FENCE (TYPE 1)



SECTION

TEMPORARY REINFORCED SILT FENCE (TYPE 2)



SECTION  
TRENCH DETAIL

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TEMPORARY WATER POLLUTION CONTROL DETAILS**  
**(TEMPORARY REINFORCED SILT FENCE)**

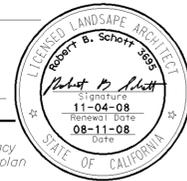
NO SCALE  
 NSP T60 DATED APRIL 3, 2009 SUPPLEMENTS  
 THE STANDARD PLANS BOOK DATED MAY 2006.

P:\proj2\01\47220\plans\pse\147220va026.dgn

2006 NEW STANDARD PLAN NSP T60

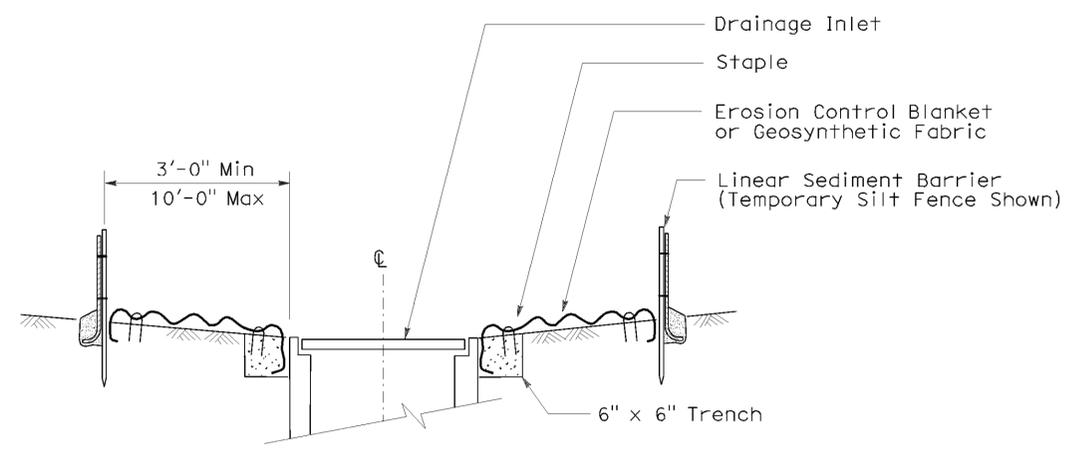
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	27	44

*Robert B. Schett*  
 LICENSED LANDSCAPE ARCHITECT  
 August 15, 2008  
 PLANS Approval DATE  
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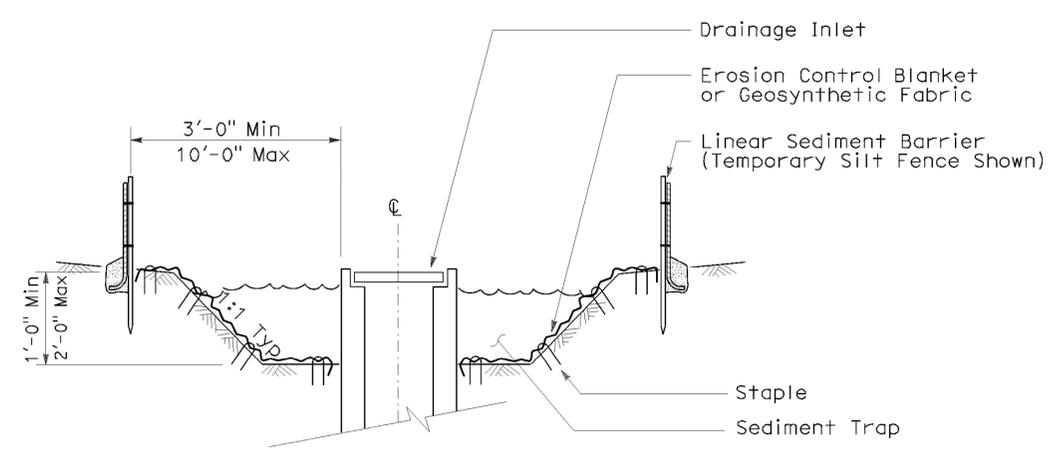


To accompany plans dated 09-20-10

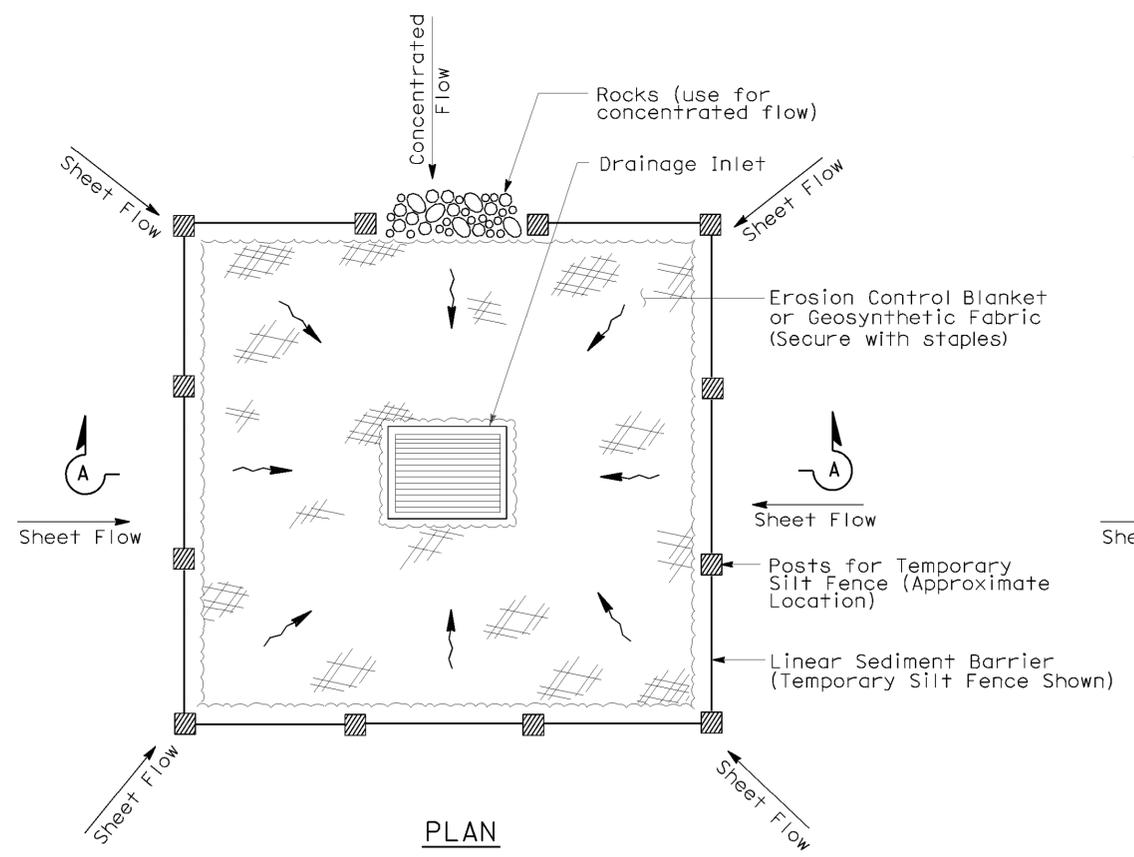
- NOTES:**
- See Standard Plan T51 for Temporary Silt Fence.
  - Dimensions may vary to fit field conditions.



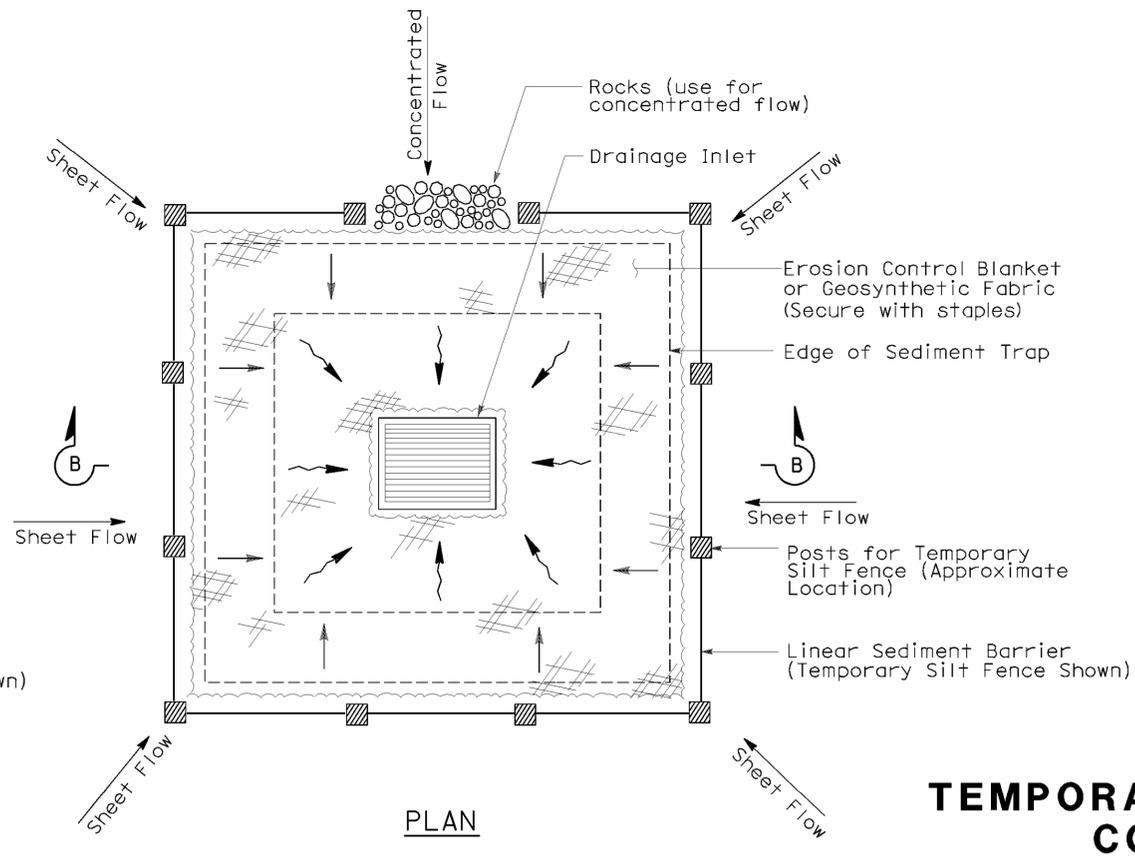
SECTION A-A



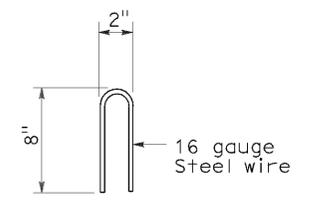
SECTION B-B



TEMPORARY DRAINAGE INLET PROTECTION (TYPE 1)



TEMPORARY DRAINAGE INLET PROTECTION (TYPE 2) (EXCAVATED SEDIMENT TRAP)



STAPLE DETAIL

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TEMPORARY WATER POLLUTION CONTROL DETAILS**  
**(TEMPORARY DRAINAGE INLET PROTECTION)**  
 NO SCALE

Nsp t61 dated august 15, 2008 supplements the standard plans book dated may 2006.

**NEW STANDARD PLAN NSP T61**

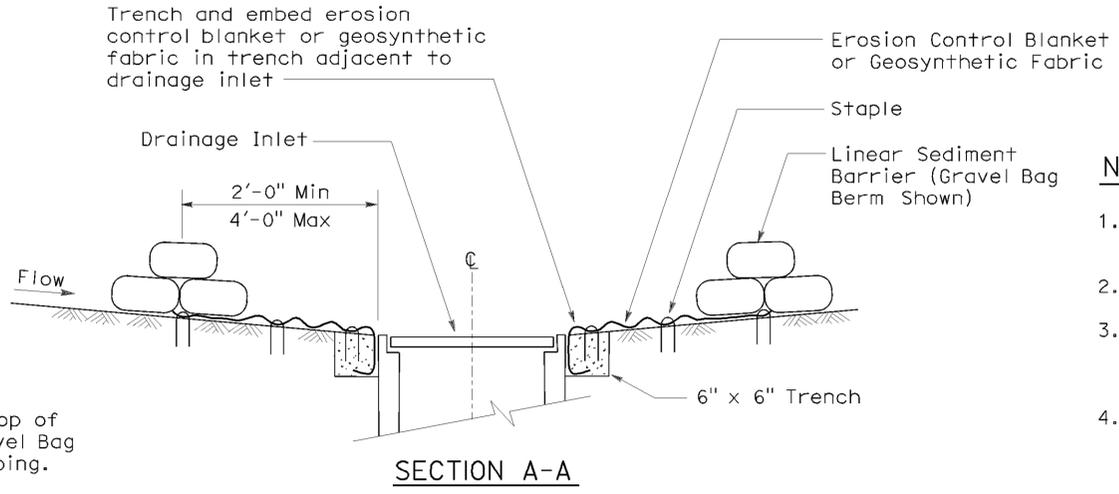
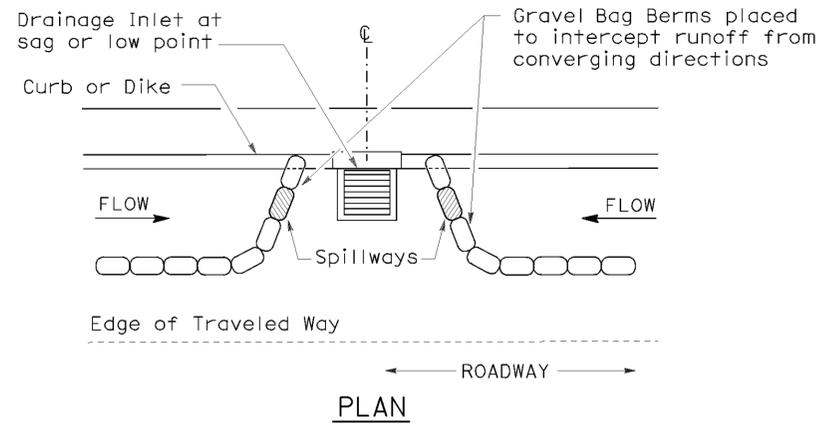
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2006 NEW STANDARD PLAN NSP T61

**GRAVEL BAG BERM (TYPE 3A) SPACING TABLE**

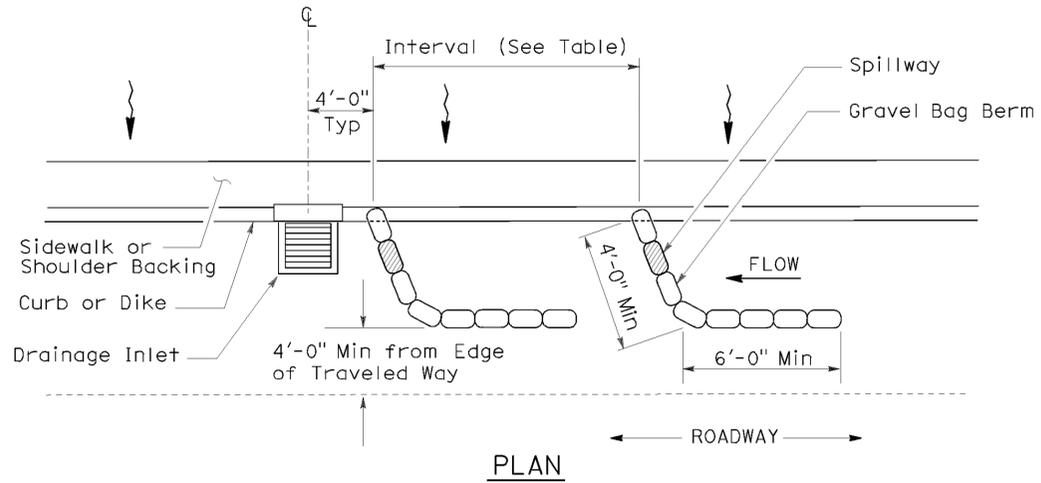
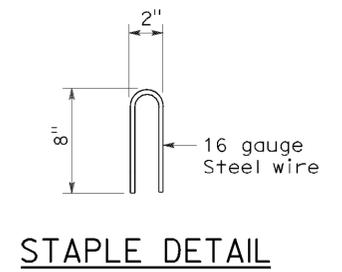
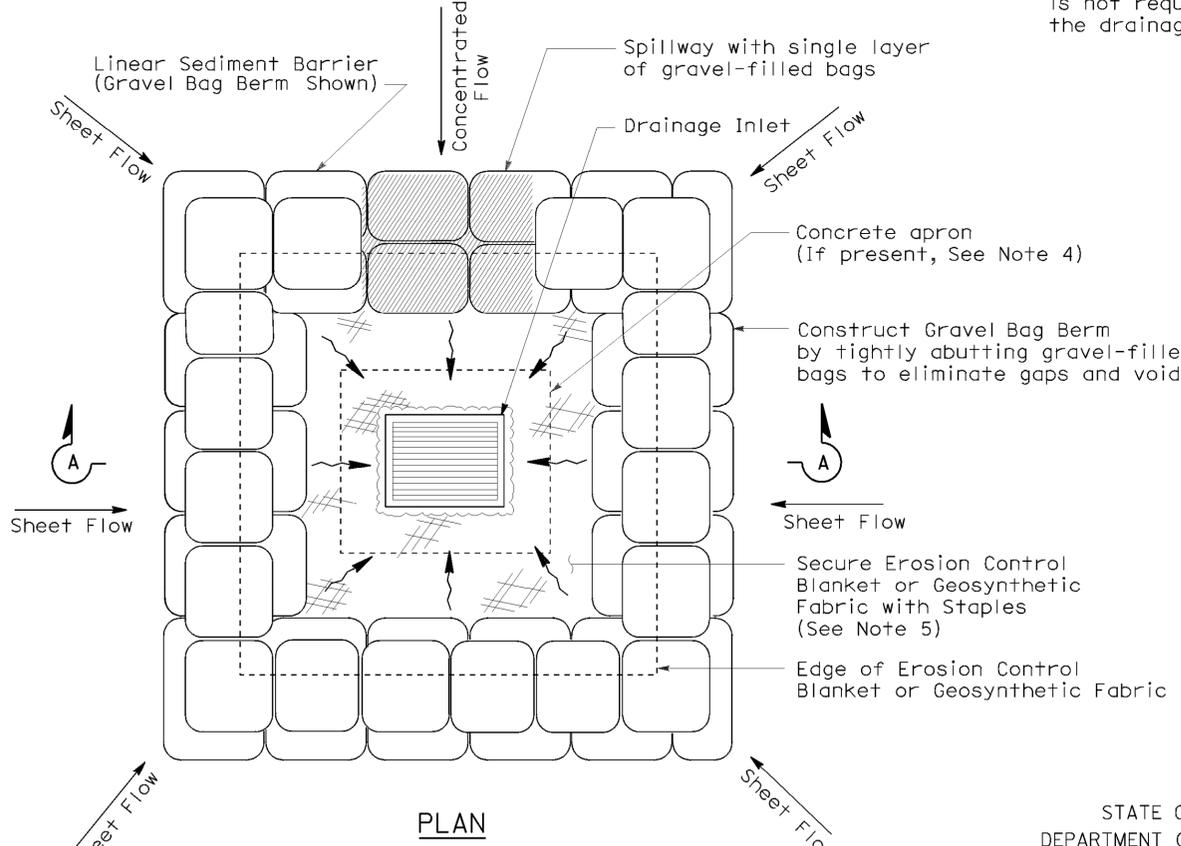
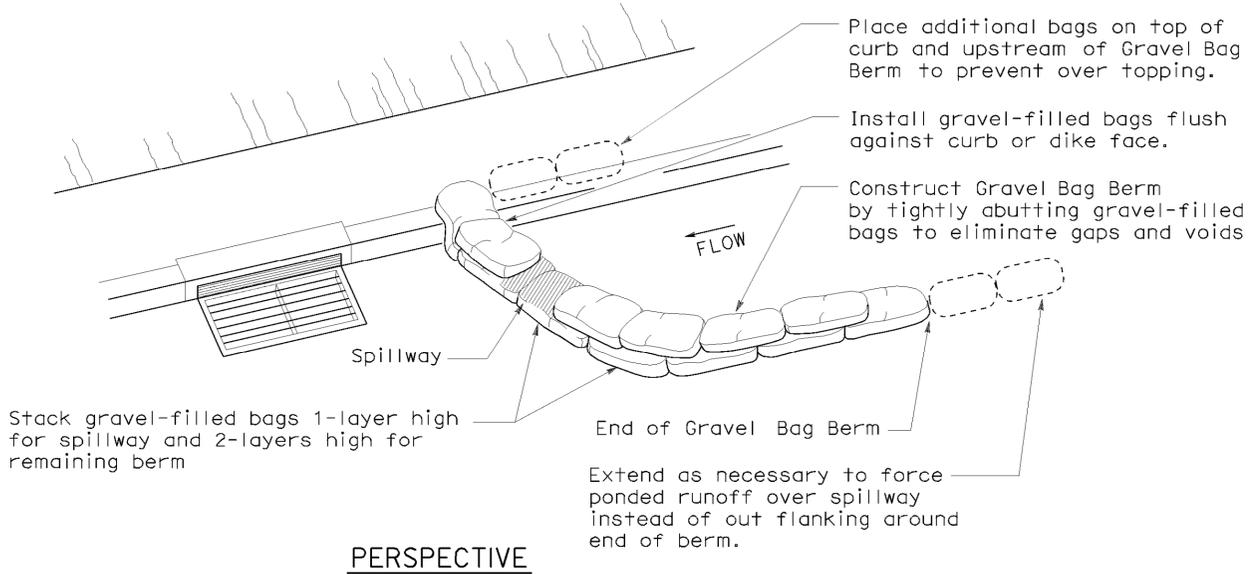
SLOPE OF ROADWAY (PERCENT)	1 to 3.9	4 to 5.9	6 to 7.9	8 to 10	10+
INTERVAL BETWEEN BERM	100'	75'	50'	25'	12'

For slope of less than 1%, install barriers only if erosion/sediment is prevalent



**NOTES:**

1. Place safety cones adjacent to drainage inlet protection.
2. Dimensions may vary to fit field conditions.
3. Install a minimum of 3 gravel bag berms upstream of each drainage inlet to be protected.
4. Position erosion control blanket or geosynthetic fabric at edge of concrete apron and secure in trench.
5. Erosion control blanket or geosynthetic fabric is not required if the area adjacent to the drainage inlet is vegetated or paved.



**TEMPORARY DRAINAGE INLET PROTECTION (TYPE 3A) (GRAVEL BAG BERM)**

**TEMPORARY DRAINAGE INLET PROTECTION (TYPE 3B)**

**TEMPORARY WATER POLLUTION CONTROL DETAILS (TEMPORARY DRAINAGE INLET PROTECTION)**

NO SCALE  
 NSP T62 DATED AUGUST 15, 2008 SUPPLEMENTS  
 THE STANDARD PLANS BOOK DATED MAY 2006.

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FLEXIBLE SEDIMENT BARRIER SPACING TABLE

SLOPE OF ROADWAY (PERCENT)	0 to 0.9	1 to 1.9	2 to 2.9	3 to 4	5+
INTERVAL BETWEEN BARRIERS	50'	35'	30'	25'	20'
ANGLE FROM FACE OF CURB	70°	70°	70°	45°	45°
SUGGESTED BARRIER LENGTH	6'	6'	6'	6'	6'

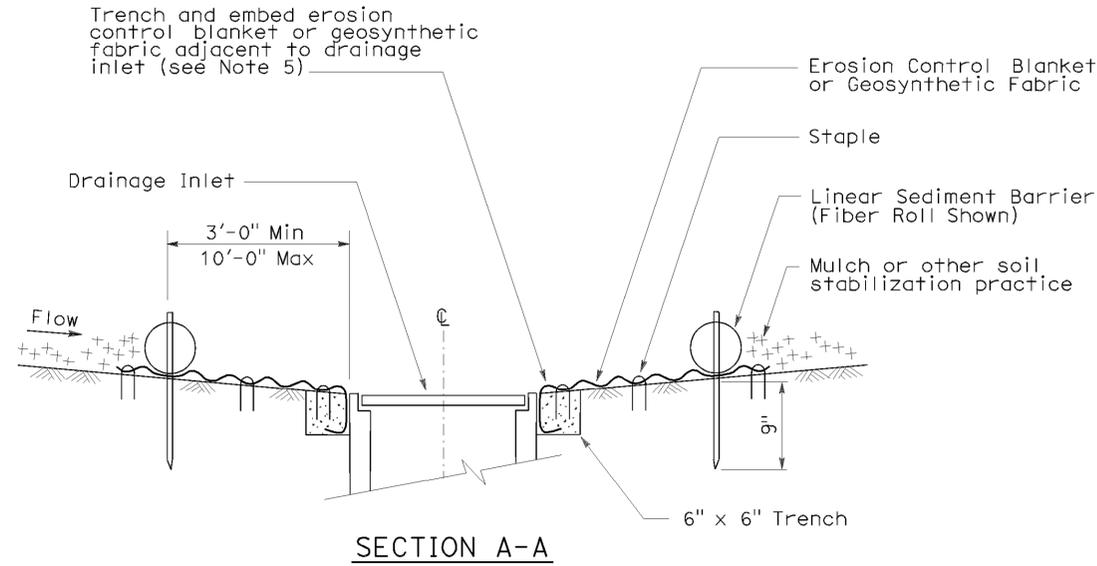
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	29	44

Robert B. Schett  
LICENSED LANDSCAPE ARCHITECT

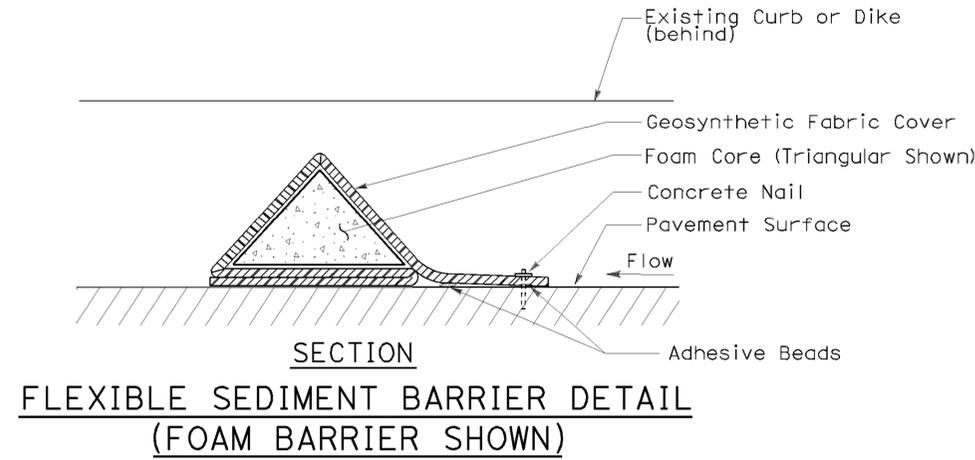
August 15, 2008  
PLANS APPROVAL DATE

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.

To accompany plans dated 09-20-10



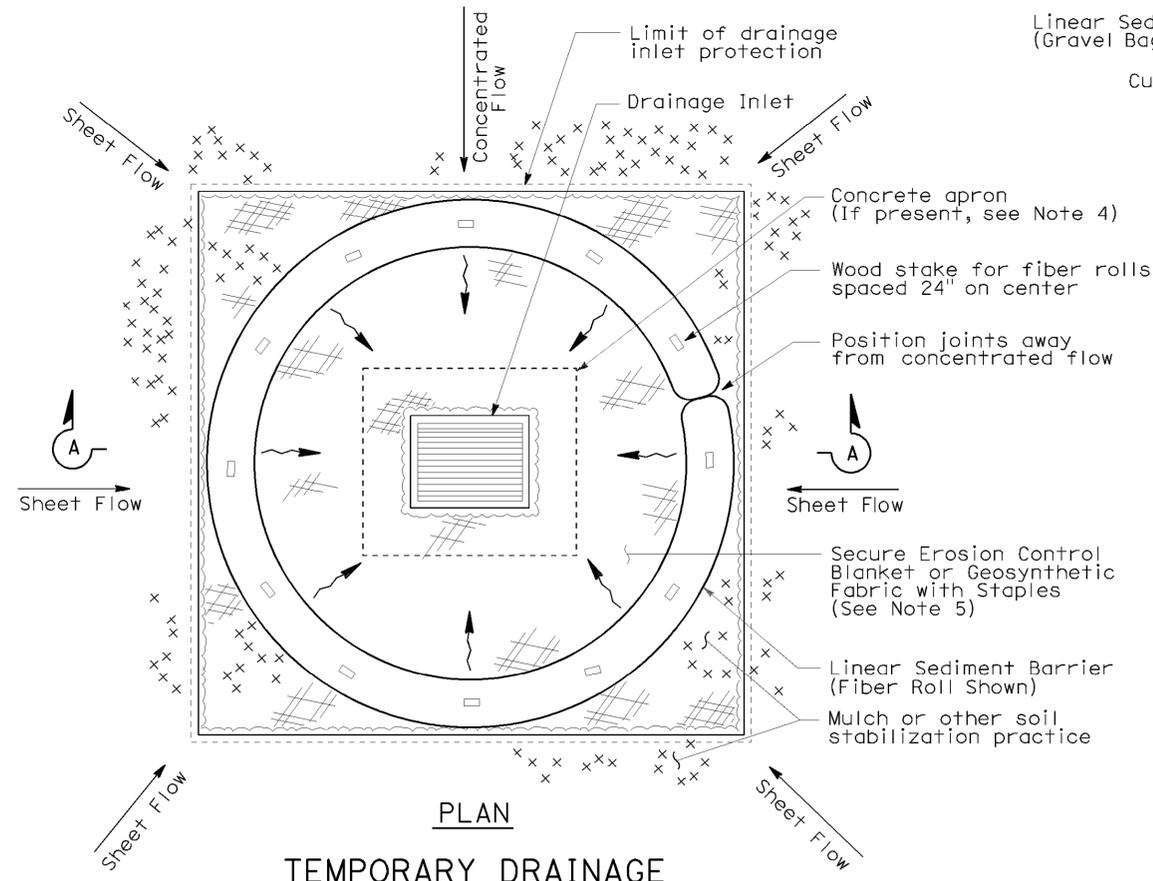
SECTION A-A



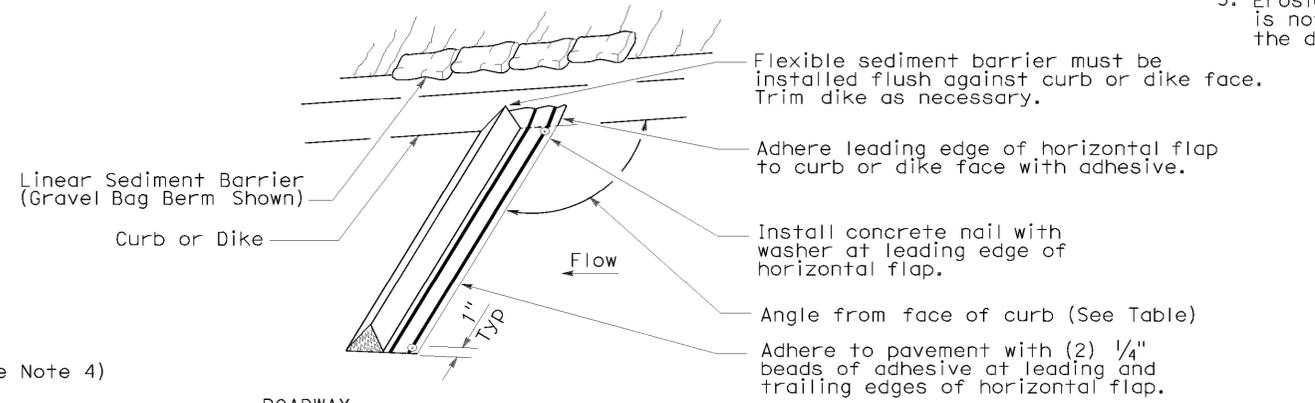
SECTION  
FLEXIBLE SEDIMENT BARRIER DETAIL  
(FOAM BARRIER SHOWN)

NOTES:

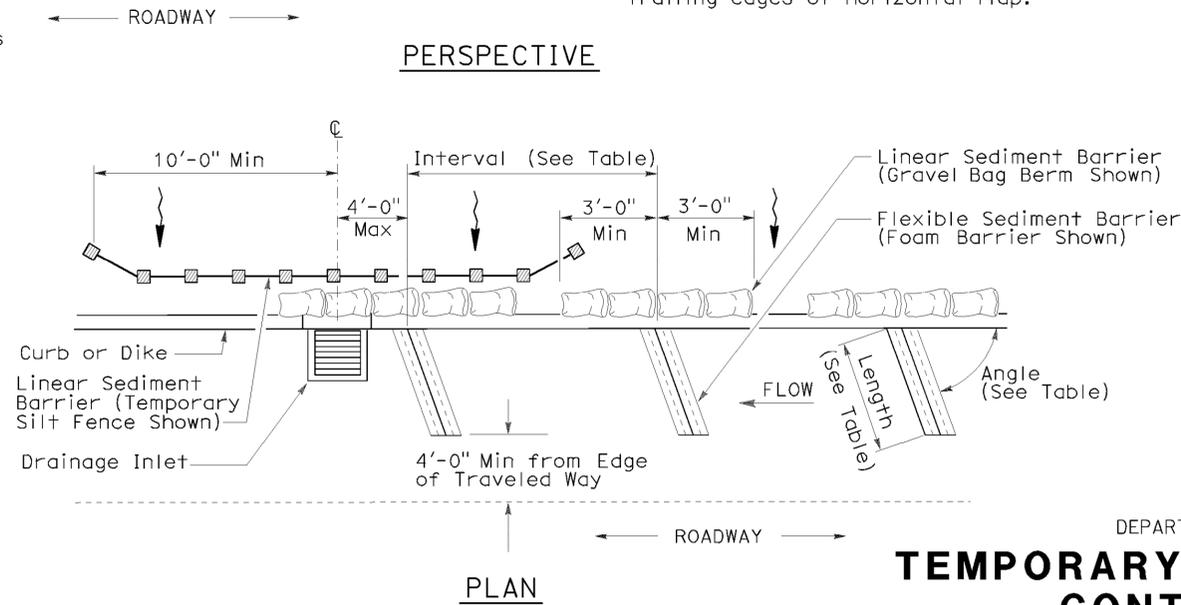
1. See Standard Plan T51 for Temporary Silt Fence.
2. Dimensions may vary to fit field conditions.
3. Install a minimum of 3 flexible sediment barriers upstream of each drainage inlet to be protected.
4. Position erosion control blanket or geosynthetic fabric at edge of concrete apron and secure in trench.
5. Erosion control blanket or geosynthetic fabric is not required if the area adjacent to the drainage inlet is vegetated.



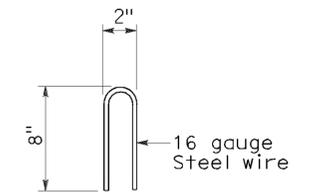
PLAN  
TEMPORARY DRAINAGE  
INLET PROTECTION (TYPE 4A)



PERSPECTIVE



PLAN  
TEMPORARY DRAINAGE  
INLET PROTECTION (TYPE 4B)  
FLEXIBLE SEDIMENT BARRIER



STAPLE DETAIL

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY WATER POLLUTION  
CONTROL DETAILS  
(TEMPORARY DRAINAGE  
INLET PROTECTION)**

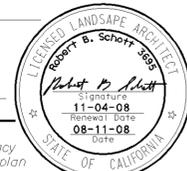
NO SCALE  
NSP T63 DATED AUGUST 15, 2008 SUPPLEMENTS  
THE STANDARD PLANS BOOK DATED MAY 2006.

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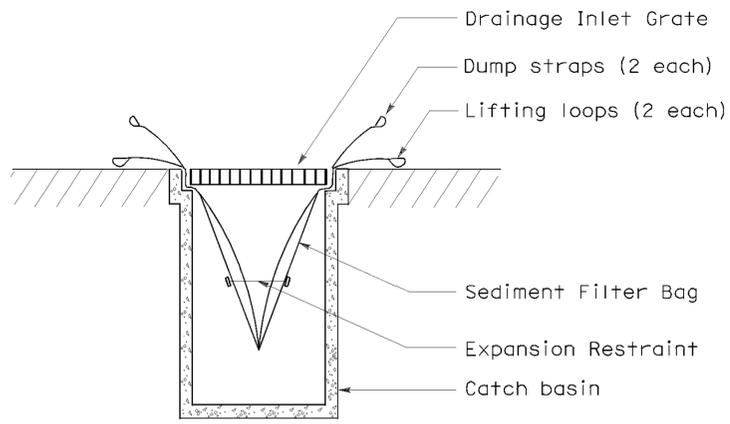
2006 NEW STANDARD PLAN NSP T63

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	30	44

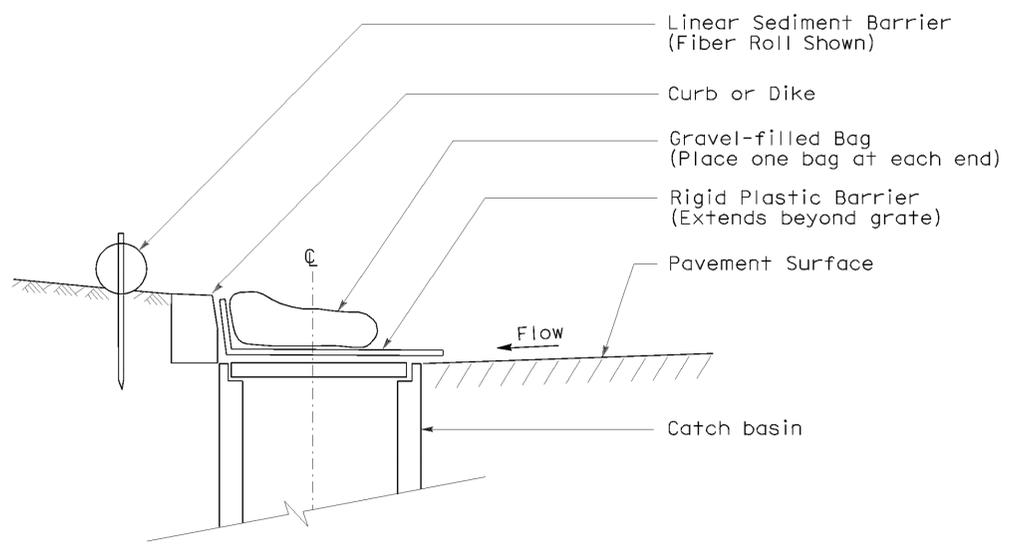
*Robert B. Schott*  
 LICENSED LANDSCAPE ARCHITECT  
 August 15, 2008  
 PLANS APPROVAL DATE  
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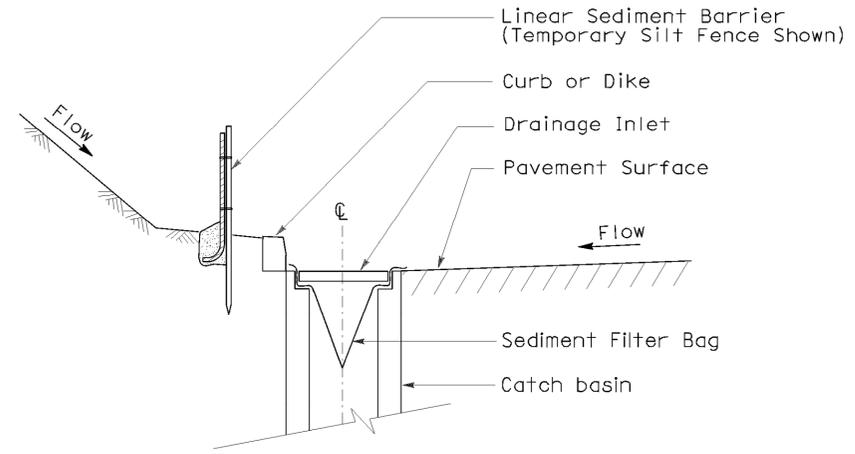
To accompany plans dated 09-20-10



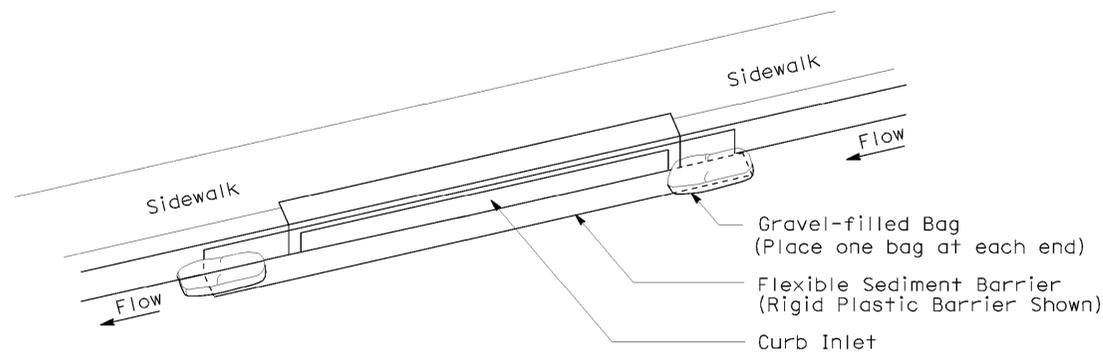
**SECTION B-B**  
**SEDIMENT FILTER BAG DETAIL**



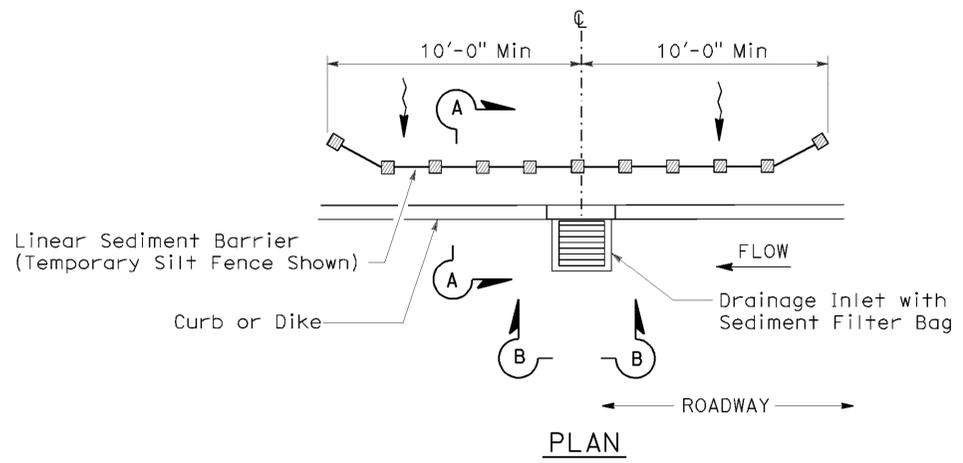
**SECTION**  
**TEMPORARY DRAINAGE**  
**INLET PROTECTION (TYPE 6A)**  
**(CATCH BASIN WITH GRATE)**



**SECTION A-A**



**PERSPECTIVE**  
**TEMPORARY DRAINAGE**  
**INLET PROTECTION (TYPE 6B)**  
**(CURB INLET WITHOUT GRATE)**



**PLAN**  
**TEMPORARY DRAINAGE**  
**INLET PROTECTION (TYPE 5)**  
**(SEDIMENT FILTER BAG)**

**NOTES:**

1. See Standard Plan T51 for Temporary Silt Fence.
2. Dimensions may vary to fit field conditions.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**TEMPORARY WATER POLLUTION CONTROL DETAILS (TEMPORARY DRAINAGE INLET PROTECTION)**

NO SCALE

NSP T64 DATED AUGUST 15, 2008 SUPPLEMENTS THE STANDARD PLANS BOOK DATED MAY 2006.

**NEW STANDARD PLAN NSP T64**

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2006 NEW STANDARD PLAN NSP T64

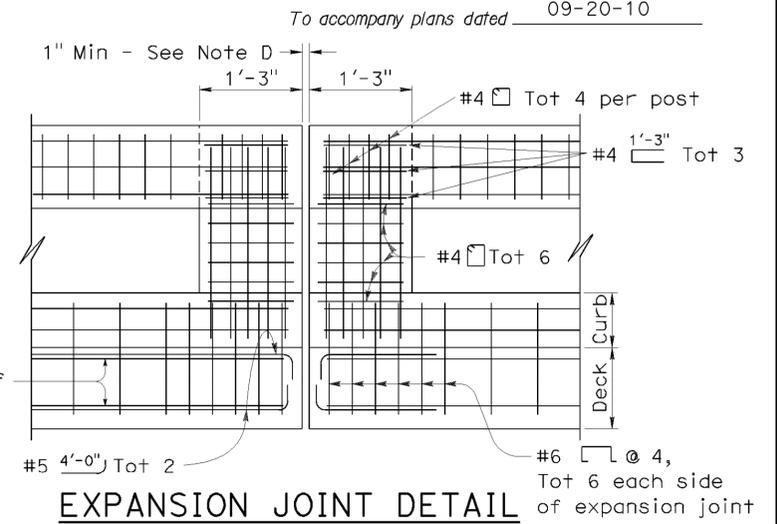
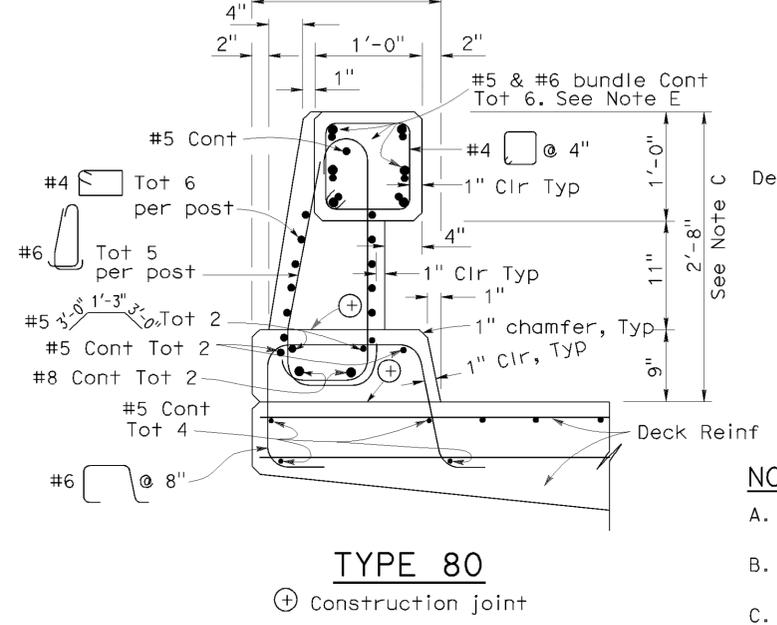
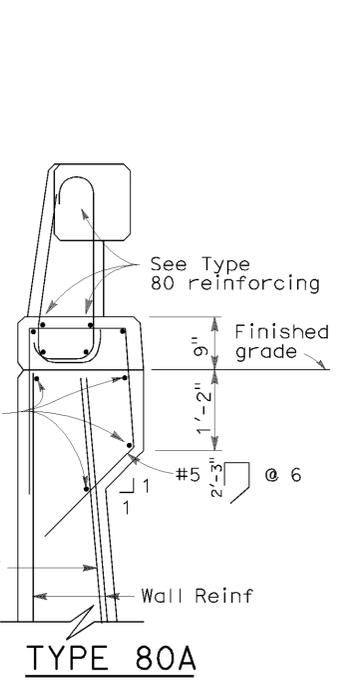
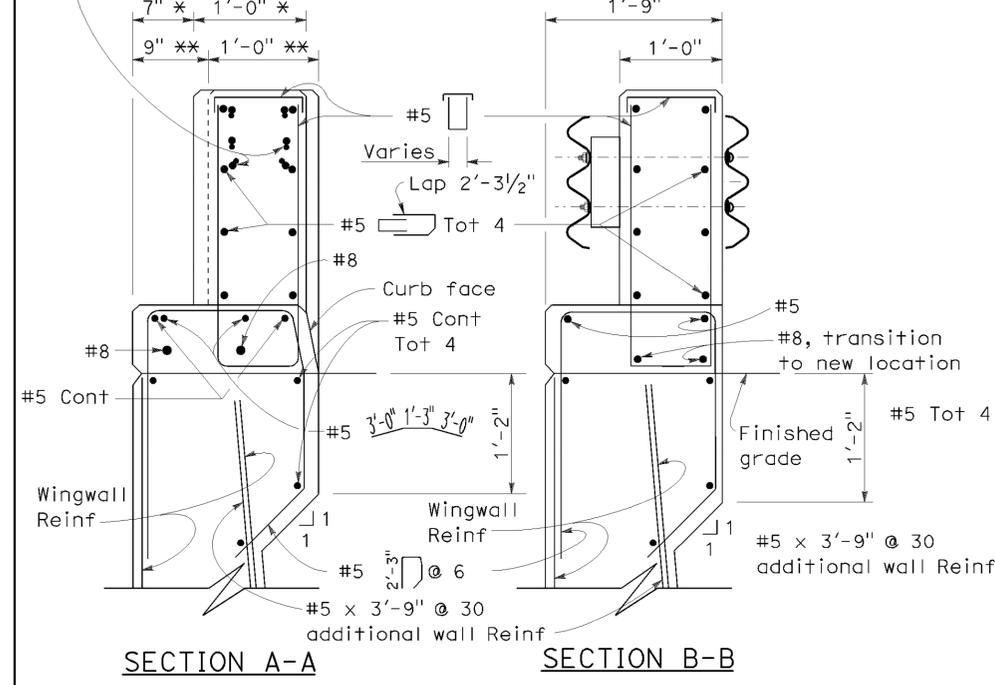
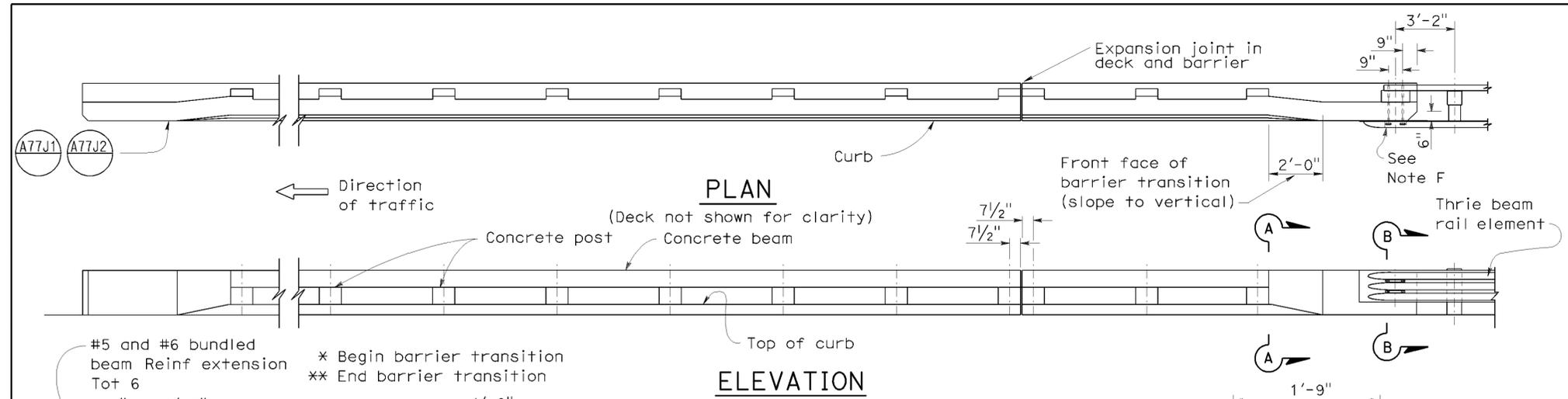
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
01	Hum	96	3.0,7.4/7.6	31	44

REGISTERED CIVIL ENGINEER

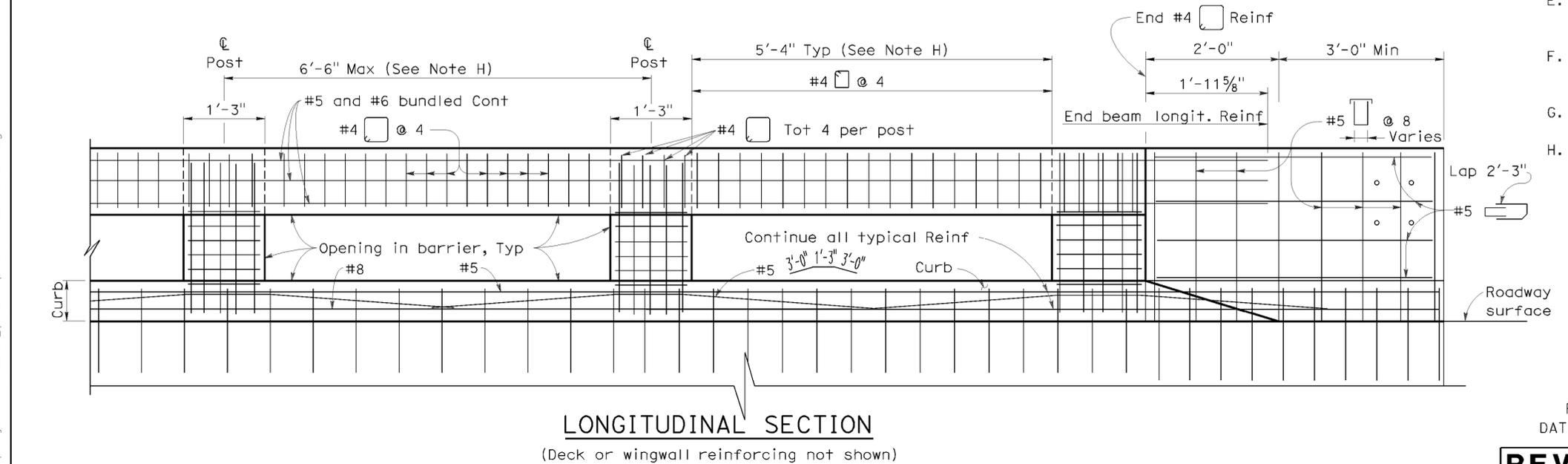
January 18, 2008  
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER  
Tillot Satter  
No. C42892  
Exp. 03-31-08  
CIVIL  
STATE OF CALIFORNIA

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- NOTES:**
- Walls are to be backfilled before the barrier is placed.
  - Longitudinal reinforcing steel to stop at all expansion joints.
  - The front face dimensions are to be constant above the finish roadway profile, but the overall height will vary with certain thicknesses of surfacing and roadway slopes.
  - Expansion joint to match deck joint.
  - No lap splicing allowed on the longitudinal rail reinforcing. Splicing shall be staggered.
  - For typical metal railing connection details not shown, see Standard Plans A77J1 and A77J2.
  - Chain link railing is not allowed on Type 80 Barriers.
  - Post to be spaced equally, typically 6'-6" spacing. Post spacing may be reduced where location of hinges or expansion joints or the length of wingwalls will not accommodate the 6'-6" spacing. Maximum see-through availability is to be strived for, where 6'-6" post spacing can not be achieved.



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**CONCRETE BARRIER  
TYPE 80  
(SHEET 1 OF 2)  
NO SCALE**

RSP B11-60 DATED JANUARY 18, 2008 SUPERSEDES STANDARD PLAN B11-60  
DATED MAY 1, 2006 - PAGE 276 OF THE STANDARD PLANS BOOK DATED MAY 2006.

**REVISED STANDARD PLAN RSP B11-60**

276

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2006 REVISED STANDARD PLAN RSP B11-60

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	96	3.0, 7.4, 7.6	32	44

REGISTERED CIVIL ENGINEER  
 N. H. Nguyen  
 No. C60069  
 Exp. 6-30-12  
 CIVIL  
 STATE OF CALIFORNIA

6-22-10  
 DATE  
 9-20-10  
 PLANS APPROVAL DATE

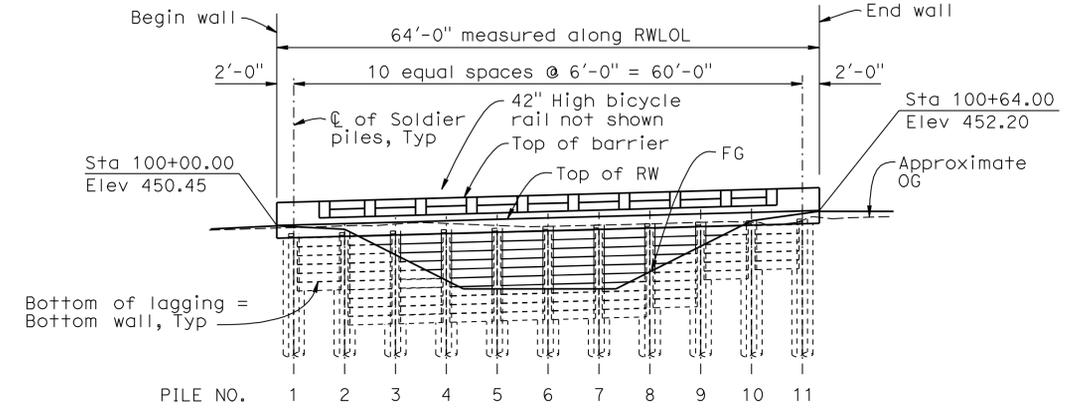
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**NOTES:**

- For General Notes, see "Structure Plan" sheet.
- For Detail A, see "Details No. 1" sheet.

**LEGEND:**

- \* New AC overlay, see "Road Plans"
- Existing Structure

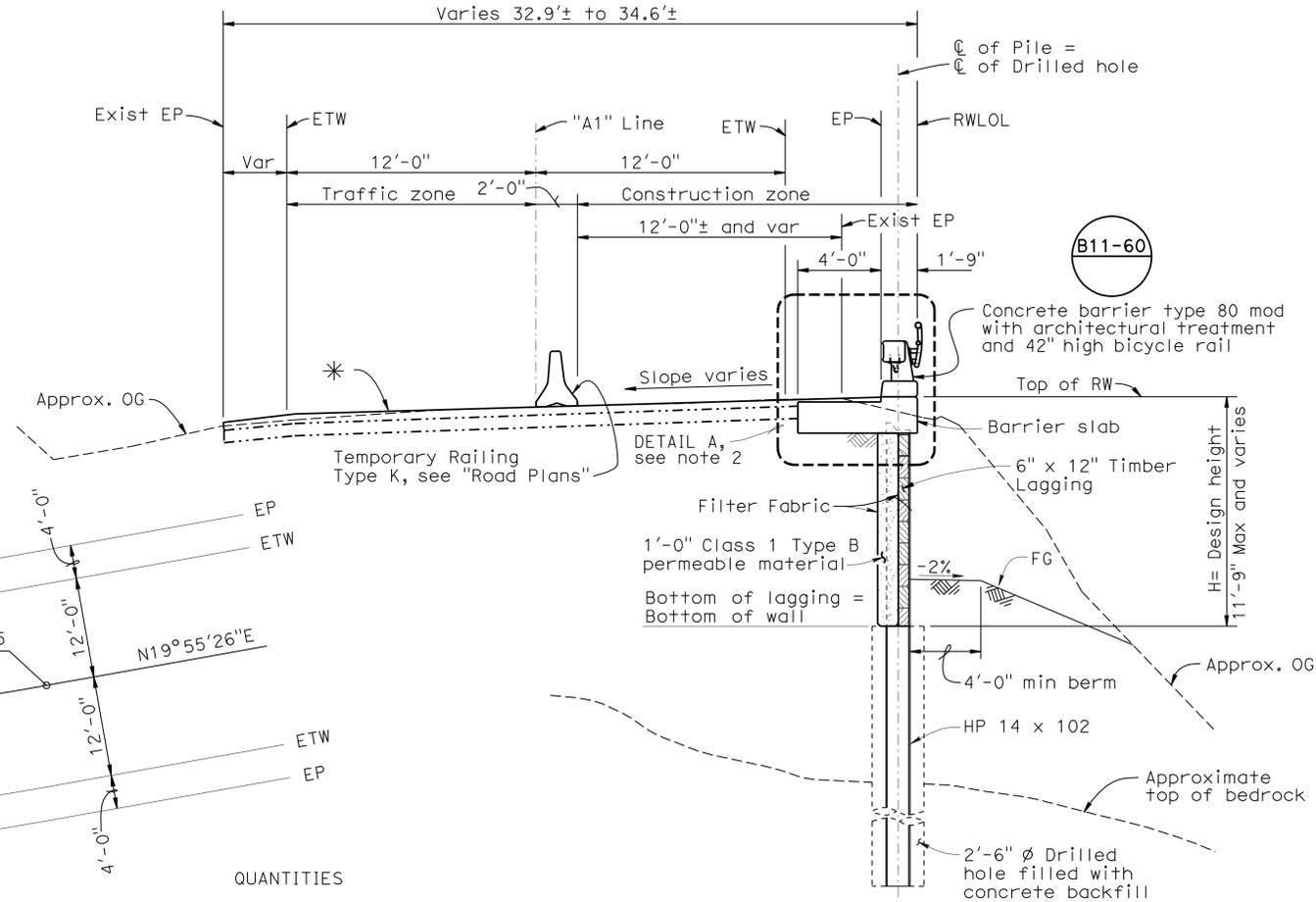
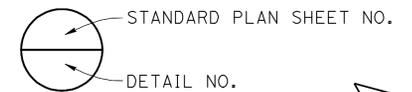


**ELEVATION**  
1" = 10'

**STANDARD PLANS DATED MAY 2006**

**INDEX TO PLANS**

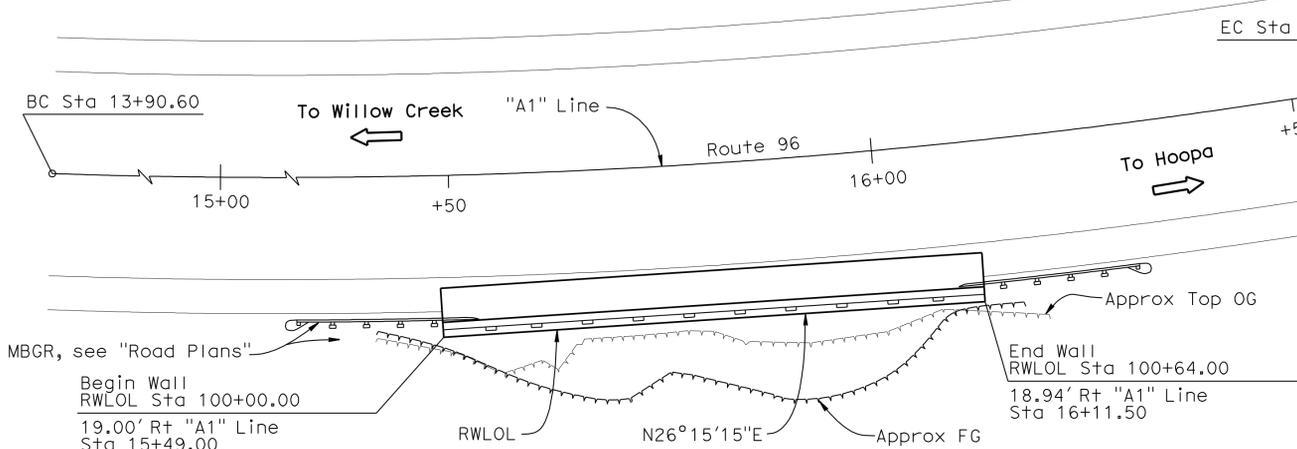
Sheet No.	Name	Symbol	Description
1	GENERAL PLAN	A10A	ACRONYMS AND ABBREVIATIONS (SHEET 1 OF 2)
2	STRUCTURE PLAN	A10B	ACRONYMS AND ABBREVIATIONS (SHEET 2 OF 2)
3	FOUNDATION PLAN	A10C	SYMBOLS (SHEET 1 OF 2)
4	DETAILS NO. 1	A10D	SYMBOLS (SHEET 2 OF 2)
5	DETAILS NO. 2	B11-60	CONCRETE BARRIER TYPE 80 (SHEET 1 OF 2)
6	42" HIGH BICYCLE RAIL	B11-61	CONCRETE BARRIER TYPE 80 (SHEET 2 OF 2)
7	ARCHITECTURAL TREATMENT DETAILS	T3	TEMPORARY RAILING (TYPE K)
8	LOG OF TEST BORINGS 1 OF 6		
9	LOG OF TEST BORINGS 2 OF 6		
10	LOG OF TEST BORINGS 3 OF 6		
11	LOG OF TEST BORINGS 4 OF 6		
12	LOG OF TEST BORINGS 5 OF 6		
13	LOG OF TEST BORINGS 6 OF 6		



**TYPICAL SECTION**  
1/4" = 1'-0"

**QUANTITIES**

STRUCTURE EXCAVATION (SOLDIER PILE WALL)	58	CY
STRUCTURE BACKFILL (SOLDIER PILE WALL)	16	CY
CONCRETE BACKFILL (SOLDIER PILE WALL)	56	CY
LEAN CONCRETE BACKFILL	18	CY
STEEL SOLDIER PILE (HP 14 X 102)	418	LF
30" DRILLED HOLE	425	LF
STRUCTURAL CONCRETE, BARRIER SLAB	22	CY
TIMBER LAGGING	3	MFBM
CLEAN AND PAINT STRUCTURAL STEEL (SOLDIER PILE)	LUMP	SUM
CLASS 1 TYPE B PERMEABLE MATERIAL	20	CY
CONCRETE BARRIER (TYPE 80 MODIFIED))	64	LF



**PLAN**  
1" = 10'

 DESIGN ENGINEER	DESIGN	BY N. Nguyen	CHECKED E. Ward	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 AND 2FT SURCHARGE	<b>STATE OF CALIFORNIA</b> <b>DEPARTMENT OF TRANSPORTATION</b>	<b>DIVISION OF ENGINEERING SERVICES</b> <b>STRUCTURE DESIGN</b> <b>DESIGN BRANCH 2</b>	BRIDGE NO.	04E0027	<b>HUMBOLDT STORM REPAIR PROJECT</b> <b>SOLDIER PILE RW LOCATION 1</b> <b>GENERAL PLAN</b>
	DETAILS	BY J. Yang	CHECKED E. Ward	LAYOUT	BY N. Nguyen			POST MILE	3.0	
	QUANTITIES	BY N. Nguyen	CHECKED E. Ward	SPECIFICATIONS	BY T. Geerts			PLANS AND SPECS COMPARED	T. Geerts	

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS: 0 1 2 3  
 CU 01 EA 472201  
 DISREGARD PRINTS BEARING EARLIER REVISION DATES: 04-28-10, 04-22-10, 04-28-10, 05-06-10, 06-1-10  
 SHEET 1 OF 13

## GENERAL NOTES

**DESIGN:**

AASHTO LRFD Bridge Design Specifications, 4th Edition with California Amendments.

**SOIL PARAMETERS:**

(For determination of design lateral earth pressures)

Above elevation 434.0'

$\phi = 33^\circ$ ,  $\gamma = 130$  pcf,  $C_u = 0$

From elevation 434.0' down to elevation 417.0'

$\phi = 34^\circ$ ,  $\gamma = 130$  pcf,  $C_u = 0$

Below elevation 417.0'

$\phi = 35^\circ$ ,  $\gamma = 145$  pcf,  $C_u = 1500$  psf

Traffic surcharge load = 240 psf (or 2 ft surcharge)

Ground water elevation 433.0'

**REINFORCED CONCRETE:**

$f'_c = 4,000$  psi. (Concrete compressive strength at 28 days)  
 $f_y = 60,000$  psi

**STRUCTURAL STEEL:**

Steel Piles: Grade 50

**STRUCTURAL TIMBER:**

Preservative Pressure  
 Treated Douglas Fir, Grade No. 1 or better  
 Timber to be full sawn.

**CONCRETE BACKFILL:**

Minimum 505 Lbs of cementitious material per cubic yard.

**Notes:**

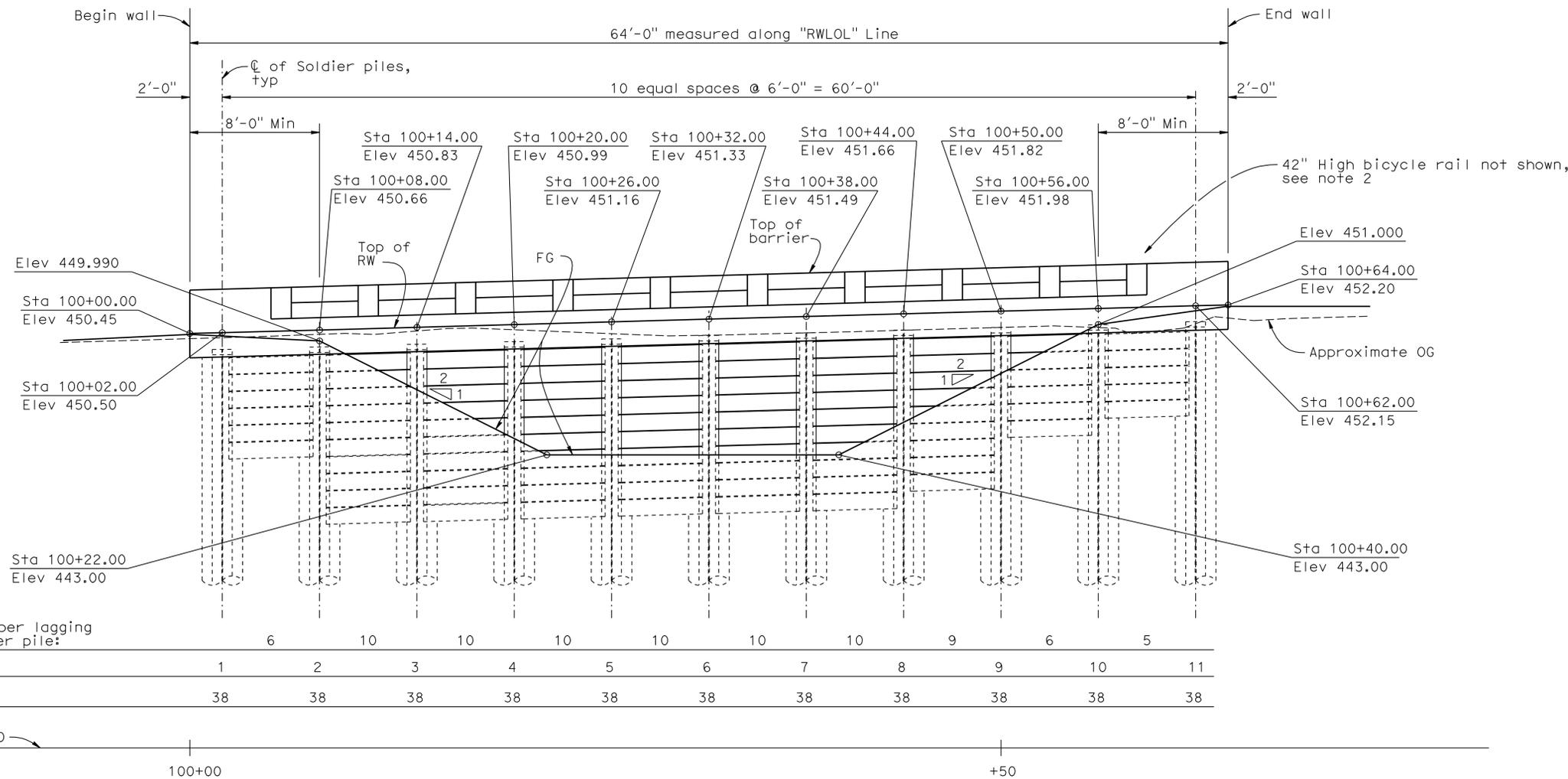
- OG elevations are approximate. FG shall be subject to approval by the Engineer.
- For bicycle rail, see "42" High Bicycle Rail" sheet.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	33	44

*N. H. Nguyen* 06-22-10  
 REGISTERED CIVIL ENGINEER DATE

9-20-10  
 PLANS APPROVAL DATE

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**ELEVATION**  
 $1/4" = 1'-0"$

<b>STATE OF CALIFORNIA</b>				<b>DEPARTMENT OF TRANSPORTATION</b>		<b>DIVISION OF ENGINEERING SERVICES</b>		<b>STRUCTURE DESIGN</b>		<b>DESIGN BRANCH 2</b>		<b>HUMBOLDT STORM REPAIR PROJECT</b>	
DESIGN BY N. Nguyen		CHECKED E. Ward		<b>STATE OF CALIFORNIA</b> <b>DEPARTMENT OF TRANSPORTATION</b>		BRIDGE NO. 04E0027		<b>SOLDIER PILE RW LOCATION 1</b>		<b>STRUCTURE PLAN</b>		SHEET 2 OF 13	
DETAILS BY J. Yang		CHECKED E. Ward				POST MILE 3.0							
QUANTITIES BY N. Nguyen		CHECKED E. Ward				DISREGARD PRINTS BEARING EARLIER REVISION DATES							

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 10/25/05)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

CU 01  
EA 472201

FILE => 04e0027\_bs+struct\_plan.dgn

REVISION DATES

04-28-10	4-28-10	4-28-10			
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USERNAME => emontevl DATE PLOTTED => 16-SEP-2010 TIME PLOTTED => 16:30

CURVE DATA				
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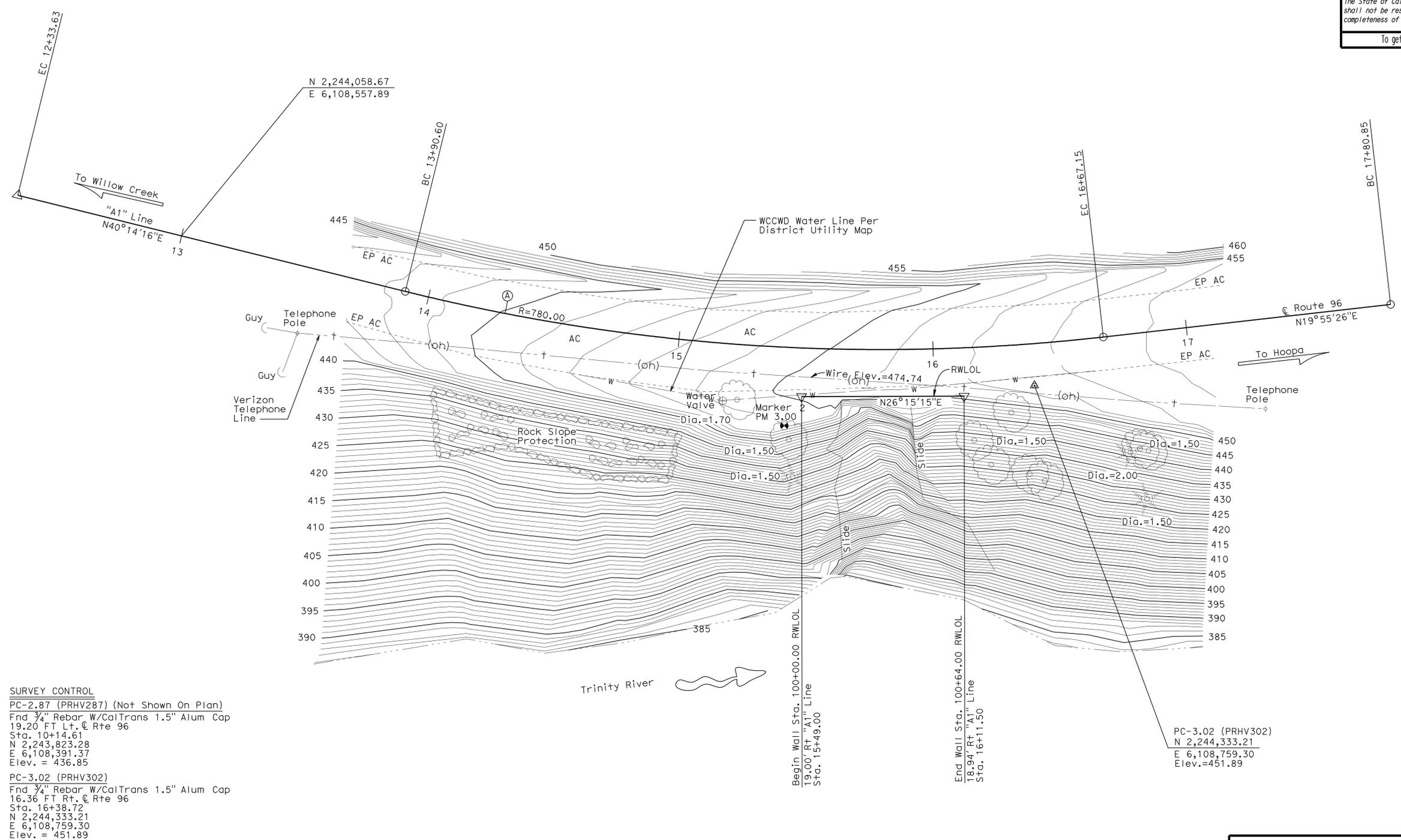
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	34	44

*N. H. Nguyen* 06-22-10  
 REGISTERED CIVIL ENGINEER DATE  
 9-20-10  
 PLANS APPROVAL DATE

N. H. Nguyen  
 No. C60069  
 Exp. 6-30-12  
 CIVIL  
 STATE OF CALIFORNIA

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**SURVEY CONTROL**  
 PC-2.87 (PRHV287) (Not Shown On Plan)  
 Fnd 3/4" Rebar W/CalTrans 1.5" Alum Cap  
 19.20 FT Lt. C Rte 96  
 Sta. 10+14.61  
 N 2,243,823.28  
 E 6,108,391.37  
 Elev. = 436.85

PC-3.02 (PRHV302)  
 Fnd 3/4" Rebar W/CalTrans 1.5" Alum Cap  
 16.36 FT Rt. C Rte 96  
 Sta. 16+38.72  
 N 2,244,333.21  
 E 6,108,759.30  
 Elev. = 451.89

PRELIMINARY INVESTIGATION SECTION				DESIGN		STATE OF CALIFORNIA		DIVISION OF ENGINEERING SERVICES		BRIDGE NO.				
SCALE	VERT. DATUM	NAVDS8	PHOTOGRAMMETRY AS OF: x	BY	N. Nguyen	CHECKED	E. Ward	DEPARTMENT OF TRANSPORTATION	STRUCTURE DESIGN	04E0027				
1"=20'	HORIZ. DATUM	NAD83 (1991.35)	SURVEYED	BY	J. Yang	CHECKED	E. Ward	DESIGN BRANCH	2					
ALIGNMENT TIES	Dist. traverse Sheet		DRAFTED	BY	N. Nguyen	CHECKED	E. Ward			POST MILE	3.0			
STRUCTURES FOUNDATION PLAN SHEET (ENGLISH) (REV. 10/25/05)											SHEET	3	OF	13

**HUMBOLDT STORM REPAIR PROJECT**

**SOLDIER PILE RW LOCATION 1**

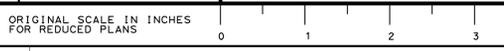
**FOUNDATION PLAN**

CU 01  
EA 472201

DISREGARD PRINTS BEARING EARLIER REVISION DATES

04/28/10	04/28/10	05/05/10							
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REVISION DATES

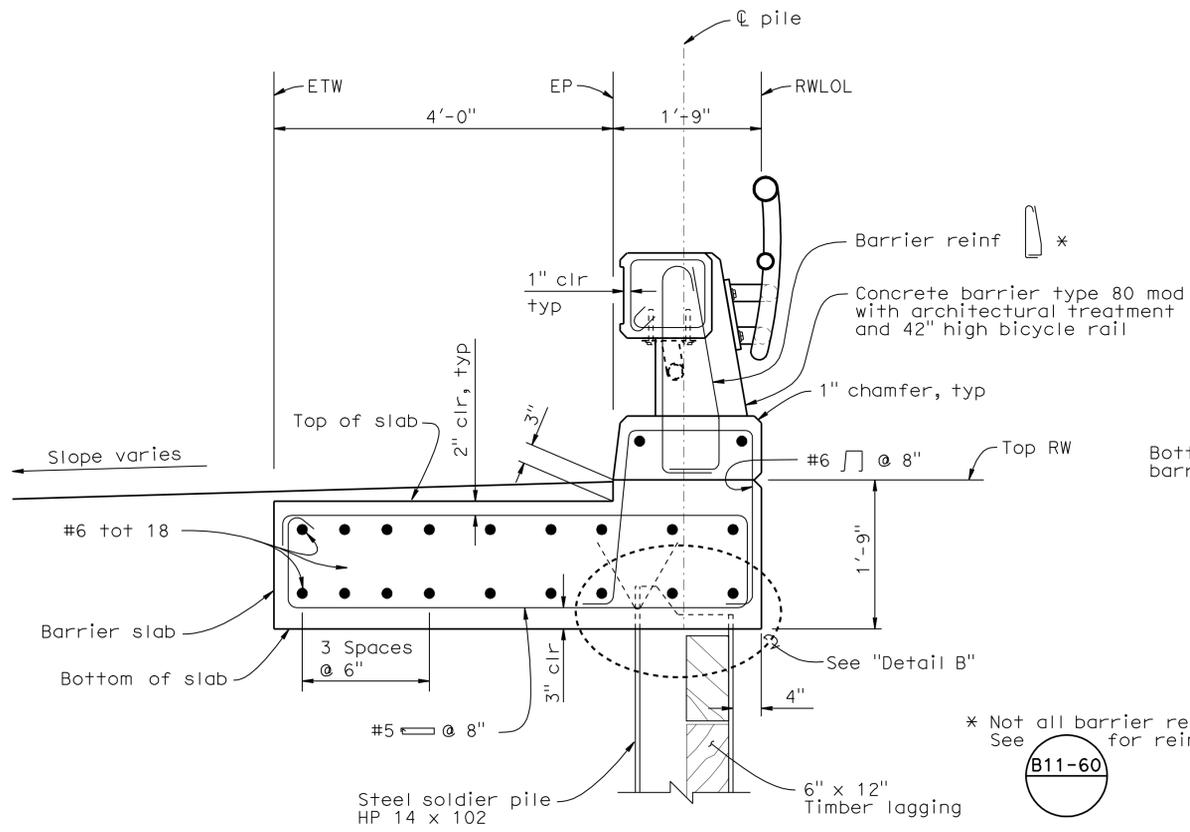


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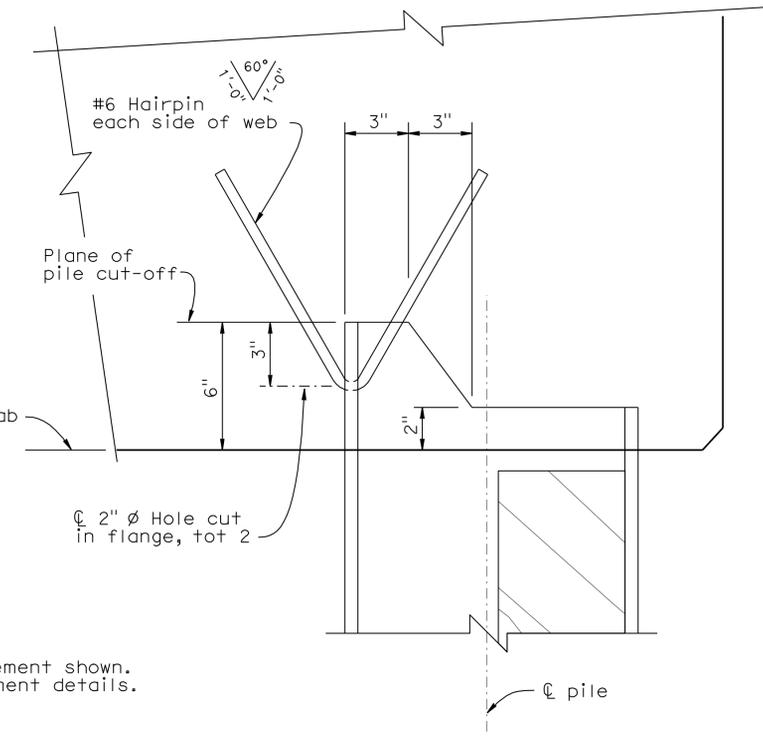
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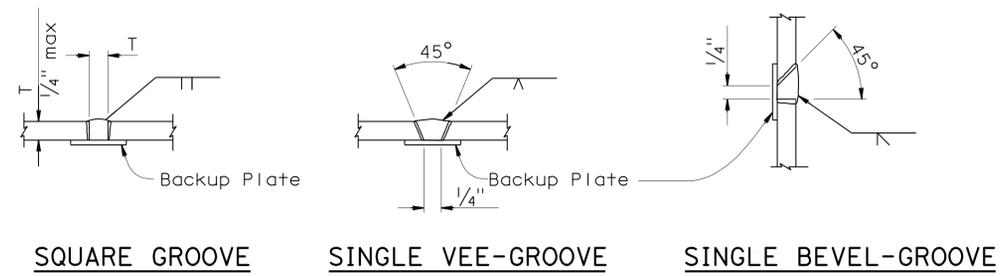
*N. H. Nguyen* 06-22-10  
 REGISTERED CIVIL ENGINEER DATE  
 PLANS APPROVAL DATE 9-20-10  
 N. H. Nguyen  
 No. C60069  
 Exp. 6-30-12  
 CIVIL  
 STATE OF CALIFORNIA  
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**DETAIL A**  
1" = 1'-0"



**STEEL PILE ANCHOR**  
**DETAIL B**  
3" = 1'-0"



**PILE WELDING DETAIL-BUTT JOINTS**

- Notes:
1. Single Vee-Groove And Square Groove Permitted for all positions.
  2. Single Bevel-Groove permitted for horizontal joints only.
  3. Splicing of H pile shall be made by full penetration groove welding along the web and both flanges.

DESIGN	BY N. Nguyen	CHECKED E. Ward
DETAILS	BY J. Yang	CHECKED E. Ward
QUANTITIES	BY N. Nguyen	CHECKED E. Ward

**STATE OF CALIFORNIA**  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF ENGINEERING SERVICES  
 STRUCTURE DESIGN  
 DESIGN BRANCH **2**

**HUMBOLDT STORM REPAIR PROJECT**  
 SOLDIER PILE RW LOCATION 1  
 DETAILS NO. 1

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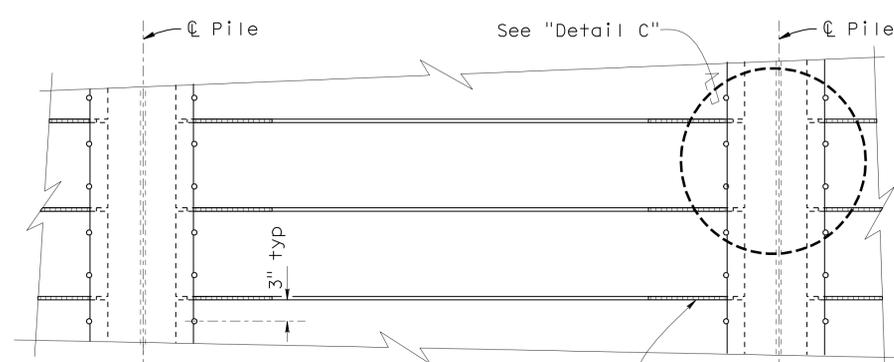
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*N. H. Nguyen* 06-22-10  
REGISTERED CIVIL ENGINEER DATE

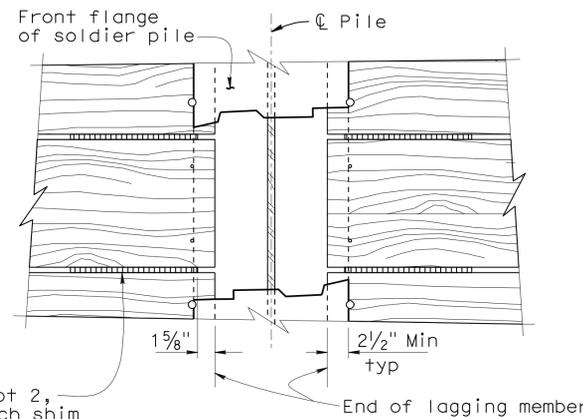
9-20-10  
PLANS APPROVAL DATE

N. H. Nguyen  
No. C60069  
Exp. 6-30-12  
CIVIL  
STATE OF CALIFORNIA

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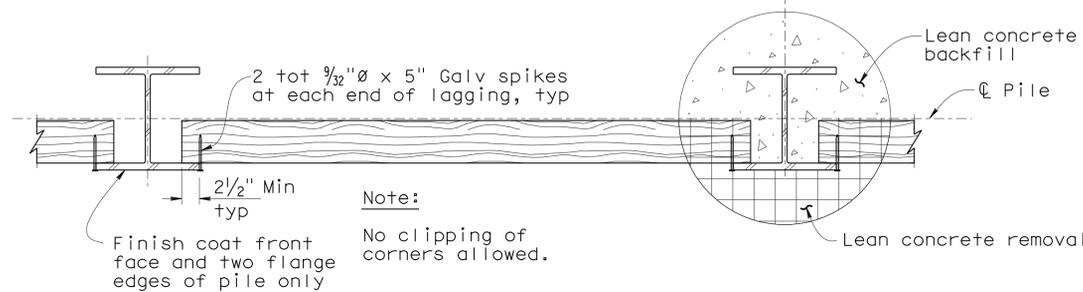


**PART ELEVATION**



**DETAIL C**

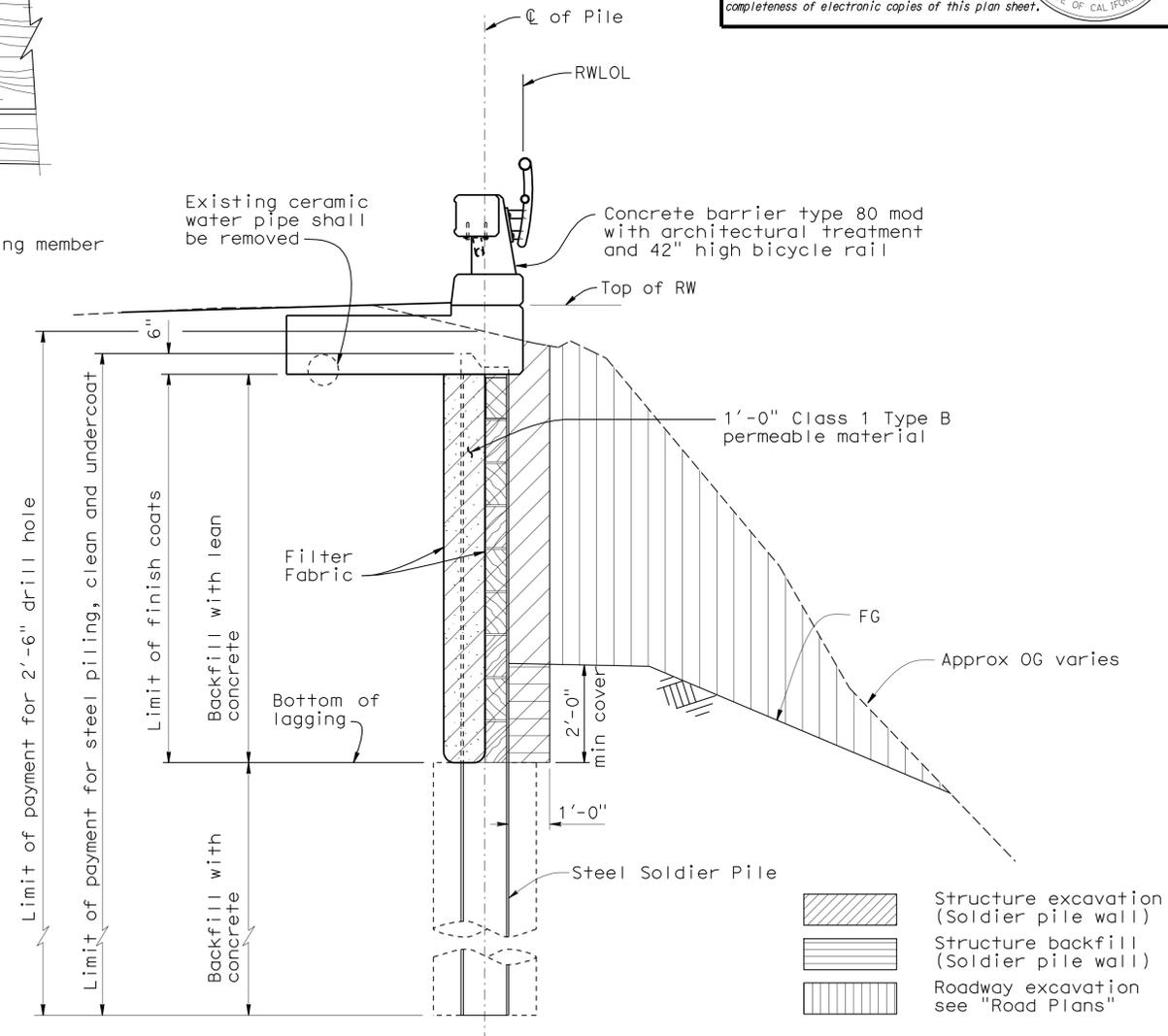
1/2" = 1'-0"



**PART PLAN OF LAGGING MEMBER**

**LAGGING DETAILS**

1" = 1'-0"



**TYPICAL WALL SECTION WITH EARTHWORK**

**LIMITS OF PAYMENT FOR EXCAVATION, BACKFILL AND SOLDIER PILE DRILLED HOLE**

1/2" = 1'-0"

- Structure excavation (Soldier pile wall)
- Structure backfill (Soldier pile wall)
- Roadway excavation see "Road Plans"

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 10/25/05)				<b>STATE OF CALIFORNIA</b> DEPARTMENT OF TRANSPORTATION		<b>DIVISION OF ENGINEERING SERVICES</b> STRUCTURE DESIGN <b>DESIGN BRANCH 2</b>		BRIDGE NO. 04E0027 POST MILE 3.0		<b>HUMBOLDT STORM REPAIR PROJECT</b> <b>SOLDIER PILE RW LOCATION 1</b> <b>DETAILS NO. 2</b>					
DESIGN	BY N. Nguyen	CHECKED E. Ward	DETAILS	BY J. Yang	CHECKED E. Ward	QUANTITIES	BY N. Nguyen	CHECKED E. Ward	CU 01	EA 472201	DISREGARD PRINTS BEARING EARLIER REVISION DATES	04-28-10	04-28-10	05-05-10	SHEET 5 OF 13

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

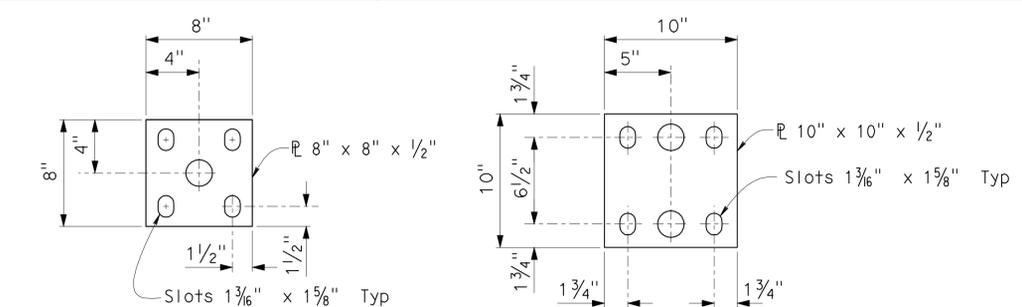
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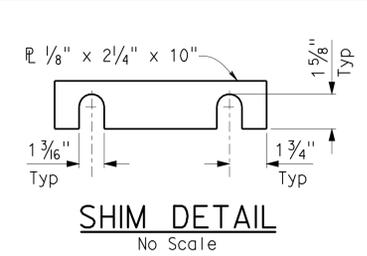
N. H. Nguyen 06-22-10  
 REGISTERED CIVIL ENGINEER DATE  
 PLANS APPROVAL DATE 9-20-10  
 No. C60069  
 Exp. 6-30-12  
 CIVIL  
 STATE OF CALIFORNIA  
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- NOTES:**
- Galvanize rail assembly after fabrication.
  - Post shall be normal to railing.
  - Rail tubes shall be shop bent or fabricated to fit horizontal curve when radius is less than 1'-0"
  - Tube splices shall be located in the tubes spanning deck or wall joints. Increase joint width in tubes to match expansion joint width and increase sleeve length correspondingly.
  - Top rail tube shall be continuous over not less than two posts except a short post spacing is permitted near deck or wall joints, electroliers, or other rail discontinuities as noted.
  - For 3 NPS XS pipe rails use 2.5 NPS STD pipe for inner coupling tube and for 2 NPS STD pipe use 1.5 NPS STD pipe for coupling tube railing.
  - For details and reinforcing not shown, see Standard Plans.
  - The contractor shall verify all dependent dimensions in the field before ordering or fabricating any material.
  - Contractor to provide anchor bolt layout before anchor bolts are placed.
  - Resin capsule anchorage is subject to approval of Engineer. Installation procedures shall comply with manufacturer's instructions.



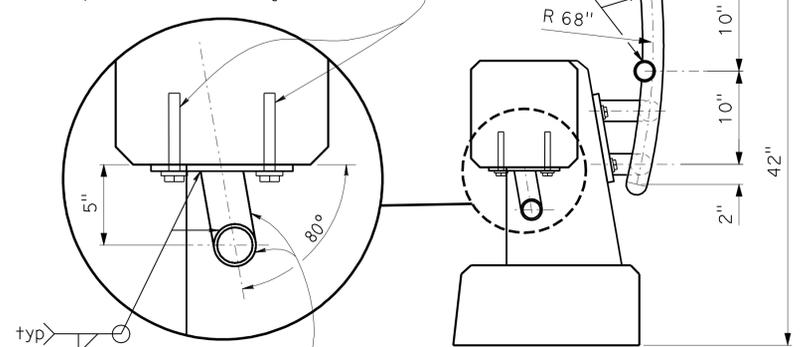
**LOWER RAIL ANCHOR PLATE DETAIL**  
No Scale

**POST ANCHOR PLATE**  
No Scale

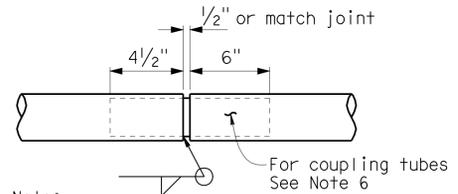


**SHIM DETAIL**  
No Scale

5/8" Ø bolt, tot 4 per anchor P with nuts and 2 1/4" x 1/4" x 2 1/4" plate washers, see "Bolt Anchorage Details"

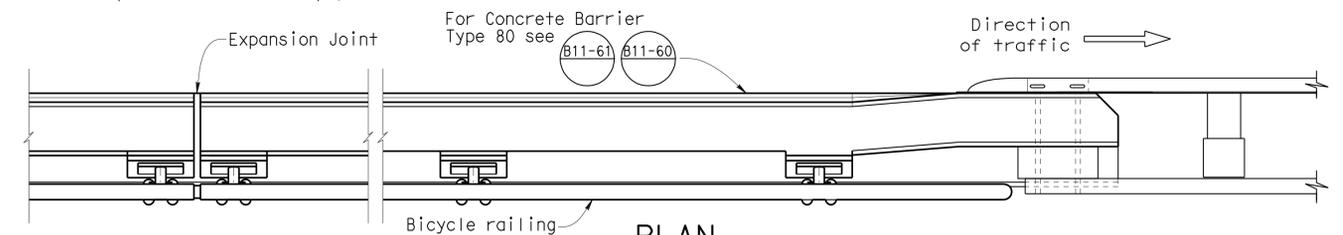


**SECTION A-A**  
No Scale

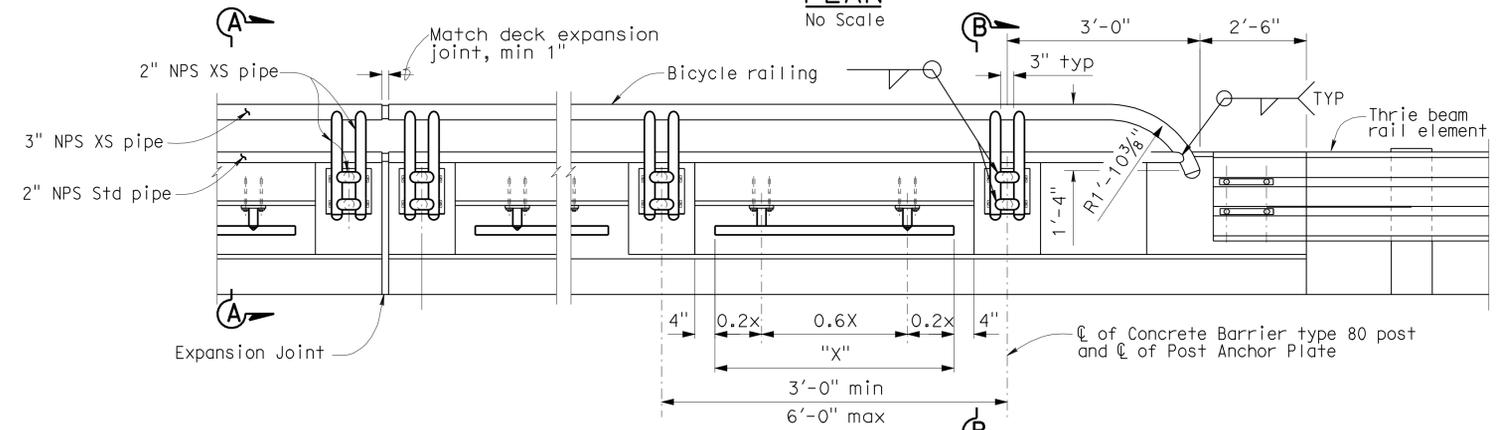


**TUBE COUPLING DETAIL**  
No Scale

Note:  
Coupling tube welded to one rail only so as to allow for expansion and contraction.

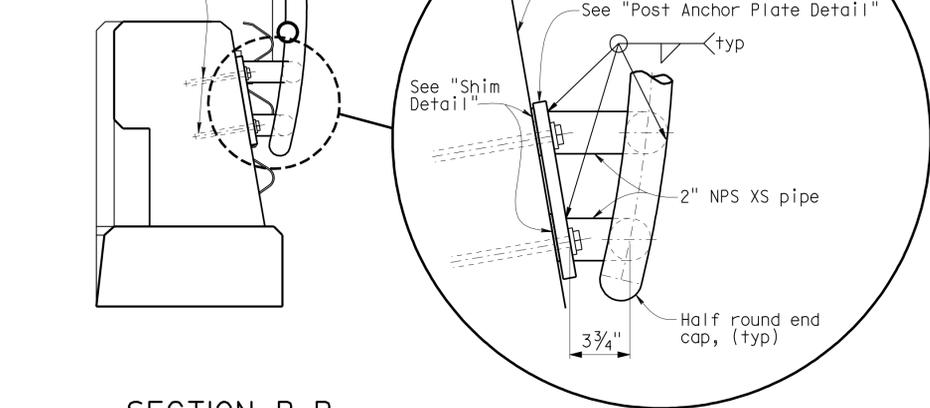


**PLAN**  
No Scale

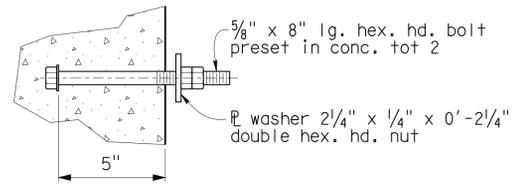


**ELEVATION**  
No Scale

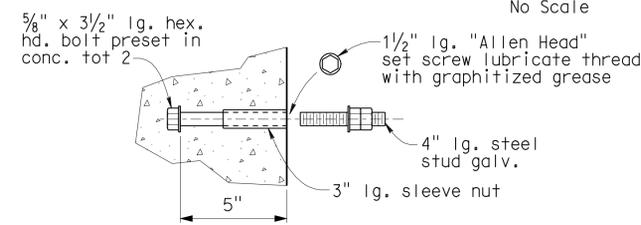
5/8" Ø bolt Tot 4 per anchor P, see "Bolt Anchorage Details"



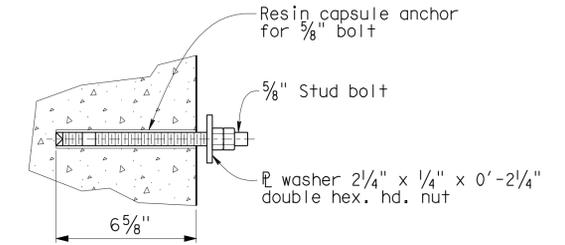
**SECTION B-B**  
No Scale



**CIP ALTERNATIVE 1**



**CIP ALTERNATIVE 2**



**RESIN CAPSULE ALTERNATIVE**

See note 10

**BOLT ANCHORAGE DETAILS**  
No Scale

See notes 8 & 9

STANDARD DRAWING		
FILE NO. <b>xsXX-XXX-X</b>	APPROVED BY <u>Tillat Satter</u> RESPONSIBLE TECHNICAL SPECIALIST	RELEASED BY <u>Robert Lacalle</u> RESPONSIBLE OFFICE CHIEF
	APPROVAL DATE <u>9-15-2009</u>	RELEASE DATE <u>9-15-2009</u>

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES	BRIDGE NO. 04E0027
		POST MILE 3.0

HUMBOLDT STORM REPAIR PROJECT	
42" HIGH BICYCLE RAIL	
FOR CONCRETE BARRIER TYPE 80	

DS OSD 2147A (ENGLISH STANDARD DRAWING "XS" BORDER REV. 01/11/08)	ORIGINAL SCALE IN INCHES FOR REDUCED PLANS	0 1 2 3	CU 01 EA 482201	DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET 6 OF 13
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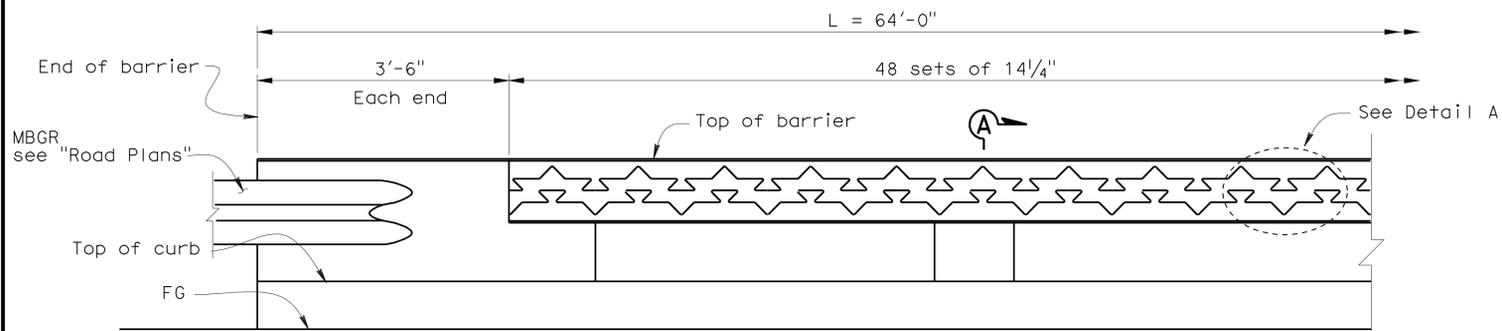
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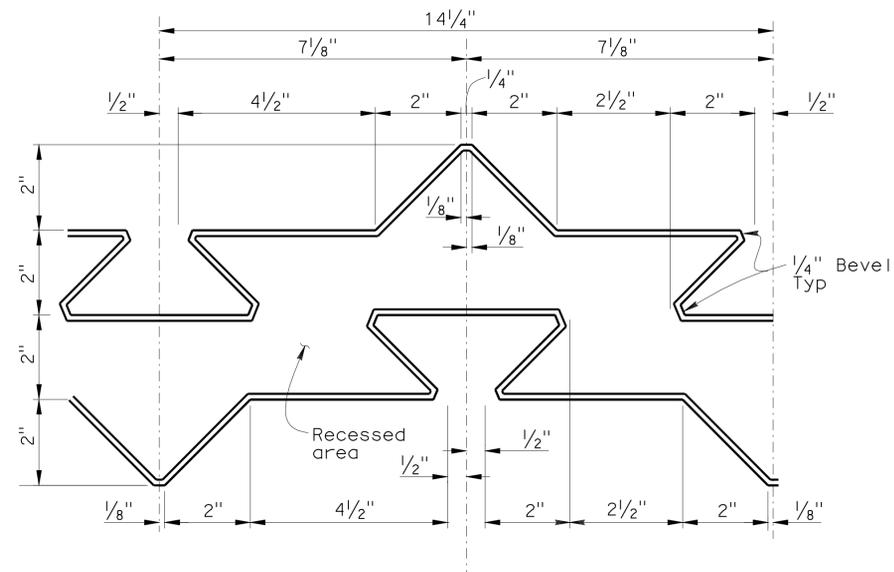
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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
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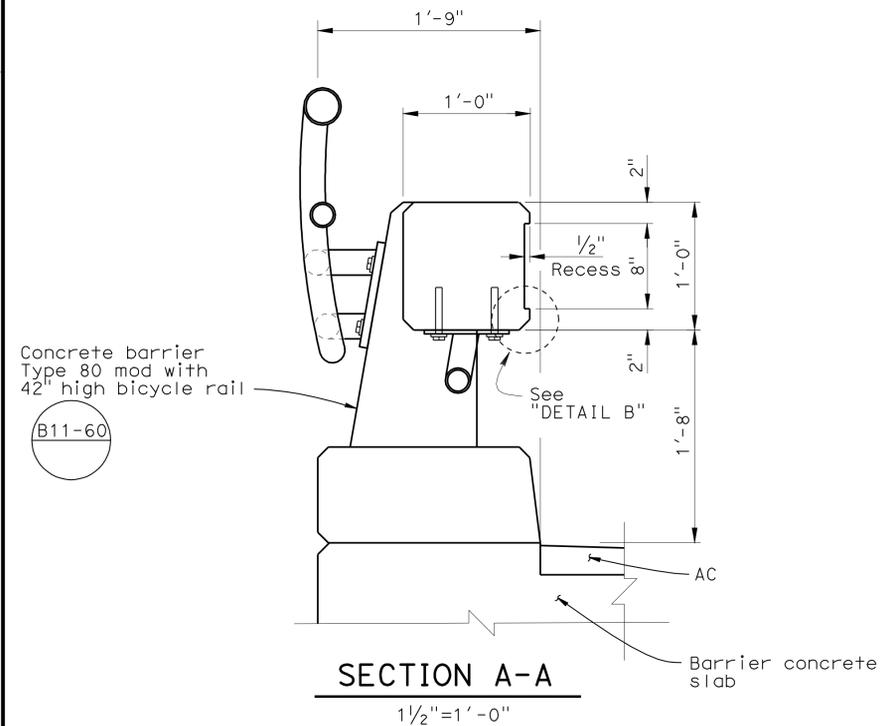
*N. H. Nguyen* 06-22-10  
 REGISTERED CIVIL ENGINEER DATE  
 PLANS APPROVAL DATE 9-20-10  
 No. C60069  
 Exp. 6-30-12  
 CIVIL  
 STATE OF CALIFORNIA  
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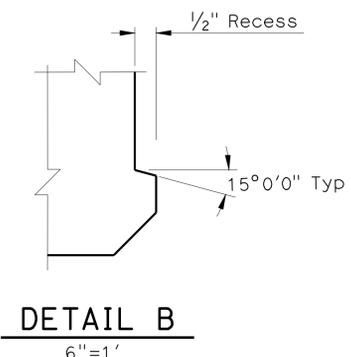
**PART ELEVATION**  
 $\frac{3}{4}'' = 1' - 0''$



**DETAIL A**  
 $6'' = 1'$



**SECTION A-A**  
 $1\frac{1}{2}'' = 1' - 0''$



**DETAIL B**  
 $6'' = 1'$

STRUCTURES DESIGN DETAIL SHEET (ENGLISH) (REV. 10/25/05)				ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		CU 01 EA 472201		DISREGARD PRINTS BEARING EARLIER REVISION DATES		REVISION DATES		SHEET 7 OF 13	
DESIGN	BY N. Nguyen	CHECKED E. Ward	<b>STATE OF CALIFORNIA</b> DEPARTMENT OF TRANSPORTATION		DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN <b>DESIGN BRANCH 2</b>		BRIDGE NO.	04E0027		<b>HUMBOLDT STORM REPAIR PROJECT</b>			
DETAILS	BY J. Yang	CHECKED E. Ward					POST MILE	3.0		<b>SOLDIER PILE RW LOCATION 1</b>			
QUANTITIES	BY N. Nguyen	CHECKED E. Ward					<b>ARCHITECTURAL TREATMENT DETAILS</b>						

USERNAME => emortrav DATE PLOTTED => 16-SEP-2010 TIME PLOTTED => 16:31

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
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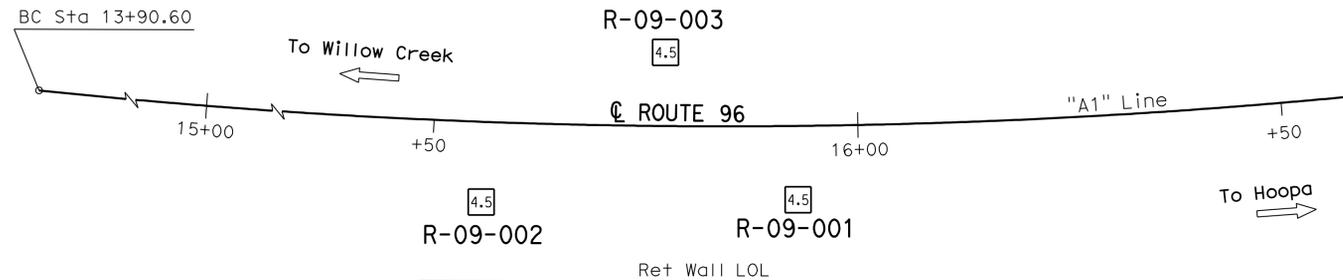
*Dawn McGuire*  
 CERTIFIED ENGINEERING GEOLOGIST 5-10-10  
 9-20-10  
 PLANS APPROVAL DATE

**PROFESSIONAL GEOLOGIST**  
 Dawn McGuire  
 No. 2280  
 Exp. 4-30-12  
 CERTIFIED ENGINEERING GEOLOGIST  
 STATE OF CALIFORNIA

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**BENCH MARK**

PRHV 302 Elev 451.891'  
 Found 3/4" Rebar w/CalTran Alum Cap, Good Condition.  
 N 2244333.2110  
 E 6108759.2990  
 SUHV 100 Elev 447.949'  
 Set Mag Nail&Shiner  
 N 2244187.2240  
 E 6108684.8450



**PLAN**  
 1" = 10'



<b>ENGINEERING SERVICES</b>		<b>GEOTECHNICAL SERVICES</b>		<b>STATE OF CALIFORNIA</b>		<b>DIVISION OF ENGINEERING SERVICES</b>		<b>HUMBOLDT STORM REPAIR PROJECT</b>	
FUNCTIONAL SUPERVISOR		DRAWN BY: C. Christian, I.G-Remmen 4/10		DEPARTMENT OF TRANSPORTATION		STRUCTURE DESIGN		<b>SOLDIER PILE RW LOCATION 1</b>	
NAME: C. Narwold		CHECKED BY: R. Newman		D. McGuire		DESIGN BRANCH		<b>LOG OF TEST BORINGS 1 OF 6</b>	
005 CIVIL LOG OF TEST BORINGS SHEET		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		CU 01 EA 472201		BRIDGE NO. 04E0027 POST MILES 3.0		REVISION DATES	
				FILE => 04e0027_z1tb01.dgn		DISREGARD PRINTS BEARING EARLIER REVISION DATES		SHEET 8 OF 13	

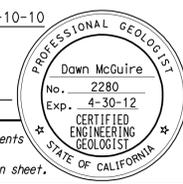
USERNAME => emortrav DATE PLOTTED => 16-SEP-2010 TIME PLOTTED => 16:31



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	41	44

*Dawn McGuire*  
 CERTIFIED ENGINEERING GEOLOGIST 5-10-10  
 9-20-10  
 PLANS APPROVAL DATE

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This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (June 2007).

FOR PLAN VIEW, SEE  
"LOG OF TEST BORINGS 1 OF 6"



ENGINEERING SERVICES		GEOTECHNICAL SERVICES		STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION		DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH		HUMBOLDT STORM REPAIR PROJECT			
FUNCTIONAL SUPERVISOR	DRAWN BY: C. Christian 4/10	FIELD INVESTIGATION BY:		CU 01 EA 472201	BRIDGE NO.	SOLDIER PILE RW LOCATION 1					
NAME: C. Narwold	CHECKED BY: R. Newman	D. McGuire			POST MILES	LOG OF TEST BORINGS 3 OF 6					
O&S CIVIL LOG OF TEST BORINGS SHEET				ORIGINAL SCALE IN INCHES FOR REDUCED PLANS	0 1 2 3	DISREGARD PRINTS BEARING EARLIER REVISION DATES	15-28-10	04-28-10	05-28-10	05-28-10	SHEET 10 OF 13

FILE => 04e0027\_z17b3.dgn

USERNAME => emontev DATE PLOTTED => 16-SEP-2010 TIME PLOTTED => 16:32

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	96	3.0, 7.4 / 7.6	42	44

Dawn McGuire  
 CERTIFIED ENGINEERING GEOLOGIST  
 5-10-10  
 9-20-10  
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REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

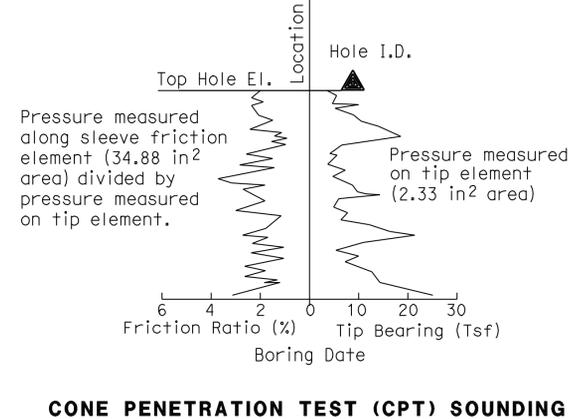
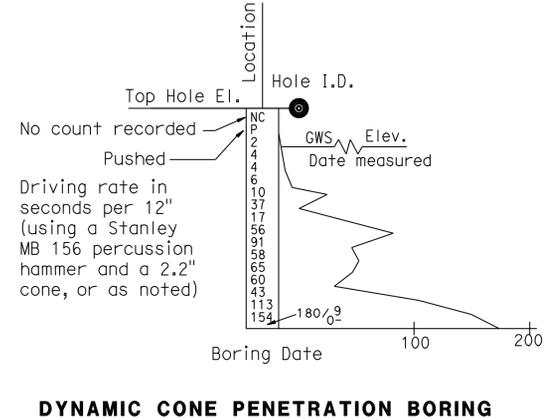
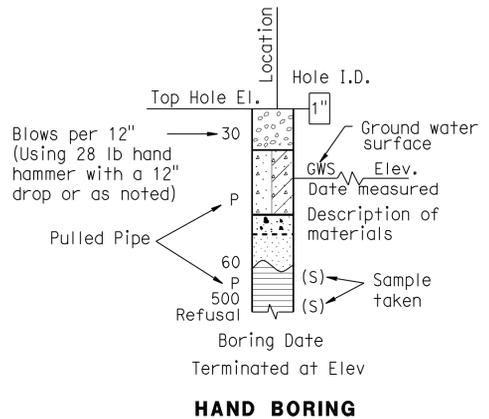
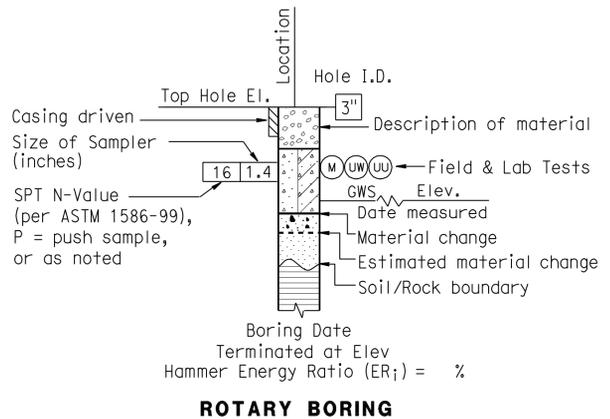
CEMENTATION	
Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

CONSISTENCY OF COHESIVE SOILS				
Description	Unconfined Compressive Strength (tsf)	Pocket Penetrometer Measurement (tsf)	Torvane Measurement (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 to 0.50	0.25 to 0.50	0.12 to 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 to 1.0	0.50 to 1.0	0.25 to 0.50	Penetrated several inches by thumb with moderate effort
Stiff	1 to 2	1 to 2	0.50 to 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2 to 4	2 to 4	1.0 to 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

BOREHOLE IDENTIFICATION		
Symbol	Hole Type	Description
	A	Auger Boring
	R	Rotary drilled boring
	P	Rotary percussion boring (air)
	R	Rotary drilled diamond core
	HD	Hand driven (1-inch soil tube)
	HA	Hand Auger
	D	Dynamic Cone Penetration Boring
	CPT	Cone Penetration Test (ASTM D 5778-95)
	O	Other

Note: Size in inches.

PLASTICITY OF FINE-GRAINED SOILS	
Description	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.



<b>ENGINEERING SERVICES</b>		<b>GEOTECHNICAL SERVICES</b>		<b>STATE OF CALIFORNIA</b>		<b>DIVISION OF ENGINEERING SERVICES</b>		<b>HUMBOLDT STORM REPAIR PROJECT</b>	
		PREPARED BY: I.G-Remmen		<b>DEPARTMENT OF TRANSPORTATION</b>		<b>STRUCTURE DESIGN</b>		<b>SOLDIER PILE RW LOCATION 1</b>	
						BRIDGE NO. 04E0027			
						POST MILE 3.0		<b>LOG OF TEST BORINGS 4 OF 6</b>	
GS LOTB SOIL LEGEND		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		CU 01 EA 472201		DISREGARD PRINTS BEARING EARLIER REVISION DATES		REVISION DATES	
		0 1 2 3		FILE => 04e0027_z1t4.dgn				SHEET 11 OF 13	

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REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Hum	96	3.0, 7.4/7.6	43	44

*Dawn McGuire*  
 CERTIFIED ENGINEERING GEOLOGIST 5-10-10  
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GROUP SYMBOLS AND NAMES			
Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
	GW Well-graded GRAVEL		CL Lean CLAY
	Well-graded GRAVEL with SAND		Lean CLAY with SAND
	GP Poorly graded GRAVEL		CL Lean CLAY with GRAVEL
	Well-graded GRAVEL with SAND		SANDY lean CLAY
	GW-GM Well-graded GRAVEL with SILT		CL-ML SANDY silty CLAY with GRAVEL
	Well-graded GRAVEL with SILT and SAND		GRAVELLY lean CLAY
	GW-GC Well-graded GRAVEL with CLAY		CL-ML GRAVELLY lean CLAY with SAND
	(or SILTY CLAY)		GRAVELLY silty CLAY with SAND
	GW-GC Well-graded GRAVEL with CLAY and SAND		ML SILT
	(or SILTY CLAY and SAND)		SILT with SAND
	GP-GM Poorly graded GRAVEL with SILT		ML SILT with GRAVEL
	Well-graded GRAVEL with SILT and SAND		SANDY SILT
	GP-GC Poorly graded GRAVEL with CLAY		ML SANDY SILT with GRAVEL
	(or SILTY CLAY)		GRAVELLY SILT
	GP-GC Poorly graded GRAVEL with CLAY and SAND		ML GRAVELLY SILT with SAND
	(or SILTY CLAY and SAND)		GRAVELLY silty CLAY with SAND
	GM SILTY GRAVEL		OL ORGANIC lean CLAY
	SILTY GRAVEL with SAND		ORGANIC lean CLAY with SAND
	GC CLAYEY GRAVEL		OL ORGANIC lean CLAY with GRAVEL
	CLAYEY GRAVEL with SAND		SANDY ORGANIC lean CLAY
	GC-GM SILTY, CLAYEY GRAVEL		OL ORGANIC silty CLAY with GRAVEL
	SILTY, CLAYEY GRAVEL with SAND		SANDY ORGANIC silty CLAY
	SW Well-graded SAND		OL ORGANIC silty CLAY with GRAVEL
	Well-graded SAND with GRAVEL		SANDY ORGANIC silty CLAY with GRAVEL
	SP Poorly graded SAND		CH FAT CLAY
	Well-graded SAND with GRAVEL		FAT CLAY with SAND
	SW-SM Well-graded SAND with SILT		CH SANDY fat CLAY
	Well-graded SAND with SILT and GRAVEL		SANDY fat CLAY with GRAVEL
	SW-SC Well-graded SAND with CLAY		CH GRAVELLY fat CLAY
	(or SILTY CLAY)		GRAVELLY fat CLAY with SAND
	SW-SC Well-graded SAND with CLAY and GRAVEL		MH Elastic SILT
	(or SILTY CLAY and GRAVEL)		Elastic SILT with SAND
	SP-SM Poorly graded SAND with SILT		MH Elastic SILT with GRAVEL
	Well-graded SAND with SILT and GRAVEL		SANDY elastic SILT
	SP-SC Poorly graded SAND with CLAY		MH SANDY elastic SILT with GRAVEL
	(or SILTY CLAY)		GRAVELLY elastic SILT
	SP-SC Poorly graded SAND with CLAY and GRAVEL		MH GRAVELLY elastic SILT with SAND
	(or SILTY CLAY and GRAVEL)		GRAVELLY elastic SILT with SAND
	SM SILTY SAND		OH ORGANIC fat CLAY
	SILTY SAND with GRAVEL		ORGANIC fat CLAY with SAND
	SC CLAYEY SAND		OH ORGANIC fat CLAY with GRAVEL
	CLAYEY SAND with GRAVEL		SANDY ORGANIC fat CLAY
	SC-SM SILTY, CLAYEY SAND		OH SANDY ORGANIC fat CLAY with GRAVEL
	SILTY, CLAYEY SAND with GRAVEL		GRAVELLY ORGANIC fat CLAY
	PT PEAT		OH GRAVELLY ORGANIC fat CLAY with SAND
			GRAVELLY ORGANIC fat CLAY with SAND
	COBBLES		OL/OH ORGANIC SOIL
	COBBLES and BOULDERS		ORGANIC SOIL with SAND
	BOULDERS		ORGANIC SOIL with GRAVEL
			SANDY ORGANIC SOIL
			SANDY ORGANIC SOIL with GRAVEL
			GRAVELLY ORGANIC SOIL
			GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTING	
(C)	Consolidation (ASTM D 2435)
(CL)	Collapse Potential (ASTM D 5333)
(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
(PP)	Pocket Penetrometer
(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)
(TV)	Pocket Torvane
(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)
(VS)	Vane Shear (AASHTO T 223)

APPARENT DENSITY OF COHESIONLESS SOILS	
Description	SPT N <sub>60</sub> (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE	
Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

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

PARTICLE SIZE		
Description	Size	
Boulder	> 12"	
Cobble	3" to 12"	
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

<b>ENGINEERING SERVICES</b>		<b>GEOTECHNICAL SERVICES</b>		<b>STATE OF CALIFORNIA</b>		<b>DIVISION OF ENGINEERING SERVICES</b>		<b>BRIDGE NO.</b>		<b>HUMBOLDT STORM REPAIR PROJECT</b>	
		PREPARED BY: I.G-Remmen		<b>DEPARTMENT OF TRANSPORTATION</b>		<b>STRUCTURE DESIGN</b>		04E0027		<b>SOLDIER PILE RW LOCATION 1</b>	
						<b>DESIGN BRANCH</b>		POST MILE 3.0		<b>LOG OF TEST BORINGS 5 OF 6</b>	
GS LOTB SOIL LEGEND		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		0 1 2 3		CU 01 EA 472201		DISREGARD PRINTS BEARING EARLIER REVISION DATES		REVISION DATES	
										SHEET 12 OF 13	

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REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

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

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

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

ROCK HARDNESS	
Description	Criteria
Extremely Hard	Specimen cannot be scratched with a pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Hard	Specimen cannot be scratched with a pocket knife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Specimen can be scratched with a pocket knife or sharp pick with difficulty (heavy pressure). Heavy hammer blows required to break specimen.
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure. Core breaks with moderate hammer blows.
Moderately Soft	Specimen can be grooved 1/6" deep with a pocket knife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Specimen can be grooved or gouged easily by a pocket knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Specimen can be readily indented, grooved or gouged with fingernail, or carved with a pocket knife. Breaks with light manual pressure.

FRACTURE DENSITY	
Description	Observed Fracture Density
Unfractured	No fractures.
Very slightly fractured	Lengths greater than 3 feet.
Slightly fractured	Lengths from 1 to 3 feet with few lengths less than 1 foot or greater than 3 feet.
Moderately fractured	Lengths mostly in 4" to 1 foot range with most lengths about 8"
Intensely fractured	Lengths average from 1 to 4" with scattered fragmented intervals with lengths less than 4"
Very intensely fractured	Mostly chips and fragments with a few scattered short core lengths.

Combination descriptors (such as "Very intensely to intensely fractured") are used where equal distribution of both fracture density characteristics is present over a significant interval or exposure, or where characteristics are "in between" the descriptor definitions. Only two adjacent descriptors may be combined.

RELATIVE STRENGTH OF INTACT ROCK	
Term	Uniaxial Compressive Strength (PSI)
Extremely Strong	> 30,000
Very Strong	14,500 - 30,000
Strong	7,000 - 14,500
Medium Strong	3,500 - 7,000
Weak	700 - 3,500
Very Weak	150 - 700
Extremely Weak	< 150

BEDDING SPACING	
Description	Thickness / Spacing
Massive	Greater than 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8" to 1 ft
Thinly bedded	1-1/4" to 3-5/8"
Very thinly bedded	3/8" to 1-1/4"
Laminated	Less than 3/8"

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 Solutioning		
	Body of Rock	Fracture Surfaces		Texture	Solutioning	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change.	No solutioning.	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 may be noted.	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."

Combination descriptors (such as "slightly weathered to fresh") are permissible where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant, identifiable zones can be delineated. Only two adjacent descriptors may be combined. "Very intensely weathered" is the combination descriptor for "intensely weathered to decomposed."

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
01	Humb	96	3.0, 7.4, 7.6	44	44

5-10-10  
 Dawn McGuire  
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 No. 2280  
 Exp. 4-30-12  
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**LEGEND OF ROCK MATERIALS**

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

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		PREPARED BY: I. G-Remmen		<b>DEPARTMENT OF TRANSPORTATION</b>		<b>STRUCTURE DESIGN</b>		<b>SOLDIER PILE RW LOCATION 1</b>	
				BRIDGE NO. 04E0027		POST MILE 3.0		<b>LOG OF TEST BORINGS 6 OF 6</b>	
GS LOTB ROCK LEGEND		ORIGINAL SCALE IN INCHES FOR REDUCED PLANS		CU 01 EA 472201		DISREGARD PRINTS BEARING EARLIER REVISION DATES		REVISION DATES	
		0 1 2 3						SHEET 13 OF 13	

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