

**PUBLIC WORKS CONTRACT (Formal Bid)**

**Holman Highway 68/Highway 1 Roundabout Project**

THIS AGREEMENT, hereinafter referred to as the "Agreement", made and entered into this 11<sup>th</sup> day of MAY, 2016, by and between the CITY OF MONTEREY, a municipal corporation, hereinafter referred to as the "City", and GRANITE CONSTRUCTION COMPANY, hereinafter referred to as the "Contractor";

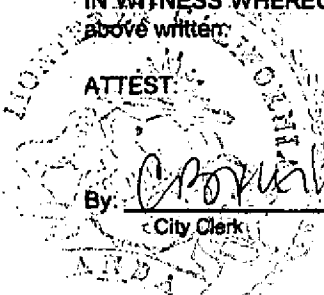
**WITNESSETH:**

WHEREAS, the Council of the City has awarded a contract to the Contractor for performing the work hereinafter described in accordance with the City's Plans and Specifications and Contractor's sealed proposal;

NOW, THEREFORE, IT IS AGREED AS FOLLOWS:

1. **SCOPE OF WORK.** The Contractor shall perform all of the work and furnish all labor, materials, equipment and transportation necessary for the **Holman Highway 68/Highway 1 Roundabout Project**. Work is to be as set out in the Plans and Specifications on file in the Office of the City Engineer and as in the Contractor's Proposal attached hereto, dated January 19, 2016, for the Total Base Bid (items 1 - 173) in an amount not to exceed **Six Million, Two Hundred Seven Thousand, Five Hundred Seventy Four Dollars and Twenty Three Cents (\$6,207,574.23)** plus a sum of up to \$515,612.77 for such contingencies as the City Manager, or his designee, deems appropriate.
2. **TIME OF PERFORMANCE.** The work under this contract shall be diligently prosecuted to completion before the expiration of two hundred and fifteen (215) working days beginning on the effective date stated in the Notice to Proceed.
3. If any provision in this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions will continue in full force without being impaired or invalidated in any way.
4. Contractor agrees that in the performance of this Agreement, it will comply with all applicable state, federal and local laws, codes and regulations. This Agreement shall be governed by and construed in accordance with the laws of the State of California and the City of Monterey.
5. In accordance with the provisions of Sections 1725.5, 1771.1, 1771.3, and 1771.4 of the Labor Code, this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined by that chapter of the Labor Code, unless currently registered and qualified to perform public work pursuant to Section 1725.5 of the Labor Code. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1735.5 at the time the contract is awarded.
6. The Monterey City Council awarded this contract on April 19, 2016 by Resolution 16-064 C.S.
7. This Agreement shall consist of this Public Works Contract document and the following items, all of which are on file in the office of the City Clerk and are incorporated herein and made a part hereof by reference:
  - A. Plans, Bid Book Special Provisions;  
Caltrans Standard Specifications (2010), and Caltrans Standard Plans (2010)
  - B. Accepted Proposal
  - C. Performance Bond
  - D. Payment Bond (labor and materials)
  - E. Non-Collusion Declaration
  - F. Debarment and Suspension Certification
  - G. Certification(s) of Good Faith Effort to Hire Local Residents

IN WITNESS WHEREOF, said Contractor and said City have hereunto set their hands, all on the day and year first above written:



ATTEST:  
By: [Signature]  
City Clerk

CITY OF MONTEREY:  
By: [Signature]  
City Manager, or his designee

GRANITE CONSTRUCTION COMPANY:  
By: [Signature]  
Authorized Signatory  
Kent H. Marshall, Vice President

T00012-CA (v. 2.2 - 9/18/2015)



**Book 1 of 2**



**CITY OF MONTEREY  
DEPARTMENT OF PLANS AND PUBLIC WORKS**

# **BID BOOK**

FOR

**FOR CONSTRUCTION ON STATE HIGHWAY  
IN MONTEREY COUNTY IN AND NEAR THE CITY OF MONTEREY**

**AT ROUTE 1/68 SEPARATION  
(SR 68 (HOLMAN HIGHWAY) ROUNDABOUT PROJECT)**

**In District 05 on Route 68 and Route 1**

**This is a Capital Improvement Project**

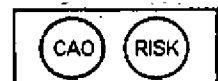
APPROVED:

CITY TRAFFIC ENGINEER

DATE: 12-2-2015

Master Revision: 01/02/15

Project Revision: November 2015



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**SR-68/HIGHWAY 1 ROUNDABOUT PROJECT**

**TABLE OF CONTENTS**

<b>NOTICE TO BIDDERS .....</b>	<b>1</b>
<b>PREVAILING WAGES .....</b>	<b>1</b>
<b>SPECIFICATIONS AND BID FORMS .....</b>	<b>2</b>
<b>BID BOND .....</b>	<b>2</b>
<b>BID VALIDITY .....</b>	<b>2</b>
<b>RESPONSIBLE BIDDER .....</b>	<b>2</b>
<b>BID REJECTION .....</b>	<b>3</b>
<b>UNBALANCED BID .....</b>	<b>3</b>
<b>INTERPRETATION OF SPECIFICATIONS .....</b>	<b>3</b>
<b>DEFINITIONS .....</b>	<b>3</b>
<b>GENERAL INFORMATION .....</b>	<b>4</b>
<b>PROPOSAL SCHEDULE OF QUANTITIES AND PRICES .....</b>	<b>6</b>
<b>BID SCHEDULE (BID ITEM LIST) .....</b>	<b>6</b>
<b>BID ITEM DESCRIPTIONS .....</b>	<b>12</b>
<b>ANCILLARY ITEMS .....</b>	<b>12</b>
<b>LUMP SUM PRICE BREAKDOWN .....</b>	<b>12</b>
<b>BID CLARIFICATION .....</b>	<b>13</b>
<b>BONDS .....</b>	<b>13</b>
<b>DECLARATION OF BIDDER RE: LICENSE QUALIFICATIONS .....</b>	<b>15</b>
<b>NONCOLLUSION AFFIDAVIT .....</b>	<b>17</b>
<b>DEBARMENT AND SUSPENSION CERTIFICATION .....</b>	<b>18</b>
<b>LOCAL HIRING REQUIREMENT .....</b>	<b>19</b>
<b>CERTIFICATION OF GOOD-FAITH EFFORT (PRIME CONTRACTOR) .....</b>	<b>20</b>
<b>CERTIFICATION OF GOOD-FAITH EFFORT (SUBCONTRACTOR) .....</b>	<b>21</b>
<b>BIDDER'S LIST OF SUBCONTRACTORS .....</b>	<b>22</b>

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**CITY OF MONTEREY  
DEPARTMENT OF PUBLIC WORKS  
MONTEREY, CALIFORNIA**

**NOTICE TO BIDDERS**

Sealed proposals will be received in the office of the City Clerk, attention Finance Director, 580 Pacific Street, Room 6, City of Monterey, California, until 2:00 p.m., **January 19, 2016** at which time they will be publicly opened and read in the City Council Chambers, for **constructing the State Route 68 (SR-68) (Holman Highway) Roundabout Project** in Monterey County, California, in accordance with these plans and specifications.

This work shall be diligently prosecuted to completion before the expiration of **215 WORKING DAYS** beginning on the date stated in the Notice to Proceed.

Plant Establishment (Type1) shall continue for 5 years (Calendar days) after completion of construction.

In general, the work consists of constructing a modern roundabout at the intersection of SR-68 and the southbound Highway 1 on/off ramps and a yield controlled intersection at 17 Mile Drive and the Highway 1 on Ramp.

At the time of the bid opening, the successful Bidder must be legally entitled to perform contracts requiring a Class A Contractor's license or a combination of Class C licenses that make up a majority of the work. Any Bidder or contractor not so licensed shall be subject to all penalties imposed by law including, but not limited to, any appropriate disciplinary action by the Contractors' State License Board.

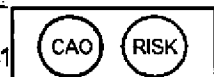
All electricians performing work under this contract, as defined as making electrical connections at or above 100 volt-amperes, shall be certified pursuant to Section 3099 et seq. of the California Labor Code. Contractor shall submit proof of certification, or proof that the requirements of Section 3099.4 (a) of the California Labor Code have been met, prior to electricians commencing work under this contract.

**PREVAILING WAGES**

Local prevailing wage rates shall be paid in accordance with Sections 1770, 1773, and 1782, as amended, of the California Labor Code, and Section 28-20(e) of the Monterey City Code, on all public works construction contracts exceeding twenty-five thousand dollars (\$25,000) and all public works contracts for alteration, demolition, repair or maintenance work exceeding fifteen thousand dollars (\$15,000). Local wage rates may be obtained from City of Monterey, Capital Projects Office, 353 Camino El Estero, Monterey, CA, (831-646-3997) or the Director, Department of Industrial Relations, State of California, 455 Golden Gate Avenue, San Francisco, California (415-703-4774). Any Bidder contractor awarded a public works contract that uses a craft or classification not in the general prevailing wage determinations may be required to pay the wage rate most closely related in the general determinations, effective at the time of the call for bids.

In accordance with the provisions of Sections 1725.5, 1771.1, 1771.3, and 1771.4 of the Labor Code, this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal (subject to the requirements of Section 4104 of the Public Contract Code), or engage in the performance of any contract for public work, as defined by that chapter of the Labor Code, unless currently registered and qualified to perform public work pursuant to Section 1725.5 of the Labor Code. **See Part IV of these Specifications for additional requirements.**

In accordance with the provisions of Section 1773.3 of the Labor Code, the City of Monterey shall provide notice to the Department of Industrial Relations (DIR) of the award of any public works contract subject to the requirements of Chapter 1 of the Labor Code, within five days of the award. The notice shall be



transmitted electronically in a format specified by the DIR (see <https://www.dir.ca.gov/pwc100ext/>) and shall include the name of the contractor, any subcontractor listed on the successful bid, the bid and contract award dates, the contract amount, the estimated start and completion dates, job site location, and any additional information the DIR specifies that aids in the administration and enforcement of this chapter.

### **SPECIFICATIONS AND BID FORMS**

Specifications, including instructions to Bidders and all necessary contract documents and forms, may be obtained at the office of the Administrative Services Center, Revenue Desk, 735 Pacific Street, City of Monterey, California for a fee of fifty dollars (\$50). Submit bid forms in sealed envelopes marked on the outside with time and date of bid opening and the work for which the bid is submitted.

### **BID BOND**

Cash, a certified check or cashier's check, payable to the order of the City of Monterey, or a satisfactory bid bond, in original form (no fax or photocopy shall be accepted), executed by the Bidder and an acceptable surety in an amount equal to ten percent (10%) of the bid amount shall be submitted with each bid.

### **BID VALIDITY**

No Bidder may withdraw their bid for a period of **ninety (90) days** from the date of opening of the bids for the purpose of reviewing the bids and investigating the qualifications of Bidders, prior to awarding of the contract.

### **RESPONSIBLE BIDDER**

Responsible bidder as it pertains to this contract shall be as follows:

1. **Standards of Responsibility:** The City may reject bids on the basis of non-responsibility. A responsible bidder is one that has the capacity in all respects to perform fully the contract requirements, and the integrity and reliability which will assure good faith performance of the contract. Factors to be considered in determining whether the standard of responsibility has been met include whether a bidder has:
  - a. The appropriate financial, material, equipment, facility, capacity (adequate workforce to complete the job in a timely fashion) and personnel resources, including all required certifications, licenses, and expertise necessary to indicate its capacity to meet all contractual requirements, including the following specific requirements:
    - i. Adequate workforce to meet multiple critical work schedules at once;
    - ii. Ability to start projects on the commencement dates set forth by the City and satisfactorily complete them within the City's stated time limits;
  - b. A satisfactory record of performance, including but not limited to any prior work performed by bidder for the City or other agency;
  - c. Adequate bonding and insurance capacity;
  - d. A satisfactory record of integrity, diligence, and professionalism in the specific contract work;
  - e. The legal qualifications to contract with the City; and
  - f. Supplied all information requested by the City in connection with the inquiry concerning responsibility.



2. Information Pertaining to Responsibility. The prospective contractor shall supply any information requested by the City concerning the responsibility of such contractor, including the qualifications and performance records of contractor's employees and proposed subcontractors. If the prospective contractor fails to supply the requested information, the City shall base the determination of responsibility in award of the Contract upon any available information, or may find the prospective contractor non-responsible on the basis of its failure to provide the requested information to the City.
3. The City's Duty Concerning Responsibility. Before awarding a contract, the City must be satisfied that the prospective contractor is responsible. The City may use the information provided by prospective contractor as well as information obtained from other legitimate sources, including City staff's own experience with the prospective contractor and prospective contractor's employees.
4. Written Determination of Non-responsibility Requirements. If a bidder or offeror who otherwise would have been awarded the Contract is found non-responsible, a written determination of non-responsibility setting forth the basis determination shall be prepared by the City and sent to the non-responsible bidder or offeror. The bidder or offeror shall have an opportunity to appeal the City's determination on non-responsibility.

### **BID REJECTION**

The City reserves the right to reject any or all bids as the best interests of the City may dictate and, to the extent permitted by law, waive any irregularity in any bid. If there is any reason for believing that collusion exists among the bidders, the City may reject any or all bids.

### **UNBALANCED BID**

Bids which are obviously unbalanced may be rejected. For the purposes of this section, an unbalanced bid is one that (a) has unit prices based on nominal prices for some items of work and enhanced unit prices for other items of work, and (b) the amount and manner in which the unit prices are distributed is not reflective of the true cost to perform the work. Any unbalanced bid may be rejected by the Public Works Director whether or not the result of the unbalanced bid increases the cost of the project to the City.

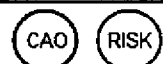
### **INTERPRETATION OF SPECIFICATIONS**

Should a Bidder be in doubt as to the true meaning of any item in the Plans or Specifications or should Bidder discover items containing discrepancies or omissions, the Engineer shall be immediately notified. All requests for interpretations must be submitted ninety-six (96) hours before bid opening. If found necessary, interpretation or correction will be made by written addendum, a copy of which will be sent to each plan holder. Such addenda are to be considered as part of the contract documents, and the Bidder shall acknowledge this condition by listing each addendum by number in his proposal. The Engineer shall not be held responsible for any oral interpretations or instructions. No addenda can be issued less than seventy-two (72) hours before bid opening without an accompanying bid time extension. The Engineer reserves the right to make decisions on extending the bid period. Please email questions and requests for information to [engineering-admin@monterey.org](mailto:engineering-admin@monterey.org).

### **DEFINITIONS**

For the purposes of this document, the following definitions shall apply:

- CITY**: The term City refers to and indicates the City of Monterey, Monterey County, State of California.
- ENGINEER OR** The term Engineer or City Engineer refers to and indicates the Public Works



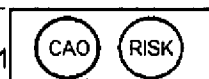


<u>CITY ENGINEER</u>	Director of the City of Monterey or his duly authorized representative.
<u>BIDDER:</u>	Party submitting a bid for consideration by the City of Monterey.
<u>CONTRACTOR:</u>	The term <u>Contractor</u> refers to and indicates the party or parties contracting to perform the work to be done in pursuance of this contract and specifications. The City Council of the City of Monterey.
<u>COUNCIL OR CITY COUNCIL:</u>	The City Council of the City of Monterey.
<u>PLANS:</u>	The project plans referred to herein.
<u>SPECIAL PROVISIONS:</u>	Part IV of these Specifications.
<u>SPECIFICATIONS:</u>	This document, in its entirety.
<u>STANDARD SPECIFICATIONS:</u>	Specifications entitled "State of California, Department of Transportation, Standard Specifications" of latest publication on file in the office of the City Clerk of the City of Monterey.
<u>STANDARD PLANS:</u>	Plans entitled "State of California, Department of Transportation, Standard Plans" of latest publication.

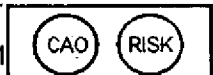
### GENERAL INFORMATION

Bids must be on a unit price basis. ***The amount of the bid for comparison purposes will be the total of all the base bid items and alternative bid items.*** The City retains the right to remove any and/or all Additive Alternatives to from the plans as they see fit.

The contract work shall begin on the date as stated in the Notice to Proceed issued by the City of Monterey.



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**SR-68 (Holman Highway) Roundabout Project**

**CITY OF MONTEREY**

**PROPOSAL SCHEDULE OF QUANTITIES AND PRICES**

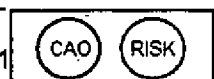
To the Honorable City Council  
City of Monterey  
City Hall  
Monterey, California

The undersigned declares to have carefully examined the location of the proposed work, that the Plans and Specifications as set forth herein have been examined, and hereby proposes to furnish all materials and equipment and do all the work required to complete the said work in accordance with said Plans and Specifications for the lump sums and unit prices set forth in the following schedule:

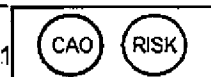
**BID SCHEDULE (BID ITEM LIST)**

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
1	027545	Remove Survey Monument	1	EA		
2	066105	Resident Engineer's Office	1	LS		
3	080050	Progress Schedule (Critical Path Method)	1	LS		
4	090105	Time Related Overhead (5%)	215	WDays		
5	120090	Construction Area Signs	1	LS		
6	120100	Traffic Control System	1	LS		
7	120120	Type III Barricade	74	EA		
8	120149	Temporary Pavement Marking (Paint)	3695	SF		
9	120159	Temporary Traffic Stripe (Paint)	21156	LF		
10	120165	Temporary Channelizer (Surface Mounted)	168	EA		
11	128601	Temporary Signal System	1	LS		
12	128650	Portable Changeable Message Sign	1	LS		
13	129000	Temporary Railing (Type K)	4120	LF		
14	129100	Temporary Crash Cushion Module	168	EA		
15	129110a	Temporary Alternative Crash Cushion System	5	EA		
16	130100	Job Site Management	1	LS		
17	130300	Prepare Storm Water Pollution Prevention Plan	1	LS		
18	130310	Rain Event Action Plan	45	EA		
19	130320	Storm Water Sampling and Analysis Day	45	EA		
20	130330	Storm Water Annual Report	2	EA		
21	130505	Move-in/Move-Out (Temporary Erosion Control)	2	EA		
22	130530	Temporary Hydraulic Mulch (Bonded Fiber Matrix)	2600	SQYD		

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
23	130610	Temporary Check Dam	450	LF		
24	130620	Temporary Drainage Inlet Protection	12	EA		
25	130710	Temporary Construction Entrance	2	EA		
26	130640	Temporary Fiber Rolls	1800	LF		
27	130660	Temporary Large Sediment Barrier	1900	LF		
28	130730	Street Sweeping	1	LS		
29	130900	Temporary Concrete Washout	1	LS		
30	141000	Temporary Fence (Type ESA)	3350	LF		
31	141103	Remove Yellow Thermoplastic Traffic Stripe (Hazardous Waste)	8105	LF		
32	141120	Treated Wood Waste	2178	LB		
33	150204	Abandon Culvert	172	LF		
34	150608	Remove Chain Link Fence	222	LF		
35	150668	Remove Flared End Section	6	EA		
36	150711	Remove Painted Traffic Stripe	11497	LF		
37	150712	Remove Painted Pavement Marking	1762	SQFT		
38	150714	Remove Thermoplastic Traffic Stripe	10675	LF		
39	150715	Remove Thermoplastic Pavement Marking	3071	SF		
40	150722	Remove Pavement Marker	1066	EA		
41	150742	Remove Roadside Sign	53	EA		
42	150768	Remove Asphalt Concrete Pavement (AC Ditch)	5	CY		
43	150771	Remove Asphalt Concrete Dike	1917	LF		
44	150772	Remove Curb	278	LF		
45	150801	Remove AC Overside Drain	11	LF		
46	150812	Remove Pipe	242	LF		
47	150820	Remove Inlet	9	EA		
48	150821	Remove Headwall	2	EA		
49	150826	Remove Manhole	1	EA		
50	150860	Remove Base and Surfacing	24	CY		
51	150630	Remove Marker (Type Q<CA>)	39	EA		
52	151296	Salvage Guardrail	393	LF		
53	152390	Relocate Roadside Sign	1	EA		
54	152438	Adjust Frame and Cover Grade	1	EA		
55	153215	Remove Concrete Curb and Gutter	1729	LF		
56	153103	Cold Plane Asphalt Concrete Pavement	1562	SQYD		
57	153121	Remove Concrete (Ditch)	26	CY		
58	160101	Clearing and Grubbing	1	LS		
59	160120	Remove Tree	10	EA		



Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
60	160120a	Remove Tree Stump	70	EA		
61(F)	190101	Roadway Excavation	7895	CY		
62	190107	Roadway Excavation ( Type Z-2) (Aerially Deposited Lead)	2171	CY		
63	190110	Lead Compliance Plan	1	LS		
64(F)	192037	Structure Excavation (Retaining Wall)	835	CY		
65(F)	193013	Structure Backfill (Retaining Wall)	465	CY		
66	200114	Rock Blanket (Cobble Median Treatment)	6301	SQFT		
67	200116	Gravel Mulch - Beach Pebbles	20	SQYD		
68	201023	Plant (Group K) (24" Box)	17	EA		
69	201024	Plant (Group K) (48" Box)	1	EA		
70	202006	Soil Amendment	18	CY		
71	202011	Wood Bark Mulch	115	CY		
72	202035	Fertilizer (Packet)	2434	EA		
73	204013	Plant (Group M) (LINER)	90	EA		
74	204035	Plant (Group A) (NO. 1)	1984	EA		
75	204036	Plant (Group B) (NO. 5)	143	EA		
76	204099	Plant Establishemnt (5 Years)	1	LS		
77	205062	Root Barrier	611	LF		
78	206005	Edging (Metal)	282	LF		
79	206562	1" Remote Control Valve	2	EA		
80	206570	Remote Control Valve (Master Valve with Flow Sensor)	1	EA		
81	206851	Master Irrigation Tubing	1	EA		
82	208222	1/2" Drip In-Line Tubing	4863	LF		
83	208301	Irrigation Controller Enclosure Cabinet	1	EA		
84	208310	Irrigation Sleeve	798	LF		
85	208421	Backflow Preventer Assembly Enclosure	1	EA		
86	208423	1" Backflow Preventer Assembly	1	EA		
87	208445	Tree Well Sprinkler Assembly	18	EA		
88	208450	1" Drip Valve Assembly	7	EA		
89	208598	1" Plastic Pipe (Schedule 40) (Main Line)	689	LF		
90	208598A	3/4" Plastic Pipe (Schedule 40) (Supply Line)	1807	LF		
91	208601	4" Schedule 40 HDPE Pipe Conduit	115	LF		
92	208738A	6" Corrugated High Density Polyethelene Conduit	814	LF		
93	209999A	1-GPH Drip Emitter	541	EA		
94	209999B	Imported Biofiltration Soil	66	CY		
95	209999C	1/2" Drip Irrigation Tubing	2845	LF		



Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
96	209999D	Dripline Flush Valves	15	EA		
97	209999E	Control & Neutral Conductors	1	LS		
98	210010	Move-In/Move-Out (Erosion Control)	2	EA		
99	210600	Compost	26233	SQFT		
100	210110	Imported Topsoil	1093	CY		
101	210270	RECEP (Netting)	26233	SQFT		
102	210430	Hydroseed	26233	SQFT		
103	260201	Aggregate Base (Class 2)	7794	CY		
104	377501	Slurry Seal	78	TON		
105	390132	Hot Mix Asphalt (Type A)	5148	TON		
106	394073	Place HMA Dike (Type A)	123	LF		
107	394075	Place HMA Dike (Type D)	89	LF		
108	394077	Place HMA Dike (Type F)	224	LF		
109	394077A	Place HMA Dike (Special)	301	LF		
110	394090	Place HMA (Miscellaneous Area)	52	SQYD		
111	397005	Tack Coat	5	TON		
112(F)	510060	Structural Concrete, Retaining Wall	234	CY		
113(F)	510502	Minor Concrete (Minor Structure) (Drainage)	33	CY		
114(F)	511035	Golden Granite Concrete Texture	3157	SQFT		
115(F)	511036	Modified Golden Granite Concrete Texture	356	SQFT		
116(F)	520103	Bar Reinforcing Steel (Retaining Wall)	36740	LB		
117(F)	560218	Furnish Sign Structure (Truss)	41220	LB		
118(F)	560219	Install Sign Structure (Truss)	41220	LB		
119	560248	Furnish Single Sheet Aluminum Sign (0.063" Unframed)	377	SF		
120	560249	Furnish Single Sheet Aluminum Sign (0.080" Unframed)	116	SF		
121	560251	Furnish Single Sheet Aluminum Sign (0.063" Framed)	204	SF		
122	560252	Furnish Single Sheet Aluminum Sign (0.080" Framed)	144	SF		
123	561005	60" Cast In Drilled Hole Concrete Pile (Sign Foundation)	45	LF		
124	566011	Roadside Sign - One Post	42	EA		
125	566012	Roadside Sign - Two Post	9	EA		
126	568001	Install Sign (Strap and Saddle Bracket Method)	8	EA		
127	568001A	Post Sleeve (Roadside Sign)	27	EA		
128	568016	Install Sign Panel on Existing Frame	18	EA		
129	650014	18" Reinforced Concrete Pipe	390	LF		

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
130	650018	24" Reinforced Concrete Pipe	342	LF		
131	665017	18" Corrugated Steel Pipe (0.079" Thick)	67	LF		
132(F)	682042	Class 2 Permeable Material	33	CY		
133	700617	Drainage Inlet Marker	14	EA		
134	705204	18" Concrete Flared End Section	1	EA		
135	705206	24" Concrete Flared End Section	1	EA		
136	707225	48" Precast Concrete Pipe Manhole	1	EA		
137	721015	Rock Slope Protection (Light, Method B)	5	CY		
138	721015A	Small Rock Slope Protection (3"-6" size cobble)	37	SQYD		
139	721015B	Small Rock Slope Protection- (6"-8" size cobble Check Dam)	4	SQYD		
140	729010	Rock Slope Protection Fabric (Class 8)	14	SY		
141	730070	Detectable Warning Surface	442	SF		
142	731504	Minor Concrete (Curb & Gutter)	133	CY		
143	731501	Minor Concrete (Curb)	55	CY		
144	731502	Minor Concrete (Misc. Construction)	4	CY		
145	731508	Minor Concrete (Exposed Aggregate Concrete)	25	CY		
146	731517	Minor Concrete (Gutter)	145	LF		
147	731519B	Minor Concrete (Truck Apron)	100	CY		
148	731519C	Minor Concrete (Central Island Curb)	28	CY		
149	731521	Minor Concrete (Sidewalk)	107	CY		
150	731623	Minor Concrete (Curb Ramp)	26	CY		
151	750001	Misc. Iron and Steel (Drainage)	3780	LB		
152	800360	Chain Link Fence (Type CL-6)	225	LF		
153	810111	Survey Monument (Type A)	3	EA		
154	820107	Delineator (Class 1)	22	EA		
155	820130	Object Marker	42	EA		
156	832007	Midwest Guard Rail System (Wood Post)	326	LF		
157	832007A	Stain Midwest Guard Railing and Alternative Terminals	67	LF		
158	832070	Vegetation Control (Minor Concrete)	213	SY		
159	833999A	Tubular Bicycle Railing	134	LF		
160(F)	839521	Cable Railing	145	LF		
161	839543	Transition Railing (Type WB-31)	3	EA		
162	839581	End Anchor Assembly (Type SFT)	4	EA		
163	839584	Alternative In-Line Terminal System	3	EA		

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
164(F)	839721	Concrete Barrier (Type 732A MOD)	134	LF		
165	840515	Thermoplastic Pavement Marking	3623	SF		
166	840504	4" Thermoplastic Traffic Stripe	23422	LF		
167	840505	6" Thermoplastic Traffic Stripe	863	LF		
168	840506	8" Thermoplastic Traffic Stripe	1847	LF		
169	850111	Pavement Marker (Retroreflective)	1062	EA		
170	860460	Lighting & Sign Illumination	1	LS		
171	860604	Flashing Beacon System	1	LS		
172	869999	Maintain Electrical System	1	LS		
173	999990	Mobilization (5%)	1	LS		

<b>TOTAL BASE BID</b>	\$
-----------------------	----

<b>Additive Alternatives</b>						
Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
1	869999a	Central Island Lighting	1	LS		
2	731519a	Minor Concrete (Colored Concrete)(Misc. Areas)	19295	SQFT		
3	590115A	Clean and Paint Structural Steel (Overhead Signs)	1	LS		
<b>TOTAL ADDITIVE ALTERNATIVES</b>						

<b>TOTAL BASE BID PLUS ALTERNATIVES</b>	\$
---	----

(F) Denotes Final Pay



## BID ITEM DESCRIPTIONS

This section covers details of individual items of the Bid Schedule to insure that it is clear as to what is to be included in each item. The costs submitted with each item are to reflect the work to be completed under that bid item only. Payment of all the following items shall be for actual materials installed on the job and for actual work accomplished.

### **Mobilization**

Measurement and payment for this item shall be on a lump sum (LS) basis. The lump sum cost shall pay for all the costs of mobilization and demobilization for items awarded. The work shall include, but not be limited to, preparatory and cleanup work necessary for performance of the work in accordance with the Standard Specifications, Plans and Specifications, and as directed by the Engineer. This item also includes the movement of construction personnel, equipment, supplies and incidentals to and from the project site, and all other work and operations, which must be incurred prior to the beginning of and after the end of construction work. This item shall also include obtaining bonds, insurance policies, licenses, and permits required by the contract documents, project meetings, coordination and all related administrative costs for this Project. Partial payment of this bid item shall be based on percent of this item completed and shall be contingent upon the Contractor's furnishing and the City's acceptance of: 1) the schedule of values, 2) the construction schedule, 3) Traffic Control Plans, 4) Quality Control Plan, 5) all submittals and shop drawings, 6) electrician certifications, 7) subcontractor's Certificate of Good Faith Effort to hire local, and 8) fringe benefit summary statement. Also included in this bid item is maintaining the project site, regular cleanup and final cleanup, temporary fencing and staging area, if any.

### **Traffic Control System**

Measurement and payment for this item shall be on a lump sum (LS) basis. The work shall include, but not be limited to, the furnishing of all labor, materials, tools, equipment, and incidentals necessary to maintain vehicular traffic for public use during performance of the work, including all related construction area sign placement and maintenance not separately measured and paid for. This work also includes the preparation, submittal and implementation of the traffic control plan(s), establishing traffic detour(s), traffic control device placement and maintenance, flagging, barriers, temporary drainage facilities, temporary access, temporary asphalt tapers, protection of adjacent existing improvements from damage or staining, removal of the detour(s) upon direction of the Engineer, and restoration of all areas affected by construction, maintenance, use, and removal of the detour in accordance with the Standard Specifications, Plans and Specifications, and as directed by the Engineer.

### **Record Drawings**

No separate measurement and payment shall be made for this item. Furnishing to the City a complete set of Record (As-Built) Drawings upon project completion shall be considered as an ancillary item.

### **FINAL PAY ITEMS**

Items designated with (F) are Final Pay items in accordance with Section 9, "Payment", of the Standard Specifications

### **ANCILLARY ITEMS**

Payment for any items that do not have instruction indicating where expenses for said items are to be accounted for are to be considered ancillary to the work and accounted for in every one of the lump sum or unit price items and no additional compensation will be allowed therefor.

### **LUMP SUM PRICE BREAKDOWN**

Immediately after award of the contract, the contractor shall submit a cost breakdown list to the Engineer for all Lump Sum Bid items. The list shall consist of major elements of work that make up the item and shall be used for determining progress pay estimates.

## **BID CLARIFICATION**

Award of contract, if any be made, shall be made to the Contractor with the lowest responsive responsible bid based on the Total Base Bid plus Additive Items taken in order up to the funding amount disclosed by City before the bid opening.

Pursuant to the provisions of the California Public Contract Code Section 20103.8, City reserves the option to award any or all the additive bid items in addition to the original contract after the lowest responsive responsible Bidder has been determined, should the City later obtain additional funding for additive alternatives not awarded with the original contract.

Unit and lump sum prices shall be for items in place, as shown on the Plans, including all labor, materials, equipment, taxes, and incidentals necessary for a complete job.

Whenever unit prices are required and there is an incorrect extension thereof, the unit price correctly extended shall prevail and the total bid shall be corrected to reflect the correct extension.

The foregoing quantities are approximate only, being given as a basis for comparison of bids, and the City of Monterey does not, expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of work by twenty-five percent (25%) or to omit portions of the work as may be deemed necessary by the Engineer.

Bidders may withdraw or revise their bid personally, or upon a written or telegraphic request, or by FAX (the City's FAX number is 646-3702), at any time prior to the hour set for the opening of bids, but not thereafter; however, the City shall not accept faxed copies of bid bonds, affidavits or any other documents where an original document or signature is required by these Specifications. Bids may not be withdrawn for the time period specified in **BID VALIDITY** of Part I.

## **BONDS**

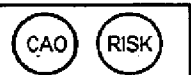
The Contractor, at the time of signing and executing the contract, shall execute and file with the City a performance bond to the satisfaction and approval of said City, in a sum of not less than one hundred percent (100%) of the amount of the contract conditional upon the faithful performance of the contract.

The Contractor, at the time of signing and executing any contract in excess of twenty-five thousand dollars (\$25,000), shall execute and file with the City a public works labor and materials bond to the satisfaction and approval of said City, in a sum of one hundred percent (100%) of the amount of the contract.

The Contractor, shall execute a separate Material and Labor Payment Bond and Performance Bond for plant establishment, issued by a corporate surety, in conformance with the requirements set forth in the contract documents, for the duration of the plant establishment period, a period of 5-calendar years (1,825 days), each for not less than one hundred percent (100%) of the contract price for landscape items. These bonds will be released upon completion of plant establishment.

The surety shall be an admitted carrier in California with a valid surety license and possess a minimum rating from A. M. Best Company of A-VII. The Surety and /or co-sureties must be listed as an acceptable surety on federal bonds by the United States Department of the Treasury, subject to the maximum amount shown in the listing. If co-sureties are used, their bonds shall be on a joint and several basis.

Notwithstanding the above, the Contractor may substitute adequate securities for any bond called for under the provisions of these Specifications as set forth in Public Contracts Code Section 22300. Alternate security substitutions shall be submitted to the City no later than ten (10) days after written notice that a contract has been awarded to the contractor to allow processing and escrow agreement for in lieu security.

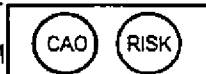


The Contractor shall submit the contract with his signature affixed thereto, required bonds or alternate security and evidence of insurance that conforms to the contract within fifteen (15) calendar days after written notice that a contract has been awarded to him.

The Contractor shall be required to submit additional performance and payment bond for project work orders more than one-hundred thousand dollars (\$100,000). Additional bonds shall be submitted within fourteen (14) calendar days after the execution of such work orders. Additional bonds shall be paid as percent of cost as described in Part II of these Specifications.

The Contractor shall maintain the faithful performance bond in full force and effect during the guarantee period for the purpose of insuring that said repairs or replacements will be made, or may, at the Contractor's option, replace said faithful performance bond for a similar bond in the amount of fifty percent (50%) of the total actual contract amount.

The Noncollusion Affidavit included in this document shall be executed and submitted with each bid. The Local Hire Certification included in this document shall be executed and submitted with each bid, except in the following cases: 1) informal bids (i.e., under \$60,000); 2) when a state or federal law or regulation applicable to a particular contract prohibits the provision of a local hire requirement; or 3) whenever the City, in accordance with the requirements of the City Code or state law, determines that the contract is necessary to respond to an emergency which endangers the public health, safety, or welfare; or 4) whenever the City determines that a suitable pool of persons providing specialized skills does not exist locally for a specific public works project.



**DECLARATION OF BIDDER  
RE: LICENSE QUALIFICATIONS**

Bidder certifies he/she posses a license in accordance with a State Act providing for the registration of Contractors. License No. : \_\_\_\_\_, Class: \_\_\_\_\_, Expiration date: \_\_\_\_\_.

Department of Industrial Relations Registration No. \_\_\_\_\_

**FAILURE TO PROVIDE THIS INFORMATION AND SIGNATURE MAY RESULT IN YOUR BID BEING DEEMED NON-RESPONSIVE OR WILL RESULT IN REJECTION OF BID.**

The foregoing information is true and correct and is executed under penalty of perjury in \_\_\_\_\_ County, California, ON \_\_\_\_\_, 201\_\_.

Name of Firm:

Address:

Telephone:

Email:

(If an individual, so state. If a firm or co-partnership, state the firm name and give the names of person authorized to execute the declaration on its behalf.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name and Title

The Bidder shall list below any and all addenda issued for this project. Failure to list issued addenda will result in a non-responsive bid:

<b>ADDENDA</b>	<b>DATE RECEIVED</b>
1. _____	_____
2. _____	_____
3. _____	_____

The Bidder shall list below jobs of a similar nature completed by Bidder's organization within the past three (3) years:

<b>Date Completed</b>	<b>Dollar Amount</b>	<b>Agency</b>	<b>Type Of Job</b>	<b>Contracting Location</b>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

The Bidder shall list below the name, the location of the place of business, and the California contractor license number of any subcontractors proposed to perform work or labor or render service on this project, or a subcontractor licensed by the State of California who will specially fabricate and install a portion of the work or improvement according to detailed drawings contained in the plans and specifications of this project, whose work is in excess of one-half of 1 percent of the Bidder's total bid or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of 1 percent of the Bidder's total bid or ten thousand dollars (\$10,000), whichever is greater:

<u>License No.</u>	<u>Trade</u>	<u>Subcontractor Name and Place of Business</u>



**NONCOLLUSION AFFIDAVIT**

**TO BE EXECUTED BY BIDDER, LEGALLY NOTARIZED AND SUBMITTED WITH BID**

State of California )  
 ) ss.  
County of \_\_\_\_\_ )

\_\_\_\_\_ being first duly sworn, deposes and says that he or she is \_\_\_\_\_ of \_\_\_\_\_, the party making the foregoing bid; that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived or agreed with any Bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the Bidder or any other Bidder, or to fix any overhead, profit, or cost element of the price bid, or of that of any other Bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the Bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid; and that the bid is not made in the interest of, or on behalf of, any member of the Monterey City Council or any City officer or employee.

Signed: \_\_\_\_\_

State of \_\_\_\_\_ )  
 ) ss.  
County of \_\_\_\_\_ )

On \_\_\_\_\_ before me, \_\_\_\_\_  
Date Name and Title of the Officer

personally appeared \_\_\_\_\_  
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity (ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the persons(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

(seal)

\_\_\_\_\_  
Notary's Signature

### DEBARMENT AND SUSPENSION CERTIFICATION

The Bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any state, federal, or local agency;
- Has not been suspended, debarred, voluntarily excluded or determined ineligible by any state, federal, or local agency within the past 3 years;
- Does not have a proposed debarment pending; and
- Has not be indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessarily result in denial of award, but will be considered in determining Bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions.

I declare under penalty of perjury that the foregoing is true and correct and that this certification is signed this \_\_\_\_\_ day of \_\_\_\_\_, 201\_\_ in \_\_\_\_\_ County, California.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name and Title



## LOCAL HIRING REQUIREMENT

All Contractors who submit bids, or proposals, to construct or provide work on any City of Monterey Public Works project, or for any other Public Works construction, or improvement, on City property must comply with Monterey City Code Article 2 of Chapter 28, which sets forth the requirements regarding the Local Hiring Requirement for Public Works Projects. A copy of Monterey's Local Hiring Requirement Ordinance is available at the City Clerk's Office; Bidders are responsible for familiarizing themselves with the contents thereof before signing the certifications required below.

Among other requirements, this ordinance requires the Contractor to promise to make a good-faith effort to hire qualified individuals who are residents of the Monterey Bay Area (Monterey, Santa Cruz and San Benito Counties), in sufficient numbers so that no less than fifty percent (50%) of the Contractor's total construction work force, including subcontractor work force, measured in labor work hours, is comprised of Monterey Bay area residents. This same requirement applies to all subcontractors.

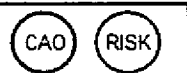
Every Bidder must complete and sign under penalty of perjury a Certification of Good-Faith effort to Hire Monterey Bay Area Residents, on the form provided, and submit said Certification with the sealed bid no later than the date and time of the bid opening. Bidder shall attach to the Certification documentary evidence supporting Bidder's promise to meet, or to make a good-faith effort to meet, the local hiring goal.

Contractor shall include in each and every subcontract relating to the project the requirement that the subcontractor promises to make a good faith effort to hire qualified individuals who are residents of the Monterey Bay Area. Contractor shall be responsible for subcontractor's compliance.

Prior to submitting bids, Bidders shall ensure that any and all subcontractors listed in their bids are not disqualified at that time pursuant to Section 28-78 of the City ordinance referenced above. Prospective contractors may consult the list, available from the City Clerk, of contractors and subcontractors, if any, who are currently disqualified.

The local hiring requirement shall not apply under the following circumstances:

- (a) Whenever a state or federal law or regulation applicable to a particular contract prohibits the provisions of a local hire requirement; or
- (b) Whenever the City, in accordance with the requirements of the Code or state law, determines that the contract is necessary to respond to an emergency which endangers the public health, safety, or welfare; or
- (c) Whenever the City determines that a suitable pool of person providing specialized skills (an example would be marine-related pile drivers) does not exist locally for a specific public works project.





**CERTIFICATION OF GOOD-FAITH EFFORT (PRIME CONTRACTOR)**

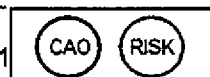
**To Hire Monterey Bay Area Residents  
(Prime Contractor – To be Submitted with Bid)**

I, \_\_\_\_\_, a licensed contractor, or responsible managing officer, of the company known as \_\_\_\_\_, do hereby certify, under penalty of perjury, that I have met, or made a good-faith effort to meet, the requirements set forth in Monterey City Code Article 2 of Chapter 28. Further, I certify that during the performance of the contract, I shall keep an accurate record on a standardized form showing the name, place or residence, trade classification, hours employed, proof of qualified individual status, per diem wages and benefits of each person employed by the company on the specific public works project, including full-time, part-time, permanent, and temporary employees, and provide such records to the City upon request, within five working days. I understand that I am responsible for insuring that any subcontractor working under my direction, complies with this ordinance, including submitting a Certification of Good Faith Effort to Hire Monterey Bay Residents, and to keeping accurate records as described above.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name and Title

\_\_\_\_\_  
Date



**CERTIFICATION OF GOOD-FAITH EFFORT (SUBCONTRACTOR)**

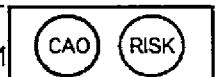
**To Hire Monterey Bay Area Residents  
(Subcontractor – To be Completed by Subcontractor After Bid is Awarded)**

I, \_\_\_\_\_, a licensed contractor, or responsible managing officer, of the company known as \_\_\_\_\_ do hereby certify, under penalty of perjury, that I have met, or made a good-faith effort to meet, the requirements set forth in Monterey City Code Article 2 of Chapter 28. Further, I certify that during the performance of the contract, I shall keep an accurate record on a standardized form showing the name, place or residence, trade classification, hours employed, proof of qualified individual status, per diem wages and benefits of each person employed by the contractor on the specific public works project, including full-time, part-time, permanent, and temporary employees, and provide such records to the City upon request, within five working days. I understand that I am responsible for insuring that any subcontractor working under my direction, complies with this ordinance, including submitting a Certification of Good Faith Effort to Hire Monterey Bay Residents, and to keeping accurate records as described above.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name and Title

\_\_\_\_\_  
Date



### BIDDER'S LIST OF SUBCONTRACTORS

The Bidder must identify each subcontractor performing work in an amount in excess of ½ of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.). Complete columns 1 through 6 and submit with the bid. Failure to provide complete information in columns 1 through 6 will result in a nonresponsive bid.

Column 1: Business Name and Location	Column 2: Ca Contractor License No.	Column 3: DIR No.*	Column 4: Bid Item Nos.	Column 5: % of Bid Item Subcontracted	Column 6: Description of Subcontracted Work

\* Department of Industrial Relations registration number



**CITY OF MONTEREY  
DEPARTMENT OF PLANS AND PUBLIC WORKS**

# **SPECIAL PROVISIONS**

**FOR CONSTRUCTION ON STATE HIGHWAY  
IN MONTEREY COUNTY IN AND NEAR THE CITY OF MONTEREY**

**AT ROUTE 1/68 SEPARATION  
(SR 68 (HOLMAN HIGHWAY) ROUNDABOUT PROJECT)**

**In District 05 on Route 68 and Route 1**

---

**Bld Book Dated: November 2, 2015 Caltrans Standard Specifications dated 2010  
Project Plans Approved: October 2015 Caltrans Standard Plans dated 2010**

---

**Identified by**

**CONTRACT NO. 37C1450C4**

**City of Monterey  
Public Works Department  
580 Pacific Street  
Monterey, CA 93904  
(831) 646-3920**

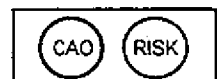
**APPROVED:**

  
CITY TRAFFIC ENGINEER

**DATE:**

12-2-2015

Project Specification Revision Nov. 2015



# SPECIAL NOTICES

- The Department has revised its HMA specifications to the Superpave design method. See section 39 of the RSS.
- See section 2-1.03 for mandatory prebid meeting requirements.
- This project has a special bid opening date and time. See the *Notice to Bidders* for details.
- See sections 2 and 3 for contractors' registration requirements.
- DBE requirements have been revised. See sections 2, 3, and 5 in the RSS and DBE forms in the *Bid* book for the revised requirements.
- This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Attention is directed to Section 2-1.33 and Section 7-1.02K(3) for bid requirements and to make electronic payroll submittals to the Department of Industrial Relations Compliance Monitoring Unit.



# Holman Highway 68 / Highway 1 Roundabout Project

## Contract No. 37C1450C4

DESIGN OVERSIGHT APPROVAL	REGISTRATION NO.	DATE
PRINTED NAME SIGNATURE <b>JOHN FOUCHÉ</b> <i>John Fouché</i>	<b>C 59472</b>	<b>12-2-15</b>

Complete for projects prepared by consultants or local agencies only.

Approved as to impact on State facilities and conformance with applicable State standards and practices as described in the A&E Consultant Services manual

The special provisions contained herein have been prepared by or under the direction of the following Registered Persons.

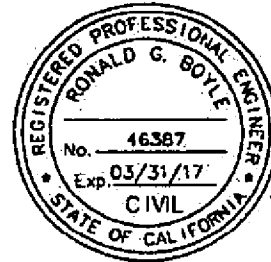
### STRUCTURES

*Shawn Cullers*  
 \_\_\_\_\_  
 SHAWN CULLERS  
 REGISTERED STRUCTURAL ENGINEER



### ROADWAY

*Ronald G. Boyle*  
 \_\_\_\_\_  
 RONALD G. BOYLE  
 REGISTERED CIVIL ENGINEER



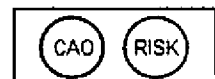
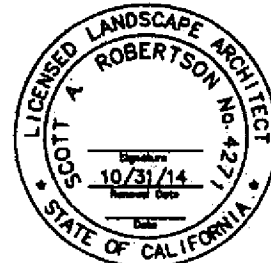
### ELECTRICAL

*Joseph P. Weiland*  
 \_\_\_\_\_  
 JOSEPH WEILAND  
 REGISTERED CIVIL ENGINEER



### LANDSCAPING

*Scott A. Robertson*  
 \_\_\_\_\_  
 SCOTT ROBERTSON  
 REGISTERED LANDSCAPE ARCHITECT



**Table of Contents**

**DIVISION I GENERAL PROVISIONS**..... 1

1 GENERAL..... 1

2 BIDDING..... 3

3 CONTRACT AWARD AND EXECUTION..... 5

5 CONTROL OF WORK..... 11

6 CONTROL OF MATERIALS..... 13

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC..... 14

8 PROSECUTION AND PROGRESS..... 18

9 PAYMENT..... 19

**DIVISION II GENERAL CONSTRUCTION**..... 20

10 GENERAL..... 20

12 TEMPORARY TRAFFIC CONTROL..... 21

13 WATER POLLUTION CONTROL..... 43

14 ENVIRONMENTAL STEWARDSHIP..... 43

15 EXISTING FACILITIES..... 51

**DIVISION III GRADING**..... 54

16 CLEARING AND GRUBBING..... 54

18 DUST PALLIATIVE..... 54

19 EARTHWORK..... 55

20 LANDSCAPE..... 55

21 EROSION CONTROL..... 58

**DIVISION V SURFACINGS AND PAVEMENTS**..... 61

39 HOT MIX ASPHALT..... 61

40 CONCRETE PAVEMENT..... 61

**DIVISION VI STRUCTURES**..... 63

49 PILING..... 63

51 CONCRETE STRUCTURES..... 64

56 SIGNS..... 64

59 PAINTING..... 65

**DIVISION VIII MISCELLANEOUS CONSTRUCTION**..... 67

72 SLOPE PROTECTION..... 67

73 CONCRETE CURBS AND SIDEWALKS..... 67

**DIVISION IX TRAFFIC CONTROL FACILITIES**..... 69

83 RAILINGS AND BARRIERS..... 69

84 TRAFFIC STRIPES AND PAVEMENT MARKINGS..... 72

86 ELECTRICAL SYSTEMS..... 74

**DIVISION X MATERIALS**..... 84

90 CONCRETE..... 85

REVISED STANDARD SPECIFICATIONS DATED 10-30-15..... 81

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## STANDARD PLANS LIST

The standard plan sheets applicable to this Contract include those listed below. The applicable revised standard plans (RSPs) listed below are included in the project plans.

### ABBREVIATIONS, LINES, SYMBOLS AND LEGEND

A10A	Abbreviations (Sheet 1 of 2)
RSP A10B	Abbreviations (Sheet 2 of 2)
A10C	Lines and Symbols (Sheet 1 of 3)
A10D	Lines and Symbols (Sheet 2 of 3)
A10E	Lines and Symbols (Sheet 3 of 3)

### PAVEMENT MARKERS, TRAFFIC LINES, AND PAVEMENT MARKINGS

A20A	Pavement Markers and Traffic Lines, Typical Details
A20B	Pavement Markers and Traffic Lines, Typical Details
RSP A20C	Pavement Markers and Traffic Lines, Typical Details
A20D	Pavement Markers and Traffic Lines, Typical Details
RSP A24A	Pavement Markings - Arrows
A24B	Pavement Markings - Arrows and Symbols
RSP A24C	Pavement Markings - Symbols and Numerals
A24D	Pavement Markings - Words
RSP A24E	Pavement Markings - Words, Limit and Yield Lines
RSP A24F	Pavement Markings - Crosswalks

### EXCAVATION AND BACKFILL

A62A	Excavation and Backfill - Miscellaneous Details
A62B	Limits of Payment for Excavation and Backfill - Bridge Surcharge and Wall
A62D	Excavation and Backfill - Concrete Pipe Culverts
A62F	Excavation and Backfill - Metal and Plastic Culverts

### OBJECT MARKERS, DELINEATORS, CHANNELIZERS AND BARRICADES

A73A	Object Markers
A73B	Markers
A73C	Delineators, Channelizers and Barricades

### SURVEY MONUMENTS

A74	Survey Monuments
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### MIDWEST GUARDRAIL SYSTEM STANDARD RAILING SECTIONS

RSP A77L1	Midwest Guardrail System Standard Railing Section (Wood Post with Wood Block)
RSP A77L3	Metal Beam Guard Railing Reconstruct Installation
RSP A77M1	Midwest Guardrail System Standard Hardware
RSP A77N1	Midwest Guardrail System Wood Post and Wood Block Details
RSP A77N3	Midwest Guardrail System Typical Line Post Embedment and Hinge Point Offset Details
RSP A77N4	Midwest Guardrail System Typical Railing Delineation and Dike Positioning Details

### MIDWEST GUARDRAIL SYSTEM TYPICAL VEGETATION CONTROL

RSP A77N5	Midwest Guardrail System Typical Vegetation Control Standard Railing Section
RSP A77N6	Midwest Guardrail System Typical Vegetation Control for Terminal System End Treatments
RSP A77N8	Midwest Guardrail System Typical Vegetation Control at Fixed Object

### MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR EMBANKMENTS

RSP A77P1	Midwest Guardrail System Typical Layouts for Embankments
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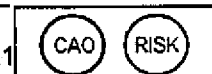
### MIDWEST GUARDRAIL SYSTEM TYPICAL LAYOUTS FOR FIXED OBJECTS

RSP A77R3	Midwest Guardrail System Typical Layouts for Roadside Fixed Objects
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### MIDWEST GUARDRAIL SYSTEM END ANCHORAGE AND RAIL TENSIONING ASSEMBLY

RSP A77S1	Midwest Guardrail System End Anchor Assembly (Type SFT)
RSP A77S2	Midwest Guardrail System Rail Tensioning Assembly
RSP A77S3	Metal Railing Anchor Cable and Anchor Plate Details
RSP A77T1	Metal Railing End Anchor Assembly (Type CA)
RSP A77T2	Midwest Guardrail System Buried Post End Anchor

### MIDWEST GUARDRAIL SYSTEM CONNECTION DETAILS AND TRANSITION



**RSP A77U4  
RSP A77U5**

**Midwest Guardrail System Transition Railing (Type WB-31)  
Midwest Guardrail System Transition to Metal Beam Guardrail  
FENCES**

**RSP A85  
A85A  
RSP A85B**

**Chain Link Fence  
Chain Link Fence Details  
Chain Link Fence Details**

**CURBS, DRIVEWAYS, DIKES, CURB RAMPS AND ACCESSIBLE PARKING**

**RSP A87A  
RSP A87B  
RSP A88A  
RSP A88B**

**Curbs and Driveways  
Hot Mix Asphalt Dikes  
Curb Ramp Details  
Curb Ramp and Island Passageway Details**

**DRAINAGE INLETS, PIPE INLETS AND GRATES**

**D71  
RSP D73  
D74C  
D75B  
D75C  
RSP D77A  
RSP D77B**

**Drainage Inlet Markers  
Drainage Inlets  
Drainage Inlet Details  
Concrete Pipe Inlets  
Pipe Inlets - Ladder and Trash Rack Details  
Grate Details No. 1  
Grate Details No. 2**

**GUTTER AND INLET DEPRESSIONS**

**D78A  
D78B  
D78C**

**Gutter Depressions  
Inlet Depressions - Concrete Shoulders  
Inlet Depressions - Hot Mix Asphalt Shoulders**

**PIPE DOWNDRAINS, ANCHORAGE SYSTEMS AND OVERSIDE DRAINS**

**D87A  
D87D**

**Corrugated Metal Pipe Downdrain Details  
Overside Drains**

**PIPE CULVERT HEADWALLS, ENDWALLS, WINGWALLS AND JUNCTION  
STRUCTURE**

**D89  
D91A  
D91B**

**Pipe Culvert Headwalls - Straight and "L"  
Cast-In-Place Reinforced Concrete - Junction Structure  
Cast-In-Place Reinforced Concrete - Junction Structure**

**PIPE RISER AND DRAINAGE INLET RISER CONNECTIONS**

**D93A  
D93B  
D93C**

**Pipe Riser Connections  
Drainage Inlet Riser Connections  
Pipe Riser with Debris Rack Cage**

**FLARED END SECTIONS**

**D94B**

**Concrete Flared End Sections**

**PIPE COUPLING AND JOINT DETAILS**

**D97G  
D97H**

**Corrugated Metal Pipe Coupling Details No. 7 - Downdrain  
Reinforced Concrete Pipe or Non-Reinforced Concrete Pipe - Standard and  
Positive Joints**

**SLOTTED AND GRATED LINE DRAINS**

**D98A  
D98B**

**Slotted Corrugated Steel Pipe Drain Details  
Slotted Corrugated Steel Pipe Drain Details**

**LANDSCAPE AND EROSION CONTROL**

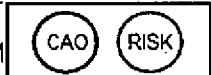
**RSP H1  
RSP H2  
H3  
RSP H4  
RSP H5  
RSP H6  
RSP H7  
RSP H8  
RSP H9  
RSP H9A  
H10  
H52**

**Landscape and Erosion Control Abbreviations  
Landscape and Erosion Control Symbols  
Landscape Details  
Landscape Details  
Landscape Details  
Landscape Details  
Landscape Details  
Landscape Details  
Landscape Details  
Landscape Details  
Landscape Details  
Landscape Details  
Irrigation Controller Enclosure Cabinet  
Rolled Erosion Control Product**

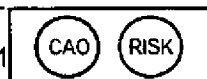
**TEMPORARY CRASH CUSHIONS, RAILING AND TRAFFIC SCREEN**

**T1A**

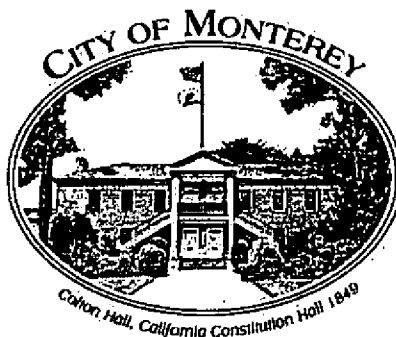
**Temporary Crash Cushion, Sand Filled (Unidirectional)**



T1B	Temporary Crash Cushion, Sand Filled (Bidirectional)
T2	Temporary Crash Cushion, Sand Filled (Shoulder Installations)
T3A	Temporary Railing (Type K)
T3B	Temporary Railing (Type K)
T5	Temporary Terminal Section (Type K)
<b>TEMPORARY TRAFFIC CONTROL SYSTEMS</b>	
RSP T9	Traffic Control System Tables for Lane and Ramp Closures
RSP T10	Traffic Control System for Lane Closure on Freeways and Expressways
RSP T10A	Traffic Control System for Lane Closures on Freeways and Expressways
RSP T13	Traffic Control System for Lane Closure on Two Lane Conventional Highways
RSP T14	Traffic Control System for Ramp Closure
<b>TEMPORARY WATER POLLUTION CONTROL</b>	
T53	Temporary Water Pollution Control Details (Temporary Cover)
T54	Temporary Water Pollution Control Details (Temporary Erosion Control Blanket)
T55	Temporary Water Pollution Control Details (Temporary Erosion Control Blanket)
T56	Temporary Water Pollution Control Details (Temporary Fiber Roll)
T57	Temporary Water Pollution Control Details (Temporary Check Dam)
T58	Temporary Water Pollution Control Details (Temporary Construction Entrance)
T59	Temporary Water Pollution Control Details (Temporary Concrete Washout Facility)
T61	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
T62	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
T63	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
T64	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
T65	Temporary Water Pollution Control Details [Temporary Fence (Type ESA)]
T66	Temporary Water Pollution Control Details (Temporary Large Sediment Barrier)
<b>BRIDGE DETAILS</b>	
B0-3	Bridge Details
<b>RETAINING WALLS</b>	
RSP B3-1A	Retaining Wall Type 1 (Case 1)
RSP B3-1B	Retaining Wall Type 1 (Case 2)
B3-6	Retaining Wall Details No. 2
<b>CHAIN LINK RAILING, CABLE RAILING AND TUBULAR HAND RAILING</b>	
RSP B11-47	Cable Railing
<b>BRIDGE CONCRETE BARRIERS</b>	
RSP B11-55	Concrete Barrier Type 732
<b>ROADSIDE SIGNS</b>	
RS1	Roadside Signs, Typical Installation Details No. 1
RS2	Roadside Signs - Wood Post, Typical Installation Details No. 2
RS4	Roadside Signs, Typical Installation Details No. 4
<b>OVERHEAD SIGNS (LIGHTWEIGHT)</b>	
<b>OVERHEAD AND ROADSIDE SIGNS PANELS</b>	
S81	Overhead Laminated Sign - Single or Multiple Panel, Type A (1" Thick)
S87	Type A-1 Mounting Hardware - Overhead Laminated Type A Panel, Truss and Lightweight Sign Structures
S93	Framing Details for Framed Single Sheet Aluminum Signs, Rectangular Shape
S94	Roadside Framed Single Sheet Aluminum Signs, Rectangular Shape
S95	Roadside Single Sheet Aluminum Signs, Diamond Shape
<b>ELECTRICAL SYSTEMS - LEGEND AND ABBREVIATIONS</b>	
RSP ES-1A	Electrical Systems (Legend and Abbreviations)
RSP ES-1B	Electrical Systems (Legend and Abbreviations)
RSP ES-1C	Electrical Systems (Legend and Abbreviations)
<b>ELECTRICAL SYSTEMS - SERVICE EQUIPMENT AND WIRING DIAGRAMS</b>	
ES-2A	Electrical Systems (Service Equipment)
ES-2C	Electrical Systems (Service Equipment Notes, Type III Series)
ES-2D	Electrical Systems (Service Equipment Enclosure and Typical Wiring Diagram, Type III - A Series)
<b>ELECTRICAL SYSTEMS - CONTROLLER CABINETS</b>	
ES-3A	Electrical Systems (Controller Cabinet Details)
ES-3B	Electrical Systems (Controller Cabinet Adapter Details)



<b>ES-3C</b>	<b>Electrical Systems (Controller Cabinet Foundation Details)</b>
	<b>ELECTRICAL SYSTEMS - IRRIGATION CONTROLLER ENCLOSURE CABINET</b>
<b>ES-3H</b>	<b>Electrical Systems (Irrigation Controller Enclosure Cabinet)</b>
	<b>ELECTRICAL SYSTEMS - LIGHTING STANDARDS</b>
<b>ES-6A</b>	<b>Electrical Systems (Lighting Standard, Types 15 and 21)</b>
<b>ES-6B</b>	<b>Electrical Systems (Electroler Anchorage and Grouting for Types 15 and 21, Barrier Rail Mounted)</b>
	<b>ELECTRICAL SYSTEMS - FLASHING BEACONS</b>
<b>RSP ES-7J</b>	<b>Electrical Systems (Flashing Beacon on a Type 1, Type 15-FBS and Type 40 Standard)</b>
	<b>ELECTRICAL SYSTEMS - PULL BOX</b>
<b>RSP ES-8A</b>	<b>Electrical Systems (Non-Traffic Pull Box)</b>
<b>RSP ES-8B</b>	<b>Electrical Systems (Traffic Pull Box)</b>
	<b>ELECTRICAL SYSTEMS - ISOFOOTCANDLE DIAGRAMS AND FOUNDATION DETAILS</b>
<b>RSP ES-10A</b>	<b>Electrical Systems (Isofootcandle Diagrams)</b>
<b>RSP ES-10B</b>	<b>Electrical Systems (Isofootcandle Diagrams)</b>
<b>RSP ES-11</b>	<b>Electrical Systems (Foundation Installations)</b>
	<b>ELECTRICAL SYSTEMS - SPLICING, FUSE RATING, KINKING AND BANDING DETAILS</b>
<b>ES-13A</b>	<b>Electrical Systems (Splicing Details)</b>
<b>ES-13B</b>	<b>Electrical Systems (Fuse Rating, Kinking and Banding Detail)</b>



**CITY OF MONTEREY  
PUBLIC WORKS DEPARTMENT**

**SPECIAL PROVISIONS**

**SR-68 (Holman Highway) Roundabout Project**

The work embraced herein shall be done in accordance with the Standard Specifications dated May 2010 and the Standard Plans dated May 2010 of the California Department of Transportation insofar as the same may apply, and these special provisions.

In case of conflict between the Standard Specifications and these special provisions, the special provisions shall take precedence over and shall be used in lieu of the conflicting portions.

\*\*\*\*\*

**DIVISION I GENERAL PROVISIONS**

**1 GENERAL**

**Add to section 1-1.01:**

Wherever, in the special provisions and standard specifications, the words State of California, State, or Department are used, they shall be understood to mean – The City of Monterey, Located in Monterey County, California; also sometimes referred to as “City”. Any reference therein to the State of California or a State agency, office or officer shall be interpreted to refer the City or it’s corresponding agency, office or officer acting under this contract, unless otherwise specified. Wherever, in the special provisions and standard specifications, the words Engineer, they shall be understood to mean – The City of Monterey acting either directly or through properly authorized agent and consultants.

Wherever, in the special provisions and standard specifications, the words requirements, conditions, provisions and laws that are applicable to the State of California rather than the City of Monterey– Said references shall be construed as references to any corresponding requirements, conditions, provisions and laws which are applicable to the City of Monterey .

**Add to section 1-1.01:****Bid Items and Applicable Sections**

Item code	Item description	Applicable section
066105	Resident Engineer's Office	10
129110A	Temporary Crash Cushion (Type ABSORB 350)	12
160120A	Remove Tree Stump	16
190107A	Hazardous Material Disposal (Type Z-2) (Aerially Deposited Lead)	19
208598A	3/4" Plastic Pipe (Schedule 40) (Supply Line)	20
208738A	6" Corrugated High Density Polyethylene Conduit	20
209999A	1-GPH Drip Emitter	20
209999B	Imported Biofiltration Soil	20
209999C	1/2" Drip Line Tubing	20
209999D	Dripline Flush Valves	20
209999E	Control & Neutral Conductors	20
394077A	Place HMA Dike (Special)	39
568001A	Post Sleeve (Roadside Sign)	56
650000A	12" Reinforced Concrete Pipe	65
721015A	Small Rock Slope Protection	72
731519B	Minor Concrete (Truck Apron)	73
731519C	Minor Concrete (Central Island Curb)	73
833999A	Tubular Bicycle Railing	83

**Replace the 6th paragraph in section 1-1.05 with:**

A Department not specified as a federal or California department is a City department.

**Add to section 1-1.07B:**

**Advertisement:** The published notice inviting sealed bids for the construction of the project.

**Caltrans:** The State of California, Department of Transportation.

**City:** The City of Monterey, located in Monterey County, California.

**City Council:** The City Council of the City of Monterey, located in Monterey County, California.

**Replace the following definitions in section 1-1.07B with:**

**Department:** Department of Public Works, City of Monterey.

**Labor Surcharge and Equipment Rental Rates:** Caltrans publication that lists labor surcharge and equipment rental rates.

**State:** The City of Monterey, located in Monterey County, California.

**Structure Design:** Caltrans Offices of Structure Design.

**Replace the 1st paragraph in section 1-1.12 with:**

Make checks and bonds payable to the City of Monterey

\*\*\*\*\*

## 2 BIDDING

**Replace section 2-1.03 with:**

**2-1.03 PREBID MEETING**

The Department will conduct a prebid meeting for this contract. The purpose of the meeting is to provide small businesses the opportunity to meet and interact with prospective bidders and increase their participation in the performance of contracts.

Each bidder is encouraged to attend the prebid meeting.

A sign-up sheet is used to identify each prospective bidder. Each bidder is requested to include the name and title of the company representative attending the prebid meeting. The Department may hold a single prebid meeting for more than 1 contract. Sign the sign-up sheet for the contract you intend to bid on. If you are bidding on multiple contracts, sign each sign-up sheet for each contract you intend to bid on.

**Replace the 2nd paragraph in section 2-1.06A with:**

The *Notice to Bidders and Special Provisions* and project plans may be viewed at the location specified in the Notice to Bidders.

**Replace the 3rd paragraph in section 2-1.06A with:**

The *Bid* books may be obtained at the location specified in the Notice to Bidders.

**Add to section 2-1.06B:**

The Department makes the following supplemental project information available:

**Supplemental Project Information**

Means	Description
Available for inspection at: Administrative Services Center, Revenue Desk, 735 Pacific Street City of Monterey, CA 93940	Cross sections Geotechnical Report Hazardous Materials Report Storm Water Data Report Caltrans Encroachment Permit
Available for inspection at: Administrative Services Center, Revenue Desk, 735 Pacific Street City of Monterey, CA 93940	Final Environmental Document Final Environmental Document and CEQA Addendum

**Delete section 2-1.15.**

**Delete section 2-1.18.**

**Replace the 2nd and 3rd paragraphs in Section 2-1.33A with:**

On the Subcontractor List, submit the percentage of each bid item subcontracted with your bid.

No contractor or subcontractor may be listed on a bid for a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

**Replace Section 2-1.33B with**

The proposal shall be made upon the form provided in the bid book therefor with all items filled out. The completed form must be without interlineations, alterations, or erasures. All submitted documents must be in original form (no photocopies or faxes).

For a unit price based bid, the Department compares bids based on the sum of the item totals.

For bids with Add Alternates, the Department compares bids based on the sum of the base bid and add alternates.

**Replace Section 2-1.34 with**

Each bid shall be accompanied by cash, a cashier's check, a certified check, or a bidder's bond executed by the bidder and an acceptable surety in original form, or any negotiable instruments in original form that are not cancelable amounting to ten percent (10%) of the bid, payable to the City of Monterey. The amount so posted shall be forfeited to the municipality if the bidder does not, within fifteen (15) calendar days after written notice that the contract has been awarded to said bidder, enter into a contract with the municipality for the work.

The City shall have the right to hold all bid bonds until award of the contract. However, the Finance Director may order the return of all bid bonds except that of the two (2) lowest bidders prior to the award.

**Add to Section 2-1.46:**

The Department will reject a bid as nonresponsive if the Contractor or subcontractors bidding on the project are not registered with the Department of Industrial Relations, Divisions of Labor Standards Enforcement (DLSE).



**Replace "Reserved" in section 2-1.33D(3)(c) in the RSS for section 2 with:**

Submit the bid forms according to the schedule shown in the following table:

**Bid Form Submittal Schedule for a Non-Federal-Aid Contract without a DBE goal**

Form	Submittal deadline
Bid to the Department	Time of bid except for the public works contractor registration number for a joint-venture contract
For a joint-venture contract, copy of the Bid to the Department as submitted at the time of bid with the public works contractor registration number	10 days after bid opening
Subcontractor List	Time of bid
Opt Out of Payment Adjustments for Price Index Fluctuations <sup>a</sup>	Time of bid
California Company Preference	Time of bid
Certified DBE Summary <sup>b</sup>	No later than 4 p.m. on the 4th business day after bid opening
Request for Small Business Preference or Non-Small Business Preference <sup>a</sup>	Time of bid
Certified Small Business Listing for the Non-Small Business Preference <sup>a</sup>	No later than 4 p.m. on the 2nd business day after bid opening

<sup>a</sup>Submit only if you choose the option or preference.

<sup>b</sup>Submit only if you obtain DBE participation or you are the apparent low bidder, 2nd low bidder, or 3rd low bidder and you choose to receive the specified incentive.

**Add to section 2-1.34:**

Bidder's security shall be made payable to the City of Monterey.

**Delete section 2-1.35.**

AA

**3 CONTRACT AWARD AND EXECUTION**

**Replace the 2nd paragraph of section 3-1.04 with:**

The contract shall be awarded, if an award is made, to the lowest responsive responsible bidder as defined in Part II, Bid Clarification, of these specifications, within ninety (90) calendar days from the date bids are publicly opened, examined and declared unless a different bid validity period is specified in Part I, Bid Validity. If the award is not made within the specified period, then all of the bids submitted shall be deemed to have been rejected by the legislative body

**Replace Section 3-1.05 with:**

The Contractor, at the time of signing and executing the contract, shall execute and file with the City a performance bond to the satisfaction and approval of said City, in a sum of not less than one hundred percent (100%) of the amount of the contract conditional upon the faithful performance of the contract. If the warranty period specified in the contract is for longer than one year, a Maintenance Bond equal to 10% of the contract price is required.

The Contractor, at the time of signing and executing any contract in excess of twenty-five thousand



dollars (\$25,000), shall execute and file with the City a labor and material payment bond to the satisfaction and approval of said City, in a sum of one hundred percent (100%) of the amount of the contract in accordance with Public Contract Code §9550 et seq.

The performance bond and the payment bond shall each be in the form and content set forth in the Contract Documents, attached hereto and labeled as "Sample Forms: Surety Bonds."

The Surety on any bond required under the Contract Documents shall be by an Admitted Surety Insurer as that term is defined in California Code of Civil Procedure §995.120, and shall be rated at least A-VII by A.M. Best. The Surety and /or co-sureties must be listed as an acceptable surety on federal bonds by the United States Department of the Treasury, subject to the maximum amount shown in the listing.

Upon request of the Contractor, the City may consider and accept, but is not obligated to do so, multiple sureties on such bonds. If co-sureties are used, their bonds shall be on a joint and several basis.

Notwithstanding the above, the Contractor may substitute adequate securities for any bond called for under the provisions of these Specifications as set forth in Public Contracts Code Section 22300. Alternate security substitutions shall be submitted to the City no later than ten (10) days after written notice that a contract has been awarded to the contractor to allow processing and escrow agreement for in lieu security.

The failure or refusal of the Contractor to furnish either the performance bond or the labor and material payment bond in strict conformity with this Section, may be deemed by the City as a default by the Contractor of a material obligation hereunder.

Sample Forms: Surety Bonds

Performance Bond

BOND NO. \_\_\_\_\_  
PREMIUM: \_\_\_\_\_

WHEREAS, The \_\_\_\_\_, (hereinafter designated as "Obligee") and \_\_\_\_\_ (hereinafter designated as "Principal") have entered into an agreement whereby principal agrees to install and complete certain designated public improvements, which said agreement, dated \_\_\_\_\_, and identified as project \_\_\_\_\_ is hereby referred to and made a part hereof; and

WHEREAS, Said principal is required under the terms of said agreement to furnish a bond for the faithful performance of said agreement;

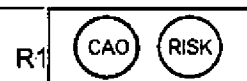
NOW, THEREFORE, We, the principal and \_\_\_\_\_ as surety, are held and firmly bound unto the hereinafter called "The Obligee," in the penal sum of \_\_\_\_\_ dollars (\$ \_\_\_\_\_) lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors, executors and administrators, jointly and severally firmly by these presents.

As part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by county in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the agreement or to the work to be performed thereunder or the specification accompanying the same shall in any wise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by the principal and surety above named, on

By \_\_\_\_\_  
PRINCIPAL  
By: \_\_\_\_\_  
PRINCIPAL  
By: \_\_\_\_\_  
ATTORNEY-IN-FACT



### Payment Bond Public Works

BOND NO.: \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, That we, \_\_\_\_\_ Principal, and \_\_\_\_\_, incorporated under the laws of the State of \_\_\_\_\_ and authorized to execute bonds and undertakings as sole surety, as Surety, are held and firmly bound unto any and all persons named in California Civil Code Section 1181 whose claim has not been paid by the contractor, company or corporation, in the aggregate total of \_\_\_\_\_ dollars (\$ \_\_\_\_\_), for the payment whereof, well and truly to be made, said Principal and Surety bind themselves, their heirs, administrators, successors and assigns, jointly and severally, firmly by these present.

The Condition of the foregoing obligation is such that; whereas the above bounden Principal has entered into a contract, dated \_\_\_\_\_, with the \_\_\_\_\_ to do the following work, to-wit:

This bond shall inure to the benefit of any person named in Section 3181 of the Civil Code of the State of California so as to vie a right of action to them or their assignees in any suit brought upon this bond.

This bond is executed and filed to comply with the provisions of the act of Legislature of the State of California as designated in Civil Code Sections 3247-3252 inclusive, and all amendments thereto.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

BY \_\_\_\_\_

BY \_\_\_\_\_  
ATTORNEY-IN-FACT

**Delete section 3-1.08.**

**Delete section 3-1.11.**

**Replace Section 3-1.18 with:**

A contract shall not be deemed to have been made between the Contractor and the City of Monterey until all of the following steps have been completed:

1. Award of the contract by the City Council
2. Execution of a written agreement by the Contractor, on the form set forth herein, within fifteen (15) calendar days after written notice that the contract has been awarded to him.

Delivery by the Contractor to the City of Monterey, the contract bonds and certificates of insurance as required by these specifications.

PUBLIC WORKS CONTRACT (Formal Bid)

[ Insert Project Name, as Listed on Resolution ] Project [ (Insert Project Code) ]

THIS AGREEMENT, hereinafter referred to as the "Agreement", made and entered into this \_\_\_ day of \_\_\_ 201\_\_\_, by and between the CITY OF MONTEREY, a municipal corporation, hereinafter referred to as the "City", and [INSERT CONTRACTOR NAME] hereinafter referred to as the "Contractor";

WITNESSETH:

WHEREAS, the Council of the City has awarded a contract to the Contractor for performing the work hereinafter described in accordance with the City's [Plans and] Specifications and Contractor's sealed proposal;

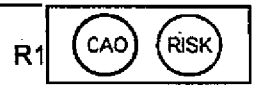
NOW, THEREFORE, IT IS AGREED AS FOLLOWS:

- 1. SCOPE OF WORK. The Contractor shall perform all of the work and furnish all labor, materials, equipment and transportation necessary for [ Holman Highway (Route 68) Roundabout Project ]. Work is to be as set out in the [Plans and] Specifications on file in the Office of the City Engineer and as in the Contractor's Proposal attached hereto, dated [ Insert Month Day, Year ], in an amount not to exceed [ Insert amount in words ] dollars (\$###,###.00) plus a sum of up to [ 10% ] for such contingencies as the City Manager, or his designee, deems appropriate.
2. TIME OF PERFORMANCE. The work under this contract shall commence within [ fourteen (14) ] calendar days from the effective date of the Notice to Proceed and shall be completed on or before the expiration of [ Insert no. of construction days (##) ] calendar days from the effective date of the Notice to Proceed.
3. If any provision in this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions will continue in full force without being impaired or invalidated in any way.
4. Contractor agrees that in the performance of this Agreement, it will comply with all applicable state, federal and local laws, codes and regulations. This Agreement shall be governed by and construed in accordance with the laws of the State of California and the City of Monterey.
5. In accordance with the provisions of Sections 1725.5, 1771.1, 1771.3, and 1771.4 of the Labor Code, this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined by that chapter of the Labor Code, unless currently registered and qualified to perform public work pursuant to Section 1725.5 of the Labor Code. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1735.5 at the time the contract is awarded.
6. The Monterey City Council awarded this contract on [ Month Day, Year ] by Resolution [ #-### ] C.S.
7. This Agreement shall consist of this Public Works Contract document and the following items, all of which are on file in the office of the City Clerk and are incorporated herein and made a part hereof by reference:
A. [Plans and] Specifications
B. Accepted Proposal
C. Performance Bond
D. Payment Bond (labor and materials)
E. Non-Collusion Declaration
F. Debarment and Suspension Certification
G. Certification(s) of Good Faith Effort to Hire Local Residents [Delete if project is federally funded]

IN WITNESS WHEREOF, said Contractor and said City have hereunto set their hands, all on the day and year first above written.

ATTEST: CITY OF MONTEREY: [ INSERT CONTRACTOR NAME ]:

By: City Clerk By: City Manager, or his designee By: [ Insert Name, Title ]



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**5 CONTROL OF WORK**

**Add to Section 5-1.01.**

All workmanship shall be fully up to the highest standard of modern construction and practice. The employment of labor shall comply with the prevailing local labor conditions and the Contractor shall employ only competent, careful, orderly persons upon the work. If at any time it shall appear to the Engineer that any person employed upon the work is incompetent, careless, reckless, or disorderly, or disobeys or evades orders and instructions, such person shall be immediately discharged and not again employed upon the work.

**Add to Section 5-1.03**

The Engineer shall have the authority to suspend the work wholly or in part, for such period as the Engineer may deem necessary due to unsuitable weather, or to such other conditions as are considered unfavorable for the suitable prosecution of the work, or for such time as the Engineer may deem necessary due to the failure on the part of the Contractor to carry out Engineer's orders given or to perform any provisions of the work. The Contractor shall immediately obey such order of the Engineer and shall not resume work until ordered in writing by the Engineer.

**Add to section 5-1.13A.**

Any Proposed substitution of subcontractors must comply with the requirements of the Subletting and Subcontracting Fair Practices Act, California Public Contract Code §4100, et seq.

The Contractor shall give his personal attention to the fulfillment of the contract and shall keep the work under his control.

Subcontractors will not be recognized as such, and all persons engaged in the work of construction will be considered as employees of the Contractor, and their work shall be subject to the provisions of the contract, plans and specifications.

Where a portion of the work sublet by the Contractor is not being prosecuted in a manner satisfactory to the Engineer, the subcontractor shall be removed immediately on the requisition of the Engineer and shall not again be employed on the work.

**Delete section 5-1.13C.**

**Delete section 5-1.13D.**

**Add to section 5-1.20A:**

During the progress of the work under this Contract, work under the following contracts may be in progress at or near the job site of this Contract:

**Coincident or Adjacent Contracts**

Contract no.	County-Route-Post Mile	Location	Type of work
05-1G330	MON-68-L4.3	SR-68/Highway 1 Overcrossing structure	Bridge overlay
05-1A760	MON - 1 - R77.6 / R85.3	IN MONTEREY COUNTY, IN AND NEAR MONTEREY, FROM SLOAT AVENUE UNDERCROSSING TO SOUTH MARINA OVERHEAD	PAVEMENT PRESERVATION (CAPM)
05-0J490	SB, SLO, MON - 1, 101, 68 - 0.0 / 50.6, 0.1 / 69.3, 0.0 / 22.0	IN SANTA BARBARA, MONTEREY, SAN BENITO, SANTA CRUZ AND SAN LUIS OBISPO COUNTIES AT VARIOUS LOCATIONS.	REPLACE ROADSIDE SIGN PANELS

**Replace Section 5-1.20D with:****5-1.20D Agency Relations****5-1.20D(1) Relations with Caltrans**

This project is located within the jurisdiction of Caltrans. An encroachment permit has been issued to the Department for work to be performed within Caltrans right of way. You must apply for and obtain a Double Permit (DP) through Caltrans Encroachment Permit Office before beginning work on the project. Contact Caltrans Encroachments regarding the Double Permit at District 5, Permits Branch, 50 Higuera Street, San Luis Obsipo, CA 93401, (805) 549-3152.

The Contractor is required to adhere to all the requirements as specified within referenced permit. The Contractor is required to pay the double permit fee.

The provisions of this section must be made a part of every subcontract executed pursuant to this contract.

**Add to section 5-1.20E:**

The local water authority is Monterey Peninsula Water Management District. You must submit an application for a Construction/Hydrant Meter permit to access water from local public hydrants. The cost of the meter/permit and water supplied for construction shall be considered as included in the item of work requiring the water and shall not be separately measured or paid for.

**Replace the paragraphs of section 5-1.20E with:****Section 5-1.24 is replaced with:****5-1.24 AS-BUILT DRAWINGS**

Maintain a set of full size drawings on the job site. On these drawings, mark all as-built conditions, locations, configurations, and provide all other supplemental details to accurately depict the as-built conditions.

Perform a post installation survey of water mains and laterals, storm drain facilities, and sewer facilities. Provide an as-built station and offset for each drainage and sewer structure with inlet grate or manhole rim elevations for each structure. The survey shall also include pipe invert elevations at inlets, outfalls, stubs, and manhole structures. Add survey data to the as-built drawings.

Prior to final acceptance, submit the as-built drawings to the Engineer.



Submit a copy of the accepted as-built drawings to the City of Monterey.

The Engineer will deduct the costs for collecting omitted as-built conditions.

**Section 5-1.27E is replaced with:**

**5-1.27E Change Order Bills**

Maintain separate records for change order work costs.

Submit change order bills in hard copy to the Department.

**Add section 5-1.27F:**

**5-1.27F Daily Reports**

Your jobsite superintendent or foreman must prepare daily reports for each work day on the project. Daily reports must include:

1. Date;
2. Weather;
3. Worker names;
4. Equipment used on the work;
5. Subcontractors working on-site;
6. Straight time and overtime hours of work for workers and equipment used. Hours of work must be categorized under Bid Items of work or change order work that workers and equipment worked on during that day;
7. Description of work progress, work completed, damage to work, delays to the work;
8. Quality control tests performed;
9. Worker injuries;
10. Stage Construction Traffic Control

Daily reports for the previous workday must be submitted to the Engineer by 12:00 PM on the following work day.

Payment for preparing and submitting daily reports to the Engineer is included in the various items of work involved.

**Add to section 5-1.36D:**

The utilities shown in the following table will not be rearranged. The utilities may interfere retaining wall construction. You must coordinate with the utility owner to ensure the retaining wall construction does not interfere with the underground facilities. If you want any of the lines marked or would like utility representation in the field during construction.

**Utilities Not Rearranged for Pile Driving, Drilling Activities, or Substructure Construction**

Utility	Location
AT&T underground telephone	North side of SR-68 approximately Station 31+80-33+50.

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**6 CONTROL OF MATERIALS**

**Add to section 6-2.03:**

Caltrans furnishes you with:

- Disks for survey monuments

Caltrans furnished materials must be picked up at the District 5 Maintenance Electrical Shop at 850 Elvee Dr in Salinas, CA . Provide at least 4 weeks notice for Caltrans to procure materials. When making arrangements to pick up Caltrans furnished materials, coordinate directly with Caltrans at 805-549-3235.

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**7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC**

**Add to Section 7-1.02A**

The Contractor shall keep fully informed of all existing and future state and federal laws and all municipal ordinances and regulations of the City of Monterey which in any manner affect those engaged or employed in the work, or the materials used in the work, or which in any way affect the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same.

All work shall comply in every respect with all the governing laws, regulations, and ordinances of the City of Monterey, which shall be considered for the purpose of contract to which the plans and specifications refer, a part thereof. The Contractor shall give to the proper authorities all necessary notices relative to the work, and shall obtain and pay for all such permits, licenses, notices, inspections, or tests required as part of the contract price. All permits issued by the City for work done under this contract shall be issued at no charge.

All bidders and contractors shall be licensed in accordance with the laws of this State, specifically the provisions the Business and Professions Code, Division 3, Chapter 9. Any bidder or contractor not so licensed is subject to the penalties imposed by such laws. In accordance with the requirements in Public Contract Code Section 10164, in all contracts where Federal funds are involved, the Contractor shall be properly licensed at the time the Contract is awarded.

**Replace Section 7-1.02K(2) with:**

Local prevailing wage rates shall be paid in accordance with Sections 1770, 1773, and 1782, as amended, of the California Labor Code, and Section 28-20(e) of the Monterey City Code, on all public works construction contracts exceeding twenty-five thousand dollars (\$25,000) and all public works contracts for alteration, demolition, repair or maintenance work exceeding fifteen thousand dollars (\$15,000).

The Contractor and any subcontractor under the Contractor shall comply with Labor Code Sections 1774 and 1775. Pursuant to Section 1775, the Contractor and any subcontractor under the Contractor shall forfeit to the State or political subdivision on whose behalf a contract is awarded a penalty of not more than two hundred dollars (\$200), or such other amount as may be amended from time to time by the Department of Industrial Relations, for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of Industrial Relations for the Work or craft in which the worker is employed for any public (City) Work done under the contract by the Contractor or by

any subcontractor under the Contractor in violation of the requirements of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. The amount of this forfeiture shall be determined by the Labor Commissioner and shall be based on consideration of the mistake, inadvertence, or neglect of the Contractor or subcontractor in failing to pay the correct rate of prevailing wages, or the previous record of the Contractor or subcontractor in meeting their respective prevailing wage obligations, or the willful failure by the Contractor or subcontractor to pay the correct rates of prevailing wages. A mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages is not excusable if the Contractor or subcontractor had knowledge of the obligations under the Labor Code. In addition to the penalty and pursuant to Labor Code Section 1775, the difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor or subcontractor. If a worker employed by a subcontractor on a public works (City) project is not paid the general prevailing per diem wages by the subcontractor, the prime contractor of the project is not liable for the penalties described above unless the prime contractor had knowledge of that failure of the subcontractor to pay the specified prevailing rate of wages to those workers or unless the prime contractor fails to comply with all of the following requirements:

1. The contract executed between the contractor and the subcontractor for the performance of Work on the public works (City) project shall include a copy of the requirements in Sections 1771, 1775, 1776, 1777.5, 1813 and 1815 of the Labor Code.
2. The contractor shall monitor the payment of the specified general prevailing rate of per diem wages by the subcontractor to the employees, by periodic review of the certified payroll records of the subcontractor.
3. Upon becoming aware of the subcontractor's failure to pay the specified prevailing rate of wages to the subcontractor's workers, the contractor shall diligently take corrective action to halt or rectify the failure, including, but not limited to, retaining sufficient funds due the subcontractor for Work performed on the public works (City) project.
4. Prior to making final payment to the subcontractor for Work performed on the public works (City) project, the contractor shall obtain an affidavit signed under penalty of perjury from the subcontractor that the subcontractor has paid the specified general prevailing rate of per diem wages to the subcontractor's employees on the public works (City) project and any amounts due pursuant to Section 1813 of the Labor Code.

Pursuant to Section 1775 of the Labor Code, the Division of Labor Standards Enforcement shall notify the Contractor on a public works (City) project within 15 days of the receipt by the Division of Labor Standards Enforcement of a complaint of the failure of a subcontractor on that public works (City) project to pay workers the general prevailing rate of per diem wages. If the Division of Labor Standards Enforcement determines that employees of a subcontractor were not paid the general prevailing rate of per diem wages and if the City did not retain sufficient money under the contract to pay those employees the balance of wages owed under the general prevailing rate of per diem wages, the contractor shall withhold an amount of moneys due the subcontractor sufficient to pay those employees the general prevailing rate of per diem wages if requested by the Division of Labor Standards Enforcement. The Contractor shall pay any money retained from and owed to a subcontractor upon receipt of notification by the Division of Labor Standards Enforcement that the wage complaint has been resolved. If notice of the resolution of the wage complaint has not been received by the Contractor within 180 days of the filing of a valid notice of completion or acceptance of the public works (City) project, whichever occurs later, the Contractor shall pay all moneys retained from the subcontractor to the City. These moneys shall be retained by the City pending the final decision of an enforcement action.

Pursuant to the requirements in Section 1773 of the Labor Code, the City has obtained the general

prevailing rate of wages (which rate includes employer payments for health and welfare, pension, vacation, travel time and subsistence pay as provided for in Section 1773.8 of the Labor Code, apprenticeship or other training programs authorized by Section 3093 of the Labor Code, and similar purposes) applicable to the Work to be done, for straight time, overtime, Saturday, Sunday and holiday Work. The holiday wage rate listed shall be applicable to all holidays recognized in the collective bargaining agreement of the particular craft, classification or type of workmen concerned.

The general prevailing wage rates and any applicable changes to these wage rates are available at the City of Monterey, Capital Projects Office, 353 Camino El Estero, Monterey, CA, (831-646-3997). General prevailing wage rates are also available from the California Department of Industrial Relations' Internet Web Site at: <http://www.dir.ca.gov>.

The wage rates determined by the Director of Industrial Relations for the project refer to expiration dates. Prevailing wage determinations with a single asterisk after the expiration date are in effect on the date of advertisement for bids and are good for the life of the contract. Prevailing wage determinations with double asterisks after the expiration date indicate that the wage rate to be paid for Work performed after this date has been determined. If Work is to extend past this date, the new rate shall be paid and incorporated in the contract. The Contractor shall contact the Department of Industrial Relations as indicated in the wage rate determinations to obtain predetermined wage changes. Pursuant to Section 1773.2 of the Labor Code, general prevailing wage rates shall be posted by the Contractor at a prominent place at the site of the Work.

Changes in general prevailing wage determinations which conform to Labor Code Section 1773.6 and Title 8 California Code of Regulations Section 16204 shall apply to the project when issued by the Director of Industrial Relations at least ten (10) days prior to the date of the Notice Inviting Bids for the project.

The City will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage rate set forth in the contract. The possibility of wage increases is one of the elements to be considered by the Contractor in determining the bid, and will not under any circumstances be considered as the basis of a claim against the City on the contract. The Contractor shall make travel and subsistence payments to each workman, needed to execute the Work, in conformance with the requirements in Labor Code Section 1773.8.

**Replace paragraphs 5 through 9 of Section 7-1.02k(3) with:**

You must submit payroll data electronically to the Department of Industrial Relations, Division of Labor Standards Enforcement (DLSE) website at <https://apps.dir.ca.gov/eCPR/DAS/altlogin>.

Payroll data must be entered manually or uploaded into the DLSE's electronic certified payroll reporting application (eCPR).

The DLSE will monitor and enforce compliance with prevailing wage requirements throughout the project. You must respond to all requests made by DLSE and you are responsible to correct all noncompliant payroll submittals.

The Department will submit electronic form PWC 100 to the DLSE within 10 days after contract award.

You are responsible to ensure that all subcontractors working on the project electronically submit their payroll data to the DLSE and correct all noncompliant payroll when required by the DLSE or the Engineer.

Provide the Engineer with copies of all payroll documents and correspondence submitted to and received from the DLSE.

Payment for submitting electronic payroll data to the DLSE, responding to all requests made by the DLSE, correcting noncompliant payroll, and providing copies of all payroll documents and correspondence to the Engineer, is included in the various items of work involved and no separate payment will be made.

**Replace section 7-1.02K(6)(j)(iii) with:**

**7-1.02K(6)(j)(iii) Earth Material Containing Lead**

Section 7-1.02K(6)(j)(iii) includes specifications for handling, removing, and disposing of earth material containing lead.

Submit a lead compliance plan.

Lead is present in earth material on the job site. The average lead concentrations are below 1,000 mg/kg total lead and below 5 mg/L soluble lead along the west shoulder of the southbound Highway 1 on ramp from approximately Station 12+00 to Station 15+25 and along both sides of 17 Mile Drive. The material on the job site:

1. Is not a hazardous waste
2. Does not require disposal at a Class 1 permitted landfill or solid waste disposal facility

Lead has been detected in material to a depth of 2 feet in unpaved areas of the highway at the following locations:

- Southbound Highway 1 off ramp
- East side of the southbound Highway 1 on ramp from station 12+00 to 15+50.
- Both sides of the southbound Highway 1 on ramp from the limits of work to Station 12+00
- SR-68 within the limits of work

Levels of lead found on the job site range from less than 65 to 535 mg/kg total lead with an average concentration of 217 mg/kg total lead as analyzed by EPA test method 6010 or EPA test method 7000 series and based upon a 95 percent upper confidence limit. Levels of lead found within the project limits have a predicted average soluble concentration of 16.6 mg/L as analyzed by the California Waste Extraction Test and based upon a 95 percent upper confidence limit.

Handle the material under all applicable laws, rules, and regulations, including those of the following agencies:

1. Cal/OSHA
2. CA RWQCB, Central Coast Region
3. CA Department of Toxic Substances Control

If the material is disposed of:

1. Disclose the lead concentration of the material to the receiving property owner when obtaining authorization for disposal on the property
2. Obtain the receiving property owner's acknowledgment of lead concentration disclosure in the written authorization for disposal
3. You are responsible for any additional sampling and analysis required by the receiving property owner

If you choose to dispose of the material at a commercial landfill:

1. Transport it to a Class III or Class II landfill appropriately permitted to receive the material

- 2. You are responsible for identifying the appropriately permitted landfill to receive the material and for all associated trucking and disposal costs, including any additional sampling and analysis required by the receiving landfill

**Replace Section 7-1.02I(2)(10) with:**

The Contractor shall comply with Section 1735 of the Labor Code, which reads as follows:

"No discrimination shall be made in the employment of persons upon public works because of the race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, sex of such persons or age over 40, except as provided in Section 12940 of the Government Code, and every contractor for public works violating this section is subject to all the penalties imposed for a violation of this chapter."

**Add to Section 7-1.05B**

Right of general supervision by the City shall not make the Contractor an agent of the City, and the liability of the Contractor for all damages to persons or to public or private property arising from the Contractor's execution of the work shall not be lessened because of such general supervision

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**8 PROSECUTION AND PROGRESS**

**Add to section 8-1.02A:**

In addition to the required CPM schedules, you must submit to the Engineer a weekly look-ahead schedule, a two-week look ahead schedule for major changes in traffic handling, and a two-week look ahead for CMS advance messaging by noon each Friday for the following week (Monday through Sunday). The weekly look-ahead schedule shall be in a narrative format and shall describe your work to be performed, including your subcontractors and suppliers. The schedule must also describe applicable activities to be performed during the week including, but not limited to, lane and shoulder closures, utility work, quality control testing, and water pollution control work.

**Add to section 8-1.02D(10):**

Payment for weekly look-ahead schedules is included in the payment for Progress Schedule (Critical Path Method).

**Replace "Reserved" in section 8-1.04C with:**

Section 8-1.04B does not apply.

Start job site activities after receiving notice that the Contract has been approved by the attorney appointed and authorized to represent the Department, but no later than April 14, 2016.

Do not start job site activities until the Department authorizes or accepts your submittal for:

- 1. CPM baseline schedule
- 2. SWPPP
- 3. Contingency plan for opening closures to public traffic
- 4. Confirmation that order has been accepted from the manufacturers for street light and overhead signs and welding quality control plan has been accepted by the Department.

Do not start other job site activities until all the submittals from the above list are authorized or accepted and the following information is received by the Engineer:

1. *Notice of Materials To Be Used* form.
2. Written statement from the vendor that the order for the sign panels has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.
3. Written statement from the vendor that the order for electrical material has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.
4. Written statement from the vendor that the order for structural steel has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.

You may start job site activities before the 85th day after Contract approval if you:

1. Obtain specified authorization or acceptance for each submittal before the 85th day
2. Receive authorization to start

Submit a notice 72 hours before starting job site activities. If the project has more than 1 location of work, submit a separate notice for each location.

**Replace the Fourth Paragraph of section 8-1.10A with:**

Liquidated damages for not completing construction with the exception of plant establishment work within 215 working days are \$5400 per day.

**Add to section 8-1.10A:**

Liquidated damages for not completing plant establishment work (Type 1) during the 5 year plant establishment period are \$30 per day.

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**9 PAYMENT**

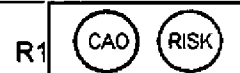
**Add to Section 9-1.02A**

The City shall not be obligated to process any payment request until thirty (30) calendar days after receipt of a correct, complete and undisputed progress payment request or sixty (60) calendar days after receipt of a correct, complete and undisputed final payment request. A payment request shall not be deemed complete unless all related documentation has been supplied and verified, and all related contract requirements have been satisfactorily met.

**Add to section 9-1.16C:**

The following items are eligible for progress payment even if they are not incorporated into the work:

1. Irrigation Controllers
2. Irrigation Controller Enclosure Cabinets
3. Irrigation Control and Neutral Conductors
4. Irrigation Pipe Conduit
5. Pipe (Irrigation System)
6. Valves
7. Pavement Dowels
8. Culvert Pipe
9. Miscellaneous Drainage Facilities
10. Miscellaneous Iron and Steel



- 11. Railings
- 12. Pavement Markings
- 13. Luminaires
- 14. Furnish Sign Structure (Truss)
- 15. Bicycle Tubular Railing
- 16. Reinforcing steel

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## DIVISION II GENERAL CONSTRUCTION

### 10 GENERAL

#### Add to section 10-1.02:

Do not place the uppermost layer of new pavement until all underlying conduits are installed.

Before starting the traffic signal functional test at any location, all items of work related to signal control must be completed and all roadside signs, pavement delineation, and pavement markings must be in place at that location.

#### Replace Section 10-1.19 with:

##### 10-1.19 RESIDENT ENGINEER FIELD OFFICE

The Contractor shall furnish, until 60 days after completion of one hundred percent of the work is accepted, a Resident Engineer's Office conforming to these special provisions. The office shall be within one-half mile of the project site or as approved by the Engineer.

The overall size of the office shall be 500 square feet minimum, and it shall be furnished with doors and windows capable of being locked. The office shall be partitioned to provide two private offices of not less than 120 square feet each and a conference area of not less than 180 square feet. The private offices shall be provided with two portable book cases, each with a minimum of three four-foot long (or four three-foot long) shelves spaced no closer than 14 inches vertically.

If the office is a trailer, the perimeter of the office area shall be secured by an 8-foot high chain link fence with 3 strands of barbed wire on top. The Contractor shall provide a lockable gate and lock assembly with 2 keys. Title to the trailer and provided contents shall remain with the Contractor. The Contractor shall provide the Engineer with a copy of written permission or agreement to place the Resident Engineer's Office trailer on private property unless such private property is within a project construction easement shown on the plans.

The office shall be furnished with:

A. Two desks with lockable drawers; one 5-foot minimum drafting table; two drafting stools; one 3-foot by 6-foot table and 8 standard chairs; 3 desk chairs with arms; 2 four-drawer legal size filing cabinets; 1 plan rack; one fire extinguisher; one first-aid kit (bandages, gauze, etc.); bottled drinking water, restroom (24 square feet minimum) equipped with toilet and sink with hot and cold running water, soap, paper products, and sewerage disposal.

B. A copier/scanner/printer with the following machine specifications, capabilities, and supplies:

- 1. automatic duplexing and collating,
- 2. black/white and color network printing,
- 3. black/white and color copying,
- 4. black/white and color scanning,



5. paper sizes 8 1/2" x 11", 8 1/2" x 14", and 11" x 17", and
6. printing and paper supplies for 2000-8 1/2" x 11", 500-8 1/2" x 14", and 1000-11" x 17" sheets per month.

C. All necessary cables and hardware devices to link a computer system together with the copier/scanner/printer.

D. The Contractor shall provide hot and cold drinking water from a water vendor.

E. The Contractor shall provide, install, and maintain two (2) telephone lines together with one (1) high-speed (1 gigabyte minimum) internet access, and pay all installation and usage charges.

Equipment furnished shall be for the Engineer's sole use and of standard quality and new or like new in appearance and function. The office shall be installed and ready for occupancy no later than ten (10) calendar days after award of contract. For each day thereafter that the office is not ready for occupancy, the Contractor will be assessed damages in the amount of \$100.00 per calendar day.

The contract lump sum price paid for Resident Engineer's Office shall include full compensation for furnishing and installing in less than 10 calendar days after award of contract, and removing the office, utility connections including bottled water service, furnishings, office equipment, office supplies, and utility billings as specified in these special provisions and as directed by the Engineer.

Payment for Resident Engineers Office will be made as follows: At such time as installation and setup are complete (ready to occupy/use), including computer system and software, then 25 percent payment for Resident Engineer's Office will be made.

At such time as fifty percent of the work is completed, an additional 50 percent (total 75 percent) payment for Resident Engineer's Office will be made.

At such time as one hundred percent of the work is accepted, then the final 25 percent (total 100 percent) payment for Resident Engineer's Office will be made.

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## 12 TEMPORARY TRAFFIC CONTROL

### Add to Section 12-1.01:

You shall provide vehicular access through the construction area at all times for emergency vehicles. When ramp closures are in place that would limit access to the Hospital, from the The Community Hospital of the Monterey Peninsula (CHOMP) must be notified two weeks prior to closures with a the anticipated duration of the closure and identify the emergency vehicle access routes. Notify CHOMP of traffic control effecting the Hospital and/or Carmel Hills Professional Center one week prior to the traffic control being implemented.

Notifications for CHOMP shall be directed to the Resident Engineer.

### Section 12-1.03 is replaced with:

#### 12-1.03 FLAGGING COSTS

You pay 100% of the cost of furnishing all flaggers and pilot cars, including transporting flaggers, furnishing stands and towers for flaggers, and operating pilot cars to provide for the passage of traffic through the work as specified in sections 7-1.03 and 7-1.04.

Flagging costs are included in the lump sum cost for traffic control system.

Additional flagging costs required by change order work will be paid for as a part of the change order work.

**Replace section 12-2 with:  
12-2 CONSTRUCTION PROJECT FUNDING SIGNS**

**12-2.01 GENERAL**

Section 12-2 includes specifications for installing construction project funding signs.

Construction project funding signs must comply with the details shown on the Department's Traffic Operations Web site.

Keep construction project funding signs clean and in good repair at all times.

**12-2.02 MATERIALS**

Construction project funding signs must be wood post signs complying with section 56-4.

Sign panels for construction project funding signs must be framed, single sheet aluminum panels complying with section 56-2.

The background on construction project funding signs must be Type II retroreflective sheeting on the Authorized Material List for signing and delineation materials.

The legend must be retroreflective, except for nonreflective black letters and numerals. The colors blue and orange must comply with PR Color no. 3 and no. 6, respectively, as specified in the Federal Highway Administration's *Color Tolerance Chart*.

The legend for the type of project on construction project funding signs must read as follows:

Highway Improvement

The legend for the types of funding on construction project funding signs must read as follows and in the following order:

MONTEREY COUNTY TRANSPORTATION FUNDS  
CITY OF MONTEREY TRANSPORTATION FUNDS  
TRANSPORTATION AGENCY OF MONTEREY COUNTY FUNDS  
PEBBLE BEACH COMPANY

The legend for the year of completion on construction project funding signs must read as follows:

YEAR OF COMPLETION 2017

The size of the legend on construction project funding signs must be as described. Do not add any additional information unless authorized.

**12-2.03 CONSTRUCTION**

Install 2 Type 1 construction project funding signs at the locations designated by the Engineer before starting major work activities visible to highway users.

When authorized, remove and dispose of construction project funding signs upon completion of the project.

**12-2.04 PAYMENT**

Not Used

**Add to section 12-3.12C:**

Start displaying the message on the portable changeable message sign 15 minutes before closing the lane.

Start displaying the message on the portable changeable message sign 5 days before a road or ramp closure.

Place the portable changeable message sign in advance of the 1st warning sign for each:

1. Stationary lane closure
2. Off-ramp closure
3. Connector closure
4. Shoulder closure

For 5 days, starting on the day of roundabout control, place 1 portable changeable message sign in each direction of travel and display the following message: " RNDABT AHEAD – PREPARE TO YIELD ."

**Replace section 12-3.16 with:**

**12-3.16 TEMPORARY SIGNAL SYSTEM**

**12-3.16A General**

Installing temporary signal system (TSS) consists of installing and maintaining temporary traffic signal, lighting, and flashing beacons for traffic control.

Furnish other materials and equipment for a TSS, including flashing beacons, signal heads, mast arms, luminaires, wood poles, conductors, and hardware.

Material and equipment used in the TSS may be new or used but must be suitable for the intended use.

Orient each signal face to be clearly visible to traffic approaching from the direction that the signal is intended to control.

**12-3.16B Operation**

TSS must operate at nominal 120 V(ac). Lighting must operate at 120 V(ac) or 240 V(ac).

Unless otherwise directed, the system must operate on a continuous, 24-hour basis except when it is necessary that traffic be controlled by flaggers.

The Department will perform timing for the TSS.

**12-3.16C Maintaining Temporary Signal System**

Except for the controller assembly, you are responsible for maintaining the TSS:

If components in the TSS are damaged, displaced, or cease to operate or function as specified from any cause during the progress of the work, immediately repair or replace the components, then restore to the original condition. Components include signs, generator, flashing beacons, and signal equipment.

If the TSS is out of operation, provide flaggers, at your expense, to maintain traffic control until the traffic signals are returned to service.

**12-3.16D Conduit**

At locations where conduit is required to be installed under pavement and if a delay to vehicles will not exceed 5 minutes, conduit may be installed by the trenching in pavement method as specified in section 86-2.05C.

**12-3.16E Conductors and Wiring**

Conductors must be the types specified in section 86-2.08 or Type UF cable of the size and number of conductors shown. The minimum conductor size must be no. 12.

If conductors are placed across paved areas, placement must comply with one of the following:

1. Place in a conduit
2. Suspend at least 25 feet above the roadway

Conductors placed outside of paved areas must be placed by one of the following methods:

1. Direct burial method with Type UF cable installed at a minimum depth of 24 inches below grade.
2. Placed in conduit. If Type 1 or 2 conduit is used, the minimum depth must be 12 inches. If Type 3 conduit is used, the minimum depth must be 18 inches.
3. Suspended from wood poles with a minimum clearance of 25 feet from grade at any point. Place the portions of the conductor installed on the face of wood poles in either Type 3 or Type 4 conduit.

Conductors placed across structures must be placed in a Type 1, 2, or 3 conduit. Install the conduit on the outside face of the railing and secure by a method determined by the Engineer.

Conductors to a terminal compartment or signal head on a pole may be spliced to through conductors of the same phase in a pull box adjacent to the pole. Do not splice conductors or cables except in pull boxes or in NEMA Type 3R enclosures.

### **12-3.16F Bonding and Grounding**

Comply with section 86-2.10.

Provide effective grounding for the generator.

### **12-3.16G Service**

#### **12-3.16G(1) General**

Use one of the following methods to provide power for the TSS:

1. Commercial power from an existing utility company

#### **12-3.16G(2) Commercial Power**

Commercial power must be 120 V(ac) or 120/240 V(ac). Protect the power source in a locked enclosure. Provide keys to all locks.

Do not use power from private parties.

Do not use electrical power from existing highway facilities unless authorized.

Make the arrangements with the utility company for providing service.

Commercial electrical power is available at the job site.

### **12-3.16H Department-Furnished Controller Assembly**

Construct the controller cabinet foundation as shown for Model 332L, 334L, or 336L cabinets, including furnishing and installing anchor bolts. Install the controller cabinet on the foundation and make field wiring connections to the terminal blocks in the controller cabinet.

A listing of field conductor terminations in each Department-furnished controller cabinet will be furnished to you at the job site.

The Department or local forces will maintain all controller assemblies.

### **12-3.16I Detectors**

Loop detector lead-in cable must be Type C.

Loop detectors are paid for as part of the lump sum cost paid for Temporary Signal System and will not be separately measured or paid for.

A video image detection system shall be used in place of loop detectors.

The video image vehicle detection system (VIVDS) shall be a Traficon VIP3, or approved equal, including a programming keypad and a 9-inch (230-mm) viewing monitor. The video detection system shall be complete for the intended purpose and shall include Traficon ViewCom that allows for remote changes

and monitoring. The video detection system shall include a video switch that allows an operator to change among all views being displayed without unplugging or plugging in a video cable. Comply with section 86-5.01A.

### **12-3.16J Completion and Restoration**

Backfill pole holes.

The following materials may be abandoned in place when no longer required:

1. Conductors placed in slots across paved areas
2. Direct buried cables, installed 24 inches or more below the ground surface

### **Add section 12-3.18:**

## **12-3.18 TEMPORARY ALTERNATIVE CRASH CUSHION SYSTEM**

### **12-3.18A General**

#### **12-3.18A(1) Summary**

Section 12-3.18 includes specifications for installing and maintaining temporary alternative crash cushions at the locations shown.

#### **12-3.18A(2) Submittals**

Submit one copy of the manufacturer's plan and parts list for the temporary crash cushion system to be installed.

Submit a certificate of compliance from the manufacturer certifying that the temporary crash cushion system conforms to the requirements stated herein.

#### **12-3.18B Materials**

Temporary alternative crash cushions supplied must comply with NCHRP Report 350, Test Level 3.

The allowable alternatives for temporary alternative crash cushion system must consist of one of the following or a Department approved equal.

1. TEMPORARY CRASH CUSHION (ABSORB 350) – Must be a 9-element system as manufactured by Barrier Systems, Inc., or approved equal and shall include all items detailed for crash cushion (ABSORB 350) shown in the manufacturer's plans and installation instructions.
2. TEMPORARY CRASH CUSHION (ADIEM-350) – Must be manufactured by Trinity Industries, Inc., and shall include all items detailed for crash cushion (ADIEM-350) shown in the manufacturer's plans and installation instructions.
3. TEMPORARY CRASH CUSHION (ACZ-350) – Must be manufactured by Energy Absorption Systems, Inc., and shall include all items detailed for crash cushion (ACZ-350) shown in the manufacturer's plans and installation instructions.

### **12-3.18C CONSTRUCTION**

Install temporary alternative crash cushions in conformance with the manufacturer's installation instructions.

Maintain temporary alternative crash cushions in place at each location, including times when work is not actively in progress. Remove temporary alternative crash cushions when no longer required.

Attach a Type P marker panel to the front of the temporary crash cushion system. Firmly fasten the marker panel to the crash cushion with commercial quality hardware or by other authorized methods.

Immediately replace temporary alternative crash cushion systems damaged due to your activities.

Repair of temporary crash cushion systems damaged by traffic is change order work.



**12-3.18D PAYMENT**

Not used.

**Replace section 12-3.19 of the RSS for section 12-3 with:**

**12-3.19 PORTABLE TRANSVERSE RUMBLE STRIPS****12-3.19A General****12-3.19A(1) Summary**

Section 12-3.19 includes specifications for placing portable transverse rumble strips.

**12-3.19A(2) Definitions**

Not Used

**12-3.19A(3) Submittals**

Submit a copy of the manufacturer's instructions.

**12-3.19A(4) Quality Control and Assurance**

Not Used

**12-3.19B Materials**

The portable transverse rumble strip must be either the RoadQuake 2 or the RoadQuake 2 Folding rumble strip manufactured by Plastic Safety Systems, Inc. For information on obtaining the rumble strips, contact:

Customer Service  
Plastic Safety Systems, Inc.  
2444 Baldwin Road  
Cleveland, OH 44104

Telephone Number: (800) 662-6338 or (216) 231-8590

**12-3.19C Construction**

Rumble strips must be in place before closing the lane to traffic.

If the RoadQuake 2 is used, securely connect the 3 sections under the manufacturer's instructions before placing them in the traffic lane.

Remove all portable transverse rumble strips and warning signs before opening the lane to traffic.

If the Engineer determines that the rumble strips no longer provide audible and vibratory alerts, replace the portable transverse rumble strips.

**12-3.19D Payment**

Not Used

**Replace the 5th paragraph of section 12-4.02A with:**

Freeways, Conventional Highway may be closed only if signed for closing 7 days in advance. Notify the Engineer and Caltrans Public Information Officer at least 30 days before signing the conventional highway, ramps or freeway for a full closure. Notify the Engineer and Caltrans Public Information Officer at least 7 days before signing the conventional highway, ramps or freeway for a partial closure. If the conventional highway, ramps or freeway is not closed on the posted day, change the closure to allow a 3-business-day advance notice before closure.

For Shoulder closure see MUTCD figures 6H-3 and 6H-4.

**Add to section 12-4.02A:**

For grinding and grooving operations closure of the adjacent traffic lane is not required if an impact attenuator vehicle is used as a shadow vehicle.

Designated holidays are shown in the following table:

**Designated Holidays**

Holiday	Date observed
New Year's Day	January 1st
Washington's Birthday	3rd Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4th
Labor Day	1st Monday in September
Veterans Day	November 11th
Thanksgiving Day	4th Thursday in November
Christmas Day	December 25th

If a designated holiday falls on a Sunday, the following Monday is a designated holiday. If November 11th falls on a Saturday, the preceding Friday is a designated holiday.

No work, closures or detours are allowed on the following Special Days:

Special Days for events at Pebble Beach	
Event	Dates
2016 Councours d'Elegance	August 15-21
2016 AT&T National Pro-Am	February 8-14
2017 Councours d'Elegance	August 14-20
2017 AT&T National Pro-Am	February 6-12

The following are Event Days, during these days lane closures and detours are not allowed:

Events at Pebble Beach	
Event	Dates
2016 First Tee Open	September 13-18
2016 Food and Wine	March 31 - April 3
2017 First Tee Open	September 19-24
2017 Food and Wine	April 20 - April 23
2016 Pebble Beach Invitational	November 15-20
Events in Pacific Grove	
2016 Triathlon at PG	September 9-11
2016 Lighthouse 5k and Kids 3k	November 12
2016 Big Sur Half Marathon	November 13
2016 Double Road Race	May 7-8
2016 Feast of the Lanterns	July 27-31
2016 Annual Good Old Days	April 9-10

For a one-way reversing traffic-control lane closure, traffic may be stopped in 1 direction for periods not to exceed 15 minutes. Emergency vehicles must have the ability to traverse through the project unobstructed at all times. If an emergency vehicle approaches the one-way reversing traffic control lane closure, it must be let through immediately. After each stoppage, all accumulated traffic for that direction must pass through the work zone before another stoppage is made.

The maximum length of a single stationary one-way reversing traffic-control lane closure is 0.5 miles between flaggers.

Personal vehicles of your employees must not be parked on the traveled way or shoulders, including sections closed to traffic.

If work vehicles or equipment are parked within 6 feet of a traffic lane, close the shoulder area as shown.

**Replace Section 12-4.03 CLOSURE SCHEDULE AND CONDITIONS, with:**

Every Monday by noon, submit a schedule of planned closures for the next week period. The next week period is defined as Sunday noon through the following Sunday noon.

Submit a schedule not less than 30 days and not more than 125 days before the anticipated start of any activity that will:

1. Require a closure of the conventional highway, freeway or ramps.
2. Reduce the horizontal clearances of traveled ways, including shoulders, to 2 lanes or less due to operations such as temporary barrier placement and paving
3. Reduce the vertical clearances available to the public due to operations such as pavement overlay, overhead sign installation, or falsework or girder erection

Use the closure schedule request form from the Engineer and show the locations and times of the proposed closures. Closure schedules submitted with incomplete or inaccurate information will be rejected and returned for correction and resubmittal. You will be notified of unauthorized closures or closures that require coordination with other parties as a condition of approval.

Submit closure schedule amendments, including adding additional closures, by noon at least 30 days before a planned full closure and 7 days prior to partial closure. Approval of amendments will be at the discretion of the Engineer.

The Engineer must be notified of a cancelled closure 2 business days before the date of the closure.

The Engineer may reschedule a closure cancelled due to unsuitable weather.

A detailed contingency plan must be prepared for reopening closures to traffic. The contingency plan must be submitted within 1 business day of the Engineer's request.

If a closure is not reopened to traffic by the specified time, work must be suspended. No further closures are allowed until the Engineer has reviewed and accepted a work plan submitted by you that insures that future closures will be reopened to traffic at the specified time. Allow the Department 2 business days to review your proposed work plan. You are not entitled to compensation for the suspension of work resulting from the late reopening of closures.

Notify the Engineer of delays in your activities caused by:

1. Your proposed closure schedule being denied although your planned closures are within the time frame allowed for closures as specified in the special provisions. You will not be entitled to compensation for amendments to the closure schedule that are not authorized.
2. Your authorized closure being denied.

If in the opinion of the Engineer your controlling activities are delayed or interfered with by reason of the conditions listed above and your loss due to that delay could not have been avoided by rescheduling the affected closure or by judicious handling of forces, equipment and plant, you will be compensated for the delay.

If you are directed to remove a closure before the time designated in the authorized closure schedule, you will be compensated for the delay.



You shall coordinate with the California Highway Patrol Officer assigned through the Construction Zone Enhance Enforcement Program (COZEEP) prior to the start of any closure and each day/night prior to each closure so the officer knows which areas will be open for travel by emergency vehicles.

Replace "Reserved" in section 12-4.04 with:

Lane Closure Restriction for Designated Holidays, Special Days and Event Days										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
x	H XX	XX	XX							
	SD XX	XX	XX							
	EV XX									
x	XX	H XX	XX							
		SD XX								
		EV XX								
	x	XX	H XX	XX						
			SD XX							
			EV XX							
	x	XX	XX	H XX	XXX					
	x	XX	XX	SD XX	XXX					
				EV XX						
				x	H XX					
				x	SD XX					
					EV XX					
					x	H XX				
						SD XX				
						EV XX				
						x	H XX	XX	XX	XX
							SD XX			
							EV XX			

Legend:	
	Refer to lane requirement charts.
x	The full width of the traveled way must be open for use by traffic after 6 am.
xx	The full width of the traveled way must be open for use by traffic and detours are not allowed
xxx	The full width of the traveled way must be open for use by traffic until 9 am.
H	Designated holiday
SD	Special day
EV	Event Day

Replace "Reserved" in section 12-4.05E with:

Chart no. 1 Complete Ramp Closure Hours/Ramp Lane Requirements																									
County: MON										Route/Direction: Southbound Highway 1 On-Ramp										PM: L4.2/75.0					
Closure limits: The southbound Highway 1 On-Ramp between SR 68 and 17 Mile Drive																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	C	C	C	C	C	C													C	C	C	C	C	C	C
Fri	C	C	C	C	C	C													C	C	C	C	C	C	C
Sat	C	C	C	C	C	C	C	C	C								C	C	C	C	C	C	C	C	C
Sun	C	C	C	C	C	C	C	C	C								C	C	C	C	C	C	C	C	C

**Legend:**  
 C Ramp may be closed completely only as specified in Remarks below  
 Work allowed within the highway where shoulder or lane closure is not required

**REMARKS:**  
 1. See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions.  
 2. Stage 1 closure (1 night) for paving. See detour plan DE-1.  
 3. Stage 4 closure (night) for median construction and paving. See DE-6.  
 4. Stage 6 closure (night) for median construction and paving. See detour plan DE-7.

Replace "Reserved" in section 12-4.05E with:

Chart no. 2 Partial Conventional Highway Closure Hours																											
County: MON												Route/Direction: SR-68/Westbound						PM: L4.2/L4.3									
Closure limits: Aguajito Road to SR-1 SB Off-Ramp (including SR-68/SR-1 Overcrossing)																											
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Mon-Thu	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
Fri	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
Sat	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Sun	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Legend:																											
<table border="0"> <tr> <td style="border: 1px solid black; padding: 2px;">C</td> <td>Conventional highway may be closed to westbound traffic, with the exception of emergency vehicles only as specified in Remarks below</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">1</td> <td>Provide at least 1 through traffic lane open in direction of travel</td> </tr> </table>																								C	Conventional highway may be closed to westbound traffic, with the exception of emergency vehicles only as specified in Remarks below	1	Provide at least 1 through traffic lane open in direction of travel
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1	Provide at least 1 through traffic lane open in direction of travel																										
REMARKS:																											
<ol style="list-style-type: none"> <li>1. See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>2. During closure, access must be provided to emergency vehicles at all times.</li> <li>3. Stage 2 (10 days max) closure. See detour plan DE-2.</li> <li>4. Stage 6, Phase D (2 nights max)</li> </ol>																											

Replace "Reserved" in section 12-4.05F with:

Chart no. 3 Full Conventional Highway Closure Hours																											
County: MON						Route/Direction: SR-68/Westbound and Eastbound						PM: L4.2/L4.3															
Closure limits: Aguajito Road to SR-1 SB Off-Ramp (including SR-68/SR-1 Overcrossing)																											
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Mon-Thu	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
Fri	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
Sat	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Sun	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
<b>Legend:</b>																											
<table border="0"> <tr> <td style="border: 1px solid black; padding: 2px;">C</td> <td>Conventional highway may be closed to both directions of traffic, with the exception of emergency vehicles only as specified in Remarks below</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">1</td> <td>Provide at least 1 through traffic lane open in direction of travel only as specified in Remarks below</td> </tr> </table>																								C	Conventional highway may be closed to both directions of traffic, with the exception of emergency vehicles only as specified in Remarks below	1	Provide at least 1 through traffic lane open in direction of travel only as specified in Remarks below
C	Conventional highway may be closed to both directions of traffic, with the exception of emergency vehicles only as specified in Remarks below																										
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<b>REMARKS:</b>																											
<ol style="list-style-type: none"> <li>1. See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>2. During closure, access must be provided to emergency vehicles at all times.</li> <li>3. Stages 2 (1 night max) closure. See detour plan DE-3.</li> </ol>																											

Replace "Reserved" in section 12-4.05G with:

Chart no. 4 Complete Ramp Closure Hours/Ramp Lane Requirements																									
County: MON										Route/Direction: Southbound Highway 1 Off-Ramp										PM: R75.4/L4.22					
Closure limits: The southbound Highway 1 Off-Ramp to intersection SR-68																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	C	C	C	C	C	C	N	N	N	N	N					N	N	N	N	C	C	C	C	C	
Fri	C	C	C	C	C	C	N	N	N	N	N					N	N	N	N	C	C	C	C	C	
Sat	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sun	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C

**Legend:**

C Ramp may be closed completely, with the exception of emergency vehicles only as specified in Remarks below

N No work allowed

Work allowed within the highway where shoulder or lane closure is not required

**REMARKS:**

1. See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions.
2. During ramp closures access must be provided to emergency vehicles at all times.
3. Stage 3, Phase B and Phase D closures (3 nights and/or 1 weekend each). See detour plan DE-4.
4. Stage 6, Phase D (2 nights max) for final lift paving
5. Stage 7 (2 nights) for off ramp splitter island construction. See detour plan DE-4.

Replace "Reserved" in section 12-4.05G with:

Chart no. 5 Partial Ramp Closure Hours/Ramp Lane Requirements																									
County: MON							Route/Direction: Southbound Highway 1 Off-Ramp							PM: R75.4/L4.22											
Closure limits: The southbound Highway 1 Off-Ramp to intersection SR-68																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	1	1	1	1	1	1	1	1	S	S	S	S	1	1	1	1	S	S	S	S	1	1	1	1	1
Fri	1	1	1	1	1	1	1	1	S	S	S	S	1	1	1	1	S	S	S	S	1	1	1	1	1
Sat																									
Sun																									

**Legend:**

**1** Provide at least 1 ramp lane, not less than 11 feet in width, open in direction of travel only as specified in Remarks below

**S** Shoulder closure allowed

Work allowed within the highway where shoulder or lane closure is not required

**REMARKS:**

- See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions.
- Stage 3, Phase A lane closure for curb and gutter
- Stage 3, Phase B lane closure for paving, overhead sign and guardrail construction.

<b>Chart no. 6</b>																									
<b>Partial City Street Closure Hours/City Street Requirements and Hours of Work</b>																									
County: MON							Route/Direction: Route 68							PM: N/A											
Closure limits: Carmel Hills Driveway																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	R	R	R	R	R	R														R	R	R	R	R	
Fri	R	R	R	R	R	R														R	R	R	R	R	
Sat	R	R	R	R	R	R														R	R	R	R	R	
Sun	R	R	R	R	R	R														R	R	R	R	R	
<b>Legend:</b>																									
<div style="border: 1px solid black; display: inline-block; width: 20px; height: 10px; margin-right: 5px;"></div> Work allowed within the highway where shoulder or lane closure is not required																									
<div style="border: 1px solid black; display: inline-block; width: 20px; height: 10px; margin-right: 5px; text-align: center; vertical-align: middle;">R</div> Provide at least 1 through traffic lane, not less than 14 feet in width, for use by entering and exiting directions of travel only as specified in Remarks below. (Flagger Required).																									
<b>REMARKS:</b>																									
1. See Lane Closure Restriction for Designated Legal Holidays and Special Days table 2. Maintain Traffic of these special provisions for additional closure restrictions. 3. Stage 3 (night) movement restriction.																									

<b>Chart no. 7</b>																									
<b>Partial City Street Closure Hours/City Street Requirements and Hours of Work</b>																									
County: MON							Route/Direction: 17 Mile Drive							PM: N/A											
Closure limits: 17 Mile Drive and access road along the Highway 1 On-Ramp between SR-68 and 17 Mile Drive																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	C	C	C	C	C	C	1	1	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	
Fri	C	C	C	C	C	C	1	1	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	
Sat	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Sun	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
<b>Legend:</b>																									
<div style="border: 1px solid black; display: inline-block; width: 20px; height: 10px; margin-right: 5px; text-align: center; vertical-align: middle;">1</div> Provide right in and right out access only as specified in Remarks below																									
<div style="border: 1px solid black; display: inline-block; width: 20px; height: 10px; margin-right: 5px; text-align: center; vertical-align: middle;">C</div> Street may be closed only as specified in Remarks below																									
<b>REMARKS:</b>																									
1. See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions. 2. Movements restricted to right turn in/right turn out. 3. Stage 4 (25 days) movement restriction. See detour plan DE-3. 4. Stage 4 (1 night) Close SB on ramp and entrance to 17 Mile Drive. See detour plan DE-6																									



<b>Chart no. 8 Partial Conventional Highway Closure Hours</b>																									
County: MON							Route/Direction: SR-68/Eastbound							PM: L4.2/L4.3											
Closure limits: Route 68 from Carmel Hills Driveway to Route 68 overcrossing.																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	R	R	R	R	R	R															R	R	R	R	R
Fri	R	R	R	R	R	R															R	R	R	R	R
Sat	R	R	R	R	R	R															R	R	R	R	R
Sun	R	R	R	R	R	R															R	R	R	R	R

**Legend:**

Work allowed within the highway where shoulder or lane closure is not required

R Provide at least 1 through traffic lane, not less than 10 feet in width, for use by each direction of travel only as specified in Remarks below. (Flagger Required).

**REMARKS:**

1. See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions.
2. During closure, access must be provided to emergency vehicles at all times.
3. Stage 5, Phase B and C.

Chart no. 9																									
Partial City Street Closure Hours/City Street Requirements and Hours of Work																									
County: MON							Route/Direction: 17 Mile Drive							PM: N/A											
Closure limits: 17 Mile Drive and SB access road along SR-1 On-Ramp between SR-68 and 17 Mile Drive																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	C	C	C	C	C	C	C	1	1	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	
Fri	C	C	C	C	C	C	C	1	1	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	
Sat	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Sun	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Legend:

1 Provide at least 1 city street lane open in direction of travel only as specified in Remarks below

C Street may be closed only as specified in Remarks below

REMARKS:

- See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions.
- Stage 6, Phases B and C (night) closure for storm drain, median construction and paving. See detour plan DE-1 and DE-7.

Chart no. 10																									
Complete City Street Closure Hours/City Street Requirements and Hours of Work																									
County: MON							Route/Direction: 17 Mile Drive							PM: N/A											
Closure limits: 17 Mile Drive and NB access road along SR-1 On-Ramp between SR-68 and 17 Mile Drive																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	C	C	C	C	C	C	1	1	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	
Fri	C	C	C	C	C	C	1	1	1	1	1	1	1	1	1	1	1	1	1	C	C	C	C	C	
Sat	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Sun	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Legend:

1 Provide at least 1 city street lane open in direction of travel only as specified in Remarks below

C Street may be closed only as specified in Remarks below

REMARKS:

- See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions.
- Stage 6, Phase B closure (10 nights) and Phase C closure (4 nights) for median construction and paving. See detour plans DE-1 and DE-7.
- Stage 6, Phase D (2 night) closure for final lift paving. See detour plan DE-5.

Chart no. 11 Complete Ramp Closure Hours/Ramp Lane Requirements																									
County: MON							Route/Direction: Southbound Highway 1 On-Ramp							PM: L4.2/75.0											
Closure limits: Southbound Highway 1 On-Ramp																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	C	C	C	C	C	C														C	C	C	C	C	
Fri	C	C	C	C	C	C														C	C	C	C	C	
Sat	C	C	C	C	C	C	C	C	C							C	C	C	C	C	C	C	C	C	
Sun	C	C	C	C	C	C	C	C	C							C	C	C	C	C	C	C	C	C	

**Legend:**  
 C Ramp may be closed completely only as specified in Remarks below.  
 Work allowed within the highway where shoulder or lane closure is not required.

**REMARKS:**  
 1. See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions.  
 2. Stage 6, Phase C closure (4 nights) for median Construction and paving. See detour plans DE-1 and DE-7.  
 3. Stage 6, Phase D closure (2 night) for final lift paving. See detour plans DE-1 and DE-7.

Replace section 12-5 with:

## 12-5 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

### 12-5.01 GENERAL

Section 12-5 includes specifications for closing traffic lanes with stationary lane closures on 2-lane, 2-way highways. The traffic control system for a lane closure must comply with the details shown.

Traffic control system includes signs.

### 12-5.02 MATERIALS

Not Used

### 12-5.03 CONSTRUCTION

Whenever components of the traffic control system are displaced or cease to operate or function as specified from any cause, immediately repair the components to the original condition or replace the components and restore the components to the original location.

For a stationary lane closure made only for the work period, remove the components of the traffic control system from the traveled way and shoulder, except for portable delineators placed along open trenches or excavation adjacent to the traveled way at the end of each work period. You may store the components at selected central locations designated by the Engineer within the limits of the highway.

Additional advance flaggers are required during Stage 5.

You may use a pilot car to control traffic. If a pilot car is used for traffic control, the cones shown along the centerline need not be placed. The pilot car must have radio contact with personnel in the work area. Operate the pilot car through the traffic control zone at a speed not greater than 25 miles per hour.

### 12-5.04 PAYMENT

Traffic control system for lane closure is paid for as traffic control system. Flagging costs are paid for as specified in section 12-1.03 of these special provisions.

The requirements in section 4-1.05 for payment adjustment do not apply to traffic control system. Adjustments in compensation for traffic control system will be made for an increase or decrease in traffic control work if ordered and will be made on the basis of the cost of the necessary increased or decreased traffic control. The adjustment will be made on a force account basis for increased work and estimated on the same basis in the case of decreased work.

A traffic control system required by change order work is paid for as a part of the change order work.

Replace section 12-8 with:

## 12-8 TEMPORARY PAVEMENT DELINEATION

### 12-8.01 GENERAL

Section 12-8 includes specifications for placing, applying, maintaining, and removing temporary pavement delineation.

Temporary signing for no-passing zones must comply with section 12-3.06.

Temporary painted traffic stripes and painted pavement markings used for temporary delineation must comply with section 84-3.

### 12-8.02 MATERIALS

#### 12-8.02A General

Not Used

**12-8.02B Temporary Lane Line and Centerline Delineation**

Temporary pavement markers must be the same color as the lane line or centerline markers being replaced. Temporary pavement markers must be temporary pavement markers on the Authorized Material List for short-term day/night use, 14 days or less, or long-term day/night use, 180 days or less. Place temporary pavement markers under the manufacturer's instructions.

**12-8.02C Temporary Edge Line Delineation**

On multilane roadways, freeways, and expressways open to traffic where edge lines are obliterated and temporary pavement delineation to replace those edge lines is not shown, provide temporary pavement delineation for:

1. Right edge lines consisting of (1) a solid 4-inch wide traffic stripe tape of the same color as the stripe being replaced, (2) traffic cones, or (3) portable delineators or channelizers placed longitudinally at intervals not exceeding 100 feet
2. Left edge lines consisting of (1) solid 4-inch wide traffic stripe tape of the same color as the stripe being replaced, (2) traffic cones, (3) portable delineators or channelizers placed longitudinally at intervals not exceeding 100 feet, or (4) temporary pavement markers placed longitudinally at intervals not exceeding 6 feet

**12-8.02D Temporary Traffic Stripe Tape**

Not Used

**12-8.02E Temporary Traffic Stripe Paint**

Not Used

**12-8.02F Temporary Pavement Marking Tape**

Not Used

**12-8.02G Temporary Pavement Marking Paint**

You may use one of the types of temporary removable pavement marking tape or permanent pavement marking tape on the Authorized Material List instead of temporary pavement marking paint.

**12-8.02H Temporary Pavement Markers**

Temporary pavement markers must be one of the temporary pavement markers on the Authorized Material List for long term day/night use, 180 days or less.

**12-8.03 CONSTRUCTION****12-8.03A General**

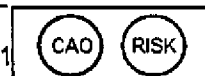
Wherever work activities obliterate pavement delineation, place temporary or permanent pavement delineation before opening the traveled way to traffic. Place lane line and centerline pavement delineation for traveled ways open to traffic. On multilane roadways, freeways and expressways, place edge line delineation for traveled ways open to traffic.

Establish the alignment for the temporary pavement delineation including required lines or markers. Surfaces to receive an application of paint or removable traffic tape must be dry and free of dirt and loose material. Do not apply temporary pavement delineation over existing pavement delineation or other temporary pavement delineation. Maintain temporary pavement delineation until it is superseded or you replace it with a new pattern of temporary pavement delineation or permanent pavement delineation.

When the Engineer determines the temporary pavement delineation is no longer required for the direction of traffic, remove the temporary pavement markers, underlying adhesive, and removable traffic tape from the final layer of surfacing and from the existing pavement to remain in place. Remove temporary pavement delineation that conflicts with any subsequent or new traffic pattern for the area.

**12-8.03B Temporary Lane line and Centerline Delineation**

Whenever lane lines or centerlines are obliterated and temporary pavement delineation to replace the lines is not shown, the minimum lane line and centerline delineation must consist of temporary pavement



markers placed longitudinally at intervals not exceeding 24 feet. For temporary pavement markers on the Authorized Material List for long-term day/night use, 180 days or less, cement the markers to the surfacing with the adhesive recommended by the manufacturer except do not use epoxy adhesive to place the pavement markers in areas where removal of the markers will be required.

For temporary lane line or centerline delineation consisting entirely of temporary pavement markers on the Authorized Material List for short-term day/night use, 14 days or less, place the markers longitudinally at intervals not exceeding 24 feet. Do not use the markers for more than 14 days on lanes opened to traffic. Place the permanent pavement delineation before the end of the 14 days. If the permanent pavement delineation is not placed within the 14 days, replace the temporary pavement markers with additional temporary pavement delineation equivalent to the pattern specified or shown for the permanent pavement delineation for the area. The Department does not pay for the additional temporary pavement delineation.

#### **12-8.03C Temporary Edge Line Delineation**

You may apply temporary painted traffic stripe where removal of a 4-inch wide traffic stripe is not required.

The Engineer determines the lateral offset for traffic cones, portable delineators, and channelizers used for temporary edge line delineation. If traffic cones or portable delineators are used for temporary pavement delineation for edge lines, maintain the cones or delineators during hours of the day when the cones or delineators are being used for temporary edge line delineation.

Channelizers used for temporary edge line delineation must be an orange surface-mounted type. Cement channelizer bases to the pavement under section 85 for cementing pavement markers to pavement except do not use epoxy adhesive to place channelizers on the top layer of the pavement. Channelizers must be one of the 36-inch, surface-mounted types on the Authorized Material List.

Remove the temporary edge line delineation when the Engineer determines it is no longer required for the direction of traffic.

#### **12-8.03D Temporary Traffic Stripe Tape**

Not Used

#### **12-8.03E Temporary Traffic Stripe Paint**

Apply 1 or 2 coats of temporary traffic stripe paint for new or existing pavement.

The painted temporary traffic stripe must be complete in place at the location shown before opening the traveled way to traffic. Removal of painted temporary traffic stripe is not required.

#### **12-8.03F Temporary Pavement Marking Tape**

Not Used

#### **12-8.03G Temporary Pavement Marking Paint**

Apply and maintain temporary pavement markings consisting of painted pavement markings at the locations shown. The painted temporary pavement marking must be complete in place at the location shown before opening the traveled way to traffic. Removal of painted temporary pavement marking is not required.

Apply 1 or 2 coats of temporary pavement marking paint for new or existing pavement.

#### **12- 8.03H Temporary Pavement Markers**

Place temporary pavement markers under the manufacturer's instructions. Cement the markers to the surfacing with the manufacturer's recommended adhesive, except do not use epoxy adhesive in areas where removal of the pavement markers is required.

You may use retroreflective pavement markers specified in section 85 instead of temporary pavement markers for long term day/night use, 180 days or less, except to simulate patterns of broken traffic stripe. Retroreflective pavement markers used for temporary pavement markers must comply with section 85,

except the waiting period before placing pavement markers on new HMA surfacing as specified in section 85-1.03 does not apply. Do not use epoxy adhesive to place pavement markers in areas where removal of the pavement markers is required.

Temporary pavement markers must be complete in place before opening the traveled way to traffic.

**12-8.04 PAYMENT**

Not Used

**13 WATER POLLUTION CONTROL**

**Add to section 13-3.01A:**

The project is risk level 2.

**Replace the 1st sentence in the 2nd paragraph in section 13-3.01B(2)(a) with:**

The SWPPP must comply with the Caltrans Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Plan (WPCP) Preparation Manual.

\*\*\*\*\*

**14 ENVIRONMENTAL STEWARDSHIP**

**Add to section 14-1.02A:**

An ESA exists on this project.

Before start of work, protect the ESA by installing Type ESA Temporary Fence.

**Replace section 14-6.02 with:**

**14-6.02 SPECIES PROTECTION**

**14-6.02A General**

Section 14-6.02 includes specifications for protecting regulated species or their habitat.

This project is within or near habitat for regulated species shown in the following table:

Species Name
Dusky Footed Woodrat

A qualified wildlife biologist shall survey the project impact area no less than 60 days prior to start of construction activities for evidence of dusky-footed woodrat nests. If woodrat nests are found within the project impact area, a qualified biologist shall, in consultation with California Department of Fish and Game, live-trap the woodrat(s) and relocate to a suitable site.

The Department anticipates nesting or attempted nesting by migratory and nongame birds from February 15 to August 31. Surveys shall be conducted no more than 14 days prior to the initiation of construction activities.

**14-6.02B Material**

Not Used

**14-6.02C Construction**

**14-6.02C(1) General**

Not Used

**14-6.02C(2) Protective Radius**

Upon discovery of a regulated species, stop construction activities within a 492 radius of the discovery or as defined in the table below. Immediately notify the Engineer. Do not resume activities until receiving notification from the Engineer.

Regulated species name	Protective radius
Dusky Footed Woodrat	492 ft
Nesting Birds	492 ft

**14-6.02D Payment**

Not Used

**Add to section 14-9.02A:**

The Contractor shall use appropriate measures from the list below when daily watering (required) is not adequate to minimize dust:

1. Prohibit all grading activities during periods of high wind (over 15 mph).
2. Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction area that are unused for four consecutive days.)
3. Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas, after cut and fill activities and after hydroseed placement area.
4. Haul trucks shall maintain at least two feet of freeboard.
5. Cover all trucks hauling dirt, sand, or loose materials.
6. Plant vegetative ground cover in disturbed areas as soon as possible.
7. Cover inactive storage piles.
8. Sweep streets if visible soil material is carried out from the construction site.
9. Post a publicly visible sign which specifies the telephone number and person to contact regarding dust complaints.

**Replace section 14-11.03 with:**

**14-11.03 MATERIAL CONTAINING HAZARDOUS WASTE CONCENTRATIONS OF AERIALLY DEPOSITED LEAD**

**14-11.03A General**

**14-11.03A(1) Summary**

Section 14-11.03 includes specifications for hazardous waste management while excavating, stockpiling, transporting, placing, and disposing of material containing hazardous waste concentrations of aerially deposited lead (ADL).

ADL is present within the project limits.

**14-11.03A(2) Definitions**

**Type Y-1:** Material that contains ADL in average concentrations (using the 90 percent Upper Confidence Limit) of 1.5 mg/L or less extractable lead (based on a modified waste extraction test using deionized water as the extractant) and 1,411 mg/kg or less total lead. This material is a California hazardous waste



that may be reused as permitted under the variance of the DTSC provided that the lead contaminated soil is placed a minimum of 5 feet above the maximum historic water table elevation and covered with at least 1 foot of non-hazardous soil.

**Type Y-2:** Material that contains ADL in average concentrations (using the 90 percent Upper Confidence Limit) that exceed either 1.5 mg/L extractable lead (based on a modified waste extraction test using deionized water as the extractant) or 1,411 mg/kg total lead but are less than 150 mg/L extractable lead (based on a modified waste extraction test using deionized water as the extractant) and less than 3,397 mg/kg of total lead. This material is a California hazardous waste that may be reused as permitted under the variance of DTSC provided that the lead contaminated soil is placed a minimum of 5 feet above the maximum historic water table elevation and protected from infiltration by a pavement structure which will be maintained by the Department.

**Type Z-2:** Material that contains ADL in average concentrations (using the 95 percent Upper Confidence Limit) greater than or equal to 1,000 mg/kg total lead, greater than or equal to 5.0 mg/L soluble lead (as tested using the California Waste Extraction Test), and the material is surplus; or material that contains ADL in average concentrations greater than 150 mg/L extractable lead (based on a modified waste extraction test using deionized water as the extractant) or greater than 3,397 mg/kg total lead. This material is a Department-generated California hazardous waste and must be transported to and disposed of at a California Class I disposal site.

**Type Z-3:** Material that contains ADL in average concentrations (using the 95 percent Upper Confidence Limit) greater than 5.0 mg/L soluble lead, (as tested using the Toxicity Characteristic Leaching Procedure). This material is a Department-generated federal hazardous waste and must be transported to and disposed of at a California Class I disposal site.

#### 14-11.03A(3) Site Conditions

ADL concentration data and sample locations maps are included in the *Information Handout*.

Type Z-2 material exists between 0 and 20 feet, measured horizontally from the edges of existing pavement, from a depth of 0 to 2 feet below existing grade, at the following locations.

- Southbound Highway 1 off ramp.
- East side of the southbound Highway 1 on ramp from Station 12+00 to 15+50
- Both sides of the southbound Highway 1 on ramp from the limits of work to station 12+00.

#### 14-11.03A(4) Submittals

##### 14-11.03A(4)(a) Lead Compliance Plan

Submit a lead compliance plan under section 7-1.02K(6)(j)(ii).

Include perimeter air monitoring incorporating upwind and downwind locations as shown or as authorized. Monitor with personal air samplers using National Institute of Safety and Health Method 7082. Sampling must achieve a detection limit of 0.05  $\mu\text{g}/\text{m}^3$  of air per day. Conduct daily monitoring while clearing and grubbing and performing earthwork operations. Analyze a single representative daily sample for lead. Analyze the sample and provide results to the Engineer within 24 hours. Analyses must be performed by a laboratory accredited by the Environmental Lead Laboratory-Accreditation Program of the American Industrial Hygiene Association. Average lead concentrations must not exceed 1.5  $\mu\text{g}/\text{m}^3$  of air per day and 0.15  $\mu\text{g}/\text{m}^3$  per day on a rolling 90-day basis. Calculate average daily concentrations based on monitoring to date, and projection based on those monitoring trends for the next 90 days or to the end of work subject to the lead compliance plan if less than the specified averaging period. If concentrations exceed these levels stop work and modify the work to prevent release of lead. Monitor under the direction of a CIH. The air monitoring data must be reviewed by and signed by the CIH.

##### 14-11.03A(4)(b) Excavation and Transportation Plan

Within 15 days after approval of the Contract, submit 3 copies of an excavation and transportation plan. Allow 7 days for review. If revisions are required, as determined by the Engineer, submit the revised plan within 7 days of receipt of the Engineer's comments. For the revision, allow 5 days for the review. Minor changes to or clarifications of the initial submittal may be made and attached as amendments to the

excavation and transportation plan. In order to allow construction to proceed, the Engineer may conditionally approve the plan while minor revisions or amendments are being completed.

Prepare the written, project specific excavation and transportation plan establishing the procedures you will use to comply with requirements for excavating, stockpiling, transporting, and placing or disposing of material containing ADL. The plan must comply with the regulations of the DTSC and Cal/OSHA and the requirements of the variance. The sampling and analysis portions of the excavation and transportation plan must meet the requirements for the design and development of the sampling plan, statistical analysis, and reporting of test results contained in US EPA, SW 846, "Test Methods for Evaluating Solid Waste," Volume II: Field Manual Physical/Chemical, Chapter Nine, Section 9.1. The plan must include the following elements:

1. Excavation schedule by location and date
2. Temporary locations of stockpiled material
3. Sampling and analysis plans for areas after removal of a stockpile. Include the following:
  - 3.1. Location and number of samples.
  - 3.2. Name and address of the laboratory where the analysis will be performed. The laboratory must be certified under the State Water Resources Control Board (SWRCB) Environmental Laboratory Accreditation Program (ELAP).
4. Survey methods for Type Y-1 or Y-2 material burial locations
7. Dust control measures
8. Air monitoring. Include the following information:
  - 8.1. Location and type of equipment
  - 8.2. Sampling frequency
  - 8.3. Name and address of the accredited laboratory where the analysis was performed
9. Transportation equipment and routes
10. Method for preventing spills and tracking material onto public roads
11. Truck waiting and staging areas
12. Site for disposal of hazardous waste
13. Example of bill of lading to be carried by trucks transporting Type Y-1 or Y-2, material. The bill of lading must include:
  - 13.1. US Department of Transportation (US DOT) description including shipping name
  - 13.2. Hazard class
  - 13.3. Identification number
  - 13.4. Handling codes
  - 13.5. Quantity of material
  - 13.6. Volume of material
14. Spill Contingency Plan for material containing ADL

#### **14-11.03A(4)(c) Burial Location Report**

Not Used

#### **14-11.03A(4)(d) Bill of Lading**

Copies of the bills of lading must be submitted as an informational submittal upon placement of Type Y-1 or Y-2 material in its final location.

#### **14-11.03A(5) Quality Control and Assurance**

Excavation, reuse, and disposal of material with ADL must comply with rules and regulations of the following agencies:

1. US DOT
2. US EPA
3. California Environmental Protection Agency
4. CDPH
5. DTSC
6. Cal/OSHA
7. California Department of Resources Recycling and Recovery

8. RWQCB, Region 3, Central Coast
9. California Air Resources Board
10. Monterey Air Quality Management District

Transport and dispose of material containing hazardous levels of lead under federal and state laws and regulations and county and municipal ordinances and regulations. Laws and regulations that govern this work include:

1. Health & Safety Code, Division 20, Chp 6.5 (California Hazardous Waste Control Act)
2. 22 CA Code of Regs, Div. 4.5 (Environmental Health Standards for the Management of Hazardous Waste)
3. 8 CA Code of Regs

#### **14-11.03B Materials**

Not Used

#### **14-11.03C Construction**

##### **14-11.03C(1) General**

Not Used

##### **14-11.03C(2) Material Management**

Not Used

##### **14-11.03C(3) Dust Control**

Excavation, transportation, placement, and handling of material containing ADL must result in no visible dust migration. A water truck or tank must be on the job site at all times while clearing and grubbing or performing earthwork operations in work areas containing ADL. Apply water to prevent visible dust.

##### **14-11.03C(4) Surveying Type Y-1 or Y-2 Material Burial Locations**

Not Used

##### **14-11.03C(5) Material Transportation**

Before traveling on public roads, remove loose and extraneous material from surfaces outside the cargo areas of the transporting vehicles and cover the cargo with tarpaulins or other cover, as outlined in the approved excavation and transportation plan. You are responsible for costs due to spillage of material containing lead during transport. Transportation routes for Type Y-1 or Y-2 material must only include the highway.

#### **14-11.03D Payment**

Payment for a lead compliance plan is not included in the payment for environmental stewardship work.

The Department does not pay for stockpiling of material containing ADL, unless the stockpiling is ordered. The Department does not pay for sampling and analysis unless it is ordered. The Department does not pay for additional sampling and analysis required by the receiving landfill.

Sampling, analyses, and reporting of results for surplus material not previously sampled is change order work.

**Replace section 14-11.07 with:**

#### **14-11.07 REMOVE YELLOW TRAFFIC STRIPE AND PAVEMENT MARKING WITH HAZARDOUS WASTE RESIDUE**

##### **14-11.07A General**

##### **14-11.07A(1) Summary**

Section 14-11.07 includes specifications for removing existing yellow thermoplastic and yellow painted traffic stripe and pavement marking. The residue from the removal of this material is a Department-generated hazardous waste.

Residue from removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking contains lead chromate. The average lead concentration is at least 1,000 mg/kg total lead or 5 mg/l soluble lead. When applied to the roadway, the yellow thermoplastic and yellow painted traffic stripe and pavement marking contained as much as 2.6 percent lead. Residue produced from the removal of this yellow thermoplastic and yellow painted traffic stripe and pavement marking contains heavy metals in concentrations that exceed thresholds established by the Health & Safety Code and 22 CA Code of Regs. For bidding purposes, assume the residue is not regulated under the Federal Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 et seq.

Yellow thermoplastic and yellow paint may produce toxic fumes when heated.

#### **14-11.07A(2) Submittals**

##### **14-11.07A(2)(a) General**

Reserved

##### **14-11.07A(2)(b) Lead Compliance Plan**

Submit a lead compliance plan under section 7-1.02K(6)(j)(ii).

##### **14-11.07A(2)(c) Work Plan**

Submit a work plan for the removal, containment, storage, and disposal of yellow thermoplastic and yellow painted traffic stripe and pavement marking. The work plan must include:

1. Objective of the operation
2. Removal equipment
3. Procedures for removal and collection of yellow thermoplastic and yellow painted traffic stripe and pavement marking residue, including dust
4. Type of hazardous waste storage containers
5. Container storage location and how it will be secured
6. Hazardous waste sampling protocol and QA/QC requirements and procedures
7. Qualifications of sampling personnel
8. Analytical lab that will perform the analyses
9. DTSC registration certificate and CA Highway Patrol (CHP) Biennial Inspection of Terminals (BIT) Program compliance documentation of the hazardous waste hauler that will transport the hazardous waste
10. Disposal site that will accept the hazardous waste residue

The Engineer will review the work plan within 5 business days of receipt.

Do not perform work that generates hazardous waste residue until the work plan has been authorized.

Correct any rejected work plan and resubmit a corrected work plan within 5 business days of notification by the Engineer. A new review period of 5 business days will begin from date of resubmittal.

##### **14-11.07A(2)(d) Analytical Test Results**

Submit analytical test results of the residue from removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking, including chain of custody documentation, for review and acceptance before:

1. Requesting the Engineer's signature on the waste profile requested by the disposal facility
2. Requesting the Engineer obtain an US EPA Generator Identification Number for disposal
3. Removing the residue from the site

##### **14-11.07A(2)(e) U.S. Environmental Protection Agency Identification Number Request**

Submit a request for the US EPA Generator Identification Number when the Engineer accepts analytical test results documenting that residue from removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking is a hazardous waste.

**14-11.07A(2)(f) Disposal Documentation**

Submit documentation of proper disposal from the receiving landfill within 5 business days of residue transport from the project.

**14-11.07B Materials**

Not Used

**14-11.07C Construction**

Where grinding or other authorized methods are used to remove yellow thermoplastic and yellow painted traffic stripe and pavement marking that will produce a hazardous waste residue, immediately contain and collect the removed residue, including dust. Use a HEPA filter-equipped vacuum attachment operated concurrently with the removal operations or other equally effective approved methods for collection of the residue.

Make necessary arrangements to test the yellow thermoplastic and yellow paint hazardous waste residue as required by the disposal facility and these special provisions. Testing must include:

1. Total lead by US EPA Method 6010B
2. Total chromium by US EPA Method 6010B
3. Soluble lead by California Waste Extraction Test (CA WET)
4. Soluble chromium by CA WET
5. Soluble lead by Toxicity Characteristic Leaching Procedure (TCLP)
6. Soluble chromium by TCLP

From the first 220 gal of hazardous waste or portion thereof if less than 220 gal of hazardous waste are produced, a minimum of 4 randomly selected samples must be taken and analyzed individually. Samples must not be composited. From each additional 880 gal of hazardous waste or portion thereof if less than 880 gal are produced, a minimum of 1 additional random sample must be taken and analyzed. Use chain of custody procedures consistent with chapter 9 of US EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) while transporting samples from the project to the laboratory. Each sample must be homogenized before analysis by the laboratory performing the analyses. A sample aliquot sufficient to cover the amount necessary for the total and the soluble analyses must then be taken. This aliquot must be homogenized a 2nd time and the total and soluble analyses run on this aliquot. The homogenization process must not include grinding of the samples. Submit the name and location of the disposal facility that will be accepting the hazardous waste and the analytical laboratory along with the testing requirements not less than 5 business days before the start of removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking. The analytical laboratory must be certified by the California Department of Public Health (CDPH) Environmental Laboratory Accreditation Program (ELAP) for all analyses to be performed.

After the Engineer accepts the analytical test results, dispose of yellow thermoplastic and yellow paint hazardous waste residue at a Class 1 disposal facility located in California under the requirements of the disposal facility operator within 30 days after accumulating 220 pounds of residue and dust.

If less than 220 pounds of hazardous waste residue and dust is generated in total, dispose of it within 30 days after the start of accumulation of the residue and dust.

The Engineer will sign all manifests as the generator within 2 business days of receiving and accepting the analytical test results and receiving your request for the US EPA Generator Identification Number. Use a transporter with a current DTSC registration certificate and that is in compliance with the CHP BIT Program when transporting hazardous waste.

**14-11.07D Payment**

Payment for a lead compliance plan is not included in the payment for environmental stewardship work.

If analytical test results demonstrate that the residue is a non-hazardous waste and the Engineer agrees, dispose of the residue at an appropriately permitted CA Class II or CA Class III facility. The Department does not adjust payment for this disposal.

**Replace section 14-11.09 with:****14-11.09 TREATED WOOD WASTE****14-11.09A General****14-11.09A(1) Summary**

Section 14-11.09 includes specifications for handling, storing, transporting, and disposing of treated wood waste (TWW).

Wood removed from metal beam guard rails and roadside signs are TWW. Manage TWW under 22 CA Code of Regs, Div. 4.5, Chp. 34.

**14-11.09A(2) Submittals**

For disposal of TWW, submit as an informational submittal a copy of each completed shipping record and weight receipt within 5 business days.

**14-11.09B Materials**

Not Used

**14-11.09C Construction****14-11.09C(1) General**

Not Used

**14-11.09C(2) Training**

Provide training to personnel who handle TWW or may come in contact with TWW. Training must include:

1. Applicable requirements of 8 CA Code of Regs
2. Procedures for identifying and segregating TWW
3. Safe handling practices
4. Requirements of 22 CA Code of Regs, Div. 4.5, Chp. 34
5. Proper disposal methods

Maintain records of personnel training for 3 years.

**14-11.09C(3) Storage**

Store TWW before disposal using the following methods:

1. Elevate on blocks above a foreseeable run-on elevation and protect from precipitation for no more than 90 days.
2. Place on a containment surface or pad protected from run-on and precipitation for no more than 180 days.
3. Place in water-resistant containers designed for shipping or solid waste collection for no more than 1 year.
4. Place in a storage building as defined in 22 CA Code of Regs, Div. 4.5, Chp. 34, § 67386.6(a)(2)(C).

Prevent unauthorized access to TWW using a secured enclosure such as a locked chain-link-fenced area or a lockable shipping container located within the job site.

Resize and segregate TWW at a location where debris from the operation including sawdust and chips can be contained. Collect and manage the debris as TWW.

Provide water-resistant labels that comply with 22 CA Code of Regs, Div. 4.5, Chp. 34, §67386.5, to clearly mark and identify TWW and accumulation areas. Labels must include:

1. Caltrans, District number, Construction, Construction Contract number
2. District office address
3. Engineer's name, address, and telephone number
4. Contractor's contact name, address and telephone number

5. Date placed in storage

**14-11.09C(4) Transporting and Disposal**

Before transporting TWW, obtain an agreement from the receiving facility that the TWW will be accepted. Protect shipments of TWW from loss and exposure to precipitation. For projects with 10,000 lb or more of TWW, request a generator's EPA Identification Number at least 5 business days before the 1st shipment. Each shipment must be accompanied by a shipping record such as a bill of lading or invoice that includes:

1. Caltrans with district number
2. Construction Contract number
3. District office address
4. Engineer's name, address, and telephone number
5. Contractor's contact name and telephone number
6. Receiving facility name and address
7. Waste description: Treated Wood Waste with preservative type if known or unknown/mixture
8. Project location
9. Estimated quantity of shipment by weight or volume
10. Date of transport
11. Date of receipt by the receiving TWW facility
12. Weight of shipment as measured by the receiving TWW facility
13. Generator's EPA Identification Number for projects with 10,000 lb or more of TWW

The shipping record must be at least a 4-part carbon or carbonless 8-1/2-by-11-inch form to allow retention of copies by the Engineer, transporter, and disposal facility.

Dispose of TWW at an approved TWW facility. A list of currently approved TWW facilities is available at:

<http://www.dtsc.ca.gov/HazardousWaste/upload/lanfillapr11pdated1.pdf>

Dispose of TWW within:

1. 90 days of generation if stored on blocks
2. 180 days of generation if stored on a containment surface or pad
3. 1 year of generation if stored in a water-resistant container or within 90 days after the container is full, whichever is shorter
4. 1 year of generation if storing in a storage building as defined in 22 CA Code of Regs, Div. 4.5, Chp. 34, § 67386.6(a)(2)(C)

**14-11.09D Payment**

Not Used

\*\*\*\*\*

**15 EXISTING FACILITIES**

**Replace section 15-1.03B with:****15-1.03B Residue Containing Lead from Paint and Thermoplastic**

Residue from grinding or cold planing contains lead from paint and thermoplastic. The average lead concentrations are less than 1,000 mg/kg total lead and 5 mg/L soluble lead. This residue:

1. Is a nonhazardous waste
2. Does not contain heavy metals in concentrations that exceed thresholds established by the Health and Safety Code and 22 CA Code of Regs
3. Is not regulated under the Federal Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 et seq.

Submit a lead compliance plan under section 7-1.02K(6)(j)(ii).

Payment for a lead compliance plan is not included in the payment for existing facilities work.

Payment for handling, removal, and disposal of grinding or cold planing residue that is a nonhazardous waste is included in the payment for the type of removal work involved.

**Replace section 15-2.02B(3) with:****15-2.02B(3) Cold Planing Asphalt Concrete Pavement****15-2.02B(3)(a) General**

Schedule cold planing activities so that not more than two days elapses between the time the pavement is cold planed and the HMA is placed.

**15-2.02B(3)(b) Materials**

Use the same quality of HMA for temporary tapers that is used for the HMA overlay or comply with the specifications for minor HMA in section 39.

**15-2.02B(3)(c) Construction****15-2.02B(3)(c)(i) General**

Do not use a heating device to soften the pavement.

The cold planing machine must be:

1. Equipped with a cutter head width that matches the planing width. If the cutter head width is wider than the cold plane area shown, submit to the Engineer a request for using a wider cutter head. Do not cold plane unless the Engineer approves your request.
2. Equipped with automatic controls for the longitudinal grade and transverse slope of the cutter head and:
  - 2.1. If a ski device is used, it must be at least 30 feet long, rigid, and a 1-piece unit. The entire length must be used in activating the sensor.
  - 2.2. If referencing from existing pavement, the cold planing machine must be controlled by a self-contained grade reference system. The system must be used at or near the centerline of the roadway. On the adjacent pass with the cold planing machine, a joint-matching shoe may be used.
3. Equipped to effectively control dust generated by the planing operation
4. Operated so that no fumes or smoke is produced.

Replace broken, missing, or worn machine teeth.

**15-2.02B(3)(c)(ii) Grade Control and Surface Smoothness**

Furnish, install, and maintain grade and transverse slope references.

The depth, length, width, and shape of the cut must be as shown or as ordered. The final cut must result in a neat and uniform surface. Do not damage the remaining surface.



The completed surface of the planed asphalt concrete pavement must not vary more than 0.02 foot when measured with a 12-foot straightedge parallel with the centerline. With the straightedge at right angles to the centerline, the transverse slope of the planed surface must not vary more than 0.03 foot.

Where lanes are open to traffic, the drop-off of between adjacent lanes must not be more than 0.15 foot.

**15-2.02B(3)(c)(iii) Temporary HMA Tapers**

If a drop-off between the existing pavement and the planed area at transverse joints cannot be avoided before opening to traffic, construct a temporary HMA taper. The HMA temporary taper must be:

1. Placed to the level of the existing pavement and tapered on a slope of 30:1 (horizontal:vertical) or flatter to the level of the planed area
2. Compacted by any method that will produce a smooth riding surface

Completely remove temporary tapers before placing permanent surfacing.

**15-2.02B(3)(c)(iv) Remove Planed Material**

Remove cold planed material concurrent with planing activities so that removal does not lag more than 50 feet behind the planer.

**15-2.02B(3)(d) Payment**

Payment for removal of pavement markers, thermoplastic traffic stripe, painted traffic stripe, and pavement marking within the area of cold planing is included in the payment for cold plane asphalt concrete pavement of the types shown in the Bid Item List.

**Replace section 15-2.02C(2) with:**

**15-2.02C(2) Remove Traffic Stripes and Pavement Markings Containing Lead**

Residue from removing traffic stripes and pavement markings contains lead from the paint or thermoplastic. The average lead concentrations are less than 1,000 mg/kg total lead and 5 mg/L soluble lead. This residue:

1. Is a nonhazardous waste
2. Does not contain heavy metals in concentrations that exceed thresholds established by the Health and Safety Code and 22 CA Code of Regs
3. Is not regulated under the Federal Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 et seq.

Submit a lead compliance plan under section 7-1.02K(6)(j)(ii).

Payment for a lead compliance plan is not included in the payment for existing facilities work.

Payment for handling, removal, and disposal of pavement residue that is a nonhazardous waste is included in the payment for the type of removal work involved.

**Replace section 15-2.02F with:**

**15-2.02F Remove Asphalt Concrete Dikes**

Before removing the dike, cut the outside edge of the asphalt concrete on a neat line and to a minimum depth of 0.17 foot.

You may dispose of the dike by burial in an embankment in the same manner as specified for burying concrete in an embankment in section 15-3.01.

**Replace section 15-2.03A(2)(b) with:**

**15-2.03A(2)(b) Department Salvage Location**

A minimum of 2 business days before hauling salvaged material to the Department salvage storage location, notify:

- 1. Engineer
- 2. District Regional Recycle coordinator at telephone number 805-549-3235

For traffic signals, light standards, controllers and guardrail, the Caltrans salvage storage location is:  
850 Elvee Dr, Salinas, CA

**Replace section 15-2.03B with:**

**15-2.03B Salvage Guardrail**

For the following listed locations, salvaging guardrail includes removing concrete anchors, steel foundation tubes, and terminal anchor assemblies:

- 1. SR 68 at the Highway 1 overcrossing.

\*\*\*\*\*

**DIVISION III GRADING**

**16 CLEARING AND GRUBBING**

**Replace the 4th paragraph in section 16-1.03A with:**

Clear and grub vegetation only within the excavation and embankment slope lines.

**Add to section 16-1.03C:**

Remove Tree Stump shall conform to this section. Any void left from removal of tree stumps within the limits of the structural pavement section, sidewalk section, or retaining wall footings shall be backfilled with 95% relatively compacted Class 2 aggregate base. Any void left from removal of tree stumps outside of the limits listed above shall be backfilled with 60% relatively compacted native soil.

**Add to section 16-1.04:**

The unit price paid for Remove Tree Stump shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in removing the stump and roots completely and backfilling of the void left by the removal.

\*\*\*\*\*

**18 DUST PALLIATIVE**

**Delete item 1 and 2 in the 2nd paragraph of the RSS for section 18-1.01A.**

AA

### 19 EARTHWORK

**Replace the third paragraph in section 19-2.01A:**

Roadway excavation includes ditch excavation. Ditch excavation shall comply with Section 19-1.03E Ditch Excavation of the Standard Specifications.

Removal of temporary pavement and over excavation for the landscape areas are included in the quantity paid for Roadway Excavation.

**Replace the 2nd, 3rd, and 4th paragraphs of section 19-2.03B with:**

Dispose of surplus material. Ensure enough material is available to complete the embankments before disposing of it.

**Add to section 19-2.03G:**

Roughen embankment slopes to receive erosion control materials by either track-walking or rolling with a sheepsfoot roller. Track-walk slopes by running track-mounted equipment perpendicular to slope contours.

**Add to section 19-3.04:**

Class 2 aggregate base placed below footings is paid for as structure backfill.

AA

### 20 LANDSCAPE

**Replace the 1st through the 5th paragraphs in section 20-1.02C of the RSS for section 20 with:**

Do not use pesticides.

**Add to section 20-1.03C(3) of the RSS for section 20:**

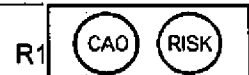
Control weeds within the highway including medians and surfaced areas such as new and existing pavement, curbs, and sidewalks.

In groundcover areas and within the area extending beyond the outer limits of the groundcover to the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, existing planting, and fences, control weeds by hand pulling. Where groundcover areas are 12 feet or more from the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, and fences, control weeds within the groundcover areas and 6 feet beyond the outer limits of the groundcover areas.

In mulched areas and within the area extending beyond the outer limits of the mulched areas to the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, existing planting, and fences, control weeds by hand pulling. Where mulched areas are 12 feet or more from the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, and fences, control weeds within the mulched areas and 6 feet beyond the outer limits of the mulched areas.

Within 2 feet of the edges of paved shoulders, dikes, curbs, and sidewalks, control weeds by hand pulling.

In areas where plants are to be planted in groups or rows 15 feet or less apart, control weeds within the planting area and the area extending 6 feet beyond the outer limits of the groups or rows of plants by hand pulling.



Where the plants are to be planted more than 15 feet apart and are located outside of groundcover areas, control weeds by hand pulling within an area 6 feet in diameter centered at each plant location.

Control weeds under guard rails, from within asphalt concrete surfacing, concrete surfacing, rock blankets, gravel mulch or decomposed granite areas, and unpaved gore areas between the edge of pavement and planting areas by hand pulling.

**Add between the 1st and 2nd paragraphs of section 20-2.05B of the RSS for section 20:**  
Electric conduit must comply with section 86-2.05A and section 86-2.05B.

**Replace item 1 in the list in the 4th paragraph of section 20-2.05B of the RSS with:**  
1. Sized as recommended by the irrigation controller manufacturer.

**Add to section 20-2.05B of the RSS for section 20:**  
You may use conductors that are not armor-clad if installed in a conduit.

**Delete item 2 in the list in the 1st paragraph of section 20-2.05C(3) of the RSS for section 20.**

**Add to the end of section 20-2.05C(3) of the RSS for section 20:**  
Install conductors in sprinkler control conduit in or on structures.

**Replace "Not Used" in section 20-2.05D of the RSS for section 20 with:**  
Payment for sprinkler control conduit is not included in the payment for control and neutral conductors.

**Add to section 20-2.07B(2)(a) of the RSS for section 20:**  
Before the irrigation system functional test begins, furnish 2 remote access devices.

**Delete items 2.2,2.3,2.4 in the list in the 1st paragraph of section 20-2.07B(3) of the RSS for section 20.**

**Add to section 20-2.07B(3) of the RSS for section 20:**  
A single irrigation controller enclosure cabinet must be 60- 20-12-

**Add section 20-2.11B(12) Air Relief Valve Assemblies:**  
Install inline drip irrigation air release valves per manufacture of dripline material and per landscape details.

**Add section 20-2.11B(13) Manual Flush Line Assemblies:**  
Install inline drip irrigation Manual Flush valves per manufacture of dripline material and where indicated on the plans and per landscape details.

**Add to section 20-3.01B(2)a plant compliance table - Liner:**  
Tree Pot Liners shall be container size: 4"x4"x14" (173 cu in).

**Replace the 2nd sentence in the 1st paragraph of section 20-3.01B(3) of the RSS for section 20 with:**

Soil amendment must as recommended by an agricultural soils analysis.

**Add to section 20-3.01B(3) of the RSS for Section 20:**

All imported topsoil shall meet requirements for agricultural suitability. Native soil or backfill in planter areas must be improved with fine compost soil amendment.

The contract price paid per cubic yard for Soil amendment shall include full compensation for the preparation of a soils analysis.

**Add to section 20-4.01A of the RSS for section 20:**

The plant establishment period must be Type 2 for a period of 5 calendar years (1,250 working days).

**Add to section 20-4.03C of the RSS for section 20:**

Apply slow-release fertilizer to the plants during the 1st week of April and September of each year.

**Replace section 20-4.03F of the RSS for Section 20 with:**

Replacement plants must comply with section 20-3.01C(4). Replacement plants must be of the same size as originally specified.

**Add to section 20-4.03G Watering:**

After 5-years plant establishment, discontinue watering (cut and cap irrigation tubing from remaining irrigation system) Pinus radiata, Quercus agrifolia, Arctostaphylos 'Howard McMinn', Ceanothus x 'Concha', Heteromeles arbutifolia that are irrigated by blank tubing and barbed emitters. Remove tubing and emitters from those plant materials.

**Replace section 20-5.03B) of the RSS for Section 20 with:**

**20-5.03B Rock Blanket**

**20-5.03B(1) General**

**20-5.03B(1)(a) Summary**

Section 20-5.03B includes specifications for placing rock blanket (Cobble Median Treatment).

**20-5.03B(1)(b) Definitions**

Reserved

**20-5.03B(1)(c) Submittals**

Submit a 1 sq yd sample of the various rock sizes.

**20-5.03B(1)(d) Quality Control and Assurance**

Reserved

**20-5.03B(2) Materials**

**20-5.03B(2)(a) General**

Use filter fabric.

**20-5.03B(2)(b) Concrete**

Concrete must be pervious concrete pavement per Section 40-8 of these special provisions. Color the concrete at the locations shown on the plans. Color to be "Sandstone"

**20-5.03B(2)(c) Rock**

Rock must be clean, smooth, and obtained from a single source and must comply with the following grading requirements:

<b>Grading Requirements</b>	
Screen size (inches)	Percentage passing
8	100
6	50-85
4	0-50

**20-5.03B(2)(d) Mortar**

Not Used

**20-5.03B(3) Construction**

Place concrete as shown, do not float or trowel.

Rock must be placed while concrete is still plastic. Remove concrete adhering to the exposed surfaces of the rock.

Loose rocks or rocks with a gap greater than 3/8 inch must be reset by an authorized method. The rock gap is measured from the edge of the rock to the surrounding concrete bedding.

**20-5.03B(4) Payment**

Rock blanket (Cobble Median Treatment) is measured parallel to the rock blanket surface.

**Replace item 1 the list in 1st paragraph of section 20-5.03C(2) of the RSS for section 20 with:**

1. Uniform beach pebbles 1"-2" in size indigenous to the area.

After clearing, grade areas to receive gravel mulch to a smooth, uniform surface, and compact to not less than 90 percent relative compaction. Place gravel mulch on filter fabric between compacted original ground.

\*\*\*\*\*

**21 EROSION CONTROL**

**Add to section 21-1.01B:**

The certificate of compliance for weed-free straw must include the *Certificate of Quarantine Compliance*.

**Replace the 4th paragraph of section 21-1.03E with:**

Apply materials at the rates specified on the plans, the locations shown, and as follows:

1. Begin application within 60 minutes after adding seed to the tank.
2. Apply in successive passes as necessary to achieve the required application rate.
3. Apply all hydromulch or hydroseed materials indicated for a single area within 72 hours.

**Replace section 21-1.02M with:**

**21-1.02M Compost**

Compost must be derived from one or a combination of the following types of materials:

1. Green material consisting of chipped, shredded, or ground vegetation or clean, processed, recycled wood products
2. Biosolids
3. Manure
4. Mixed food waste

Compost must not be derived from mixed municipal solid waste and must not contain paint, petroleum products, pesticides, or other chemical residues harmful to plant or animal life. Metal concentrations in compost must not exceed the maximum listed under 14 CA Code of Regs § 17868.2.

Process compost materials under 14 CA Code of Regs § 17868.3.

The quality characteristics of compost must have the values shown in the following table:

<b>Compost</b>		
Quality Characteristic	Test method <sup>a</sup>	Value
pH	TMECC 04.11-A	6–8.5
Soluble salts (dS/m)	TMECC 04.10-A	0–10
Moisture content (% wet weight)	TMECC 03.09-A	30–60
Organic matter content (% dry weight)	TMECC 05.07-A	30–70
Maturity (seed emergence) (% relative to positive control)	TMECC 05.05-A	80 or above
Maturity (seedling vigor) (% relative to positive control)	TMECC 05.05-A	80 or above
Stability (mg CO <sub>2</sub> -C/g OM per day)	TMECC 05.08-B	8 or below
Particle size for fine compost <sup>b</sup> dry weight	TMECC 02.02-B	
Pass 2-inch sieve (% min)		98
Pass 3/8-inch sieve (% min)		95
Particle size for medium compost <sup>b</sup> dry weight	TMECC 02.02-B	
Pass 2-inch sieve (% min)		90
Pass 3/8-inch sieve (% min)		40
Pass 3/8-inch sieve (% max)		75
Particle size for coarse compost <sup>b</sup> dry weight	TMECC 02.02-B	
Pass 2-inch sieve (% min)		90
Pass 3/8-inch sieve (% max)		30
Pathogen Salmonella (most probable number per 4 grams dry weight basis)	TMECC 07.01-B	< 3
Pathogen Fecal coliform (most probable number per gram dry weight basis)	TMECC 07.01-B	< 1,000
Physical contaminants (% dry weight) Plastic, glass, and metal	TMECC 02.02-C	combined total: < 0.5
Physical contaminants (% dry weight) Sharps	TMECC 02.02-C	None detected

<sup>a</sup>TMECC refers to "Test Methods for the Examination of Composting and Compost," published by the United States Department of Agriculture and the United States Compost Council (USCC).

<sup>b</sup>Maximum particle length must be 6 inches.

**Add to section 21:****21-2 IMPORTED BIOFILTRATION SOIL****21-2.01 GENERAL****21-2.01A Summary**

Section 21-2 includes specifications for furnishing and applying imported biofiltration soil mix.

**21-2.01B Submittals**

Submit a certificate of compliance from the soil supplier.

Submit the compost producer's *Compost Technical Data Sheet* including test results and *Seal of Testing Assurance* certificate before mixing compost with sand and soil.

**21-2.01C Quality Control and Assurance**

Saturated hydraulic conductivity for imported biofiltration soil must be at least 5 inches per hour.

**21-2.02 MATERIALS****21-2.02A General**

Imported biofiltration soil consists of a uniform mixture of sand, compost, and topsoil. The ratio of the components of imported biofiltration soil by volume must be 2 parts sand, 1 part compost, and 0.5 part topsoil.

**21-2.02B Sand**

Sand must be free of wood, waste, coating such as clay, stone dust, carbonate, or any other deleterious material. All aggregate passing No. 200 sieve size must be non-plastic. Sand must be graded within the following limits:

Sieve Sizes	Percentage Passing
3/8"	100
No. 4	90 - 100
No. 8	70 - 100
No. 16	40 - 95
No. 30	15 - 70
No. 40	5-55
No. 100	0 - 15
No. 200	0 - 5

Grain size analysis results of the sand component must be performed under ASTM D 422.

**21-2.02C Compost**

Fine compost must comply with section 21-1.02M.

**21-2.02D Topsoil**

Soil must be free of wood, waste or other deleterious material. The soil texture must be loamy. Overall dry weight percentages must be 60 to 90 percent sand, with less than 20 percent passing the No. 200 sieve, less than 5 percent clay, and no gravel.

**21-2.03 CONSTRUCTION**

Site preparation must comply with section 21-1.03A of the Revised Standard Specifications.

Place imported biofiltration soil after all other earthwork in an area is complete.

Place imported biofiltration soil in lifts of 8 to 12 inches and spread to a uniform thickness. Do not compact lifts.



**21-2.04 PAYMENT**

Not Used

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**DIVISION V SURFACINGS AND PAVEMENTS**

**39 HOT MIX ASPHALT**

**Add to Section 39-1.01A:**

The final lift shall be placed from edge of pavement to edge of pavement and will be uniform and continuous. Final lift shall be placed as shown on plans.

**Replace the 2nd, 3rd, and 4th paragraphs of section 39-1.03D(1) of the RSS for section 39 with:**  
Place HMA on adjacent traveled way lanes so that at the end of each work shift the distance between the ends of HMA layers on adjacent lanes is from 5 to 10 feet. Place additional HMA along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional HMA to form temporary conforms. You may place kraft paper or another authorized release agent under the conform tapers to facilitate the taper removal when paving activities resume.

**Delete section 39-1.03D(2) of the RSS for section 39.**

**Replace "Reserved" in section 39-2.02C of the RSS for section 39:**

The grade of asphalt binder for Type A HMA must be PG 64-16.

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**40 CONCRETE PAVEMENT**

**Replace section 40-8 of the RSS for section 40 with:**

**40-8 PERVIOUS CONCRETE PAVEMENT**

**40-8.01 GENERAL**

**40-8.02 MATERIALS**

The maximum size aggregate for the pavement surface must not exceed 1/2 inch. If the pavement is constructed in 2 or more layers, layers below the surface layer may have a larger maximum size aggregate.

Determine the minimum cementitious material content. The cementitious material content must not exceed 590 lbs/cu yd.

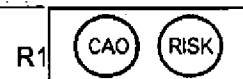
**40-8.03 CONSTRUCTION**

**40-8.03A General**

Not Used

**40-8.03B Subgrade Preparation**

Immediately before placing pavement, grade and finish the subgrade. The subgrade must:



- 1. Comply with the specified compaction and grading
- 2. Be free of loose and extraneous material
- 3. Be uniformly moist and free of standing or flowing water

The finished subgrade surface must not project into the pavement cross-section at any point. Verify the finished subgrade surface by:

- 1. Means of a template supported on the side forms for fixed form method
- 2. Measuring from the offset guide line or survey marks for extruded or slip form methods

Fill areas of subgrade lower than the required grade with pervious concrete pavement. No payment is made for pavement used to fill these low areas.

**40-8.03C Paving**

Place pervious concrete pavement under section 40-1.03H(1) except the 3rd paragraph does not apply.

Spread, compact, and shape pervious concrete pavement under section 40-1.03H(4) or under section 40-1.03H(5). Vibrators must not be used. You may use wood side forms.

Compact pervious concrete to the required cross section. If you construct pervious concrete pavement in 2 or more layers, compact the lower layer before placing the next layer. Do not allow cold joints between layers. Compact within 30 minutes after spreading the pervious concrete. Do not disturb placed plastic concrete. Do not allow foot traffic on the un-compacted surface.

Use hand tampers to compact the concrete along the formed edges. After compaction and repair of surface flaws no further finishing is required.

If you delay placing 2 consecutive loads of pervious concrete by 20 minutes or more, form a construction joint. The joint must comply with section 40-1.03E(2) except you must remove the bulkhead and dampen the face with an atomized spray when placement continues.

**40-8.03D Joints**

Construct contraction joints where shown by scoring concrete with a grooving tool and rounding corners with an edger tool or by saw-cutting hardened concrete to a depth of at least 1/4 of the pavement depth.

Construct an isolation joint at pre-existing structures that abut or penetrate the pervious concrete area. The isolation joint must extend the full depth of the pervious concrete. Place and secure the isolation joint material before placing concrete.

For sidewalks construct joints under section 73-1.03E.

**40-8.03E Finishing**

The finished surface must not vary more than 0.02 foot from a 12 foot straightedge except at grade changes.

If placing pavement around or adjacent to miscellaneous structures such as manholes or pipe inlets, do not finish the miscellaneous structures to final grade until the pavement is finished beyond the miscellaneous structure.

**40-8.04 PAYMENT**

Pervious concrete pavement is measured based on the dimensions shown.

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## DIVISION VI STRUCTURES

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### 49 PILING

**Replace "Reserved" in section 49-3.02A(4)(b) with:**

Schedule and hold a preconstruction meeting for CIDH concrete pile construction (1) at least 5 business days after submitting the pile installation plan and (2) at least 10 days before the start of CIDH concrete pile construction. You must provide a facility for the meeting.

The meeting must include the Engineer, your representatives, and any subcontractors involved in CIDH concrete pile construction.

The purpose of this meeting is to:

1. Establish contacts and communication protocol between you and your representatives, any subcontractors, and the Engineer
2. Review the construction process, acceptance testing, and anomaly mitigation of CIDH concrete piles

The Engineer will conduct the meeting. Be prepared to discuss the following:

1. Pile placement plan, dry and wet
2. Acceptance testing, including gamma-gamma logging, cross-hole sonic logging, and coring
3. *Pile Design Data Form*
4. Mitigation process
5. Timeline and critical path activities
6. Structural, geotechnical, and corrosion design requirements
7. Future meetings, if necessary, for pile mitigation and pile mitigation plan review
8. Safety requirements, including Cal/OSHA and Tunnel Safety Orders

**Add to section 49-3.02B(6)(c):**

The synthetic slurry must be one of the materials shown in the following table:

Material	Manufacturer
SlurryPro CDP	KB INTERNATIONAL LLC 735 BOARD ST STE 209 CHATTANOOGA TN 37402 (423) 266-6964
Super Mud	PDS CO INC 105 W SHARP ST EL DORADO AR 71731 (870) 863-5707
Shore Pac GCV	CETCO CONSTRUCTION DRILLING PRODUCTS 2870 FORBS AVE HOFFMAN ESTATES IL 60192 (800) 527-9948
Terragel or Novagel Polymer	GEO-TECH SERVICES LLC 220 N. ZAPATA HWY STE 11A-449A LAREDO TX 78043 (210) 259-6386

Use synthetic slurries in compliance with the manufacturer's instructions. Synthetic slurries shown in the above table may not be appropriate for a given job site.

Synthetic slurries must comply with the Department's requirements for synthetic slurries to be included in the above table. The requirements are available from the Offices of Structure Design, P.O. Box 168041, MS# 9-4/11G, Sacramento, CA 95816-8041.

SlurryPro CDP synthetic slurry must comply with the requirements shown in the following table:

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### 51 CONCRETE STRUCTURES

#### Add Section 51-1.03E(14)

##### 51-1.03E(14) Retaining Wall Gutter Drains

Where shown, construct wall drains for retaining wall gutters.  
Grates must conform to Section 75.  
Drain pipe must conform to Section 64.  
Wall drains for retaining walls are paid for as minor concrete, gutter.

#### Add to section 51-1.03G(1):

The intent of the golden granite surface texture at Retaining Wall No. 1 and Retaining Wall No. 2 is to closely resemble the texture, color, and pattern of the golden granite veneer at the entry guardhouse to 17 Mile Drive located approximately 500 ft. east of the Highway 68 Overcrossing.

Stain areas receiving golden granite concrete surface texture at Retaining Wall No. 1 and Retaining Wall No. 2 under section 59-7.

The pattern of the golden granite concrete surface texture at Retaining Wall No. 1 must be smooth and continuous over the horizontal construction joint between the retaining wall and the concrete barrier rail. No separated or discontinuous joint lines or fragmented stones are allowed.

Contractor must submit architectural drawings showing pattern layout, dimensions and transitions.

#### Add to section 51-1.03G(2):

The form liner for golden granite concrete surface texture at Retaining Wall No. 1 and Retaining Wall No. 2 must be Fitzgerald Formliner #17915 Petaluma Fieldstone or approved equal.

The form liner for modified golden granite concrete surface texture at the traffic face of the concrete barrier at Retaining Wall No. 1 must be Fitzgerald Formliner #17915 Petaluma Fieldstone or approved equal, modified as shown.

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### 56 SIGNS

#### Add to section 56-3.02K(2):

Seal the perimeters of direct tension indicator gaps with caulking. Caulking must be gray and at least 50 mils thick. Apply caulking before painting.

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### 59 PAINTING

**Add to section 59-7.01B(2) of the RSS for section 59-7:**

The stain used for golden granite concrete texture must consist of 1 base stain color and at least 3 accent stain colors. The base and accent stain colors must be from the same manufacturer.

**Replace "Reserved" in section 59-7.01B(3) of the RSS for section 59-7 with:**

**Add to section 59-7.02A(1) of the RSS for section 59-7:**

Completed stained golden granite concrete texture at Retaining Wall No. 1 and Retaining Wall No. 2 must closely resemble the colors, mottling, shades, flecking and veining of the golden granite veneer at the entry guardhouse to 17 Mile Drive located approximately 500 ft. west of the Highway 68 Overcrossing.

**Replace "Not Used" in section 59-7.02C of the RSS for section 59-7 with:**

Apply the stain in at least 3 separate applications. The 1st and 2nd applications must be by air or airless sprayer.

**Replace section 59-7.02D of the RSS for section 59-7 with:**

Prepare and stain of golden granite concrete texture at Retaining Wall No. 1 and Retaining Wall No. 2 is paid for as golden granite concrete texture.

Prepare and stain of modified golden granite concrete texture at Retaining Wall No. 1 is paid for as modified golden granite concrete texture.

**Replace "Reserved" in section 59-11 with:**

**59-11.01 GENERAL**

**59-11.01A Summary**

Section 59-11 includes specifications for staining galvanized surfaces to achieve a rustic brown color with a matte finish.

Apply the stain to all visible galvanized surfaces of the tubular bicycle railing at Retaining Wall No. 1, the cable railing at Retaining Wall No. 2.

Apply the stain all Midwest guardrailing and alternative terminals within the project limits.

**59-11.01B Definitions**

Not Used

**59-11.01C Submittals**

Submit the following:

1. Product data, including the manufacturer's product sheet, MSDS, and instructions for application of the stain
2. Certificate of compliance for the stain
3. Work plan showing methods to control overspray and spillage and protect adjacent surfaces during staining

**59-11.01D Quality Control and Assurance**

Apply the stain to a minimum 2-foot-long test section.

The test section may be a section of the surface to be stained if authorized.

The test section must be:



1. Prepared and stained using the same materials, equipment, and methods to be used in the staining work
2. Allowed to cure as specified in the manufacturer's instructions
3. Authorized before starting the staining work

Notify the Engineer at least 5 business days before staining the test section.

If ordered, prepare and stain additional test sections. If more than 1 additional test section is ordered, this is change order work.

The Engineer uses the authorized test section to determine the acceptability of the staining work.

#### **59-11.02 MATERIALS**

The stain must be Natina Steel from Natina Products, LLC.

You may obtain the stain from:

Natina Products, LLC  
 PO Box 4563  
 Palm Desert, CA 92261  
 (877) 762-8462

#### **59-11.03 CONSTRUCTION**

##### **59-11.03A General**

Not Used

##### **59-11.03B Preparation**

Before applying the stain:

1. Identify and obtain authorization for the surfaces to be stained
2. Remove oils, dirt, and other contaminants from surfaces to be stained
3. Dry all surfaces to be stained

##### **59-11.03C Application**

Stain the galvanized surfaces under the manufacturer's instructions to achieve a color consistent with or as close as possible to the authorized test section color. Apply stain only to thoroughly dry surfaces during periods of favorable weather.

Protect adjacent surfaces during staining using an authorized method.

Keep stained galvanized surfaces dry following the application of the stain as specified in the manufacturer's instructions.

Repair stained surfaces damaged during work activities with materials equal to that of the specified stain.

#### **59-11.04 PAYMENT**

Payment for staining of galvanized tubular bicycle railing surfaces with Natina stain is paid for as tubular bicycle railing.

Payment for staining of galvanized cable railing surfaces with Natina stain is paid for as cable railing.

Payment for staining of galvanized cable Midwest guardrailing and alternative terminals with Natina stain is paid for as stain Midwest guardrailing and alternative terminals

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## DIVISION VIII MISCELLANEOUS CONSTRUCTION

### 72 SLOPE PROTECTION

**Replace section 72-4.02 MATERIALS with:**

Rock must be 3"-6" rounded cobble rock per Landscape Details in areas where cobble mulch is used as a diffuser (IE beginning and end of swale).

Rock must be 6"-8" size cobble rock per Landscape Details in areas where cobble mulch is used as a check dam in the swale bottom.

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### 73 CONCRETE CURBS AND SIDEWALKS

**Add to section 73-1.04:**

Minor Concrete (Truck Apron) includes payment for integral color and stamped finishes .

**Replace section 73-3.01A with:**

Section 73-3 includes specifications for constructing sidewalks, gutters, gutter depressions, curb ramps, bicycle ramps, driveways, truck aprons, and stamped concrete.

**Add to section 73-3.01D:**

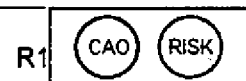
For all pedestrian curb ramps, perform a preconstruction survey to verify that forms and site constraints will allow the design dimensioning and slope requirements to be achieved. Allow 48 hours for verification. Do not proceed with pouring concrete until verification of acceptable grades is complete. Upon completing construction of these facilities, perform a post construction survey and verify that design dimensioning and slope requirements were achieved. The post construction survey must include a minimum of 3 measurements for each dimension and slope requirement shown. Individual measurements must be equally distributed across the specified slope or dimensional surface. Initial survey of forms and survey post construction of these facilities will be performed by City's surveyor at no charge to the Contractor. All subsequent surveys required to verify reset or corrected forms will be billed to the Contractor on a time and materials basis.

**Add before the 1st paragraph in section 73-3.03:**

Before placing concrete, verify that forms and site constraints allow the required dimensioning and slopes shown. Immediately notify the Engineer if you encounter site conditions that will not accommodate the design details. Modifications ordered by the Engineer are change order work.

**Add to section 73-4.01A:**

You shall pour three samples of concrete, "Harvest Gold", "Sandstone" and another color to be determined by the engineer if necessary for the purpose of confirming the final color to be used in the truck apron, median paving, sidewalks, curbs and other areas specified in these special provisions. Test panels shall be a minimum of 4'x4' and 5" deep. Samples of each color shall be poured on the same day,



60 days in advance of final color selection by the engineer. Samples shall have texture applied per specifications.

Color the concrete at the locations shown on the plans.

Color the concrete at the following locations as part of the additive alternative item Minor Concrete (Colored Concrete)(Misc. Areas). The concrete must be integrally pigmented colored concrete.

1. All sidewalks/shared use paths
2. Curbs and Gutters
3. Curb Ramps
4. Vegetation Control areas for guardrails

**Replace section 73-6 with:**

### **73-6 MINOR CONCRETE (EXPOSED AGGREGATE CONCRETE)**

#### **73-6.01 GENERAL**

##### **73-6.01A Summary**

Section 73-6 includes specification for constructing minor concrete with an exposed aggregate finish using integrally colored concrete.

##### **73-6.01B Submittals**

For integrally colored concrete, submit technical data, manufacturer's specifications, and a work plan for mixing, delivery, placement, finish, and curing of the concrete.

##### **73-6.01C Quality Control and Assurance**

Test panels must be:

1. Constructed at an authorized location
2. At least 4 by 4 feet by 5 inches deep
3. Constructed and finished using the personnel, materials, equipment, and methods to be used in the work
4. Authorized before starting work

The Engineer may request that additional test panels be constructed until the specified finish, texture, and color are attained.

The Engineer uses the authorized test panel to determine acceptability of the work.

Dispose of the test panels after the work is complete and authorized. Notify the Engineer before disposing of the test panels.

#### **73-6.02 MATERIALS**

Color pigment for integrally colored concrete must comply with ASTM C 979. The color must be "Sandstone"

Coarse aggregate must comply with the 1 inch x No. 4 primary size coarse aggregate specified in section 90-1.02C(4)(b).

Concrete set retarders must be commercial quality, manufactured specifically for use on the top surface of concrete. The retarder must effectively slow the setting time and depth of the cement and fine aggregate matrix to permit exposing the aggregates.

Curing compound must comply with ASTM C1315, Type 1, Class A.

#### **73-6.03 CONSTRUCTION**

Place integrally colored concrete under section 51-1.03D(5).



The coloring agent must be uniformly and homogeneously mixed with the concrete.

Place and consolidate the concrete so that the coarse aggregate remains uniformly distributed throughout the concrete.

Apply a concrete set retarder to the surface of the concrete after placing, consolidating, and finishing of the concrete is complete. Apply the set retarder under the manufacturer's instructions.

When the mass of the concrete is sufficiently set to permit removing the matrix of cement and fine aggregate, expose the coarse aggregate:

1. With water spray, coarse brooming, abrasive blasting, or a combination of these procedures. Removal methods must not dislodge or loosen the coarse aggregate from embedment in the mortar.
2. To a depth of approximately 3/16 to 3/8 inch. Exposed aggregate surfaces must be uniform in appearance.

Immediately after the cement mortar has hardened sufficiently to resist further removal, clean all cement film and other loose material from the exposed aggregate and all other surfaces with stiff brooms and water.

Cure concrete under section 90-1.03B. Except when operations for exposing the aggregate are underway, cure the concrete. You may use the water curing method. If you remove an area of curing compound during the curing period, keep the area continuously wet until the end of the curing period or until you reapply the curing compound.

**73-6.04 PAYMENT**

Not Used

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**DIVISION IX TRAFFIC CONTROL FACILITIES**

**83 RAILINGS AND BARRIERS**

**Add to section 83-1.02A**

Stain all visible galvanized surfaces of tubular bicycle railing at Retaining Wall No. 1, cable railing at Retaining Wall No. 2 under Section 59-11 and midwest guardrail and flared terminal system.

**Replace "Reserved" in section 83-1.02B(1) with:**

**83-1.02B(1)(a) General**

**83-1.02B(1)(a)(i) Summary**

Section 83-1.02B(1) includes specifications for constructing vegetation control areas around midwest guardrail system, metal beam guardrail to be reconstructed, and thrie beam barrier posts using minor concrete.

**83-1.02B(1)(a)(ii) Definitions**

Not Used

**83-1.02B(1)(a)(iii) Submittals**

Submit a mix design for the minor concrete to be used. The mix design must show proportions of:

1. Coarse aggregate

2. Fine aggregate
3. Cementitious material
4. Reinforcing fiber
5. Water

Include compressive strength test results with your mix design.

**83-1.02B(1)(a)(iv) Quality Control and Assurance**

Not Used

**83-1.02B(1)(b) Materials**

**83-1.02B(1)(b)(i) General**

The concrete color must match color "Sandstone".

**83-1.02B(1)(b)(ii) Minor Concrete**

Minor concrete must include reinforcing fibers.

Section 90-2.02B does not apply. Minor concrete must contain at least:

1. 400 pounds of cementitious material per cubic yard.

The 3rd paragraph of section 90-2.02C does not apply. Minor concrete must have a maximum aggregate size of 3/8 inch.

All ingredients must be added at the concrete plant before delivery to the job site.

You may use volumetric proportioning under ASTM C 685/C 685M or section 90-3.02B.

Minor concrete must have a 28-day compressive strength from 1,400 to 1,800 psi.

**83-1.02B(1)(b)(iii) Crumb Rubber Aggregate**

Not Used

**83-1.02B(1)(b)(iv) Reinforcing Fibers**

Reinforcing fibers for minor concrete must be:

1. Manufactured specifically for use as concrete reinforcement from one of the following:
  - 1.1. Polypropylene, polyethylene, or a combination of both.
  - 1.2. Copolymer of polypropylene and polyethylene.
2. Blended ratio from 4 to 5.67 parts by weight of macro synthetic fibers to 1 part by weight of micro synthetic fibers. Synthetic fibers must be:
  - 2.1. Nonfibrillated macro fibers with individual fiber lengths less than  $2 \pm 1/2$  inch.
  - 2.2. Fibrillated or monofilament micro fibers of various lengths and thicknesses.
3. Supplied in sealed, degradable bags of appropriate size for adding whole bags to concrete batches.
4. From a commercial source.

The reinforcing fiber content of minor concrete must be from 5 to 6 lb/cu yd.

**83-1.02B(1)(b)(v) Coloring Agent**

If a color for concrete is specified in section 83-1.02B(1)(b)(i), the coloring agent must be integral to the concrete mix and added at the concrete plant.

**83-1.02B(1)(b)(vi) Block-Out Material**

Use a commercially available expanded polystyrene foam for the block-out material. The expanded polystyrene foam must have a compressive strength of  $13 \pm 5$  psi at 10 percent deformation when tested under ASTM D1621.

You may substitute an alternative material that meets the compressive strength requirements of the expanded polystyrene foam if authorized.

### **83-1.02B(1)(c) Construction**

#### **83-1.02B(1)(c)(i) General**

Areas to receive vegetation control must be cleared of vegetation, trash, and debris. Dispose of removed material.

#### **83-1.02B(1)(c)(ii) Earthwork**

Excavate areas to receive vegetation control. Where vegetation control abuts the existing surfacing, the edge of the existing surfacing must be on a neat line or must be cut on a neat line to a minimum depth of 2 inches before removing the surfacing. The finished elevation of the excavated area to receive vegetation control must maintain planned flow lines, slope gradients, and contours of the job site.

Grade areas to receive vegetation control to a smooth, uniform surface and compact to a relative compaction of not less than 95 percent.

Dispose of surplus excavated material uniformly along the adjacent roadway except as specified in section 14-11.

#### **83-1.02B(1)(c)(iii) Block Out**

If block-out material is supplied in more than 1 piece, tape the pieces together to make a smooth surface on the top and sides.

Ensure block-out material does not move during concrete placement.

#### **83-1.02B(1)(c)(iv) Placing Minor Concrete**

Place minor concrete for vegetation control by hand.

Strike off and compact minor concrete with a mechanical or vibratory screed device. Apply a broom finish. Match the finished grade to the adjacent section of vegetation control, pavement, shoulder, or existing grade.

If the curing compound method is used for colored concrete, use curing compound no. 6.

#### **83-1.02B(1)(d) Payment**

Not Used

### **Replace section 83-1.02C(2) with:**

#### **83-1.02C(2) Alternative In-Line Terminal System**

Alternative in-line terminal system must be furnished and installed as shown on the plans and under these special provisions.

The allowable alternatives for an in-line terminal system must consist of one of the following or a Department-authorized equal.

1. TYPE SKT-SP-MGS TERMINAL SYSTEM - Type SKT-MGS terminal system must be a SKT 350 sequential kinking terminal, system length 53'-1-1/2", manufactured by Road Systems, Inc., located in Big Spring, Texas, and must include items detailed for Type SKT-MGS terminal system shown on the plans. The SKT 350 sequential kinking terminal can be obtained from the distributor, Universal Industrial Sales, P.O. Box 699, Pleasant Grove, UT 84062, telephone (801) 785-0505 or from the distributor, Gregory Highway Products, 4100 13th Street, S.W., Canton, OH 44708, telephone (330) 477-4800.
2. TYPE X-LITE - Type X-Lite terminal system must be a 31" X-Lite Guard Rail End Terminal as manufactured by Barrier Systems, Inc., located in Vacaville, CA, and must include items detailed for Type 31" X-Lite terminal system shown on the plans. The 31" X-Lite Guard Rail End Terminal can be

obtained from the distributor, Statewide Safety and Signs, Inc., 130 Grobric Court, Fairfield, CA 94533, telephone (800) 770-2644.

- 3. TYPE 31" X-TENSION - Type 31" X-Tension terminal system must be a 31" X-Tension Guard Rail End Terminal as manufactured by Barrier Systems, Inc., located in Vacaville, CA, and must include items detailed for Type 31" X-Tension terminal system shown on the plans. The 31" X-Tension Guard Rail End Terminal can be obtained from the distributor, Statewide Safety and Signs, Inc., 130 Grobric Court, Fairfield, CA 94533, telephone (800) 770-2644.

Option 1, Type SKT-SP-MGS Terminal System, may not be used at the Route 68/Route 1 Separation Structure guardrail location.

Submit a certificate of compliance for terminal systems.

Terminal systems must be installed under the manufacturer's installation instructions and these specifications. Each terminal system installed must be identified by painting the type of terminal system in neat black letters and figures 2 inches high on the backside of the rail element between system posts numbers 4 and 5. Paint must be metallic acrylic resin type spray paint. Before applying terminal system identification, the surface to receive terminal system identification must be removed of all dirt, grease, oil, salt, or other contaminants by washing the surface with detergent or other suitable cleaner. Rinse thoroughly with fresh water and allow to fully dry.

For Type SKT-SP-MGS terminal system, install the soil tube with soil plate attached at Post 1, hinged breakaway post at Post 2, and 6'-0" W6 x 9 steel posts at Posts 3 through 8. Use a W6 x 15 steel post at Post 1. The soil tube with soil plate must be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted.

For Type 31" X-Lite terminal system, all crimped posts and line posts must be W6 x 8.5 or W6 x 9 steel posts. All posts, must be, at the Contractor's option, either driven or placed in drilled holes. Space around the crimped posts, Post 2 with attached soil plate and lines posts must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. All blocks must be plastic.

For Type 31" X-Tension terminal system, the steel bottom post and I-beam post must be placed in drilled hole. The soil anchor and steel line posts must be, at the Contractor's option, either driven or placed in drilled holes. Space around the steel bottom post, steel line posts and soil anchor must be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer must be moistened and thoroughly compacted. All blocks must be plastic.

After installing the terminal system, dispose of surplus excavated material in a uniform manner along the adjacent roadway where designated by the Engineer.

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## 84 TRAFFIC STRIPES AND PAVEMENT MARKINGS

Add section 84-2.03D:

### 84-2.03D Thermoplastic Pavement Shield

#### 84-2.03D(1) Material

Must be composed of an ester modified rosin resistant to degradation by motor fuels, lubricants etc. in conjunction with aggregates, pigments, binders, abrasives, and glass beads which have been factory produced as a finished product, and meets the requirements of the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways. The thermoplastic material conforms to AASHTO

designation M249, with the exception of the relevant differences due to the material being supplied in a preformed state, and potentially being of a color different from white or yellow

**Graded Glass Beads:**

The non-black sections of the markings must contain a minimum of thirty percent (30%) intermixed graded glass beads by weight. The intermixed beads shall be clear and transparent. Not more than twenty percent (20%) consists of irregular fused spheroids, or silica. The index of refraction shall not be less than 1.50.

The material must have factory applied coated surface beads and abrasives in addition to the intermixed beads at a rate of 1/2 lb. (± 20%) per 11 sq. ft. The surface beads and abrasives must be applied in an alternating arrangement across the surface of the material so that the surface is covered in what is best described as a "checkerboard" pattern of glass beads and abrasive materials. The abrasive material must have a minimum hardness of 7 (Mohs scale). These factory applied coated surface beads shall have the following specifications:

1. Minimum 80% rounds
2. Minimum refractive index of 1.5

Size Gradation		Retained, %	Passing, %
US Mesh	um		
12	1700	0 - 2%	98 - 100%
14	1400	0 - 6%	94 - 100%
16	1180	1 - 21%	79 - 99%
18	1000	28 - 62%	38 - 72%
20	850	62 - 71%	29 - 38%
30	600	67 - 77%	23 - 33%
50	300	86 - 95%	5 - 14%
80	200	97-100%	0 - 3%

**Heating indicators:** The top surface of the material (same side as the factory applied surface beads) shall have regularly spaced indents. These indents shall act as a visual cue during application that the material has reached a molten state so satisfactory adhesion and proper bead embedment has been achieved and a post-application visual cue that the installation procedures have been followed.

**Skid Resistance:** The surface of the preformed retroreflective marking materials, wherein every other shaped portion contains glass beads, or abrasives with a minimum hardness of 7 (Mohs scale), shall upon application provide a minimum skid resistance value of 60 BPN when tested according to ASTM: E 303.

**Thickness:** The material must be supplied at a minimum thickness of 90 mils (2.29 mm) or 125 mils (3.15 mm).

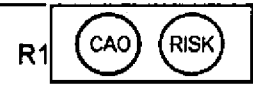
**Retroreflectivity:** The preformed retroreflective marking materials upon application shall exhibit adequate and uniform nighttime retroreflectivity. The marking materials shall have the following retroreflectivity as measured using a Delta LTL 2000 or LTL-X Retroreflectometer:

White preformed reflective marking materials—minimum of 275 mcd·m<sup>-2</sup>·lx<sup>-1</sup>

Initial retroreflection and skid resistance are affected by the amount of heat applied during installation. When ambient temperatures are such that greater amounts of heat are required for proper installation, initial retroreflection and skid resistance levels may be affected.

**Environmental Resistance:** The material must be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to oil and gasoline.

**Abrasives:** The abrasives and surface beads must be applied in an alternating arrangement across the surface of the material so that the surface is covered in what is best described as a "checkerboard" pattern of glass beads and abrasive materials. The abrasive material must have a minimum hardness of 7 (Mohs scale).



interconnected: The material must consist of interconnected individual pieces of preformed thermoplastic pavement material, which through a variety of colors and patterns, make up the desired design. The individual pieces in each material segment (typically 24 in. by 36 in.) must be factory assembled with a compatible material and interconnected so that in the field it is not necessary to assemble the individual pieces within a material segment.

**84-2.03D(2) Application**

The materials shall be applied using the propane torch or an infrared/radiant heater method recommended by the manufacturer. The material must be capable of being applied at ambient and road temperatures as low as 45°F without any preheating of the pavement to a specific temperature. A sealer specified by the manufacturer must be applied to the substrate prior to material application to assure proper adhesion. The material must be able to be applied without the use of a thermometer. The pavement shall be clean, dry and free of debris. Supplier must enclose application instructions with each box/package.

AA

**86 ELECTRICAL SYSTEMS**

**Add to the end of the 1st paragraph of the RSS for section 86-1.01:**

This work is shown on plan sheets labeled E. The work involved in each bid item is shown on a sheet with a title matching the bid item description except for the following bid items:

- 1. Maintain Electrical System
- 2. Flashing beacon system

**Replace "15" in the 1st paragraph of the RSS for section 86-1.03 with:**

Submit a schedule of values within 15 days after Contract Approval.

**Add to section 86-2.05A:**

Conduit installed underground must be Type 3.

**Add to section 86-2.05B:**

The conduit in a foundation and between a foundation and the nearest pull box must be Type 1 or Type 3.

**Add to section 86-2.05C:**

If Type 3 conduit is placed in a trench, not in the pavement or under concrete sidewalk, after the bedding material is placed and the conduit is installed, backfill the trench to not less than 4 inches above the conduit with backfill material or surfacing per plans.

After conductors have been installed, the ends of the conduits terminating in pull boxes, service equipment enclosures, and controller cabinets must be sealed with an authorized type of sealing compound.

At locations where conduit is required to be installed under pavement and if a delay to vehicles will not exceed 5 minutes, conduit may be installed by the trenching in pavement method.

The final 2 feet of conduit entering a pull box in a reinforced concrete structure may be Type 4.

Install detectable underground tape 12 inches directly above buried Type 3 conduit except for conduits installed using the "Trenching in Pavement Method." When installing Type 3 conduits using the "Trenching in Pavement Method," install detectable underground tape directly above the sand covering

the conduits prior to backfilling the trench with concrete. Detectable underground tape is not required when the directional boring method is used.

#### **86-2.05C(1) Directional Boring Method**

Directional boring method may be used with approval by the Engineer. Install pull boxes and vaults at the locations shown on the plans.

Minimum depth of conduit below finished grade in pavement areas shall be 4 feet.

A listing of materials (composition and strength) and methods used in directional boring shall be submitted to the Engineer for review.

The diameter of the boring tool shall not exceed 1.5 times the outside diameter of the conduit. Mineral slurry or wetting solution shall only be used to lubricate the boring tool and to stabilize the soil surrounding the boring path. Mineral slurry or wetting solution shall be water based and environmentally safe.

Residue from directional boring operations shall be removed by vacuuming or other approved method and disposed of.

The directional boring equipment shall have directional control of the boring tool and have an electronic boring tool location detection system. During operation, the directional boring equipment shall be able to determine the location of the tool both horizontally and vertically.

The directional boring equipment shall be equipped with a tension measuring device that indicates the amount of tension exerted on conduit during conduit pulling operations.

Slurry cement backfill and warning tape for trench installations of conduit, are not required where the directional boring method is used. Tracer wire shall be attached to the uppermost conduit prior to conduit installation.

You must have a representative in direct charge and control of the directional boring operation at all times.

Notify the Engineer 2 working days in advance of starting directional boring operations.

**Replace "Reserved" in section 86-2.06B of the RSS for section 86-2.06 with:**

#### **86-2.06B(1) General**

##### **86-2.06B(1)(a) Summary**

Section 86-2.06B includes specifications for installing non-traffic-rated pull boxes.

##### **86-2.06B(1)(b) Submittals**

Before shipping pull boxes to the job site, submit a list of materials used to fabricate the pull boxes to METS. Include:

1. Contract number
2. Manufacturer's name
3. Manufacturer's installation instructions
4. Your contact information

Submit reports for pull boxes from an NRTL-accredited laboratory.

Before installing a pull box and cover, submit the manufacturer's replacement warranty for them.

##### **86-2.06B(1)(c) Quality Control and Assurance**

##### **86-2.06B(1)(c)(i) Functional Testing**

The pull box and cover must be tested under ANSI/SCTE 77, "Specification for Underground Enclosure Integrity."

**86-2.06B(1)(c)(ii) Warranty**

Provide a 2-year manufacturer's replacement warranty for the pull box and cover. The warranty period starts on the date of Contract acceptance.

Deliver replacement parts within 5 business days after you receive notification of a failed pull box, cover, or both to the Department's Maintenance Electrical Shop at 850 Elvee Dr in Salinas, CA:

**86-2.06B(2) Materials**

The pull box and cover must comply with ANSI/SCTE 77, "Specification for Underground Enclosure Integrity," for tier 22 load rating and must be gray or brown.

Each pull box cover must have a 1/4 inch steel plate cast inside. The steel plate must be 21-1/4 by 11-3/4 inch for a No. 5 pull box and 28-1/2 by 15-1/2 inch for a No. 6 pull box.

A pull box extension must be made of the same material as the pull box and attached to the box to maintain the minimum combined depths.

Include recesses for a hanger if a transformer or other device must be placed in a pull box.

The bolts, nuts, and washers must be a captive design.

The captive bolt must be capable of withstanding a torque from 55 to 60 ft-lb and a minimum pull-out strength of 750 lb. Perform the test with the cover in place and the bolts torqued. The pull box and cover must not be damaged while performing the test.

Hardware must be stainless steel with 18 percent chromium and 8 percent nickel content.

Galvanize ferrous metal parts under section 75-1.05.

The manufacturer's instructions must include:

1. Quantity and size of entries that can be made without degrading the strength of the pull box below the tier 22 load rating
2. Locations where side entries cannot be made
3. Acceptable method for creating the entry

The tier 22 load rating must be labeled or stenciled by the manufacturer on the inside and outside of the pull box and on the underside of the cover.

**86-2.06B(3) Construction**

Do not install a pull box in curb ramps or driveways.

A pull box for a post or a pole standard must be located within 5 feet of the standard. Place the pull box adjacent to the back of the curb or edge of the shoulder. If this is impractical, place the pull box in a suitable, protected, and accessible location.

If only the cover is to be replaced, anchor the cover to the pull box.

**Add to section 86-2.06****86-2.06D TAMPER RESISTANT COVER FOR NON-TRAFFIC RATED PULL BOX****86-2.06D(1) General****86-2.06D(1)(a) Summary**

This work includes installing tamper resistant (TR) cover for pull box.

**86-2.06D(1)(b) Submittals**

Before shipping TR cover and accessories to the job site, submit a list of materials, contract number, manufacturer's name, and manufacturer's instructions for installation.

Submit warranty documentation before installation.



**86-2.06D(1)(c) Quality Control and Assurance****86-2.06D(1)(c)(i) Warranty**

Provide a 2-year replacement warranty from the manufacturer against any defects or failures. The effective date of the warranty is the date of final acceptance.

Provide replacement parts within 5 business days after receipt of failed parts. The department does not pay for replacement parts. Deliver replacement parts to the following Department's Maintenance Electrical Shop:

850 Elvee Dr in Salinas, CA

**86-2.06D(2) Materials**

Provide TR cover and accessories. The cover must be galvanized 3/16 inch thick minimum steel diamond plate with non skid surface. Cover must be marked for the application as shown and as directed by the Engineer.

TR cover and accessories must be manufactured by the following companies or equal:

1. Sipra Corp., 14449 Mallard Meadows Lane, Prather, CA, 93651. Telephone (888) 775-5543.
2. Jensen MetalTech, 450 East Glendale Avenue, Sparks, NV. 89431. Telephone (775) 352-2700.
3. MR Steel, 4100 West Glenrosa Avenue, Phoenix, Az, 85019. Telephone (602) 278-3355.

TR covers manufactured by Sipra Corp., Jensen MetalTech, and MR Steel are patented and royalty payments may apply.

The cover locking mechanism must have security bolts that are keyed for the District. The manufacturer must provide 50 keys directly to the Engineer.

Stainless steel hardware must have 18 percent chromium content and an 8 percent nickel content.

Galvanize ferrous metal parts must comply with section 75-1.05.

**86-2.06D(3) Construction**

Install TR cover as follows:

1. Bond and ground TR cover. Bonding jumper must be 3' long minimum.
2. Secure TR cover to pull box per manufacturer's recommendations.
3. Top of TR cover must be flush with finished grade.

**86-2.06D(4) Payment**

Not Used.

**Add to section 86-2.08A:**

Wrap conductors around the projecting end of conduit in pull boxes as shown. Secure conductors and cables to the projecting end of the conduit in pull boxes.

**Replace the 1st paragraph of section 86-2.09 with:**

Solder conductors by hot iron, pouring, or dipping method, connectors and terminal lugs for conductor sizes No. 10 and smaller. Do not perform open-flame soldering.

**Add to section 86-2.11A:**

Circuit breakers must be the cable-in/cable-out type mounted on non-energized clips. All circuit breakers must be mounted vertically with the up position of the handle being the "ON" position.

**Replace 7th and 8th paragraphs of section 86-2.11A with:**

Service equipment enclosures must be the stainless steel type.

**Replace section 86-2.18 with:****86-2.18 NUMBERING ELECTRICAL EQUIPMENT**

The placement of numbers on electrical equipment will be done by others.

**Replace section 86-6.02 with:****86-6.02 LED LUMINAIRES****86-6.02A General****86-6.02A(1) Summary**

Section 86-6.02 includes specifications for installing LED luminaires.

**86-6.02A(2) Definitions**

**CALIPER:** Commercially Available LED Product Evaluation and Reporting. A U.S. DOE program that individually tests and provides unbiased information on the performance of commercially-available LED luminaires and lights.

**correlated color temperature:** Absolute temperature in kelvin of a blackbody whose chromaticity most nearly resembles that of the light source.

**house side lumens:** Lumens from a luminaire directed to light up areas between the fixture and the pole, such as sidewalks at intersection or areas off the shoulders on freeways.

**International Electrotechnical Commission (IEC):** Organization that prepares and publishes international standards for all electrical, electronic, and related technologies.

**junction temperature:** Temperature of the electronic junction of the LED device. The junction temperature is critical in determining photometric performance, estimating operational life, and preventing catastrophic failure of the LED.

**L70:** Extrapolated life in hours of the luminaire when the luminous output depreciates 30 percent from initial values.

**LM-79:** Test method from the Illumination Engineering Society of North America specifying test conditions, measurements, and report format for testing solid state lighting devices, including LED luminaires.

**LM-80:** Test method from the Illumination Engineering Society of North America specifying test conditions, measurements, and report format for testing and estimating the long-term performance of LEDs for general lighting purposes.

**National Voluntary Laboratory Accreditation Program (NVLAP):** U.S. DOE program that accredits independent testing laboratories.

**power factor:** Ratio of the real power component to the complex power component.

**street side lumens:** Lumens from a luminaire directed to light up areas between the fixture and the roadway, such as traveled ways and freeway lanes.

**surge protection device (SPD):** Subsystem or component that protects the unit against short-duration voltage and current surges.

**total harmonic distortion:** Ratio of the rms value of the sum of the squared individual harmonic amplitudes to the rms value of the fundamental frequency of a complex waveform.

**86-6.02A(3) Submittals**

Submit a sample luminaire to METS for testing after the manufacturer's testing is completed. Include the manufacturer's test data.

Product submittals must include:

1. LED luminaire checklist.
2. Product specification sheets, including:
  - 2.1. Maximum power in watts.
  - 2.2. Maximum designed junction temperature.
  - 2.3. Heat sink area in square inches.
  - 2.4. Designed junction to ambient thermal resistance calculation with thermal resistance components clearly defined.
  - 2.5. L70 in hours when extrapolated for the average nighttime operating temperature.
3. LM-79 and LM-80 compliant test reports from a CALiPER-qualified or NVLAP-approved testing laboratory for the specific model submitted.
4. Photometric file based on LM-79 test report.
5. Initial and depreciated isofootcandle diagrams showing the specified minimum illuminance for the particular application. The diagrams must be calibrated to feet and show a 40 by 40 foot grid. The diagrams must be calibrated to the mounting height specified for that particular application. The depreciated isofootcandle diagrams must be calculated at the minimum operational life.
6. Test report showing SPD performance as tested under ANSI/IEEE C62.41.2 and ANSI/IEEE C62.45.
7. Test report showing mechanical vibration test results as tested under California Test 611 or equal.
8. Data sheets from the LED manufacturer that include information on life expectancy based on junction temperature.
9. Data sheets from the power supply manufacturer that include life expectancy information.

Submit documentation of a production QA performed by the luminaire manufacturer that:

1. Ensures the minimum specified performance level
2. Includes a documented process for resolving problems

Submit the QA documentation as an informational submittal.

Submit the manufacturer's warranty documentation as an informational submittal before installing LED luminaires.

**86-6.02A(4) Quality Control and Assurance****86-6.02A(4)(a) General**

The Department may test random samples of the luminaires under section 86-2.14A. The Department tests luminaires under California Test 678 and may test any parameters specified in section 86-6.01.

Fit 1 sample luminaire with a thermistor or thermocouple temperature sensor. A temperature sensor must be mounted on the:

1. LED solder pad as close to the LED as possible
2. Power supply case
3. Light bar or modular system as close to the center of the module as possible

Other configurations must have at least 5 sensors per luminaire. The Engineer provides advice on sensor location. Thermocouples must be either Type K or C. Thermistors must be a negative-temperature-coefficient type with a nominal resistance of 20 kΩ. Use the appropriate thermocouple wire. The leads must be a minimum of 6 feet. Submit documentation with the test unit describing the type of sensor used.

Before performing any testing, energize the sample luminaires for a minimum of 24 hours at 100 percent on-time duty cycle and a temperature of +70 degrees F.

Depreciate the luminaire lighting's performance for the minimum operating life by using the LED manufacturer's data or the data from the LM-80 test report, whichever results in a higher lumen depreciation.

Failure of the luminaire that renders the unit noncompliant with section 86-6.02 specifications is cause for rejection.

**86-6.02A(4)(b) Warranty**

Provide a 7-year manufacturer's warranty against any defects or failures. The warranty period begins on the date of Contract acceptance. Furnish a replacement luminaire within 10 days after receipt of the failed luminaire. The Department does not pay for the replacement. Deliver replacement luminaires to the Department's Maintenance Electrical Shop at: 850 Elvee Dr in Salinas, CA.

**86-6.02B Materials**

**86-6.02B(1) General**

The luminaire must include an assembly that uses LEDs as the light source. The assembly must include a housing, an LED array, and an electronic driver. The luminaire must:

1. Be UL listed under UL 1598 for luminaires in wet locations or an equivalent standard from a recognized testing laboratory
2. Have a minimum operational life of 63,000 hours
3. Operate at an average operating time of 11.5 hours per night
4. Be designed to operate at an average nighttime operating temperature of 70 degrees F
5. Have an operating temperature range from -40 to +130 degrees F
6. Be defined by the following applications:

Application	Replaces
Roadway 1	200 W high-pressure sodium luminaire mounted at 34 ft
Roadway 2	310 W high-pressure sodium luminaire mounted at 40 ft
Roadway 3	310 W high-pressure sodium luminaire mounted at 40 ft with back side control
Roadway 4	400 W high-pressure sodium luminaire mounted at 40 ft

The individual LEDs must be connected such that a catastrophic loss or a failure of 1 LED does not result in the loss of more than 20 percent of the luminous output of the luminaire.

**86-6.02B(2) Luminaire Identification**

Each luminaire must have the following identification permanently marked inside the unit and outside of its packaging box:

1. Manufacturer's name
2. Trademark
3. Model number
4. Serial number
5. Month and year of manufacture
6. Lot number
7. Contract number
8. Rated voltage
9. Rated wattage
10. Rated power in VA

**86-6.02B(3) Electrical Requirements**

The luminaire must operate from a 60 ± 3 Hz AC power source. The fluctuations of line voltage must have no visible effect on the luminous output. The operating voltage may range from 120 to 480 V(ac). The

luminaire must operate over the entire voltage range or the voltage range must be selected from either of the following options:

1. Luminaire must operate over a voltage range of 95 to 277 V(ac). The operating voltages for this option are 120 V(ac) and 240 V(ac).
2. Luminaire must operate over a voltage range of 347 to 480 V(ac). The operating voltage for this option is 480 V(ac).

The power factor of the luminaire must be 0.90 or greater. The total harmonic distortion, current, and voltage induced into an AC power line by a luminaire must not exceed 20 percent. The maximum power consumption allowed for the luminaire must be as shown in the following table:

Application	Maximum consumption (watts)
Roadway 1	165
Roadway 2	235
Roadway 3	235
Roadway 4	300

**86-6.02B(4) Surge Suppression and Electromagnetic Interference**

The luminaire's on-board circuitry must include an SPD to withstand high repetition noise transients caused by utility line switching, nearby lightning strikes, and other interferences. The SPD must protect the luminaire from damage and failure due to transient voltages and currents as defined in Tables 1 and 4 of ANSI/IEEE C64.41.2 for location category C-High. The SPD must comply with UL 1449. The SPD must be tested under ANSI/IEEE C62.45 based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for location category C-High.

The luminaires and associated on-board circuitry must comply with the Class A emission limits under 47 CFR 15, subpart B, for the emission of electronic noise.

**86-6.02B(5) Compatibility**

The luminaire must be operationally compatible with currently-used lighting control systems and photoelectric controls.

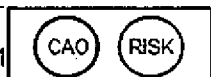
**86-6.02B(6) Photometric Requirements**

The luminaire must maintain a minimum illuminance level throughout the minimum operating life. The L70 of the luminaire must be the minimum operating life or greater. The measurements must be calibrated to standard photopic calibrations. The minimum maintained illuminance values measured at a point must be as shown in the following table:

Application	Mounting height (ft)	Minimum maintained illuminance (fc)	Light pattern figure (isofootcandle curve)
Roadway 1	34	0.15	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(82)^2} + \frac{(y - 20)^2}{(52)^2} = 1$ <p>where:                      x = direction longitudinal to the roadway                      y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 20 feet to the house side of the pattern.</p>
Roadway 2	40	0.2	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(82)^2} + \frac{(y - 20)^2}{(52)^2} = 1$ <p>where:                      x = direction longitudinal to the roadway                      y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 20 feet to the house side of the pattern.</p>
Roadway 3	40	0.2	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(82)^2} + \frac{(y - 20)^2}{(52)^2} = 1$ <p>for <math>y \geq 0</math> (street side)</p> <p>where:                      x = direction longitudinal to the roadway                      y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 20 feet to the house side of the pattern.</p>
Roadway 4	40	0.2	<p>Pattern defined by an ellipse with the equation:</p> $\frac{x^2}{(92)^2} + \frac{(y - 23)^2}{(55)^2} = 1$ <p>where:                      x = direction longitudinal to the roadway                      y = direction transverse to the roadway and the luminaire is offset from the center of the pattern by 23 feet to the house side of the pattern.</p>

The luminaire must have a correlated color temperature range from 3,500 to 6,500 K. The color rendering index must be 65 or greater.

The luminaire must not allow more than:



1. 10 percent of the rated lumens to project above 80 degrees from vertical
2. 2.5 percent of the rated lumens to project above 90 degrees from vertical

#### **86-6.02B(7) Thermal Management**

The passive thermal management of the heat generated by the LEDs must have enough capacity to ensure proper operation of the luminaire over the minimum operation life. The LED maximum junction temperature for the minimum operation life must not exceed 221 degrees F.

The junction-to-ambient thermal resistance must be 95 degrees F per watt or less. The use of fans or other mechanical devices is not allowed. The heat sink material must be aluminum or other material of equal or lower thermal resistance.

The luminaire must contain circuitry that automatically reduces the power to the LEDs so the maximum junction temperature is not exceeded when the ambient outside temperature is 100 degrees F or greater.

#### **86-6.02B(8) Physical and Mechanical Requirements**

The luminaire must:

1. Be a single, self-contained device not requiring job-site assembly for installation
2. Have an integral power supply
3. Weigh no more than 35 lb
4. Have a maximum-effective projected area of 1.4 sq ft when viewed from either side or end
5. Have a housing color that matches color number from 26152 to 26440, from 36231 to 36375, or 36440 of FED-STD-595.

The housing must be fabricated from materials designed to withstand a 3,000-hour salt spray test under ASTM B 117. All aluminum used in housings and brackets must be made of a marine-grade alloy with less than 0.2 percent copper. All exposed aluminum must be anodized.

Each refractor or lens must be made from UV-inhibited high-impact plastic such as acrylic or polycarbonate or heat- and impact-resistant glass and be resistant to scratching. Polymeric materials except lenses of enclosures containing either the power supply or electronic components of the luminaire must be made of UL94VO flame retardant materials. The housing's paint must comply with section 86-2.16. A chromate conversion undercoating must be used underneath a thermoplastic polyester powder coat.

Provide each housing with a slip fitter capable of mounting on a 2-inch pipe tenon. This slip fitter must fit on mast arms with outside diameters from 1-5/8 to 2-3/8 inches. The slip fitter must be capable of being adjusted a minimum of  $\pm 5$  degrees from the axis of the tenon in a minimum of 5 steps: +5, +2.5, 0, -2.5, -5. The clamping brackets of the slip fitter must not bottom out on the housing bosses when adjusted within the designed angular range. No part of the slip fitter's mounting brackets must develop a permanent set in excess of 1/32 inch when the bracket's two or four 3/8-inch-diameter cap screws are tightened to 10 ft-lb. Two sets of cap screws may be furnished to allow the slip fitter to be mounted on the pipe tenon in the acceptable range without the cap screws bottoming out in the threaded holes. The cap screws and the clamping brackets must be made of corrosion-resistant materials or treated to prevent galvanic reactions and be compatible with the luminaire housing and the mast arm.

The LED luminaire must be assembled and manufactured such that its internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources. When tested under California Test 611, the luminaire to be mounted horizontally on the mast arm must be capable of withstanding the following cyclic loading for a minimum of 2 million cycles without failure of any luminaire part:

**Cyclic Loading**

Plane	Power supply	Minimum peak acceleration level
Vertical	Installed	3.0 g peak-to-peak sinusoidal loading (same as 1.5 g peak)
Horizontal <sup>a</sup>	Installed	1.5 g peak-to-peak sinusoidal loading (same as 0.75 g peak)

<sup>a</sup>Perpendicular to the direction of the mast arm

The housing must be designed to prevent the buildup of water on top of the housing. Exposed heat sink fins must be oriented to allow water to freely run off of the luminaire and carry dust and other accumulated debris away from the unit. The optical assembly of the luminaire must be protected against dust and moisture intrusion to at least an ANSI/IEC rating of IP66. The power supply enclosure must be protected to at least an ANSI/IEC rating of IP43.

Furnish each mounted luminaire with an ANSI C136.41-compliant, locking-type photocontrol receptacle with dimming connections and a raintight shorting cap. The receptacle must comply with section 86-6.11A.

When the components are mounted on a down-opening door, the door must be hinged and secured to the luminaire housing separately from the refractor or flat lens frame. The door must be secured to the housing such that accidental opening is prevented. A safety cable must mechanically connect the door to the housing.

Field wires connected to the luminaire must terminate on a barrier-type terminal block secured to the housing. The terminal screws must be captive and equipped with wire grips for conductors up to no. 6. Each terminal position must be clearly identified.

The power supply must be rated for outdoor operation and have at least an ANSI/IEC rating of IP65.

The power supply must be rated for a minimum operational life equal to the minimum operational life of the luminaire or greater.

The power supply case temperature must have a self rise of 77 degrees F or less above ambient temperature in free air with no additional heat sinks.

The power supply must have 2 leads to accept standard 0-10 V(dc). The dimming control must be compatible with IEC 60929. If the control leads are open or the analog control signal is lost, the circuit must default to 100-percent power.

Conductors and terminals must be identified.

**86-6.02C Construction**

Not Used

**86-6.02D Payment**

Not Used

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**DIVISION X MATERIALS**



## 90 CONCRETE

### Add to section 90-2.02B:

You may use rice hull ash as an SCM. Rice hull ash must comply with AASHTO M 321 and the chemical and physical requirements shown in the following tables:

Chemical property	Requirement (percent)
Silicon dioxide (SiO <sub>2</sub> ) <sup>a</sup>	90 min
Loss on ignition	5.0 max
Total alkalis as Na <sub>2</sub> O equivalent	3.0 max

Physical property	Requirement
Particle size distribution	
Less than 45 microns	95 percent
Less than 10 microns	50 percent
Strength activity index with portland cement <sup>b</sup>	
7 days	95 percent (min percent of control)
28 days	110 percent (min percent of control)
Expansion at 16 days when testing project materials under ASTM C 1567 <sup>c</sup>	0.10 percent max
Surface area when testing by nitrogen adsorption under ASTM D 5604	40.0 m <sup>2</sup> /g min

<sup>a</sup>SiO<sub>2</sub> in crystalline form must not exceed 1.0 percent.

<sup>b</sup>When tested under AASHTO M 307 for strength activity testing of silica fume.

<sup>c</sup>In the test mix, Type II or V portland cement must be replaced with at least 12 percent rice hull ash by weight.

For the purpose of calculating the equations for the cementitious material specifications, consider rice hull ash to be represented by the variable *UF*.

### Add to section 90-2.01B Definitions:

An exposed-aggregate surface is obtained by placing concrete and then removing the outer 'skin' of cement paste to uncover coarse aggregate.

Stamped concrete is obtained by using, stamping mats, or seamless texturing skins to resemble brick, cobble, or other materials.

Colored concrete is concrete where the color is integral to the concrete mix.

### Add to section 90-2.01C Submittals:

Submit samples of the stamped concrete pattern.

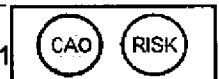
Submit a color chip sample of the stamped concrete color.

### Add to section 90-2.02C Aggregate:

Crushed concrete may not be used for aggregate in areas where exposed aggregate concrete is identified on the plans.

**Add section 90-2.02F Colored Stamped Concrete:**

The color of the Minor Concrete (Truck Apron) must be equivalent to "Davis Colors" Harvest Gold (pigment # 5084). Color must be integral in concrete. The stamp pattern must be equivalent to a "Euro-cobble" pattern.



## REVISED STANDARD SPECIFICATIONS DATED 10-30-15

### ORGANIZATION

Revised standard specifications are under headings that correspond with the main-section headings of the *Standard Specifications*. A main-section heading is a heading shown in the table of contents of the *Standard Specifications*. A date under a main-section heading is the date of the latest revision to the section.

Each revision to the *Standard Specifications* begins with a revision clause that describes or introduces a revision to the *Standard Specifications*. For a revision clause that describes a revision, the date on the right above the clause is the publication date of the revision. For a revision clause that introduces a revision, the date on the right above a revised term, phrase, clause, paragraph, or section is the publication date of the revised term, phrase, clause, paragraph, or section. For a multiple-paragraph or multiple-section revision, the date on the right above a paragraph or section is the publication date of the paragraphs or sections that follow.

Any paragraph added or deleted by a revision clause does not change the paragraph numbering of the *Standard Specifications* for any other reference to a paragraph of the *Standard Specifications*.

\*\*\*\*\*

### ORGANIZATIONAL REVISIONS

07-19-13

Transfer section 36 from division IV to division V.

\*\*\*\*\*

### DIVISION I GENERAL PROVISIONS

#### 1 GENERAL

10-30-15

Add between the 14th and 15th paragraphs of section 1-1.01:

10-30-15

Specifications in a section titled *General* apply to all subordinate sections within the section.

Specifications in the general section of a division apply to all sections within the division.

Replace "current" in the 2nd paragraph of section 1-1.05 with:

04-20-12

most recent

Add to the 4th paragraph of section 1-1.05:

04-20-12

Any reference directly to a revised standard specification section is for convenience only. Lack of a direct reference to a revised standard specification section does not indicate a revised standard specification for the section does not exist.

Replace "MSDS" in the 1st table in section 1-1.06 with:

MSDS<sup>b</sup>

10-17-14

Add to the 1st table in section 1-1.06:

10-30-15

LCS	Department's lane closure system
MPQP	Material Plant Quality Program published by the Department
POC	pedestrian overcrossing
QSD	qualified SWPPP developer
QSP	qualified SWPPP practitioner
SDS	safety data sheet
TRO	time-related overhead
WPC	water pollution control

Add to the notes of the 1st table in section 1-1.06:

10-17-14

<sup>b</sup>Interpret a reference to MSDS as a reference to SDS under 29 CFR 1910.1200.

Delete the abbreviation and its meaning for *UDBE* in the 1st table of section 1-1.06.

08-20-12

Delete "Contract completion date" and its definition in section 1-1.07B.

10-19-12

Delete "critical delay" and its definition in section 1-1.07B.

10-19-12

Replace "day" and its definition in section 1-1.07B with:

10-19-12

**day:** 24 consecutive hours running from midnight to midnight; calendar day.

1. **business day:** Day on the calendar except a Saturday and a holiday.
2. **working day:** Time measure unit for work progress. A working day is any 24-consecutive-hour period except:
  - 2.1. Saturday and holiday.
  - 2.2. Day during which you cannot perform work on the controlling activity for at least 50 percent of the scheduled work shift with at least 50 percent of the scheduled labor and equipment due to any of the following:
    - 2.2.1. Adverse weather-related conditions.
    - 2.2.2. Maintaining traffic under the Contract.
    - 2.2.3. Suspension of a controlling activity that you and the Engineer agree benefits both parties.
    - 2.2.4. Unanticipated event not caused by either party such as:
      - 2.2.4.1. Act of God.
      - 2.2.4.2. Act of a public enemy.
      - 2.2.4.3. Epidemic.

- 2.2.4.4. Fire.
- 2.2.4.5. Flood.
- 2.2.4.6. Governor-declared state of emergency.
- 2.2.4.7. Landslide.
- 2.2.4.8. Quarantine restriction.
- 2.2.5. Issue involving a third party, including:
  - 2.2.5.1. Industry or area-wide labor strike.
  - 2.2.5.2. Material shortage.
  - 2.2.5.3. Freight embargo.
  - 2.2.5.4. Jurisdictional requirement of a law enforcement agency.
  - 2.2.5.5. Workforce labor dispute of a utility or nonhighway facility owner resulting in a nonhighway facility rearrangement not described and not solely for the Contractor's convenience. Rearrangement of a nonhighway facility includes installation, relocation, alteration, or removal of the facility.
- 2.3. Day during a concurrent delay.
- 3. **original working days:**
  - 3.1. Working days to complete the work shown on the *Notice to Bidders* for a non-cost plus time based bid.
  - 3.2. Working days bid to complete the work for a cost plus time based bid.

Where working days is specified without the modifier "original" in the context of the number of working days to complete the work, interpret the number as the number of original working days as adjusted by any time adjustment.

**Replace "Contract" in the definition of "early completion time" in section 1-1.07B with:**

10-19-12

work

**Replace "excusable delay" and its definition in section 1-1.07B with:**

10-19-12

**delay:** Event that extends the completion of an activity.

1. **excusable delay:** Delay caused by the Department and not reasonably foreseeable when the work began such as:
  - 1.1. Change in the work
  - 1.2. Department action that is not part of the Contract
  - 1.3. Presence of an underground utility main not described in the Contract or in a location substantially different from that specified
  - 1.4. Described facility rearrangement not rearranged as described, by the utility owner by the date specified, unless the rearrangement is solely for the Contractor's convenience
  - 1.5. Department's failure to obtain timely access to the right-of-way
  - 1.6. Department's failure to review a submittal or provide notification in the time specified
2. **critical delay:** Excusable delay that extends the scheduled completion date
3. **concurrent delay:** Occurrence of at least 2 of the following events in the same period of time, either partially or entirely:
  - 3.1. Critical delay
  - 3.2. Delay to a controlling activity caused by you
  - 3.3. Non-working day

**Replace "project" in the definition of "scheduled completion date" in section 1-1.07B with:**

10-19-12

work

**Add to section 1-1.07B:**

- abandon:** Render unserviceable in place. 10-30-15
- adjust:** Raise or lower a facility to match a new grade line.
- Contract time:** Number of original working days as adjusted by any time adjustment. 10-19-12
- Disadvantaged Business Enterprise:** Disadvantaged Business Enterprise as defined in 49 CFR 26.5. 06-20-12
- modify:** Add to or subtract from an appurtenant part. 10-30-15
- obliterate:** Place an earth cover over or root, plow, pulverize, or scarify.
- quality characteristic:** Characteristic of a material that is measured to determine conformance with a given requirement.
- reconstruct:** Remove and disassemble and construct again at an existing or new location.
- relocate:** Remove and install or place in a new location.
- remove:** Remove and dispose of.
- reset:** Remove and install or place laterally at the same station location.
- salvage:** Remove, clean, and haul to a specified location.

**Replace "PO BOX 911" in the District 3 mailing address in the table in section 1-1.08 with:**

703 B ST

04-20-12

**Replace the Web site for the Department of General Services, Office of Small Business and DVBE Services in the table in section 1-1.11 with:**

<http://www.dgs.ca.gov/dgs/ProgramsServices/BusServices.aspx>

11-15-13

**Replace "-" for the telephone number for the Office Engineer in the table in section 1-1.11 with:**

(916) 227-6299

02-27-15

**Add to the table in section 1-1.11:**

10-30-15

MPQP	<a href="http://www.dot.ca.gov/manuals.htm">http://www.dot.ca.gov/manuals.htm</a>	-	-
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AA

## 2 BIDDING

04-10-15

Replace the headings and paragraphs in section 2 with:

02-21-14

### 2-1.01 GENERAL

Section 2 includes specifications related to bid eligibility and the bidding process.

The electronic bid specifications in section 2 apply if *Electronic Bidding Contract* is shown on the cover of the *Notice to Bidders and Special Provisions*.

### 2-1.02 BID INELIGIBILITY

A firm that has provided architectural or engineering services to the Department for this contract before bid submittal for this contract is prohibited from any of the following:

- 1. Submitting a bid
- 2. Subcontracting for a part of the work
- 3. Supplying materials

### 2-1.03 RESERVED

02-27-15

### 2-1.04 CONTRACTOR REGISTRATION

No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

02-21-14

### 2-1.05 RESERVED

10-17-14

### 2-1.06 BID DOCUMENTS

01-23-15

#### 2-1.06A General

The *Bid* book includes bid forms and certifications. For an electronic bid, the *Bid* book includes forms not available through the electronic bidding service.

The *Notice to Bidders and Special Provisions* includes the *Notice to Bidders*, revised standard specifications, and special provisions.

The *Bid* book, including *Bid* book forms not available through the electronic bidding service, *Notice to Bidders and Special Provisions*, project plans, and any addenda to these documents may be accessed at the Bidders' Exchange website.

The *Standard Specifications* and *Standard Plans* may be viewed at the Bidders' Exchange website and may be purchased at the Publication Distribution Unit.

10-17-14

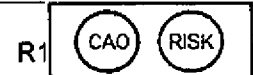
#### 2-1.06B Supplemental Project Information

The Department makes supplemental information available as specified in the special provisions.

Logs of test borings are supplemental project information.

If an *Information Handout* or cross sections are available, you may view them at the Contract Plans and Special Provisions link at the Bidders' Exchange website.

If rock cores are available, you may view them by sending a request to [Coreroom@dot.ca.gov](mailto:Coreroom@dot.ca.gov).



If other supplemental project information is available for inspection, you may view it by phoning in a request.

Make your request at least 7 days before viewing. Include in your request:

1. District-County-Route
2. Contract number
3. Viewing date
4. Contact information, including telephone number

For rock cores, also include the bridge number in your request.

If bridge as-built drawings are available:

1. For a project in District 1 through 6 or 10, you may request them from the Office of Structure Maintenance and Investigations, fax (916) 227-8357
2. For a project in District 7, 8, 9, 11, or 12, you may request them from the Office of Structure Maintenance and Investigations, fax (916) 227-8357, and they are available at the Office of Structure Maintenance and Investigations, Los Angeles, CA, telephone (213) 897-0877

As-built drawings may not show existing dimensions and conditions. Where new construction dimensions are dependent on existing bridge dimensions, verify the field dimensions and adjust dimensions of the work to fit existing conditions.

#### **2-1.06C-2-1.06D Reserved**

#### **2-1.07 JOB SITE AND DOCUMENT EXAMINATION**

Examine the job site and bid documents. Notify the Department of apparent errors and patent ambiguities in the plans, specifications, and Bid Item List. Failure to do so may result in rejection of a bid or rescission of an award.

Bid submission is your acknowledgment that you have examined the job site and bid documents and are satisfied with:

1. General and local conditions to be encountered
2. Character, quality, and scope of work to be performed
3. Quantities of materials to be furnished
4. Character, quality, and quantity of surface and subsurface materials or obstacles
5. Requirements of the contract

02-21-14

#### **2-1.08 RESERVED**

#### **2-1.09 BID ITEM LIST**

Submit a bid based on the bid item quantities the Department shows on the Bid Item List.

02-27-15

#### **2-1.10 SUBCONTRACTOR LIST**

On the Subcontractor List form, list each subcontractor to perform work in an amount in excess of 1/2 of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.).

For each subcontractor listed, the Subcontractor List form must show:

1. Business name and the location of its place of business.
2. California contractor license number for a non-federal-aid contract.
3. Public works contractor registration number
4. Portion of work it will perform. Show the portion of the work by:
  - 4.1. Bid item numbers for the subcontracted work
  - 4.2. Percentage of the subcontracted work for each bid item listed



- 4.3. Description of the subcontracted work if the percentage of the bid item listed is less than 100 percent

02-21-14

## 2-1.11 RESERVED

01-23-15

## 2-1.12 DISADVANTAGED BUSINESS ENTERPRISES

### 2-1.12A General

Section 2-1.12 applies to a federal-aid contract.

Under 49 CFR 26.13(b):

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

Include this assurance in each subcontract you sign with a subcontractor.

### 2-1.12B Disadvantaged Business Enterprise Goal

#### 2-1.12B(1) General

Section 2-1.12B applies if a DBE goal is shown on the *Notice to Bidders*.

The Department shows a goal for DBEs to comply with the DBE program objectives provided in 49 CFR 26.1.

Make work available to DBEs and select work parts consistent with available DBEs, including subcontractors, suppliers, service providers, and truckers.

Meet the DBE goal shown on the *Notice to Bidders* or demonstrate that you made adequate good faith efforts to meet this goal.

You are responsible to verify at bid opening the DBE firm is certified as a DBE by the California Unified Certification Program and possess the work codes applicable to the type of work the firm will perform on the Contract.

Determine that selected DBEs perform a commercially useful function for the type of work the DBE will perform on the Contract as provided in 49 CFR 26.55(c)(1)-(4). Under 49 CFR 26.55(c)(1)-(4), the DBE must be responsible for the execution of a distinct element of work and must carry out its responsibility by actually performing, managing, and supervising the work.

All DBE participation will count toward the Department's federally-mandated statewide overall DBE goal.

Credit for materials or supplies you purchase from DBEs will be evaluated on a contract-by-contract basis and counts toward the goal in the following manner:

1. 100 percent if the materials or supplies are obtained from a DBE manufacturer.
2. 60 percent if the materials or supplies are obtained from a DBE regular dealer.
3. Only fees, commissions, and charges for assistance in the procurement and delivery of materials or supplies, if they are obtained from a DBE that is neither a manufacturer nor regular dealer. 49 CFR 26.55 defines "manufacturer" and "regular dealer."

You receive credit toward the goal if you employ a DBE trucking company that is performing a commercially useful function. The Department uses the following factors in determining whether a DBE trucking company is performing a commercially useful function:

- The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.
- The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
- The DBE receives credit for the total value of the transportation services it provides on the Contract using trucks it owns, insures, and operates using drivers it employs.
- The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the Contract.
- The DBE may lease trucks without drivers from a non-DBE truck leasing company. If the DBE leases trucks from a non-DBE truck leasing company and uses its own employees as drivers, it is entitled to credit for the total value of these hauling services.
- A lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

[49 Fed Reg 59595 (10/2/14) (to be codified at 49 CFR 26.55(d))]

04-10-15

### **2-1.12B(2) DBE Commitment Submittal**

Submit DBE information under section 2-1.33.

Submit a copy of the quote from each DBE shown on the DBE Commitment form that describes the type and dollar amount of work shown on the form. Submit a DBE Confirmation form for each DBE shown on the DBE Commitment form to establish that it will be participating in the Contract in the type and dollar amount of work shown on the form. If a DBE is participating as a joint venture partner, submit a copy of the joint venture agreement.

01-23-15

### **2-1.12B(3) DBE Good Faith Efforts Submittal**

You can meet the DBE requirements by either documenting commitments to DBEs to meet the Contract goal or by documenting adequate good faith efforts to meet the Contract goal. An adequate good faith effort means that the bidder must show that it took all necessary and reasonable steps to achieve a DBE goal that, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to meet the DBE goal.

If you have not met the DBE goal, complete and submit the DBE Good Faith Efforts Documentation form under section 2-1.33 showing that you made adequate good faith efforts to meet the goal. Only good faith efforts directed toward obtaining participation by DBEs are considered.

Submit good faith efforts documentation within the specified time to protect your eligibility for award of the contract in the event the Department finds that the DBE goal has not been met.

Refer to 49 CFR 26 app A for guidance regarding evaluation of good faith efforts to meet the DBE goal.

The Department considers DBE commitments of other bidders in determining whether the low bidder made good faith efforts to meet the DBE goal.

**2-1.13–2-1.14 RESERVED****2-1.15 DISABLED VETERAN BUSINESS ENTERPRISES****2-1.15A General**

Section 2-1.15 applies to a non-federal-aid contract.

Take necessary and reasonable steps to ensure that DVBEs have the opportunity to participate in the Contract.

Comply with Mil & Vet Code § 999 et seq.

**2-1.15B Projects \$5 Million or Less**

Section 2-1.15B applies to a project with an estimated cost of \$5 million or less.

Make work available to DVBEs and select work parts consistent with available DVBE subcontractors and suppliers.

Meet the goal shown on the *Notice to Bidders*.

Complete and submit the Certified DVBE Summary form under section 2-1.33. List all DVBE participation on this form.

If a DVBE joint venture is used, submit the joint venture agreement with the Certified DVBE Summary form.

List each 1st-tier DVBE subcontractor on the Subcontractor List form regardless of percentage of the total bid.

**2-1.15C Projects More Than \$5 Million****2-1.15C(1) General**

Section 2-1.15C applies to a project with an estimated cost of more than \$5 million.

The Department encourages bidders to obtain DVBE participation to ensure the Department achieves its State-mandated overall DVBE goal.

If you obtain DVBE participation:

1. Complete and submit the Certified DVBE Summary form under section 2-1.33. List all DVBE participation on this form.
2. List each 1st tier DVBE subcontractor in the Subcontractor List form regardless of percentage of the total bid.

If a DVBE joint venture is used, submit the joint venture agreement with the Certified DVBE Summary form.

**2-1.15C(2) DVBE Incentive**

The Department grants a DVBE incentive to each bidder who achieves a DVBE participation of 1 percent or greater (Mil & Vet Code 999.5 and Code of Regs § 1896.98 et seq.).

To receive this incentive, submit the Certified DVBE Summary form under section 2-1.33.

Bidders other than the apparent low bidder, the 2nd low bidder, and the 3rd low bidder may be required to submit the Certified DVBE Summary form if the bid ranking changes. If the Department requests a Certified DVBE Summary form from you, submit the completed form within 4 business days of the request.

**2-1.15C(3) Incentive Evaluation**

The Department applies the small business and non-small business preference during bid verification and proceeds with the evaluation specified below for DVBE incentive.

The DVBE incentive is a reduction, for bid comparison only, in the total bid submitted by the lesser of the following amounts:

1. Percentage of DVBE achievement rounded to 2 decimal places of the verified total bid of the low bidder
2. 5 percent of the verified total bid of the low bidder
3. \$250,000

The Department applies DVBE incentive and determines whether bid ranking changes.

A non-small business bidder cannot displace a small business bidder. However, a small business bidder with higher DVBE achievement can displace another small business bidder.

The Department proceeds with awarding the contract to the new low bidder and posts the new verified bid results at the Department's Web site.

## **2-1.16–2-1.17 RESERVED**

## **2-1.18 SMALL BUSINESS AND NON-SMALL BUSINESS SUBCONTRACTOR PREFERENCES**

### **2-1.18A General**

Section 2-1.18 applies to a non-federal-aid contract.

The Department applies small business preferences and non-small business preferences under Govt Code § 14835 et seq. and 2 CA Code of Regs § 1896 et seq.

Any contractor, subcontractor, supplier, or service provider who qualifies as a small business is encouraged to apply for certification as a small business by submitting its application to the Department of General Services, Office of Small Business and DVBE Services.

Contract award is based on the total bid, not the reduced bid.

### **2-1.18B Small Business Preference**

The Department allows a bidder certified as a small business by the Department of General Services, Office of Small Business and DVBE Services, a preference if:

1. Bidder submitted a completed Request for Small Business Preference or Non-Small Business Preference form with its bid
2. Low bidder did not request the preference or is not certified as a small business

The bidder's signature on the Request for Small Business Preference or Non-Small Business Preference form certifies that the bidder is certified as a small business at the date and time of bid or has submitted a complete application to the Department of General Services. The complete application and any required substantiating documentation must be received by the Department of General Services by 5:00 p.m. on the bid opening date.

The Department of General Services determines whether a bidder was certified on the bid opening date. The Department of Transportation confirms the bidder's status as a small business before applying the small business preference.

The small business preference is a reduction for bid comparison in the total bid submitted by the small business contractor by the lesser of the following amounts:

1. 5 percent of the verified total bid of the low bidder
2. \$50,000

If the Department determines that a certified small business bidder is the low bidder after the application of the small business preference, the Department does not consider a request for non-small business preference.

**2-1.18C Non-Small Business Subcontractor Preference**

The Department allows a bidder not certified as a small business by the Department of General Services, Office of Small Business and DVBE Services, a preference if:

1. Bidder submitted a completed Request for Small Business Preference or Non-Small Business Preference form with its bid
2. Certified Small Business Listing for the Non-Small Business Preference form shows that you are subcontracting at least 25 percent to certified small businesses

Each listed subcontractor and supplier must be certified as a small business at the date and time of bid or must have submitted a complete application to the Department of General Services. The complete application and any required substantiating documentation must be received by the Department of General Services by 5:00 p.m. on the bid opening date.

The non-small business subcontractor preference is a reduction for bid comparison in the total bid submitted by the non-small business contractor requesting the preference by the lesser of the following amounts:

1. 5 percent of the verified total bid of the low bidder
2. \$50,000

**2-1.19-2-1.26 RESERVED****2-1.27 CALIFORNIA COMPANIES**

Section 2-1.27 applies to a non-federal-aid contract.

Under Pub Cont Code § 6107, the Department gives preference to a "California company," as defined, for bid comparison purposes over a nonresident contractor from any state that gives or requires a preference to be given to contractors from that state on its public entity construction contracts.

Complete a California Company Preference form.

The California company reciprocal preference amount is equal to the preference amount applied by the state of the nonresident contractor with the lowest responsive bid unless the California company is eligible for a small business preference or a non-small business subcontractor preference, in which case the preference amount is the greater of the two, but not both.

If the low bidder is not a California company and a California company's bid with reciprocal preference is equal to or less than the lowest bid, the Department awards the contract to the California company on the basis of its total bid.

**2-1.28 RESERVED****2-1.29 OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS**

You may opt out of the payment adjustments for price index fluctuations specified in section 9-1.07. To opt out, submit a completed Opt Out of Payment Adjustments for Price Index Fluctuations form under section 2-1.33.

**2-1.30-2-1.32 RESERVED**

02-27-15

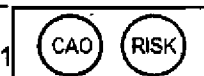
**2-1.33 BID DOCUMENT COMPLETION AND SUBMITTAL****2-1.33A General**

Complete the forms in the *Bid* book.

Use the forms provided by the Department except as otherwise specified for a bidder's bond.

Do not fax forms except for the copies of forms with the public works contractor registration number submitted after the time of bid. Fax these copies to (916) 227-6282.

Submit the forms and copies of the forms to the Office Engineer.



Failure to submit the forms and information as specified may result in a nonresponsive bid.

If an agent other than the authorized corporate officer or a partnership member signs the bid, file a Power of Attorney with the Department either before opening bids or with the bid. Otherwise, the bid may be nonresponsive.

### **2-1.33B Electronic Bids**

Section 2-1.33B applies to electronic bids.

For an electronic bid, complete and submit the electronic portion of the *Bid* book under the *Electronic Bidding Guide* at the Bidders' Exchange website and submit the paper forms as specified for a paper bid.

Your authorized digital signature is your confirmation of and agreement to all certifications and statements contained in the *Bid* book.

On forms and certifications that you submit through the electronic bidding service, you agree that each form and certification where a signature is required is deemed as having your signature.

### **2-1.33C Paper Bids**

Section 2-1.33C applies to paper bids.

Submit your bid and any *Bid* book forms after you submit your bid:

1. Under sealed cover
2. Marked as a bid
3. Identifying the contract number and the bid opening date

### **2-1.33D Bid Form Submittal Schedules**

#### **2-1.33D(1) General**

The *Bid* book includes forms specific to the contract. The deadlines for the submittal of the forms vary depending on the requirements of each contract. Determine the requirements of the contract and submit the forms based on the applicable schedule specified in section 2-1.33D.

Bid forms and information on the form that are due after the time of bid may be submitted at the time of bid.

#### **2-1.33D(2) Federal-Aid Contracts**

##### **2-1.33D(2)(a) General**

Section 2-1.33D(2) applies to a federal-aid contract.

04-10-15

##### **2-1.33D(2)(b) Contracts with a DBE Goal**

Section 2-1.33D(2)(b) applies if a DBE goal is shown on the *Notice to Bidders*.

Submit the bid forms according to the schedule shown in the following table:

**Bid Form Submittal Schedule for a  
Federal-Aid Contract with a DBE Goal**

Form	Submittal deadline
Bid to the Department of Transportation	Time of bid except for the public works contractor registration number
Copy of the Bid to the Department of Transportation as submitted at the time of bid with the public works contractor registration number	10 days after bid opening
Subcontractor List	Time of bid except for the public works contractor registration number
Copy of the Subcontractor List as submitted at the time of bid with the public works contractor registration number	10 days after bid opening
Small Business Status	Time of bid
Opt Out of Payment Adjustments for Price Index Fluctuations <sup>a</sup>	Time of bid
DBE Commitment	No later than 4 p.m. on the 4th business day after bid opening
DBE Confirmation	No later than 4 p.m. on the 4th business day after bid opening
DBE Good Faith Efforts Documentation	No later than 4 p.m. on the 4th business day after bid opening

<sup>a</sup>Submit only if you choose the option.

02-27-15

**2-1.33D(2)(c) Contracts without a DBE Goal**

Reserved

**2-1.33D(2)(d)–2-1.33D(2)(h) Reserved**

**2-1.33D(3) Non-Federal-Aid Contracts**

**2-1.33D(3)(a) General**

Section 2-1.33D(3) applies to non-federal-aid contracts.

**2-1.33D(3)(b) Contracts with a DVBE Goal**

Section 2-1.33D(3)(b) applies if a DVBE goal is shown on the *Notice to Bidders*.

Submit the bid forms according to the schedule shown in the following table:

**Bid Form Submittal Schedule for a  
Non-Federal-Aid Contract with a DVBE Goal**

Form	Submittal deadline
Bid to the Department of Transportation	Time of bid except for the public works contractor registration number for a joint-venture contract
For a joint-venture contract, copy of the Bid to the Department of Transportation as submitted at the time of bid with the public works contractor registration number	10 days after bid opening
Subcontractor List	Time of bid
Opt Out of Payment Adjustments for Price Index Fluctuations <sup>a</sup>	Time of bid
Certified DVBE Summary	No later than 4 p.m. on the 4th business day after bid opening
California Company Preference	Time of bid
Request for Small Business Preference or Non-Small Business Preference <sup>a</sup>	Time of bid
Certified Small Business Listing for the Non-Small Business Preference <sup>a</sup>	No later than 4 p.m. on the 2nd business day after bid opening

<sup>a</sup>Submit only if you choose the option or preference.

**2-1.33D(3)(c) Contracts without a DVBE Goal**

Reserved

**2-1.33D(3)(d)–2-1.33D(3)(h) Reserved**

**2-1.33D(4)–2-1.33D(9) Reserved**

02-21-14

**2-1.34 BIDDER'S SECURITY**

Submit one of the following forms of bidder's security equal to at least 10 percent of the bid:

1. Cash
2. Cashier's check
3. Certified check
4. Signed bidder's bond by an admitted surety insurer
5. For an electronic bid, electronic bidder's bond by an admitted surety insurer submitted using an electronic registry service approved by the Department.

Submit cash, cashier's check, certified check, or bidder's bond to the Department at the Bidders Exchange before the bid opening time.

Submit electronic bidder's bond with the electronic bid.

If using a bidder's bond, you may use the form in the *Bid* book. If you do not use the form in the *Bid* book, use a form containing the same information.

**2-1.35–2-1.39 RESERVED**

**2-1.40 BID WITHDRAWAL**

For a paper bid:

1. An authorized agent may withdraw a bid before the bid opening date and time by submitting a written bid withdrawal request at the location where the bid was submitted. Withdrawing a bid does not prevent you from submitting a new bid.
2. After the bid opening time, you cannot withdraw a bid.





For an electronic bid:

- 1. Bids are not filed with the Department until the date and time of bid opening.
- 2. A bidder may withdraw or revise a bid after it has been submitted to the electronic bidding service if this is done before the bid opening date and time.

**2-1.41–2-1.42 RESERVED**

**2-1.43 BID OPENING**

The Department publicly opens and reads bids at the time and place shown on the *Notice to Bidders*.

**2-1.44–2-1.45 RESERVED**

**2-1.46 DEPARTMENT'S DECISION ON BID**

The Department's decision on the bid amount is final.

The Department may reject:

- 1. All bids
- 2. A nonresponsive bid

**2-1.47 BID RELIEF**

The Department may grant bid relief under Pub Cont Code § 5100 et seq. Submit any request for bid relief to the Office Engineer. The Relief of Bid Request form is available at the Department's website.

**2-1.48 RESERVED**

**2-1.49 SUBMITTAL FAILURE HISTORY**

The Department considers a bidder's past failure to submit documents required after bid opening in determining a bidder's responsibility.

**2-1.50 BID RIGGING**

Section 2-1.50 applies to a federal-aid contract.

The U.S. Department of Transportation (DOT) provides a toll-free hotline to report bid rigging activities. Use the hotline to report bid rigging, bidder collusion, and other fraudulent activities. The hotline number is (800) 424-9071. The service is available 24 hours 7 days a week and is confidential and anonymous. The hotline is part of the DOT's effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General.

\*\*\*\*\*

**3 CONTRACT AWARD AND EXECUTION**

02-27-15

Replace section 3-1.02 with:

02-21-14

**3-1.02 CONSIDERATION OF BIDS**

**3-1.02A General**

For a lump sum based bid, the Department compares bids based on the total price.

For a unit price based bid, the Department compares bids based on the sum of the item totals.

For a cost plus time based bid, the Department compares bids based on the sum of the item totals and the total bid for time.

**3-1.02B Tied Bids**

The Department breaks a tied bid with a coin toss except:



1. If a small business bidder and a non-small business bidder request preferences and the reductions result in a tied bid, the Department awards the contract to the small business bidder.
2. If a DVBE small business bidder and a non-DVBE small business bidder request preferences and the reduction results in a tied bid, the Department awards the contract to the DVBE small business bidder.

**Replace section 3-1.03 with:**

02-27-15

**3-1.03 CONTRACTOR REGISTRATION**

No contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

**Add to the end of section 3-1.04:**

10-19-12

You may request to extend the award period by faxing a request to (916) 227-6282 before 4:00 p.m. on the last day of the award period. If you do not make this request, after the specified award period:

1. Your bid becomes invalid
2. You are not eligible for the award of the contract

**Replace the paragraph in section 3-1.11 with:**

10-19-12

Complete and deliver to the Office Engineer a *Payee Data Record* when requested by the Department.

**Replace section 3-1.12 with:**

01-23-15

**3-1.12 RESERVED**

**Replace section 3-1.13 with:**

07-27-12

**3-1.13 FORM FHWA-1273**

For a federal-aid contract, form FHWA-1273 is included with the Contract form in the documents sent to the successful bidder for execution. Comply with its provisions. Interpret the training and promotion section as specified in section 7-1.11A.

**Delete items 4 and 6 of the 2nd paragraph of section 3-1.18.**

01-23-15

**Delete the 3rd paragraph of section 3-1.18.**

02-27-15

**Replace "For all other contracts, the" in the 4th paragraph of section 3-1.18 with:**

02-27-15

The

\*\*\*\*\*

**4 SCOPE OF WORK**

10-30-15

**Replace the 2nd paragraph of section 4-1.13 with:**

10-30-15

The Department does not require you to remove warning, regulatory, or guide signs before Contract acceptance.

\*\*\*\*\*

**5 CONTROL OF WORK**

10-30-15

**Add between "million" and ", professionally" in the 3rd paragraph of section 5-1.09A:**

10-19-12

and 100 or more working days

**Add to the list in the 4th paragraph of section 5-1.09A:**

10-19-12

- 9. Considering discussing with and involving all stakeholders in evaluating potential VECPs

**Add to the end of Item 1.1 In the list in the 7th paragraph of section 5-1.09A:**

10-19-12

, including VECPs

**Replace the 1st paragraph of section 5-1.09C with:**

10-19-12

For a contract with a total bid over \$10 million and 100 or more working days, training in partnering skills development is required.

**Delete the 2nd paragraph of section 5-1.09C.**

10-19-12

**Replace "at least 2 representatives" in the 5th paragraph of section 5-1.09C with:**

10-19-12

field supervisory personnel

**Replace the 8th paragraph of section 5-1.13A with:**

04-24-15

Each subcontractor must have an active and valid:

- 1. State contractor license with a classification appropriate for the work to be performed (Bus & Prof Code §.7000 et seq.)
- 2. Public works contractor registration number with the Department of Industrial Relations



**Replace section 5-1.13B with:**

01-23-15

**5-1.13B Disadvantaged Business Enterprises****5-1.13B(1) General**

Section 5-1.13B applies to a federal-aid contract.

Use each DBE as listed on the DBE Commitment form unless you receive authorization for a substitution. Ensure that all subcontracts and agreements with DBEs to supply labor or materials are performed under 49 CFR 26.

Maintain records, including:

1. Name and business address of each 1st-tier subcontractor
2. Name and business address of each DBE subcontractor, DBE vendor, and DBE trucking company, regardless of tier
3. Date of payment and total amount paid to each business

If you are a DBE contractor, include the date of work performed by your own forces and the corresponding value of the work.

Before the 15th day of each month for the previous month's work, submit:

1. Monthly DBE Trucking Verification form
2. Monthly DBE Payment form

If a DBE is decertified before completing its work, the DBE must notify you in writing of the decertification date. If a business becomes a certified DBE before completing its work, the business must notify you in writing of the certification date. Submit the notifications. Upon work completion, complete a Disadvantaged Business Enterprises (DBE) Certification Status Change form. Submit the form within 30 days of Contract acceptance.

Upon work completion, complete a Final Report – Utilization of Disadvantaged Business Enterprises (DBE), First-Tier Subcontractors form. Submit it within 30 days of Contract acceptance. The Department withholds \$10,000 until the form is submitted. The Department releases the withhold upon submission of the completed form.

04-10-15

**5-1.13B(2) Performance of Disadvantaged Business Enterprises**

Section 5-1.13(B)(2) applies if a DBE goal is shown on the *Notice to Bidders*.

DBEs must perform work or supply materials as listed on the DBE Commitment form.

Do not terminate or substitute a listed DBE for convenience and perform the work with your own forces or those of an affiliate, a non-DBE firm, or another DBE firm or obtain materials from other sources without authorization from the Department.

The Department authorizes a request to use other forces or sources of materials if it shows any of the following justifications:

1. Listed DBE fails or refuses to execute a written contract based on the plans and specifications for the project.
2. You stipulated that a bond is a condition of executing the subcontract and the listed DBE fails to meet your bond requirements.
3. Work requires a contractor license and the listed DBE does not have a valid license under the Contractors License Law.
4. Listed DBE fails or refuses to perform the work or furnish the listed materials.
5. Listed DBE's work is unsatisfactory and not in compliance with the Contract.

6. Listed DBE is ineligible to work on the project because of suspension or debarment.
7. Listed DBE becomes bankrupt or insolvent.
8. Listed DBE voluntarily withdraws with written notice from the Contract.
9. Listed DBE is ineligible to receive credit for the type of work required.
10. Listed DBE owner dies or becomes disabled resulting in the inability to perform the work on the Contract.
11. Department determines other documented good cause under 49 CFR 26.53.

Notify the original DBE of your intent to use other forces or material sources and provide the reasons. Provide the DBE with 5 business days to respond to your notice and advise you and the Department of the reasons why the use of other forces or sources of materials should not occur. Your request to use other forces or material sources must include:

1. 1 or more of the reasons listed in the preceding paragraph
2. Notices from you to the DBE regarding the request
3. Notices from the DBE to you regarding the request

If the Department authorizes the termination or substitution of a listed DBE, make good faith efforts to find another DBE. The substitute DBE must (1) perform at least the same dollar amount of work as the original DBE under the Contract to the extent needed to meet the DBE goal and (2) be certified as a DBE with the work code applicable to the type of work the DBE will perform on the Contract at the time of your request for substitution. Submit your documentation of good faith efforts within 7 days of your request for authorization of the substitution. The Department may authorize a 7-day extension of this submittal period at your request. Refer to 49 CFR 26 app A for guidance regarding evaluation of good faith efforts to meet the DBE goal.

Unless the Department authorizes a request to terminate or substitute a listed DBE, the Department does not pay for work unless it is performed or supplied by the DBE listed on the DBE Commitment form. You may be subject to other sanctions under 49 CFR 26.

**Replace the paragraphs of section 5-1.13C with:**

11-15-13

Section 5-1.13C applies to a non-federal-aid contract.

Use each DVBE as shown on the *Certified DVBE Summary* form unless you receive authorization from the Department for a substitution. The substitute must be another DVBE unless DVBEs are not available, in which case, you must substitute with a small business. Any authorization for a substitute is contingent upon the Department of General Services' approval of the substitute.

The requirement that DVBEs be certified by the bid opening date does not apply to DVBE substitutions after Contract award.

The Department authorizes substitutions for any of the reasons provided in 2 CA Code of Regs § 1896.73.

Include in your substitution request:

1. Copy of the written notice issued to the DVBE with proof of delivery
2. Copy of the DVBE's response to the notice
3. Name and certification number of the listed DVBE and the proposed substitute

Requests for substitutions of a listed DVBE with a small business must include documentation of the unavailability of DVBEs, including:

1. Contact with the small business/DVBE advocate from the Department and the Department of Veterans Affairs
2. Search results from the Department of General Services' website of available DVBEs

3. Communication with a DVBE community organization nearest the job site, if applicable
4. Documented communication with the DVBE and small businesses describing the work to be performed, the percentage of the total bid, the corresponding dollar amount, and the responses to the communication

The Department forwards your substitution request to the Department of General Services. The Department of General Services issues a notice of approval or denial. The Department provides you this notice.

If you fail to use a listed DVBE without an authorized substitution request, the Department issues a penalty of up to 10 percent of the dollar amount of the work of the listed DVBE.

Maintain records of subcontracts made with DVBEs. Include in the records:

1. Name and business address of each business
2. Total amount paid to each business

For the purpose of determining compliance with Pub Cont Code § 10115 et seq.:

1. Upon work completion, complete and submit *Final Report - Utilization of Disabled Veteran Business Enterprises (DVBE) State Funded Projects Only* form.
2. Upon reasonable notice and during normal business hours, permit access to its premises for the purposes of:
  - 2.1. Interviewing employees.
  - 2.2. Inspecting and copying books, records, accounts and other material that may be relevant to a matter under investigation.

**Replace "Reserved" in section 5-1.20C with:**

10-19-12

If the Contract includes an agreement with a railroad company, the Department makes the provisions of the agreement available in the *Information Handout* in the document titled "Railroad Relations and Insurance Requirements." Comply with the requirements in the document.

**Replace section 5-1.20E with:**

05-30-14

**5-1.20E Water Meter Charges**

Section 5-1.20E applies if a bid item for water meter charges is shown on the Bid Item List. The charges are specified in a special provision for section 5-1.20E.

The local water authority will install the water meters.

The charges by the local water authority include:

1. Furnishing and installing each water meter
2. Connecting to the local water authority's main water line, including any required hot tap or tee
3. Furnishing and installing an extension pipe from the main water line to the water meter
4. Sterilizing the extension pipe

Make arrangements and pay the charges for the installation of the water meters.

If a charge is changed at the time of installation, the Department adjusts the lump sum price based on the difference between the specified charges and the changed charges.

**Replace section 5-1.20F with:**

**5-1.20F Irrigation Water Service Charges**  
Reserved

05-30-14

**Add between the 2nd and 3rd paragraphs of section 5-1.23A:**

Submit action and informational submittals to the Engineer.

10-19-12

**Add between the 5th and 6th paragraphs of section 5-1.23B(1):**

For a revised submittal, allow the same number of days for review as for the original submittal.

07-19-13

**Delete the 1st sentence in the 10th paragraph of section 5-1.23B(2).**

07-19-13

**Add to the list in the 1st paragraph of section 5-1.36A:**

10. Survey monuments

07-19-13

**Add to section 5-1.36C:**

If the Contract does not include an agreement with a railroad company, do not allow personnel or equipment on railroad property.

07-20-12

Prevent material, equipment, and debris from falling onto railroad property.

**Add to section 5-1.36:**

07-19-13

**5-1.36E Survey Monuments**

Protect survey monuments on and off the highway. Upon discovery of a survey monument not identified and located immediately:

1. Stop work near the monument
2. Notify the Engineer

Do not resume work near the monument until authorized.

**Add between the 1st and 2nd paragraphs of section 5-1.37A:**

Do not remove any padlock used to secure a portion of the work until the Engineer is present to replace it. Notify the Engineer at least 3 days before removing the lock.

10-19-12

Replace the 1st sentence of the 1st paragraph of section 5-1.39C(2) with:

10-19-12

Section 5-1.39C(2) applies if a plant establishment period of 3 years or more is shown on the *Notice to Bidders*.

Replace "working days" in the 1st paragraph of section 5-1.43E(1)(a) with:

10-19-12

original working days

Replace "settled" in the last paragraph of section 5-1.43E(1)(d) with:

04-10-15

resolved

Replace items 3.1 and 3.2 in the list in the paragraph of section 5-1.43E(3)(b) with:

04-24-15

- 3.1. One-time objection to the other's candidate without stating a reason
- 3.2. Objection to any of the other's subsequent candidates based on a specific breach of the candidate's responsibilities or qualifications under items 1 and 2 above

Add between "held" and "no later than" in the 2nd sentence of the 1st paragraph of section 5-1.43E(3)(e):

10-30-15

no sooner than 30 days and

\*\*\*\*\*

## 6 CONTROL OF MATERIALS

10-30-15

Add between "replacing" and "Department-furnished" in the 1st sentence in the last paragraph of section 6-2.03:

10-30-15

lost or damaged

Replace section 6-2.05C with:

04-19-13

### 6-2.05C Steel and Iron Materials

Steel and iron materials must be melted and manufactured in the United States except:

- 1. Foreign pig iron and processed, pelletized, and reduced iron ore may be used in the domestic production of the steel and iron materials
- 2. If the total combined cost of the materials does not exceed the greater of 0.1 percent of the total bid or \$2,500, materials produced outside the United States may be used if authorized



10-24-15

Furnish steel and iron materials to be incorporated into the work with certificates of compliance and certified mill test reports. Mill test reports must indicate where the steel and iron were melted and manufactured.

04-19-13

All melting and manufacturing processes for these materials, including an application of a coating, must occur in the United States. Coating includes all processes that protect or enhance the value of the material to which the coating is applied.

**Replace the 2nd paragraph of section 6-3.04 with:**

10-30-15

Develop, implement, and maintain a QC program.

Prepare and maintain QC records, including:

- 1. Names and qualifications of:
  - 1.1. Samplers
  - 1.2. Testers
  - 1.3. Inspectors
- 2. Testing laboratories' identification and certifications
- 3. Testing equipment calibrations and certifications
- 4. Inspection reports
- 5. Sampling and testing records organized by date and type of material
- 6. Test results with comparison of quality characteristic requirements
- 7. Test results in relation to action and any suspension limits
- 8. Records of corrective actions and suspensions

Within 24 hours, notify the Engineer of any noncompliance identified by your QC program.

Allow the Department access to all QC records.

Submit QC test data and QC test results within 2 business days of test completion.

**Add between the 1st and 2nd paragraphs of section 6-3.05A:**

10-30-15

The Department may inspect, sample, and test materials for compliance with the Contract at any time.

The Department's independent assurance program is described in the Department's *Independent Assurance Manual: Procedures for Accreditation of Laboratories and Qualification of Testers*. For the manual, go to the METS website.

10-30-15

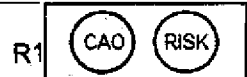
**Delete "if they are available at the job site" from the 3rd paragraph of section 6-3.05A.**

**Replace "Precast concrete members specified section 11-2" in the table in section 6-3.05B with:**

07-19-13

Precast concrete members specified as tier 1 or tier 2 in section 90-4.01D(1)

\*\*\*\*\*



**7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC**

10-30-15

**Replace "§§ 1727 and 1770-1815" in the 1st sentence of the 1st paragraph of section 7-1.02K(1) with:**

02-27-15

§ 1720 et seq.

**Replace "\$50" in the 1st sentence in the 6th paragraph of section 7-1.02K(2) with:**

07-19-13

\$200

**Replace "\$25" in the 2nd sentence in the 13th paragraph of section 7-1.02K(3) with:**

07-19-13

\$100

**Add between the 1st and 2nd sentences in the 2nd paragraph of section 7-1.02K(6)(b):**

05-30-14

10-30-15

Shop drawings of protective systems for which the Construction Safety Orders require design by a registered professional engineer must be sealed and signed by an engineer who is registered as a civil engineer in the State.

**Delete "water or" in the 9th paragraph of section 7-1.03.**

**Add to the end of the 10th paragraph of section 7-1.03:**

10-30-15

Flagging must comply with section 12-1. The Department pays you for this work under section 12-1.04.

**Add between the 1st and 2nd sentences of the 7th paragraph of section 7-1.04:**

10-30-15

Flagging must comply with section 12-1. The Department pays you for this work under section 12-1.04.

**Replace "20 days" in the 14th paragraph of section 7-1.04 with:**

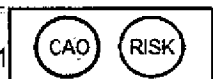
09-16-11

25 days

**Replace "90 days" in the 14th paragraph of section 7-1.04 with:**

09-16-11

125 days



**Add between the 18th and 19th paragraphs of section 7-1.04:**

09-16-11

Temporary facilities that could be a hazard to public safety if improperly designed must comply with design requirements described in the Contract for those facilities or, if none are described, with standard design criteria or codes appropriate for the facility involved. Submit shop drawings and design calculations for the temporary facilities and show the standard design criteria or codes used. Shop drawings and supplemental calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State.

**Delete "lane" in the 2nd sentence in the 27th paragraph of section 7-1.04.**

10-30-15

**Replace the 2nd paragraph of section 7-1.11A with:**

07-27-12

A copy of form FHWA-1273 is included in section 7-1.11B. The training and promotion section of section ii refers to training provisions as if they were included in the special provisions. The Department specifies the provisions in section 7-1.11D of the *Standard Specifications*. If a number of trainees or apprentices is required, the Department shows the number on the *Notice to Bidders*. Interpret each FHWA-1273 clause shown in the following table as having the same meaning as the corresponding Department clause:

**FHWA-1273 Nondiscrimination Clauses**

FHWA-1273 section	FHWA-1273 clause	Department clause
Training and Promotion	In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.	If section 7-1.11D applies, section 7-1.11D supersedes this subparagraph.
Records and Reports	If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.	If the Contract requires on-the-job training, collect and report training data.

**Replace the form in section 7-1.11B with:**

07-20-12

**REQUIRED CONTRACT PROVISIONS  
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

**ATTACHMENTS**

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

**I. GENERAL**

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following section's, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

**II. NONDISCRIMINATION**

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 833.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 833.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. **Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

**7. Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

**8. Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

**9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

**10. Assurance Required by 49 CFR 26.13(b):**

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

**11. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

### III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

### IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

#### 1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein. Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

## 2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

## 3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.



(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and trainees

##### a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program; who is not individually registered in the program; but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

##### b. Trainees (programs of the USDOL).

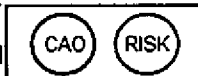
Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.



d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

**VI. SUBLETTING OR ASSIGNING THE CONTRACT**

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

**VII. SAFETY: ACCIDENT PREVENTION**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

**VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:



"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented:

Shall be fined under this title or imprisoned not more than 5 years or both."

#### **IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

#### **X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more - as defined in 2 CFR Parts 180 and 1200.

##### **1. Instructions for Certification - First Tier Participants:**

- a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

.....

**2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - First Tier Participants:**

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

**2. Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contractor). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

.....

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

.....

**XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.



AA

**8 PROSECUTION AND PROGRESS**

**10-30-15**

**Replace "working days" in the 1st paragraph of section 8-1.02B(1) with:**

original working days

10-19-12

**Replace "working days" at each occurrence in the 1st paragraph of section 8-1.02C(1) with:**

original working days

10-19-12

**Delete the 4th paragraph of section 8-1.02C(1).**

04-20-12

**Replace "Contract" in the 9th paragraph of section 8-1.02C(1) with:**

work

10-19-12

**Replace the 1st paragraph of section 8-1.02C(3)(a) with:**

Submit a description of your proposed schedule software for authorization.

04-20-12

**Delete the last paragraph of section 8-1.02C(3)(a).**

04-20-12

**Replace section 8-1.02C(3)(b) with:**

**8-1.02C(3)(b) Reserved**

10-19-12

**Delete the 3rd paragraph of section 8-1.02C(5).**

04-20-12

**Replace "Contract" in the last paragraph of section 8-1.02C(5) with:**

original

10-19-12

**Replace "working days" in the 1st paragraph of section 8-1.02D(1) with:**

original working days

10-19-12

**Replace "8-1.02D(1)" in the 2nd paragraph of section 8-1.02D(1) with:**  
8-1.02C(1) 10-19-12

**Replace "Contract" in the 3rd paragraph of section 8-1.02D(2) with:**  
work 10-19-12

**Replace "Contract" in item 9 in the list in the 4th paragraph of section 8-1.02D(4) with:**  
work 10-19-12

**Replace "Contract completion" in the 4th paragraph of section 8-1.02D(6) with:**  
work completion 10-19-12

**Replace "Contract working days" in the 4th paragraph of section 8-1.02D(6) with:**  
original working days 10-19-12

**Delete items 1.3 and 1.4 in the list in the 1st paragraph of section 8-1.02D(10).** 04-20-12

**Replace the last paragraph of section 8-1.04B with:**  
The Department does not adjust time for work performed before Contract approval. 10-30-15

**Replace the 1st paragraph of section 8-1.05 with:**  
Contract time starts on the earlier of the following: 10-30-15  
1. Day you start job site activities after Contract approval  
2. Last day specified to start job site activities in section 8-1.04

**Replace the 2nd paragraph of section 8-1.05 with:**  
Complete the work within the Contract time. 10-19-12

**Delete "unless the Contract is suspended for reasons unrelated to your performance" in the 4th paragraph of section 8-1.05.** 10-19-12

**Replace the headings and paragraphs in section 8-1.06 with:**  
The Engineer may suspend work wholly or in part due to conditions unsuitable for work progress. Provide for public safety and a smooth and unobstructed passageway through the work zone during the 10-19-12



suspension as specified under sections 7-1.03 and 7-1.04. Providing the passageway is force account work. The Department makes a time adjustment for the suspension due to a critical delay.

The Engineer may suspend work wholly or in part due to your failure to (1) fulfill the Engineer's orders, (2) fulfill a Contract part, or (3) perform weather-dependent work when conditions are favorable so that weather-related unsuitable conditions are avoided or do not occur. The Department may provide for a smooth and unobstructed passageway through the work during the suspension and deduct the cost from payments. The Department does not make a time adjustment for the suspension.

Upon the Engineer's order of suspension, suspend work immediately. Resume work when ordered.

**Replace the 1st sentence in the 1st paragraph of section 8-1.07B with:**

10-19-12

For a critical delay, the Department may make a time adjustment.

**Add to the end of section 8-1.07C:**

10-30-15

The Department does not make a payment adjustment for overhead incurred during non-working days of additional construction seasons experienced by reason of delay.

**Replace the 1st paragraph of section 8-1.07C with:**

10-19-12

For an excusable delay that affects your costs, the Department may make a payment adjustment.

**Replace "8-1.08B and 8-1.08C" in the 1st paragraph of section 8-1.10A with:**

08-05-11

8-1.10B and 8-1.10C

**Replace section 8-1.10D with:**

10-19-12

**8-1.10D Reserved**

AA

**9 PAYMENT**

10-30-15

**Add to the list in the 1st paragraph of section 9-1.03:**

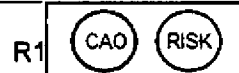
07-19-13

- 3. Any royalties and costs arising from patents, trademarks, and copyrights involved in the work

**Replace item 1 in the 3rd paragraph of section 9-1.03 with:**

01-18-13

- 1. Full compensation for all work involved in each bid item shown on the Bid Item List by the unit of measure shown for that bid item



**Replace "10" in the last paragraph of section 9-1.03 with:**

01-23-15

7

**Replace "in" in the 3rd paragraph of section 9-1.04A with:**

10-19-12

for

**Add to the end of section 9-1.04A:**

10-19-12

For nonsubcontracted work paid by force account for a contract with a TRO bid item, the markups are those shown in the following table instead of those specified in sections 9-1.04B–D:

Cost	Percent markup
Labor	30
Materials	10
Equipment rental	10

**Replace the heading and the 1st paragraph of section 9-1.04D(3) with:**

01-23-15

**9-1.04D(3) Equipment Not On the Job Site and Not Required for Original Contract Work**

For equipment not on the job site at the time required to perform work paid by force account and not required for original Contract work, the time paid is the time the equipment is operated to perform work paid by force account and the time to return the equipment to its source when the work paid by force account is completed.

**Replace item 2 in the 3rd paragraph of section 9-1.04D(3) with:**

01-23-15

- Operated less than 4 hours is paid as 1/2 day

**Replace section 9-1.04D(4) with:**

01-23-15

**9-1.04D(4) Equipment Not On the Job Site and Required for Original Contract Work**

For equipment not on the job site at the time required to perform work paid by force account and required for original Contract work, the time paid is the time:

- To move the equipment to the location of work paid by force account plus an equal amount of time to move the equipment to a location on the job site or its source when the work paid by force account is completed
- Equipment is operated to perform work paid by force account

**Delete ", Huntington Beach," in the 3rd paragraph of section 9-1.07A.**

04-20-12

**Replace the formula in section 9-1.07B(2) with:**

04-20-12

$$Qh = HMATT \times Xa$$

**Replace "weight of dry aggregate" in the definition of the variable  $X_a$  in section 9-1.07B(2) with:**  
 total weight of HMA

04-20-12

**Replace the formula in section 9-1.07B(3) with:**

$$Q_{rh} = RHMATT \times 0.80 \times X_{arb}$$

04-20-12

**Replace "weight of dry aggregate" in the definition of the variable  $X_{arb}$  in section 9-1.07B(3) with:**  
 total weight of rubberized HMA

04-20-12

**Replace the heading of section 9-1.07B(4) with:**

**Hot Mix Asphalt with Modified Asphalt Binder**

04-20-12

**Add between "in" and "modified" in the introductory clause of section 9-1.07B(4):**

HMA with

04-20-12

**Replace the formula in section 9-1.07B(4) with:**

$$Q_{mh} = MHMATT \times [(100 - X_{am}) / 100] \times X_{mab}$$

04-20-12

**Replace "weight of dry aggregate" in the definition of the variable  $X_{mab}$  in section 9-1.07B(4) with:**  
 total weight of HMA

04-20-12

**Replace the formula in section 9-1.07B(5) with:**

$$Q_{rap} = HMATT \times X_{aa}$$

04-20-12

**Replace "weight of dry aggregate" in the definitions of the variables  $X_{aa}$  and  $X_{ta}$  in section 9-1.07B(5) with:**

total weight of HMA

04-20-12

**Add after the variable definitions in section 9-1.07B(9):**

The quantity of extender oil is included in the quantity of asphalt.

04-20-12

**Replace the headings and paragraphs in section 9-1.11 with:**

10-19-12

**9-1.11A General**

Section 9-1.11 applies if a bid item for time-related overhead is included in the Contract. If a bid item for time-related overhead is included, you must exclude the time-related overhead from every other bid item price.

**9-1.11B Payment Quantity**

The TRO quantity does not include the number of working days to complete plant establishment work.

For a contract with a TRO lump sum quantity on the Bid Item List, the Department pays you based on the following conversions:

1. LS unit of measure is replaced with WDAY
2. Lump sum quantity is replaced with the number of working days bid
3. Lump sum unit price is replaced with the item total divided by the number of working days bid

**9-1.11C Payment Inclusions**

Payment for the TRO bid item includes payment for time-related field- and home-office overhead for the time required to complete the work.

The field office overhead includes time-related expenses associated with the normal and recurring construction activities not directly attributed to the work, including:

1. Salaries, benefits, and equipment costs of:
  - 1.1. Project managers
  - 1.2. General superintendents
  - 1.3. Field office managers
  - 1.4. Field office staff assigned to the project
2. Rent
3. Utilities
4. Maintenance
5. Security
6. Supplies
7. Office equipment costs for the project's field office

The home-office overhead includes the fixed general and administrative expenses for operating your business, including:

1. General administration
2. Insurance
3. Personnel and subcontract administration
4. Purchasing
5. Accounting
6. Project engineering and estimating

Payment for the TRO bid item does not include payment for:

1. The home-office overhead expenses specifically related to:
  - 1.1. Your other contracts or other businesses
  - 1.2. Equipment coordination
  - 1.3. Material deliveries
  - 1.4. Consultant and legal fees
2. Non-time-related costs and expenses such as mobilization, licenses, permits, and other charges incurred once during the Contract
3. Additional overhead involved in incentive/disincentive provisions to satisfy an internal milestone or multiple calendar requirements
4. Additional overhead involved in performing additional work that is not a controlling activity

5. Overhead costs incurred by your subcontractors of any tier or suppliers

**9-1.11D Payment Schedule**

For progress payments, the total work completed for the TRO bid item is the number of working days shown for the pay period on the *Weekly Statement of Working Days*.

For progress payments, the Department pays a unit price equal to the lesser of the following amounts:

1. Price per working day as bid or as converted under section 9-1.11B.
2. 20 percent of the total bid divided by the number of original working days

For a contract without plant establishment work, the Department pays you the balance due of the TRO item total as specified in section 9-1.17B.

For a contract with plant establishment work, the Department pays you the balance due of the TRO item total in the 1st progress payment after all non-plant establishment work is completed.

**9-1.11E Payment Adjustments**

The 3rd paragraph of section 9-1.17C does not apply.

The Department does not adjust the unit price for an increase or decrease in the TRO quantity except as specified in section 9-1.11E.

Section 9-1.17D(2)(b) does not apply except as specified for the audit report below.

If the TRO bid item quantity exceeds 149 percent of the quantity shown on the Bid Item List or as converted under section 9-1.11B, the Engineer may adjust or you may request an adjustment of the unit price for the excess quantity. For the adjustment, submit an audit report within 60 days of the Engineer's request. The report must be prepared as specified for an audit report for an overhead claim in section 9-1.17D(2)(b).

Within 20 days of the Engineer's request, make your financial records available for an audit by the State for the purpose of verifying the actual rate of TRO described in your audit. The actual rate of TRO described is subject to the Engineer's authorization.

The Department pays the authorized actual rate for TRO in excess of 149 percent of the quantity shown on the Bid Item List or as converted under section 9-1.11B.

The Department pays for 1/2 the cost of the report; the Contractor pays for the other 1/2. The cost is determined under section 9-1.05.

**Replace the paragraphs of section 9-1.16D with:**

07-18-13

**9-1.16D(1) General**

Section 9-1.16D applies if a bid item for mobilization is shown on the Bid Item List.

Payments for mobilization made under section 9-1.16D are in addition to the partial payments made under Pub Cont Code § 10261.

Section 9-1.16D(2) applies unless the Contract includes a special provision for section 9-1.16D(1) that specifies section 9-1.16D(3) applies.

11-15-13

**9-1.16D(2) Mobilization for Projects Except for Those Over Water Requiring Marine Access**

07-18-13

The Department makes partial payments for mobilization under Pub Cont Code § 10264(a) except the amount of work completed does not include the amount earned for mobilization. The partial payment

amount is reduced by a prorated amount bid in excess of the maximum allowed under Pub Cont Code § 10264(a)(5).

The Department pays the item total for mobilization in excess of the maximum allowed under Pub Cont Code § 10264(a)(5) in the 1st payment after Contract acceptance.

**9-1.16D(3) Mobilization for Projects Over Water Requiring Marine Access**

The Department makes partial payments for mobilization under Pub Cont Code § 10264(b) except the amount of work completed does not include the amount earned for mobilization. The partial payment amount is reduced by a prorated amount bid in excess of the maximum allowed under Pub Cont Code § 10264(b)(6).

The Department pays the item total for mobilization in excess of the maximum allowed under Pub Cont Code § 10264(b)(6) in the 1st payment after Contract acceptance.

**Add to the end of the 2nd paragraph of section 9-1.16E(1):**

10-30-15

except as specified in section 9-1.16E(3)

**Delete "revised Contract" in item 1 of the 1st paragraph of section 9-1.16E(2).**

10-19-12

**Add to the end of the 1st sentence of the 1st paragraph of section 9-1.16E(3):**

10-30-15

except as specified below for the failure to submit a document during the last estimate period

**Add to the end of section 9-1.16E(3):**

10-30-15

During the last estimate period, if you fail to submit a document as specified, the Department withholds \$10,000 for each document. The Department returns the withhold within 30 days after receipt of the document.

**Replace the 1st paragraph of section 9-1.16E(4) with:**

10-30-15

The Department withholds payments to cover claims filed under Civ Code § 9000 et seq.

**Replace "2014" in the 1st paragraph of section 9-1.16F with:**

10-19-12

2020

**Replace the 2nd paragraph of section 9-1.17C with:**

10-19-12

Submit either a written acceptance of the proposed final estimate or a claim statement postmarked or hand delivered before the 31st day after receiving the proposed final estimate.

**Add between "the" and "final estimate" in the 1st sentence in the 3rd paragraph of section 9-1.17C:**

proposed

10-19-12

**Replace the 1st sentence in the 6th paragraph of section 9-1.17D(2)(b) with:**

The CPA's audit must be performed as an examination-level engagement under the attestation engagements in the *Government Auditing Standards* published by the Comptroller General of the United States.

07-19-13

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**DIVISION II GENERAL CONSTRUCTION**

**10 GENERAL**

10-30-15

**Replace the headings and paragraphs in section 10 with:**

04-19-13

**10-1 GENERAL**

**10-1.01 GENERAL**

Section 10 includes general specifications for general construction work.

10-30-15

**10-1.02. WORK SEQUENCING**

Before obliterating any traffic stripes, pavement markings, and pavement markers to be replaced at the same location, reference the stripes, markings, and markers. Include limits and transitions with control points to reestablish the new stripes, markings, and markers. Submit your references to the control points at least 5 business days before obliterating the stripes, markings, and markers.

04-19-13

**10-1.03 TIME CONSTRAINTS**

Reserved

**10-1.04 TRAINING AND MEETINGS**

Training and meetings are held at times and locations you and the Engineer agree to.

**10-1.05-10-1.10 RESERVED**

10-30-15

**10-2-10-3 RESERVED**

05-30-14

**10-4 WATER USAGE**

Section 10-4 includes general specifications for your use of water for construction activities.

The Department encourages you to conserve water in all construction activities.

The Engineer notifies you of any (1) water shortage or (2) mandate from a local water authority to ration water. Within 10 days of the notification, submit a water conservation plan. The plan must include:

1. List of construction activities that require water
2. Measures you will implement for each activity to conserve water
3. Method for curing concrete other than the water method if included in the work
4. Dust palliative you will use for dust control

Any unavailability of water that delays a controlling activity is a material shortage.

05-30-14

**10-5 DUST CONTROL**

Section 10-5 includes general specifications for controlling dust resulting from the work.

Prevent and alleviate dust by:

- 1. Applying a dust palliative under section 18
- 2. Applying temporary soil stabilization under section 13-5
- 3. Managing material stockpiles under section 13-4.03C(3)

04-19-13

**10-6 JOB SITE WATER CONTROL**

**10-6.01 GENERAL**

Section 10-6 includes specifications for controlling water to provide a dry working area at the job site.

**10-6.02 WATER-FILLED COFFERDAM**

Reserved

**10-6.03-10-6.10 RESERVED**

**10-7-10-20 RESERVED**

\*\*\*\*\*

**11 QUALITY CONTROL AND ASSURANCE**

10-30-15

Replace section 11-2 with:

07-19-13

**11-2 RESERVED**

Replace the table in the 3rd paragraph of section 11-3.01A with:

07-19-13

AWS code	Year of adoption
D1.1	2010
D1.3	2008
D1.4	2011
D1.5	2010
D1.6	2007
D1.8	2009

Replace "does" in the definition of "continuous inspection" in section 11-3.01B with:

07-19-13

do



**Replace "gross nonconformance" and its definition in section 11-3.01B with:**

07-19-13

**gross nonconformance:** Rejectable indications are present in more than 20 percent of the tested weld length.

**Replace the introductory clause in the 1st paragraph of section 11-3.01C with:**

07-19-13

Replace clause 6.1.3 of AWS D1.1, the 1st paragraph of clause 7.1.2 of AWS D1.4, and clause 6.1.2 of AWS D1.5 with:

**Replace the 3rd paragraph of section 11-3.01C with:**

07-19-13

For each inspection, including fit-up, WPS verification, and final weld inspection, the QC Inspector must confirm and document compliance with the specifications, AWS welding codes, and any referenced drawings.

**Replace the paragraphs in section 11-3.01D with:**

07-19-13

The Engineer has the authority to verify the qualifications or certifications of any welder, QC Inspector, or NDT personnel to specified levels by retests or other means determined by the Engineer. If welding will be performed without gas shielding, then qualification must also include welding without gas shielding.

Replace clause 6.14.6.1 of AWS D1.1, clause 7.8 of AWS D1.4, and clause 6.1.3.4 of AWS D1.5 with:

Personnel performing NDT must be qualified and certified under American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the written practice of the NDT firm. The written practice of the NDT firm must comply with or exceed the guidelines of the ASNT Recommended Practice No. SNT-TC-1A. Individuals who perform NDT, review the results, and prepare the written reports must be one of the following:

1. Certified NDT Level II technicians
2. Level III technicians certified to perform the work of Level II technicians

**Replace the heading and the 1st through 3rd paragraphs of section 11-3.01E with:**

07-19-13

**11-3.01E Weld Joint Details**

If weld joint details proposed for use in the work are not prequalified under clause 3 of AWS D1.1 or figure 2.4 or 2.5 of AWS D1.5, submit the proposed WPS and the intended weld joint locations.

Upon authorization of the proposed joint detail locations and qualification of the proposed joint details, welders and welding operators using these details must weld an additional qualification test plate using the WPS variables and the weld joint detail to be used in production. The test plate must:

1. Have the maximum thickness to be used in production and a minimum length of 18 inches.
2. Be mechanically and radiographically tested. Mechanical and radiographic testing and acceptance criteria must comply with the applicable AWS codes.

If a nonprequalified weld joint configuration is proposed using a combination of WPSs for work welded under AWS D1.1, you may conduct a single test combining the WPSs to be used in production, if the essential variables, including weld bead placement, of each process are limited to those established in table 4.5 of AWS D1.1.

**Replace the 1st paragraph of section 11-3.01F with:**

07-19-13

Replace paragraph 3 of clause 6.26.3.2 of AWS D1.5 with:

3. If indications that exhibit these planar characteristics are present at scanning sensitivity, or other evidence exists to suggest the presence of transverse cracks, a more detailed evaluation of the discontinuity by other means must be performed (e.g., alternate UT techniques, RT, grinding, or gouging for visual inspection or MT of the excavated areas.). For welds that have transverse cracks, excavate the full length of the crack plus 2 inches of weld metal on each side adjacent to the crack and reweld.

**Replace "section" in the 2nd paragraph of section 11-3.01F with:**

07-19-13

clause

**Replace the 1st paragraph of section 11-3.02A with:**

07-19-13

Except for stud welding, section 11-3.02 applies to (1) work welded under sections 49, 52, 55, and 75-1.03E and (2) work in section 99 that must comply with an AWS welding code.

**Replace the 4th through 6th paragraphs of section 11-3.02C(2) with:**

07-19-13

Submit an amended welding QC plan or an addendum to the welding QC plan for any changes to:

1. WPSs
2. NDT firms
3. QC personnel or procedures
4. NDT personnel or procedures
5. Systems for tracking and identifying welds
6. Welding personnel

Allow 15 days for the Engineer's review of an amended welding QC plan or an addendum to the welding QC plan.

Submit 7 copies of each authorized QC plan and any authorized addendums. Make 1 copy available at each location where work is performed.

**Replace the 1st paragraph of section 11-3.02C(3) with:**

07-19-13

Submit a welding report within 7 days following the performance of any welding. The welding report must include:

1. Daily production log for welding for each day that welding is performed
2. Reports of all visual weld inspections and NDT performed, whether specified, additional, or informational
3. Radiographs and radiographic reports, and other required NDT reports
4. Summary of welding and NDT activities that occurred during the reporting period
5. Reports of each application of heat straightening
6. Summarized log listing the rejected lengths of weld by welder, position, process, joint configuration, and piece number

7. Documentation that you have:
  - 7.1. Evaluated all radiographs and radiograph reports and NDT and NDT reports
  - 7.2. Corrected all rejectable deficiencies and that all repaired welds have been reexamined using the required NDT and found acceptable
8. Reports or chart recordings of each application of any stress relieving used
9. Reports and chart recordings for any electroslag welding used

**Add between "radiographic" and "envelopes" in the introductory clause in the 3rd paragraph of section 11-3.02C(3):**

film

07-19-13

**Delete the 3rd sentence in the 5th paragraph of section 11-3.02C(3).**

07-19-13

**Replace the introductory clause in the 1st paragraph of section 11-3.02D with:**

Clauses 6.1.4.1 and 6.1.4.3 of AWS D1.1, the 2nd paragraph of clause 7.1.2. of AWS D1.4, clauses 6.1.3.1 through 6.1.3.3 of AWS D1.5, and clause 7.2.3 of AWS D1.8 are replaced with:

07-19-13

**Replace items 1 and 2 in the list in the 2nd paragraph of section 11-3.02D with:**

1. Work is welded at a permanent fabrication or manufacturing plant that is certified under the AISC Certification Program for Steel Bridge Fabricators, Intermediate Bridges, and Fracture-Critical Member endorsement if required.
2. Structural steel for building construction work is performed at a permanent fabrication or manufacturing plant that is certified under the AISC Quality Certification Program, Category STD, Standard for Steel Building Structures.

07-19-13

**Delete the 3rd paragraph of section 11-3.02D.**

07-19-13

**Replace the 1st sentence in the 4th paragraph of section 11-3.02D with:**

Except for the exempt facilities identified above, an authorized independent third party must witness the qualification tests for welders or welding operators.

07-19-13

**Replace the paragraph in section 11-3.02F with:**

Welding procedures qualification for work welded under AWS D1.5 must comply with clause 5.12 or 5.12.4 of AWS D1.5 and the following:

07-19-13

1. Unless considered prequalified, qualify fillet welds in each position. Conduct the fillet weld soundness test using the essential variables of the WPS as established by the PQR.
2. For qualifying joints that do not comply with figures 2.4 and 2.5 of AWS D1.5, conduct the test complying with figure 5.3 using the welding parameters that were established for the test conducted complying with figure 5.1.

- 3. Macroetch tests are required for WPS qualification tests, and acceptance must comply with clause 5.19.3 of AWS D1.5.
- 4. If a nonstandard weld joint is to be made using a combination of WPSs, you may conduct a test under figure 5.3, combining the qualified or prequalified WPSs to be used in production, if the essential variables, including weld bead placement, of each process are limited to those established in table 5.3 of AWS D1.5.
- 5. Before preparing mechanical test specimens, inspect the PQR welds by visual and radiographic tests. The backing bar must be 3 inches in width and must remain in place during NDT. Results of the visual and radiographic tests must comply with clause 6.26.2 of AWS D1.5 excluding clause 6.26.2.2. All other requirements for clause 5.17 are applicable.

**Add to the list in the 3rd paragraph of section 11-3.02G:**

07-19-13

- 3. Repairs not included in the welding QC plan

**Replace the 1st sentence of the 4th paragraph of section 11-3.02G with:**

07-19-13

Requests to perform 3rd-time excavations, repairs of cracks, or repairs not included in the welding QC plan must include an engineering evaluation.

**Replace the 2nd and 3rd paragraphs in section 11-3.03B with:**

10-30-15

The AISC Certification category for overhead sign structures is Bridge and Highway Metal Component (CPT) or Simple Steel Bridge Structures (SBR).

The AISC Certification category for pole structures is Bridge and Highway Metal Component (CPT) or Standard for Steel Building Structures (STD).

\*\*\*\*\*

**12 TEMPORARY TRAFFIC CONTROL**

10-30-15

**Replace the 5th paragraph of section 12-3.01A(1) with:**

05-30-14

Repair or replace traffic-handling equipment and devices damaged from any cause during the Contract, including repainting if necessary. The condition of temporary traffic control devices must comply with the current American Traffic Safety Services Association publication "Quality Guidelines for Temporary Traffic Control Devices and Features."

**Replace the 1st paragraph of section 12-3.01A(4) with:**

10-19-12

Category 2 temporary traffic control devices must be on FHWA's list of acceptable, crashworthy Category 2 hardware for work zones. This list is available on FHWA's Safety Program Web site.

**Replace "project" in the 4th paragraph of section 12-3.02C with:**

work

10-19-12

**Add after "Display" in item 4 in the list in the 2nd paragraph of section 12-3.03B:**

or Alternating Diamond

04-19-13

**Replace the 2nd and 3rd paragraphs of section 12-3.04B with:**

Portable delineators must be a minimum of 36 inches in height. The vertical portion of portable delineators must be predominantly orange-colored. The posts must be not less than 3 inches in width or diameter. Retroreflectorization of portable delineators that have a height of less than 42 inches must be provided by two 3-inch-wide white bands placed a maximum of 2 inches from the top with a maximum of 6 inches between the bands. Retroreflectorization of portable delineators that have a height of 42 inches or more must be provided by four 4- to 6-inch-wide alternating orange and white stripes with the top stripe being orange.

10-30-15

**Add between the 1st and 2nd paragraphs of section 12-3.06A(1):**

Construction project funding signs must comply with section 12-2.

10-30-15

**Replace "project" in the 3rd paragraph of section 12-3.07C with:**

work

10-19-12

**Replace the 1st sentence of the 5th paragraph of section 12-3.08C with:**

Install a reflector on the top or face of the rail of each rail unit placed within 10 feet of a traffic lane.

10-30-15

**Add to section 12-3:**

**12-3.18 AUTOMATED WORK ZONE INFORMATION SYSTEM**

Reserved

**12-3.19-12-3.25 RESERVED**

07-19-13

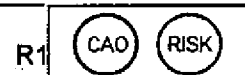
**Replace the 7th through 9th paragraphs of section 12-4.02A with:**

If pedestrian traffic is allowed to pass through construction areas, provide a temporary pedestrian facility through the construction areas within the highway. Include protective overhead covering as necessary to ensure protection from falling objects and drippings from overhead structures.

At locations where pedestrian openings through falsework are required, provide a temporary pedestrian facility with protective overhead covering during all bridge construction activities.

Temporary pedestrian facilities must comply with section 12-7.

07-19-13



If an activity requires a closure of a walkway, another walkway must be made available nearby, off of the traveled way.

07-19-13

**Delete the 12th paragraph of section 12-4.02A.**

**Replace section 12-4.03 with:**

07-19-13

### **12-4.03 CLOSURE SCHEDULES AND CONDITIONS**

#### **12-4.03A General**

Submit closure schedule requests and closure schedule amendments using LCS to show the locations and times of the requested closures.

The Department provides LCS training. Request the LCS training at least 30 days before submitting the 1st lane closure request. The Department provides the training within 15 days after your request. The training may be web based.

Except for web-based training, the training is held at a time and location you and the Engineer agree to.

For web-based training, the Engineer provides you the website address to access the training.

Within 5 business days after completion of the training, the Department provides LCS accounts and user identifications to your assigned, trained representatives.

Each representative must maintain a unique password and current user information in the LCS.

#### **12-4.03B Closure Schedules**

Every Monday by noon, submit a closure schedule request of planned closures for the next week period. The next week period is defined as Sunday noon through the following Sunday noon.

Submit a closure schedule request not less than 25 days and not more than 125 days before the anticipated start of any activity that reduces:

1. Horizontal clearances of traveled ways, including shoulders, to 2 lanes or less due to activities such as temporary barrier placement and paving
2. Vertical clearances of traveled way, including shoulders, due to activities such as pavement overlays, overhead sign installation, falsework, or girder erection

Submit closure schedule amendments, including adding additional closures, by noon at least 3 business days before a planned closure.

Cancel closure requests using LCS at least 48 hours before the start time of the closure.

You will be notified through LCS of unauthorized closures or closures that require coordination with other parties as a condition for authorization.

The Engineer may reschedule a closure cancelled due to unsuitable weather.

If a closure is not opened to traffic by the specified time, suspend work. No further closures are allowed until the Engineer has reviewed and authorized a work plan submitted by you that ensures that future closures will be opened to traffic by the specified time. Allow 2 business days for review of your proposed work plan. The Department does not compensate you for your losses due to the suspension of work resulting from the late opening of closures.

Notify the Engineer of delays in your activities caused by:

1. Your closure schedule request being denied although your requested closures are within the specified time frame allowed for closures. The Department does not compensate you for your losses due to amendments to the closure schedule that are not authorized.
2. Your authorized closure being denied.

10-30-15

If the Engineer orders you to remove a closure before the time designated in the authorized closure schedule, any delay caused by this order is an excusable delay.

07-19-13

#### **12-4.03C Contingency Plan**

Section 12-4.03C applies if a contingency plan is specified in the special provisions or if a contingency plan is requested.

If a contingency plan is requested, submit the contingency plan within 1 business day of the request.

The contingency plan must identify the activities, equipment, processes, and materials that may cause a delay in the opening of a closure to traffic. The plan must include:

1. List of additional or alternate equipment, materials, or workers necessary to ensure continuing activities and on-time opening of closures if a problem occurs. If the additional or alternate equipment, materials, or workers are not on site, specify their location, the method for mobilizing these items, and the required time to complete mobilization.
2. General time-scaled logic diagram displaying the major activities and sequence of planned operations. For each activity, identify the critical event when the contingency plan will be activated.

Based on the Engineer's review, additional materials, equipment, workers, or time to complete activities from that specified in the contingency plan may be required.

Submit revisions to a contingency plan at least 3 business days before starting the activity requiring a contingency plan. Allow 2 business days for review of the revised contingency plan.

#### **Add to the end of section 12-6.01:**

10-30-15

A traffic control system for a closure includes the temporary traffic control devices described as part of the traffic control system. The temporary traffic control devices must comply with section 12-3.

#### **Replace section 12-7 with:**

07-19-13

### **12-7 TEMPORARY PEDESTRIAN FACILITIES**

#### **12-7.01 GENERAL**

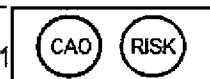
Section 12-7 includes specifications for constructing temporary pedestrian facilities.

Temporary pedestrian facilities must comply with the *California MUTCD*, Part 6, Chapter 6D, "Pedestrian and Worker Safety."

Design temporary pedestrian facilities with protective overhead covering to support all imposed loads.

The design load and maximum allowable stresses for temporary pedestrian facilities with protective overhead covering must comply with section 48-2.01D(3). The minimum design live load for the temporary pedestrian facilities with protective overhead covering must be 150 psf for the entire structure.

The minimum width of the temporary pedestrian facilities with protective overhead covering between the inside face of handrails must be 60 inches. The clear height of the temporary pedestrian facilities with protective overhead covering measured from the floor surface to the canopy overhead must be at least 8 feet. Provide adequate lighting at all times. Lighting must comply with section 86-6.13.



Submit shop drawings with supporting calculations for temporary pedestrian facilities with protective overhead covering. Shop drawings and calculations must be signed by an engineer who is registered as a civil engineer in the State.

**12-7.02 MATERIALS**

Walkways must be surfaced with HMA, portland cement concrete, or wood. The surface must be skid resistant and free of irregularities.

Hand railings must be S4S lumber and painted white.

Protective overhead covering of temporary pedestrian facilities must be plywood at least 3/4 inch thick or wood planking with a nominal thickness of 2 inches minimum.

**12-7.03 CONSTRUCTION**

Construct hand railings on each side of a temporary pedestrian facility as necessary to protect pedestrian traffic from hazards due to work activities or adjacent vehicular traffic.

Maintain temporary pedestrian facilities in good condition and keep them clear of obstructions.

**12-7.04 PAYMENT**

Not Used

\*\*\*\*\*

**13 WATER POLLUTION CONTROL**

05-15-15

04-19-13

**Delete item 3 in the list in the 4th paragraph of section 13-1.01A.**

**Add to section 13-1.01A:**

11-15-13

Comply with the Department's general permit issued by the State Water Resources Control Board for Order No. 2012-0011-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans). The Department's general permit governs stormwater and nonstormwater discharges from the Department's properties, facilities, and activities. The Department's general permit may be viewed at the Web site for the State Water Resources Control Board, Storm Water Program, Caltrans General Permit.

**Add to the list in the 1st paragraph of section 13-1.01D(3)(b):**

10-21-11

- 3. Have completed SWRCB approved QSD training and passed the QSD exam

**Add to the list in the 2nd paragraph of section 13-1.01D(3)(b):**

10-21-11

- 3. Have completed SWRCB approved QSP training and passed the QSP exam



**Replace "NEL violation" in item 3.6.2 in the list in the 1st paragraph of section 13-1.01D(3)(c) with:**

04-19-13

receiving water monitoring trigger

**Replace the 1st paragraph in section 13-2.01B with:**

04-19-13

Within 7 days after Contract approval, submit 2 copies of your WPCP for review. Allow 5 business days for review.

After the Engineer authorizes the WPCP, submit an electronic copy and 3 printed copies of the authorized WPCP.

If the RWQCB requires review of the authorized WPCP, the Engineer submits the authorized WPCP to the RWQCB for its review and comment. If the Engineer orders changes to the WPCP based on the RWQCB's comments, amend the WPCP within 3 business days.

**Replace the 1st paragraph in section 13-3.01B(2)(a) with:**

04-19-13

Within 15 days of Contract approval, submit 3 copies of your SWPPP for review. The Engineer provides comments and specifies the date when the review stopped if revisions are required. Change and resubmit a revised SWPPP within 15 days of receiving the Engineer's comments. The Department's review resumes when a complete SWPPP has been resubmitted.

When the Engineer authorizes the SWPPP, submit an electronic copy and 4 printed copies of the authorized SWPPP.

If the RWQCB requires review of the authorized SWPPP, the Engineer submits the authorized SWPPP to the RWQCB for its review and comment. If the Engineer requests changes to the SWPPP based on the RWQCB's comments, amend the SWPPP within 10 days.

**Replace "NELs" in item 3.1 in the 3rd paragraph of section 13-3.01B(2)(a) with:**

04-19-13

receiving water monitoring triggers

**Replace the 3rd paragraph of section 13-3.01B(2)(c) with:**

05-15-15

The SAP must identify the sample containers, preservation requirements, holding times, analytical method, and the laboratory certified under the Environmental Laboratory Accreditation Program of the State Water Resources Control Board. For a list of certified laboratories, go to the board's website.

**Replace section 13-3.01B(6)(c) with:**

04-19-13

### **13-3.01B(6)(c) Receiving Water Monitoring Trigger Report**

Whenever a receiving water monitoring trigger is exceeded, notify the Engineer and submit a receiving water monitoring trigger report within 48 hours after conclusion of a storm event. The report must include:

1. Field sampling results and inspections, including:
  - 1.1. Analytical methods, reporting units, and detection limits
  - 1.2. Date, location, time of sampling, visual observation and measurements
  - 1.3. Quantity of precipitation from the storm event
2. Description of BMPs and corrective actions

**Replace "NEL" in the 6th paragraph of section 13-3.01C(1) with:**

receiving water monitoring trigger

04-19-13

**Replace section 13-3.01C(3) with:**

**13-3.01C(3) Receiving Water Monitoring Trigger**

For a risk level 3 project, receiving water monitoring triggers must comply with the values shown in the following table:

04-19-13

**Receiving Water Monitoring Trigger**

Parameter	Test method	Detection limit (min)	Unit	Value
pH	Field test with calibrated portable instrument	0.2	pH	Lower limit = 6.0 Upper limit = 9.0
Turbidity	Field test with calibrated portable instrument	1	NTU	500 NTU max

The storm event daily average for storms up to the 5-year, 24-hour storm must not exceed the receiving water monitoring trigger for turbidity.

The daily average sampling results must not exceed the receiving water monitoring trigger for pH.

**Delete "and NELs are violated" in the 3rd paragraph of section 13-3.03C.**

04-19-13

**Replace "working days" at each occurrence in section 13-3.04 with:**

original working days

10-19-12

**Delete the 1st sentence in the 2nd paragraph of section 13-4.03C(3).**

04-19-13

**Add between the 2nd and 3rd paragraphs of section 13-4.03C(3):**

Manage stockpiles by implementing water pollution control practices on:

04-19-13

1. Active stockpiles before a forecasted storm event
2. Inactive stockpiles according to the WPCP or SWPPP schedule

**Delete the 7th paragraph of section 13-4.03C(3).**

05-30-14

**Replace the heading of section 13-4.03E(1) with:**

**General**

05-30-14

**Delete the 1st through 5th sentences in the 2nd paragraph of section 13-4.03E(1).**

05-30-14

**Replace the 1st sentence of the 1st paragraph of section 13-4.03E(3) with:**

Limit vehicle and equipment cleaning or washing at the job site to that needed for safety and protection of the equipment and compliance with PLACs.

05-30-14

**Replace the paragraph in section 13-4.04 with:**

**Not Used**

04-20-12

**Replace "20-7.02D(6)" in section 13-5.02C with:**

**20-5.03E**

07-19-13

**Delete "or stockpile" in the 3rd paragraph of section 13-5.02F.**

10-19-12

**Replace "20-7.03I(10)" in section 13-5.03C with:**

**20-5.03E(3)**

07-19-13

**Replace section 13-5.03F with:**

**13-5.03F Reserved**

04-20-12

**Delete "or stockpile" in Item 1 in the list in the 1st paragraph of section 13-5.03K.**

10-19-12

**Delete the 3rd paragraph of section 13-5.03K.**

10-19-12

**Replace the 2nd sentence in the 1st paragraph of section 13-9.01A with:**

You may use any of the following systems for temporary concrete washout:

10-19-12

1. Temporary concrete washout facility
2. Portable temporary concrete washout

3. Temporary concrete washout bin

**Replace the 2nd paragraph of section 13-9.01B with:**

10-19-12

Retain and submit an informational submittal for records of disposed concrete waste.

**Delete the 4th paragraph of section 13-9.01B.**

10-19-12

**Delete "if authorized" in the 1st sentence in the 1st paragraph of section 13-9.02A.**

10-19-12

**Replace "at least 3-inch" in the 3rd sentence in the 1st paragraph of section 13-9.02A with:**

10-19-12

6-inch

\*\*\*\*\*

**14 ENVIRONMENTAL STEWARDSHIP**

05-15-15

**Replace section 14-9.03 with:**

05-30-14

**14-9.03 RESERVED**

**Replace "California Department of Public Health (CDPH)" in the 2nd paragraph of section 14-11.02E(1) with:**

05-15-15

State Water Resources Control Board

\*\*\*\*\*

**15 EXISTING FACILITIES**

10-30-15

**Replace section 15-1.03D with:**

07-19-13

**15-1.03D Reserved**

**Replace "metal beam guard railing" in the 1st paragraph of section 15-2.01C with:**

07-19-13

guardrail

**Replace the paragraphs of section 15-2.02B(1) with:**

07-19-13

Section 15-2.02B includes specifications for removing pavement, base, subbase, and subgrade.

If only a portion of the pavement is removed, saw-cut the outline of the removal area on a neat line and with a power-driven saw before removing.

For asphalt concrete pavement, saw cuts must be at least 2 inches deep unless otherwise described.

**Replace section 15-2.02B(4)(b) with:**

07-19-13

**15-2.02B(4)(b) Reserved****Add to section 15-2.02B:**

07-19-13

**15-2.02B(5) Remove Concrete Pavement****15-2.02B(5)(a) General**

Remove only the portion of pavement to be replaced or repaired during the same lane closure. If there is overlying material on the concrete pavement, remove it with the pavement.

Do not impact the surface within 18 inches of the pavement to remain in place. Use removal methods that do not damage the remaining pavement and base. Slab-lifting equipment must attach to the pavement.

Instead of disposing of removed concrete pavement by removing it from the job site, you may dispose of it under section 15-3.01.

**15-2.02B(5)(b) Saw Cuts**

Saw cut using a diamond blade and make cuts perpendicular to the pavement surface. Saw cutting is not required where concrete pavement is adjacent to asphalt concrete pavement.

Saw cut (1) no more than 2 days before removing pavement and (2) such that traffic will not dislodge any pavement piece or segment. Saw cut perpendicular to the traveled way except you may cut parallel or diagonal to the traveled way when removing the pavement during the same lane closure as the saw cutting.

You may make additional saw cuts within the sawed outline.

Saw cuts must be the full depth of the pavement unless otherwise shown.

Saw cut at longitudinal and transverse joints to remove entire slabs. For partial-slab areas, the Engineer determines the exact-saw-cut locations.

**15-2.02B(5)(c) Reserved****15-2.02B(6) Reserved****15-2.02B(7) Payment**

Reserved

**Replace section 15-2.02G with:**

07-19-13

**15-2.02G Remove Guardrail**

Where removing guardrail, remove any concrete anchors and steel foundation tubes.

**Replace the 1st paragraph of section 15-2.02K with:**

07-19-13

Box culverts, concrete pipes, inlets, headwalls, and endwalls must be completely removed if any portion of these structures is (1) within 3 feet of the grading plane in excavation areas, (2) within 1 foot of original ground in embankment areas, or (3) shown to be removed.

**Replace "Metal beam guard railing" in the table in the 2nd paragraph of section 15-2.03A(2)(a) with:**

07-19-13

Guardrail

10-30-15

**Delete "using Department-furnished tags" in the 4th paragraph of section 15-2.03A(2)(a).**

**Replace the heading of section 15-2.03B with:**

07-19-13

Salvage Guardrail

**Replace the heading of section 15-2.04D with:**

07-19-13

Reconstruct Guardrail

**Replace section 15-2.09D with:**

07-19-13

15-2.09D Reserved

**Replace the 4th paragraph of section 15-2.10B with:**

01-18-13

Instead of using new materials similar in character to those in the existing structure, you may use raising devices to adjust a manhole to grade. Before starting paving work, measure and fabricate raising devices. Raising devices must:

1. Comply with the specifications for section 75 except that galvanizing is not required
2. Have a shape and size that matches the existing frame
3. Be match marked by painting identification numbers on the device and corresponding structure
4. Result in an installation that is equal to or better than the existing one in stability, support, and nonrocking characteristics
5. Be fastened securely to the existing frame without projections above the surface of the road or into the clear opening

**Replace the heading of section 15-2.10D with:**

07-19-13

Adjust Guardrail

**Replace the paragraphs of section 15-3.01 with:**

07-19-13

Section 15-3 includes specifications for removing all or a portion of a concrete facility.

Concrete facilities include curbs, gutters, gutter depressions, sidewalks, driveways, slope paving, island paving, barriers, retaining walls, sound walls, minor structures, aprons, spillways, and dams.

Where broken-concrete slope protection is shown, use removed concrete for the construction of the broken-concrete slope protection.

Instead of disposing of removed concrete by removing it from the job site, you may dispose of it on the job site by one of the following methods:

1. Burying it in embankments at authorized locations. Removed concrete must be broken into pieces that can be readily handled and incorporated into embankments and placed at a depth of at least 3 feet below finished grade and slope lines. Concrete must not be buried in areas where piling is to be placed or within 10 feet of trees, pipelines, poles, buildings or other permanent objects or structures.
2. Placing it at authorized locations. The removed concrete must not present an unsightly appearance from the highway.

**Replace the paragraph of section 15-3.02 with:**

Not Used

07-19-13

**Delete the 5th paragraph of section 15-3.03.**

07-19-13

**Replace the paragraphs of section 15-3.04 with:**

Not Used

10-30-15

**Add to the end of section 15-4.01A(2):**

Allow 20 days for review of the bridge removal work plan.

04-19-13

**Replace the 2nd sentence of the 3rd paragraph of section 15-4.02C(1) with:**

Paint exposed ends of the remaining reinforcement with 2 applications of organic zinc-rich primer as specified for painting exposed ends of prestressing steel in section 50-1.03B(3).

10-17-14

**Replace the 1st paragraph of section 15-5.01C(1) with:**

Before starting deck rehabilitation activities, complete the removal of any traffic stripes, pavement markings, and pavement markers.

10-19-12

**Replace the 2nd and 3rd paragraphs of section 15-5.01C(2) with:**

Perform the following activities in the order listed:

10-18-12

1. Abrasive blast the deck surface with steel shot. Perform abrasive blasting after the removal of any unsound concrete and placement of any rapid setting concrete patches.
2. Sweep the deck surface.

3. Blow the deck surface clean using high-pressure air.

**Replace the 2nd paragraph of section 15-5.01C(4) with:**

10-19-12

Before removing asphalt concrete surfacing, verify the depth of the surfacing at the supports and midspans of each structure (1) in each shoulder, (2) in the traveled way, and (3) at the roadway crown, if a crown is present.

**Delete "and concrete expansion dams" in the 3rd paragraph of section 15-5.01C(4).**

04-19-13

**Replace the 2nd paragraph of section 15-5.03A(2) with:**

10-19-12

For a contract with less than 60 original working days, submit certificates of compliance for the filler material and bonding agents.

**Replace "51-1.02C" in the 1st paragraph of section 15-5.03B with:**

04-19-13

51-1.02F

**Replace the 4th paragraph of section 15-5.03B with:**

10-19-12

For a contract with less than 60 original working days, alternative materials must be authorized before use.

**Add between the 5th and 6th paragraphs of section 15-5.03C:**

10-19-12

The final surface finish of the patched concrete surface must comply with section 51-1.03F.

**Delete the 4th paragraph of section 15-5.05C.**

10-19-12

**Replace "51-1.03F(5)" in the 3rd paragraph of section 15-5.06C(1) with:**

07-19-13

51-1.01D(4)(b)

**Replace "51-1.03E(5)" in the 5th paragraph of section 15-5.06C(1) with:**

10-19-12

51-1.03F(5)

**Delete the 9th paragraph of section 15-5.06C(1).**

10-19-12



**Delete the 15th paragraph of section 15-5.06C(1).**

04-19-13

**Add between the 18th and 19th paragraphs of section 15-5.06C(1):**

07-19-13

Texture the polyester concrete surface before gelling occurs by longitudinal tining under 51-1.03F(5)(b)(iii), except do not perform initial texturing.

**Replace section 15-5.06C(2) with:**

04-19-13

**15-5.06C(2) Reserved**

**Delete the 3rd paragraph of section 15-5.06D.**

04-19-13

**Replace the 1st paragraph in section 15-5.07B(4) with:**

10-19-12

Payment for furnishing dowels is not included in the payment for core and pressure grout dowel.

**Replace section 15-5.09 with:**

04-19-13

**15-5.09 POLYESTER CONCRETE EXPANSION DAMS**

**15-5.09A General**

Section 15-5.09 includes specifications for constructing polyester concrete expansion dams.

Polyester concrete expansion dams must comply with the specifications for polyester concrete overlays in section 15-5.06, except a trial slab is not required.

Reinforcement must comply with section 52.

**15-5.09B Materials**

Not Used

**15-5.09C Construction**

For new asphalt concrete overlays, place the asphalt concrete overlay before starting polyester concrete activities. Saw cut and remove asphalt concrete at expansion dam locations.

For existing asphalt concrete overlays, remove expansion dams and asphalt concrete to the limits shown. Removing expansion dams must comply with section 15-4 except a bridge removal work plan is not required.

Where a portion of the asphalt concrete overlay is to remain, saw cut a 2-inch-deep neat line along the edge to remain in place before removing the asphalt concrete. Do not damage the existing surfacing to remain in place.

Prepare the deck surface under section 15-5.01C(2).

You may use a mechanical mixer to mix the polyester concrete for expansion dams. The mixer capacity must not exceed 9 cu ft unless authorized. Initiate the resin and thoroughly blend it immediately before mixing it with the aggregate. Mix the polyester concrete for at least 2 minutes before placing.

The application rate of methacrylate resin must be approximately 100-sq ft/gal.

You may place and finish expansion dams using hand methods.

Protect expansion dams from moisture, traffic, and equipment for at least 4 hours after finishing.

For expansion dams over 6 feet long, install 1/4-inch-wide joint material at 6-foot intervals across the width of the expansion dam. Joint material must be either expanded polyurethane or expanded polyethylene.

**15-5.09D Payment**

Not Used

**Add to section 15-6.01A(3)(a):**

07-19-13

Within 5 days of completing annular space grouting at a culvert, submit the grouting records.

**Replace "41-1.01" in item 10.3 in the list in the 2nd paragraph of section 15-6.01A(3)(d) with:**

07-19-13

41-2

**Replace "41-1.02" in 1st paragraph of section 15-6.01B(2) with:**

07-19-13

41-2

**Replace the heading of section 15-6.04 with:**

01-18-13

**INVERT PAVING**

**Replace the 1st paragraph of section 15-6.13A(1) with:**

07-19-13

Section 15-6.13 includes specifications for installing machine spiral wound PVC pipeliners directly into the culvert.

**Replace the heading of section 15-6.13B with:**

07-19-13

**Machine Spiral Wound PVC Pipeliners, Grouted**

\*\*\*\*\*

**DIVISION III GRADING  
16 CLEARING AND GRUBBING**

07-19-13

**Replace "20-3.03B(4)" in the 3rd paragraph of section 16-1.01 with:**

07-19-13

20-2.02C(2)

Replace "20-1.03D" in the 2nd paragraph of section 16-1.03B with:

07-19-13

20-3.01C(2)

AA

**18 DUST PALLIATIVE**

10-30-15

Replace section 18 with:

10-30-15

**18 DUST PALLIATIVES**

**18-1.01 GENERAL**

**18-1.01A Summary**

Section 18 includes specifications for applying dust palliatives.

A dust palliative must be any of the following:

- 1. Water
- 2. Dust suppressant
- 3. Dust control binder

Water must comply with section 17.

**18-1.01B Definitions**

Reserved

**18-1.01C Submittals**

If a dust suppressant or dust control binder is to be used, submit a dust treatment plan at least 15 days before starting job site activities. The dust treatment plan must include:

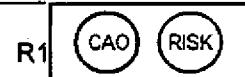
- 1. Product name and type
- 2. Manufacturer's name
- 3. Polymer emulsion type if a synthetic polymer emulsion is used, including identification of:
  - 3.1. Individual components greater than 5 percent by volume in blends of polymers with different compositions
  - 3.2. Additives greater than 2 percent by volume
- 4. SDS
- 5. Proposed methods for applying products
- 6. Application rate per pass, total application rate, and residual application rate
- 7. Required weather conditions for application, including ambient and surface temperatures, wind conditions, and allowable period before expected precipitation
- 8. Drying time or curing time required before traffic is allowed on the treated surface

Submit the manufacturer's instructions for the material to be used.

Submit a certificate of compliance for the dust suppressant, dust control binders, and fibers.

For a dust suppressant, include with the certificate of compliance:

- 1. Test results verifying compliance with the quality characteristic requirements in section 18-1.01D. The results must be from a test conducted within 12 months before the date of the certificate of compliance.
- 2. Test results from a test conducted within 12 months before the date of the certificate of compliance verifying compliance with the following environmental requirements:



- 2.1. Maximum constituent concentration levels
- 2.2. Organic and inorganic requirements for:
  - 2.2.1. VOCs
  - 2.2.2. Semi-VOCs
  - 2.2.3. Synthetic precipitation leaching procedure
- 2.3. Aquatic toxicity

**18-1.01D Quality Control and Assurance**

A dust suppressant or dust control binder must comply with US EPA requirements and RWQCB requirements for soil stabilizers.

A dust suppressant must be tested by either an ASTM- or AMRL-AASHTO-accredited laboratory for compliance with the specified quality characteristic requirements.

A dust suppressant must be tested by an EPA-accredited laboratory for environmental requirements. Liquid chemical treatments must be tested before dilution. Solid products must be mixed with water to a 25 percent concentration before testing. The constituent concentration for each dust suppressant must not exceed the maximum levels shown in the following table:

**Maximum Constituent Concentration Levels**

Constituent	Test method	Requirement maximum level (ppm)
Arsenic	EPA Method 200.7	5.0
Barium		100.0
Cadmium		0.2
Chromium		1.0
Copper		1.0
Lead		1.0
Mercury	EPA Method 245.1	0.05
Selenium	EPA Method 200.7	5.0
Zinc		10.0
Phosphorus	EPA Method 365.4	2500.0
Cyanide	EPA Method 335.4	0.2

A dust suppressant must comply with the requirements shown in the following table:

**Organic and Inorganic Requirements**

Quality characteristic	Test method	Requirement
VOCs	EPA Method 8260	Set by the CalEPA Air Resources Board and local air district
Semi-VOCs	EPA Method 8270	US EPA Target Compound List and Contract-required quantitation limits
Synthetic precipitation leaching procedure	EPA Method 1312	Set by the RWQCB

A dust suppressant must comply with the aquatic toxicity requirements shown in the following table:

**Aquatic Toxicity Requirements**

Quality characteristic	Test method	Requirement
Aquatic toxicity <sup>a</sup> (LC50 min, ppm)	ASTM E729 or EPA Method 600/4-90/027F and EPA Method 600/4-91/002	10
Aquatic toxicity <sup>a</sup> (rating)	ASTM E729 or EPA Method 600/4-90/027F and EPA Method 600/4-91/002	slightly toxic or better
Renewal toxicity <sup>b</sup> (LC50 min, ppm)	ASTM E1295	10
Renewal toxicity <sup>b</sup> (rating)	ASTM E1295	slightly toxic or better

<sup>a</sup>Using *Ceriodaphnia dubia* (water flea), *Oncorhynchus mykiss* (rainbow trout), *Pimephales promelas* (fathead minnow), and *Americamysis bahia* (mysid shrimp)

<sup>b</sup>Using *Ceriodaphnia dubia* (water flea)

**18-1.02 MATERIALS****18-1.02A General**

A dust suppressant or a control binder must be either (1) miscible in water or (2) a material that is directly applied to the surface without mixing with water.

**18-1.02B Dust Suppressants****18-1.02B(1) General**

A dust suppressant must be one of the following:

1. Petroleum-based organic product
2. Nonpetroleum-based organic product
3. Hygroscopic product
4. Synthetic polymer emulsion

**18-1.02B(2) Petroleum-Based Organic Products**

A petroleum-based organic dust suppressant must be an asphalt emulsion, petroleum resin, base oil, mineral oil, or synthetic fluid.

An asphalt emulsion must be Grade SS1h.

A petroleum resin must comply with the requirements shown in the following table:

**Petroleum Resin Requirements**

Quality characteristic	Test method	Requirement
Residue (min, %)	ASTM D6934	60
pH	ASTM D1429	4.0-7.0
sp gr at 16 °C (min)	ASTM D1298	1.00
Kinematic visc at 25 °C (min, Saybolt Furol seconds <sup>a</sup> )	ASTM D2170	188
Flash point (min °C)	ASTM D92	205
Particle charge test	ASTM D7402	Positive

<sup>a</sup>Use ASTM D2161 to convert the mm<sup>2</sup>/s value to Saybolt Furol seconds

A base or mineral oil must comply with the requirements shown in the following table:

**Base and Mineral Oils Requirements**

Quality characteristic	Test method	Requirement
Base and mineral oil content (min, %)	—	75
sp gr at 16 °C (min)	ASTM D1298	0.85-0.90
Brookfield absolute visc at 20 °C (max, cP)	ASTM D2196	250
Flash point (min, °C)	ASTM D93	150

A synthetic fluid must comply with 40 CFR 35 and the requirements shown in the following table:

#### Synthetic Fluids Requirements

Quality characteristic	Test method	Requirement
Synthetic fluid content (min, %)	—	75
sp gr at 16 °C (min)	ASTM D1298	0.85–0.90
Brookfield absolute visc at 20 °C (max, cP)	ASTM D2196	250
Flash point (min, °C)	ASTM D93	140

#### 18-1.02B(3) Nonpetroleum-Based Organic Products

A nonpetroleum-based organic dust suppressant must be lignosulfonate, plant oil, or tall oil pitch rosin.

A lignosulfonate must comply with the requirements shown in the following table:

#### Lignosulfonate Requirements

Quality characteristic	Test method	Requirement
Lignin sulfonate content ready to use (min, %)	ASTM D4900	25
Residue total solids content (min, %)	ASTM D4903 or D2834	52
Lignin sulfonate content of residue (min, %)	—	50
Reducing sugars content of residue (min, %)	ASTM D5896 or D6406	25
pH	ASTM D1293	6.0–9.0
sp gr (min)	ASTM D1429	1.20
Brookfield absolute visc at 25 °C (max, cP)	ASTM D2196	1,000

A plant oil must comply with the requirements shown in the following table:

#### Plant Oil Requirements

Quality characteristic	Test method	Requirement
Residue active solids content (min, %)	ASTM D4903	50
sp gr (min)	ASTM D1429	0.93
Brookfield absolute visc 25 °C (cP)	ASTM D2196	50–200
Flash point (min, °C)	ASTM D93	288

A tall oil pitch rosin must comply with the requirements shown in the following table:

#### Tall Oil Pitch Rosin Requirements

Quality characteristic	Test method	Requirement
Rosin acid content (min, %)	ASTM D1240	10
Residue active solids content (min, %)	ASTM D2834	45
pH	ASTM D1293	3.0–9.0
sp gr (min)	ASTM D1429	1.00
Brookfield absolute visc at 25 °C (cP)	ASTM D2196	50–200

#### 18-1.02B(4) Hygroscopic Products

A hygroscopic dust suppressant must be calcium chloride, calcium chloride flake, or magnesium chloride.

Calcium chloride must comply with the requirements shown in the following table:

**Calcium Chloride<sup>a</sup> Requirements**

Quality characteristic	Test method	Requirement
Calcium chloride content (%)	ASTM E449	28-42
Total magnesium chloride (max, %)	ASTM E449	6.0
Total alkali chlorides as sodium chloride (max, %)	ASTM E449	6.0
Calcium hydroxide content (max, %)	ASTM E449	0.2
pH with 5 percent solution	ASTM D1293	7.0-9.0
sp gr	ASTM D1429	1.28-1.44

<sup>a</sup>ASTM D98 or AASHTO M144

Calcium chloride flake must comply with the requirements shown in the following table:

**Calcium Chloride Flake<sup>a</sup> Requirements**

Quality characteristic	Test method	Requirement
Calcium chloride content (min, %)	ASTM E449	75
Total magnesium as MgCl <sub>2</sub> (max, %)	ASTM E449	6.0
Total alkali chlorides as sodium chloride (max, %)	ASTM E449	6.0
Calcium hydroxide content (max, %)	ASTM E449	0.2
pH with 5 percent solution	ASTM D1293	7.0-9.0
Gradation percent passing		
3/8-inch sieve	ASTM C136	100
No. 4 sieve		80-100
No. 30 sieve		0-5

<sup>a</sup>ASTM D98 or AASHTO M144

Magnesium chloride must comply with the requirements shown in the following table:

**Magnesium Chloride Requirements**

Quality characteristic	Test method	Requirement
Magnesium chloride content (%)	ASTM D4691 or ASTM D511 <sup>a</sup>	28-33
Sulfate content as magnesium sulfate (max, %)	ASTM D4691 <sup>a</sup>	4.0
Potassium content as potassium chloride (max, %)	ASTM E449	0.5
Sodium chloride content (max, %)	ASTM E449	1.0
pH with 5% solution	ASTM D1293	7.0-9.0
sp gr	ASTM D1429	1.31 ± 0.02

<sup>a</sup>You may use another appropriate atomic absorption spectrophotometry method such as that in *Standard Methods for the Examination of Water and Waste Water* by APHA-AWWA-WPCF.**18-1.02B(5) Synthetic Polymer Emulsions**

A synthetic polymer emulsion must comply with the requirements shown in the following table:

**Synthetic Polymer Emulsion Requirements**

Quality characteristic	Test method	Requirement
Residue active solids content (min, %)	ASTM D2834	40
pH	ASTM D1429	4.0-9.5
sp gr at 16 °C	ASTM D1298	1.00-1.15
Brookfield absolute visc (max, cP)	ASTM D2196	1,000
Polymer film tensile strength - dry (psi)	ASTM D412	500
Retained coagulum on no. 100 sieve (max, %)	ASTM D1417	0.1
Ash content (max, %)	ASTM D5040	2

**18-1.02C Dust Control Binders**

A dust control binder must comply with the specifications for a tackifier in section 21-1.02F except section 21-1.01 does not apply.

Fibers must comply with section 21-1.02E except section 21-1.01 does not apply.

**18-1.03 CONSTRUCTION****18-1.03A General**

Monitor dust conditions and apply a dust palliative for dust control as described and as ordered. Reapply the dust palliative at any time to control dust.

Apply a dust suppressant to:

1. Temporary haul roads
2. Construction staging, material storage, and layout areas
3. Compacted soil or AB roads or driveways
4. Paved surfaces

Apply a dust control binder to:

1. Rough-graded soils
2. Completed slopes
3. Soil stockpiles unless another practice is already used

Do not use a dust suppressant or dust control binder within 100 feet of a wetland or body of water.

**18-1.03B Equipment**

Apply dust suppressants that are miscible in water with either (1) a pressure-type water distributor truck equipped with a spray system or (2) a pressure-type asphalt distributor truck as specified in section 93-1.03C.

Apply dust suppressant flakes to the surface using a spreader or spinner disk.

Apply dust control binders with either (1) a pressure-type water distributor truck equipped with a spray system or (2) hydraulic spray equipment as specified for applying hydromulch in section 21-1.03E.

**18-1.03C Mixing and Application Rates**

Use the mix proportions and application rate for the corresponding dust suppressant as shown in the following table:



**Dust Suppressant Application**

Dust suppressant	Mix proportions	Application rate
Asphaltic emulsion, Grade SS1H	5 parts water to 1 part emulsion	0.20–1.0 gal/sq yd
Petroleum resin emulsion	5 parts water to 1 part emulsion	0.20–1.0 gal/sq yd
Base and mineral oil	Apply undiluted	0.30–0.35 gal/sq yd
Lignosulfonate	1 part water to 1 part concentrate	1.0 gal/sq yd
Plant oil	Apply undiluted	0.25–0.50 gal/sq yd
Tall oil pitch rosin	5 parts water to 1 part emulsion for clayey soil and 10 parts water to 1 part emulsion for sandy soil	0.30–1.0 gal/sq yd
Calcium chloride solution (hygroscopic)	Apply undiluted	0.20–0.35 gal/sq yd
Calcium chloride flakes (hygroscopic)	---	1.0–1.5 lb/sq yd
Magnesium chloride (hygroscopic)	Apply undiluted	0.30–0.50 gal/sq yd
Synthetic polymer emulsion	9 parts water to 1 part concentrate	0.50 gal/sq yd

Apply hygroscopic dust suppressants under the manufacturer's instructions.

Apply calcium chloride flakes to a moist surface.

Allow surfaces treated with a dust suppressant to cure before opening them to traffic. Adequate cure occurs when moisture is evaporated, sheen is gone, and tracking is nonextant.

Use the mix proportions and application rate for the corresponding dust control binder as shown in the following table:

**Dust Control Binder Application**

Dust control binder	Mix proportions	Application rate
Guar	11 to 15 lb per 1,000 gal of water	44–59 lb/acre
Psyllium	Enough water to allow for uniform slurry flow	80–200 lb/acre
Starch	Manufacturer's recommended mix proportions with water	150 lb/acre
Liquid acrylic copolymers and polymers <sup>a</sup>	10 parts water to 1 part polymer	1,175 gal/acre
Liquid methacrylate and acrylate polymers	Manufacturer's recommended mix proportions with water	20 gal/acre
Copolymers of sodium acrylates and acrylamides	Manufacturer's recommended mix proportions with water	3–10 lb/acre
Polyacrylamide and copolymer of acrylamide	10 lb per 1,000 gal of water	5 lb/acre
Hydrocolloid polymers	Manufacturer's recommended mix proportions with water	54–64 lb/acre

<sup>a</sup>Mix and handle the polymeric compound in a manner that will not cause foaming. You may add an antifoaming agent.

Do not allow stormwater runoff from polyacrylamide treated soils unless water passes through:

1. Sediment basin if the total drainage area is greater than or equal to 5 acres.
2. Sediment trap or a series of check dams if the total drainage area is less than 5 acres. Maximize the number of check dams used and space them evenly in the drainage channel such that sediment settlement is maximized.

You may add fibers to dust control binders at a rate of 2,000 lb/acre.

You may reapply dust palliatives at a reduced application rate if authorized.

**18-1.04 PAYMENT**  
Not Used

AA

**19 EARTHWORK**

10-17-14

**Replace "20-3.03B(4)" in the 2nd paragraph of section 19-1.01A with:**

20-2.02C(2)

07-19-13

**Replace the 3rd paragraph in section 19-2.01A with:**

Pavement removal within the limits of roadway excavation must comply with section 15-2.02B.

07-19-13

**Delete the 2nd paragraph in section 19-2.03A.**

07-19-13

**Add to the 2nd paragraph of section 19-2.03D:**

Topsoil must comply with section 21.

10-17-14

**Replace the 2nd paragraph of section 19-3.01A(2)(b) with:**

For cofferdams on or affecting railroad property, allow 85 days for review.

07-01-11

**Add to the list in the 1st paragraph of section 19-3.01A(2)(d):**

9. Provisions for discontinuous rows of soil nails

01-20-12

**Replace "sets" in the 3rd and 4th paragraphs of section 19-3.01A(2)(d) with:**

copies

04-19-13

**Add to section 19-3.01A(3)(b):**

For soil nail walls, wall zones are specified in the special provisions.

01-20-12

For ground anchor walls, a wall zone is the entire wall unless otherwise specified in the special provisions.

**Delete the 2nd sentence in the 4th paragraph of section 19-3.01A(3)(b).**

01-20-12

**Replace "90" in the paragraph of section 19-3.02G with:**

90-1

01-18-13

**Add to section 19-3.02:**

**19-3.02I Filter Fabric**

Filter fabric must be Class A.

07-19-13

**Replace the heading of section 19-3.03C with:**

**19-3.03B(4) Cofferdams**

04-19-13

**Replace the heading of section 19-3.03D with:**

**19-3.03B(5) Water Control and Foundation Treatment**

04-19-13

**Replace the 1st paragraph of section 19-3.03E(3) with:**

Compact structure backfill behind lagging of soldier pile walls by hand tamping, mechanical compaction, or other authorized means.

01-20-12

**Add to the end of section 19-3.03E(3):**

If filter fabric is shown behind the lagging:

07-19-13

1. Immediately before placing the filter fabric, remove any loose or extraneous material and sharp objects from the surface to receive the filter fabric.
2. Handle and place the filter fabric under the manufacturer's instructions. Stretch, align, and place the fabric without wrinkling.
3. Stitch the adjacent borders of filter fabric or overlap the adjacent borders by 12 to 18 inches. If stitching the border, use yarn of a contrasting color. Yarn size and composition must be as recommended by the fabric manufacturer. Use 5 to 7 stitches per inch of seam.
4. Repair any damaged filter fabric by placing a piece of filter fabric large enough to cover the damaged area and comply with the overlapping or stitching requirements.

**Replace the 2nd paragraph of section 19-3.03F with:**

Do not backfill over or place material over slurry cement backfill until 4 hours after placement. When concrete sand is used as aggregate and the in-place material is free draining, you may start backfilling as soon as the surface water is gone.

01-20-12

**Add between the 2nd and 3rd paragraphs of section 19-3.03K:**

01-20-12

Before you excavate for the installation of ground anchors in a wall zone:

- 1. Complete stability testing
- 2. Obtain authorization of test data

**Replace the 2nd sentence of the 7th paragraph of section 19-3.03K:**

01-20-12

Stop construction in unstable areas until remedial measures have been taken. Remedial measures must be submitted and authorized.

**Add between the 8th and 9th paragraphs of section 19-3.03K:**

01-20-12

When your excavation and installation methods result in a discontinuous wall along any soil nail row, the ends of the structurally completed wall section must extend beyond the ends of the next lower excavation lift by a distance equal to twice the lift height. Maintain temporary slopes at the ends of each wall section to ensure slope stability.

**Replace the 9th paragraph of section 19-3.03K:**

01-20-12

Do not excavate to the next underlying excavation lift until the following conditions have been attained for the portion of the soil nail or ground anchor wall in the current excavation lift:

- 1. Soil nails or ground anchors are installed and grouted.
- 2. Reinforced shotcrete facing is constructed.
- 3. Grout and shotcrete have cured for at least 72 hours.
- 4. Specified tests are complete for that portion of wall and the results are authorized.
- 5. Soil nail facing anchorages are attached or ground anchors are locked off.

01-18-13

01-20-12

**Replace the 2nd sentence in the 7th paragraph of section 19-3.04 with:**

01-18-13

Structure excavation more than 0.5 foot from the depth shown is paid for as a work-character change if you request an adjustment or the Engineer orders an adjustment.

**Replace "Contract completion time" in the 8th paragraph of section 19-6.03D with:**

10-19-12

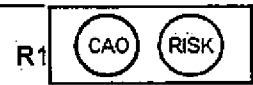
work completion date

**Add to section 19:**

01-18-13

**19-10-19-20 RESERVED**

AA



## 20 LANDSCAPE

10-30-15

Replace the headings and paragraphs in section 20 with:

07-19-13

### 20-1 GENERAL

#### 20-1.01 GENERAL

##### 20-1.01A Summary

Section 20-1 includes general specifications for performing landscaping.

If an irrigation system is to be installed in an existing planting area to be maintained, check for plant deficiencies under section 20-3.02A(4) before starting irrigation work.

Perform a functional test for each irrigation system under 20-2.01A(4)(d):

1. Before planting the plants
2. After planting the plants
3. Before the start of the plant establishment work

If a plant is to be transplanted or an irrigation component is to be relocated, transplant plant or protect irrigation components before performing other construction activities in the area.

Perform roadside clearing:

1. As required to prepare the job site for construction work
2. Until the start of the plant establishment work or Contract acceptance, whichever comes first

##### 20-1.01B Definitions

Reserved

##### 20-1.01C Submittals

At least 15 days before applying any pesticide, submit a copy of the licensed pest control adviser's recommendation.

At the end of each week, submit a report documenting the application of all pesticides as an informational submittal. Use form *Report of Chemical Spray Operations*.

Before mixing a pesticide, submit a copy of the registered label for the pesticide as an informational submittal. If unable to copy, allow the Engineer to read the label on the container.

##### 20-1.01D Quality Control and Assurance

###### 20-1.01D(1) General

Obtain a recommendation from a licensed pest control adviser for the use of all pesticides under the Food & Agri Code. The recommendation must include the pesticides to be used, rates of application, methods of application, and application areas.

The pesticide applicator must have an active and valid qualified applicator license or certificate from the Department of Pesticide Regulation.

###### 20-1.01D(2) Progress Inspections

10-30-15

The Engineer performs a progress inspection:

1. Before cultivating work starts
2. During pressure testing of irrigation pipe on the supply side of control valves
3. During testing of low voltage conductors
4. During irrigation system functional tests
5. Before planting work starts
6. After completion of planting work

07-19-13

Notify the Engineer at least 4 business days before each inspection is required. Allow at least 3 business days for the Engineer's inspection.

Unless otherwise authorized, do not proceed with the next construction activity until the inspection has been completed and any required corrective work has been performed and authorized.

**20-1.02 MATERIALS**

**20-1.02A General**

Reserved

**20-1.02B Water**

10-30-15

Unless there is a bid item for irrigation water service charges, the Department furnishes water if it is available from an existing Department-owned facility within the project limits or an irrigation system to be installed under the Contract.

07-19-13

If water is not available, make arrangements for supplying water. Water must be of a quality that will promote plant growth.

**20-1.02C Pesticides**

Pesticides must comply with the Department of Pesticide Regulation.

Insecticide must be imidacloprid.

Rodenticides must be brodifacoum, bromadiolone, or diphacinone.

Do not use oil or pelleted forms of pesticides for weed control.

For weed control, use a pesticide with a photosensitive dye that produces a contrasting color when sprayed on the ground. The color must disappear between 2 to 3 days after being applied. The dye must not stain surfaces or injure plants or wildlife when applied at the manufacturer's recommended application rate.

**20-1.03 CONSTRUCTION**

**20-1.03A General**

Take precautions to prevent irrigation water from:

1. Wetting vehicles, pedestrians, and pavement
2. Eroding soil
3. Causing excess runoff

05-30-14

10-30-15

If water use calculations are provided as supplemental project information, water plants under the Model Water Efficient Landscape Ordinance, 23 CA Code of Regs § 490 et seq., and local water agency requirements.

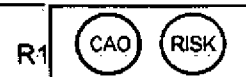
05-30-14

Water plants at night unless otherwise authorized.

07-19-13

Dispose of removed, pruned, and damaged vegetative material.

You may reduce removed vegetative material to chips with a maximum thickness of 1/2 inch and spread within the job site at locations determined by the Engineer. Chipped material must not be substituted for wood mulch, nor must the chipped material be placed within areas to receive wood mulch.



**20-1.03B Pesticides**

Notify the Engineer of pesticide application times at least 24 hours before each application.

Mix and apply pesticides under the requirements of the Department of Pesticide Regulation and the instructions on the pesticide product label.

Do not apply pesticides:

1. On Saturdays and holidays unless authorized
2. Whenever weather and wind conditions are unsuitable for application
3. Within the plant basin
4. On the foliage and woody parts of the plant

If a granular preemergent is used, it must be covered with mulch on the same work day. Do not apply granular preemergent in plant basins.

Do not apply preemergents:

1. To groundcover plants before the plants have been planted a minimum of 3 days and have been thoroughly watered
2. Within 18 inches of trees, shrubs, and seeded areas

**20-1.03C Roadside Clearing****20-1.03C(1) General**

Perform roadside clearing by:

1. Removing and disposing of trash and debris
2. Controlling the following pests:
  - 2.1. Rodents
  - 2.2. Insects
  - 2.3. Weeds
3. Removing existing plants as described

Control rodents by using rodenticides or traps.

**20-1.03C(2) Remove Existing Plants**

Remove existing plants as described. Removal of existing plants includes removing their stumps and roots 2 inches or larger in diameter to a minimum depth of 12 inches below finished grade. Backfill holes resulting from stump removal to finished grade with material obtained from adjacent areas.

If a plant is to be planted within existing groundcover area, remove existing groundcover from within an area 6 feet in diameter centered at each plant location.

**20-1.03C(3) Weed Control**

Control weeds by the use of pesticides, hand pulling, or mowing.

If pesticides are used to control weeds, apply pesticides before the weeds reach the seed stage of growth or exceed 4 inches in length, whichever occurs first. Do not use pesticides at cutting plant locations.

Where cuttings are to be planted, control weeds by hand pulling within an area 2 feet in diameter centered at each plant location.

If weeds are to be controlled by hand pulling, hand pull weeds before they reach the seed stage of growth or exceed 4 inches in length, whichever occurs first.

Where liner, plug, or seedling plants are to be planted 10 feet or more apart, control weeds by the use of pesticides or hand pulling within an area 2 feet in diameter centered at each plant location. Where liner, plug, or seedling plants are to be planted less than 10 feet apart, control weeds by the use of pesticides within the entire area.

Control weeds by mowing outside of mulched areas, plant basins, groundcover areas, and within areas to be seeded. Mowing must extend to the edges of pavement, dikes, curbs, sidewalks, walls, and fences.

If mowing is to be performed within areas to be seeded, perform mowing as needed until the start of the seeding operation specified in section 21.

Mowing must be performed before the weeds reach the seed stage of growth or exceed 6 inches in length, whichever occurs first. Mow weeds to a height of 3 inches.

#### **20-1.03C(4) Disposal of Removed Groundcover, Weeds, and Mowed Material**

Dispose of hand pulled weeds the same day they are pulled. Dispose of removed groundcover within 3 days.

Dispose of mowed material from the initial mowing. Disposal of material from subsequent mowing is not required.

#### **20-1.03D Cultivation**

Cultivation must be by mechanical methods and performed until the soil is in a loose condition to a minimum depth of 6 inches. Soil clods must not be larger than 2 inches in maximum dimension after cultivation.

The areas to be cultivated must extend 12 inches beyond the outer limit of each planting area requiring cultivation.

After initial cultivation, place soil amendment and fertilizer at specified rates.

Recultivate to thoroughly mix native soil and amendments.

Do not drive on cultivated areas after cultivation.

Planting areas that have been cultivated and become compacted must be recultivated.

Rocks and debris encountered during soil preparation in planting areas must be brought to the surface of the ground.

Remove rocks and debris as ordered. This work is change order work.

#### **20-1.03E Weed Germination**

Reserved

#### **20-1.04 PAYMENT**

Items paid for by area are measured parallel to the ground surface.

Planting areas that do not require cultivation but are within the cultivation areas will not be deducted.

### **20-2 IRRIGATION**

#### **20-2.01 GENERAL**

##### **20-2.01A General**

##### **20-2.01A(1) Summary**

Section 20-2 includes specifications for installing irrigation systems.

The irrigation systems shown are diagrammatic.

##### **20-2.01A(2) Definitions**

Reserved



**20-2.01A(3) Submittals****20-2.01A(3)(a) General**

Submit shop drawings for the electrical components of the irrigation system except electrical service 30 days before installation. The drawings must:

1. Include schematic wiring diagrams showing wire sizes and routes between electrical components
2. Show conduit sizes
3. Bear the written approval of the controller manufacturer or the manufacturer's authorized agent
4. Be accompanied by:
  - 4.1. Colored wire and splice samples
  - 4.2. Manufacturer's descriptive and technical literature

After the work shown on the drawing is complete, submit 3 copies of the as-built shop drawings including any wire modifications for each controller installed.

For each controller, laminate and place in an envelope 1 copy of:

1. As-built schematic wiring diagram including wiring modifications
2. 11 by 17 inches as-built irrigation plan

The laminate must be clear, mat-finished plastic that is at least 10 mils thick. The envelope must be heavy-duty plastic.

Attach the envelope to the inside of the controller enclosure or cabinet door. If the door is not large enough to secure the envelope, submit the envelope and its contents.

**20-2.01A(3)(b) Manufacturer's Instructions**

Submit as an informational submittal the manufacturer's installation instructions 15 days before installing:

1. Couplings for conduits used for irrigation conduits
2. Plastic pipe and fittings
3. Solvent cement for plastic pipe and flexible hose
4. Sprinklers
5. Flow sensors
6. Rain sensors
7. Remote control valves
8. Backflow preventers

10-30-15

07-19-13

**20-2.01A(3)(c) Maintenance and Operation Manuals**

Before Contract acceptance, submit as an informational submittal a manufacturer's maintenance and operation manual for each type of controller installed.

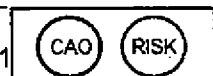
**20-2.01A(4) Quality Control and Assurance****20-2.01A(4)(a) General**

Reserved

**20-2.01A(4)(b) Pressure Testing****20-2.01A(4)(b)(I) General**

Perform pressure testing for leakage on irrigation supply lines:

1. In the Engineer's presence
2. On business days between 8 a.m. and 5 p.m. unless authorized
3. Before backfilling supply line trenches
4. With irrigation system gate valves open
5. With open ends of the supply line and fittings plugged or capped



Notify the Engineer at least 48 hours before performing a pressure test.

Choose either Method A or B to test supply lines installed by trenching and backfilling and supply lines that are completely visible after installation.

All other supply lines, including those installed in the ground by methods other than trenching and backfilling must be tested by Method A.

Test irrigation supply line in conduit by Method A with the testing period modified to 0.5 hour and no allowable pressure drop.

#### **20-2.01A(4)(b)(ii) Method A**

Method A pressure testing procedures for leakage must comply with the following:

1. Pressure gauge must be calibrated from 0 to 200 psi in 5 psi increments and be accurate to within a tolerance of 2 psi.
2. Supply line must be filled with water and connected to a pressure gauge. Place the pipeline under a pressure of 125 psi. Remove the source of pressure and leave the line under the required pressure.
3. Test the supply line under the required pressure for a period of 1 hour. The pressure gauge must remain in place until each test period is complete.
4. Leaks that develop in the tested portion of the system must be located and repaired after each test period if a drop of more than 5 psi is indicated by the pressure gauge. After the leaks have been repaired, repeat the 1 hour pressure test until the drop in pressure is 5 psi or less.

If a system consists of a new supply line connected to an existing line, the new supply line must be isolated from the existing line and tested.

#### **20-2.01A(4)(b)(iii) Method B**

Method B pressure testing procedures for leakage must comply with the following:

1. Before any portion of the supply line on the upstream side of a control valve is backfilled, water must be turned on for that portion of the line and maintained at full pressure from the water source for a period not less than 8 consecutive hours after all air has been expelled from the line. Before any portion of the supply line on the downstream side of the control valve is backfilled, perform the same test for a period not less than 1 hour.
2. Repair leaks that develop in the tested portion of the system. After the leaks have been repaired, repeat the pressure test until no leaks occur as determined by the Engineer.

#### **20-2.01A(4)(c) Sprinkler Coverage Check**

After installation of the sprinklers, check and adjust the entire sprinkler system for proper orientation and uniform coverage.

#### **20-2.01A(4)(d) Irrigation System Functional Tests**

The functional tests for each irrigation controller or group of controllers and associated irrigation system served by a single electric service point must consist of at least 1 complete cycle of operation. The Engineer determines the length of the cycle.

Notify the Engineer at least 10 days before performing each functional test.

#### **20-2.01A(4)(e) Final Irrigation System Check**

Perform the final check of the existing and new irrigation system between 20 and 30 days before Contract acceptance. The Engineer determines the length of the cycle.

Remote control valves connected to existing and new irrigation controllers must be checked for automatic operation when the controllers are in automatic mode.

**20-2.01B Materials****20-2.01B(1) General**

Use minor concrete for replacing removed concrete facilities.

HMA for replacing removed asphalt concrete surfacing and facilities must comply with section 39. You may use minor HMA if authorized.

**20-2.01B(2) Garden Valves**

Each garden valve must:

1. Be inverted nose type and of brass or bronze construction with female thread inlet
2. Have a replaceable seat washer, rising valve stem within a protective collar, and male thread hose outlet
3. Have a loose key handle

**20-2.01B(3) Recycled Water Identification**

Irrigation components used for recycled water must be manufactured or painted purple. Recycled water irrigation pipe and tubing must have a permanent label with the wording "CAUTION RECYCLED WATER" every 24 inches in 2 rows spaced approximately 180 degrees apart in the longitudinal direction of the pipe or tubing.

The recycled water warning sign must be a decal or a decal attached to a 1/16-inch thick aluminum plate or tag.

Each warning sign decal must:

1. Show the phrase "Recycled Water, Do Not Drink" and the drinking glass graphic symbol
2. Be UV fade and weather resistant and manufactured from flexible vinyl with or without mylar
3. Have a purple background, black text, and self-adhesive backing

Each warning tag must:

1. Show the phrase "RECYCLED WATER" and the drinking glass graphic symbol
2. Be UV fade and weather resistant
3. Be purple, double-sided, and manufactured from polyurethane
4. Have an integral neck attachment and attachment hole capable of withstanding 178 lb of pull-out resistance
5. Have hot-stamped black lettering

Posts and hardware for warning signs must comply with section 56-4.

Concrete sprinkler protectors used with recycled water must be painted purple.

**20-2.01B(4) Location Markers**

Location markers must be schedule 40 white PVC plastic pipe.

**20-2.01B(5) Pull Boxes**

10-30-15

Pull boxes must comply with section 86-2.06 and be no. 5 or larger unless otherwise shown. Pull boxes for low voltage conductors must not have side openings.

07-19-13

Pull box covers used solely for irrigation electrical service must be marked "IRRIGATION".

**20-2.01B(6) Unions**

Unions must be brass or malleable iron capable of withstanding the maximum required working pressure.

**20-2.01B(7) Valve Boxes and Covers**

Valve boxes must be precast concrete.

Covers must be:

1. Concrete, steel, or cast iron. 10-30-15
2. Marked "WATER" in cast-in letters not less than 1 inch high unless shown. 07-19-13
3. 1 piece, except 2 pieces are required when the weight of the valve box cover exceeds 35 lb. 10-30-15

The valve box covers must include a polyurethane label with the appropriate controller letter and station number as shown.

10-30-15

**20-2.01B(8) Wye Strainers**

Wye strainers, except those used for drip valve assemblies, must:

1. Have a cast iron or all bronze body
2. Have a removable stainless steel strainer screen with 40-mesh woven wire
3. Have a 20-mesh woven wire screen or perforated sheet with 0.045-inch-diameter holes when on a backflow preventer assembly
4. Be capable of withstanding a working pressure of 150 psi
5. Be equipped with a garden valve at the outlet

07-19-13

**20-2.01C Construction**

**20-2.01C(1) General**

05-30-14

Immediately shut off water to broken supply lines, valves, or sprinkler assemblies. Repair irrigation systems within 24 hours after a malfunction or damage occurs.

07-19-13

Connect underground metallic pipes, valves, or fittings made of dissimilar metals through a dielectric coupling or bushing.

You may install conduits, conductors, and supply lines by methods other than trenching provided that they are not damaged and are installed at the depths specified.

**20-2.01C(2) Trenching and Backfilling**

10-30-15

Trench and backfill under section 86-2.01.

07-19-13

Remove plants under 20-1.03C as necessary to perform trenching. If plants are to remain, adjust trench alignment to minimize damage.

If removal of:

1. Turf is required, remove to a maximum width of 12 inches.
2. Groundcover is required, remove to a maximum width of 6 feet. Existing *Carpobrotus* and *Delosperma* may be rototilled if the backfill for the trenches does not contain plants longer than 6 inches in length.

Make a 2-inch deep sawcut along neat lines around the perimeter of the pavement to be removed at locations determined by the Engineer.

The trench must have uniform bearing throughout the entire length and must be free of jagged rubble or sharp objects. Ensure conduit, supply line, and joints are not moved or damaged by backfill operations.

For a project with multiple water service points, excavate and backfill trenches for 1 service point at a time.

11-15-13

Trenches for irrigation supply lines and conduits 3 inches and larger must be 5 times the pipe or conduit diameter deep and 2 times the pipe or conduit diameter wide.

Trenches for irrigation supply lines and conduits 2-1/2 inches or less in diameter must be a minimum of 12 inches below finished grade, measured from the top of the installed pipe.

07-19-13

Trenches must be at least 4 feet from curbs, dikes, and paved shoulders.

Rocks and debris encountered during trenching operations must be brought to the surface of the ground. Remove rocks and debris as ordered. This work is change order work.

If trenching requires the removal of plants, in areas with:

1. Turf, replace turf with sod under section 20-3.03C(3)(e).
2. Groundcover, replace groundcover plants from flats and plant at 12 inches on center under section 20-3.03C. No replacement of *Carpobrotus* and *Delosperma* is required if removed by rototilling.

11-15-13

Where existing surfacing is removed, replace the structural section to match the materials removed. Replacement concrete must be of uniform smoothness, color, and texture equal to the adjacent concrete surface. Dispose of removed material. Install supply line and conduits at the bottom of trenches and backfill with sand to a depth of 2 inches over the top of the supply lines and conduits. Excluding the part of the trench backfilled with surfacing or pavement, the remainder of the trench must be backfilled with material that is excavated from the trench. Rock, broken concrete, asphalt concrete and other particles larger than 2 inches in greatest dimension must not be used.

07-19-13

### 20-2.01C(3) Pull Boxes

10-30-15

Install pull boxes under section 86-2.06 at the following locations:

07-19-13

1. At all conductor splices except splices made in valve boxes
2. Within 5 feet of irrigation controllers
3. At ends of electrical conduits
4. At other locations shown

### 20-2.01C(4) Valve Boxes and Covers

Install and identify each valve box as shown.

In walkways and paved areas, install the top of the valve box flush with the surrounding finished grade.

### 20-2.01C(5) Recycled Water Warning Signs

Install recycled water warning signs on irrigation facilities using recycled water.

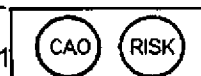
Install sign decals directly to clean, smooth surfaces. Clean the surface with alcohol or an equivalent cleaner before applying the decal.

Install a 4 by 4 inch warning sign decal to each:

1. Backflow preventer assembly
2. Irrigation controller enclosure cabinet door

Install a 2 by 2 inch warning tag to the each remote control valve and valve box cover.

Install a 2-1/2 by 3 inches sign decal to each sprinkler riser.



10-30-15

Under local regulations, install a 12 by 12 inch warning sign decal on an aluminum plate and attach to gates, fences, and walls located in the vicinity of a recycled water irrigation system. On gates and fences, install signs with S hooks and C clips or 14-gauge galvanized steel wire. On concrete walls or other rough surfaces, install signs with a silicon-based adhesive. In open areas, install signs on metal posts under section 82-3.

07-19-13

#### **20-2.01C(6) Garden Valves**

Furnish 3 keys for each garden valve before Contract acceptance.

#### **20-2.01D Payment**

Not Used

### **20-2.02 EXISTING IRRIGATION FACILITIES**

#### **20-2.02A General**

##### **20-2.02A(1) Summary**

Section 20-2.02 includes specifications for checking, testing, operating, replacing, and relocating existing irrigation facilities.

10-30-15

Work performed on existing irrigation facilities must comply with section 15.

07-19-13

##### **20-2.02A(2) Definitions**

Reserved

##### **20-2.02A(3) Submittals**

Submit a list of irrigation system deficiencies within 7 days after checking the existing facilities.

##### **20-2.02A(4) Quality Control and Assurance**

After irrigation facilities have been relocated, demonstrate in the presence of the Engineer that the relocated facilities function properly.

Certify each existing backflow preventer under section 20-2.03A(4).

##### **20-2.02B Materials**

Valve box covers must be the same size as the covers they replace.

Control and neutral conductors must be the same size and color as the control and neutral conductors they replace.

#### **20-2.02C Construction**

##### **20-2.02C(1) General**

Notify the Engineer at least 4 business days before shutting off the water supply to any portion of the existing irrigation system and immediately after restoring the water supply to any portion of the existing irrigation system.

If an irrigation facility to be relocated is determined unsuitable by the Engineer, replace irrigation facility under section 20-2. This work is change order work.

##### **20-2.02C(2) Check and Test Existing Irrigation Facilities**

Before performing irrigation system work, check existing irrigation facilities to remain in place or to be relocated. The Engineer determines the test watering cycle lengths. Check for deficiencies including missing parts, damaged components, and improper operation. Correct deficiencies as ordered. The correction of deficiencies is change order work.

**20-2.02C(3) Operate Existing Irrigation Facilities**

If the Contract includes a bid item for operate existing irrigation facilities, after performing work under section 20-2.02C(2), operate existing irrigation facilities through Contract acceptance.

Operate existing irrigation facilities except for water meters, underground supply lines, control and neutral conductors, and electrical conduits.

Check for proper operation at least once every 30 days. Adjust, repair, or replace existing irrigation facilities within 7 days of finding any deficiency.

Operate irrigation systems using the automatic irrigation controller until Contract acceptance. You may operate irrigation controllers manually during plant replacement, fertilization, weed germination, and repair work.

Program the irrigation controllers for seasonal requirements.

**20-2.02C(4) Replace Valve Box Covers**

Existing valve box covers shown to be replaced must remain in place until the new covers are ready to be installed.

Dispose of removed valve box covers.

**20-2.02C(5) Relocate Backflow Preventer Assemblies**

Relocate backflow preventer assembly as shown and install under section 20-2.03C.

**20-2.02C(6) Relocate Water Meters**

Relocate water meter as shown.

**20-2.02C(7) Relocate Irrigation Controllers**

Relocate irrigation controller as shown and install under section 20-2.07C.

10-30-15

**20-2.02C(8) Remove Irrigation Facilities**

Irrigation facilities to be removed that are more than 6 inches below the finished grade may be abandoned in place unless salvaging is specified or shown.

Immediately after disconnecting an existing irrigation facility to be removed or abandoned from an existing facility to remain, the remaining facility must be capped or plugged, or connected to a new or existing irrigation facility.

**20-2.02C(9) Salvage Irrigation Facilities**

Salvage irrigation facilities under section 15-2.03.

07-19-13

**20-2.02D Payment**

Not Used

**20-2.03 BACKFLOW PREVENTER ASSEMBLIES****20-2.03A General****20-2.03A(1) Summary**

Section 20-2.03 includes specifications for installing a backflow preventer assembly.

**20-2.03A(2) Definitions**

Reserved

**20-2.03A(3) Submittals**

Reserved

**20-2.03A(4) Quality Control and Assurance**

Each backflow preventer assembly must be certified by a backflow preventer tester. The tester must have an active and valid certification from the water purveyor having jurisdiction.

If the local water purveyor does not have a certification program, the tester must be certified by AWWA or a nearby county with a certification program.

Notify the Engineer at least 5 business days before certifying backflow preventer assembly.

Certify each backflow preventer assembly annually and within 10 days before Contract acceptance.

**20-2.03B Materials****20-2.03B(1) General**

Each backflow preventer assembly must include:

1. Backflow preventer including gate valve, wye strainer, brass or malleable iron unions, fittings, and supports
2. Blanket
3. Enclosure
4. Concrete pad

Concrete for the pad must be minor concrete, except the concrete must not contain less than 463 pounds of cementitious material per cubic yard. Hand mixing of the concrete is allowed.

**20-2.03B(2) Backflow Preventers**

Each backflow preventer must:

1. Be reduced-pressure principle type.
2. Comply with the requirements of the water purveyor that has jurisdiction.
3. Be factory-assembled with:
  - 3.1. 2 check valves
  - 3.2. 1 pressure differential relief valve
  - 3.3. 4 test cocks
  - 3.4. 2 shut-off valves manufactured from iron or bronze. Shut-off valves must be one of the following:
    - 3.4.1. Resilient wedge gate valves
    - 3.4.2. Resilient seated and fully ported ball valves
    - 3.4.3. Resilient seated butterfly valves

Backflow preventer components must be capable of withstanding a working pressure of 150 psi.

**20-2.03B(3) Backflow Preventer Blankets**

Each backflow preventer blanket must:

1. Be polyester fabric coated with vinyl or polymeric resin
2. Be resistant to UV light, water, mildew, and fire
3. Have an R-value from R-30 to R-38

Blankets must have a securing mechanism that includes either zippers, hook-pile tape, grommets, snaps, buttons, or any combination of these. Wherever the backflow preventer is not in an enclosure, the securing mechanism must be capable of accepting a padlock.

10-30-15

**20-2.03B(4) Backflow Preventer Enclosures**

Each backflow preventer enclosure must:

1. Be Type 304 stainless steel



2. Have expanded metal side, end, and top panels fabricated from 9-gauge minimum-thickness sheet with openings of approximately 3/4 by 1-3/4 inches
3. Have expanded metal panels attached to the 3/16-inch-thick frame by a series of welds not less than 1/4 inch in length and spaced not more than 4 inches on center, along the edges of the enclosure.
4. Have lock guards with a minimum thickness of 12 gauge
5. Have hexagonal nuts and lock-type washers
6. Have padlock-clasp or latch-and-lock mechanism

07-19-13

**20-2.03C Construction**

Finish exposed top surfaces of concrete pad with a medium broom finish applied parallel to the long dimension of pads.

Install hold-downs for the backflow preventer assembly enclosure when concrete is still plastic.

**20-2.03D Payment**

Not Used

**20-2.04 CAM COUPLER ASSEMBLIES****20-2.04A General**

Section 20-2.04 includes specifications for installing a cam coupler assembly.

**20-2.04B Materials**

Each cam coupler assembly must consist of a cam coupler, dust cap, check valve, pipes, fittings, concrete thrust block, and valve box with woven wire cloth and gravel.

Cam couplers and keys must be manufactured of brass or bronze and be able to withstand a working pressure of 150 psi.

Furnish 3 loose cam coupler keys before Contract acceptance.

**20-2.04C Construction**

Install cam coupler assemblies in valve boxes as shown.

**20-2.04D Payment**

Not Used

**20-2.05 CONTROL AND NEUTRAL CONDUCTORS****20-2.05A General****20-2.05A(1) Summary**

Section 20-2.05 includes specifications for installing control and neutral conductors.

**20-2.05A(2) Definitions**

Reserved

**20-2.05A(3) Submittals**

Reserved

**20-2.05A(4) Quality Control and Assurance**

10-30-15

Perform field tests on control and neutral conductors. Field tests must comply with the specifications in section 86-2.14B.

07-19-13

Where the conductors are installed by trenching and backfilling, perform field tests after a minimum of 6 inches of backfill material has been placed and compacted over the conductors.

**20-2.05B Materials**

10-30-15

Control and neutral conductors must comply with the requirements in section 86-2.08.

Electrical conduit and fittings must comply with section 86.

07-19-13

For connections between 24-volt irrigation controllers and valve solenoids, use control and neutral conductors. Conductors must include a control conductor for each valve and a common neutral.

Conductor insulation color, except for the stripes, must be continuous throughout. The color of the conductors must be consistent from the controller to each valve. Neutral conductors must be white. Do not use white for control conductors. Do not use conductors with green insulation except as permitted by the NEC.

Conductors must be:

1. Of the size recommended by the manufacturer of the controllers to be installed
2. Rated for 36 V or 600 V for armor-clad
3. Rated for direct burial
4. Underground feeder cable Type UF and TWU
5. Solid, uncoated copper for armor-clad
6. Not less than 90 percent of the AWG diameter required

No. 10 and smaller conductors must be insulated with a minimum of 56 mils of PVC or a minimum of 41 mils of polyethylene. No. 8 and larger conductors must be insulated with a minimum of 70 mils of PVC.

No. 10 and smaller armor-clad conductors must be insulated with a minimum of 41 mils of polyethylene. No. 8 and larger armor-clad conductors must be insulated with 54 to 60 mils of PVC.

Armor-clad conductors must include:

1. Stainless steel tape armor, Type 304 and helically wrapped with a 33 percent minimum overlap. The tape must be 0.5 inch wide and at least 0.005 inch thick.
2. PVC outer conductor jacket that is UV resistant and complies with the ICEA S-61-402, NEMA standard WC5 and UL listing 1263. The jacket nominal thickness must be 24 to 30 mils thick.

**20-2.05C Construction****20-2.05C(1) General**

Reserved

**20-2.05C(2) In Open Trenches**

Do not install control and neutral conductors above each other in an open trench. Wrap conductors together with electrical tape at 5 foot intervals.

Where conductors are installed in the same trench as supply line, install at the same depth as the line. At other locations, install conductors not less than 12 inches below finished grade.

Where conductors are not in a supply line trench, install conductors at least 4 feet from curbs, dikes, and paved shoulders.

**20-2.05C(3) In Conduits**

Install conductors in electrical conduit if conductors are to be:

1. Surface mounted
2. Installed in or on structures
3. Installed under paved areas
4. Installed in irrigation conduits
5. Placed in concrete

**20-2.05C(4) Splicing**

10-30-15

Splice low voltage control and neutral conductors under sections 86-2.09C, 86-2.09D, and 86-2.09E, except do not use method B. Tape used for splice insulation must be PVC tape.

07-19-13

Leave at least 2 feet of slack for each conductor at each:

1. Pull box
2. Valve box for each conductor that is connected to other facilities within the box or spliced within the box

Do not splice conductors in irrigation controller cabinets.

Permanent splice connections must be made with freshly cut and skinned conductors. Do not use temporary splices made for testing valve circuits as permanent splices.

**20-2.05C(5) Marking**

Mark control and neutral conductors in pull boxes, valve boxes, at irrigation control terminals, and at splices.

Mark conductor terminations and splices with adhesive cloth wrap-around markers. Seal markers with clear, heat-shrinkable sleeves.

Mark nonspliced conductors with clip-on C-shaped white extruded PVC sleeves. Sleeves must have black indented legends of uniform depth with transparent overlays over the legends and chevron cuts for the alignment of 2 or more sleeves.

Identify markers for the control conductors with the appropriate irrigation controller and station number.

**20-2.05D Payment**

Not Used

**20-2.06 FLOW SENSORS****20-2.06A General**

Section 20-2.06 includes specifications for installing a flow sensor.

**20-2.06B Materials**

Each flow sensor must be an inline type with a nonmagnetic spinning impeller as the only moving part.

The electronics housing must:

1. Be schedule 80 PVC or cast 85-5-5-5 bronze
2. Include glass-filled polyphenylene sulfide
3. Be easily removable from the meter body and include 2 ethylene-propylene O-rings

The impeller must be tungsten carbide.

The electronics must be rated to withstand prolonged water immersion conditions and include 2 single conductor 18 AWG leads, 48 inches long.

The insulation must be direct burial UF type colored red for the positive lead and black for the negative lead.

The flow sensor must be capable of withstanding:

1. 100 to 400 psi operating pressure depending on sensor size shown
2. Liquid temperatures up to 220 degrees F
3. Flows from 1/2 to 15 ft/sec

**20-2.06C Construction**

Install flow sensor as shown.

**20-2.06D Payment**

Not Used

10-30-16

**20-2.07 IRRIGATION CONTROLLERS****20-2.07A General****20-2.07A(1) Summary**

Section 20-2.07 includes specifications for installing irrigation controllers.

**20-2.07A(2) Definitions**

**base station:** Designated computer that collects data from a series of satellite controllers through a centralized server.

**centralized server:** Designated server that collects data from all base stations.

**network communication:** Identified means through which satellite controllers, base stations, and a centralized server communicate to one another, such as fiber optics, spread spectrum, and phone lines.

**remote access device:** Wireless device, such as an FCC-compliant radio remote, web-enabled smart phone, or wireless computer or tablet, used to communicate with satellite controllers from a remote location.

**remote irrigation control system:** Centralized water-management system that consists of:

1. Base station
2. Centralized server or web-based application
3. Satellite controllers
4. Remote access device

**satellite controller:** Irrigation controller that communicates directly to a base station or centralized server.

**smart controller:** Irrigation controller that estimates or measures depletion of available plant soil moisture in order to operate an irrigation system, replenishing water as needed while minimizing excess water use.

**web-based application:** Encrypted managing software that is coded in a browser-supported language and is executable via a common Internet web browser, such as Internet Explorer, Firefox, and Safari.

**20-2.07A(3) Submittals**

Submit a complete manufacturer's maintenance and operations manual for each type of installed controller as an informational submittal.

After the work is complete, submit 3 copies of the as-built shop drawings, including any wire modifications for each controller installed.

For each controller, laminate and place in an envelope 1 copy of:

1. As-built schematic wiring diagram, including wiring modifications
2. 11-by-17-inch as-built irrigation plan

The laminate must be clear, mat-finished plastic that is at least 10 mils thick. The envelope must be heavy-duty plastic.

Attach the envelope to the inside of the controller enclosure or cabinet door. If the door is not large enough to secure the envelope, submit the envelope and its contents.

#### **20-2.07A(4) Quality Control and Assurance**

Provide training by a qualified person on the use and adjustment of the installed irrigation controllers at least 30 days before Contract acceptance.

Modifications to electrical components must be done by the manufacturer before shipment to the job site.

The installation date and expiration date of the manufacturer's guarantee for the controllers must be permanently marked on the inside face of the controller.

#### **20-2.07B Materials**

##### **20-2.07B(1) General**

Conventional AC-powered irrigation controllers must operate on 120 V(ac), 60 Hz, and supply from 24 to 30 V(ac), 60 Hz for operating electrical remote control valves.

Concrete for the pad and foundation must be minor concrete except the cementitious material content of the concrete must be at least 463 lb/cu yd. Hand mixing of the concrete is allowed.

##### **20-2.07B(2) Irrigation Controllers**

###### **20-2.07B(2)(a) General**

The irrigation controllers must:

1. Be a smart controller from a single manufacturer.
2. Be fully automatic and capable of operating a complete 30-day or longer irrigation program.
3. Have a switch or button on the face of the irrigation control panel showing that the irrigation controller can be turned on or off and provide for automatic or manual operation. Manual operation must allow cycle start at the desired station and allow for the minimum activation of a single station or have the option to operate multiple stations in sequential or simultaneous operation modes.
4. Have nonvolatile memory.
5. Have a watering time display on the face of the control panel.
6. Have a panel and circuit board connected to the low voltage control and neutral conductors by means of a plug and receptacle connectors located within the cabinet enclosure.
7. Have a variable or incremental timing adjustment ranging from 1 to 360 minutes per station.
8. Be capable of operating at least 3 program schedules.
9. Be capable of having at least 4 start times per program schedule.
10. Have an output that can energize a pump start circuit or a remote control master valve.
11. Be protected by fuses and circuit breakers.
12. Display a program and station affected by a sensory alert without changing other watering schedules not affected by the alert.
13. Be capable of global manual and automatic seasonal adjustments to all valves in any given program.
14. Automatically change watering schedule based on evapotranspiration data provided by a local weather station or have an internal programmed default of historical evapotranspiration data for a given region.
15. Support a flow sensor, and a rain sensor or access to a weather station, and have automatic shut-off capability.
16. Be capable of communicating with the remote access device.

If the irrigation controller is installed in an enclosure cabinet, the cabinet must be stainless steel and must comply with section 20-2.07B(3).

Irrigation controllers not installed in enclosure cabinets must be weatherproof, constructed of fiberglass or metal and have a door lock with 2 keys provided.

A remote irrigation system must comply with the specifications for an irrigation controller and be capable of being accessible only through a secured and encrypted server that is password- and firewall-protected

by the Department or be accessible through a firewall-secured remote server that is independent from any Department servers. The Department will set up and manage the network communication.

#### **20-2.07B(2)(b) Battery Powered Irrigation Controllers**

Reserved

#### **20-2.07B(2)(c) Solar Powered Irrigation Controllers**

Reserved

#### **20-2.07B(2)(d) Two-wire Irrigation Controllers**

Reserved

#### **20-2.07B(3) Irrigation Controller Enclosure Cabinets**

The irrigation controller enclosure cabinet must comply with section 86 and:

1. Be minimum 14-gauge Type 304 stainless steel.
2. Include a mounting panel. Fabricate mounting panels using any of the following materials:
  - 2.1. 3/4-inch exterior AC grade veneer plywood. Paint panels with 1 application of an exterior, latex based, wood primer and 2 applications of an exterior, vinyl acrylic enamel, white in color. Paint panels on all sides and edges before installation of the panels in the cabinets and the equipment on the panels.
  - 2.2. 3/16-inch-thick aluminum sheets.
  - 2.3. 10-gauge cold-rolled steel sheets.
  - 2.4. 0.157-inch stainless steel metal sheets.
3. Provide cross ventilation, roof ventilation, or a combination of both. Ventilation must not compromise the weather resistance properties of the cabinet and must be fabricated by the cabinet manufacturer.
4. Include protection against lightning damage.
5. Have an area inside the cabinet doors for storage of the as-built schematic wiring diagram and irrigation plans.
6. Have padlock clasp or latch and lock mechanism.

#### **20-2.07B(4) Rain Sensors**

A rain sensor unit must be a solid-state, automatic shut-off type, and compatible with the irrigation controller. The rain sensor unit must automatically interrupt the master remote control valves if approximately 1/8 inch of rain has fallen. The irrigation controller must automatically be enabled again when the accumulated rainfall evaporates from the rain sensor unit collection cup.

Rain sensor units must be one of the following:

1. Rated from 24 to 30 V(ac)
2. Wireless and FCC compliant

#### **20-2.07C Construction**

Finish the exposed top surface of concrete pad with a medium broom finish applied parallel to the long dimension.

Install electrical components for automatic irrigation systems under section 86-1.02.

Install irrigation controllers under the manufacturer's instructions.

If 2 or more irrigation controllers operate the same remote master control valve, install an isolation relay under the controller manufacturer's instructions.

Where direct burial conductors are to be connected to the terminal strip, connect the conductors with the open-end-crimp-on wire terminals. Exposed wire must not extend beyond the crimp of the terminal and the wires must be parallel on the terminal strip.

Install rain sensor units for irrigation controllers on the irrigation controller enclosure cabinets. Provide protection against lightning damage.

#### **20-2.07D Payment**

Payment for 120-volt or higher electrical service is not included in the payment for any type of irrigation controller.

07-19-13

### **20-2.08 IRRIGATION CONDUIT**

#### **20-2.08A General**

##### **20-2.08A(1) Summary**

Section 20-2.08 includes specifications for installing irrigation conduit under a roadway or other facility to accommodate electrical conduit for control and neutral conductors and irrigation supply lines.

Before performing work on irrigation systems, locate existing conduits shown to be incorporated into the new work.

Before removing or disturbing existing Type A pavement markers that show the location of the existing conduit, mark the location of the existing conduit on the pavement.

##### **20-2.08A(2) Definitions**

Reserved

##### **20-2.08A(3) Submittals**

Reserved

##### **20-2.08A(4) Quality Control and Assurance**

Demonstrate the conduits are free of obstructions after placement of base and surfacing.

Before and after extending the irrigation supply line in a conduit, pressure test the supply line under section 20-2.01A(4)(b).

After conductors are installed in a conduit, test the conductors under section 20-2.05A(4).

Assign a technical representative to direct and control the directional bore activities. The representative must be present during directional bore activities. Unless otherwise authorized, perform directional bore activities in the presence of the Engineer.

#### **20-2.08B Materials**

##### **20-2.08B(1) General**

Reserved

##### **20-2.08B(2) ABS Composite Pipe Conduit**

ABS composite pipe and couplings must comply with ASTM D 2680. Couplings must be solvent cement type.

##### **20-2.08B(3) Corrugated High Density Polyethylene Pipe Conduit**

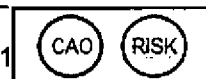
Corrugated high density polyethylene pipe must comply with ASTM F 405 and F 667 or be Type S and comply with AASHTO M252 and M294. Couplings and fittings must be as recommended by the pipe manufacturer.

##### **20-2.08B(4) Corrugated Steel Pipe Conduit**

Corrugated steel pipe conduit must comply with section 66. The nominal thickness of metal sheets for pipe must be 0.064 inch for corrugated steel pipe and 0.060 inch for corrugated aluminum pipe. Coupling bands and hardware must comply with section 66.

##### **20-2.08B(5) Polyvinyl Chloride Pipe Conduit**

PVC pipe conduit must be schedule 40 and comply with ASTM D 1785.



Fittings must be schedule 80.

### 20-2.08B(6) Welded Steel Pipe Conduit

Welded steel pipe must comply with ASTM A 53. Pipe must be black and have either welded or threaded joints.

The minimum wall thickness for the various sizes of welded steel pipe must comply with the dimensions shown in the following table:

Pipe size, nominal (inch)	Minimum wall thickness (inch)
3	0.216
4	0.237
6	0.280
8	0.277
10	0.279
12	0.330

### 20-2.08C Construction

#### 20-2.08C(1) General

When existing conduits are to be incorporated in new work, excavate exploratory holes for locating existing conduits at the locations indicated by existing markers or as directed. Excavate and backfill exploratory holes to a maximum size of 2-1/2 feet in width, 5 feet in depth, and 5 feet on each side of the marker or directed location parallel to the roadway. If the conduit is not found and if ordered, increase the size of the exploratory holes beyond the dimensions specified. The additional excavation and backfill is change order work.

If extending an existing conduit, remove conductors from the conduit.

Use a coupling band if the new conduit matches the existing conduit diameter, otherwise overlap the conduit at least 12 inches.

After extending existing conduits, install conductors that match the color and size of the existing conductors without splices. Splice conductors in adjacent pull boxes.

If installing a control and neutral conductor and electrical conduit through the irrigation conduit, install a no. 5 pull box at each end.

Remove debris found in the conduit before performing other work. Debris found more than 3 feet from the ends of the conduits is removed as change order work.

Extend conduit 2 feet beyond all paving unless otherwise shown.

Cap the ends of unused conduit.

Designate the location of each conduit by cementing a Type A pavement marker as shown. Type A pavement markers and adhesive must comply with section 85.

#### 20-2.08C(2) Welded Steel Pipe Conduit

##### 20-2.08C(2)(a) General

Install welded steel pipe by directional boring or jack and drill.

Install top of conduits:

1. 18 to 30 inches below the finished surface in sidewalk areas
2. 40 to 52 inches below the finished grade in other paved areas



**20-2.08C(2)(b) Directional Boring**

Notify the Engineer 2 business days before starting directional bore activities.

The diameter of the boring tool for directional boring must be only as large as necessary to install the conduit.

Mineral slurry or wetting solution may be used to lubricate the boring tool and to stabilize the soil surrounding the boring path. The mineral slurry or wetting solution must be water based.

The directional bore equipment must have directional control of the boring tool and have an electronic boring tool location detection system. During operation, the directional bore equipment must be able to determine the location of the tool both horizontally and vertically.

**20-2.08C(2)(c) Jack and Drill**

Notify the Engineer 2 business days before starting jack and drill activities.

Jacking or drilling pits must be no closer than 2 feet from pavement edge whenever possible.

If authorized, small holes may be cut in the pavement to locate or remove obstructions.

Do not use excessive water that will soften subgrade or undermine pavement.

**20-2.08C(3) Schedule 40 Pipe Conduit**

Where schedule 40 pipe conduit 2 inches or less in outside diameter is installed under surfacing, you may install by directional boring under section 20-2.08C(2)(b).

For conduit 2 inches or less in diameter, the top of the conduit must be a minimum of 18 inches below surfacing.

Extend schedule 40 pipe conduit 6 inches beyond surfacing. Cap ends of conduit until used.

**20-2.08D Payment**

Schedule 40 PVC pipe conduit is paid for as plastic pipe (schedule 40) (supply line).

**20-2.09 IRRIGATION SUPPLY LINE****20-2.09A General****20-2.09A(1) Summary**

Section 20-2.09 includes specifications for installing irrigation supply line.

If the supply line location interferes with the excavation of plant holes, relocate the plant hole to clear the supply line. Do not install supply lines through plant holes unless shown.

Supply lines, control and neutral conductors and electrical conduits installed in common trenches must not be installed above each other.

**20-2.09A(2) Definitions**

Reserved

**20-2.09A(3) Submittals**

Submit a certificate of compliance for polyethylene pipe and plastic pipe supply line.

**20-2.09A(4) Quality Control and Assurance**

Solvent cement must comply with the local Air Quality Management District requirements.

**20-2.09B Materials****20-2.09B(1) General**

Irrigation supply pipe must be metal or plastic as shown.

PCC for thrust blocks must be produced from commercial-quality aggregates. The concrete must contain at least 295 pounds of cementitious material per cubic yard.

#### 20-2.09B(2) Copper Pipe Supply Line

Copper pipe must be Type K rigid pipe and comply with ASTM B 88. Fittings must be wrought copper or cast bronze either soldered or threaded.

Solder must be 95 percent tin and 5 percent antimony.

#### 20-2.09B(3) Galvanized Steel Pipe Supply Line

Galvanized steel pipe supply line and couplings must be standard weight and comply with ASTM A 53, except that the zinc coating must not be less than 90 percent of the specified amount. Except for couplings, fittings must be galvanized malleable iron, banded and threaded, and comply with ANSI B16.3, Class 150.

Joint compound must be nonhardening and noncorrosive. Do not use pipe thread sealant tape.

#### 20-2.09B(4) Drip Irrigation Tubing

Drip irrigation tubing must be virgin polyethylene plastic and comply with ASTM D 2737.

The drip irrigation tubing must be distribution tubing with preinstalled in-line emitters.

If preinstalled in-line drip irrigation tubing is not shown, you may install emitters that match the distribution requirements shown. The emitters must be barbed or threaded-type outlet devices with dual silicone diaphragms and installed under the manufacturer's instructions.

The emitters must meet the flow rate and operating pressure range shown.

The wall thickness of polyethylene tubing must comply with the following requirements when tested under ASTM D 2122:

Pipe size, nominal (inch)	Minimum wall thickness (inch)	Maximum wall thickness (inch)
1/2	0.050	0.070
5/8	0.055	0.075
3/4	0.060	0.080

The polyethylene tubing fittings must be leak-free, compression type and have female sockets with an internal barb to provide a positive pipe-to-fitting connection that will not separate at the designed pressure.

#### 20-2.09B(5) Plastic Pipe Supply Line

Plastic pipe supply line must be PVC pipe that is NSF approved.

Schedule 40 plastic pipe supply line must comply with ASTM D 1785.

Class 315 plastic pipe supply line must comply with ASTM D 2241.

PVC gasketed bell joints must comply with ASTM D 2672, ASTM D2241, ASTM D 3139, and ASTM F 477.

For solvent-cemented type joints, the primer and solvent cement must be made by the same manufacturer. The primer color must contrast with the color of the pipe and fittings.

10-30-15

Solvent-cemented fittings for schedule 40 plastic pipe supply line must be injection molded PVC, schedule 40, and comply with ASTM D2466.

Solvent-cemented fittings for class 315 plastic pipe supply line must be injection molded PVC, schedule 80, and comply with ASTM D1784 and ASTM D2467.

07-19-13

Fittings for supply line placed in irrigation conduit must be schedule 80.

Fittings for plastic pipe supply line larger than 4 inches must be ductile iron under section 20-2.14C(2)(b).

If UV-resistant plastic pipe supply line is required, the pipe must be homogeneous, uniform color and be manufactured of:

1. At least 80 percent vinyl chloride resin with UV stabilizers
2. Non-PVC resin modifiers and coloring ingredients
3. Coloring ingredients with UV stabilizers

### **20-2.09C Construction**

#### **20-2.09C(1) General**

Cut pipe straight and true. After cutting, ream out the ends to the full inside diameter of the pipe.

05-30-14

Prevent foreign material from entering the irrigation system during installation. Immediately before assembling, clean all pipes, valves, and fittings. Flush lines before attaching sprinklers, emitters, and other terminal fittings. Reuse water from waterline flushing for landscape irrigation if practicable.

07-19-13

Pipe supply lines installed between the water meter and backflow preventer assembly must be installed not less than 18 inches below finished grade measured to the top of the pipe.

Where a connection is made to existing supply lines, bell and gasketed fittings or compression fittings may be used.

Install a thrust block at each change in direction on the main supply line, terminus run, and at other locations shown.

Where supply lines cross paved ditches more than 3 feet deep at their flow line, install galvanized steel pipe for the entire span of the ditch.

Secure UV resistant plastic pipe supply line on grade as shown.

#### **20-2.09C(2) Galvanized Steel Pipe Supply Line**

Coat male pipe threads on galvanized steel pipe according to the manufacturer's instructions.

#### **20-2.09C(3) Drip Irrigation Tubing**

Install drip irrigation tubing on grade and under manufacturer's instructions.

Install a flush valve and an air-relief valve if recommended by the drip valve assembly manufacturer.

#### **20-2.09C(4) Plastic Pipe Supply Line**

For PVC pipe 1-1/2 inches in diameter or smaller, cut the pipe with PVC cutters.

For solvent-cemented type joints, apply primer and solvent-cement separately under the manufacturer's instructions.

Wrap the male portion of each threaded plastic pipe fitting with at least 2 layers of pipe thread sealant tape.

Install plastic pipe supply line mains with solvent-cemented type joints not less than 18 inches below finished grade measured to the top of the pipe.

Install plastic pipe supply line laterals with solvent-cemented type joints not less than 12 inches below finished grade measured to the top of the pipe.

Snake plastic pipe installed by trenching and backfilling methods.

#### 20-2.09D Payment

Supply line pipe and drip irrigation tubing are measured along the slope.

### 20-2.10 SPRINKLER ASSEMBLIES

#### 20-2.10A General

Section 20-2.10 includes specifications for installing sprinkler assemblies.

#### 20-2.10B Materials

##### 20-2.10B(1) General

Each sprinkler assembly must meet the characteristics shown in the irrigation legend.

Where shown, a sprinkler assembly must have a flow shut-off device that automatically stops the flow of water on the downstream side of the device when the assembly is broken. You may use a sprinkler assembly with a preinstalled flow shut-off device or you must install a flow shut-off device under the manufacturer's instructions.

Flexible hose for sprinkler assembly must be leak-free, nonrigid and comply with ASTM D 2287, cell Type 6564500. The hose wall thickness must comply with ASTM D 2122 for the hose diameters shown in the following table:

Hose diameter, nominal (inch)	Minimum wall thickness (inch)
1/2	0.127
3/4	0.154
1	0.179

Solvent cement and fittings for flexible hose must comply with section 20-2.09B(5).

##### 20-2.10B(2) Pop-Up Sprinkler Assemblies

Each pop-up sprinkler assembly must include a body, nozzle, swing joint, pressure compensation device, check valve, sprinkler protector, and fittings as shown.

##### 20-2.10B(3) Riser Sprinkler Assemblies

Each riser sprinkler assembly must include a riser or flexible hose, threaded nipple, swing joint, check valve, and nozzle as shown. The riser must be UV resistant schedule 80, PVC 1120 or PVC 1220 pipe and comply with ASTM D 1785.

11-15-13

##### 20-2.10B(4) Tree Well Sprinkler Assemblies

Each tree well sprinkler assembly must include a body, riser, swing joint, perforated drainpipe, and drain cap.

07-19-13

The perforated drainpipe must be commercial grade, rigid, PVC pipe with holes spaced not more than 6 inches on center on 1 side of the pipe.

Drain cap must be commercially available, 1 piece, injection molded drain grate manufactured from structural foam polyolefins with UV light inhibitors. Drain grate must be black.

Gravel for filling the drainpipe must be graded such that 100 percent passes the 3/4-inch sieve and 100 percent is retained on the 1/2-inch sieve. Gravel must be clean, washed, dry, and free from clay or organic material.

#### 20-2.10C Construction

Install pop-up and riser sprinkler assembly:

1. 6-1/2 to 8 feet from curbs, dikes, and sidewalks
2. 10 feet from paved shoulders
3. 3 feet from fences and walls

If sprinkler assembly cannot be installed within these limits, the location will be determined by the Engineer.

Set sprinkler assembly riser on slopes perpendicular to the plane of the slope.

Install tree well sprinkler assembly as shown.

**20-2.10D Payment**

Not Used

**20-2.11 VALVES**

**20-2.11A General**

Section 20-2.11 includes specifications for installing valves.

**20-2.11B Materials**

**20-2.11B(1) General**

Not Used

10-30-15

07-19-13

**20-2.11B(2) Ball Valves**

Ball valve must be a two-piece brass or bronze body and comply with the requirements shown in the following table:

Property	Requirements
Nonshock working pressure, min	400 psi
Seats	PTFE
O-ring seals	PTFE

10-30-15

07-19-13

**20-2.11B(3) Check Valves**

Each check valve must:

1. Be schedule 80 PVC and factory set to 5 psi for adjustable spring check valve
2. Be Class 200 PVC for swing check valves on non pressurized plastic irrigation supply line

**20-2.11B(4) Drip Valve Assemblies**

Each drip valve assembly must include:

1. Remote control valve
2. Wye filter with:
  - 2.1. Filter housing that:
    - 2.1.1. Can withstand a working pressure of 150 psi
    - 2.1.2. Is manufactured of reinforced polypropylene plastic
  - 2.2. Reusable stainless steel filter cartridge with a 200 mesh size filtration
3. Ball valve under 20-2.11B(2)
4. Schedule 80 PVC pipes and fittings
5. Pressure regulator

**20-2.11B(5) Garden Valve Assemblies**

Each garden valve assembly must have:

1. Garden valve
2. Location marker

#### **20-2.11B(6) Gate Valves**

Gate valves must be:

1. Flanged or threaded type
2. Iron or bronze body
3. Bronze trimmed with one of the following:
  - 3.1. Internally threading rising stem
  - 3.2. Nonrising stem
4. Able to withstand a working pressure of 150 psi
5. Same size as the pipeline that the valves serves unless otherwise shown

Gate valves smaller than 3 inches must have a cross handle.

Gate valves 3 inches or larger must be flanged type with a square nut. Furnish 3 long shank keys before Contract acceptance.

Gate valves attached to the outlets of a wye strainer must have seating rings on the discharge side of the gate valves must be PTFE. Valve wedges must be driven obliquely by cam action into the seating rings.

#### **20-2.11B(7) Pressure Regulating Valves**

Pressure regulating valve must be:

1. Flanged or threaded type
2. Brass, bronze, cast iron, or plastic body
3. Spring diaphragm type
4. Pilot controlled

Pressure regulating valve must have no internal filter screens.

#### **20-2.11B(8) Pressure Relief Valves**

Pressure relief valve must have a brass or bronze body, stainless steel springs, bronze nickel chrome seats, composition seat discs, female bottom inlets, and female side outlets.

#### **20-2.11B(9) Quick Coupling Valves**

Quick coupling valve must be 3/4 inch double slotted with a self-closing cap, 3/4-inch brass key and 3/4-inch brass hose swivel unless otherwise shown. Except for the cap, quick coupling valve must be brass or bronze construction. Furnish 3 loose quick coupling brass keys and brass hose swivels before Contract acceptance.

#### **20-2.11B(10) Remote Control Valves**

##### **20-2.11B(10)(a) General**

Each remote control valve must:

1. Be normally closed type.
2. Be glass filled nylon, brass, or bronze.
3. Be completely serviceable from the top without removing the valve body from the system.
4. Be equipped with a device that regulates and adjusts the flow of water and be provided with a manual shut-off. The manual shut-off for valves larger than 3/4 inch must be operated by a cross handle.
5. Have solenoids compatible with the irrigation controller.
6. Have a manual bleed device.
7. Be capable of withstanding a pressure of 200 psi
8. Have replaceable compression discs or diaphragms.
9. Have threaded fittings for inlets and outlets.

10. Have DC latching solenoids when used with solar or battery controllers. Solenoids must operate on 3.5 V.

10-30-15

11. Be bottom, angled, or straight inlet configuration.

07-19-13

#### **20-2.11B(10)(b) Remote Control Valves with Flow Sensor**

Reserved

#### **20-2.11B(10)(c) Remote Control Valves with Pressure Regulator**

Each remote control valve with pressure regulator must be factory assembled as 1 unit.

#### **20-2.11B(11) Wye Strainer Assemblies**

Each wye strainer assembly must include:

1. Wye strainer
2. Garden valve

#### **20-2.11C Construction**

##### **20-2.11C(1) General**

10-30-15

All valves must be installed in a valve box with a cover except:

1. Check valves
2. Garden valves
3. Pressure regulating valves installed on backflow preventers

07-19-13

Install control valves:

1. 6-1/2 to 8 feet from curbs, dikes, and sidewalks
2. 10 feet from paved shoulders
3. 3 feet from fences, walls, or both

If a control valve cannot be installed within these limits, the location will be determined by the Engineer.

##### **20-2.11C(2) Check Valves**

Unless otherwise shown, install spring-action check valves as necessary to prevent low head drainage.

##### **20-2.11C(3) Garden Valve Assemblies**

Install a location marker 8 to 10 inches from the back of each garden valve.

##### **20-2.11C(4) Pressure Regulating Valves**

Install pressure regulating valves with threaded connections and a union on the inlet side of the valves.

##### **20-2.11C(5) Wye Strainer Assemblies**

Unless shown, install wye strainer assembly on the upstream side of the remote control valves.

Install garden valve so that when the system is flushed, the discharge sprays out of the valve box.

#### **20-2.11D Payment**

Not Used

05-30-14

**20-2.12–20-2.13 RESERVED**

07-19-13

**20-2.14 SUPPLY LINE ON STRUCTURES****20-2.14A General****20-2.14A(1) General****20-2.14A(1)(a) Summary**

Section 20-14 includes specifications for installing water supply lines through bridges and on the exterior of concrete structures.

**20-2.14A(1)(b) Definitions**

Reserved

**20-2.14A(1)(c) Submittals**

Submit a work plan for temporary casing support at the abutments as an informational submittal.

**20-2.14A(1)(d) Quality Control and Assurance****20-2.14A(1)(d)(i) General**

Before installing seismic expansion assemblies or expansion assemblies, the Engineer must authorize the extension setting.

**20-2.14A(1)(d)(ii) Regulatory Requirements**

Piping materials must bear the label, stamp, or other markings of the specified standards.

**20-2.14A(1)(d)(iii) Site Tests**

Test water supply lines before:

1. Backfilling
2. Beginning work on box girder cell decks
3. Otherwise covering the water supply lines

Furnish pipe anchorages to resist thrust forces occurring during testing.

Test the water supply lines as 1 unit. The limits of the unit must be 5 feet beyond the casing at each end of the bridge.

Cap each end of the water supply lines before testing. Caps must be rated for the test pressure.

Test water supply lines under section 20-2.01A(4)(b), except that the testing period must be 4 hours with no pressure drop.

For water supply lines 4 inches and larger testing must meet the following additional requirements:

1. Testing pressure must be at least 120 psi
2. Air relief valve must not be subjected to water pressure due to testing

If water supply lines fail testing, retest the lines after repair.

**20-2.14A(2) Materials****20-2.14A(2)(a) General**

Protect stored piping from moisture and dirt. Elevate piping above grade. Support piping to prevent sagging and bending.

Protect flanges, fittings, and assemblies from moisture and dirt.



**20-2.14A(2)(b) Air Release Valve Assemblies**

Air release valve assemblies include an air release valve, ball valve, tank vent, nipples, and pipe saddle. Assemblies must comply with the following:

1. Air release valves must have a cast iron body with stainless steel trim and float, 1-inch NPT inlet, 1/2-inch NPT outlet, and 3/16-inch orifice.
2. Ball valves must have a 2-piece bronze body with chrome plated or brass ball, 1-inch full-size port, and be rated for at least 400 psi.
3. Tank vents must have a 1/2-inch NPT inlet and downward-facing double openings with screened covers.
4. Nipples must be schedule 40 galvanized steel pipe.
5. Pipe saddle must be rated for at least 150 psi and compatible with water supply line. Pipe saddle must be (1) single strap pipe saddle for water supply lines smaller than 4 inches or (2) double strap pipe saddle for water supply lines 4 inches and larger. You may use a tee fitting for galvanized steel water supply lines.

**20-2.14A(2)(c) Casings**

Casings must be welded steel pipe casing complying with section 70-7.

**20-2.14A(2)(d) Pipe Wrap Tape**

Pipe wrap tape must be pressure sensitive tape made from PVC or polyethylene. Pipe wrap tape must be at least 50 mils thick and not wider than 2 inches.

**20-2.14A(2)(e) Pipe Hangers**

Pipe hangers must comply with section 70-7.02C.

The pipe hanger must be rated for the water supply line. If casings are shown, include the casings weight.

**20-2.14A(2)(f) Epoxy Adhesives**

Epoxy used for anchoring concrete pipe supports must comply with section 70-7.02D.

**20-2.14A(2)(g) Concrete Pipe Supports**

Concrete pipe supports must comply with section 70-7.02D.

**20-2.14A(2)(h) Pipe Clamps and Anchors**

Metal clamps must be commercial quality steel complying with section 75-1.02. Anchors must comply with the specifications for concrete anchorage devices in section 75-1.03C.

**20-2.14A(2)(i) Pull Boxes**

Pull boxes and covers must comply with section 20-2.01B(5).

**20.2.14A(3) Construction****20-2.14A(3)(a) General**

Support water supply lines as described.

Where water supply lines penetrate bridge superstructure concrete, either form or install pipe sleeves at least 2 pipe sizes larger than the pipe.

**20-2.14A(3)(b) Preparation**

Clean the interior of the pipe before installation. Cap or plug openings as pipe is installed to prevent the entrance of foreign material. Leave caps or plugs in place until the next pipe section is installed.

**20-2.14A(3)(c) Installation****20-2.14A(3)(c)(i) General**

Reserved

**20-2.14A(3)(c)(ii) Casings**

Install casings under section 70-7.03.

Seal casing end with 8 inches of polyurethane foam at dirt stop or pipe end seal.

**20-2.14A(3)(c)(iii) Wrapping Water Supply Line**

Wrap damaged supply line coatings with pipe wrap tape. Wrap field joints and fittings that are in contact with the earth.

Wrapping must comply with the following:

1. Clean and prime area as recommended by the tape manufacturer.
2. Tightly wrap tape with 1/2 uniform overlap, free from wrinkles and voids, to provide not less than a 100 mil thickness.
3. The tape must conform to joint or fitting contours.
4. Extend tape at least 6 inches over adjacent pipe.

**20-2.14A(3)(c)(iv) Pipe Clamps and Anchors**

Install water supply lines on the exterior surfaces of bridges or other concrete structures with metal clamps and anchors.

Drilling of holes for anchors must comply with the following:

1. Drill holes to manufacturers recommended depth.
2. Drilling tools must be authorized.
3. Do not drill holes closer than 6 inches to the edge of a concrete structure.
4. Relocate holes if reinforcing steel is encountered. Fill abandoned holes with mortar. Mortar must comply with section 51-1.02F.

Where water supply lines are mounted vertically for more than 2 feet, install clamps and anchors within 6 inches of the elbows.

Where water supply lines are mounted vertically for more than 10 feet, install additional clamps and anchors at 10 foot centers unless otherwise shown.

**20-2.14A(3)(d) Sequences of Operation**

If the bridge superstructure is to be prestressed do not place mortar around casings in abutments and hinges until bridge superstructure prestressing has been completed.

**20-2.14A(4) Payment**

Supply line on structures is measured from end to end, along the centerline.

The Department does not pay for failed tests.

**20-2.14B Supply Line on Structures, Less than 4 Inches****20-2.14B(1) General****20-2.14B(1)(a) Summary**

Section 20-2.14B includes specifications for installing water supply lines smaller than 4 inches.

**20-2.14B(1)(b) Definitions**

Reserved

**20-2.14B(1)(c) Submittals**

Product data for materials includes catalog cuts, performance data, and installation instructions.

Submit product data for:

1. Water supply line

2. Expansion assemblies
3. Casing insulators
4. Pipe end seals
5. Pipe anchorages
6. Air release valve assemblies
7. Casings
8. Pipe hangers
9. Epoxy adhesives
10. Concrete pipe supports

#### **20-2.14B(1)(d) Quality Control and Assurance**

Reserved

#### **20-2.14B(2) Materials**

##### **20-2.14B(2)(a) General**

Reserved

##### **20-2.14B(2)(b) Water Supply Line**

Water supply lines must comply with section 20-2.09.

##### **20-2.14B(2)(c) Expansion Assemblies**

Expansion assemblies must consist of a hose with ends, insulated flange connections, and elbows. Expansion assemblies must have the same nominal inside diameter as the water supply line. Working pressure must be at least 150 psi.

Hose must be medium or heavy weight, crush and kink resistant, rated for at least 150 psi. Cover must be flexible, oil resistant rubber or synthetic, reinforced with at least 2-ply synthetic yarn or steel wire. The inner tube must meet FDA and USDA Standards for potable water. Hose ends must be stainless steel flanged connections with stainless steel crimped bands or swaged end connectors. Do not use barbed ends with band clamps.

Elbows must be 45 degree, standard weight galvanized steel fittings.

##### **20-2.14B(2)(d) Casing Insulators**

Casing insulators must be:

1. 2-piece, high-density, injection-molded polyethylene, nonconductive inner liner, with cadmium-plated nuts and bolts.
2. Factory constructed to ensure the water supply line is centered in the casing. Insulators must not allow any contact between pipe and casing and have at least 2 runners seated on the bottom of the casing.
3. Sized for the casing and water supply line shown.

##### **20-2.14B(2)(e) Pipe Anchorages**

Pipe anchorages must consist of an I-beam, U-bolts, anchors, and double nuts.

Use concrete anchorage devices for anchors on existing bridges. Use L-anchor bolts for anchors on new bridges.

Fabricate the I-beam from 1/2-inch steel plate. Steel plate, U-bolts, L-anchors, and nuts must comply with section 75-1.02. Concrete anchorage devices must comply with section 75-1.03C.

##### **20-2.14B(2)(f) Pipe End Seals**

Pipe end seals must consist of a pipe end seal, stainless steel bands, and polyurethane foam.

Pipe end seal must be factory constructed from seamless neoprene and sized for the casing and water supply line shown. Neoprene must be at least 1/8 inch thick. Stainless steel bands must be crimped.

Polyurethane foam must be expanding foam spray that is water resistant and moisture cured.

### **20-2.14B(3) Construction**

Locate pipe anchorage halfway between expansion assemblies.

Pipe end seal must be pulled onto the casing during pipe installation. Do not use wrap-around type end seals.

### **20-2.14B(4) Payment**

Supply line on structures is paid for as galvanized steel pipe (supply line on bridge).

## **20-2.14C Supply Line on Structures, 4 Inches and Larger**

### **20-2.14C(1) General**

#### **20-2.14C(1)(a) Summary**

Section 20-2.14C includes specifications for installing water supply lines 4 inches and larger.

#### **20-2.14C(1)(b) Definitions**

Reserved

#### **20-2.14C(1)(c) Submittals**

Product data for materials includes catalog cuts, performance data, and installation instructions.

Submit product data for:

1. Water supply line
2. Expansion assemblies
3. Flange insulating gaskets
4. Casing insulators
5. Seismic expansion assemblies
6. Lateral restraint assemblies
7. Air release valve assemblies
8. Casings
9. Pipe hangers
10. Epoxy adhesives
11. Concrete pipe supports

Submit the maximum range and preset dimension for each expansion assembly or seismic expansion assembly as an informational submittal.

Submit at least 5 sets of product data to OSD, Documents Unit. Each set must be bound together and include an index stating equipment names, manufacturers, and model numbers. Two sets will be returned. Notify the Engineer of the submittal. Include in the notification the date and contents of the submittal.

#### **20-2.14C(1)(d) Quality Control and Assurance**

Reserved

### **20-2.14C(2) Materials**

#### **20-2.14C(2)(a) General**

Reserved

#### **20-2.14C(2)(b) Water Supply Line**

Water supply lines must consist of ductile iron pipe and fittings. Pipe must comply with ANSI/AWWA C151/A21.51, Class 350. Fittings must comply with ANSI/AWWA C110/A21.10, rated for a working pressure of 350 psi.

Ductile iron pipe connections to expansion assemblies must be a flanged joint complying with ANSI/AWWA C115/A21.15. Flange gaskets must be rated for a working pressure of 350 psi. Fasteners must comply with section 75-1.02, except that stainless steel fasteners must not be used.

All other ductile iron pipe and fitting joints must be push-on, restrained type complying with ANSI/AWWA C111/A21.11. Push-on, restrained type joints may use proprietary dimensions and proprietary restrained joint locking systems.

Ductile iron pipe and fittings must have an asphaltic coating complying with ANSI/AWWA C151/A21.51, and a cement mortar lining complying with ANSI/AWWA C104/A21.4.

#### **20-2.14C(2)(c) Expansion Assemblies**

Expansion assemblies must be a sleeve type expansion joint. The expansion assembly must have:

1. Ductile iron body complying with ANSI/AWWA C153/A21.53
2. Flanged ends complying with ANSI/AWWA C110/A21.10
3. Fusion bonded epoxy internal lining complying with ANSI/AWWA C213 at least 15 mils thick
4. Internal expansion sleeve limiting stop collars and be pressure balanced
5. Working pressure of at least 350 psi for sizes 24 inches and smaller and 250 psi for sizes larger than 24 inches
6. NSF 61 certification

The expansion assembly must be factory set at 1/2 the extension capacity.

#### **20-2.14C(2)(d) Flange Insulating Gaskets**

Flange insulating gaskets must consist of a dielectric flange gasket, insulating washers and sleeves, and commercial quality steel bolts and nuts. Dielectric flange gasket must have a dielectric strength of at least 500 vpm.

#### **20-2.14C(2)(e) Casing Insulators**

Casing insulators must be:

1. 2-piece, 8-inch, 14-gauge epoxy-coated or galvanized steel band, four 2-inch-wide glass-reinforced polyester or polyethylene runners, with cadmium-plated nuts and bolts.
2. Coated with at least 15-mils heat-fused PVC to provide a nonconductive inner liner.
3. Factory constructed to ensure the water supply line is centered in the casing. Insulators must not allow any pipe to casing contact and have at least 2 runners seated on the bottom of the casing.
4. Sized for the casing and water supply line shown.

#### **20-2.14C(2)(f) Dirt Stops**

Dirt stops must consist of a redwood cover with polyurethane foam.

Use construction heart grade redwood complying with 57-2.01B(2). Construct cover to fit snugly around the water supply line. The cover must be 2 inches taller and 2 inches wider than the casing.

Polyurethane foam must be expanding foam spray that is water resistant and moisture cured.

#### **20-2.14C(2)(g) Seismic Expansion Assemblies**

Seismic expansion assemblies must be a sleeve type expansion joint with integral ball joints at each end.

Seismic expansion assemblies must have:

1. Ability to withstand at least 15 degree angular deflection at each end and maximum movement in all 3 planes at the same time
2. Ductile iron body complying with ANSI/AWWA C153/A21.53
3. Flanged ends complying with ANSI/AWWA C110/A21.10
4. Fusion bonded epoxy internal lining complying with ANSI/AWWA C213 at least 15 mils thick
5. Internal expansion sleeve limiting stop collars and pressure balanced
6. Ball joints contained in flanged retainers with seal gaskets

- 7. Working pressure of at least 350 psi for sizes 24 inches and smaller and 250 psi for sizes larger than 24 inches
- 8. NSF 61 certification

The seismic expansion assembly must be factory set at 1/2 the extension capacity.

**20-2.14C(2)(h) Lateral Restraint Assemblies**

Lateral restraint assemblies must be (1) constructed from commercial quality steel components complying with section 75-1.02, (2) adjustable, and (3) able to resist a horizontal force of 10 percent of the contributory dead load.

**20-2.14C(3) Construction**

Each ductile iron pipe must be connected and fully extended (pulled out) after joint assembly before the next pipe section is added.

Install flange insulating gaskets on the outside flange of seismic expansion assemblies and expansion assemblies.

**20-2.14C(4) Payment**

Supply line on structures is paid for as supply line (bridge).

**20-2.15 TEMPORARY IRRIGATION SYSTEMS**

Reserved

**20-2.16–20-2.19 RESERVED**

**20-3 PLANTING**

**20-3.01 GENERAL**

**20-3.01A General**

**20-3.01A(1) Summary**

Section 20-3 includes specifications for performing planting work in new and existing landscapes.

**20-3.01A(2) Definitions**

Reserved

**20-3.01A(3) Submittals**

**20-3.01A(3)(a) General**

10-30-15

Submit nursery invoices showing sizes, quantities, and botanical names of plants, including genus, species, and variety. Include lot numbers for plants grown from the same seed lot or cutting source.

07-19-13

If a root stimulant is required, submit a copy of the root stimulant manufacturer's product sheet and instructions for the application of the root stimulant.

If cuttings are to be taken from outside the right-of-way, submit proof of permits and payment of associated fees. Notify the Engineer of the location at least 15 days before taking cuttings.

**20-3.01A(3)(b) Vendor Statements**

At least 60 days before planting the plants, submit a statement from the vendor that the order for the plants required, including sample plants used for inspection, has been received and accepted by the vendor. The statement from the vendor must include the plant names, sizes, and quantities and the anticipated delivery date.

**20-3.01A(3)(c) Certificates of Compliance**

Submit a certificate of compliance for:

- 1. Sod

2. Soil amendment

**20-3.01A(4) Quality Control and Assurance**

Plants must comply with federal and state laws requiring inspection for diseases and infestations. Inspection certificates required by law must accompany each shipment of plants.

10-30-16  
07-18-13

The Engineer inspects the roots of container-grown sample plants by removing earth from the rootball of not less than 2 plants, nor more than 2 percent of the total number of plants of each species or variety. If container-grown plants are purchased from several sources, the Engineer inspects the roots of not less than 2 of each sample plant species or variety from each source. The rootball of container grown plants must not show evidence of being underdeveloped, deformed, or having been restricted.

If the Engineer finds noncompliant plants, the entire lot represented by the noncompliant sample plants will be rejected.

Cuttings with mature or brown stems and cuttings that have been trimmed will be rejected.

**20-3.01B Materials**

**20-3.01B(1) General**

Notify the Engineer at least 10 days before the plants are shipped to the job site.

**20-3.01B(2) Plants**

**20-3.01B(2)(a) General**

Plants must be the variety and size shown and true to the type or name shown. Plants must be individually tagged or tagged in groups identifying the plants by species or variety. Tagging is not required for cuttings.

Plants must be healthy, well-formed, not root-bound, free from insect pests and disease, and grown in nurseries inspected by the Department of Food and Agriculture.

The plants must comply with the size and type shown in the following table:

Plant group designation	Description	Container size (cu in)
A	No. 1 container	152-251
B	No. 5 container	785-1242
C	Balled and burlapped	--
E	Bulb	--
F	In flats	--
H	Cutting	--
I	Pot	--
K	24-inch box	5775-6861
M	Liner <sup>a</sup>	--
O	Acorn	--
P	Plugs <sup>a, b</sup>	--
S	Seedling <sup>c</sup>	--
U	No. 15 container	2768-3696

<sup>a</sup>Do not use containers made of biodegradable material.

<sup>b</sup>Grown in individual container cells.

<sup>c</sup>Bare root.

Trucks used for transporting plants must be equipped with covers to protect plants from windburn.

Handle and pack plants in an authorized way for the species or variety.

**20-3.01B(2)(b) Cuttings****20-3.01B(2)(b)(i) General**

Take cuttings at random from healthy, vigorous plants. Make cuts with sharp, clean tools. Do not take more than 25 percent of an individual plant and not more than 50 percent of the plants in an area.

Keep cuttings covered and wet until planted. Do not allow cuttings to dry or wither.

Plant cuttings no more than 2 days after being cut.

**20-3.01B(2)(b)(ii) *Carpobrotus* and *Delosperma* Cuttings**

You may take cuttings for new *Carpobrotus* and *Delosperma* groundcover from the existing highway planting areas, but these areas may not provide enough material to complete the work. Contact the local District's encroachment permit office to obtain a permit to harvest cuttings, identify acceptable cutting harvest areas, and to determine acceptable quantities to take.

Take tip cuttings from healthy, vigorous *Carpobrotus* and *Delosperma* plants that are free of pests and disease.

*Carpobrotus* cuttings must be 10 inches or more in length and not have roots.

*Delosperma* cuttings must be 6 inches or more in length and not have roots.

**20-3.01B(2)(b)(iii) Willow Cuttings**

Take willow cuttings from areas shown or designated by the Engineer.

Willow cuttings must be:

1. Reasonably straight
2. 20 to 24 inches in length
3. 3/4 to 1-1/2 inch in diameter at the base of the cutting

Cut the top of each willow cutting square above a leaf bud. Cut the base below a leaf bud at approximately a 45 degree angle. Trim off leaves and branches flush with the stem of the cutting.

**20-3.01B(2)(b)(iv) Cottonwood Cuttings**

Cottonwood cuttings must comply with the requirements for willow cuttings in section 20-3.01B(2)(b)(iii).

**20-3.01B(2)(b)(v)–20-3.01B(2)(b)(viii) Reserved****20-3.01B(2)(c) Sod**

Sod must:

1. Be grown to comply with the Food & Agri Code
2. Be free from weeds and undesirable types of grasses and clovers
3. Be field-grown on soil containing less than 50 percent silt and clay
3. Have less than 1/2-inch-thick thatch
4. Not be less than 8 months or more than 16 months old
5. Be machine-cut to a uniform soil thickness of 5/8 ± 1/4 inch, not including top growth and thatch

Protect sod with tarps or other protective covers during delivery. Do not allow sod to dry out during delivery or before placement.

**20-3.01B(3) Soil Amendment**

Soil amendment must comply with the requirements in the Food & Agri Code. Soil amendment must be one or a combination of the following:

1. Sphagnum peat moss
2. Nitrolized fir bark
3. Vermiculite



## 4. Perlite

**20-3.01B(4) Fertilizers****20-3.01B(4)(a) General**

Deliver fertilizer in labeled containers showing weight, chemical analysis, and manufacturer's name.

Fertilizer must comply with the requirements of the Food & Agri Code.

**20-3.01B(4)(b) Slow-release Fertilizers**

Slow-release fertilizer must be a pelleted or granular form with a nutrient release over an 8 to 12 month period and must comply with the chemical analysis ranges shown in the following table:

Ingredient	Content (percent)
Nitrogen (N)	16-21
Phosphoric acid (P)	6-8
Water soluble potash (K)	4-10

**20-3.01B(4)(c) Packet Fertilizers**

Packet fertilizer must be a biodegradable packet with a nutrient release over a 12 month period. Each packet must have a weight of  $10 \pm 1$  grams and must comply with the chemical analysis shown in the following table:

Ingredient	Content (percent)
Nitrogen(N)	20
Phosphoric acid (P)	10
Water soluble potash (K)	5

**20-3.01B(4)(d) Organic Fertilizers**

Organic fertilizer must be pelleted or granular with a cumulative nitrogen release rate of no more than 70 percent for the first 70 days after incubation at 86 degrees F with 100 percent at 350 days or more. Organic fertilizer must comply with the chemical analysis shown in the following table:

Ingredient	Content (percent)
Nitrogen (N)	5-7
Phosphoric acid (P)	1-5
Water soluble potash (K)	1-10

**20-3.01B(5) Root Stimulants**

Root stimulant must be a commercial quality product.

**20-3.01B(6) Plaster Sand**

Backfill material for the palm tree planting holes must be 100 percent commercial quality washed plaster sand.

10-30-15

**20-3.01B(7) Root Barrier**

Root barrier must be an injection molded or extruded modular panel made of high-density polypropylene or polyethylene plastic.

07-19-13

Each panel must:

1. Be at least 1/16-inch thick
2. Have at least 4 molded root-deflecting vertical ribs 0.5- to 0.8-inch wide, 6 to 8 inches apart
3. Have a locking strip or an integral male-female sliding lock designed to resist slippage between panels
4. Be at least 2 feet wide and 2 feet in depth

#### **20-3.01B(8) Root Protectors**

Each root protector must be:

1. Fabricated from 1-inch, hexagonal pattern, 20-gauge mesh wire
2. Closed bottom design with a height and diameter that provides a minimum of 6 inches of clearance between the root ball and the sides and bottom of the wire cylinder

Wire edges at the top of the cylinder must be the uncut manufactured finished edge free of sharp points.

#### **20-3.01B(9) Foliage Protectors**

Each foliage protector must be:

1. Fabricated from 1-inch, hexagonal pattern, 20-gauge mesh wire
2. Approximately 4 feet high and 2 feet in diameter

Wire edges at the top of the cylinder must be the uncut manufactured finished edge free of sharp points. Other wire edges that are cut must be free of sharp points.

Support stakes must be one of the following:

1. 3/4-inch reinforcing steel bar a minimum of 5 feet long with an orange or red plastic safety cap that fits snugly onto the top of the reinforcing steel bar
2. 2-inch nominal diameter or 2 by 2 inch nominal size wood stakes a minimum of 5 feet long. Wood stakes must be straight

The jute mesh cover must comply with section 21-1.02O(2). Twine required to hold the jute mesh cover in place must be 1/8-inch diameter manila hemp twine.

#### **20-3.01B(10) Wood Plant Stakes**

Each plant stake must be nominal 2 by 2 inch or nominal 2-inch diameter and of sufficient length to keep the plant in an upright position.

Plant stakes for vines must be nominal 1 by 1 inch, 18 inches long.

#### **20-3.01B(11) Plant Ties**

Plant ties must be extruded vinyl-based tape, 1 inch wide and at least 10 mils thick.

#### **20-3.01C Construction**

##### **20-3.01C(1) General**

Apply a root stimulant under the manufacturer's instructions to the plants specified in the special provisions.

Before transporting the plants to the planting area, thoroughly wet the root ball.

##### **20-3.01C(2) Pruning**

Prune plants under the latest edition of ANSI A300 part 1, *Pruning*, published by the Tree Care Industry Association.

Do not use tree seal compounds to cover pruning cuts.

**20-3.01C(3) Watering**

Water existing plants to be maintained, transplanted trees, and new plants as needed to keep the plants in a healthy growing condition.

**20-3.01C(4) Replacement Plants**

Plants that show signs of failure to grow at any time or are so injured or damaged as to render them unsuitable for the purpose intended, must be removed, replaced, and replanted. Replace unsuitable plants within 2 weeks after the Engineer marks or indicates that the plants must be replaced.

Replacement planting must comply with the original planting requirements, spacing, and size provisions described for the plants being replaced.

Replacement planting for transplanted trees must comply with the work plan and be planted in the same planting hole.

Replacement ground cover plants must be the same species specified for the ground cover being replaced. Other replacement plants must be the same species as the plants being replaced.

Place orders for replacement plants with the vendor at the appropriate time so that the replacement plants are not in a root-bound condition.

The Department does not pay for replacement plants or the planting of replacement plants.

**20-3.01C(5) Maintain Plants**

Maintain plants from the time of planting until Contract acceptance if no plant establishment period is specified or until the start of the plant establishment period.

**20-3.01D Payment**

Reserved

**20-3.02 EXISTING PLANTING****20-3.02A General****20-3.02A(1) Summary**

Section 20-3.02 includes specifications for pruning existing plants, transplanting trees, and maintaining existing planted areas.

Transplant palm trees between March 15 and October 15.

**20-3.02A(2) Definitions**

Reserved

**20-3.02A(3) Submittals**

Submit a work plan for:

1. Transplanting trees. The work plan must include methods for lifting, transporting, storing, planting, guying, and maintaining each tree to be transplanted. Include root ball size, method of root ball containment, and a maintenance program for each tree.
2. Maintaining existing planted areas. The work plan must include weed control, fertilization, mowing and trimming of turf areas, watering, and controlling rodents and pests.

Submit a copy of the manufacturer's product sheet for root stimulant including application instructions.

**20-3.02A(4) Quality Control and Assurance**

Inspect for deficiencies of existing planted areas in the presence of the Engineer. Complete the inspection within 15 days after the start of job site activities.

Deficiencies requiring corrective action include:

1. Weeds
2. Dead, diseased, or unhealthy plants
3. Missing plant stakes and tree ties
4. Inadequate plant basins and basin mulch
5. Other deficiencies needing corrective action to promote healthy plant life
6. Rodents and pests

### 20-3.02B Materials

Not Used

### 20-3.02C Construction

#### 20-3.02C(1) General

Correct deficiencies of existing planted areas as ordered within 15 days of the order. Correction of deficiencies is change order work.

After deficiencies are corrected, perform work to maintain existing planted areas in a neat and presentable condition and to promote healthy plant growth through Contract acceptance.

#### 20-3.02C(2) Prune Existing Plants

Prune existing plants as shown.

If no bid item for prune existing plants is included, prune existing plants as ordered. Pruning existing plants is change order work.

#### 20-3.02C(3) Transplant Trees

Prune each tree to be transplanted immediately before lifting.

If the tree to be transplanted is a palm, prune by removing dead fronds and frond stubs from the trunk. Remove green fronds up to 2 rows of fronds away from the center of growth. Tie the remaining 2 rows of fronds in an upright position with light hemp or manila rope. Remove fronds and frond stubs at the trunk in a manner that will not injure the trunk. Remove fronds and frond stubs for *Phoenix dactylifera* (Date Palm) approximately 4 inches from the trunk.

Prepare each hole in the new location before lifting the tree to be transplanted.

Lift tree to be transplanted as described in the work plan.

Comply with section 20-3.03C(3) for handling and planting each tree to be transplanted.

Until replanted, cover exposed root ball with wet burlap or canvas and cover the crown with 90 percent shade cloth.

Replant each tree on the same day it is lifted if possible. If the transplant location is not ready to receive the tree, store and maintain the tree to be transplanted until the transplant location is authorized. Store tree in an upright position.

Replace damaged transplanted tree under 20-3.01C(4) and with the number of trees specified in the special provisions.

The replacement trees must be planted in individual plant holes at the location determined by the Engineer within the area of the tree being replaced. Comply with section 20-3.03C(2) for the planting of the replacement trees.

#### 20-3.02C(4) Maintain Existing Planted Areas

If a bid item for maintain existing planted areas is included, the existing plant basins must be kept well-formed and free of sediment. If the existing plant basins need repairs, and the basins contain mulch, replace the mulch after the repairs are done.

Control weeds within the existing planted area and:

1. From the existing planted area limit to the adjacent edges of paving and fences if less than or equal to 12 feet.
2. From the existing planted area limit to 6 feet beyond the outer limit of the existing planted area if the adjacent edge of paving or fence is more than 12 feet away
3. Within a 3-foot radius from each existing tree and shrub

If no bid item for maintain existing planted areas is included, maintain existing planted areas as ordered. Maintain existing planted areas is change order work.

#### **20-3.02D Payment**

Not Used

### **20-3.03 PLANTING WORK**

#### **20-3.03A General**

Section 20-3.03 includes specifications for planting plants.

#### **20-3.03B Materials**

Not Used

#### **20-3.03C Construction**

##### **20-3.03C(1) General**

Do not begin planting until authorized.

If an irrigation system is required, do not begin planting in an area until the functional test has been completed and authorized for the irrigation system serving that area.

##### **20-3.03C(2) Preparing Planting Areas**

The location of each plant is as shown unless the Engineer designates otherwise. If the Engineer designates the location, it will be marked by a stake, flag, or other marker.

Conduct work so the existing flow line in drainage ditches is maintained. Material displaced by your operations that interferes with drainage must be removed.

Where a minimum distance to a drainage ditch is shown, locate the plant so that the outer edge of its basin wall is at least the minimum distance shown for each plant involved.

Excavate each planting hole by hand digging or by drilling. The bottom of each planting hole must be flat. Do not use water for excavating the hole.

Unless a larger planting hole is specified, the planting hole must be large enough to receive the root ball or the total length and width of roots, backfill, amendments, and fertilizer. Where rock or other hard material prohibits the hole from being excavated, a new hole must be excavated and the abandoned hole backfilled.

##### **20-3.03C(3) Planting Plants**

###### **20-3.03C(3)(a) General**

Do not plant plants in soil that is too wet, too dry, not properly conditioned as specified, or in an unsatisfactory condition for planting.

Do not distribute more plants than can be planted and watered on that day.

Water plants immediately after planting. Apply water until the backfill soil around and below the roots or ball of earth around the roots of each plant is thoroughly saturated. When watering with a hose, use a nozzle, water disbursement device, or pressure reducing device. Do not allow the full force of the water from the open end of the hose to fall within the basin around any plant. Groundcover plants in areas with an irrigation system must be watered by sprinklers. Several consecutive watering cycles may be necessary to thoroughly saturate the soil.

If shown, install root barriers between trees and concrete sidewalk or curb. Install panels flush with finished grade and join with locking strips or integral male-female sliding locks. Install barriers with root deflectors facing inward.

If a tree grate is shown, install root barrier panels 0.5 inch above finish grade or as shown.

Adjust planting locations so that each tree or shrub is at least 8 feet away from any sprinkler.

Where a tree, shrub, or vine is to be planted within a groundcover area or cutting planting area, plant it before planting groundcover or cuttings.

Where shrubs and groundcovers are shown to be planted in groups, the outer rows directly adjacent to the nearest roadway or highway fence must be parallel to the nearest roadway or highway fence. Stagger shrubs and groundcovers in adjacent rows. Adjust the alignment of the plants within the outer rows.

Core holes in concrete masonry block wall as shown.

Where a vine is to be planted against a wall or fence, plant it as close as possible to the wall or fence. If a vine planted next to a wall is to be staked, stake and tie the vine at the time of planting. A vine planted next to a fence must be tied to the fence at the time of planting.

Protect tree trunks from injury. Do not:

1. Drag tree
2. Use chains to move a tree
3. Lay tree on the ground

### **20-3.03C(3)(b) Trees, Shrubs, and Vines**

After preparing holes, thoroughly mix soil amendment and granular fertilizer at the rate shown with native soil to be used as backfill material. Remove containers from plants in such a manner that the ball of earth surrounding the roots is not broken. Do not cut plant containers before delivery of the plants to the planting area. Plant and water plants immediately after removal from their containers.

Place packet fertilizer in the backfill within 6 to 8 inches of the ground surface and approximately 1 inch from the root ball. If more than 1 packet is required per plant, distribute the packets evenly around the root ball.

If a root stimulant is to be used, apply it according to the manufacturer's instructions.

If required, install root protectors in the plant holes as shown.

Ensure roots are not restricted or distorted.

Distribute backfill uniformly throughout the entire depth of the plant hole without clods or lumps. After the planting holes have been backfilled, jet water into the backfill with a pipe or tube inserted into the bottom of the hole until the backfill material is saturated for the full depth. If the backfill material settles below this level, add additional backfill to the required level. If a plant settles deeper than shown, replant it at the required level.

Remove nursery stakes after planting.

Install 2 plant stakes for each plant to be staked at the time of planting as shown. Ensure the rootball is not damaged.

Tie the plant to the stakes with 2 plant ties, 1 tie to each stake. Each tie must form a figure 8 by crossing the tie between the plant and the stake as shown. Install ties at the lowest position that will support the plant in an upright position. Ties must provide trunk flexibility but not allow the trunk to rub against the stakes. Wrap each end of the tie 1-1/2 turns around the stake and securely tie.

Construct a watering basin around each plant as shown.

If required, install a foliage protector:

1. Over the plant within 2 days after planting.
2. Vertically and centered over the plant as shown

If foliage protectors are required:

1. Cut the bottom of the wire cylinder to match the slope of the ground. Do not leave sharp points of wire after cutting. Sharp points must be bent over or blunted.
2. Install 2 support stakes for foliage protectors vertically and embed in the soil on opposite sides of the plant as shown and in a transverse direction to the prevailing wind.
3. Either weave the support stakes through the wire cylinder mesh at 6 inch maximum centers or fasten the wire cylinder to the support stakes at 6 inch maximum centers.
4. Wire cylinder must be snug against the support stakes but loose enough to be raised for pesticide application or to perform weeding within the plant basin.
5. Install jute mesh cover over the foliage protector and secure with twine as shown.

### **20-3.03C(3)(c) Groundcover Plants**

Each groundcover planting area irrigated by a single control valve must be completely planted and watered before planting other groundcover planting areas.

Plant groundcover plants in moist soil, and in neat, straight rows, spaced as shown.

Apply fertilizer to groundcover plants and water into the soil immediately after planting.

### **20-3.03C(3)(d) Cuttings, Liners, Plugs, and Seedling Plants**

#### **20-3.03C(3)(d)(i) General**

Apply fertilizer to cuttings, liners, plugs, and seedling plants and water immediately after planting.

Ensure the soil is moist to a minimum depth of 8 inches before planting cuttings.

If a root stimulant is to be used, apply it according to the manufacturer's instructions.

#### **20-3.03C(3)(d)(ii) Willow Cuttings**

Unless otherwise shown, for willow cuttings excavate planting holes perpendicular to the ground line by using a steel bar, auger, post hole digger, or similar tools. Holes must be large enough to receive the cuttings and fertilizer packet. Plant willow cuttings to the specified depths without damaging the bark.

Where rock or other hard material prohibits the excavation of the planting holes, excavate new holes and backfill the unused holes.

Plant willow cuttings during the period specified in the special provisions.

Apply root stimulant according to the manufacturer's instructions.

Plant the base of the cutting 10 to 12 inches deep with 3 to 5 bud scars exposed above the ground. If more than 5 bud scars are exposed, trim off the excess willow cutting length.

Place 1 fertilizer packet in the backfill of each cutting, 6 to 8 inches below the ground surface and approximately 1 inch from the cutting.

Backfill the plant holes with excavated material after planting. Distribute the excavated material evenly within the hole without clods, lumps, or air pockets. Compact the backfill so that the cutting cannot be easily removed from the soil. Do not damage the cutting's bark.

Dispose of trimmings and unused cuttings.

#### **20-3.03C(3)(d)(iii) Cottonwood Cuttings**

Reserved

**20-3.03C(3)(d)(iv) *Carpobrotus* and *Delosperma* Cuttings**

Plant *Carpobrotus* cuttings to a depth so that not less than 2 nodes are covered with soil. The basal end of *Delosperma* cuttings must not be less than 2 inches below the surface of the soil and the basal end of *Carpobrotus* cuttings must not be less than 4 inches below the surface of the soil.

Apply root stimulant to *Delosperma* cuttings before planting.

Do not plant *Carpobrotus* or *Delosperma* cuttings in soil that does not contain sufficient moisture at an average depth of 2 inches below the surface.

**20-3.03C(3)(d)(v) Liner Plants**

Plant liner plants during the period specified in the special provisions.

If a foliage protector is required, install under section 20-3.03C(3)(b).

**20-3.03C(3)(d)(vi) Plug Plants**

Plant plug plants during the period specified in the special provisions.

**20-3.03C(3)(d)(vii) Seedling Plants**

Plant seedling plants during the period specified in the special provisions.

**20-3.03C(3)(e) Sod**

After all other planting is performed, grade sod areas to drain and to a smooth and uniform surface. Fine grade and roll sod areas before placing sod.

Areas adjacent to sidewalks, edging, and other paved borders and surfaced areas must be 1 inch below the finished surface elevation of the facilities, after fine grading, rolling, and settlement of the soil.

Place sod such that the end of each adjacent strip is staggered a minimum of 2 feet. Place the edge and end of sod firmly against adjacent sod and against sidewalks, edging, and other paved borders and surfaced areas.

Lightly roll the entire sodded area to eliminate air pockets and ensure close contact with the soil after placement of sod. Water the sodded areas so that the soil is moist to a minimum depth of 4 inches after rolling. Do not allow the sod to dry out.

If irregular or uneven areas appear in the sodded areas, restore to a smooth and even appearance.

Trim sod to a uniform edge at sidewalks, edging, and other paved borders and surfaced areas. Trimming must be repeated whenever the edge of sod extends 1 inch beyond the edge of the edging, sidewalks, and other paved borders and surfaced areas. Remove and dispose of trimmed sod.

Mow sod when it has reached a height of 4 inches. Mow sod to a height of 2.5 inches.

**20-3.03D Payment**

Soil amendment is measured in the vehicle at the point of delivery.

Measurement for slow-release fertilizer, organic fertilizer, or iron sulfate is determined from marked weight or sack count.

Various sizes and types of plants are measured by either the product of the average plant density and the total area planted or by actual count of the living plants in place, determined by the Engineer. The average plant density is the number of living plants per sq yd determined from actual count of test areas chosen representing the total planted area. The size and location of the test areas is determined by you and the Engineer, except that the total area tested must be equal to not less than 3 percent nor more than 5 percent of the planted area being determined. The Engineer makes the final determination of the areas to be tested.



**20-3.04–20-3.08 RESERVED****20-4 PLANT ESTABLISHMENT WORK****20-4.01 GENERAL****20-4.01A Summary**

Section 20-4 includes specifications for performing plant establishment work.

Plant establishment consists of caring for the plants, including watering, fertilizing, pruning, replacing damaged plants, pest control, and operating and repairing of all existing irrigation facilities used and irrigation facilities installed as part of the new irrigation system.

Working days on which no work is required, as determined by the Engineer, will be credited as a plant establishment working day, regardless of whether or not you perform plant establishment work.

Working days whenever you fail to adequately perform plant establishment work will not be credited toward the plant establishment working days.

**20-4.01B Definitions**

**Type 1 plant establishment:** Plant establishment period with the number of working days specified for plant establishment beginning after all work has been completed except for plant establishment work and other bid items specified to be performed until Contract acceptance.

**Type 2 plant establishment:** Plant establishment period with the number of working days specified for plant establishment beginning after all planting work has been completed except for plant establishment work and other bid items specified to be performed until Contract acceptance, provided that the Contract must not be accepted unless the plant establishment work has been satisfactorily performed for at least the number of working days specified for plant establishment.

If maintenance and protection relief is granted for a completed portion of the work under section 5-1.38, Type 2 plant establishment period for the completed portion of the work is the time between completion of all planting work except for plant establishment work, and the granting of maintenance and protection relief, provided that the relief must not be granted unless the plant establishment work in the completed portion of the work has been satisfactorily performed for at least the number of working days specified for the plant establishment period.

**20-4.01C Submittals****20-4.01C(1) General**

Submit seasonal watering schedules for use during the plant establishment period within 10 days after the start of the plant establishment period. Remote irrigation control system watering schedule must utilize the remote irrigation control system software program.

Submit updated watering schedules within 5 business days after any changes have been made to the authorized schedules.

Submit a revised watering schedule for each irrigation controller not less than 30 days before completion of the plant establishment period.

**20-4.01C(2) Notification**

The Engineer will notify you in writing when the plant establishment period begins and will furnish statements regarding the number of working days credited to the plant establishment period after the notification.

Notify the Engineer at least 5 business days before applying each application of fertilizer.

**20-4.01D Quality Control and Assurance**

Provide training by a qualified person on the use and adjustment of the irrigation controllers installed, 30 days before completion of the plant establishment period.



Perform a final inspection of the plant establishment work in the presence of the Engineer between 20 and 30 days before Contract acceptance.

#### **20-4.02 MATERIALS**

##### **20-4.02A General**

Reserved

##### **20-4.02B Fertilizers**

Fertilizer must comply with section 20-3.01B(5).

#### **20-4.03 CONSTRUCTION**

##### **20-4.03A General**

Remove trash and debris.

Surplus earth accumulated in roadside clearing and planting areas must be removed.

Trim and mow turf areas as specified for sod in section 20-3.03C(3)(e). Dispose of trimmed and mowed material.

If irregular or uneven areas appear within turf areas, restore to a smooth and even appearance. Reseed turf seed areas.

Remove the tops of foliage protectors if plants become restricted.

Remove foliage protectors, including support stakes, within 30 days before the completion of the plant establishment period.

Keep plant basin walls well formed.

Clean new wye strainers and existing wye strainers that are a part of the new irrigation system annually until the completion of the plant establishment period. The last cleaning must be done within 15 days before the completion of the plant establishment period.

Remove, clean, and reinstall new filters and existing filters that are a part of the new irrigation system annually until the completion of the plant establishment period. The last cleaning must be done within 15 days before the completion of the plant establishment period.

##### **20-4.03B Plant Growth Control**

Prune plants planted as part of the Contract as authorized.

Remove plant growth that extends within 2 feet of sidewalks, curbs, dikes, shoulders, walls or fences.

Remove proposed and existing ground cover from within the plant basins, including basin walls, turf areas, and planting areas within edging.

Vines next to walls and fences must be kept staked and tied. Train vines on fences and walls or through cored holes in walls.

##### **20-4.03C Fertilizers**

Apply fertilizer to the plants as specified and water into the soil after each application.

Apply fertilizer at the rates shown and spread with a mechanical spreader, whenever possible.

##### **20-4.03D Weed Control**

Control weeds under section 20-1.03C(3).

##### **20-4.03E Plant Staking**

Replace the plant stakes that are inadequate to support plants with larger stakes.

Remove plant stakes when the Engineer determines they are no longer needed.

**20-4.03F Replacement Plants**

Replacement plants must comply with section 20-3.01C(4).

Replacement of plants up to and including the 125th plant establishment working day must be with a plant of the same size as originally specified. Plants of a larger container size than those originally specified for replacement plants may be used during the first 125 working days of the plant establishment period.

Replacement of plants after the 125th plant establishment working day must comply with the following size requirements:

Plant size (Original)	Plant size (Replacement)
Pot/liner/plug/seedling	No. 1 container
No. 1 container	No. 5 container
No. 5 container	No. 15 container

Other replacement plants must be the same size as originally specified.

Replacement ground cover plants must comply with the following spacing requirements:

Original spacing (inches)	On center spacing of replacement ground cover plants (inches)		
	Number of completed plant establishment working days		
	1-125	126-190	191-End of plant establishment period
9	9	6	6
12	12	9	6
18	18	12	9
24	24	18	12
36	36	24	18

**20-4.03G Watering**

Operate the electric automatic irrigation systems in the automatic mode unless authorized.

If any component of the electric automatic irrigation system is operated manually, the day will not be credited as a plant establishment working day unless the manual operation is authorized.

Water plants utilizing the remote irrigation control system software program unless authorized.

Implement the watering schedule at least 10 days before completion of the plant establishment period.

**20-4.04 PAYMENT**

Not Used

**20-5 LANDSCAPE ELEMENTS**

**20-5.01 GENERAL**

**20-5.01A General**

Section 20-5 includes specifications for constructing and installing landscape elements.

**20-5.01B Materials**

Not Used

**20-5.01C Construction**

Earthwork must comply with section 19.

**20-5.01D Payment**

Not Used

**20-5.02 EDGING****20-5.02A General**

Section 20-5.02 includes specifications for constructing landscape edging.

**20-5.02B Materials****20-5.02B(1) General**

Reserved

**20-5.02B(2) Header Board Edging**

Lumber for header board edging must be one of the following types:

1. Construction grade cedar
2. Pressure-treated Douglas fir
3. Construction heart grade redwood complying with section 57-2.01B(2)

Lumber must be:

1. Rough cut from sound timber.
2. Straight. Sweep must not exceed 1 inch in 6 feet.
3. Free from loose or unsound knots. Knots must be sound, tight, well spaced, and not to exceed 2 inches in size on any face.
4. Free of shakes in excess of 1/3 the thickness of the lumber.
5. Free of splits longer than the thickness of the lumber.
6. Free of other defects that would render the lumber unfit structurally for the purpose intended.

Edging anchors for header board edging must be stakes of the size and shape shown.

**20-5.02B(3) Metal Edging**

Metal edging must be commercial quality, made of aluminum or steel, and have an L-shaped design. Edging must be a minimum of 4 inches in height. The thickness must be as recommended by the manufacturer for the use intended.

Edging anchors must be from the same manufacturer as the metal edging.

**20-5.02B(4) High Density Polyethylene Edging**

HDPE edging must be commercial quality and a minimum of 4 inches in height. The thickness must be as recommended by the manufacturer for commercial installation for the use intended.

Edging anchors must be from the same manufacturer as HDPE edging.

**20-5.02B(5) Concrete Edging**

Concrete for edging must be minor concrete.

**20-5.02B(6)–20-5.02B(10) Reserved****20-5.02C Construction****20-5.02C(1) General**

Where edging is used to delineate the limits of inert ground cover or mulch areas, install edging before installing inert ground cover or mulch areas.

Saw cut surfaces where (1) asphalt concrete or concrete surfacing must be removed to permit the installation of edging and (2) no joint exists between the surfacing to be removed and the surfacing to

remain in place. The surfacing must be cut in a straight line to a minimum depth of 2 inches with a power-driven saw before the surfacing is removed. Spike or stake spacing must comply with the manufacturer's instructions for use and site conditions.

**20-5.02C(2) Header Board Edging**

Each stake must be driven flush with the top edge of the header board edging and the stake top must be beveled away from the header board at a 45 degree angle. Attach stake to header board with a minimum of two 12-penny hot dipped galvanized nails per stake.

**20-5.02C(3) Metal and High Density Polyethylene Edging**

Spike or stake spacing must comply with the manufacturer's instructions for use and site conditions.

**20-5.02C(4) Concrete Edging**

Construct and finish minor concrete edging under section 73-2.

**20-5.02C(5)–20-5.02C(9) Reserved**

**20-5.02D Payment**

Edging is measured parallel to the ground surface.

**20-5.03 INERT GROUND COVERS AND MULCHES**

**20-5.03A General**

**20-5.03A(1) General**

**20-5.03A(1)(a) Summary**

Section 20-5.03 includes specifications for installing inert ground covers and mulches.

**20-5.03A(1)(b) Definitions**

Reserved

**20-5.03A(1)(c) Submittals**

Submit:

1. Filter fabric product data including the manufacturer's product sheet and installation instructions
2. Certificate of compliance for filter fabric at least 5 business days before delivery of the material to the job site

**20-5.03A(1)(d) Quality Control and Assurance**

Reserved

**20-5.03A(2) Materials**

Soil sterilant must be oxadiazon granular preemergent and must comply with section 20-1.02C.

Filter fabric must be Class A. Staples for filter fabric must comply with section 21-1.02R.

**20-5.03A(3) Construction**

**20-5.03A(3)(a) General**

Before performing inert ground cover and mulch work, remove plants and weeds to ground level.

**20-5.03A(3)(b) Earthwork**

Excavate areas to receive inert ground cover or mulch to the depth shown. Maintain the planned flow lines, slope gradients, and contours of the job site. Grade subgrade to a smooth and uniform surface and compact to not less than 90 percent relative compaction.

**20-5.03A(3)(c) Treatment of Soil**

After compaction, apply soil sterilant at the maximum label rate. Do not apply soil sterilant more than 12 inches beyond the inert ground cover or mulch limits. The soil sterilant application and inert ground cover or mulch placement must be completed within the same work day.

**20-5.03A(3)(d) Filter Fabric**

Immediately before placing filter fabric, surfaces to receive filter fabric must be free of loose or extraneous material and sharp objects that may damage the filter fabric during installation.

Align fabric and place in a wrinkle-free manner.

Overlap adjacent rolls of the fabric from 12 to 18 inches. Spread each overlapping roll in the same direction. Fasten fabric with staples flush with the adjacent fabric to prevent movement of fabric by placement of inert ground cover or mulch.

Repair or replace fabric damaged during placement of inert ground cover or mulch with sufficient fabric to comply with overlap requirements.

**20-5.03A(4) Payment**

Not Used

**20-5.03B Rock Blanket**

**20-5.03B(1) General**

**20-5.03B(1)(a) Summary**

Section 20-5.03B includes specifications for placing rock blanket.

**20-5.03B(1)(b) Definitions**

Reserved

**20-5.03B(1)(c) Submittals**

Submit a 1 sq yd sample of the various rock sizes.

**20-5.03B(1)(d) Quality Control and Assurance**

Reserved

**20-5.03B(2) Materials**

**20-5.03B(2)(a) General**

Do not use filter fabric.

**20-5.03B(2)(b) Concrete**

Concrete must be minor concrete.

**20-5.03B(2)(c) Rock**

Rock must be clean, smooth, and obtained from a single source and must comply with the following grading requirements:

**Grading Requirements**

Screen size (inches)	Percentage passing
8	100
6	50-85
4	0-50

**20-5.03B(2)(d) Mortar**

Mortar must comply with section 51-1.02F.

**20-5.03B(3) Construction**

Place concrete as shown.

Rock must be placed while concrete is still plastic. Remove concrete adhering to the exposed surfaces of the rock.

Loose rocks or rocks with a gap greater than 3/8 inch must be reset by an authorized method. The rock gap is measured from the edge of the rock to the surrounding concrete bedding.

Place mortar as shown.

**20-5.03B(4) Payment**

Rock blanket is measured parallel to the rock blanket surface.

**20-5.03C Gravel Mulch**

**20-5.03C(1) General**

**20-5.03C(1)(a) Summary**

Section 20-5.03C includes specifications for placing gravel mulch.

**20-5.03C(1)(b) Definitions**

Reserved

**20-5.03C(1)(c) Submittals**

Submit a 5-lb sample of the gravel mulch.

**20-5.03C(1)(d) Quality Control and Assurance**

Reserved

**20-5.03C(2) Materials**

Gravel mulch must be:

1. Uniform gray color
2. From a single source only
3. Crushed rock that complies with the following grading requirements:

**Grading Requirements**

Sieve size	Percent passing
1-1/4 inch	100
3/4 inch	60-80
1/2 inch	45-65
No. 40	5-20

**20-5.03C(3) Construction**

Place gravel and compact by rolling.

The finished gravel mulch surface must be smooth and uniform, maintaining original flow lines, slope gradients, and contours of the job site.

**20-5.03C(4) Payment**

Gravel mulch is measured parallel to the gravel mulch surface.

**20-5.03D Decomposed Granite**

**20-5.03D(1) General**

**20-5.03D(1)(a) Summary**

Section 20-5.03D includes specifications for placing decomposed granite.

**20-5.03D(1)(b) Definitions**

Reserved

**20-5.03D(1)(c) Submittals**

Five business days before delivery of the materials to the job site, submit:

1. Solidifying emulsion product data including the manufacturers' product sheets and installation instructions
2. Certificate of compliance for solidifying emulsion
3. 5-lb sample of the decomposed granite

**20-5.03D(1)(d) Quality Control and Assurance**

Test plot must be:

1. Constructed at an authorized location
2. At least 3 by 12 feet
3. Constructed using the materials, equipment, and methods to be used in the work
4. Authorized before starting work

Notify the Engineer not less than 7 days before constructing the test plot.

The Engineer uses the authorized test plot to determine acceptability of the work.

If ordered, prepare additional test plots. Additional test plots are change order work.

If the test plot is not incorporated into the work, the Engineer may order you to remove it.

**20-5.03D(2) Materials**

**20-5.03D(2)(a) General**

Decomposed granite must be:

1. Uniform gray or tan color
2. From one source only
3. Crushed granite rock that complies with grading requirements shown in the following table:

**Grading Requirements**

Sieve size	Percent passing
3/8 inch	100
No. 4	95-100
No. 8	75-80
No. 16	55-65
No. 30	40-50
No. 50	25-35
No. 100	20-25
No. 200	5-15

Note:

Grading based upon AASHTO T11-82 and T27-82

**20-5.03D(2)(b) Solidifying Emulsion**

Solidifying emulsion must be either a water-based polymer or nontoxic organic powdered binder specifically manufactured to harden decomposed granite. The solidifying emulsion must not alter the decomposed granite color.

**20-5.03D(3) Construction**

Do not place decomposed granite during rainy conditions.

Mix solidifying emulsion thoroughly and uniformly throughout the decomposed granite and under the manufacturer's instructions. Mix the material in the field using portable mixing equipment, or delivered in mixer trucks from a local ready-mixed plant.



Place decomposed granite uniformly in layers no more than 1-1/2 inch thick. Compact each layer of decomposed granite to a relative compaction of not less than 90 percent. Begin compaction within 6 to 48 hours of placement.

If the material was mixed in the field, apply an application of solidifying emulsion after compaction as recommended by the manufacturer. Prevent runoff or overspray of solidifying emulsion onto adjacent paved or planting areas.

The finished decomposed granite surface must be smooth and uniform, compacted to a relative compaction of not less than 90 percent, maintaining original flow lines, slope gradients, and contours of the job site.

#### **20-5.03D(4) Payment**

Not Used

#### **20-5.03E Wood Mulch**

##### **20-5.03E(1) General**

##### **20-5.03E(1)(a) Summary**

Section 20-5.03E includes specifications for placing wood mulch.

##### **20-5.03E(1)(b) Definitions**

Reserved

##### **20-5.03E(1)(c) Submittals**

Submit a certificate of compliance for mulch.

Submit a 2 cu ft mulch sample with the mulch source listed on the bag and obtain approval before delivery of mulch to the job site.

##### **20-5.03E(1)(d) Quality Control and Assurance**

Reserved

##### **20-5.03E(2) Materials**

##### **20-5.03E(2)(a) General**

Mulch must not contain more than 0.1 percent of deleterious materials such as rocks, glass, plastics, metals, clods, weeds, weed seeds, coarse objects, sticks larger than the specified particle size, salts, paint, petroleum products, pesticides or other chemical residues harmful to plant or animal life.

Do not use filter fabric.

##### **20-5.03E(2)(b) Tree Bark Mulch**

Tree bark mulch must be derived from cedar, Douglas fir, or redwood species.

Tree bark mulch must be ground so that at least 95 percent of the material by volume is less than 2 inches and no more than 30 percent by volume is less than 1 inch.

##### **20-5.03E(2)(c) Wood Chip Mulch**

Wood chip mulch must:

1. Be derived from clean wood
2. Not contain leaves or small twigs
3. Contain at least 95 percent wood chips by volume with average thickness of 1/16 to 3/8 inch in any direction and 1/2 to 3 inches in length

##### **20-5.03E(2)(d) Shredded Bark Mulch**

Shredded bark mulch must:

1. Be derived from trees

- 2. Be a blend of loose, long, thin wood, or bark pieces
- 3. Contain at least 95 percent wood strands by volume with average thickness of 1/8 to 1-1/2 inches in any direction and 2 to 8 inches in length

**20-5.03E(2)(e) Tree Trimming Mulch**

Tree trimming mulch must:

- 1. Be derived from chipped trees and may contain leaves and small twigs.
- 2. Contain at least 95 percent material by volume less than 3 inches and no more than 30 percent by volume less than 1 inch

**20-5.03E(2)(f)–20-5.03E(2)(j) Reserved**

**20-5.03E(3) Construction**

Spread mulch placed in areas outside of plant basins to a uniform thickness as shown.

Mulch must be placed at the rate described and placed in the plant basins or spread in areas as shown after the plants have been planted. Mulch placed in plant basins must not come in contact with the plant crown and stem.

Spread mulch from the outside edge of the proposed plant basin or plant without basin to the adjacent edges of shoulders, paving, retaining walls, dikes, edging, curbs, sidewalks, walls, fences, and existing plantings. If the proposed plant or plant without basin is 12 feet or more from the adjacent edges of shoulders, paving, retaining walls, dikes, edging, curbs, sidewalks, walls, fences, and existing plantings, spread the mulch 6 feet beyond the outside edge of the proposed plant basin or plant without basin.

Do not place mulch within 4 feet of:

- 1. Flow line of earthen drainage ditches
- 2. Edge of paved ditches
- 3. Drainage flow lines

**20-5.03E(4) Payment**

Mulch is measured in the vehicle at the point of delivery.

**20-5.03F–20-5.03J Reserved**

**20-5.04 RESERVED**

Reserved

**20-5.05 SITE FURNISHINGS**

**20-5.05A General**

Section 20-5.05 includes specifications for installing site furnishings.

**20-5.05B–20-5.05Z Reserved**

**20-5.06–20-5.10 RESERVED**

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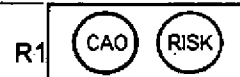
**21 EROSION CONTROL**

07-19-13

**Replace ", bonded fiber matrix, and polymer-stabilized fiber matrix" in the 1st paragraph of section 21-1.01B with:**

and bonded fiber matrix

04-20-12



**Delete the last paragraph of section 21-1.02E.**

04-20-12

**Replace section 21-1.02F(2) with:**

**21-1.02F(2) Reserved**

04-20-12

**Replace "20-7.02D(1)" in the 1st paragraph of section 21-1.02H with:**

**20-3.01B(4)**

07-19-13

**Replace section 21-1.02J with:**

**21-1.02J Reserved**

04-20-12

**Replace the row for organic matter content in the table in the 4th paragraph of section 21-1.02M with:**

01-18-13

Organic matter content	TMECC 05.07-A Loss-on-ignition organic matter method (LOI) % dry weight basis	30-100
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**Replace the paragraph in section 21-1.02P with:**

10-19-12

Fiber roll must be a premanufactured roll filled with rice or wheat straw, wood excelsior, or coconut fiber. Fiber roll must be covered with biodegradable jute, sisal, or coir fiber netting secured tightly at each end and must be one of the following:

1. 8 to 10 inches in diameter and at least 1.1 lb/ft
2. 10 to 12 inches in diameter and at least 3 lb/ft

Fiber roll must have a minimum functional longevity of 1 year.

**Add between the 1st and 2nd paragraphs of section 21-1.03A:**

01-18-13

Remove and dispose of trash, debris, and weeds in areas to receive erosion control materials.

Remove and dispose of loose rocks larger than 2-1/2 inches in maximum dimension unless otherwise authorized.

Protect the traveled way, sidewalks, lined drainage channels, and existing vegetation from overspray of hydraulically-applied material.

Replace section 21-1.03B with:

01-18-13

21-1.03B Reserved

Replace "3 passes" in item 2 in the list in the 2nd paragraph of section 21-1.03G with:

04-18-13

2 passes

Replace section 21-1.03I with:

04-20-12

21-1.03I Reserved

Add between the 4th and 5th paragraphs of section 21-1.03P:

10-19-12

If soil conditions do not permit driving the stakes into the soil, drill pilot holes to facilitate driving of the stakes.

Delete the 1st and 2nd sentences of the 3rd paragraph in section 21-1.04.

01-18-13

AA

**28 CONCRETE BASES**

11-15-13

Replace "Reserved" in section 28-1 with:

07-19-13

Section 28 includes specifications for constructing new concrete base and replacing existing base.

Replace section 28-2 with:

07-19-13

**28-2 LEAN CONCRETE BASE**

**28-2.01 GENERAL**

**28-2.01A Summary**

Section 28-2 includes specifications for constructing lean concrete base (LCB).

**28-2.01B Definitions**

**coarse aggregate:** Aggregate retained on a no. 4 sieve.

**fine aggregate:** Aggregate passing a no. 4 sieve.

**28-2.01C Submittals**

**28-2.01C(1) General**

At least 25 days before field qualification, submit the name of your proposed testing laboratory.

At least 10 days before field qualification, submit:

- 1. Aggregate qualification test results
- 2. Proposed aggregate gradation

3. Mix design, including:
  - 3.1. Proportions
  - 3.2. Types and amounts of chemical admixtures
4. Optional notice stating intent to produce LCB qualifying for a transverse contraction joint waiver under section 28-2.03D

Submittals for cementitious material must comply with section 90-1.01C(3).

Submit QC test results within 24 hours of test completion.

### **28-2.01C(2) Field Qualification**

11-15-13

For each field qualification for each mix design, manufacture 12 specimens under ASTM C 31 and submit six of the specimens from 24 to 72 hours after manufacture. Use one batch for all 12 specimens.

07-19-13

Submit field qualification data and test reports including:

1. Mixing date
2. Mixing equipment and procedures used
3. Batch volume in cu yd, the minimum is 5 cu yd
4. Type and source of ingredients used
5. Age and strength from compression strength results

Field qualification test reports must be signed by the official in responsible charge of the laboratory performing the tests.

### **28-2.01D Quality Control and Assurance**

#### **28-2.01D(1) General**

Stop LCB activities and immediately notify the Engineer whenever:

1. Any quality control or acceptance test result does not comply with the specifications
2. Visual inspection shows noncompliant LCB

If LCB activities are stopped, before resuming activities:

1. Inform the Engineer of the adjustments you will make
2. Remedy or replace the noncompliant LCB
3. Obtain authorization

Molds for compressive strength testing under ASTM C 31 or ASTM C 192 must be 6 by 12 inches.

Quality control and assurance for cementitious materials and admixtures must comply with section 90-1.01D(1)

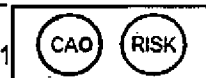
#### **28-2.01D(2) Aggregate Qualification Testing**

Qualify the aggregate for each proposed aggregate source and gradation. Qualification tests include (1) sand equivalent and (2) average 7-day compressive strength under ASTM C 39 on 3 specimens manufactured under ASTM C 192. The cement content for this test must be 300 lb/cu yd, and the 7-day average compressive strength must be at least 610 psi. Cement must be Type II portland cement under section 90-1.02B(2).

LCB must have from 3 to 4 percent air content during aggregate qualification testing.

#### **28-2.01D(3) Field Qualification Testing**

Before placing LCB, you must perform field qualification testing and obtain authorization for each mix design. Retest and obtain authorization for changes to authorized mixed designs.



Proposed mix designs must be field qualified before you place the LCB represented by those mix designs. Use an American Concrete Institute (ACI) certified "Concrete Laboratory Technician, Grade I" to perform field qualification tests and calculations.

Notify the Engineer at least 5 days before field qualification. Perform field qualification within the job site or a location authorized by the Engineer.

Field qualification testing includes compressive strength, air content, and penetration or slump in compliance with the table titled "Quality Control Requirements."

Field qualification testing for compressive strength must comply with the following:

1. Manufacture 12 cylinders under ASTM C 31 from a single batch
2. Perform 3 tests; each test consists of determining the average compressive strength of 2 cylinders at 7 days under ASTM C 39
3. The average compressive strength for each test must be at least 530 psi

If you submitted a notice to produce LCB qualifying for a transverse contraction joint waiver, manufacture additional specimens and test LCB for compressive strength at 3 days. Prepare compressive strength cylinders under ASTM C 31 at the same time using the same material and procedures as the 7-day compressive strength cylinders except do not submit 6 additional test cylinders. The average 3-day compressive strength for each test must be not more than 500 psi.

**28-2.01D(4) Quality Control Testing**

Provide a testing laboratory to perform quality control tests. Maintain sampling and testing equipment in proper working condition. Perform sampling under California Test 125.

Testing laboratories and testing equipment must comply with the Department's Independent Assurance Program.

Perform quality control sampling, testing, and inspection throughout LCB production and placement. LCB must comply with the requirements for the quality characteristics shown in the following table:

**Quality Control Requirements**

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement
Sand equivalent (min)	ASTM D 2419	1 per 500 cubic yards but at least 1 per day of production	18
Aggregate gradation	ASTM C 136		Note a
Air content (max, percent) <sup>b</sup>	ASTM C 231		4
Penetration (inches)	ASTM C 360		0 to 1-1/2 nominal <sup>c, d</sup>
Slump (inches)	ASTM C 143		0-3 nominal <sup>c, d</sup>
Compressive strength (min, psi at 7 days)	ASTM C 39 <sup>e</sup>		530
Compressive strength (max, psi at 3 days) <sup>f</sup>	ASTM C 39 <sup>e</sup>		500

<sup>a</sup> Comply with the table titled "Aggregate Grading" in section 28-2.02C.

<sup>b</sup> If no single test in the first 5 air content tests exceeds 1-1/2 percent, no further air content tests are required.

<sup>c</sup> Maximum penetration must not exceed 2 inches and maximum slump must not exceed 4 inches

<sup>d</sup> Test for either penetration or slump

<sup>e</sup> Prepare cylinders under ASTM C 31

<sup>f</sup> Only applicable if you (1) submitted a notice stating intent to produce LCB qualifying for a transverse contraction joint waiver and (2) successfully field qualified the LCB for 3-day compressive strength. Make cylinders at the same time using the same material and procedures as QC testing for 7-day compressive strength.

**28-2.01D(5) Acceptance Criteria**

For acceptance, properties of LCB must comply with values shown in the following table:

Property	Test method	Value
Compressive strength (min, psi at 7 days)	ASTM C 39 <sup>a</sup>	530 <sup>b</sup>

<sup>a</sup> Cylinders prepared under ASTM C 31

<sup>b</sup> A compressive strength test represents up to (1) 1,000 cu yd or (2) 1 day's production if less than 1,000 cu yd.

**28-2.02 MATERIALS****28-2.02A General**

Water must comply with section 90-1.02D.

The air content in LCB must not exceed 4 percent. If the aggregate used for LCB is produced from processed reclaimed asphalt concrete or other material that may cause the air content to exceed 4 percent, reduce the air content with an admixture.

A water-reducing chemical admixture may be used. Water-reducing chemical admixture must comply with ASTM C 494, Type A or Type F.

Air-entraining admixtures must comply with section 90-1.02E.

**28-2.02B Cementitious Material**

Portland cement must comply with section 90-1.02B. Portland cement content must not exceed 300 lb/cu yd.

SCM must comply with section 90-1.02B except the equations for SCM content under 90-1.02B(3) do not apply.

For aggregate qualification testing, use Type II portland cement under section 90-1.02B(2) without SCM.

**28-2.02C Aggregate**

Aggregate must be clean and free from decomposed material, organic material, and other deleterious substances. Aggregate samples must not be treated with lime, cement, or chemicals before testing for sand equivalent.

Use either 1-1/2 inch or 1 inch grading. Do not change your selected aggregate grading without authorization.

When tested under ASTM C 136, the percentage composition by weight of the aggregate must comply with the grading requirements for the sieve sizes shown in the following table:

Sieve sizes	Percentage passing			
	1-1/2" maximum		1" maximum	
	Operating range	Contract compliance	Operating range	Contract compliance
2"	100	100	—	—
1-1/2"	90-100	87-100	100	100
1"	—	—	90-100	87-100
3/4"	50-85	45-90	50-100	45-100
3/8"	40-75	35-80	40-75	35-80
No. 4	25-60	20-65	35-60	30-65
No. 30	10-30	6-34	10-30	6-34
No. 200	0-12	0-15	0-12	0-15

Aggregate must comply with the quality requirements shown in the following table:

<b>Aggregate Quality</b>			
Property	Test Method	Operating range	Contract compliance
Sand equivalent (min)	ASTM D 2419	21	18
Compressive strength (min, psi at 7 days)	ASTM C 192 ASTM C 39	--	610 at 300 lb/cu yd cement content

Note: Cement must be Type II portland cement under section 90-1.02B(2).

If the aggregate grading or the sand equivalent test results, or both comply with contract compliance requirements but not operating range requirements, you may continue placing LCB for the remainder of the work day. Do not place additional LCB until you demonstrate the LCB to be placed complies with the operating range requirements.

### **28-2.03 CONSTRUCTION**

#### **28-2.03A General**

Do not allow traffic or equipment on the LCB for at least 72 hours after the 1st application of the curing compound and completion of contraction joints. Limit traffic and equipment on the LCB to that is required for placing additional layers of LCB or paving.

#### **28-2.03B Subgrade**

Immediately before spreading LCB, the subgrade must:

1. Comply with the specified compaction and elevation tolerance for the material involved
2. Be free from loose or extraneous material
3. Be uniformly moist

Areas of subgrade lower than the grade established by the Engineer must be filled with LCB. The Department does not pay for filling low areas of subgrade.

#### **28-2.03C Proportioning, Mixing, and Transporting**

Proportion LCB under section 90-1.02F except aggregate does not have to be separated into sizes.

Mix and transport LCB under section 90-1.02G except the 5th and 7th paragraphs in section 90-1.02G(6) do not apply.

#### **28-2.03D Placing**

Place LCB under section 40-1.03H(1) except the 3rd paragraph does not apply.

Unless otherwise described, construct LCB in minimum widths of 12 feet separated by construction joints. For LCB constructed monolithically in widths greater than 26 feet, construct a longitudinal contraction joint offset no more than 3 feet from the centerline of the width being constructed.

Contraction joints must comply with section 40-1.03D(3).

Construct transverse contraction joints in intervals that result in LCB areas where the lengths and widths are within 20 percent of each other. Measure the widths from any longitudinal construction or longitudinal contraction joints.

The Engineer waives the requirement for transverse contraction joints if you:

1. Submitted a notice under 28-2.01C(1)
2. Successfully field qualified LCB for 3-day compressive strength testing
3. Submit QC test results for 3-day compressive strength under section 28-2.01D(4).



If concrete pavement will be placed on LCB, construct longitudinal construction and longitudinal contraction joints in the LCB. Provide at least 1 foot horizontal clearance from planned longitudinal construction and longitudinal contraction joints in the concrete pavement.

Do not mix or place LCB when the atmospheric temperature is below 35 degrees F. Do not place LCB on frozen ground.

### 28-2.03E Finishing

Place LCB under section 40-1.03H(4) or under section 40-1.03H(5) except where there are confined work areas and when authorized:

1. Spread and shape LCB using suitable powered finishing machines and supplement with hand work as necessary
2. Consolidate LCB using high-frequency internal vibrators within 15 minutes after LCB is deposited on the subgrade
3. Vibrate with care such that adequate consolidation occurs across the full paving width and do not use vibrators for extensive weight shifting of the LCB

For LCB to be paved with HMA, before curing operation texture the LCB finished surface by dragging a broom, burlap, or a spring steel tine device. If using a spring steel tine device, the device must produce a scored surface with scores parallel or transverse to the pavement centerline. Texture at a time and in a manner that produces the coarsest texture for the method used.

For LCB to be paved with HMA, the finished surface must not vary more than 0.05 foot from the grade established by the Engineer.

Do not texture LCB that will be covered with concrete pavement. Before applying curing compound, finish LCB to a smooth surface free from mortar ridges and other projections.

For LCB to be paved with concrete pavement, the finished surface must not be above the grade, or more than 0.05 foot below the grade established by the Engineer.

The finished surface must be free from porous areas.

### 28-2.03F Curing

After finishing LCB, cure LCB with pigmented curing compound under section 90-1.03B(3) and 40-1.03K except for LCB to be paved with concrete pavement, comply with section 36-2. Apply curing compound to the area to be paved with concrete pavement:

1. In 2 separate applications
2. Before the atmospheric temperature falls below 40 degrees F
3. At a rate of 1 gal/150 sq ft for the first application
4. At a rate of 1 gal/200 sq ft for the second application. Within 4 days after the first application, clean the surface and apply the second application.

Immediately repair damage to the curing compound or LCB.

### 28-2.03G Surfaces Not Within Tolerance

Where LCB will be paved with concrete pavement, remove the base wherever the surface is higher than the grade established by the Engineer and replace it with LCB. Where LCB will not be paved with concrete pavement, remove the base wherever the surface is higher than 0.05 foot above the grade established by the Engineer and replace it with LCB. If authorized, grind the surface with either a diamond or carborundum blade to within tolerance. After grinding LCB to be paved with concrete pavement and after all free water has left the surface, clean foreign material and grinding residue from the surface. Apply curing compound to the ground area at a rate of approximately 1 gal/150 sq ft.

Where the surface of LCB is lower than 0.05 foot from the grade established by the Engineer, remove the base and replace it with LCB or, if authorized, fill low areas according to the pavement material as follows:



- 1. For HMA pavement, fill low areas with HMA that complies with the specifications for the lowest layer of pavement. Do not fill low areas concurrently with the paving operation.
- 2. For concrete pavement, fill low areas with pavement concrete concurrent with the paving operation.

**28-2.04 PAYMENT**

LCB is measured from the dimensions shown.

**Replace section 28-3 with:**

**28-3 RAPID STRENGTH CONCRETE BASE**

07-19-13

Reserved

**Replace section 28-4 with:**

**28-4 LEAN CONCRETE BASE RAPID SETTING**

07-19-13

Reserved

**Replace section 28-5 with:**

**28-5 CONCRETE BASE**

07-19-13

Reserved

**Add to section 28:**

**28-6-28-14 RESERVED**

**28-15 REPLACE BASE**

07-19-13

Reserved

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**DIVISION IV SUBBASES AND BASES**

**29 TREATED PERMEABLE BASES**

04-18-14

**Replace "section 68-4.02C" in the 6th paragraph of section 29-1.03A with:**

section 64-4.03

04-20-12

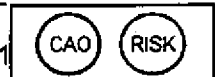
**Replace the 1st paragraph of section 29-1.03B with:**

04-18-14

Produce ATPB under section 39-1.02H, except a JMF is not required. Do not use RAP.

The temperature of the aggregate before adding the asphalt binder must be from 275 to 325 degrees F.

Do not store ATPB longer than 2 hours.



Combine aggregate with 2.5 percent asphalt binder by weight of dry aggregate. An increase or decrease in the asphalt content may be ordered after your proposed aggregate supply has been tested. If an ordered increase or decrease exceeds the specified amount of asphalt content by more than 0.1 percent by weight of dry aggregate, compensation for ATPB is determined by the total increase or decrease in asphalt.

The Engineer determines the asphalt content of the asphalt mixture under California Test 382. The bitumen ratio (pounds of asphalt per 100 lb of dry aggregate) must not vary more than 0.5 lb of asphalt above or below the amount designated by the Engineer. Samples used to determine the bitumen ratio are obtained from trucks at the plant or from the mat behind the paver before rolling. If the sample is taken from the mat behind the paver, the bitumen ratio must not be less than the amount designated by the Engineer, less 0.7 lb of asphalt per 100 lb of dry aggregate.

**Replace the introductory clause of the 2nd paragraph of section 29-1.03B with:**

04-18-14

Equipment for spreading and compacting ATPB must comply with section 39-1.03B. Compact ATPB in 1 layer using one of the following methods:

**Replace "3rd" in the 4th paragraph of section 29-1.03C with:**

07-19-13

4th

\*\*\*\*\*

**Replace section 30 with:**

04-20-12

**30 RECLAIMED PAVEMENTS**

04-20-12

**30-1 GENERAL**

**30-1.01 GENERAL**

Section 30 includes specifications for reclaiming the pavement section and constructing a base.

**30-2 FULL DEPTH RECLAIMED—FOAMED ASPHALT**

Reserved

**30-3-30-6 RESERVED**

\*\*\*\*\*

**DIVISION V SURFACINGS AND PAVEMENTS**

**Replace section 36 with:**

07-19-13

**36 GENERAL**

07-19-13

**36-1 GENERAL**

Section 36 includes general specifications for constructing surfacings and pavements.

**36-2 BASE BOND BREAKER**

Reserved

**36-3-36-15 RESERVED**

\*\*\*\*\*

**37 BITUMINOUS SEALS**

10-30-15

**Replace section 37-1.01 with:**

01-18-13

**37-1.01 GENERAL****37-1.01A Summary**

Section 37-1 includes general specifications for applying bituminous seals.

**37-1.01B Definitions**

Reserved

**37-1.01C Submittals**

Reserved

**37-1.01D Quality Control and Assurance****37-1.01D(1) General**

Reserved

**37-1.01D(2) Prepaving Conference**

For seal coats and micro-surfacing, schedule a prepaving conference at a mutually agreed upon time and place to meet with the Engineer.

Prepaving conference attendees must sign an attendance sheet provided by the Engineer. The prepaving conference must be attended by your:

1. Project superintendent
2. Paving construction foreman
3. Traffic control foreman

Be prepared to discuss:

1. Quality control
2. Acceptance testing
3. Placement
4. Training on placement methods
5. Checklist of items for proper placement
6. Unique issues specific to the project, including:
  - 6.1. Weather
  - 6.2. Alignment and geometrics
  - 6.3. Traffic control issues
  - 6.4. Haul distances
  - 6.5. Presence and absence of shaded areas
  - 6.6. Any other local issues

**37-1.02 MATERIALS**

Not Used

**37-1.03 CONSTRUCTION**

Not Used

**37-1.04 PAYMENT**

Not Used

Replace section 37-2 with:

07-19-13

**37-2 SEAL COATS**

**37-2.01 GENERAL**

**37-2.01A General**

**37-2.01A(1) Summary**

Section 37-2 includes specifications for applying seal coats.

**37-2.01A(2) Definitions**

Reserved

**37-2.01A(3) Submittals**

Reserved

**37-2.01A(4) Quality Control and Assurance**

The following personnel must attend the prepaving conference:

1. Aggregate suppliers
2. Chip spreader operators
3. Emulsion and binder distributor
4. Coated chips producer if coated chips are used

**37-2.01B Materials**

Screenings must be broken stone, crushed gravel, or both. At least 90 percent of screenings by weight must be crushed particles as determined under California Test 205.

Screenings for seal coats must have the properties specified in the following table:

**Seal Coat Screenings**

Properties	Test method	Specification
Los Angeles Rattler, %, max	California Test	
Loss at 100 revolutions.	211	10
Loss at 500 revolutions.		40
Film stripping, %, max	California Test	25
	302	

**37-2.01C Construction**

**37-2.01C(1) General**

Wherever final sweeping or brooming of the seal coat surface is complete, place permanent traffic stripes and pavement markings within 10 days.

If you fail to place the permanent traffic stripes and pavement markings within the specified time, the Department withholds 50 percent of the estimated value of the seal coat work completed that has not received permanent traffic stripes and pavement markings.

**37-2.01C(2) Equipment**

Equipment for seal coats must include and comply with the following:

1. Screenings haul trucks. Haul trucks must have:
  - 1.1. Tailgates that discharge screenings
  - 1.2. Devices to lock onto the rear screenings spreader hitch
  - 1.3. Dump beds that will not push down on the spreader when fully raised
  - 1.4. Dump beds that will not spill screenings on the roadway when transferred to the spreader hopper
  - 1.5. Tarpaulins to cover precoated screenings when haul distance exceeds 30 minutes or ambient temperature is less than 65 degrees F
2. Self-propelled screenings spreader. The spreader must have:
  - 2.1. Screenings hopper in the rear
  - 2.2. Belt conveyors that carry the screenings to the front
  - 2.3. Spreading hopper capable of providing a uniform screening spread rate over the entire width of the traffic lane in 1 application.
3. Self-propelled power brooms. Do not use gutter brooms or steel-tined brooms. Brooms must be capable of removing loose screenings adjacent to barriers that prevent screenings from being swept off the roadway, including curbs, gutters, dikes, berms, and railings.
4. Pneumatic-tired rollers. Pneumatic-tired rollers must be an oscillating type at least 4 feet wide. Each roller must be self-propelled and reversible. Pneumatic tires must be of equal size, diameter, type, and ply. The roller must carry at least 3,000 lb of load on each wheel and each tire must have an air pressure of  $100 \pm 5$  psi.

### 37-2.01C(3) Surface Preparation

Before applying seal coat, cover manholes, valve and monument covers, grates, or other exposed facilities located within the area of application, using a plastic or oil resistant construction paper secured by tape or adhesive to the facility being covered. Reference the covered facilities with a sufficient number of control points to relocate the facilities after the application of the seal coat.

After completion of the seal coat operation, remove covers from the facilities.

Immediately before applying seal coat, clean the surface to receive seal coat by removing extraneous material and drying. Cleaning the existing pavement includes the use of brooms.

### 37-2.01C(4) Applying Emulsion and Asphalt Binder

Prevent spray on existing pavement not intended for seal coat or on previously applied seal coat using a material such as building paper. Remove the material after use.

Align longitudinal joints between seal coat applications with designated traffic lanes.

For emulsion, overlap longitudinal joints by not more than 4 inches. You may overlap longitudinal joints up to 8 inches if authorized.

For areas not accessible to a truck distributor bar, apply the emulsion with a squeegee or other authorized means. For asphalt binder, hand spray nonaccessible areas. You may overlap the emulsion or asphalt binder applications before the application of screenings at longitudinal joints.

Do not apply the emulsion or asphalt binder unless there are sufficient screenings at the job site to cover the emulsion or asphalt binder.

Discontinue application of emulsion or asphalt binder early enough to comply with lane closure specifications and darkness. Apply to 1 lane at a time and cover the lane entirely in 1 operation.

### 37-2.01C(5) Spreading Screenings

Prevent vehicles from driving on asphaltic emulsion or asphalt binder before spreading screenings.

Spread screenings at a uniform rate over the full lane width in 1 application.

Broom excess screenings at joints before spreading adjacent screenings.

Operate the spreader at speeds slow enough to prevent screenings from rolling over after dropping.

If the spreader is not moving, screenings must not drop. If you stop spreading and screenings drop, remove the excess screenings before resuming activities.

### 37-2.01C(6) Finishing

Remove piles, ridges, or unevenly distributed screenings. Repair permanent ridges, bumps, or depressions in the finished surface. Spread additional screenings and roll if screenings are picked up by rollers or vehicles.

Seal coat joints between adjacent applications of seal coat must be smooth, straight, uniform, and completely covered. Longitudinal joints must be at lane lines and not overlap by more than 4 inches. Blend the adjacent applications by brooming.

A coverage is the number of passes a roller needs to cover the width. A pass is 1 roller movement parallel to the seal coat application in either direction. Overlapping passes are part of the coverage being made and are not part of a subsequent coverage. Do not start a coverage until completing the previous coverage.

Before opening to traffic, finish seal coat in the following sequence:

1. Perform initial rolling consisting of 1 coverage with a pneumatic-tired roller
2. Perform final rolling consisting of 3 coverages with a pneumatic-tired roller
3. Broom excess screenings from the roadway and adjacent abutting areas
4. Apply flush coat if specified

The Engineer may order salvaging of excess screenings.

Dispose of excess screenings the Engineer determines are not salvageable. Dispose of screenings in any of the following ways or locations:

1. Under section 14-10
2. On embankment slopes
3. In authorized areas

Salvaging and stockpiling excess screenings is change order work.

### 37-2.01C(7) Seal Coat Maintenance

Seals coat surfaces must be maintained for 4 consecutive days from the day screenings are applied. Maintenance must include brooming to maintain a surface free of loose screenings, to distribute screenings over the surface so as to absorb any free asphaltic material, to cover any areas deficient in cover coat material, and to prevent formation of corrugations.

After 4 consecutive days, excess screenings must be removed from the paved areas. Brooming must not displace screenings set in asphaltic material.

The exact time of brooming will be determined by the Engineer. As a minimum, brooming will be required at the following times:

1. On 2-lane 2-way roadways, from 2 to 4 hours after traffic, controlled with pilot cars, has been routed on the seal coat
2. On multilane roadways, from 2 to 4 hours after screenings have been placed
3. In addition to previous brooming, immediately before opening any lane to public traffic, not controlled with pilot cars
4. On the morning following the application of screenings on any lane that has been open to public traffic not controlled with pilot cars and before starting any other activities

For 2-lane 2-way roadways under 1-way traffic control, upon completion of secondary rolling, public traffic must be controlled with pilot cars and routed over the new seal coat for a period of 2 to 4 hours. The Engineer will determine the exact period of time.

Schedule the operations so that seal coat is placed on both lanes of the traveled way each work shift and so that 1-way traffic control is discontinued 1 hour before darkness. At the end of the work shift, the end of the seal coat on both lanes must generally match.

On multilane roadways, initial brooming must begin after the screenings have been in place for a period of 2 to 4 hours. If the initial brooming is not completed during the work shift in which the screenings were placed, the initial brooming must be completed at the beginning of the next work shift.

Public traffic must be controlled with pilot cars and be routed on the new seal coat surface of the lane for a minimum of 2 hours after completion of the initial brooming and before opening the lane to traffic not controlled with pilot cars. When traffic is controlled with pilot cars, a maximum of 1 lane in the direction of travel must be open to public traffic. Once traffic controlled with pilot cars is routed over the seal coat at a particular location, continuous control must be maintained at that location until the seal coat placement and brooming on adjacent lanes to receive seal coat is completed.

#### **37-2.01D Payment**

If there is no bid item for a traffic control system, furnishing and using a pilot car is included in the various items of the work involved in applying the seal coat.

If test results for the screenings grading do not comply with specifications, you may remove the seal coat represented by these tests or request that it remain in place with a payment deduction. The deduction is \$1.75 per ton for the screenings represented by the test results.

#### **37-2.02 FOG SEAL**

##### **37-2.02A General**

##### **37-2.02A(1) Summary**

Fog seal coat includes applying a slow-setting asphaltic emulsion.

##### **37-2.02A(2) Definitions**

Reserved

##### **37-2.02A(3) Submittals**

Submit a 1/2-gallon sample of the asphaltic emulsion in a plastic container. Take the sample from the distributor truck spray bar at mid-load.

##### **37-2.02A(4) Quality Control and Assurance**

Reserved

##### **37-2.02B Material**

The Engineer selects the grade of slow-setting asphaltic emulsion to be used.

If additional water is added to the asphaltic emulsion, the resultant mixture must not be more than 1 part asphaltic emulsion to 1 part water. The Engineer determines the exact amount of additional water.

##### **37-2.02C Construction**

Apply asphaltic emulsion for fog seal coat at a residual asphalt rate from 0.02 to 0.06 gal/sq yd. The Engineer determines the exact rate.

Apply fog seal coat when the ambient air temperature is above 40 degrees F.

Sprinkle water on fog seal coat that becomes tacky in an amount determined by the Engineer.

If fog seal coat and seal coat with screenings are specified on the same project, apply fog seal coat at least 4 days before applying the adjoining seal coat with screenings. The joint between the seal coats must be neat and uniform.



**37-2.02D Payment**

The Department does not adjust the unit price for an increase or decrease in the asphaltic emulsion (fog seal coat) quantity.

**37-2.03 FLUSH COATS****37-2.03A General**

Flush coat includes applying a fog seal coat to the surface, followed by sand.

03-21-14

07-19-13

**37-2.03B Material**

The Engineer selects the grade of slow-setting or quick-setting asphaltic emulsion to be used.

Sand for flush coat must comply with the material specifications for fine aggregate grading in section 90-1.02C(3). Sand must not include organic material or clay.

**37-2.03C Construction**

Apply asphaltic emulsion for flush coat at a residual asphalt rate from 0.02 to 0.06 gal/sq yd. The Engineer determines the exact rate.

During flush coat activities, close adjacent lanes to traffic. Do not track asphaltic emulsion on existing pavement surfaces.

Apply sand immediately after the asphaltic emulsion application.

Spread sand with a self-propelled screenings spreader equipped with a mechanical device that spreads sand at a uniform rate over the full width of a traffic lane in a single application. Spread sand at a rate from 2 to 6 lb/sq yd. The Engineer determines the exact rate.

**37-2.03D Payment**

The Department does not adjust the unit price for an increase or decrease in the sand cover for the flush coat quantity.

**37-2.04 ASPHALTIC EMULSION SEAL COAT****37-2.04A General****37-2.04A(1) General****37-2.04A(1)(a) Summary**

Section 37-2.04 includes specifications for applying asphaltic emulsion seal coat. Asphaltic emulsion seal coat includes applying asphaltic emulsion, followed by screenings, and then a flush coat.

Asphaltic emulsion seal coat includes one or more of the following types:

1. Nonpolymer asphaltic emulsion seal coat
2. Polymer asphaltic emulsion seal coat

A double asphaltic emulsion seal coat is the application of asphaltic emulsion, followed by screenings applied twice in sequence.

**37-2.04A(1)(b) Definitions**

Reserved

**37-2.04A(1)(c) Submittals**

At least 10 days before starting asphaltic emulsion seal coat application, submit the name of an authorized laboratory that will be performing asphaltic emulsion QC testing.

03-21-14

Submit a sample of asphaltic emulsion in a 1/2-gallon plastic container to the Engineer and to the authorized laboratory. Each sample must be submitted in an insulated shipping container within 24 hours of sampling.

07-19-13

Within 7 days after taking samples, submit the authorized laboratory's test results for asphaltic emulsion.

#### **37-2.04A(1)(d) Quality Control and Assurance**

Samples for the screenings grading and cleanness value must be taken from the spreader conveyor belt.

03-21-14

Within 3 business days of sampling, the authorized laboratory must test the asphaltic emulsion for:

1. Viscosity under AASHTO T 59
2. Sieve test under AASHTO T 59
3. Demulsibility under AASHTO T 59
4. Torsional recovery under California Test 332 for polymer asphaltic emulsion
5. Elastic recovery under AASHTO T 301 for polymer asphaltic emulsion

Circulate asphaltic emulsion in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer take two 1/2-gallon samples every 55 tons or at least 1 day's production.

07-19-13

#### **37-2.04A(2) Materials**

Not Used

#### **37-2.04A(3) Construction**

The Engineer determines the exact application rate.

At the time of application, the temperature of the asphaltic emulsion must be from 130 to 180 degrees F.

When tested under California Test 339, the application rate for asphaltic emulsion must not vary from the average by more than:

1. 15 percent in the transverse direction
2. 10 percent in the longitudinal direction

#### **37-2.04A(4) Payment**

Not Used

#### **37-2.04B Nonpolymer Asphaltic Emulsion Seal Coat**

##### **37-2.04B(1) General**

##### **37-2.04B(1)(a) Summary**

Section 37-2.04B includes specifications for applying a nonpolymer asphaltic emulsion seal coat.

##### **37-2.04B(1)(b) Definitions**

Reserved

##### **37-2.04B(1)(c) Submittals**

Reserved

##### **37-2.04B(1)(d) Quality Control and Assurance**

For nonpolymer asphaltic emulsion seal coat, if a test result for the screenings cleanness value is from 75 to 80, you may request that the asphaltic emulsion seal coat represented by the test remain in place. A payment deduction is made as specified in section 37-2.04D. If the screenings cleanness value is less than 75, remove the asphaltic emulsion seal coat.

**37-2.04B(2) Materials**

Screenings for nonpolymer asphaltic emulsion seal coat must have the gradation as determined under California Test 202 in the following table.

**Nonpolymer Asphaltic Emulsion Seal Coat Screenings Gradation**

Sieve sizes	Percentage passing			
	Coarse 1/2" max	Medium 3/8" max	Medium fine 5/16" max	Fine 1/4" max
3/4"	100	--	--	--
1/2"	95-100	100	--	--
3/8"	50-80	90-100	100	100
No. 4	0-15	5-30	30-60	60-85
No. 8	0-5	0-10	0-15	0-25
No. 16	--	0-5	0-5	0-5
No. 30	--	--	0-3	0-3
No. 200	0-2	0-2	0-2	0-2

The cleanness value determined under California Test 227 must be 80 or greater.

03-21-14

**37-2.04B(3) Construction**

Asphaltic emulsion must be applied within the application rate ranges shown in the following table:

07-19-13

**Asphaltic Emulsion Application Rates**

Screenings	Application rate range (gallons per square yard)
Fine	0.15-0.30
Medium fine	0.25-0.35
Medium	0.25-0.40
Coarse	0.30-0.40

Apply asphaltic emulsion when the ambient air temperature is from 65 to 110 degrees F and the pavement surface temperature is at least 80 degrees F.

Do not apply asphaltic emulsion when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

For double asphaltic emulsion seal coat, the asphaltic emulsion must be applied within the application rates shown in the following table:

**Asphaltic Emulsion Application Rates**

Screenings	Application rate range (gal/sq yd)
Double	
1st application	0.20-0.35
2nd application	0.20-0.30

You may stockpile screenings for asphaltic emulsion seal coat if you prevent contamination. Screenings must have damp surfaces at spreading. If water visibly separates from the screenings, do not spread. You may redampen them in the delivery vehicle.

Spread screenings before the asphaltic emulsion sets or breaks.

Spread screenings within 10 percent of the rate determined by the Engineer. Screenings must have a spread rate within the ranges shown in the following table:

**Screening Spread Rates**

Seal coat type	Range (lb/sq yd)
Fine	12-20
Medium fine	16-25
Medium	20-30
Coarse	23-30

Do not spread screenings more than 2,500 feet ahead of the completed initial rolling.

For double asphaltic emulsion seal coat, screenings must have a spread rate within the ranges shown in the following table:

**Screening Spread Rates**

Seal coat type	Range (lb/sq yd)
Double	
1st application	23-30
2nd application	12-20

Remove excess screenings on the 1st application before the 2nd application of asphaltic emulsion.

**37-2.04B(4) Payment**

If asphaltic emulsion seal coat with screenings does not comply with the cleanness value specifications, you may request that the seal coat remain in place with a pay deduction corresponding to the cleanness value shown in the following table:

**Asphaltic Emulsion Seal Coat Cleanness Value Deductions**

Cleanness value	Deduction
80 or over	None
79	\$2.00 /ton
77-78	\$4.00 /ton
75-76	\$6.00 /ton

**37-2.04C Polymer Asphaltic Emulsion Seal Coat**

**37-2.04C(1) General**

**37-2.04C(1)(a) Summary**

Section 37-2.04C includes specifications for applying a polymer asphaltic emulsion seal coat.

**37-2.04C(1)(b) Definitions**

Reserved

**37-2.04C(1)(c) Submittals**

At least 10 days before starting polymer asphaltic emulsion seal coat application, submit a signed copy of the test result report of the Vialit test method for aggregate retention in chip seals (french chip) to the Engineer and to:

DEPARTMENT OF TRANSPORTATION  
 Division of Maintenance, Roadway Maintenance Office  
 1120 N Street, MS 31  
 Sacramento, CA 95814

**37-2.04C(1)(d) Quality Control and Assurance**

The authorized laboratory must test screenings for retention under the Vialit test method for aggregate in chip seals (french chip). The Vialit test results are not used for acceptance. The Vialit test is available at the METS Web site.

If the test results for polymer asphaltic emulsion do not comply with the specifications, the Engineer assesses a pay factor value for the following properties and increments:

10-30-15

**Polymer Asphaltic Emulsion Pay Factor Table**

Test method and property	Increment	Pay factor
<b>Test on polymer asphaltic emulsion</b>		
AASHTO T 59 (Viscosity, sec Saybolt Furol, at 50 °C)	Each 10 seconds above max or below min	1
AASHTO T 59 (settlement, 5 days, percent)	Each 1.5 percent above max	1
AASHTO T 59 (sieve test, percent max)	Each 0.2 percent above max	1
AASHTO T 59 (demulsibility percent)	Each 2 percent below min	1
<b>Test on residue from evaporation test</b>		
AASHTO T 49 (penetration, 25 °C)	Each 2 dm above max or below min	1
ASTM D 36 (field softening point °C)	2 °C below min	1
California Test 332 (torsional recovery <sup>a</sup> )	For each 1 increment below the min value of 18	1
	For each 2 increments below the min value of 18	3
	For each 3 or more increments below the min value of 18	10
AASHTO T 301 (elastic recovery <sup>a</sup> )	For each 1 increment below the min value of 60	1
	For each 2 increment below the min value of 60	3
	For each 3 increment below the min value of 60	10

<sup>a</sup> The highest pay factor applies

07-19-13

The Engineer assesses a pay factor of 1 for sampling not performed in compliance with the specifications, including shipping and sampling containers.

For polymer asphaltic emulsion seal coat, if a test result for the screenings cleanness value is from 75 to 86, you may request that the asphaltic emulsion seal coat represented by the test remain in place. A payment deduction is made as specified in section 37-2.04D. If the screenings cleanness value is less than 75, remove the asphaltic emulsion seal coat.

**37-2.04C(2) Materials**

Polymer asphaltic emulsion must include elastomeric polymer.

03-21-14

Polymer asphaltic emulsion must comply with section 94, Table 3, under the test on residue from evaporation test for Grades PMRS2, PMRS2h, PMCRS2, and PMCRS2h and the following:

1. The penetration at 39.2 degrees F (200g for 60 seconds) determined under AASHTO T 49 must be at least 6.
2. Elastic recovery determined under AASHTO T 301 must be at least 60 percent.
3. Polymer content in percent by weight does not apply.
4. The ring and ball softening point temperature determined under AASHTO T 53 for Test on Residue from Evaporation Test must comply with the following minimum temperature requirement:
  - 4.1. 126 degrees F for a geographical ambient temperature from 32 to 104 degrees F
  - 4.2. 129 degrees F for a geographical ambient temperature from 18 to 104 degrees F
  - 4.3. 135 degrees F for a geographical ambient temperature from 18 to greater than 104 degrees F

07-19-13

Screenings for polymer asphaltic emulsion seal coat must have the gradation as determined under California Test 202 in the following table:

**Polymer Asphaltic Emulsion Seal Coat Screenings Gradation**

Sieve sizes	Percentage passing			
	Coarse 1/2" max	Medium 3/8" max	Medium fine 5/16" max	Fine 1/4" max
3/4"	100	--	--	--
1/2"	85-100	100	--	--
3/8"	0-30	85-100	100	100
No. 4	0-5	0-15	0-50	60-85
No. 8	--	0-5	0-15	0-25
No. 16	--	--	0-5	0-5
No. 30	--	--	0-3	0-3
No. 200	0-2	0-2	0-2	0-2

03-21-14

The cleanness value determined under California Test 227 must be 86 or greater.

07-19-13

**37-2.04C(3) Construction**

Polymer asphaltic emulsion must be applied within the application rate ranges shown in the following table:

**Polymer Asphaltic Emulsion Application Rates**

Screenings	Application rate range(gallons per square yard)
Fine	0.15-0.30
Medium fine	0.25-0.35
Medium	0.25-0.40
Coarse	0.30-0.40

Apply polymer asphaltic emulsion when the ambient air temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 55 degrees F.

Do not apply polymer asphaltic emulsion when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

For double asphaltic emulsion seal coat, polymer asphaltic emulsion must be applied within the application rates shown in the following table:

**Polymer Asphaltic Emulsion Application Rates**

Screenings	Application rate range (gal/sq yd)
Double	
1st application	0.20–0.35
2nd application	0.20–0.30

You may stockpile screenings for polymer emulsion seal coat if you prevent contamination. Screenings must have damp surfaces at spreading. If water visibly separates from the screenings, do not spread. You may redampen them in the delivery vehicle.

Spread screenings before the polymer emulsion sets or breaks.

Spread screenings within 10 percent of the rate determined by the Engineer. Screenings must have a spread rate within the ranges shown in the following table:

**Screening Spread Rates**

Seal coat type	Range (lb/sq yd)
Fine	12–20
Medium fine	16–25
Medium	20–30
Coarse	23–30

Do not spread screenings more than 2,500 feet ahead of the completed initial rolling.

For double seal coat, screenings must have a spread rate within the ranges shown in the following table:

**Screening Spread Rates**

Seal coat type	Range (lb/sq yd)
Double	
1st application	23–30
2nd application	12–20

Remove excess screenings on the 1st application before the 2nd application of asphaltic emulsion.

**37-2.04C(4) Payment**

If polymer asphaltic emulsion seal coat with screenings does not comply with the specifications for cleanness value you may request that the seal coat remain in place with a pay deduction corresponding by the cleanness value shown in the following table:

**Polymer Asphaltic Emulsion Seal Coat Cleanness Value Deductions**

Cleanness value	Deduction
86 or over	None
81–85	\$2.20/ton
77–80	\$4.40/ton
75–76	\$6.60/ton

If test results for polymer asphaltic emulsion aggregate grading and cleanness value test results do not comply with the specifications, all deductions are made. A test for polymer asphaltic emulsion represents the smaller of 55 tons or 1 day's production. A test for the screenings grading or cleanness value represents the smaller of 300 tons or 1 day's production.

The payment deduction for noncompliant polymer asphaltic emulsion is based on the total pay factor value determined from the table titled, "Polymer Asphaltic Emulsion Pay Factor Deduction." You must

remove polymer asphaltic emulsion seal coat with a pay factor value greater than 20. You may request seal coat with noncompliant polymer asphaltic emulsion to remain in place with a pay deduction for the total pay factor value shown in the following table:

**Polymer Asphaltic Emulsion Pay Factor  
Deductions**

Total pay factor value	Deduction
0	none
1-2	\$5.00/ton
3-5	\$10.00/ton
6-9	\$15.00/ton
10-14	\$25.00/ton
15-20	\$50.00/ton

### **37-2.05 ASPHALT BINDER SEAL COATS**

#### **37-2.05A General**

Reserved

10-30-15

#### **37-2.05B Asphalt Rubber Binder Seal Coats**

##### **37-2.05B(1) General**

##### **37-2.05B(1)(a) Summary**

Section 37-2.05B includes specifications for applying asphalt rubber binder seal coat.

Asphalt rubber binder seal coat consists of applying asphalt rubber binder followed by heated screenings precoated with asphalt binder followed by a flush coat.

##### **37-2.05B(1)(b) Definitions**

**crumb rubber modifier:** Combination of ground or granulated high natural crumb rubber and scrap tire crumb rubber.

**descending viscosity reading:** Subsequent viscosity reading at least 5 percent lower than the previous viscosity reading.

**high natural crumb rubber:** Material containing 40 to 48 percent natural rubber.

**scrap tire crumb rubber:** Any combination of:

1. Automobile tires
2. Truck tires
3. Tire buffing

##### **37-2.05B(1)(c) Submittals**

At least 5 business days before use, submit the permit issued by the local air district for asphalt rubber binder field blending equipment and application equipment. If an air quality permit is not required by the local air district for producing asphalt rubber binder, submit verification from the local air district that an air quality permit is not required.

At least 10 days before starting seal coat activities, submit the name of an authorized laboratory to perform QC testing for asphalt rubber binder. The authorized laboratory must comply with the Department's Independent Assurance Program.

For each delivery of asphalt rubber binder ingredients and asphalt rubber binder to the job site, submit a certificate of compliance and a copy of the specified test results.



Submit a certified volume or weight slip for each delivery of asphalt rubber binder ingredients and asphalt rubber binder.

Submit SDS for each asphalt rubber binder ingredient and the asphalt rubber binder.

At least 15 days before use, submit:

1. Four 1 qt cans of mixed asphalt rubber binder
2. Samples of each asphalt rubber binder ingredient
3. Asphalt rubber binder formulation and data as follows:
  - 3.1. For asphalt binder and asphalt modifier, include:
    - 3.1.1. Source and grade of asphalt binder
    - 3.1.2. Source and type of asphalt modifier
    - 3.1.3. Percentage of asphalt modifier by weight of asphalt binder
    - 3.1.4. Percentage of combined asphalt binder and asphalt modifier by weight of asphalt rubber binder
    - 3.1.5. Test results for the specified quality characteristics
  - 3.2. For crumb rubber modifier, include:
    - 3.2.1. Each source and type of scrap tire crumb rubber and high natural rubber
    - 3.2.2. Percentage of scrap tire crumb rubber and high natural rubber by total weight of asphalt rubber binder
    - 3.2.3. Test results for the specified quality characteristics
  - 3.3. For asphalt rubber binder, include:
    - 3.3.1. Test results for the specified quality characteristics
    - 3.3.2. Minimum reaction time and temperature

Submit a certificate of compliance and accuracy verification of test results for viscometers.

Submit notification 15 minutes before each viscosity test or submit a schedule of testing times.

Submit the log of asphalt rubber binder viscosity test results each day of asphalt rubber binder seal coat work.

Submit viscosity test results within 2 business days after testing.

Submit resilience and softening point test results within 3 business days after testing.

**37-2.05B(1)(d) Quality Control and Assurance**

**37-2.05B(1)(d)(i) General**

The equipment used in producing asphalt rubber binder and the equipment used in spreading asphalt rubber binder must be permitted for use by the local air district.

**37-2.05B(1)(d)(ii) Quality Control**

**37-2.05B(1)(d)(ii)(A) General**

Reserved

**37-2.05B(1)(d)(ii)(B) Asphalt Modifier**

Test asphalt modifier under the test methods and frequencies shown in the following table:

**Asphalt Modifier for Asphalt Rubber Binder**

Quality characteristic	Test method	Frequency
Viscosity	ASTM D445	1 per shipment
Flash point	ASTM D92	
Molecular analysis Asphaltenes Aromatics	ASTM D2007	1 per shipment

**37-2.05B(1)(d)(ii)(C) Crumb Rubber Modifier**

Sample and test scrap tire CRM and high natural CRM separately. Test CRM under the test methods and frequencies shown in the following table:

**Crumb Rubber Modifier**

Quality characteristic	Test method	Frequency
Scrap tire crumb rubber gradation	California Test 385	1 per 250 tons or 1 per project, whichever is greater
High natural crumb rubber gradation	California Test 385	1 per 250 tons or 1 per project, whichever is greater
Wire in CRM	California Test 385	1 per 10,000 lb
Fabric in CRM	California Test 385	
CRM particle length	-	
CRM specific gravity	California Test 208	
Natural rubber content in high natural crumb rubber	ASTM D297	1 per 3,400 lb

**37-2.05B(1)(d)(ii)(D) Asphalt Rubber Binder**

Test asphalt rubber binder under the test methods and frequencies shown in the following table:

Quality characteristic	Test method	Sampling location	Frequency
Descending viscosity <sup>a</sup>	ASTM D7741/D7741M	Reaction vessel	1 per lot <sup>b</sup>
Viscosity at 375 °F	ASTM D7741/D7741M	Distribution truck	15 minutes before use per lot <sup>b</sup>
Cone penetration	ASTM D217	Distribution truck	1 per lot <sup>b</sup>
Resilience	ASTM D5329		
Softening point	ASTM D36/D36M		

<sup>a</sup>Start taking viscosity readings at least 45 minutes after adding crumb rubber modifier and continue taking viscosity readings every 30 minutes until 2 consecutive descending viscosity readings have been obtained and the final viscosity complies with the specification requirement.

<sup>b</sup>The lot is defined in the Department's *MPQP*.

Retain the sample from each lot. Test for cone penetration, resilience, and softening point for the first 3 lots and if all 3 lots pass, the testing frequency may be reduced to once for every 3 lots.

If QC test results indicate that the asphalt rubber binder does not meet the specifications, take corrective action and notify the Engineer.

**37-2.05B(1)(d)(iii) Department Acceptance****37-2.05B(1)(d)(iii)(A) General**

Reserved

**37-2.05B(1)(d)(iii)(B) Crumb Rubber Modifier**

The Department accepts CRM based on the gradation requirements shown in the following table when tested under California Test 385:

### Crumb Rubber Modifier Gradation Requirements

Sieve size	Scrap tire crumb rubber		High natural crumb rubber	
	Operating range	Contract compliance	Operating range	Contract compliance
No. 8	100	100	—	—
No. 10	95–100	90–100	100	100
No. 16	35–85	32–88	92–100	85–100
No. 30	2–25	1–30	25–95	20–98
No. 50	0–10	0–15	6–35	2–40
No. 100	0–5	0–10	0–7	0–10
No. 200	0–2	0–5	0–3	0–5

If a test result for CRM gradation does not comply with the specifications, the Department deducts the corresponding amount for each gradation test as shown in the following table:

Material	Test result <sup>a</sup>	Deduction
Scrap tire crumb rubber	Operating range < TR < Contract compliance	\$250
Scrap tire crumb rubber	TR > Contract compliance	\$1,100
High natural crumb rubber	Operating range < TR < Contract compliance	\$250
High natural crumb rubber	TR > Contract compliance	\$600

<sup>a</sup> Test Result = TR

Each gradation test for scrap tire crumb rubber represents 10,000 lbs or the quantity used in that day's production, whichever is less.

Each gradation test for high natural crumb rubber represents 3,400 lbs or the quantity used in that day's production, whichever is less.

#### 37-2.05B(1)(d)(iii)(C) Asphalt Rubber Binder

For Department acceptance testing, take a sample of asphalt rubber binder in the Engineer's presence every 5 lots or once a day, whichever is greater. Each sample must be in a 6 qt can with open top and friction lid.

The Department accepts asphalt rubber binder based on compliance with the requirements shown in the following table:

Quality characteristic	Test method	Requirement
Cone penetration at 25 °C (0.10 mm)	ASTM D217	25–60
Resilience at 25 °C (% rebound)	ASTM D5329	18–50
Softening point (°C)	ASTM D36/D36M	55–88
Viscosity at 375 °F (Pa·s x 10 <sup>-3</sup> ) <sup>a</sup>	ASTM D7741/D7741M	1,500–2,500

<sup>a</sup> Prepare sample for viscosity test under California Test 388.

#### 37-2.05B(1)(d)(iii)(D) Precoated Screenings

The Department accepts precoated screenings based on compliance with the requirements shown in the following table:

**Precoated Screenings Acceptance Criteria**

Quality characteristic	Test method	Requirement		
Los Angeles Rattler Loss (max, %)	California Test 211	10		
Loss at 100 revolutions				
Loss at 500 revolutions				
Film stripping (max, %)	California Test 302	25		
Cleanness value (min)	California Test 227	80		
Durability (min)	California Test 229	52		
Gradation (% passing by weight)	California Test 202	Coarse 1/2" max	Medium 1/2" max	Fine 3/8" max
Sieve sizes:		100	100	100
3/4"		75-90	85-90	95-100
1/2"		0-20	0-30	70-85
3/8"		0-2	0-5	0-15
No. 4		--	--	0-5
No. 8		0-1	0-1	0-1
No. 200				

**37-2.05B(2) Materials****37-2.05B(2)(a) General**

Reserved

**37-2.05B(2)(b) Asphalt Binder**

Asphalt binder must comply with the specifications for asphalt binder. Do not modify asphalt binder with polymer.

**37-2.05B(2)(c) Asphalt Modifier**

Asphalt modifier must be a resinous, high flash point, and aromatic hydrocarbon. Asphalt modifier must comply with the requirements shown in the following table:

**Asphalt Modifier for Asphalt Rubber Binder**

Quality characteristic	Test method	Requirement
Viscosity at 100 °C ( $m^2/s \times 10^{-6}$ )	ASTM D445	$X \pm 3^a$
Flash point (C.L.O.C., °C)	ASTM D92	207 min
Molecular analysis	ASTM D2007	0.1
Asphaltenes by mass (max, %)		
Aromatics by mass (min, %)		55

<sup>a</sup> X denotes the proposed asphalt modifier viscosity from 19 to 36. A change in X requires a new asphalt rubber binder submittal.

**37-2.05B(2)(d) Crumb Rubber Modifier**

CRM must be ground or granulated at ambient temperature.

Scrap tire crumb rubber and high natural crumb rubber must be delivered to the asphalt rubber binder production site in separate bags.

Steel and fiber must be separated. If steel and fiber are cryogenically separated, it must occur before grinding and granulating. Cryogenically-produced CRM particles must be large enough to be ground or granulated.

Wire must not be more than 0.01 percent by weight of CRM when tested under California Test 385. CRM must be free of contaminants except fabric, which must not exceed 0.05 percent by weight of CRM.

The length of an individual CRM particle must not exceed 3/16 inch.

CRM must be dry, free-flowing particles that do not stick together. A maximum of 3 percent calcium carbonate or talc by weight of CRM may be added. CRM must not cause foaming when combined with the asphalt binder and asphalt modifier.

Specific gravity of CRM must be from 1.1 to 1.2 determined under California Test 208.

The CRM must comply with the requirements shown in the following table:

**Crumb Rubber Modifier Requirements**

Quality characteristic	Test method	Requirement	
		Scrap tire crumb rubber	High natural crumb rubber
Acetone extract (%)	ASTM D297	6.0–16.0	4.0–16.0
Rubber hydrocarbon (%)	ASTM D297	42.0–65.0	50.0 min
Natural rubber content (%)	ASTM D297	22.0–39.0	40.0–48.0
Carbon black content (%)	ASTM D297	28.0–38.0	–
Ash content (%)	ASTM D297	8.0 min	–

When tested under California Test 385, scrap tire crumb rubber must comply with the gradation requirements shown in the following table:

**Scrap Tire Crumb Rubber Gradation**  
Percentage passing

Sieve size	Gradation limit	Operating range	Contract compliance
No. 8	100	100	100
No. 10	98–100	95–100	90–100
No. 16	45–75	35–85	32–88
No. 30	2–20	2–25	1–30
No. 50	0–6	0–10	0–15
No. 100	0–2	0–5	0–10
No. 200	0	0–2	0–5

When tested under California Test 385, high natural crumb rubber must comply with the gradation requirements shown in the following table:

**High Natural Crumb Rubber Gradation**  
Percentage passing

Sieve size	Gradation limit	Operating range	Contract compliance
No. 10	100	100	100
No. 16	95–100	92–100	85–100
No. 30	35–85	25–95	20–98
No. 50	10–30	6–35	2–40
No. 100	0–4	0–7	0–10
No. 200	0–1	0–3	0–5

### 37-2.05B(2)(e) Asphalt Rubber Binder

Asphalt rubber binder must be a combination of:

1. Asphalt binder
2. Asphalt modifier
3. Crumb rubber modifier

Asphalt rubber binder blending equipment must be authorized under the Department's Material Plant Quality Program.

The blending equipment must allow the determination of weight percentages of each asphalt rubber binder ingredient.

Asphalt rubber binder must be  $79 \pm 1$  percent by weight asphalt binder and  $21 \pm 1$  percent by weight of CRM. The minimum percentage of CRM must be 20.0 percent and lower values may not be rounded up.

CRM must be  $76 \pm 2$  percent by weight scrap tire crumb rubber and  $24 \pm 2$  percent by weight high natural crumb rubber.

Asphalt modifier and asphalt binder must be blended at the production site. Asphalt modifier must be from 2.5 to 6.0 percent by weight of the asphalt binder in the asphalt rubber binder. The asphalt rubber binder supplier determines the exact percentage.

If blended, the asphalt binder must be from 375 to 440 degrees F when asphalt modifier is added and the mixture must circulate for at least 20 minutes. Asphalt binder, asphalt modifier, and CRM may be proportioned and combined simultaneously.

The blend of asphalt binder and asphalt modifier must be combined with the CRM at the asphalt rubber binder production site. The asphalt binder and asphalt modifier blend must be from 375 to 440 degrees F when the CRM is added. Combined ingredients must be allowed to react at least 45 minutes at temperatures from 375 to 425 degrees F except the temperature must be at least 10 degrees F below the flash point of the asphalt rubber binder.

After reacting, the asphalt rubber binder must comply with the requirements shown in the following table:

Quality characteristic	Test method	Requirement
Cone penetration at 25 °C (0.10 mm)	ASTM D217	25–60
Resilience at 25 °C (% rebound)	ASTM D5329	18–50
Softening point (°C)	ASTM D36/D36M	55–88
Viscosity at 375 °F (Pa·s $\times 10^{-3}$ ) <sup>a</sup>	ASTM D7741/D7741M	1,500–2,500

<sup>a</sup>Prepare sample for viscosity test under California Test 388.

Maintain asphalt rubber binder at a temperature from 375 to 415 degrees F.

Stop heating unused asphalt rubber binder 4 hours after the 45-minute reaction period. Reheating asphalt rubber binder that cools below 375 degrees F is a reheat cycle. Do not exceed 2 reheat cycles. If reheating, asphalt rubber binder must be from 375 to 415 degrees F before use.

During reheating, you may add scrap tire crumb rubber. Scrap tire crumb rubber must not exceed 10 percent by weight of the asphalt rubber binder. Allow added scrap tire crumb rubber to react for at least 45 minutes. Reheated asphalt rubber binder must comply with the specifications for asphalt rubber binder.

### 37-2.05B(2)(f) Screenings

Before precoating with asphalt binder, screenings for asphalt rubber binder seal coat must comply with the gradation requirements shown in the following table:

**Asphalt Rubber Binder Seal Coat Screenings Gradation**

Percentage passing by weight		
Sieve sizes	Medium 1/2" max	Fine 3/8" max
3/4"	100	100
1/2"	85-90	95-100
3/8"	0-30	70-85
No. 4	0-5	0-15
No. 8	--	0-5
No. 200	0-1	0-1

The seal coat screenings must comply with the requirements shown in the following table:

**Seal Coat Screenings**

Quality characteristic	Test method	Requirement
Cleanness value (min)	California Test 227	80
Durability (min)	California Test 229	52

**37-2.05B(3) Construction****37-2.05B(3)(a) General**

Reserved

**37-2.05B(3)(b) Equipment**

Self-propelled distributor truck for applying asphalt rubber binder must have the following features:

1. Heating unit
2. Internal mixing unit
3. Pumps that spray asphalt rubber binder within 0.05 gal/sq yd of the specified rate
4. Fully circulating spray bar that applies asphalt rubber binder uniformly
5. Tachometer
6. Pressure gauges
7. Volume measuring devices
8. Thermometer
9. Observation platform on the rear of the truck for an observer on the platform to see the nozzles and unplug them if needed

**37-2.05B(3)(c) Precoating Screenings**

Precoating of screenings must be performed at a central mixing plant. The plant must be authorized under the Department's Material Plant Quality Program.

For asphalt rubber binder seal coat, do not recombine fine materials collected in dust control systems except cyclone collectors or knock-out boxes with any other aggregate used in the production of screenings.

For asphalt rubber binder seal coat, screenings must be preheated from 260 to 325 degrees F. Coat with any of the asphalts specified in the table titled "Performance Graded Asphalt Binder" in section 92. The asphalt must be from 0.5 to 1.0 percent by weight of dry screenings. The Engineer determines the exact rate.

Do not stockpile preheated or precoated screenings.

**37-2.05B(3)(d) Asphalt Rubber Binder Application**

Apply asphalt rubber binder immediately after the reaction period. At the time of application, the temperature of asphalt rubber binder must be from 385 to 415 degrees F.

Apply asphalt rubber binder at a rate from 0.55 to 0.65 gal/sq yd. The Engineer determines the exact rate. You may reduce the application rate by 0.050 gal/sq yd in the wheel paths.

Apply asphalt rubber binder when the ambient temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 55 degrees F.

Do not apply asphalt rubber binder unless enough screenings are available at the job site to cover the asphalt rubber binder within 2 minutes. Intersections, turn lanes, gore points, and irregular areas must be covered within 15 minutes.

Do not apply asphalt rubber binder when pavement is damp or during high wind conditions. If authorized, you may adjust the distributor bar height and distribution speed and use shielding equipment during high wind conditions.

**37-2.05B(3)(e) Screenings Application**

During transit, cover precoated screenings for asphalt rubber binder seal coat with tarpaulins if the ambient air temperature is below 65 degrees F or the haul time exceeds 30 minutes.

At the time of application, screenings for asphalt rubber binder seal coat must be from 225 to 325 degrees F.

Spread screenings at a rate from 28 to 40 lb/sq yd. The exact rate is determined by the Engineer. Spread to within 10 percent of the determined rate.

**37-2.05B(3)(f) Rolling and Sweeping**

Perform initial rolling within 90 seconds of spreading screenings. Do not spread screenings more than 200 feet ahead of the initial rolling.

If authorized for final rolling, you may use a steel-wheeled roller weighing from 8 to 10 tons in static mode only.

Perform a final sweeping before Contract acceptance. The final sweeping must not dislodge screenings.

**37-2.05B(4) Payment**

The payment quantity for precoated screenings is the weight measured after the screenings are preheated and precoated with asphalt binder.

If recorded batch weights are printed automatically, the payment quantity for screenings is the weight determined from the printed batch weights if:

1. Total aggregate weight for the screenings per batch is printed
2. Total asphalt binder weight per batch is printed
3. Each truckload's zero tolerance weight is printed before weighing the first batch and after weighing the last batch
4. Time, date, mix number, load number and truck identification are correlated with a load slip
5. Copy of the recorded batch weights is certified by a licensed weighmaster

Asphalt rubber binder is measured as specified for asphalt binder.

07-19-13

**37-2.05C Modified Asphalt Binder Seal Coat**

Reserved

03-21-14

**37-2.06 STRESS ABSORBING MEMBRANE INTERLAYER**

**37-2.06A General**

Section 37-2.06 applies where a stress absorbing membrane interlayer (SAMI) is shown.

Comply with section 37-2.05B except a flush coat is not required.



**37-2.06B Materials**

For SAMI, screenings must comply with the 3/8-inch maximum gradation.

**37-2.06C Construction**

For SAMI, section 37-2.01C(7) does not apply.

Final rolling and sweeping are not required for SAMI.

**37-2.06D Payment**

Not Used

**37-2.07-37-2.10 RESERVED**

**Add to section 37-3.01D(1):**

01-18-13

Micro-surfacing spreader operators must attend the prepaying conference.

AA

**39 HOT MIX ASPHALT**

10-30-15

**Replace the headings and paragraphs in section 39 with:**

04-18-14

**39-1 GENERAL**

**39-1.01 GENERAL**

**39-1.01A Summary**

Section 39-1 includes general specifications for producing and placing hot mix asphalt.

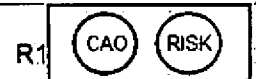
HMA includes one or more of the following types:

- 1. Type A HMA
- 2. RHMA-G
- 3. OGFC
- 4. BWC
- 5. Minor HMA

10-30-15

If the use of a warm mix asphalt technology is allowed or required by a special provision, the warm mix asphalt technology to be used must be on the Authorized Materials List for approved technologies.

Wherever reference is made to the following test methods, the year of publication for these test methods is as shown in the following table:



Test method	Year of publication
AASHTO M 17	2011 (2015)
AASHTO M 323	2013
AASHTO R 30	2002 (2015)
AASHTO R 35	2014
AASHTO R 56	2014
AASHTO R 57	2014
AASHTO T 27	2014
AASHTO T 49	2014
AASHTO T 59	2013
AASHTO T 96	2002 (2010)
AASHTO T 164	2014
AASHTO T 176	2008
AASHTO T 209	2012
AASHTO T 269	2014
AASHTO T 275	2007 (2012)
AASHTO T 283	2014
AASHTO T 304	2011
AASHTO T 305	2014
AASHTO T 308	2010
AASHTO T 312	2014
AASHTO T 324	2014
AASHTO T 329	2013
AASHTO T 335	2009
ASTM D36/D36M	2014 <sup>e1</sup>
ASTM D92	2012b
ASTM D217	2010
ASTM D297	2013
ASTM D445	2014
ASTM D2007	2011
ASTM D2074	2007 (Reapproved 2013)
ASTM D2995	1999 (Reapproved 2009)
ASTM D4791	2010
ASTM D5329	2009
ASTM D7741/D7741M	2011 <sup>e1</sup>

### 39-1.01B Definitions

**binder replacement:** Binder from RAP expressed as a percent of the total binder in the mix.

**coarse aggregate:** Aggregate retained on a no. 4 sieve.

**fine aggregate:** Aggregate passing the no. 4 sieve.

**leveling course:** Thin layer of HMA used to correct minor variations in the longitudinal and transverse profile of the pavement before placement of other pavement layers.

10-30-15

**miscellaneous areas:** Areas outside the traveled way and shoulders such as:

1. Median areas not including inside shoulders
2. Island areas
3. Sidewalks
4. Gutters
5. Ditches
6. Overside drains

## 7. Aprons at ends of drainage structures

04-18-14

**processed RAP:** RAP that has been fractionated.

10-30-15

**supplemental fine aggregate:** Mineral filler consisting of rock dust, slag dust, hydrated lime, hydraulic cement, or any combination of these and complying with AASHTO M 17.

04-18-14

**39-1.01C Submittals****39-1.01C(1) General**

Reserved

**39-1.01C(2) Job Mix Formula****39-1.01C(2)(a) General**

Except for the HMA to be used in miscellaneous areas and dikes, submit your proposed JMF for each type of HMA to be used. The JMF must be submitted on the Contractor Job Mix Formula Proposal form along with:

1. Mix design documentation on Contractor Hot Mix Asphalt Design Data form dated within 12 months of submittal
2. JMF verification on a Caltrans Hot Mix Asphalt Verification form, if applicable
3. JMF renewal on a Caltrans Job Mix Formula Renewal form, if applicable
4. MSDS for:
  - 4.1. Asphalt binder
  - 4.2. Supplemental fine aggregate except fines from dust collectors
  - 4.3. Antistrip additives

The Contractor Hot Mix Asphalt Design Data form must show documentation on aggregate quality.

If you cannot submit a Department-verified JMF on a Caltrans Hot Mix Asphalt Verification form dated within 12 months before HMA production, the Engineer verifies the JMF.

Submit a new JMF if you change any of the following:

1. Target asphalt binder percentage greater than  $\pm 0.2$  percent
2. Asphalt binder supplier
3. Combined aggregate gradation
4. Aggregate sources
5. Liquid antistrip producer or dosage
6. Average binder content in a new fractionated RAP stockpile by more than  $\pm 2.00$  percent from the average RAP binder content reported on page 4 of your Contractor Hot Mix Asphalt Design Data form
7. Average maximum specific gravity in a new fractionated RAP stockpile by more than  $\pm 0.060$  from the average maximum specific gravity value reported on page 4 of your Contractor Hot Mix Asphalt Design Data form
8. Any material in the JMF

Allow the Engineer 5 business days from a complete JMF submittal for document review of the aggregate qualities, mix design, and JMF. The Engineer notifies you if the proposed JMF submittal is accepted.

10-30-15

If your JMF fails verification testing, submit an adjusted JMF based on your testing. The adjusted JMF must include a new Contractor Job Mix Formula Proposal form, Contractor Hot Mix Asphalt Design Data form, and the results of the failed verification testing.

04-18-14

You may submit an adjusted aggregate gradation TV on a Contractor Job Mix Formula Proposal form before verification testing. Aggregate gradation TV must be within the TV limits specified.

**39-1.01C(2)(b) Job Mix Formula Renewal**

You may request a JMF renewal by submitting:

1. Proposed JMF on a Contractor Job Mix Formula Proposal form
2. Previously verified JMF documented on a Caltrans Hot Mix Asphalt Verification form dated within 12 months
3. Mix design documentation on a Contractor Hot Mix Asphalt Design Data form used for the previously verified JMF

**39-1.01C(2)(c) Job Mix Formula Modification**

For an authorized JMF, submit a modified JMF if you change any of the following:

1. Asphalt binder supplier
2. Liquid antistrip producer
3. Liquid antistrip dosage

You may change any of the above items only once during the Contract.

Submit your modified JMF request a minimum of 15 days before production. Each modified JMF submittal must consist of:

1. Proposed modified JMF on Contractor Job Mix Formula Proposal form, marked *Modified*.
2. Mix design records on Contractor Hot Mix Asphalt Design Data form for the authorized JMF to be modified.
3. JMF verification on Hot Mix Asphalt Verification form for the authorized JMF to be modified.
4. Test results for the modified JMF in compliance with the mix design specifications. Perform tests at the mix design OBC as shown on the Contractor Asphalt Mix Design Data form.

With an accepted modified JMF submittal, the Engineer verifies each modified JMF within 10 days of receiving all verification samples.

**39-1.01C(3) Quality Control Plan**

With your proposed JMF submittal, submit a QC plan for HMA.

The QC plan must describe the organization and procedures for:

1. Controlling HMA quality characteristics
2. Taking samples, including sampling locations
3. Establishing, implementing, and maintaining QC
4. Determining when corrective actions are needed
5. Implementing corrective actions
6. Methods and materials for backfilling core locations

The QC plan must address the elements affecting HMA quality including:

1. Aggregate
2. Asphalt binder
3. Additives
4. Production
5. Paving

The QC plan must include aggregate QC sampling and testing during lime treatment.

The Engineer reviews the QC plan within 5 business days from the submittal. Do not start HMA production until the Engineer authorizes the plan.

10-30-15

If QC procedures, personnel, or sample testing locations change, submit a QC plan supplement at least 3 business days before implementing the proposed change. Do not implement the change without authorization.

04-18-14

### 39-1.01C(4) Test Results

For mix design, JMF verification, production start-up, and each 10,000 tons, submit AASHTO T 283 and AASHTO T 324 (Modified) test results to the Engineer and electronically to:

Moisture\_Tests@dot.ca.gov

Submit all QC test results, except AASHTO T 283 and AASHTO T 324 (Modified), within 3 business days of a request. Submit AASHTO T 283 QC tests within 15 days of sampling.

For tests performed under AASHTO T 324 (Modified), submit test data and 1 tested sample set within 5 business days of sampling.

If coarse and fine durability index tests are required, submit test results within 2 business days of testing.

10-30-15

If a tapered notched wedge is used, submit compaction test result values within 24 hours of testing.

04-18-14

### 39-1.01C(5) Reserved

### 39-1.01C(6) Liquid Antistrip Treatment

If liquid antistrip treatment is used, submit the following with your proposed JMF submittal:

1. One 1-pint sample
2. Infrared analysis including copy of absorption spectra
3. Certified copy of test results
4. Certificate of compliance for each liquid antistrip shipment. On each certificate of compliance, include:
  - 4.1. Your signature and printed name
  - 4.2. Shipment number
  - 4.3. Material type
  - 4.4. Material specific gravity
  - 4.5. Refinery
  - 4.6. Consignee
  - 4.7. Destination
  - 4.8. Quantity
  - 4.9. Contact or purchase order number
  - 4.10. Shipment date
5. Proposed proportions for liquid antistrip

For each delivery of liquid antistrip to the HMA production plant, submit a 1-pint sample to METS. Submit shipping documents. Label each liquid antistrip sampling container with:

1. Liquid antistrip type
2. Application rate
3. Sample date
4. Contract number

At the end of each day's production shift, submit production data in electronic and printed media. Present data on electronic media in tab delimited format. Use line feed carriage return with 1 separate record per line for each production data set. Allow sufficient fields for the specified data. Include data titles at least once per report. For each HMA mixing plant type, submit the following information in the order specified:

1. For batch plant mixing:
  - 1.1. Production date

- 1.2. Time of batch completion
- 1.3. Mix size and type
- 1.4. Each ingredient's weight
- 1.5. Asphalt binder content as a percentage of the total weight of mix
- 1.6. Liquid antistriper content as a percentage of the asphalt binder weight
2. For continuous mixing plant:
  - 2.1. Production date
  - 2.2. Data capture time
  - 2.3. Mix size and type
  - 2.4. Flow rate of wet aggregate collected directly from the aggregate weigh belt
  - 2.5. Aggregate moisture content as percentage of the dry aggregate weight
  - 2.6. Flow rate of asphalt binder collected from the asphalt binder meter
  - 2.7. Flow rate of liquid antistriper collected from the liquid antistriper meter
  - 2.8. Asphalt binder content as percentage of the total weight of mix calculated from:
    - 2.8.1. Aggregate weigh belt output
    - 2.8.2. Aggregate moisture input
    - 2.8.3. Asphalt binder meter output
  - 2.9. Liquid antistriper content as percentage of the asphalt binder weight calculated from:
    - 2.9.1. Asphalt binder meter output
    - 2.9.2. Liquid antistriper meter output

### 39-1.01C(7) Lime Treatment

If aggregate lime treatment is used, submit the following with your proposed JMF submittal and each time you produce lime-treated aggregate:

1. Exact lime proportions for fine and coarse virgin aggregate
2. If marination is required, the averaged aggregate quality test results within 24 hours of sampling
3. For dry lime aggregate treatment, a treatment data log from the dry lime and aggregate proportioning device in the following order:
  - 3.1. Treatment date
  - 3.2. Time of day the data is captured
  - 3.3. Aggregate size being treated
  - 3.4. HMA type and mix aggregate size
  - 3.5. Wet aggregate flow rate collected directly from the aggregate weigh belt
  - 3.6. Aggregate moisture content, expressed as a percent of the dry aggregate weight
  - 3.7. Flow rate of dry aggregate calculated from the flow rate of wet aggregate
  - 3.8. Dry lime flow rate
  - 3.9. Lime ratio from the authorized JMF for each aggregate size being treated
  - 3.10. Lime ratio from the authorized JMF for the combined aggregate
  - 3.11. Actual lime ratio calculated from the aggregate weigh belt output, the aggregate moisture input, and the dry lime meter output, expressed as a percent of the dry aggregate weight
  - 3.12. Calculated difference between the authorized lime ratio and the actual lime ratio
4. For lime slurry aggregate treatment, a treatment data log from the slurry proportioning device in the following order:
  - 4.1. Treatment date
  - 4.2. Time of day the data is captured
  - 4.3. Aggregate size being treated
  - 4.4. Wet aggregate flow rate collected directly from the aggregate weigh belt
  - 4.5. Moisture content of the aggregate just before treatment, expressed as a percent of the dry aggregate weight
  - 4.6. Dry aggregate flow rate calculated from the wet aggregate flow rate
  - 4.7. Lime slurry flow rate measured by the slurry meter
  - 4.8. Dry lime flow rate calculated from the slurry meter output
  - 4.9. Authorized lime ratio for each aggregate size being treated
  - 4.10. Actual lime ratio calculated from the aggregate weigh belt and the slurry meter output, expressed as a percent of the dry aggregate weight

- 4.11. Calculated difference between the authorized lime ratio and the actual lime ratio
- 4.12. Dry lime and water proportions at the slurry treatment time

Each day during lime treatment, submit the treatment data log on electronic media in tab delimited format on a removable CD-ROM storage disk. Each continuous treatment data set must be a separate record using a line feed carriage return to present the specified data on 1 line. The reported data must include data titles at least once per report.

### 39-1.01C(8) Warm Mix Asphalt Technology

If a warm mix asphalt technology is used, submit the following with your proposed JMF submittal:

1. MSDS for warm mix asphalt technology
2. For warm mix asphalt water injection foam technology:
  - 2.1. Name of technology
  - 2.2. Proposed foaming water content
  - 2.3. Proposed HMA production temperature range
  - 2.4. Certification from binder supplier stating no antifoaming agent is used.
3. For warm mix asphalt additive technology:
  - 3.1. Name of technology
  - 3.2. Percent admixture by weight of binder and percent admixture by total weight of HMA as recommended by the manufacturer
  - 3.3. Methodology for inclusion of admixture in laboratory-produced HMA
  - 3.4. Proposed HMA production temperature range

Collect and hold data for the duration of the Contract and submit the electronic media, daily and upon request. The snapshot of production data must include the following:

1. Date of production
2. Production location
3. Time of day the data is captured
4. HMA mix type being produced and target binder rate
5. HMA additive type, brand, and target rate
6. Temperature of the binder and HMA mixture
7. For a continuous mixing plant, the rate of flow of the dry aggregate calculated from the wet aggregate flow rate as determined by the conveyor scale
8. For a continuous mixing plant, the rate of flow of the asphalt meter
9. For a continuous mixing plant, the rate of flow of HMA additive meter
10. For batch plant mixing, actual batch weights of all ingredients
11. Dry aggregate to binder ratio calculated from metered ingredient output
12. Dry aggregate to HMA additive ratio calculated from metered output

At the end of each day's production shift, submit electronic and printed media from the HMA plant process controller. Present data on electronic media in comma-separated values or tab-separated values format. The captured data for the ingredients represented by production snapshot must have allowances for sufficient fields to satisfy the amount of data required by these specifications and include data titles at least once per report.

### 39-1.01C(9) Samples

For the samples taken for JMF verification, submit 3 parts to the Engineer and use 1 part for your testing.

At production start-up and within 1000 tons of the halfway point of production of HMA, submit samples split from your HMA production sample for AASHTO T 283 and AASHTO T 324 (Modified) tests to the Engineer.

**39-1.01C(10)–39-1.01C(11) Reserved****39-1.01C(12) Data Cores**

Section 39-1.01C(12) applies if a bid item for data core is shown on the Bid Item List.

Submit a summary of data cores taken and a photograph of each data core to the Engineer and to:

Coring@dot.ca.gov

For each data core, the summary must include:

1. Project identification number
2. Date cored
3. Core identification number
4. Type of materials recovered
5. Type and approximate thickness of unstabilized material not recovered
6. Total core thickness
7. Thickness of each individual material to within:
  - 7.1. For recovered material, 1/2 inch
  - 7.2. For unstabilized material, 1.0 inch
8. Location including:
  - 8.1. County
  - 8.2. Route
  - 8.3. Post mile
  - 8.4. Lane number
  - 8.5. Lane direction
  - 8.6. Station

Each data core digital photograph must include a ruler laid next to the data core. Each photograph must include:

1. Core
2. Project identification number
3. Core identification number
4. Date cored
5. County
6. Route
7. Post mile
8. Lane number
9. Lane direction

**39-1.01C(13) Pavement Smoothness****39-1.01C(13)(a) General**

Reserved

**39-1.01C(13)(b) Straightedge Measurements**

Within 2 business days of performing straightedge measurements, submit areas requiring smoothness correction. Identify locations of smoothness correction by:

1. Location Number
2. District-County-Route
3. Beginning station or post mile to the nearest 0.01 mile
4. For correction areas within a lane:
  - 4.1. Lane direction as NB, SB, EB, or WB
  - 4.2. Lane number from left to right in direction of travel
  - 4.3. Wheel path as "L" for left, "R" for right, or "B" for both
5. For correction areas not within a lane:
  - 5.1. Identify pavement area (i.e., shoulder, weight station, turnout)



- 5.2. Direction and distance from centerline as "L" for left or "R" for right
6. Estimated size of correction area

### 39-1.01C(13)(c) Inertial Profiler Certification

At least 5 business days before the start of initial profiling or changing inertial profiler or operator, submit:

1. Inertial profiler certification issued by the Department.
2. Operator certification for the inertial profiler issued by the Department.
3. List of manufacturer's recommended test procedures for the inertial profiler calibration and verification.

Within 2 business days after cross-correlation testing, submit ProVAL profiler certification analysis report for cross-correlation test results performed on test section to the Engineer and to the electronic mailbox address:

smoothness@dot.ca.gov

### 39-1.01C(13)(d) Inertial Profiler Data

10-30-15

At least 15 days before inertial profiling, you must register with the Department's secure file sharing system. To obtain information on the registration process, send an e-mail with your contact information to the following electronic mailbox address:

smoothness@dot.ca.gov

Within 2 business days after each day of profiling, submit the profile information to the Engineer and to the Department's secure file sharing system. After submitting the profile information to the Department's file sharing system, send a notification of your electronic submittal to the Engineer and to the above electronic mailbox address with the names of the files submitted.

The profiling information must include:

1. Raw profile data for each lane.
2. ProVAL ride quality analysis report for the International Roughness Index of the left and right wheel paths of each lane. Submit each report as a PDF file.
3. ProVAL ride quality analysis report for the Mean Roughness Index of each lane. Submit each report as a PDF file.
4. ProVAL smoothness assurance analysis report for the International Roughness Index of the left and right wheel paths of each lane. Submit each report as a PDF file.
5. ProVAL smoothness assurance analysis reports for the grinding locations of the left and right wheel paths of each lane. Submit each report as a PDF file.
6. GPS data file for each lane. Submit the data file in GPS eXchange file format.
7. Manufacturer's recommended calibration and verification test results for the inertial profiler.
8. Inertial profiler's calibration and verification test results, including bounce, block, and distance measurement instrument.

Submit the raw profile data in an unfiltered electronic pavement profile file format. Use the following file-naming convention:

YYYYMMDD\_TTCCRRR\_EA\_D\_L\_W\_B\_E\_X\_PT.PPF

where:

YYYY = year

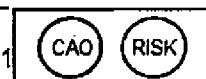
MM = month, leading zero

DD = day of month, leading zero

TT = district, leading zero

CCC = county, 2- or 3-letter abbreviation as shown in section 1-1.08

RRR = route number, no leading zeros



EA = Contract number, excluding district identification number, expressed as 6 characters  
 D = traffic direction, *NB*, *SB*, *WB*, or *EB*  
 L = lane number from left to right in the direction of travel  
 W = wheel path, *L* for left, *R* for right, or *B* for both  
 B = beginning station to the nearest foot, such as 10+20, or beginning post mile to the nearest hundredth, such as 25.06, no leading zero  
 E = ending station to the nearest foot, such as 14+20, or ending post mile to the nearest hundredth, such as 28.06, no leading zero  
 X = profile operation, *EXIST* for existing pavement, *INTER* for after prepaving smoothness correction, *PAVE* for after paving, and *CORR* for after final surface pavement correction  
 PT = type of HMA pavement, such as Type A HMA or RHMA-G

If submitting multiple inertial profiler data files, compress the files into a zip format and submit them using the file-naming convention TT\_EA\_X\_YYYYMMDD.zip.

04-18-14

**39-1.01C(13)(e) Reserved****39-1.01C(14)–39-1.01C(15) Reserved****39-1.01D Quality Control and Assurance****39-1.01D(1) General**

When testing under AASHTO T 324 (Modified), test under AASHTO T 324 with the following parameters:

1. Target air voids must equal  $7.0 \pm 1.0$  percent
2. Specimen height must be  $60 \pm 1$  mm
3. Number of test specimens must be 4 (2 test sets)
4. Do not average test sets
5. Test specimen must be a 150 mm gyratory compacted specimen
6. Test temperature must be set at:
  - 6.1.  $113 \pm 2$  degrees F for PG 58
  - 6.2.  $122 \pm 2$  degrees F for PG 64
  - 6.3.  $131 \pm 2$  degrees F for PG 70 and above

10-17-14

7. Measurements for impression must be taken at every 100 passes along the total length of sample
8. Inflection point defined as the number of wheel passes at the intersection of the creep slope and the stripping slope at maximum rut depth
9. Testing shut off must be set at 25,000 passes
10. Submersion time for samples must not exceed 4 hours

04-18-14

Take samples under California Test 125.

**39-1.01D(2) Job Mix Formula Verification**

10-17-14

The Engineer verifies the JMF from samples taken from HMA produced by the plant to be used. The production set point at the plant must be within  $\pm 0.2$  from the asphalt binder percentage target value shown in your Contractor Job Mix Formula Proposal form. Notify the Engineer at least 2 business days before sampling materials. Samples may be taken from a different project including a non-Department project if you make arrangements for the Engineer to be present during sampling.

04-18-14

In the Engineer's presence and from the same production run, take samples of:

1. Aggregate. Coarse, fine, and supplemental fine aggregate must be taken from the combined cold feed belt, or hot bins. If lime treatment is required, samples must be taken from individual stockpiles before lime treatment. Samples must be at least 120 lb for each coarse aggregate, 80 lb for each fine aggregate, and 10 lb for each type of supplemental fine aggregate. For hot bin samples, the

Department combines these aggregate samples to comply with the TV submitted on a Contractor Job Mix Formula Proposal form.

2. Asphalt binder. Take 2 samples minimum. Each sample must be in a 1-quart cylindrical-shaped can with an open top and friction lid. If the asphalt binder is modified or rubberized, the asphalt binder must be sampled with the components blended in the proportions to be used.
3. RAP. RAP samples must be at least 50 lb from each fractionated stockpile used or 100 lb from the belt.
4. Plant-produced HMA. The HMA samples must be at least 250 lb.

For aggregate, RAP, and HMA, split the samples into at least 4 parts and label their containers. Three parts are for the Department's verification testing and 1 part is for your testing.

After acceptance of the JMF submittal, the Engineer verifies each proposed JMF within 20 days of receiving all verification samples.

For JMF verification, the Engineer tests the following for compliance with the specifications:

1. Aggregate quality
2. Aggregate gradation
3. Voids in mineral aggregate on laboratory-produced HMA must comply with the mix design specifications for voids in mineral aggregate
4. HMA quality characteristics for Department acceptance

To verify the HMA for air voids, voids in mineral aggregate, and dust proportion, the Engineer uses an average of 3 briquettes. The Engineer tests plant-produced material.

If the Engineer verifies the JMF, the Engineer furnishes you a Hot Mix Asphalt Verification form.

If the Engineer's test results on plant-produced samples do not show compliance with the specifications, the Engineer notifies you. Adjust your JMF based on your testing unless the Engineer authorizes reverification without adjustments. JMF adjustments may include a change in:

1. Asphalt binder content target value up to  $\pm 0.20$  percent from the OBC value submitted on Contractor Hot Mix Asphalt Design Data form
2. Aggregate gradation target values within the target value limits specified in the aggregate gradation table

You may adjust the JMF only once due to a failed verification test.

For each HMA type and aggregate size specified, the Engineer verifies up to 2 proposed JMF submittals including a JMF adjusted after verification failure. If you submit more than 2 JMFs for each type of HMA and aggregate size, the Engineer deducts \$3,000 from payments for each verification exceeding this limit. This deduction does not apply to verifications initiated by the Engineer or if a JMF expires while HMA production is stopped longer than 30 days.

A verified JMF is valid for 12 months.

### **39-1.01D(3) Job Mix Formula Authorization**

You may start HMA production if:

1. The Engineer's review of the JMF shows compliance with the specifications
2. The Department has verified the JMF within 12 months before HMA production
3. The Engineer authorizes the verified JMF

### **39-1.01D(4) Job Mix Formula Renewal**

For a JMF renewal and upon request, in the Engineer's presence and from the same production run, take samples of:

1. Aggregate. Coarse, fine, and supplemental fine aggregate must be taken from combined cold-feed belt, or hot bins. If lime treatment is required, samples must be taken from individual stockpiles before lime treatment. Samples must be at least 120 lb for each coarse aggregate, 80 lb for each fine aggregate, and 10 lb for each type of supplemental fines. For hot bins, the Department combines these aggregate samples to comply with the TV submitted on a Contractor Job Mix Formula Proposal form.
2. Asphalt binder. Take 2 samples minimum. Each sample must be in a 1-quart cylindrical-shaped can with an open top and friction lid. If the asphalt binder is modified or rubberized, the asphalt binder must be sampled with the components blended in the proportions to be used.
3. RAP. RAP samples must be at least 50 lb from each fractionated stockpile.
4. Plant-produced HMA. The HMA samples must be at least 250 lb.

Notify the Engineer at least 2 business days before sampling materials. For aggregate, RAP, and HMA, split samples into at least 4 parts. Submit 3 parts to the Engineer and use 1 part for your testing.

Allow the Engineer 5 business days from a complete JMF reverification submittal for document review of the aggregate qualities, mix design, and JMF.

The most recent aggregate quality test results within the past 12 months may be used for verification of JMF renewal or upon request, the Engineer may perform aggregate quality tests for verification of JMF renewal.

The Engineer verifies the JMF for renewal under section 39-1.01D(2) except:

1. The Engineer keeps the samples until you provide test results for your part on a Contractor Job Mix Formula Renewal form.
2. The Department tests samples of materials obtained from the HMA production unit after you submit test results that comply with the mix design specifications.
3. After completion of the JMF verification renewal document review, the Engineer verifies each proposed JMF within 20 days of receiving the verification renewal samples and the complete Contractor Job Mix Formula Renewal form.
4. You may not adjust the JMF due to a failed verification.
5. For each HMA type and aggregate gradation specified, the Engineer verifies at no cost to you 1 proposed JMF renewal within a 12-month period.

If the Engineer verifies the JMF renewal, the Engineer furnishes you a Hot Mix Asphalt Verification form. The Hot Mix Asphalt Verification form is valid for 12 months.

#### **39-1.01D(5) Job Mix Formula Modification**

The Engineer verifies the modified JMF after the modified JMF HMA is placed on the project and verification samples are taken within the first 750 tons. The Engineer tests verification samples for compliance with:

1. Hamburg wheel track mix design specifications
2. Air void content
3. Voids in mineral aggregate on plant-produced HMA mix design specifications
4. Dust proportion mix design specifications

The Engineer may test for moisture susceptibility for compliance with the mix design specifications.

If the modified JMF is verified, the Engineer revises your Hot Mix Asphalt Verification form to include the new asphalt binder source, new liquid antistriper producer, or new liquid antistriper dosage. Your revised form will have the same expiration date as the original form.

If a modified JMF is not verified, stop production and any HMA placed using the modified JMF is rejected.

The Engineer deducts \$2,000 from payments for each JMF modification.

**39-1.01D(6) Certifications****39-1.01D(6)(a) General**

Laboratories testing aggregate and HMA qualities used to prepare the mix design and JMF must be qualified under AASHTO Materials Reference Laboratory program and the Department's Independent Assurance Program.

**39-1.01D(6)(b) Hot Mix Asphalt Plants**

Before production, the HMA plant must have a current qualification under the Department's Material Plant Quality Program.

**39-1.01D(6)(c) Inertial Profiler Certifications**

The inertial profiler equipment must display a current certification decal with expiration date.

The inertial profiler operator and device certifications must be not more than 12 months old.

The operator must be certified for each different model of inertial profiler device operated.

**39-1.01D(6)(d)–39-1.01D(6)(e) Reserved****39-1.01D(7) Prepaving Meeting**

Meet with the Engineer at a prepaving meeting at a mutually agreed time and place. Discuss the QC plan and the methods of performing HMA production and paving work.

The following personnel must attend the prepaving meeting:

1. Project manager
2. Superintendent
3. HMA plant manager
4. HMA paving foreman

If a warm mix asphalt technology is used, a technical representative for warm mix asphalt technology must attend the prepaving meeting.

**39-1.01D(8) Quality Control****39-1.01D(8)(a) General**

QC test results must comply with the specifications for Department acceptance.

Prepare 3 briquettes for air voids content and voids in mineral aggregate determination. Report the average of 3 tests.

Except for smoothness, if 2 consecutive QC test results or any 3 QC test results for 1 day's production do not comply with the materials specifications:

1. Stop HMA production
2. Notify the Engineer
3. Take corrective action
4. Demonstrate compliance with the specifications before resuming production and placement

For QC tests performed under AASHTO T 27, results are considered 1 QC test regardless of number of sieves out of compliance.

Do not resume production and placement until the Engineer authorizes your corrective action proposal.

**39-1.01D(8)(b) Reserved****39-1.01D(8)(c) Aggregate****39-1.01D(8)(c)(i) General**

Reserved

**39-1.01D(8)(c)(ii) Aggregate Lime Treatments**

If lime treatment is required, sample coarse and fine aggregate from individual stockpiles before lime treatment. Combine aggregate in the JMF proportions. Test the aggregate under the test methods and frequencies shown in the following table:

10-30-15

**Aggregate Quality Control During Lime Treatment**

Quality characteristic	Test method	Minimum sampling and testing frequency
Sand equivalent <sup>a, b</sup>	AASHTO T 176	1 per 750 tons of untreated aggregate
Percent of crushed particles	AASHTO T 335	1 per 10,000 tons or 2 per project whichever is greater
Los Angeles Rattler	AASHTO T 96	
Fine aggregate angularity	AASHTO T 304 Method A	
Flat and elongated particles	ASTM D4791	

<sup>a</sup>Report test results as the average of 3 tests from a single sample.

<sup>b</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 7.1.2, and 8.4.3 do not apply. Prepare the stock solution as specified in section 4.8.1, except omit the addition of formaldehyde.

For lime slurry aggregate treatment, determine the aggregate moisture content at least once every 2 hours of treatment. Calculate moisture content under AASHTO T 255 and report it as a percent of dry aggregate weight. Use the moisture content calculations as a set point for the proportioning process controller.

04-18-14

The device controlling lime and aggregate proportioning must produce a treatment data log. The log consists of a series of data sets captured at 10-minute intervals throughout daily treatment. The data must be a treatment activity register and not a summation. The material represented by a data set is the quantity produced 5 minutes before and 5 minutes after the capture time. For the duration of the Contract, collected data must be stored by the controller.

If 3 consecutive sets of recorded treatment data indicate a deviation of more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment and take corrective action.

If a set of recorded treatment data indicates a deviation of more than 0.4 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the material represented by that set of data in HMA.

If 20 percent or more of the total daily treatment indicates a deviation of more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use that day's treated aggregate in HMA.

The Engineer may order you to stop aggregate treatment activities for any of following:

1. You fail to submit treatment data log
2. You fail to submit aggregate QC data for marinated aggregate
3. You submit incomplete, untimely, or incorrectly formatted data
4. You do not take corrective actions
5. You take late or unsuccessful corrective actions
6. You do not stop treatment when proportioning tolerances are exceeded
7. You use malfunctioning or failed proportioning devices

If you stop treatment for noncompliance, notify the Engineer of any corrective actions taken and conduct a successful 20-minute test run before resuming treatment.

### 39-1.01D(8)(d) Liquid Antistrip Treatment

For continuous mixing or batch-plant mixing, sample asphalt binder before adding liquid antistrip. For continuous mixing, sample the combined asphalt binder and liquid antistrip after the static mixer.

### 39-1.01D(8)(e) Production Start-up Evaluation

You and the Engineer evaluate HMA production and placement at production start-up.

Within the first 750 tons produced on the 1st day of HMA production, in the Engineer's presence, and from the same production run, take samples of:

1. Aggregate
2. Asphalt binder
3. RAP
4. HMA

Sample aggregate from the combined cold-feed belt or hot bin. Take RAP samples from the RAP system.

For aggregate, RAP, and HMA, split the samples into at least 4 parts and label their containers. Submit 3 parts to the Engineer and keep 1 part.

You and the Engineer must test the samples and report test results, except for AASHTO T 324 (Modified) and AASHTO T 283 test results, within 5 business days of sampling. For AASHTO T 324 (Modified) and AASHTO T 283 test results, report test results within 15 days of sampling. If you proceed before receipt of the test results, the Engineer may consider the HMA placed to be represented by these test results.

Take one 4- or 6-inch diameter density core for each 250 tons or portion thereof of HMA placed. For each density core, the Engineer reports the bulk specific gravity determined under AASHTO T 275, Method A, in addition to the percent of theoretical maximum density.

### 39-1.01D(8)(f) Hot Mix Asphalt Density

During HMA placement determine HMA density using a nuclear gauge. On the 1st day of production, develop a correlation factor between cores and nuclear gauge under California Test 375.

Test for in-place density using cores and a nuclear gauge. Test at random locations you select and include the test results in your QC production tests reports.

### 39-1.01D(8)(g) Tapered Notched Wedge

Perform QC testing on the completed tapered notched wedge joint as follows:

1. Perform density tests using a calibrated nuclear gage at a rate of 1 test for every 750-foot section along the joint. Select random locations for testing within each 750-foot section.
2. Perform density tests at the centerline of the joint, 6 inches from the upper vertical notch, after the adjacent lane is placed and before opening the pavement to traffic.
3. Determine theoretical maximum density.
4. Determine percent compaction of the longitudinal joint as the ratio of the daily average density to the maximum density test results.

10-30-15

Determine percent compaction values each day the tapered notched wedge joint is completed. If the percent compaction of 1 day's production is less than 91 percent, that day's notched wedge joint is rejected. Discontinue placement of the tapered notched wedge and notify the Engineer of changes you will make to your construction process in order to comply with the specifications.

04-18-19

**39-1.01D(8)(h) Density Cores**

10-30-15

Except for HMA pavement placed using method compaction, take 4- or 6-inch diameter density cores at least once every 5 business days. Take 1 density core for every 250 tons of HMA from random locations the Engineer selects. Take density cores in the Engineer's presence, and backfill and compact holes with authorized material. Before submitting a density core, mark it with the density core's location and place it in a protective container.

04-18-14

If a density core is damaged, replace it with a density core taken within 1 foot longitudinally from the original density core. Relocate any density core located within 1 foot of a rumble strip to 1 foot transversely away from the rumble strip.

For a tapered notched wedge joint, take 4- or 6-inch diameter density cores 6 inches from the upper vertical notch of the completed longitudinal joint for every 3,000 feet at locations selected by the Engineer. Take cores after the adjacent lane is placed and before opening the pavement to traffic. Take cores in the presence of the Engineer, and backfill and compact holes with authorized material. Before submitting a density core, mark it with the core's location and place it in a protective container.

**39-1.01D(8)(i) Reserved****39-1.01D(8)(j) Pavement Smoothness****39-1.01D(8)(j)(i) General**

Test pavement smoothness using an inertial profiler except use a 12-foot straightedge for the HMA pavement at the following locations:

1. Traffic lanes less than 1,000 feet in length including ramps, turn lanes, and acceleration and deceleration lanes
2. HMA pavement within 3 feet from and parallel to the construction joint formed between curbs, gutters, or existing pavement
3. Areas within 15 feet of manholes
4. Shoulders
5. Weigh-in-motion areas
6. Miscellaneous areas such as medians, gore areas, turnouts, and maintenance pullouts

10-30-15

Where inertial profiler testing is required:

1. Determine the pavement smoothness for each traffic lane by obtaining the International Roughness Index for the left and right wheel paths in an individual lane. The average of the International Roughness Index values for the left and right wheel paths for the same traffic lane is the Mean Roughness Index of the lane. The wheel paths are a pair of lines 3 feet from and parallel to the edge of a traffic lane. Left and right wheel paths are based on the direction of travel.
2. Identify the areas of localized roughness using the FHWA's engineering software ProVAL to perform smoothness assurance analysis. Calculate the continuous International Roughness Index values for each wheel path with a 25-foot interval using a 250 mm filter.

Collect profiling data under AASHTO R 56 and analyze data using 250 mm and International Roughness Index filters.

Where OGFC is required, test pavement smoothness of the final HMA or concrete pavement surface before placing OGFC and after placing OGFC.

04-18-14

**39-1.01D(8)(j)(ii) Inertial Profiler Calibration and Verification Tests**

Operate the inertial profiler according to the manufacturer's instructions and AASHTO R 57 at 1-inch recording intervals.

Notify the Engineer 2 business days before performing inertial profiler calibration and verification testing.



Conduct the following inertial profiler calibration and verification tests in the Engineer's presence each day before performing inertial profiling:

1. Block test. Verify the height sensor accuracy under California Test 387.
2. Bounce test. Verify the combined height sensor and accelerometer accuracy under California Test 387. 10-30-15
3. Distance measurement index test. Verify the accuracy of the distance measuring instrument under California Test 387. 04-18-14
4. Manufacturer's recommended tests.

Conduct cross-correlation inertial profiler verification test in the Engineer's presence before performing initial profiling. Verify cross-correlation inertial profiler verification test at least annually. Conduct 5 repeat runs of the inertial profiler on an authorized test section. The test section must be on an existing asphalt concrete pavement surface 0.1 mile long. Calculate a cross-correlation to determine the repeatability of your device under California Test 387 using ProVAL profiler certification analysis with a 3 feet maximum offset. The cross-correlation must be a minimum of 0.92.

### **39-1.01D(8)(j)(iii) Smoothness Testing**

Notify the Engineer of start location by station and start time at least 2 business days before profiling.

Remove foreign objects on the pavement surface before profiling.

Mark the beginning and ending station on the pavement shoulder before profiling. Stationing must be the same when profiling more than one surface.

While collecting the profile data to determine the International Roughness Index values, record the following locations in the raw profile data:

1. Begin and end of all bridge approach slabs
2. Begin and end of all bridges
3. Begin and end of all culverts visible on the roadway surface 10-17-14
4. Begin and end of all at-grade intersections 04-18-14

Determine the Mean Roughness Index for 0.1-mile fixed sections using the ProVAL ride quality analysis with a 250 mm filter. Profile the left and right wheel paths of each lane. Calculate the Mean Roughness Index of each lane. A partial section less than 0.1 mile that is the result of an interruption to continuous pavement surface must comply with the Mean Roughness Index specifications for a full section. Adjust the Mean Roughness Index for a partial section to reflect a full section based on the proportion of a section paved.

Determine the areas of localized roughness using a continuous International Roughness Index for each wheel path with a 25-foot interval using a 250 mm filter.

### **39-1.01D(9) Department Acceptance**

#### **39-1.01D(9)(a) General**

The Department tests treated aggregate for acceptance before lime treatment except for gradation.

The Engineer takes HMA samples for AASHTO T 283 and AASHTO T 324 (Modified) from one of the following: 10-17-14

1. At the plant
2. At the truck
3. Windrow

The Engineer takes HMA samples for all other tests from one of the following:

1. At the plant
2. At the truck
3. Windrow
4. Mat behind the paver

10-30-15

To obtain workability of the HMA sample for splitting, the Engineer reheats each sample of HMA mixture not more than 2 cycles. Each reheat cycle is performed by placing the loose mixture in a mechanical forced-draft oven for 2 hours or less after the sample reaches 140 degrees F.

The Engineer conditions each at-the-plant sample of HMA mixture in compliance with sections 7.1.2, 7.1.3, and 7.1.4 of AASHTO R 30.

04-18-14

The Engineer's sampling and testing is independent of your QC sampling and testing.

If you request, the Engineer splits samples and provides you with a part.

No single test result may represent more than 750 tons or one day's production, whichever is less, excluding AASHTO T 283 and AASHTO T 324 (Modified).

Except for smoothness, if 2 consecutive Department acceptance test results or any 3 Department acceptance test results for 1 day's production do not comply with the specifications:

1. Stop HMA production
2. Take corrective action
3. Demonstrate compliance with the specifications before resuming production and placement

10-17-14

For Department acceptance tests performed under AASHTO T 27, results are considered 1 Department acceptance test regardless of the number of sieves out of compliance.

04-18-14

The Engineer accepts HMA based on:

1. Authorized JMF
2. Authorized QC plan
3. Asphalt binder compliance
4. Asphalt emulsion compliance
5. Visual inspection
6. Pavement smoothness

### **39-1.01D(9)(b) In-Place Density**

10-17-14

Except for HMA pavement placed using method compaction, the Engineer tests the density core you take from each 250 tons of HMA. The Engineer determines the percent of theoretical maximum density for each density core by determining the density core's density and dividing by the theoretical maximum density.

10-30-15

Density cores must be taken from the final layer, cored through the entire pavement thickness shown. Where OGFC is required, take the density cores before placing OGFC.

If the percent of theoretical maximum density does not comply with the specifications, the Engineer may accept the HMA and take a payment deduction as shown in the following table:

**Reduced Payment Factors for Percent of Maximum Theoretical Density**

HMA percent of maximum theoretical density	Reduced payment factor	HMA percent of maximum theoretical density	Reduced payment factor
91.0	0.0000	97.0	0.0000
90.9	0.0125	97.1	0.0125
90.8	0.0250	97.2	0.0250
90.7	0.0375	97.3	0.0375
90.6	0.0500	97.4	0.0500
90.5	0.0625	97.5	0.0625
90.4	0.0750	97.6	0.0750
90.3	0.0875	97.7	0.0875
90.2	0.1000	97.8	0.1000
90.1	0.1125	97.9	0.1125
90.0	0.1250	98.0	0.1250
89.9	0.1375	98.1	0.1375
89.8	0.1500	98.2	0.1500
89.7	0.1625	98.3	0.1625
89.6	0.1750	98.4	0.1750
89.5	0.1875	98.5	0.1875
89.4	0.2000	98.6	0.2000
89.3	0.2125	98.7	0.2125
89.2	0.2250	98.8	0.2250
89.1	0.2375	98.9	0.2375
89.0	0.2500	99.0	0.2500
< 89.0	Remove and replace	> 99.0	Remove and replace

For acceptance of a completed tapered notched wedge joint, the Engineer determines density from cores you take every 3,000 feet.

04-18-14

**39-1.01D(9)(c) Pavement Smoothness**

For areas that require pavement smoothness determined using an inertial profiler, the pavement surface must:

1. Have no areas of localized roughness with an International Roughness Index greater than 160 in/mi
2. Comply with the Mean Roughness Index requirements shown in the following table for a 0.1 mile section:

**HMA Pavement Smoothness Acceptance Criteria**

HMA thickness	Mean Roughness Index requirement
> 0.20 foot	60 in/mi or less
≤ 0.20 foot	75 in/mi or less

Note: These requirements do not apply to the OGFC surface. Smoothness requirements for OGFC are specified in section 39-4.01D(3)(c).

Where OGFC is required, the final HMA surface must comply with the Mean Roughness Index requirements before placing OGFC. Correct the pavement surface that does not meet the Mean Roughness Index specifications. Areas of localized roughness greater than 160 in/mi must be corrected regardless of the Mean Roughness Index values of a 0.1-mile section.

04-18-14

For areas that require pavement smoothness determined using a 12-foot straightedge, the HMA pavement surface must not vary from the lower edge of the straightedge by more than:

1. 0.01 foot when the straightedge is laid parallel with the centerline
2. 0.02 foot when the straightedge is laid perpendicular to the centerline and extends from edge to edge of a traffic lane
3. 0.02 foot when the straightedge is laid within 24 feet of a pavement conform

Pavement smoothness may be accepted based on your testing in the absence of the Department's testing.

For each 0.1 mile section, your International Roughness Index values must be within 10 percent of the Department's International Roughness Index values. The Engineer may order you to recalibrate your inertial profiler equipment and reprofile. If your results are inaccurate due to operator error, the Engineer may disqualify your inertial profiler operator.

### **39-1.01D(9)(d) Dispute Resolution**

You and the Engineer must work together to avoid potential conflicts and to resolve disputes regarding test result discrepancies. Notify the Engineer within 5 business days of receiving a test result if you dispute the test result.

If you or the Engineer dispute the other's test results, submit your test results and copies of paperwork including worksheets used to determine the disputed test results. An independent third party performs referee testing. Before the third party participates in a dispute resolution, it must be qualified under AASHTO Materials Reference Laboratory program, and the Department's Independent Assurance Program. The independent third party must have no prior direct involvement on this Contract. By mutual agreement, the independent third party is chosen from:

1. Department laboratory in a district or region not in the district or region the project is located
2. Transportation Laboratory
3. Laboratory not currently employed by you or your HMA producer

10-30-15

If the Department's portion of the split QC samples or acceptance samples are not available, the independent third party uses any available material representing the disputed HMA for evaluation.

For a dispute involving JMF verification, the independent third party performs referee testing as specified in the 5th paragraph of section 39-1.01D(2).

04-18-14

If the independent third party determines the Department's test results are valid, the Engineer deducts the independent third party's testing costs from payments. If the independent third party determines your test results are valid, the Department pays the independent third party's testing costs.

### **39-1.02 MATERIALS**

#### **39-1.02A General**

Reserved

#### **39-1.02B Mix Design**

##### **39-1.02B(1) General**

The HMA mix design must comply with AASHTO R 35 except:

1. Notes 3, 6, and 10 do not apply
2. AASHTO M 323 does not apply on combinations of aggregate gradation and asphalt binder contents to determine the OBC and HMA mixture qualities

The Contractor Hot Mix Asphalt Design Data form must show documentation on aggregate quality.

**39-1.02B(2) Hot Mix Asphalt Treatments**

If the test results for AASHTO T 283 or AASHTO T 324 (Modified) for untreated plant-produced HMA are less than the minimum requirements for HMA mix design, determine the plasticity index of the aggregate blend under California Test 204.

If the plasticity index is greater than 10, do not use that aggregate blend.

If the plasticity index is from 4 to 10, treat the aggregate with dry lime with marination or lime slurry with marination.

If the plasticity index is less than 4, treat the aggregate with dry lime or lime slurry with marination, or treat the HMA with liquid antistriper.

**39-1.02B(3) Warm Mix Asphalt Technology**

10-30-15

For HMA with warm mix asphalt additive technology, produce HMA mix samples for your mix design using your methodology for inclusion of warm mix asphalt admixture in laboratory-produced HMA. Cure the samples in a forced-air draft oven at 275 degrees F for 4 hours  $\pm$  10 minutes.

04-18-14

For warm mix asphalt water injection foam technology, the use of foamed asphalt for mix design is not required.

**39-1.02C Asphalt Binder**

Asphalt binder must comply with section 92.

10-30-15

For hot mix asphalt (leveling) the grade of asphalt binder for the HMA must be PG 64-10 or PG 64-16.

04-18-14

**39-1.02D Aggregate****39-1.02D(1) General**

Aggregate must be clean and free from deleterious substances.

The aggregate for hot mix asphalt (leveling) must comply with the gradation specifications for Type A HMA in section 39-2.02.

**39-1.02D(2) Aggregate Gradations**

10-30-15

Aggregate gradation must be determined before the addition of asphalt binder and must include supplemental fine aggregates. Test for aggregate gradation under AASHTO T 27. Do not wash the coarse aggregate. Wash the fine aggregate only. Use a mechanical sieve shaker. Aggregate shaking time must not exceed 10 minutes for each coarse and fine aggregate portion.

04-18-14

Choose a target value within the target value limits shown in the tables titled "Aggregate Gradations."

Gradations are based on nominal maximum aggregate size.

**39-1.02D(3) Aggregate Lime Treatments****39-1.02D(3)(a) General**

If aggregate lime treatment is required, virgin aggregate must comply with the aggregate quality specifications.

Lime for treating aggregate must comply with section 24-2.02B.

Water for lime treatment of aggregate with lime slurry must comply with section 24-2.02C.

Notify the Engineer at least 24 hours before the start of aggregate treatment.

Do not treat RAP.

The lime ratio is the pounds of dry lime per 100 lb of dry virgin aggregate expressed as a percentage. Water content of slurry or untreated aggregate must not affect the lime ratio.

Coarse and fine aggregate fractions must have the lime ratio ranges shown in the following table:

Aggregate fractions	Lime ratio percent
Coarse	0.4–1.0
Fine	1.5–2.0
Combined	0.8–1.5

The lime ratio for fine and coarse aggregate must be within  $\pm 0.2$  percent of the lime ratio in the accepted JMF. The lime ratio must be within  $\pm 0.2$  percent of the authorized lime ratio when you combine the individual aggregate sizes in the JMF proportions. The lime ratio must be determined before the addition of RAP.

If marination is required, marinate treated aggregate in stockpiles from 24 hours to 60 days before using in HMA. Do not use aggregate marinated longer than 60 days.

Treated aggregate must not have lime balls or clods.

### 39-1.02D(3)(b) Dry Lime

If marination is required:

1. Treat and marinate coarse and fine aggregates separately
2. Treat the aggregate and stockpile for marination only once
3. Treat the aggregate separate from HMA production

Proportion dry lime by weight with an automatic continuous proportioning system.

If you use a batch-type proportioning system for HMA production, control proportioning in compliance with the specifications for continuous mixing plants. Use a separate dry lime aggregate treatment system for HMA batch mixing including:

1. Pugmill mixer
2. Controller
3. Weigh belt for the lime
4. Weigh belt for the aggregate

If using a continuous mixing plant for HMA production without lime marinated aggregates, use a controller that measures the blended aggregate weight after any additional water is added to the mixture. The controller must determine the quantity of lime added to the aggregate from the aggregate weigh belt input in connection with the manually input total aggregate moisture, the manually input target lime content, and the lime proportioning system output. Use a continuous aggregate weigh belt and pugmill mixer for lime treatment in addition to the weigh belt for the aggregate proportioning to asphalt binder in the HMA plant. If you use a water meter for moisture control for lime treatment, the meter must comply with Department's *MPQP* manual.

At the time of mixing dry lime with aggregate, the aggregate moisture content must ensure complete lime coating. The aggregate moisture content must not cause aggregate to be lost between the point of weighing the combined aggregate continuous stream and the dryer. Add water to the aggregate for mixing and coating before dry lime addition. Immediately before mixing lime with aggregate, water must not visibly separate from the aggregate.

Mix aggregate, water, and dry lime with a continuous pugmill mixer with twin shafts. Immediately before mixing lime with aggregate, water must not visibly separate from the aggregate. Store dry lime in a uniform and free-flowing condition. Introduce dry lime to the pugmill in a continuous process. The

introduction must occur after the aggregate cold feed and before the point of proportioning across a weigh belt and the aggregate dryer. Prevent loss of dry lime.

The pugmill must be equipped with paddles arranged to provide sufficient mixing action and mixture movement. The pugmill must produce a homogeneous mixture of uniformly coated aggregates at mixer discharge.

If the aggregate treatment process is stopped longer than 1 hour, clean the equipment of partially treated aggregate and lime.

Aggregate must be completely treated before introduction into the mixing drum.

### **39-1.02D(3)(c) Lime Slurry**

For lime slurry aggregate treatment, treat aggregate separate from HMA production. Stockpile and marinate the aggregate.

Proportion lime and water with a continuous or batch mixing system.

Add lime to the aggregate as slurry consisting of mixed dry lime and water at a ratio of 1 part lime to from 2 to 3 parts water by weight. The slurry must completely coat the aggregate.

Immediately before mixing lime slurry with the aggregate, water must not visibly separate from the aggregate.

Proportion lime slurry and aggregate by weight in a continuous process.

### **39-1.02E Liquid Antistrip Treatment**

Liquid antistrip must be from 0.25 to 1.0 percent by weight of asphalt binder. Do not use liquid antistrip as a substitute for asphalt binder.

Liquid antistrip total amine value must be 325 minimum when tested under ASTM D2074.

Use only 1 liquid antistrip type or brand at a time. Do not mix liquid antistrip types or brands.

Store and mix liquid antistrip under the manufacturer's instructions.

### **39-1.02F–39-1.02G Reserved**

### **39-1.02H Hot Mix Asphalt Production**

#### **39-1.02H(1) General**

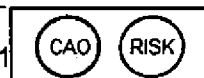
Do not start HMA production before verification and authorization of JMF.

HMA plants must be Department-qualified. Before production, the HMA plant must have a current qualification under the Department's Material Plant Quality Program.

Weighing and metering devices used for the production of HMA modified with additives must comply with the requirements of the Department's *MPQP*. If a loss-in-weight meter is used for dry HMA additive, the meter must have an automatic and integral material delivery control system for the refill cycle.

Calibrate the loss-in-weight meter by:

1. Including at least 1 complete system refill cycle during each calibration test run
2. Operating the device in a normal run mode for 10 minutes immediately before starting the calibration process
3. Isolating the scale system within the loss-in-weight feeder from surrounding vibration
4. Checking the scale system within the loss-in-weight feeder for accuracy before and after the calibration process and daily during mix production
5. Using a 15-minute or 250-pound-minimum test run size for a dry ingredient delivery rate of less than 1 ton per hour.
6. Complying with the limits of Table B, "Conveyor Scale Testing Extremes," in the Department's *MPQP*



10-17-14

Proportion aggregate by hot or cold-feed control.

Aggregate temperature must not be more than 375 degrees F when mixed with the asphalt binder.

04-18-14

Asphalt binder temperature must be from 275 to 375 degrees F when mixed with aggregate.

Mix HMA ingredients into a homogeneous mixture of coated aggregates.

HMA with or without RAP must not be more than 325 degrees F.

For HMA produced using warm mix asphalt technology, HMA must be at a temperature between 240 and 325 degrees F.

If method compaction is used, HMA must be produced at a temperature between 305 and 325 degrees F.

If you stop production for longer than 30 days, a production start-up evaluation is required.

### **39-1.02H(2) Liquid Antistrip**

If 3 consecutive sets of recorded production data show actual delivered liquid antistrip weight is more than  $\pm 1$  percent of the authorized mix design liquid antistrip weight, stop production and take corrective action.

If a set of recorded production data shows actual delivered liquid antistrip weight is more than  $\pm 2$  percent of the authorized mix design liquid antistrip weight, stop production. If the liquid antistrip weight exceeds 1.2 percent of the asphalt binder weight, do not use the HMA represented by that data.

The continuous mixing plant controller proportioning the HMA must produce a production data log. The log consists of a series of data sets captured at 10-minute intervals throughout daily production. The data must be a production activity register and not a summation. The material represented by the data is the quantity produced 5 minutes before and 5 minutes after the capture time. For the duration of the Contract, collected data must be stored by the plant controller or a computer's memory at the plant.

The Engineer orders proportioning activities stopped for any of the following:

1. You do not submit data
2. You submit incomplete, untimely, or incorrectly formatted data
3. You do not take corrective actions
4. You take late or unsuccessful corrective actions
5. You do not stop production when proportioning tolerances are exceeded
6. You use malfunctioning or failed proportioning devices

If you stop production, notify the Engineer of any corrective actions taken before resuming.

### **39-1.02H(3) Warm Mix Asphalt Technology**

Proportion all ingredients by weight. The HMA plant process controller must be the sole source of ingredient proportioning control and be fully interfaced with all scales and meters used in the production process. The addition of the HMA additive must be controlled by the plant process controller.

Liquid ingredient additive, including a normally dry ingredient made liquid, must be proportioned with a mass flow meter at continuous mixing plants. Use a mass flow meter or a container scale to proportion liquid additives at batch mixing plants.

Continuous mixing plants using HMA additives must comply with the following:

1. Dry ingredient additives for continuous production must be proportioned with a conveyor scale or a loss-in-weight meter.
2. HMA plant process controller and ingredient measuring systems must be capable of varying all ingredient feed rates proportionate with the dry aggregate delivery at all production rates and rate changes.



3. Liquid HMA additive must enter the production stream with the binder. Dry HMA additive must enter the production stream at or before the mixing area. 10-30-15
4. If dry HMA additives are used at continuous mixing HMA plants, baghouse dust systems must return all captured material to the mix. This requirement is waived for lime-treated aggregates. 04-18-14
5. HMA additive must be proportioned to within  $\pm 0.3$  percent of the target additive rate.

Batch mixing plants using HMA additives must comply with the following:

1. Metered HMA additive must be placed in an intermediate holding vessel before being added to the stream of asphalt binder as it enters the pugmill.
2. If a container scale is used, weigh additive before combining with asphalt binder. Keep the container scale separate from other ingredient proportioning. The container scale capacity must be no more than twice the volume of the maximum additive batch size. The container scale's graduations must be smaller than the proportioning tolerance or 0.001 times the container scale capacity.
3. Dry HMA additive proportioning devices must be separate from metering devices for the aggregates and asphalt binder. Proportion dry HMA additive directly into the pugmill or place in an intermediate holding vessel to be added to the pugmill at the appropriate time in the batch cycle. Dry ingredients for batch production must be proportioned with a hopper scale.
4. Zero tolerance for the HMA additive batch scale is  $\pm 0.5$  percent of the target additive weight. The indicated HMA additive batch scale weight may vary from the preselected weight setting by up to  $\pm 1.0$  percent of the target additive weight.

#### 39-1.02I Geosynthetic Pavement Interlayer

Geosynthetic pavement interlayer must comply with the specifications for pavement fabric, paving mat, paving grid, paving geocomposite grid, or geocomposite strip membrane as shown.

The asphalt binder for geosynthetic pavement interlayer must be PG 64-10, PG 64-16, or PG 70-10.

#### 39-1.02J Tack Coat

Tack coat must comply with the specifications for asphaltic emulsion or asphalt binder. Choose the type and grade.

#### 39-1.02K Miscellaneous Areas and Dikes

For miscellaneous areas and dikes:

1. Choose either the 3/8-inch or 1/2-inch aggregate gradation for Type A HMA. 10-30-15
2. Minimum asphalt binder content must be 6.40 percent for 3/8-inch aggregate and 5.70 percent for 1/2-inch aggregate. If you request and the Engineer authorizes, you may reduce the minimum asphalt binder content. 04-18-14
3. Choose asphalt binder Grade PG 64-10, PG 64-16 or PG 70-10.

For HMA used in miscellaneous areas and dikes, sections 39-1.01C, 39-1.01D, 39-1.02B, 39-1.02D(3), and 39-1.02E-J do not apply.

10-30-15

#### 39-1.02L Replace Asphalt Concrete Surfacing

HMA to be used for replacing asphalt concrete surfacing must comply with Type A HMA as specified in section 39-2.

The grade of asphalt binder must be PG 64-10 or PG 64-16.

04-18-14

**39-1.03 CONSTRUCTION****39-1.03A General**

Do not place HMA on wet pavement or frozen surface.

You may deposit HMA in a windrow and load it in the paver if:

1. Paver is equipped with a hopper that automatically feeds the screed
2. Loading equipment can pick up the windrowed material and deposit it in the paver hopper without damaging base material
3. Activities for deposit, pickup, loading, and paving are continuous
4. HMA temperature in the windrow does not fall below 260 degrees F

10-17-14

HMA placed in a windrow on the roadway surface must not extend more than 250 feet in front of the loading equipment or material transfer vehicle.

04-18-14

You may place HMA in 1 or more layers on areas less than 5 feet wide and outside the traveled way, including shoulders. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

HMA handled, spread, or windrowed must not stain the finished surface of any improvement, including pavement.

Do not use petroleum products such as kerosene or diesel fuel to release HMA from trucks, spreaders, or compactors.

HMA must be free of:

1. Segregation
2. Coarse or fine aggregate pockets
3. Hardened lumps

Complete finish rolling activities before the pavement surface temperature is:

1. Below 150 degrees F for HMA with unmodified binder
2. Below 140 degrees F for HMA with modified binder
3. Below 130 degrees F for HMA with warm mix asphalt technology

**39-1.03B Spreading and Compacting Equipment****39-1.03B(1) General**

Paving equipment for spreading must be:

1. Self-propelled
2. Mechanical
3. Equipped with a screed or strike-off assembly that can distribute HMA the full width of a traffic lane
4. Equipped with a full-width compacting device
5. Equipped with automatic screed controls and sensing devices that control the thickness, longitudinal grade, and transverse screed slope

Install and maintain grade and slope references.

The screed must be heated and produce a uniform HMA surface texture without tearing, shoving, or gouging.

The paver must not leave marks such as ridges and indentations unless you can eliminate them by rolling.

Rollers must be equipped with a system that prevents HMA from sticking to the wheels. You may use a parting agent that does not damage the HMA or impede the bonding of layers.

In areas inaccessible to spreading and compacting equipment:

1. Spread the HMA by any means to obtain the specified lines, grades, and cross sections
2. Use a pneumatic tamper, plate compactor, or equivalent to achieve thorough compaction

### **39-1.03B(2) Material Transfer Vehicle**

If a material transfer vehicle is specified, the material transfer vehicle must have sufficient capacity to prevent stopping the paver and must be capable of:

1. Either receiving HMA directly from trucks or using a windrow pickup head to load it from a windrow deposited on the roadway surface
2. Remixing the HMA with augers before transferring into the paver's receiving hopper or feed system
3. Transferring HMA directly into the paver's receiving hopper or feed system

### **39-1.03B(3) Method Compaction Equipment**

For method compaction, each paver spreading HMA must be followed by 3 rollers:

1. One vibratory roller specifically designed to compact HMA. The roller must be capable of at least 2,500 vibrations per minute and must be equipped with amplitude and frequency controls. The roller's gross static weight must be at least 7.5 tons.
2. One oscillating type pneumatic-tired roller at least 4 feet wide. Pneumatic tires must be of equal size, diameter, type, and ply. The tires must be inflated to 60 psi minimum and maintained so that the air pressure does not vary more than 5 psi.
3. One steel-tired, 2-axle tandem roller. The roller's gross static weight must be at least 7.5 tons.

Each roller must have a separate operator. Rollers must be self-propelled and reversible.

### **39-1.03B(4)–39-1.03B(6) Reserved**

### **39-1.03C Surface Preparation**

#### **39-1.03C(1) General**

Before placing HMA, remove loose paving particles, dirt, and other extraneous material by any means including flushing and sweeping.

#### **39-1.03C(2) Subgrade**

Prepare subgrade to receive HMA under the sections for the material involved. Subgrade must be free of loose and extraneous material.

#### **39-1.03C(3) Reserved**

#### **39-1.03C(4) Prepaving Inertial Profiler**

Section 39-1.03C(4) applies to existing asphalt concrete surfaces receiving an HMA overlay if a bid item for prepaving inertial profiler is shown in the Bid Item List.

Before starting paving activities, perform prepaving inertial profiler measurements. Prepaving inertial profiler includes taking profiles of the existing pavement, analyzing the data with ProVAL to determine existing pavement International Roughness Index, Mean Roughness Index, and areas of localized roughness.

If the Contract includes cold planing, perform prepaving inertial profiler measurements before cold planing.

If the Contract includes replace asphalt concrete surfacing, perform prepaving inertial profiler measurements after replacing the asphalt concrete surfacing.

**39-1.03C(5) Prepaving Grinding**

Section 39-1.03C(5) applies to all existing asphalt concrete surfaces that will not be cold planned or milled and that will receive an HMA overlay less than or equal to 0.20 foot exclusive of OGFC if a bid item for prepaving grinding day is shown in the Bid Item List.

After performing prepaving inertial profiling, correct areas of localized roughness greater than 180 in/mi.

10-17-14

Notify the Engineer of those areas of localized roughness that cannot be corrected by prepaving grinding according to the ProVAL smoothness assurance analysis grinding report. The Engineer responds to your notification within 5 business days.

04-18-14

For those areas of localized roughness that cannot be corrected by grinding, the Engineer may order you to either (1) not correct the areas of localized roughness or (2) correct areas of localized roughness by a different method and take profiles of the corrected areas with an inertial profiler. Corrective work performed by a different method, including taking profiles of the corrected areas and associated traffic control, is change order work.

If ordered not to correct areas of localized roughness, the smoothness specifications do not apply to the final pavement surface placed in those areas.

10-30-15

After correcting prepaving areas of localized roughness, take profiles of the corrected area and submit profile data as specified in section 39-1.01C(13)(d).

04-18-14

Dispose of grinding residue.

Pave within 7 days of correcting areas.

The final pavement surface must comply with section 39-1.01D(9)(c).

If the Engineer determines more time is required for prepaving grinding than the Contract allows for and if prepaving grinding is a controlling activity, the Engineer makes a time adjustment.

04-18-14

**39-1.03C(6) Tack Coat**

Apply tack coat:

1. To existing pavement including planed surfaces
2. Between HMA layers
3. To vertical surfaces of:
  - 3.1. Curbs
  - 3.2. Gutters
  - 3.3. Construction joints

Before placing HMA, apply tack coat in 1 application at the minimum residual rate shown in the following table for the condition of the underlying surface:

**Tack Coat Application Rates for HMA**

HMA over:	Minimum Residual Rates (gal/sq yd)		
	CSS1/CSS1h, SS1/SS1h and QS1h/QQS1h Asphaltic Emulsion	CRS1/CRS2, RS1/RS2 and QS1/CQS1 Asphaltic Emulsion	Asphalt Binder and PMRS2/PMCRS2 and PMRS2h/PMCRS2h Asphaltic Emulsion
New HMA (between layers)	0.02	0.03	0.02
PCC and existing AC surfacing	0.03	0.04	0.03
Planed pavement	0.05	0.06	0.04

10-30-15

If a stress absorbing membrane interlayer as specified in section 37-2.06 is applied, the tack coat application rates for new HMA apply.

04-18-14

Notify the Engineer if you dilute asphaltic emulsion with water. The weight ratio of added water to asphaltic emulsion must not exceed 1 to 1.

Measure added water either by weight or volume under section 9-1.02 or you may use water meters from water districts, cities, or counties. If you measure water by volume, apply a conversion factor to determine the correct weight.

With each dilution, submit:

1. Weight ratio of water to bituminous material in the original asphaltic emulsion
2. Weight of asphaltic emulsion before diluting
3. Weight of added water
4. Final dilution weight ratio of water to asphaltic emulsion

Apply to vertical surfaces with a residual tack coat rate that will thoroughly coat the vertical face without running off.

If you request and the Engineer authorizes, you may:

1. Change tack coat rates
2. Omit tack coat between layers of new HMA during the same work shift if:
  - 2.1. No dust, dirt, or extraneous material is present
  - 2.2. Surface is at least 140 degrees F

Immediately in advance of placing HMA, apply additional tack coat to damaged areas or where loose or extraneous material is removed.

Close areas receiving tack coat to traffic. Do not track tack coat onto pavement surfaces beyond the job site.

Asphalt binder tack coat temperature must be from 285 to 350 degrees F when applied.

**39-1.03C(7) Geosynthetic Pavement Interlayer**

If specified, place geosynthetic pavement interlayer over a coat of asphalt binder. Place geosynthetic pavement interlayer in compliance with the manufacturer's instructions.

Before placing the geosynthetic pavement interlayer and asphalt binder:

1. Repair cracks 1/4 inch and wider, spalls, and holes in the pavement. Repairing cracks is change order work.
2. Clean the pavement of loose and extraneous material.

Immediately before placing the interlayer, apply  $0.25 \pm 0.03$  gallon of asphalt binder per square yard of interlayer or until the fabric is saturated. Apply asphalt binder the width of the geosynthetic pavement interlayer plus 3 inches on each side. At an interlayer overlap, apply asphalt binder on the lower interlayer the same overlap distance as the upper interlayer.

Align and place the interlayer with no overlapping wrinkles, except a wrinkle that overlaps may remain if it is less than 1/2 inch thick. If the overlapping wrinkle is more than 1/2 inch thick, cut the wrinkle out and overlap the interlayer no more than 2 inches.

The minimum HMA thickness over the interlayer must be 0.12 foot thick including conform tapers. Do not place the interlayer on a wet or frozen surface.

Overlap the interlayer borders between 2 to 4 inches. In the direction of paving, overlap the following roll with the preceding roll at any break.

You may use rolling equipment to correct distortions or wrinkles in the interlayer.

If asphalt binder tracked onto the interlayer or brought to the surface by construction equipment causes interlayer displacement, cover it with a small quantity of HMA.

Before placing HMA on the interlayer, do not expose the interlayer to:

1. Traffic except for crossings under traffic control and only after you place a small HMA quantity
2. Sharp turns from construction equipment
3. Damaging elements

Pave HMA on the interlayer during the same work shift.

### **39-1.03D Longitudinal Joints**

#### **39-1.03D(1) General**

Longitudinal joints in the top layer must match lane lines. Alternate the longitudinal joint offsets in the lower layers at least 0.5 foot from each side of the lane line. You may request other longitudinal joint placement patterns.

A vertical longitudinal joint of more than 0.15 foot is not allowed at any time between adjacent lanes open to traffic.

For HMA thickness of 0.15 foot or less, the distance between the ends of the adjacent surfaced lanes at the end of each day's work must not be greater than can be completed in the following day of normal paving.

For HMA thickness greater than 0.15 foot, you must place HMA on adjacent traveled way lanes or shoulder so that at the end of each work shift the distance between the ends of HMA layers on adjacent lanes is from 5 to 10 feet. Place additional HMA along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional HMA to form temporary conforms. You may place kraft paper or other authorized release agent under the conform tapers to facilitate the taper removal when paving activities resume.

If placing HMA against the edge of existing pavement, sawcut or grind the pavement straight and vertical along the joint and remove extraneous material.

#### **39-1.03D(2) Tapered Notched Wedge**

For divided highways with an HMA lift thickness greater than 0.15 foot, you may construct a 1-foot wide tapered notched wedge joint as a longitudinal joint between adjacent lanes open to traffic. A vertical notch of 0.75 inch maximum must be placed at the top and bottom of the tapered wedge.

The tapered notched wedge must retain its shape while exposed to traffic. Pave the adjacent lane within 1 day.

Construct the tapered portion of the tapered notched wedge with an authorized strike-off device. The strike-off device must provide a uniform slope and must not restrict the main screed of the paver.

You may use a device attached to the screed to construct longitudinal joints that will form a tapered notched wedge in a single pass. The tapered notched wedge must be compacted to a minimum of 91 percent compaction.

10-30-15

### **39-1.03E Pavement Edge Treatments**

Construct edge treatment on the HMA pavement as shown.

Where a tapered edge is required, use the same type of HMA used for the adjacent lane or shoulder.

The edge of roadway where the tapered edge is to be placed must have a solid base, free of debris such as loose material, grass, weeds, or mud. Grade the areas to receive the tapered edge as required.

The tapered edge must be placed monolithic with the adjacent lane or shoulder and must be shaped and compacted with a device attached to the paver.

The device must be capable of shaping and compacting HMA to the required cross section as shown. Compaction must be accomplished by constraining the HMA to reduce the cross sectional area by 10 to 15 percent. The device must produce a uniform surface texture without tearing, shoving, or gouging and must not leave marks such as ridges and indentations. The device must be capable of transitioning to cross roads, driveways, and obstructions.

For the tapered edge, the angle of the slope must not deviate by more than  $\pm 5$  degrees from the angle shown. Measure the angle from the plane of the adjacent finished pavement surface.

If paving is done in multiple lifts, the tapered edge must be placed with each lift.

Short sections of hand work are allowed to construct tapered edge transitions.

04-18-14

### **39-1.03F Widening Existing Pavement**

If widening existing pavement, construct new pavement structure to match the elevation of the existing pavement's edge before placing HMA over the existing pavement.

### **39-1.03G Shoulders, Medians, and Other Road Connections**

Until the adjoining through lane's top layer has been paved, do not pave the top layer of:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets

If the number of lanes changes, pave each through lane's top layer before paving a tapering lane's top layer. Simultaneous to paving a through lane's top layer, you may pave an adjoining area's top layer, including shoulders. Do not operate spreading equipment on any area's top layer until completing final compaction.

If shoulders or median borders are shown, pave shoulders and median borders adjacent to the lane before opening a lane to traffic.

If shoulder conform tapers are shown, place conform tapers concurrently with the adjacent lane's paving.

If a driveway or a road connection is shown, place additional HMA along the pavement's edge to conform to road connections and driveways. Hand rake, if necessary, and compact the additional HMA to form a smooth conform taper.

### 39-1.03H Leveling

Section 39-1.03H applies if a bid item for hot mix asphalt (leveling) is shown on the Bid Item List.

Fill and level irregularities and ruts with HMA before spreading HMA over the base, existing surfaces, or bridge decks. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture. HMA used to change an existing surface's cross slope or profile is not paid for as hot mix asphalt (leveling).

### 39-1.03I Miscellaneous Areas and Dikes

Prepare the area to receive HMA for miscellaneous areas and dikes, including excavation and backfill as needed.

Spread miscellaneous areas in 1 layer and compact to the specified lines and grades.

In median areas adjacent to slotted median drains, each layer of HMA must not exceed 0.20 foot maximum compacted thickness.

The finished surface must be:

1. Textured uniformly
2. Compacted firmly
3. Without depressions, humps, and irregularities

### 39-1.03J Replace Asphalt Concrete Surfacing

Where replace asphalt concrete surfacing is shown, remove existing asphalt concrete surfacing and replace with HMA. The Engineer determines the exact limits of asphalt concrete surfacing to be replaced.

Replace asphalt concrete in a lane before the lane is specified to be opened to traffic.

Before removing asphalt concrete, outline the replacement area and cut neat lines with a saw or grind to full depth of the existing asphalt concrete. Do not damage asphalt concrete and base remaining in place.

If the base is excavated beyond the specified plane, replace it with HMA. The Department does not pay for this HMA.

Do not use a material transfer vehicle if replace asphalt concrete surfacing is specified.

### 39-1.03K–39-1.03N Reserved

### 39-1.03O Compaction

#### 39-1.03O(1) General

Rolling must leave the completed surface compacted and smooth without tearing, cracking, or shoving.

If a vibratory roller is used as a finish roller, turn the vibrator off.

10-30-15

Do not open new HMA pavement to traffic until its mid depth temperature is below 160 degrees F.

04-18-14

If the surface to be paved is both in sunlight and shade, pavement surface temperatures are taken in the shade.

#### 39-1.03O(2) Method Compaction

Use method compaction for any of the following conditions:

10-17-14

1. HMA pavement thickness shown is less than 0.15 foot



2. Replace asphalt concrete surfacing
3. Leveling courses
4. Areas the Engineer determines conventional compaction and compaction measurement methods are impeded

04-18-14

HMA compaction coverage is the number of passes needed to cover the paving width. A pass is 1 roller's movement parallel to the paving in either direction. Overlapping passes are part of the coverage being made and are not a subsequent coverage. Do not start a coverage until completing the prior coverage.

Method compaction must consist of performing:

1. Breakdown compaction of each layer with 3 coverages using a vibratory roller. The speed of the vibratory roller in miles per hour must not exceed the vibrations per minute divided by 1,000. If the HMA layer thickness is less than 0.08 foot, turn the vibrator off.
2. Intermediate compaction of each layer of HMA with 3 coverages using a pneumatic-tired roller at a speed not to exceed 5 mph.
3. Finish compaction of HMA with 1 coverage using a steel-tired roller.

Start rolling at the lower edge and progress toward the highest part.

The Engineer may order fewer coverages if the layer thickness of HMA is less than 0.15 foot.

#### **39-1.03O(3)–39-1.03O(5) Reserved**

#### **39-1.03P Smoothness Corrections**

10-30-15

If the pavement surface does not comply with section 39-1.01D(9)(c), grind the pavement to within specified tolerances, remove and replace the pavement, or place an overlay of HMA. Do not start corrective work until your method is authorized.

Do not use equipment with carbide cutting teeth to grind the pavement unless authorized.

Smoothness corrections must leave at least 75 percent of the specified HMA thickness. If ordered, core the pavement at the locations determined by the Engineer. Coring, including traffic control, is change order work. Remove and replace deficient pavement areas where the overlay thickness is less than 75 percent of the thickness specified as determined by the Engineer.

04-18-14

Corrected HMA pavement areas must be uniform rectangles with edges:

1. Parallel to the nearest HMA pavement edge or lane line
2. Perpendicular to the pavement centerline

On ground areas not to be overlaid with OGFC, apply fog seal coat under section 37-2.

Where corrections are made within areas requiring testing with inertial profiler, reprofile the entire lane length with the inertial profiler device.

Where corrections are made within areas requiring testing with a 12-foot straightedge, retest the corrected area with the straightedge.

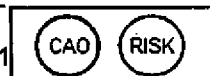
#### **39-1.03Q Data Cores**

Section 39-1.03Q applies if a bid item for data core is shown on the Bid Item List.

Take data cores of the completed HMA pavement, underlying base, and subbase material. Notify the Engineer 3 business days before coring.

Protect data cores and surrounding pavement from damage.

Take 4-inch or 6-inch diameter data cores:



1. At the beginning, end, and every 1/2 mile within the paving limits of each route on the project
2. After all paving is complete
3. From the center of the specified lane

On a 2-lane roadway, take data cores from either lane. On a 4-lane roadway, take data cores from each direction in the outermost lane. On a roadway with more than 4 lanes, take data cores from the median lane and the outermost lane in each direction.

Each core must include the stabilized materials encountered. You may choose not to recover unstabilized material but you must identify the material. Unstabilized material includes:

1. Granular material
2. Crumbled or cracked stabilized material
3. Sandy or clayey soil

Where data core samples are taken, backfill and compact the holes with authorized material.

After data core summary and photograph submittal, dispose of cores.

### 39-1.04 PAYMENT

10-30-15

The payment quantity for geosynthetic pavement interlayer is the area measured from the actual pavement area covered.

Except for tack coat used in minor HMA, payment for tack coat is not included in the payment quantity for hot mix asphalt.

If tack coat, asphalt binder, and asphaltic emulsion are paid as separate bid items, their bid items are measured under section 92 or section 94.

The Department does not adjust the unit price for an increase or decrease in the tack coat quantity.

The payment quantity for HMA of the type shown on the Bid Item List is measured based on the combined mixture weight. If recorded batch weights are printed automatically, the bid item for HMA is measured by using the printed batch weights, provided:

1. Total aggregate and supplemental fine aggregate weight per batch is printed. If supplemental fine aggregate is weighed cumulatively with the aggregate, the total aggregate batch weight must include the supplemental fine aggregate weight.
2. Total virgin asphalt binder weight per batch is printed.
3. Each truckload's zero tolerance weight is printed before weighing the first batch and after weighing the last batch.
4. Time, date, mix number, load number and truck identification is correlated with a load slip.
5. Copy of the recorded batch weights is certified by a licensed weigh master and submitted.

The payment quantity for place hot mix asphalt dike of the type shown on the Bid Item List is the length measured from end to end. Payment for the HMA used to construct the dike is not included in the payment for place hot mix asphalt dike.

The payment quantity for place hot mix asphalt (miscellaneous areas) is the area measured for the in-place compacted area. Payment for the HMA used for miscellaneous areas is not included in the payment for place hot mix asphalt (miscellaneous areas).

The payment quantity for replace asphalt concrete is the volume measured based on the specified dimensions and any adjustments ordered.

The Department does not adjust the unit price for an increase or decrease in the prepaving grinding day quantity.

**39-2 TYPE A HOT MIX ASPHALT****39-2.01 GENERAL****39-2.01A Summary**

Section 39-2 includes specifications for producing and placing Type A hot mix asphalt.

You may produce Type A HMA using an authorized warm mix asphalt technology.

**39-2.01B Definitions**

Reserved

**39-2.01C Submittals****39-2.01C(1) General**

Reserved

**39-2.01C(2) Job Mix Formula**

The JMF must be based on an HMA mix design determined as described in the Superpave Mix Design SP-2 Manual by the Asphalt Institute.

**39-2.01C(3) Reclaimed Asphalt Pavement**

Submit QC test results for RAP gradation with the combined aggregate gradation within 2 business days of taking RAP samples during HMA production.

**39-2.01C(4)–39-2.01C(6) Reserved****39-2.01D Quality Control and Assurance****39-2.01D(1) General**

Reserved

**39-2.01D(2) Quality Control****39-2.01D(2)(a) General**

Reserved

**39-2.01D(2)(b) Aggregate**

Test the quality characteristics of aggregate under the test methods and frequencies shown in the following table:

10-30-15

**Aggregate Testing Frequencies**

Quality characteristic	Test method	Minimum testing frequency
Gradation <sup>a</sup>	AASHTO T 27	1 per 750 tons and any remaining part
Sand equivalent <sup>b, c</sup>	AASHTO T 176	
Moisture content <sup>d</sup>	AASHTO T 255	
Crushed particles	AASHTO T 335	1 per 10,000 tons or 2 per project whichever is greater
Los Angeles rattler	AASHTO T 96	
Flat and elongated particles	ASTM D4791	
Fine aggregate angularity	AASHTO T 304 Method A	

<sup>a</sup>If RAP is used, test the combined aggregate gradation under California Test 384.

<sup>b</sup>Reported value must be the average of 3 tests from a single sample.

<sup>c</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 7.1.2, 8.4.2 and 8.4.3 do not apply. Prepare the stock solution as specified in section 4.8.1, except omit the addition of formaldehyde.

<sup>d</sup>Test at continuous mixing plants only. If RAP is used, test the RAP moisture content at continuous mixing plant and batch mixing plant.

04-18-14

For lime treated aggregate, test aggregate before treatment and test for gradation and moisture content during HMA production.

**39-2.01D(2)(c) Reclaimed Asphalt Pavement**

10-17-14

Sample and test processed RAP at a minimum frequency of 1 sample per 1000 tons with a minimum of 6 samples per fractionated stockpile. If the fractionated stockpile has not been augmented, the 3 RAP samples taken and tested for mix design may be part of this minimum sample requirement. If a fractionated RAP stockpile is augmented, sample and test processed RAP quality characteristics at a minimum frequency of 1 sample per 500 tons of augmented RAP.

04-18-14

The combined RAP sample when tested under AASHTO T 164 must be within  $\pm 2.00$  percent of the average asphalt binder content reported on page 4 of your Contractor Hot Mix Asphalt Design Data form. If new fractionated RAP stockpiles are required, the average binder content of the new fractionated RAP stockpile must be within  $\pm 2.00$  percent of the average binder reported on page 4 of your Contractor Hot Mix Asphalt Design Data form.

The combined RAP sample when tested under AASHTO T 209 must be within  $\pm 0.06$  of the average maximum specific gravity reported on page 4 of your Contractor Hot Mix Asphalt Design Data form.

During Type A HMA production, sample RAP twice daily and perform QC testing for:

1. Aggregate gradation at least once a day under California Test 384
2. Moisture content at least twice a day

**39-2.01D(2)(d) Type A Hot Mix Asphalt Production**

Test the quality characteristics of Type A HMA under the test methods and frequencies shown in the following table:

**Type A HMA Production Testing Frequencies**

Quality characteristic	Test method	Minimum testing frequency
Asphalt binder content	AASHTO T 308 Method A	1 per 750 tons and any remaining part
HMA moisture content	AASHTO T 329	1 per 2,500 tons but not less than 1 per paving day
Air voids content	AASHTO T 269	1 per 4,000 tons or 2 every 5 paving days, whichever is greater
Voids in mineral aggregate	SP-2 Asphalt Mixture Volumetrics	1 per 10,000 tons or 2 per project whichever is greater
Dust proportion	SP-2 Asphalt Mixture Volumetrics	
Density of core	California Test 375	2 per paving day
Nuclear gauge density	California Test 375	3 per 250 tons or 3 per paving day, whichever is greater
Hamburg wheel track	AASHTO T 324 (Modified)	1 per 10,000 tons or 1 per project, whichever is greater
Moisture susceptibility	AASHTO T 283	greater

**39-2.01D(3)–39-2.01D(4) Reserved****39-2.01D(5) Department Acceptance**

The Department accepts Type A HMA based on compliance with:

1. Aggregate quality requirements shown in the following table:

10-30-15

**Aggregate Quality**

Quality characteristic	Test method	Requirement
Aggregate gradation <sup>a</sup>	AASHTO T 27	JMF ± Tolerance
Percent of crushed particles		
Coarse aggregate (min, %)		
One-fractured face		95
Two-fractured faces	AASHTO T 335	90
Fine aggregate (min, %)		
(Passing No. 4 sieve and retained on No. 8 sieve.)		
One fractured face		70
Los Angeles Rattler (max, %)		
Loss at 100 Rev.	AASHTO T 96	12
Loss at 500 Rev.		40
Sand equivalent (min.) <sup>b, c</sup>	AASHTO T 176	47
Flat and elongated particles (max, % by weight at 5:1)	ASTM D4791	10
Fine aggregate angularity (min, %) <sup>d</sup>	AASHTO T 304 Method A	45

<sup>a</sup>The Engineer determines combined aggregate gradations containing RAP under California Test 384.

<sup>b</sup>Reported value must be the average of 3 tests from a single sample.

<sup>c</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 7.1.2, 8.4.2 and 8.4.3 do not apply. Prepare the stock solution as specified in section 4.8.1, except omit the addition of formaldehyde.

<sup>d</sup>The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

04-18-14

2. If RAP is used, RAP quality requirements shown in the following table:

**Reclaimed Asphalt Pavement Quality**

Quality characteristic	Test method	Requirement
Binder content (% within the average value reported)	AASHTO T 164	±2.00
Specific gravity (within the average value reported)	AASHTO T 209	±0.06

3. In-place Type A HMA quality requirements shown in the following table:

## Type A HMA Acceptance In Place

Quality characteristic	Test method	Requirement
Asphalt binder content (%)	AASHTO T 308 Method A	JMF -0.30, +0.50
HMA moisture content (max, %)	AASHTO T 329	1.00
Air voids content at N <sub>design</sub> (%) <sup>a, b</sup>	AASHTO T 269	4.0 ± 1.5 (5.0 ± 1.5 for 1-inch aggregate)
Voids in mineral aggregate on laboratory-produced HMA (min, %) <sup>a</sup> Gradation: No. 4 3/8-inch 1/2-inch 3/4-inch 1-inch with NMA <sup>g</sup> = 1-inch with NMA <sup>g</sup> = 3/4-inch	SP-2 Asphalt Mixture Volumetrics <sup>c</sup>	16.5–19.5 15.5–18.5 14.5–17.5 13.5–16.5 13.5–16.5 14.5–17.5
Voids in mineral aggregate on plant-produced HMA (min, %) <sup>a</sup> Gradation: No. 4 3/8-inch 1/2-inch 3/4-inch 1-inch with NMA <sup>g</sup> = 1-inch with NMA <sup>g</sup> = 3/4-inch	SP-2 Asphalt Mixture Volumetrics <sup>c</sup>	15.5–18.5 14.5–17.5 13.5–16.5 12.5–15.5 12.5–15.5 13.5–16.5
Dust proportion	SP-2 Asphalt Mixture Volumetrics	0.6–1.3 <sup>h</sup>
Density of core (% of max theoretical density) <sup>e, f</sup>	California Test 375	91.0–97.0
Hamburg wheel track (min number of passes at 0.5-inch rut depth) Binder grade: PG 58 PG 64 PG 70 PG 76 or higher	AASHTO T 324 (Modified)	10,000 15,000 20,000 25,000
Hamburg wheel track (min number of passes at inflection point) Binder grade: PG 58 PG 64 PG 70 PG 76 or higher	AASHTO T 324 (Modified)	10,000 10,000 12,500 15,000
Moisture susceptibility (min, psi, dry strength)	AASHTO T 283	100
Moisture susceptibility (min, psi, wet strength)	AASHTO T 283	70

<sup>a</sup>Prepare 3 briquettes. Report the average of 3 tests.

<sup>b</sup>The Engineer determines the bulk specific gravity of each lab-compacted briquette under AASHTO T 275, Method A, and theoretical maximum specific gravity under AASHTO T 209, Method A.

<sup>c</sup>Determine bulk specific gravity under AASHTO T 275, Method A.

<sup>d</sup>The Engineer determines the laboratory-prepared HMA value for mix design verification only.

<sup>e</sup>The Engineer determines percent of theoretical maximum density under California Test 375 except the Engineer uses:

- 
1. AASHTO T 275 to determine in-place density of each density core
  2. AASHTO T 209, Method A to determine theoretical maximum density instead of calculating test maximum density

<sup>1</sup>The Engineer determines theoretical maximum density under AASHTO T 209, Method A, at the frequency specified in California Test 375, Part 5D.

<sup>9</sup>NMAS means nominal maximum aggregate size.

<sup>h</sup>For treated aggregate, the dust proportion requirement is 0.6–1.5.

04-18-14

**39-2.02 MATERIALS**

**39-2.02A General**

Reserved



**39-2.02B Mix Design**

The mix design for Type A HMA must comply with the requirements shown in the following table:

**Type A HMA Mix Design Requirements**

Quality characteristic	Test method	Requirement
Air voids content (%)	AASHTO T 269 <sup>a</sup>	$N_{\text{initial}} > 8.0$ $N_{\text{design}} = 4.0$ ( $N_{\text{design}} = 5.0$ for 1-inch aggregate) $N_{\text{max}} > 2.0$
Gyrations compaction (no. of gyrations)	AASHTO T 312	$N_{\text{initial}} = 8$ $N_{\text{design}} = 85.0$ $N_{\text{max}} = 130$
Voids in mineral aggregate (min, %) <sup>b</sup> Gradation: No. 4 3/8-inch 1/2-inch 3/4-inch 1-inch with NMAS <sup>e</sup> = 1-inch with NMAS <sup>e</sup> = 3/4-inch	SP-2 Asphalt Mixture Volumetrics	16.5–19.5 15.5–18.5 14.5–17.5 13.5–16.5  13.5–16.5 14.5–17.5
Dust proportion	SP-2 Asphalt Mixture Volumetrics	0.6–1.3
Hamburg wheel track (min number of passes at 0.5-inch rut depth) Binder grade: PG 58 PG 64 PG 70 PG 76 or higher	AASHTO T 324 (Modified) <sup>c</sup>	10,000 15,000 20,000 25,000
Hamburg wheel track (min number of passes at the inflection point) Binder grade: PG 58 PG 64 PG 70 PG 76 or higher	AASHTO T 324 (Modified) <sup>c</sup>	10,000 10,000 12,500 15,000
Moisture susceptibility, dry strength (min, psi)	AASHTO T 283 <sup>c</sup>	100
Moisture susceptibility, wet strength (min, psi)	AASHTO T 283 <sup>c, d</sup>	70

<sup>a</sup>Calculate the air voids content of each specimen using AASHTO T 275, Method A, to determine bulk specific gravity. Use AASHTO T 209, Method A, to determine theoretical maximum specific gravity. Use a digital manometer and pycnometer when performing AASHTO T 209.

<sup>b</sup>Measure bulk specific gravity using AASHTO T 275, Method A.

<sup>c</sup>Test plant produced HMA.

<sup>d</sup>Freeze thaw required.

<sup>e</sup>NMAS means nominal maximum aggregate size.

10-30-15

For Type A HMA mixtures using RAP, the maximum allowed binder replacement is 25.0 percent in the upper 0.2 feet of HMA exclusive of OGFC and 40.0 percent below. Binder replacement is calculated as a percentage of the approved JMF target asphalt binder content.

04-18-14

For Type A HMA with a binder replacement percent less than or equal to 25 percent of your specified OBC, you may request that the performance graded asphalt binder grade with upper and lower temperature classifications be reduced by 6 degrees C from the specified grade.

For Type A HMA with a binder replacement greater than 25 percent of your specified OBC and less than or equal to 40 percent of OBC, you must use a performance graded asphalt binder grade with upper and lower temperature classifications reduced by 6 degrees C from the specified grade.

**39-2.02C Asphalt Binder**

Reserved

**39-2.02D Aggregates**

**39-2.02D(1) General**

Before the addition of asphalt binder and lime treatment, the aggregate must comply with the requirements shown in the following table:

10-30-15

**Aggregate Quality**

Quality characteristic	Test method	Requirement
Percent of crushed particles	AASHTO T 335	95
Coarse aggregate (min, %)		
One-fractured face		
Two-fractured faces		
Fine aggregate (min, %)	AASHTO T 335	90
(Passing No. 4 sieve and retained on No. 8 sieve.)		
One fractured face		
Los Angeles Rattler (max, %)	AASHTO T 96	12
Loss at 100 Rev.		
		40
Loss at 500 Rev.		
Sand equivalent (min) <sup>a, b</sup>	AASHTO T 176	47
Flat and elongated particles (max, % by weight at 5:1)	ASTM D4791	10
Fine aggregate angularity (min, %) <sup>c</sup>	AASHTO T 304 Method A	45

<sup>a</sup>Reported value must be the average of 3 tests from a single sample.

<sup>b</sup>Use of a Sand Reader Indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 7.1.2, 8.4.2 and 8.4.3 do not apply. Prepare the stock solution as specified in section 4.8.1, except omit the addition of formaldehyde.

<sup>c</sup>The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate, except if your JMF fails verification. Manufactured sand is fine aggregate produced by crushing rock or gravel.

04-18-14

**39-2.02D(2) Aggregate Gradations**

The aggregate gradations for Type A HMA must comply with the requirements shown in the following table:

10-17-14

**Aggregate Gradation Requirements**

Type A HMA pavement thickness shown	Gradation
0.10 foot	3/8 inch
Greater than 0.10 to less than 0.20 foot	1/2 inch
0.20 foot to less than 0.25 foot	3/4 inch
0.25 foot or greater	3/4 inch or 1 inch

Aggregate gradation must be within the target value limits for the specified sieve size shown in the following tables:

**Aggregate Gradations for Type A HMA  
(Percentage Passing)**

**1 Inch**

Sieve size	Target value limit	Allowable tolerance
1"	100	--
3/4"	88-93	TV ± 5
1/2"	72-85	TV ± 6
3/8"	55-70	TV ± 6
No. 4	35-52	TV ± 7
No. 8	22-40	TV ± 5
No. 30	8-24	TV ± 4
No. 50	5-18	TV ± 4
No. 200	3.0-7.0	TV ± 2.0

**3/4 inch**

Sieve size	Target value limit	Allowable tolerance
1"	100	--
3/4"	90-98	TV ± 5
1/2"	70-90	TV ± 6
No. 4	42-58	TV ± 5
No. 8	29-43	TV ± 5
No. 30	10-23	TV ± 4
No. 200	2.0-7.0	TV ± 2.0

**1/2 inch**

Sieve sizes	Target value limit	Allowable tolerance
3/4"	100	--
1/2"	95-98	TV ± 5
3/8"	72-95	TV ± 5
No. 4	52-69	TV ± 5
No. 8	35-55	TV ± 5
No. 30	15-30	TV ± 4
No. 200	2.0-8.0	TV ± 2.0

**3/8 Inch**

Sieve sizes	Target value limits	Allowable tolerance
1/2"	100	--
3/8"	95-98	TV ± 5
No. 4	55-75	TV ± 5
No. 8	30-50	TV ± 5
No. 30	15-35	TV ± 5
No. 200	2.0-9.0	TV ± 2.0

**No. 4**

Sieve sizes	Target value limits	Allowable tolerance
3/8"	100	--
No. 4	95-98	TV ± 5
No. 8	70-80	TV ± 6
No. 30	34-45	TV ± 5

No. 200	2.0-12.0	TV ± 4.0
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**39-2.02E Reclaimed Asphalt Pavement**

You may substitute RAP for part of the virgin aggregate in a quantity up to a maximum of 25 percent of the aggregate blend.

Provide enough space for meeting all RAP handling requirements at your facility. Provide a clean, graded base, well drained area for stockpiles.

If RAP is from multiple sources, blend the RAP thoroughly and completely before fractionating.

For RAP substitution greater than 15 percent of the aggregate blend, fractionate RAP stockpiles into 2 sizes, a coarse fraction RAP retained on 3/8-inch sieve, and a fine fraction RAP passing 3/8-inch sieve. For RAP substitution of 15 percent of the aggregate blend or less, fractionation is not required.

The RAP fractionation must comply with the requirements shown in the following table:

**RAP Stockpile Fractionation Gradation Requirements**

Quality characteristic	Test method	Requirement
Coarse (% passing the 1-inch sieve)	California Test 202 <sup>a</sup>	100
Fine (% passing the 3/8-inch sieve)	California Test 202 <sup>a</sup>	98-100

<sup>a</sup>Maximum mechanical shaking time is 10 minutes

You may use the coarse fractionated stockpile, the fine fractionated stockpile, or a combination of the coarse and fine fractionated stockpiles.

Isolate the processed RAP stockpiles from other materials. Store processed RAP in conical or longitudinal stockpiles. Processed RAP must not be agglomerated or be allowed to congeal in large stockpiles.

**39-2.02F Type A Hot Mix Asphalt Production**

10-17-14

If RAP is used, the asphalt plant must automatically adjust the virgin asphalt binder to account for RAP percentage and RAP binder.

During production, you may adjust hot or cold-feed proportion controls for virgin aggregate and RAP. RAP must be within ±3 of RAP percentage shown in your Contractor Job Mix Formula Proposal form without exceeding 25 percent.

**39-2.03 CONSTRUCTION**

10-30-15

Where the pavement thickness shown is greater than 0.30 foot, you may place Type A HMA in multiple lifts not less than 0.15 foot each. If placing Type A HMA in multiple lifts:

1. Aggregate gradation must comply with the requirements shown in the following table:

**Aggregate Gradation Requirements**

Type A HMA lift thickness	Gradation
0.15 to less than 0.20 foot	1/2 inch
0.20 foot to less than 0.25 foot	3/4 inch
0.25 foot or greater	3/4 inch or 1 inch

2. Apply tack coat before placing a subsequent lift
3. The Engineer evaluates each HMA lift individually for compliance

Spread Type A HMA at the atmospheric and surface temperatures shown in the following table:

**Minimum Atmospheric and Surface Temperatures for Type A HMA**

Lift thickness, feet	Atmospheric, °F		Surface, °F	
	Unmodified asphalt binder	Modified asphalt binder	Unmodified asphalt binder	Modified asphalt binder
< 0.15	55	50	60	55
≥ 0.15	45	45	50	50

For method compaction, the maximum lift thickness must be 0.25 foot.

04-18-14

For Type A HMA placed under method compaction, if the asphalt binder is:

1. Unmodified, complete:
  - 1.1. 1st coverage of breakdown compaction before the surface temperature drops below 250 degrees F
  - 1.2. Breakdown and intermediate compaction before the surface temperature drops below 190 degrees F
  - 1.3. Finish compaction before the surface temperature drops below 150 degrees F
2. Modified, complete:
  - 2.1. 1st coverage of breakdown compaction before the surface temperature drops below 240 degrees F
  - 2.2. Breakdown and intermediate compaction before the surface temperature drops below 180 degrees F
  - 2.3. Finish compaction before the surface temperature drops below 140 degrees F

If you request and the Engineer authorizes, you may cool Type A HMA with water when rolling activities are complete. Apply water under section 17.

### 39-2.04 PAYMENT

Not Used

## 39-3 RUBBERIZED HOT MIX ASPHALT-GAP GRADED

### 39-3.01 GENERAL

#### 39-3.01A Summary

Section 39-3 includes specifications for producing and placing rubberized hot mix asphalt-gap graded.

You may produce RHMA-G using a warm mix asphalt technology.

#### 39-3.01B Definitions

Reserved

#### 39-3.01C Submittals

##### 39-3.01C(1) General

10-17-14

At least 5 business days before use, submit the permit issued by the local air district for asphalt rubber binder blending equipment. If an air quality permit is not required by the local air district for producing asphalt rubber binder, submit verification from the local air district that an air quality permit is not required.

At least 10 days before RHMA-G production, submit the name of an authorized laboratory to perform QC testing for asphalt rubber binder. The authorized laboratory must comply with the Caltrans Independent Assurance Program.

04-18-14

##### 39-3.01C(2) Job Mix Formula

With your proposed JMF include MSDS for:

1. Base asphalt binder

2. CRM and asphalt modifier
3. Blended asphalt rubber binder components

The JMF must be based on an HMA mix design determined as described in the Superpave Mix Design SP-2 Manual by the Asphalt Institute.

### **39-3.01C(3) Asphalt Rubber Binder**

Submit a proposal for asphalt rubber binder design and profile. In the design, include the asphalt binder, asphalt modifier, and CRM and their proportions.

If you change asphalt rubber binder supplier or any component material used in asphalt rubber binder or its percentage, submit a new JMF.

For the asphalt rubber binder used, submit:

1. Log of production daily.
2. Certificate of compliance with test results for CRM and asphalt modifier with each truckload delivered to the HMA plant. The certificate of compliance for asphalt modifier must represent no more than 5,000 lb.
3. Certified weight slips for the CRM and asphalt modifier furnished.
4. QC test results on viscosity within 2 business days after sampling.
5. QC test results on cone penetration, resilience, and softening point within 3 business days after sampling.

10-17-14

Submit a certificate of compliance for the CRM and asphalt modifier. With the certificate of compliance, submit test results for CRM and asphalt modifier with each truckload delivered to the HMA plant.

04-18-14

### **39-3.01D Quality Control and Assurance**

#### **39-3.01D(1) General**

Reserved

#### **39-3.01D(2) Job Mix Formula Verification**

If you request, the Engineer verifies RHMA-G quality requirements within 7 days of receiving all verification samples and after the JMF document submittal has been accepted.

#### **39-3.01D(3) Quality Control**

##### **39-3.01D(3)(a) General**

Reserved

##### **39-3.01D(3)(b) Asphalt Rubber Binder**

###### **39-3.01D(3)(b)(i) General**

The asphalt rubber binder blending plant must be authorized under the Department's Material Plant Quality Program.

10-17-14

Take asphalt rubber binder samples from the feed line connecting the asphalt rubber binder tank to the HMA plant.

04-18-14

###### **39-3.01D(3)(b)(ii) Asphalt Modifier**

Test asphalt modifier under the test methods and frequencies shown in the following table:

**Asphalt Modifier for Asphalt Rubber Binder**

Quality characteristic	Test method	Frequency
Viscosity	ASTM D445	1 per shipment
Flash point	ASTM D92	
<b>Molecular Analysis</b>		
Asphaltenes	ASTM D2007	1 per shipment
Aromatics	ASTM D2007	

**39-3.01D(3)(b)(iii) Crumb Rubber Modifier**

10-30-15

Sample and test scrap tire crumb rubber and high natural crumb rubber separately. Test CRM under the test methods and frequencies shown in the following table:

**Crumb Rubber Modifier for Asphalt Rubber Binder**

Quality characteristic	Test method	Frequency
Scrap tire crumb rubber gradation	California Test 385	1 per 10,000 lb
High natural crumb rubber gradation	California Test 385	1 per 3,400 lb
Wire in CRM	California Test 385	1 per 10,000 lb
Fabric in CRM	California Test 385	
CRM particle length	—	
CRM specific gravity	California Test 208	
Natural rubber content in high natural crumb rubber	ASTM D297	1 per 3,400 lb

**39-3.01D(3)(b)(iv) Asphalt Rubber Binder**

Test asphalt rubber binder under the test methods and frequencies shown in the following table:

Quality characteristic	Test method	Frequency
Cone penetration	ASTM D217	1 per lot <sup>a</sup>
Resilience	ASTM D5329	
Softening point	ASTM D36	
Viscosity	ASTM D7741	15 minutes before use per lot <sup>a</sup>

<sup>a</sup>The lot is defined in the Department's *MPQP*.

10-17-14

Retain the sample from each lot. Test for cone penetration, resilience, and softening point for the first 3 lots and, if all 3 lots pass, the testing frequency may be reduced to once for every 3 lots.

If QC test results indicate that the asphalt rubber binder does not meet the specifications, take corrective action and notify the Engineer.

04-18-14

**39-3.01D(3)(c) Aggregate**

Test the quality characteristics of aggregate under the test methods and frequencies shown in the following table:



**Aggregate Testing Frequencies**

Quality characteristic	Test method	Minimum testing frequency
Gradation	AASHTO T 27	1 per 750 tons and any remaining part
Sand equivalent <sup>a, b</sup>	AASHTO T 176	
Moisture content <sup>c</sup>	AASHTO T 255	
Crushed particles	AASHTO T 335	1 per 10,000 tons or 2 per project, whichever is greater
Los Angeles rattler	AASHTO T 96	
Flat and elongated particles	ASTM D4791	
Fine aggregate angularity	AASHTO T 304 Method A	

<sup>a</sup>Reported value must be the average of 3 tests from a single sample.

<sup>b</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 7.1.2, 8.4.2 and 8.4.3 do not apply. Prepare the stock solution as specified in section 4.8.1, except omit the addition of formaldehyde.

<sup>c</sup>Test at continuous mixing plants only

04-18-14

For lime treated aggregate, test aggregate before treatment and test for gradation and moisture content during RHMA-G production.

**39-3.01D(3)(d) Rubberized Hot Mix Asphalt-Gap Graded Production**

Test the quality characteristics of RHMA-G under the test methods and frequencies shown in the following table:

**RHMA-G Production Testing Frequencies**

Quality characteristic	Test method	Minimum testing frequency
Asphalt binder content	AASHTO T 308 Method A	1 per 750 tons and any remaining part
HMA moisture content	AASHTO T 329	1 per 2,500 tons but not less than 1 per paving day
Air voids content	AASHTO T 269	1 per 4,000 tons or 2 every 5 paving days, whichever is greater
Voids in mineral aggregate	SP-2 Asphalt Mixture Volumetrics	1 per 10,000 tons or 2 per project whichever is greater
Dust proportion	SP-2 Asphalt Mixture Volumetrics	
Density of core	California Test 375	2 per paving day
Nuclear gauge density	California Test 375	3 per 250 tons or 3 per paving day, whichever is greater
Hamburg wheel track	AASHTO T 324 (Modified)	1 per 10,000 tons or 1 per project, whichever is greater
Moisture susceptibility	AASHTO T 283	

**39-3.01D(4) Reserved****39-3.01D(5) Department Acceptance****39-3.01D(5)(a) General**

The Department accepts RHMA-G based on compliance with:

- Aggregate quality requirements shown in the following table:

**Aggregate Quality**

Quality characteristic	Test method	Requirement
Aggregate gradation	AASHTO T 27	JMF ± Tolerance
Percent of crushed particles Coarse aggregate (min, %) One-fractured face Two-fractured faces	AASHTO T 335	-- 90
Fine aggregate (min, %) (Passing No. 4 sieve and retained on No. 8 sieve.) One fractured face		70
Los Angeles Rattler (max, %) Loss at 100 Rev. Loss at 500 Rev.	AASHTO T 96	12 40
Sand equivalent (min) <sup>a, b</sup>	AASHTO T 176	47
Flat and elongated particles (max, % by weight at 5:1)	ASTM D4791	Report only
Fine aggregate angularity (min, %) <sup>c</sup>	AASHTO T 304 Method A	45

<sup>a</sup>Reported value must be the average of 3 tests from a single sample.

<sup>b</sup>Use of a sand reading Indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 7.1.2, 8.4.2 and 8.4.3 do not apply. Prepare the stock solution as specified in section 4.8.1, except omit the addition of formaldehyde.

<sup>c</sup>The Engineer waives this specification if RHMA-G contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

2. In-place RHMA-G quality requirements shown in the following table:

**RHMA-G Acceptance In Place**

Quality characteristic	Test method	Requirement
Asphalt binder content (%)	AASHTO T 308 Method A	JMF -0.40, +0.50
HMA moisture content (max, %)	AASHTO T 329	1.00
Air voids content @ $N_{design}$ (%) <sup>a, b</sup>	AASHTO T 269	4.0 ± 1.5
Voids in mineral aggregate on laboratory-produced HMA <sup>d</sup> (min, %) Gradation: 1/2-inch and 3/4-inch	SP-2 Asphalt Mixture Volumetrics <sup>c</sup>	18.0–23.0
Voids in mineral aggregate on plant-produced HMA (min, %) <sup>a</sup> Gradation: 1/2-inch and 3/4-inch	SP-2 Asphalt Mixture Volumetrics <sup>c</sup>	17.0–22.0
Dust proportion <sup>a</sup>	SP-2 Asphalt Mixture Volumetrics	Report only
Density of core (% of max theoretical density) <sup>e, f</sup>	California Test 375	91.0–97.0
Hamburg wheel track (min number of passes at 0.5-inch rut depth) Binder grade: PG 58 PG 64 PG 70	AASHTO T 324 (Modified)	15,000 20,000 25,000
Hamburg wheel track (min number of passes at inflection point) Binder grade: PG 58 PG 64 PG 70	AASHTO T 324 (Modified)	10,000 12,500 15,000
Moisture susceptibility (min, psi, dry strength)	AASHTO T 283	100
Moisture susceptibility (min, psi, wet strength)	AASHTO T 283	70

<sup>a</sup>Prepare 3 briquettes. Report the average of 3 tests.

<sup>b</sup>The Engineer determines the bulk specific gravity of each lab-compacted briquette under AASHTO T 275, Method A, and theoretical maximum specific gravity under AASHTO T 209, Method A.

<sup>c</sup>Determine bulk specific gravity under AASHTO T 275, Method A.

<sup>d</sup>The Engineer determines the laboratory-prepared RHMA-G value for mix design verification only.

<sup>e</sup>The Engineer determines percent of theoretical maximum density under California Test 375 except the Engineer uses:

1. AASHTO T 275, Method A, to determine in-place density of each density core instead of using the nuclear gauge
2. AASHTO T 209, Method A to determine theoretical maximum density instead of calculating test maximum density.

<sup>f</sup>The Engineer determines theoretical maximum density under AASHTO T 209, Method A, at the frequency specified in California Test 375, Part 5D.

04-18-14

**39-3.01D(5)(b) Asphalt Rubber Binder****39-3.01D(5)(b)(i) General**

The Department does not use asphalt rubber binder design profile for production acceptance.

**39-3.01D(5)(b)(ii) Asphalt Modifier**

The Department accepts asphalt modifier based on compliance with the requirements shown in the following table:

**Asphalt Modifier for Asphalt Rubber Binder**

Quality characteristic	Test method	Requirement
Viscosity at 100 °C (m <sup>2</sup> /s x 10 <sup>-6</sup> )	ASTM D445	X ± 3 <sup>a</sup>
Flash point (min, °C)	ASTM D92	207
<b>Molecular Analysis</b>		
Asphaltenes (max, % by mass (max))	ASTM D2007	0.1
Aromatics (min % by mass)	ASTM D2007	55

<sup>a</sup>The symbol "X" is the asphalt modifier viscosity.

**39-3.01D(5)(b)(III) Crumb Rubber Modifier**

10-30-15

The Department accepts CRM, scrap tire crumb rubber, and high natural crumb rubber based on compliance with the requirements shown in the following table:

**Crumb Rubber Modifier for Asphalt Rubber Binder**

Quality characteristic	Test method	Requirement
Scrap tire crumb rubber gradation (% passing No. 8 sieve)	California Test 385	100
High natural scrap tire crumb rubber gradation (% passing No. 10 sieve)	California Test 385	100
Wire in CRM (max, %)	California Test 385	0.01
Fabric in CRM (max, %)	California Test 385	0.05
CRM particle length (max, in)	—	3/16
CRM specific gravity	California Test 208	1.1–1.2
Natural rubber content in high natural crumb rubber (%)	ASTM D297	40.0–48.0

Scrap tire crumb rubber and high natural crumb rubber are sampled and tested separately.

**39-3.01D(5)(b)(iv) Asphalt Rubber Binder**

10-17-14

For Department acceptance testing, take samples in the Engineer's presence of asphalt rubber binder in 6 qt cans with open tops and friction lids. Take samples once per day or every 5 lots, whichever is greater.

The Department accepts asphalt rubber binder based on compliance with the requirements shown in the following table:

Quality characteristic	Test method	Requirement
Cone penetration at 25 °C (0.10 mm)	ASTM D217	25–70
Resilience at 25 °C (min, % rebound)	ASTM D5329	18
Softening point (°C)	ASTM D36	52–74
Viscosity at 190 °C (centipoises) <sup>a</sup>	ASTM D7741	1,500–4,000

<sup>a</sup>Prepare sample for viscosity test under California Test 388.

**39-3.01D(5)(c)–39-3.01D(5)(f) Reserved****39-3.02 MATERIALS****39-3.02A General**

Reserved

**39-3.02B Rubberized Hot Mix Asphalt–Gap Graded Mix Design**

For RHMA-G, the mix design must comply with the requirements shown in the following table:

**RHMA-G Mix Design Requirements**

Quality characteristic	Test method	Requirement
Air voids content (%)	AASHTO T 269 <sup>a</sup>	$N_{design} = 4.0$
Gyratory compaction (no. of gyrations)	AASHTO T 312	$N_{design} = 50-150^b$
Voids in mineral aggregate (min, %)	SP-2 Asphalt Mixture Volumetrics <sup>c</sup>	18.0–23.0
Dust proportion	SP-2 Asphalt Mixture Volumetrics	Report only
Hamburg wheel track (min number of passes at 0.5-inch rut depth) Binder grade: PG 58 PG 64 PG 70	AASHTO T 324 (Modified) <sup>d</sup>	15,000 20,000 25,000
Hamburg wheel track (min number of passes at the inflection point) Binder grade: PG 58 PG 64 PG 70	AASHTO T 324 (Modified) <sup>d</sup>	10,000 10,000 12,500
Moisture susceptibility, dry strength (min, psi)	AASHTO T 283 <sup>d</sup>	100
Moisture susceptibility, wet strength (min, psi)	AASHTO T 283 <sup>d, e</sup>	70

<sup>a</sup>Calculate the air voids content of each specimen using AASHTO T 275, Method A, to determine bulk specific gravity and AASHTO T 209, Method A, to determine theoretical maximum specific gravity. Under AASHTO T 209 use a digital manometer and pycnometer when performing AASHTO T 209.

<sup>b</sup>Superpave gyratory compactor ram pressure may be increased to a maximum of 825kPa, and specimens may be held at a constant height for a maximum of 90 minutes.

<sup>c</sup>Measure bulk specific gravity using AASHTO T 275, Method A.

<sup>d</sup>Test plant produced RHMA.

<sup>e</sup>Freeze thaw required.

Determine the amount of asphalt rubber binder to be mixed with the aggregate for RHMA-G as follows:

1. Base the calculations on the average of 3 briquettes produced at each asphalt rubber binder content.
2. Plot asphalt rubber binder content versus average air voids content for each set of 3 specimens and connect adjacent points with a best-fit curve.
3. Calculate voids in mineral aggregate for each specimen, average each set, and plot the average versus asphalt rubber binder content.

4. Calculate the dust proportion and plot versus asphalt rubber binder content.
5. From the curve plotted, select the theoretical asphalt rubber binder content at 4 percent air voids.
6. At the selected asphalt rubber binder content, calculate dust proportion.
7. Record the asphalt rubber binder content in the Contractor Hot Mix Asphalt Design Data Form as the OBC.

The OBC must not fall below 7.5 percent by total weight of the mix.

Laboratory mixing and compaction must comply with AASHTO R 35, except the mixing temperature of the aggregate must be between 300 and 325 degrees F. The mixing temperature of the asphalt rubber binder must be between 375 and 425 degrees F. The compaction temperature of the combined mixture must be between 290 and 320 degrees F.

**39-3.02C Asphalt Rubber Binder**

**39-3.02C(1) General**

Asphalt rubber binder must be a combination of:

1. Asphalt binder
2. Asphalt modifier
3. CRM

The combined asphalt binder and asphalt modifier must be 80.0 ± 2.0 percent by weight of the asphalt rubber binder.

**39-3.02C(2) Asphalt Modifier**

Asphalt modifier must be a resinous, high flash point, and aromatic hydrocarbon, and must comply with the requirements shown in the following table:

**Asphalt Modifier for Asphalt Rubber Binder**

Quality characteristic	Test method	Requirement
Viscosity at 100 °C. (m <sup>2</sup> /s. x 10 <sup>-5</sup> )	ASTM D445	X ± 3 <sup>a</sup>
Flash point (min, °C)	ASTM D92	207
<b>Molecular Analysis</b>		
Asphaltenes (max, % by mass)	ASTM D2007	0.1
Aromatics (min, % by mass)	ASTM D2007	55

<sup>a</sup>The symbol "X" is the proposed asphalt modifier viscosity. "X" must be between 19 and 36. A change in "X" requires a new asphalt rubber binder design.

Asphalt modifier must be from 2.0 to 6.0 percent by weight of the asphalt binder in the asphalt rubber binder.

**39-3.02C(3) Crumb Rubber Modifier**

10-30-15

CRM must be a ground or granulated combination of scrap tire crumb rubber and high natural scrap tire crumb rubber. CRM must be 75.0 ± 2.0 percent scrap tire crumb rubber and 25.0 ± 2.0 percent high natural scrap tire crumb rubber by total weight of CRM. Scrap tire crumb rubber and high natural scrap tire crumb rubber must be derived from waste tires described in Pub Res Code § 42703.

The CRM must comply with the requirements shown in the following table:

**Crumb Rubber Modifier for Asphalt Rubber Binder**

Quality characteristic	Test method	Requirement
Scrap tire crumb rubber gradation (% passing No. 8 sieve)	California Test 385	100
High natural crumb rubber gradation (% passing No. 10 sieve)	California Test 385	100
Wire in CRM (max, %)	California Test 385	0.01
Fabric in CRM (max, %)	California Test 385	0.05
CRM particle length (max, in) <sup>a</sup>	—	3/16
CRM specific gravity	California Test 208	1.1–1.2
Natural rubber content in high natural crumb rubber (%)	ASTM D297	40.0–48.0

<sup>a</sup>Test at mix design and for certificate of compliance.

04-18-14

CRM must be ground or granulated at ambient temperature. If steel and fiber are cryogenically separated, separation must occur before grinding or granulating. Cryogenically produced CRM particles must be ground or granulated and not pass through the grinder or granulator.

CRM must be dry, free-flowing particles that do not stick together. CRM must not cause foaming when combined with the asphalt binder and asphalt modifier. You may add calcium carbonate or talc up to 3 percent by weight of CRM.

**39-3.02C(4) Design and Profile**

Design the asphalt rubber binder from testing you perform for each quality characteristic and for the reaction temperatures expected during production. The profile must include the same component sources for the asphalt rubber binder used. The 24-hour (1,440-minute) interaction period determines the design profile. At a minimum, mix asphalt rubber binder components, take samples, and perform and record the tests shown in the following table:

**Asphalt Rubber Binder Reaction Design Profile**

Quality characteristic	Test Method	Minutes of reaction <sup>a</sup>							Limits
		45	60	90	120	240	360	1440	
Cone penetration at 25 °C (0.10 mm)	ASTM D217	X <sup>b</sup>				X		X	25–70
Resilience at 25 °C (min, % rebound)	ASTM D5329	X				X		X	18
Field softening point (°C)	ASTM D36	X				X		X	52–74
Viscosity (centipoises)	ASTM D7741	X	X	X	X	X	X	X	1,500–4,000

<sup>a</sup>Six hours (360 minutes) after CRM addition, reduce the oven temperature to 275 °F for 16 hours. After the 16-hour (960 minutes) cool down after CRM addition, reheat the binder to the reaction temperature expected during production for sampling and testing at 24 hours (1,440 minutes).

<sup>b</sup>"X" denotes required testing

**39-3.02C(5) Asphalt Rubber Binder Production****39-3.02C(5)(a) General**

10-30-15

Deliver scrap tire crumb rubber and high natural scrap tire crumb rubber in separate bags.

04-18-14

**39-3.02C(5)(b) Mixing**

Proportion and mix asphalt binder, asphalt modifier, and CRM simultaneously or premix the asphalt binder and asphalt modifier before adding CRM. If you premix asphalt binder and asphalt modifier, mix them for at least 20 minutes. When you add CRM, the asphalt binder and asphalt modifier must be from 375 to 440 degrees F.

After interacting for at least 45 minutes, the quality characteristics of asphalt rubber binder must comply with the requirements shown in the following table:

10-17-14

Quality characteristic	Test method	Requirement
Cone penetration at 25 °C (0.10 mm)	ASTM D217	25-70
Resilience at 25 °C (min, % rebound)	ASTM D5329	18
Softening point (°C)	ASTM D36	52-74
Viscosity at 190 °C (centipoises) <sup>a</sup>	ASTM D7741	1,500-4,000

<sup>a</sup>Prepare sample for viscosity test under California Test 388.

04-18-14

Do not use asphalt rubber binder during the first 45 minutes of the reaction period. During this period, the asphalt rubber binder mixture must be between 375 degrees F and the lower of 425 or 25 degrees F below the asphalt binder's flash point indicated in the MSDS.

10-30-15

If any asphalt rubber binder is not used within 4 hours after the reaction period, discontinue heating. If the asphalt rubber binder drops below 375 degrees F, reheat before use. If you add more scrap tire crumb rubber to the reheated asphalt rubber binder, the binder must undergo a 45-minute reaction period. The added scrap tire crumb rubber must not exceed 10 percent of the total asphalt rubber binder weight. Reheated and reacted asphalt rubber binder must comply with the viscosity specifications. Do not reheat asphalt rubber binder more than twice.

04-18-14

**39-3.02D Aggregates**

**39-3.02D(1) General**

For RHMA-G, before the addition of asphalt binder and lime treatment, the aggregate must comply with the requirements shown in the following table:



**Aggregate Quality**

Quality characteristic	Test method	Requirement
Percent of crushed particles Coarse aggregate (min, %) One-fractured face Two-fractured faces	AASHTO T 335	-- 90
Fine aggregate (min, %) (Passing No. 4 sieve and retained on No. 8 sieve.) One fractured face		70
Los Angeles Rattler (max, %) Loss at 100 Rev. Loss at 500 Rev.	AASHTO T 96	12 40
Sand equivalent (min) <sup>a, b</sup>	AASHTO T 176	47
Flat and elongated particles (max, % by weight at 5:1)	ASTM D4791	Report only
Fine aggregate angularity (min, %) <sup>c</sup>	AASHTO T 304 Method A	45

<sup>a</sup>Reported value must be the average of 3 tests from a single sample.

<sup>b</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 7.1.2, 8.4.2 and 8.4.3 do not apply. Prepare the stock solution as specified in section 4.8.1, except omit the addition of formaldehyde.

<sup>c</sup>The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate, except if your JMF fails verification. Manufactured sand is fine aggregate produced by crushing rock or gravel.

04-18-14

**39-3.02D(2) Aggregate Gradations**

The aggregate gradations for RHMA-G must comply with the requirements shown in the following table:

10-17-14

**Aggregate Gradation Requirements**

RHMA-G pavement thickness shown	Gradation
0.10 to less than 0.20 foot	1/2 inch
0.20 foot or greater	3/4 inch

04-18-14

For RHMA-G, the aggregate gradations must be within the target value limits for the specified sieve size shown in the following tables:

**Aggregate Gradations for RHMA-G  
(Percentage Passing)**

**3/4 inch**

Sieve Sizes	Target Value Limits	Allowable Tolerance
1"	100	-
3/4"	95-98	TV ± 5
1/2"	83-87	TV ± 6
3/8"	65-70	TV ± 5
No. 4	28-42	TV ± 6
No. 8	14-22	TV ± 5
No. 200	0.0-6.0	TV ± 2.0

**1/2 inch**

Sieve Sizes	Target Value Limits	Allowable Tolerance
3/4"	100	-
1/2"	90-98	TV ± 6
3/8"	83-87	TV ± 5
No. 4	28-42	TV ± 6
No. 8	14-22	TV ± 5
No. 200	0.0-6.0	TV ± 2.0

**39-3.02E Rubberized Hot Mix Asphalt-Gap Graded Production**

Asphalt rubber binder must be from 375 to 425 degrees F when mixed with aggregate.

If the dry and wet moisture susceptibility test result for treated plant-produced RHMA-G is less than the RHMA-G mix design requirement for dry and wet moisture susceptibility strength, the minimum dry and wet strength requirement is waived, but you must use one of the following treatments:

1. Aggregate lime treatment using the slurry method
2. Aggregate lime treatment using the dry lime method
3. Liquid antistrip treatment of HMA

**39-3.03 CONSTRUCTION**

Use a material transfer vehicle when placing RHMA-G.

Do not use a pneumatic tired roller to compact RHMA-G.

10-17-14

Spread and compact RHMA-G at an atmospheric temperature of at least 55 degrees F and a surface temperature of at least 60 degrees F.

If the atmospheric temperature is below 70 degrees F, cover loads in trucks with tarps. The tarps must completely cover the exposed load until you transfer the mixture to the paver's hopper or to the pavement surface. Tarps are not required if the time from discharge to truck until transfer to the paver's hopper or the pavement surface is less than 30 minutes.

For RHMA-G placed under method compaction:

1. Complete the 1st coverage of breakdown compaction before the surface temperature drops below 285 degrees F.
2. Complete breakdown and intermediate compaction before the surface temperature drops below 250 degrees F. Use a static steel-tired roller instead of the pneumatic-tired roller for intermediate compaction.
3. Complete finish compaction before the surface temperature drops below 200 degrees F.

04-18-14

Spread sand at a rate between 1 and 2 lb/sq yd on new RHMA-G pavement when finish rolling is complete. Sand must be free of clay or organic matter. Sand must comply with section 90-1.02C(3). Keep traffic off the pavement until spreading of the sand is complete.

**39-3.04 PAYMENT**

Not Used

**39-4 OPEN GRADED FRICTION COURSES**

**39-4.01 GENERAL**

**39-4.01A Summary**

Section 39-4 includes specifications for producing and placing open graded friction courses. Open graded friction courses include HMA-O, RHMA-O, and RHMA-O-HB.

You may produce OGFC using a warm mix asphalt technology.

**39-4.01B Definitions**

Reserved

**39-4.01C Submittals**

Submit a complete JMF, except do not specify an asphalt binder content.

10-30-15

For RHMA-O and RHMA-O-HB, the JMF submittal must comply with section 39-3.01C(3).

04-18-14

**39-4.01D Quality Control and Assurance**

**39-4.01D(1) General**

Reserved

**39-4.01D(2) Quality Control**

**39-4.01D(2)(a) General**

Reserved

**39-4.01D(2)(b) Asphalt Rubber Binder**

For RHMA-O and RHMA-O-HB, the asphalt rubber binder must comply with the specifications in 39-3.01D(3)(b).

**39-4.01D(2)(c) Aggregate**

Test the quality characteristics of aggregate under the test methods and frequencies shown in the following table:

10-30-15

**Aggregate Testing Frequencies**

Quality characteristic	Test method	Minimum testing frequency
Gradation	AASHTO T 27	1 per 750 tons and any remaining part
Moisture content <sup>a</sup>	AASHTO T 255	1 per 1500 tons and any remaining part
Crushed particles	AASHTO T 335	1 per 10,000 tons or 2 per project, whichever is greater
Los Angeles rattler	AASHTO T 96	
Flat and elongated particles	ASTM D4791	

<sup>a</sup>Test at continuous mixing plants only

04-18-14

For lime treated aggregate, test aggregate before treatment and test for gradation and moisture content during OGFC production.

### 39-4.01D(2)(d) Open Graded Friction Course Production

Test the quality characteristics of OGFC under the test methods and frequencies shown in the following table:

**OGFC Testing Frequencies**

Quality characteristic	Test method	Minimum testing frequency
Asphalt binder content	AASHTO T 308 Method A	1 per 750 tons and any remaining part
HMA moisture content	AASHTO T 329	1 per 2,500 tons but not less than 1 per paving day

### 39-4.01D(3) Department Acceptance

#### 39-4.01D(3)(a) General

The Department accepts OGFC based on compliance with:

- Aggregate quality requirements shown in the following table:

**Aggregate Quality**

Quality characteristic	Test method	Requirement
Aggregate gradation	AASHTO T 27	JMF ± Tolerance
Percent of crushed particles Coarse aggregate (min, %) One-fractured face Two-fractured faces Fine aggregate (min, %) (Passing No. 4 sieve and retained on No. 8 sieve.) One fractured face	AASHTO T 335	90 90 90
Los Angeles Rattler (max, %) Loss at 100 Rev. Loss at 500 Rev.	AASHTO T 96	12 40
Flat and elongated particles (max, % by weight @ 5:1)	ASTM D4791	Report only

- In-place OGFC quality requirements shown in the following table:

**OGFC Acceptance In Place**

Quality characteristic	Test method	Requirement
Asphalt binder content (%)	AASHTO T 308 Method A	JMF -0.40, +0.50
HMA moisture content (max, %)	AASHTO T 329	1.00

### 39-4.01D(3)(b) Asphalt Rubber Binder

The Department accepts asphalt rubber binder in RHMA-O and RHMA-O-HB under 39-3.01D(5)(b).

**39-4.01D(3)(c) Pavement Smoothness**

Pavement smoothness of OGFC must comply with the Mean Roughness Index requirements shown in the following table for a 0.1 mile section:

**OGFC Pavement Smoothness Acceptance Criteria**

OGFC placement on	Mean Roughness Index requirement
New construction or HMA overlay	60 in/mi or less
Existing pavement	75 in/mi or less
Milled surface	75 in/mi or less

**39-4.01D(3)(d)–39-4.01D(3)(f) Reserved**

**39-4.02 MATERIALS**

**39-4.02A General**

When mixed with asphalt binder, aggregate must not be more than 325 degrees F except aggregate for OGFC with unmodified asphalt binder must be not more than 275 degrees F.

**39-4.02B Open Graded Friction Course Mix Design**

The Department determines the asphalt binder content under California Test 368 within 20 days of your complete JMF submittal and provides you a Caltrans Hot Mix Asphalt Verification form.

For OGFC, the 1st paragraph of section 39-1.02B(1) does not apply.

**39-4.02C Asphalt Binder**

Asphalt rubber binder in RHMA-O and RHMA-O-HB must comply with section 39-3.02C.

**39-4.02D Aggregate**

**39-4.02D(1) General**

Aggregate must comply with the requirements shown in the following table:

**Aggregate Quality**

Quality characteristic	Test method	Requirement
Percent of crushed particles Coarse aggregate (min, %) One-fractured face Two-fractured faces	AASHTO T 335	–
Fine aggregate (min, %) (Passing No. 4 sieve and retained on No. 8 sieve.) One fractured face.		90
Los Angeles Rattler (max, %) Loss at 100 Rev. Loss at 500 Rev.	AASHTO T 96	12 40
Flat and elongated particles (max, % by weight at 5:1)	ASTM D4791	Report only

**39-4.02D(2) Aggregate Gradations**

10-17-14

The aggregate gradations for HMA-O must comply with the requirements shown in the following table:

**Aggregate Gradation Requirements**

HMA-O pavement thickness shown	Gradation
0.10 foot or greater to less than 0.15 foot	1/2 inch
0.15 foot or greater	1 inch

The aggregate gradations for RHMA-O and RHMA-O-HB must comply with the requirements shown in the following table:

**Aggregate Gradation Requirements**

RHMA-O and RHMA-O-HB pavement thickness shown	Gradation
0.10 foot or greater	1/2 inch

04-18-14

For RHMA-O and RHMA-O-HB, the 1-inch aggregate gradation is not allowed.

For OGFC, the aggregate gradations must be within the target value limits for the specified sieve size shown in the following tables:

**Aggregate Gradations for OGFC  
(Percentage Passing)****1 inch**

Sieve size	Target value limit	Allowable tolerance
1 1/2"	100	-
1"	99-100	TV ± 5
3/4"	85-96	TV ± 5
1/2"	55-71	TV ± 6
No. 4	10-25	TV ± 7
No. 8	6-16	TV ± 5
No. 200	0.0-6.0	TV ± 2.0

**1/2 inch**

Sieve size	Target value limit	Allowable tolerance
3/4"	100	-
1/2"	95-100	TV ± 6
3/8"	78-89	TV ± 6
No. 4	28-37	TV ± 7
No. 8	7-18	TV ± 5
No. 30	0-10	TV ± 4
No. 200	0.0-3.0	TV ± 2.0

If lime treatment is required, you may reduce the lime ratio for the combined aggregate from 1.0 to 0.5 percent for OGFC.

**39-4.03 CONSTRUCTION**

Use a material transfer vehicle when placing OGFC.

If the atmospheric temperature is below 70 degrees F, cover loads in trucks with tarps. The tarps must completely cover the exposed load until you transfer the mixture to the paver's hopper or to the pavement surface. Tarps are not required if the time from discharge to truck until transfer to the paver's hopper or the pavement surface is less than 30 minutes.

Apply a tack coat before placing OGFC. The tack coat application rate must comply with the requirements of the following table:

**Tack Coat Application Rates for OGFC**

OGFC over:	Minimum Residual Rates (gal/sq yd)		
	CSS1/CSS1h, SS1/SS1h and QS1h/CQS1h Asphaltic Emulsion	CRS1/CRS2, RS1/RS2 and QS1/CQS1 Asphaltic Emulsion	Asphalt Binder and PMRS2/PMCRS2 and PMRS2h/PMCRS2h Asphaltic Emulsion
New HMA	0.03	0.04	0.03
PCC and existing AC surfacing	0.05	0.06	0.04
Planned pavement	0.06	0.07	0.05

Compact OGFC with steel-tired, 2-axle tandem rollers. If placing over 300 tons of OGFC per hour, use at least 3 rollers for each paver. If placing less than 300 tons of OGFC per hour, use at least 2 rollers for each paver. Each roller must weigh between 126 to 172 lb per linear inch of drum width. Turn the vibrator off.

Compact OGFC with 2 coverages. The Engineer may order fewer coverages if the layer thickness of OGFC is less than 0.20 foot.

For HMA-O with unmodified asphalt binder:

1. Spread and compact only if the atmospheric temperature is at least 55 degrees F and the surface temperature is at least 60 degrees F.
2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
3. Complete all compaction before the surface temperature drops below 200 degrees F.

For HMA-O with modified asphalt binder except asphalt rubber binder:

1. Spread and compact only if the atmospheric temperature is at least 50 degrees F and the surface temperature is at least 50 degrees F.
2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
3. Complete all compaction before the surface temperature drops below 180 degrees F.

For RHMA-O and RHMA-O-HB:

1. Spread and compact only if the atmospheric temperature is at least 55 degrees F and surface temperature is at least 60 degrees F.
2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 280 degrees F.
3. Complete compaction before the surface temperature drops below 250 degrees F.

Spread sand at a rate between 1 and 2 lb/sq yd on new RHMA-O and RHMA-O-HB pavement when finish rolling is complete. Sand must be free of clay or organic matter. Sand must comply with section 90-1.02C(3). Keep traffic off the pavement until spreading sand is complete.

If you choose to correct OGFC for smoothness, the Engineer determines if the corrective method causes raveling. OGFC that is raveling must be removed and replaced.

#### 39-4.04 PAYMENT

Not Used

## 39-5 BONDED WEARING COURSES

### 39-5.01 GENERAL

#### 39-5.01A General

##### 39-5.01A(1) Summary

Section 39-5 includes specifications for producing and placing bonded wearing courses.

10-30-15

BWC consists of placing a polymer modified asphaltic emulsion and the specified HMA in a single pass with an integrated paving machine.

04-18-14

BWC using RHMA-G, RHMA-O, or HMA-O must comply with the specifications for RHMA-G, RHMA-O, or HMA-O.

##### 39-5.01A(2) Definitions

Reserved

##### 39-5.01A(3) Submittals

With your JMF submittal, include:

1. Asphaltic emulsion target residual rate
2. Weight ratio of water to bituminous material in the original asphaltic emulsion

Within 3 business days following the 1st job site delivery, submit test results for asphaltic emulsion properties performed on a sample taken from the asphaltic emulsion delivered.

Within 1 business day of each job site delivery of asphaltic emulsion, submit to METS a 2-quart sample and a certificate of compliance. Ship each sample so that it is received at METS within 48 hours of sampling.

Each day BWC is placed, submit the residual and application rate for the asphaltic emulsion.

During production, submit certified volume or weight slips for the materials supplied.

##### 39-5.01A(4) Quality Control and Assurance

###### 39-5.01A(4)(a) General

For each job site delivery of asphaltic emulsion, take a 2-quart sample in the presence of the Engineer. Take samples from the delivery truck at mid-load from a sampling tap or thief. If the sample is taken from the tap, draw and discard 4 quarts before sampling.

If you unload asphalt binder or asphaltic emulsion into a bulk storage tank, do not use material from the tank until you submit test results for a sample taken from the bulk storage tank. Testing must be performed by an AASHTO-accredited laboratory.

###### 39-5.01A(4)(b) Quality Control

Sample BWC in two 1-gallon metal containers.

The asphaltic emulsion must be tested under ASTM D2995 at least once per paving day at the job site.



**39-5.01A(4)(c) Department Acceptance**

The Department accepts asphaltic emulsion based on compliance with the requirements shown in the following table:

10-17-14

**Asphaltic Emulsion**

Quality characteristic	Test method	Requirement
Saybolt Furol Viscosity at 25 °C (SFS) <sup>a</sup>	AASHTO T 59	20-100
Sieve test on original emulsion at time of delivery (max, %)	AASHTO T 59	0.05
24-hour storage stability (max, %)	AASHTO T 59	1
Residue by evaporation (min, %)	California Test 331	63
Tests on residue from evaporation test:		
Torsional recovery, measure entire arc of recovery at 25 °C (min, %)	California Test 332	40
Penetration at 25 °C (0.01 mm)	AASHTO T 49	70-150

<sup>a</sup>SFS means Saybolt Furol seconds

04-18-14

The Department accepts the BWC based on the submitted asphaltic emulsion target residual rate  $\pm 0.02$  gal/sq yd when tested under ASTM D2995.

**39-5.01B Materials****39-5.01B(1) General**

Reserved

**39-5.01B(2) Asphaltic Emulsion**

The asphaltic emulsion must comply with the requirements shown in the following table:

10-17-14

**Asphaltic Emulsion**

Quality characteristic	Test method	Requirement
Saybolt Furol Viscosity at 25 °C (SFS) <sup>a</sup>	AASHTO T 59	20-100
Sieve test on original emulsion at time of delivery (max, %)	AASHTO T 59	0.05
24-hour storage stability (max, %)	AASHTO T 59	1
Residue by evaporation (min, %)	California Test 331	63
Tests on residue from evaporation test:		
Torsional recovery, measure entire arc of recovery at 25 °C (min, %)	California Test 332	40
Penetration at 25 °C (0.01 mm)	AASHTO T 49	70-150

<sup>a</sup>SFS means Saybolt Furol seconds

04-18-14

**39-5.01B(3) Reserved****39-5.01C Construction****39-5.01C(1) General**

Use method compaction for BWC.

Do not dilute the asphaltic emulsion.

Do not place BWC if rain is forecast for the project area within 24 hours by the National Weather Service.

**39-5.01C(2) Spreading and Compacting Equipment**

Use a material transfer vehicle when placing BWC.

Use an integrated distributor paver capable of spraying the asphaltic emulsion, spreading the HMA, and leveling the mat surface in 1 pass.

Apply asphaltic emulsion at a uniform rate for the full paving width. The asphaltic emulsion must not be touched by any part of the paver including wheels or tracks.

If the spray bar is adjusted for changing pavement widths, the paver must prevent excess spraying of asphaltic emulsion beyond 2 inches of the HMA edge.

**39-5.01C(3) Applying Asphaltic Emulsion**

10-17-14

Before spreading HMA, apply asphaltic emulsion on dry or damp pavement with no free water.

04-18-14

Apply emulsion at a temperature from 120 to 180 degrees F and in a single application at the residual rate specified for the condition of the underlying surface. Asphaltic emulsion must have a target residual rate for the surfaces to receive the emulsion as shown in the following table:

**Asphaltic Emulsion Target Residual Rate**

Surface to receive asphaltic emulsion	Target residual rates (gal/sq yd)
PCC pavement	0.09–0.11
Dense, compacted, new HMA pavement	0.11–0.14
Open textured, dry, aged or oxidized existing AC pavement	0.13–0.17

If requested and authorized, you may change the asphaltic emulsion application rates.

**39-5.01C(4) Placing and Compacting Hot Mix Asphalt**

Construct a transverse joint if the HMA remains in the paver for more than 30 minutes.

Do not reintroduce HMA spread over asphaltic emulsion into the paving process.

Do not overlap or hot lap HMA. Pave through lanes after paving adjacent:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets
10. Ramps

For BWC placed on areas adjacent to through lanes that extend into the through lanes, cut the BWC to a neat, straight vertical line at the lane line.

If you spill asphaltic emulsion into the paver hopper, stop paving and remove the contaminated material.

10-30-15

**39-5.01D Payment**

Payment for asphaltic emulsion is not included in the payment for the type of HMA used in a bonded wearing course.

**39-5.02 BONDED WEARING COURSES-GAP GRADED**

**39-5.02A General**

**39-5.02A(1) Summary**

Section 39-5.02 includes specifications for producing bonded wearing course-gap graded.

**39-5.02A(2) Definitions**

Reserved

**39-5.02A(3) Submittals**

Include film thickness and calculations and AASHTO T 305 results with your JMF submittal.

**39-5.02A(4) Quality Control and Assurance**

**39-5.02A(4)(a) General**

Reserved

**39-5.02A(4)(b) Quality Control**

**39-5.02A(4)(b)(i) General**

Reserved

**39-5.02A(4)(b)(ii) Aggregate**

Test the quality characteristics of aggregate under the test methods and frequencies shown in the following table:

**Aggregate Testing Frequencies**

Quality characteristic	Test method	Minimum testing frequency
Gradation	AASHTO T 27	1 per 750 tons and any remaining part
Sand equivalent <sup>a, b</sup>	AASHTO T 176	
Moisture content <sup>c</sup>	AASHTO T 255	1 per 1500 tons and any remaining part
Crushed particles	AASHTO T 335	1 per 10,000 tons or 2 per project, whichever is greater
Los Angeles rattler	AASHTO T 96	
Flat and elongated particles	ASTM D4791	
Fine aggregate angularity	AASHTO T 304 Method A	

<sup>a</sup>Reported value must be the average of 3 tests from a single sample.

<sup>b</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 7.1.2, 8.4.2, and 8.4.3 do not apply. Prepare the stock solution as specified in section 4.8.1, except omit the addition of formaldehyde.

<sup>c</sup>Test at continuous mixing plants only.

For lime treated aggregate, test aggregate before treatment and test for gradation and moisture content during BWC-G production.

**39-5.02A(4)(b)(iii) Hot Mix Asphalt Production**

Sample BWC in two 1-gallon metal containers.

Test the quality characteristics of BWC-G under the test methods and frequencies shown in the following table:

**BWC-G Testing Frequencies**

Quality characteristic	Test method	Minimum testing frequency
Asphalt binder content	AASHTO T 308 Method A	1 per 750 tons and any remaining part
HMA moisture content	AASHTO T 329	1 per 2,500 tons but not less than 1 per paving day

**39-5.02A(4)(b)(iv)–39-5.02A(4)(b)(vii) Reserved****39-5.02A(4)(c) Department Acceptance**

The Department accepts BWC-G based on compliance with:

1. Asphalt binder content at JMF -0.40, +0.50 percent when tested under AASHTO T 308, Method A.
2. Aggregate quality requirements shown in the following table:

10-30-15

**Aggregate Quality**

Quality characteristic	Test method	Requirement
Aggregate gradation	AASHTO T 27	JMF ± Tolerance
Percent of crushed particles Coarse aggregate (min, %) One-fractured face Two-fractured faces	AASHTO T 335	90
Fine aggregate (min, %) (Passing No. 4 sieve and retained on No. 8 sieve.) One fractured face		85
Los Angeles Rattler (max, %) Loss at 100 Rev. Loss at 500 Rev.	AASHTO T 96	12 35
Sand equivalent (min)	AASHTO T 176	47
Flat and elongated particles (max, % by weight at 5:1)	ASTM D4791	25
Fine aggregate angularity (min, %)	AASHTO T 304 Method A	45

<sup>a</sup>Reported value must be the average of 3 tests from a single sample.

<sup>b</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 7.1.2, 8.4.2 and 8.4.3 do not apply. Prepare the stock solution as specified in section 4.8.1, except omit the addition of formaldehyde.

04-18-14

**39-5.02B Materials****39-5.02B(1) General**

Reserved

**39-5.02B(2) Mix Design**

For BWC-G, the 1st paragraph of section 39-1.02B(1) does not apply.

Determine the proposed OBC from a mix design that complies with the requirements shown in the following table:

**Hot Mix Asphalt Mix Design Requirements**

Quality characteristic	Test method	Requirement
Film thickness (min, $\mu\text{m}$ )	Asphalt Institute MS-2 Table 6.1 <sup>a</sup>	12
Drain down (max, %)	AASHTO T 305 <sup>b</sup>	0.1

<sup>a</sup> Film thickness is calculated based on the effective asphalt content and determined as follows:

$$FT = \left( \frac{P_{be}}{SA \times G_b \times 1000} \right) 10^6$$

Where:

- FT = Film thickness in  $\mu\text{m}$
- $P_{be}$  = Effective asphalt content by total weight of mix using SP-2 Asphalt Mixture
- SA = Estimated surface area of the aggregate blend in  $\text{m}^2/\text{kg}$  from Table 6.1 in the Asphalt Institute Manual Series No. 2 (MS-2).
- $G_b$  = Specific gravity of asphalt binder

<sup>b</sup> Combine aggregate and asphalt at the asphalt binder supplier's instructed mixing temperature. Coated aggregates that fall through the wire basket during loading must be returned to the basket before conditioning at 350 °F for 1 hour.

The OBC must be greater than 4.9 percent by total weight of mix.

**39-5.02B(3) Asphalt Binder**

Reserved

**39-5.02B(4) Aggregate**

The aggregate must comply with the requirements shown in the following table:

10-30-15

**Aggregate Quality**

Quality characteristic	Test method	Requirement
Percent of crushed particles	AASHTO T 335	--
Coarse aggregate (min, %)		
One-fractured face		
Two-fractured faces	AASHTO T 335	90
Fine aggregate (min, %)		
(Passing No. 4 sieve and retained on No. 8 sieve.)		
One fractured face		85
Los Angeles Rattler (max, %)	AASHTO T 96	12
Loss at 100 Rev.		
Loss at 500 Rev.		
Sand equivalent (min)	AASHTO T 176	47
Flat and elongated particles (max, % by weight @ 5:1)	ASTM D4791	25
Fine aggregate angularity (min, %)	AASHTO T 304 Method A	45

<sup>a</sup>Reported value must be the average of 3 tests from a single sample.

<sup>b</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, 7.1.2, 8.4.2 and 8.4.3 do not apply. Prepare the stock solution as specified in section 4.8.1, except omit the addition of formaldehyde.

04-18-14

The aggregate gradations for BWC-G must comply with the requirements shown in the following table:

10-17-14

**Aggregate Gradation Requirements**

BWC-G pavement thickness shown	Gradation
less than 0.08 foot	No. 4 or 3/8 inch
0.08 foot or greater	1/2 inch

04-18-14

The proposed aggregate gradation must be within the TV limits for the specified sieve sizes shown in the following tables:



**Aggregate Gradations for BWC-G  
(Percentage Passing)**

<b>1/2 inch</b>		
Sieve sizes	Target value limits	Allowable tolerance
3/4"	100	—
1/2"	80–100	TV ± 6
3/8"	55–80	TV ± 6
No. 4	25–40	TV ± 7
No. 8	19–32	TV ± 5
No. 16	16–22	TV ± 5
No. 30	10–18	TV ± 4
No. 50	8–13	TV ± 4
No. 100	6–10	TV ± 2
No. 200	4.0–7.0	TV ± 2.0

<b>3/8 inch</b>		
Sieve sizes	Target value limits	Allowable tolerance
1/2"	100	—
3/8"	80–100	TV ± 6
No. 4	25–40	TV ± 7
No. 8	19–32	TV ± 5
No. 16	16–22	TV ± 5
No. 30	10–18	TV ± 4
No. 50	8–13	TV ± 4
No. 100	7–11	TV ± 2
No. 200	6.0–10.0	TV ± 2.0

<b>No. 4</b>		
Sieve sizes	Target value limits	Allowable tolerance
1/2"	100	—
3/8"	95–100	TV ± 2
No. 4	42–55	TV ± 7
No. 8	19–32	TV ± 5
No. 16	16–22	TV ± 5
No. 30	10–18	TV ± 4
No. 50	8–13	TV ± 4
No. 100	7–11	TV ± 2
No. 200	6.0–10.0	TV ± 2.0

**39-5.02C Construction**

Apply asphaltic emulsion when the atmospheric and pavement temperatures are above 50 degrees F.

10-30-15

04-18-14

**39-5.02D Payment**

Not Used

**39-6 HOT MIX ASPHALT ON BRIDGE DECKS****39-6.01 GENERAL**

Section 39-6 includes specifications for producing and placing hot mix asphalt on bridge decks.

HMA used for bridge decks must comply with the specifications for Type A HMA in section 39-2.

**39-6.02 MATERIALS**

Do not use the 1-inch or 3/4-inch aggregate gradation for HMA on bridge decks.

The grade of asphalt binder for HMA must be PG 64-10 or PG 64-16.

**39-6.03 CONSTRUCTION**

Spread and compact HMA on bridge decks using method compaction.

If a concrete expansion dam is to be placed at a bridge deck expansion joint, tape oil-resistant construction paper to the deck over the area to be covered by the dam before placing the tack coat and HMA across the joint.

Apply tack coat at the minimum residual rate specified in section 39-1.03C(5). For HMA placed on a deck seal, use the minimum residual rate specified for PCC.

For HMA placed on a deck seal:

1. Place the HMA within 7 days after installing the deck seal.
2. If a paper mask is placed on the deck under section 54-5.03, place the HMA continuously across the paper mask.
3. Place HMA in at least 2 approximately equal layers.
4. For placement of the 1st HMA layer:
  - 4.1. Comply with the HMA application temperature recommended by the deck seal manufacturer.
  - 4.2. Deliver and place HMA using equipment with pneumatic tires or rubber-faced wheels. Do not operate other vehicles or equipment on the bare deck seal.
  - 4.3. Deposit HMA on the deck seal in such a way that the deck seal is not damaged. Do not use a windrow.
  - 4.4. Place HMA in a downhill direction on bridge decks with grades over 2 percent.
  - 4.5. Self-propelled spreading equipment is not required.

**39-6.04 PAYMENT**

Not Used

**39-7 MINOR HOT MIX ASPHALT****39-7.01 GENERAL****39-7.01A Summary**

Section 39-7 includes specifications for producing and placing minor hot mix asphalt.

Minor HMA must comply with section 39-2 except as specified in this section 39-7.

**39-7.01B Definitions**

Reserved

**39-7.01C Submittals**

The QC plan, test results, and inertial profiler specifications in sections 39-1.01C(3), 39-1.01C(4), 39-1.01C(13)(c)-(d) do not apply.

**39-7.01D Quality Control and Assurance****39-7.01D(1) General**

For minor HMA, the JMF renewal, inertial profiler certifications and testing, and prepaving meeting specifications in sections 39-1.01D(4), 39-1.01D(6)(c), and 39-1.01D(7) do not apply.

Test pavement smoothness with a 12 foot straightedge.

**39-7.01D(2) Quality Control**

For minor HMA, section 39-2.01D(2) applies except testing for compliance with the following quality characteristics is not required:



- 1. Flat and elongated particles
- 2. Fine aggregate angularity
- 3. Hamburg wheel track
- 4. Moisture susceptibility

**39-7.01D(3) Department Acceptance**

The Department accepts minor HMA under section 39-2.01D(5) except compliance with the following quality characteristics is not required:

- 1. Flat and elongated particles
- 2. Fine aggregate angularity
- 3. Hamburg wheel track
- 4. Moisture susceptibility

**39-7.02 MATERIALS**

**39-7.02A General**

Reserved

**39-7.02B Mix Design**

The mix design for minor HMA must comply with section 39-2.02B except the Hamburg wheel track and moisture susceptibility requirements do not apply.

**39-7.02C Asphalt Binder**

The grade of asphalt binder for minor HMA must be PG-64-10 or PG-64-16.

**39-7.02D Liquid Antistrip Treatment**

Treat minor HMA with liquid antistrip. Liquid antistrip treatment is not required if you submit AASHTO T 283 and AASHTO T 324 (Modified) test results showing compliance with section 39-2.02B. The tests must be dated within 12 months of submittal.

10-17-14

**39-7.03 CONSTRUCTION**

Not Used

**39-7.04 PAYMENT**

Not Used

04-18-14

**39-8-39-10 RESERVED**

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**40 CONCRETE PAVEMENT**

10-30-15

Replace the headings and paragraphs in section 40 with:

**40-1 GENERAL**

07-19-13

**40-1.01 GENERAL**

**40-1.01A Summary**

Section 40-1 includes general specifications for constructing concrete pavement.

**40-1.01B Definitions**

**concrete raveling:** Progressive disintegration of the pavement surface resulting from dislodged aggregate.



**full depth crack:** Crack that runs from one edge of the slab to the opposite or adjacent side of the slab, except a crack parallel to and within 0.5 foot of either side of a planned contraction joint

**working crack:** Crack that extends through the full depth of the slab and is parallel to and within 0.5 foot of either side of a planned contraction joint.

**action limit:** Value at which corrective actions must be made while production may continue.

**suspension limit:** Value at which production must be suspended while corrections are made.

#### **40-1.01C Submittals**

##### **40-1.01C(1) General**

At least 15 days before delivery to the job site, submit manufacturer's recommendations and instructions for storage and installation of:

1. Threaded tie bar splice couplers
2. Joint filler

As an informational submittal, submit calibration documentation and operational guidelines for frequency measuring devices (tachometer) for concrete consolidation vibrators.

Submit updated quality control charts each paving day.

##### **40-1.01C(2) Certificates of Compliance**

Submit a certificate of compliance for:

1. Tie bars
2. Threaded tie bar splice couplers
3. Dowel bars
4. Tie bar baskets
5. Dowel bar baskets
6. Joint filler
7. Epoxy powder coating

##### **40-1.01C(3) Quality Control Plan**

Submit a concrete pavement QC plan. Allow 30 days for review.

##### **40-1.01C(4) Mix Design**

At least 15 days before testing for mix proportions, submit a copy of the AASHTO accreditation for your laboratory determining the mix proportions. At least 15 days before starting field qualification, submit the proposed concrete mix proportions, the corresponding mix identifications, and laboratory test reports including the modulus of rupture for each trial mixture at 10, 21, 28, and 42 days.

##### **40-1.01C(5) Concrete Field Qualification**

Submit field qualification data and test reports including:

1. Mixing date
2. Mixing equipment and procedures used
3. Batch volume in cubic yards. The minimum batch size is 5 cu yd.
4. Type and source of ingredients used
5. Penetration of the concrete
6. Air content of the plastic concrete
7. Age and strength at time of concrete beam testing

Field qualification test reports must be certified with a signature by an official in responsible charge of the laboratory performing the tests.

**40-1.01C(6) Cores**

Submit for authorization the name of the laboratory you propose to use for testing the cores for air content.

Submit each core in an individual plastic bag marked with a location description.

**40-1.01C(7) Profile Data and Straightedge Measurements**

At least 5 business days before start of initial profiling or changing profiler or operator, submit:

1. Inertial profiler (IP) certification issued by the Department. The certification must not be more than 12 months old.
2. Operator certification for the IP issued by the Department. The operator must be certified for each different model of IP device operated. The certification must not be more than 12 months old.
3. List of manufacturer's recommended test procedures for IP calibration and verification.

Within 2 business days after cross correlation testing, submit ProVAL profiler certification analysis report for cross correlation test results performed on test section. ProVAL is FHWA's software. Submit the certification analysis report to the Engineer and to the electronic mailbox address:

smoothness@dot.ca.gov

Within 2 business days after each day of inertial profiling, submit profile data to the Engineer and to the electronic mailbox address:

smoothness@dot.ca.gov

Within 2 business days of performing straightedge testing, submit a report of areas requiring smoothness correction.

**40-1.01C(8)–40-1.01C(12) Reserved****40-1.01D Quality Control and Assurance****40-1.01D(1) General**

If the pavement quantity is at least 2000 cu yd, provide a QC manager.

Core pavement as described for, thickness, bar placement, and air content.

For the Department's modulus of rupture testing, assist the Engineer in fabricating test beams by providing materials and labor.

Allow at least 25 days for the Department to schedule testing for coefficient of friction. Notify the Engineer when the pavement is scheduled to be opened to traffic. Notify the Engineer when the pavement is ready for testing which is the latter of:

1. Seven days after paving
2. When the pavement has attained a modulus of rupture of at least 550 psi

The Department tests for coefficient of friction within 7 days of receiving notification that the pavement is ready for testing.

**40-1.01D(2) Preparing Conference**

Schedule a preparing conference at a mutually agreed upon time and place to meet with the Engineer. Make the arrangements for the conference facility. Discuss QC plan and methods of performing each item of the work.

Preparing conference attendees must sign an attendance sheet provided by the Engineer. The preparing conference must be attended by your:

1. Project superintendent
2. QC manager



3. Paving construction foreman
4. Workers and your subcontractor's workers, including:
  - 4.1. Foremen including subcontractor's Foremen
  - 4.2. Concrete plant manager
  - 4.3. Concrete plant operator

Do not start paving activities including test strips until the listed personnel have attended a prepping conference.

#### **40-1.01D(3) Just-In-Time-Training**

Reserved

#### **40-1.01D(4) Quality Control Plan**

Establish, implement, and maintain a QC plan for pavement. The QC plan must describe the organization and procedures used to:

1. Control the production process
2. Determine if a change to the production process is needed
3. Implement a change

The QC plan must include action and suspension limits and details of corrective action to be taken if any process is out of those limits. Suspension limits must not exceed specified acceptance criteria.

The QC plan must address the elements affecting concrete pavement quality including:

1. Mix proportions
2. Aggregate gradation
3. Materials quality
4. Stockpile management
5. Line and grade control
6. Proportioning
7. Mixing and transportation
8. Placing and consolidation
9. Contraction and construction joints
10. Bar reinforcement placement and alignment
11. Dowel bar placement, alignment, and anchorage
12. Tie bar placement
13. Modulus of rupture
14. Finishing and curing
15. Protecting pavement
16. Surface smoothness

#### **40-1.01D(5) Mix Design**

Use a laboratory that complies with ASTM C 1077 to determine the mix proportions for concrete pavement. The laboratory must have a current AASHTO accreditation for:

1. AASHTO T 97 or ASTM C 78
2. ASTM C 192/C 192M

Make trial mixtures no more than 24 months before field qualification.

Using your trial mixtures, determine the minimum cementitious materials content. Use your value for minimum cementitious material content for *MC* in equation 1 and equation 2 of section 90-1.02B(3).

To determine the minimum cementitious materials content or maximum water to cementitious materials ratio, use modulus of rupture values of at least 570 psi for 28 days age and at least 650 psi for 42 days age.

If changing an aggregate supply source or the mix proportions, produce a trial batch and field-qualify the new concrete. The Engineer does not adjust contract time for performing sampling, testing, and qualifying new mix proportions or changing an aggregate supply source.

#### 40-1.01D(6) Quality Control Testing

##### 40-1.01D(6)(a) General

Testing laboratories and testing equipment must comply with the Department's Independent Assurance Program.

##### 40-1.01D(6)(b) Concrete Mix

Before placing pavement, your mix design must be field qualified. Use an ACI certified "Concrete Laboratory Technician, Grade I" to perform field qualification tests and calculations. Test for modulus of rupture under California Test 523 at 10, 21, and 28 days of age.

When placing pavement, your quality control must include testing properties at the frequencies shown in the following table:

**QC Testing Frequency**

Property	Test method	Minimum frequency
Cleanness value	California Test 227	2 per day
Sand equivalent	California Test 217	2 per day
Aggregate gradation	California Test 202	2 per day
Air content (air entrainment specified)	California Test 504	1 per hour
Air content (air entrainment not specified)	California Test 504	1 per 4 hours
Density	California Test 518	1 per 4 hours
Penetration	California Test 533	1 per 4 hours
Aggregate moisture meter calibration <sup>a</sup>	California Test 223 or California Test 226	1 per day

<sup>a</sup> Check calibration of the plant moisture meter by comparing moisture meter readings with California Test 223 or California Test 226 test results.

Maintain control charts to identify potential problems and assignable causes. Post a copy of each control chart at a location determined by the Engineer.

Individual measurement control charts must use the target values in the mix proportions as indicators of central tendency.

Develop linear control charts for:

1. Cleanness value
2. Sand equivalent
3. Fine and coarse aggregate gradation
4. Air content
5. Penetration

Control charts must include:

1. Contract number
2. Mix proportions
3. Test number
4. Each test parameter
5. Action and suspension limits
6. Specification limits
7. Quality control test results

For fine and coarse aggregate gradation control charts, record the running average of the previous 4 consecutive gradation tests for each sieve and superimpose the specification limits.

For air content control charts, the action limit is  $\pm 1.0$  percent of the specified value. If no value is specified, the action limit is  $\pm 1.0$  percent of the value used for your approved mix design.

As a minimum, a process is out of control if any of the following occurs:

1. For fine and coarse aggregate gradation, 2 consecutive running averages of 4 tests are outside the specification limits
2. For individual penetration or air content measurements:
  - 2.1. One point falls outside the suspension limit line
  - 2.2. Two points in a row fall outside the action limit line

Stop production and take corrective action for out of control processes or the Engineer rejects subsequent material.

Before each day's concrete pavement placement and at intervals not to exceed 4 hours of production, use a tachometer to test and record vibration frequency for concrete consolidation vibrators.

#### **40-1.01D(6)(c) Pavement Smoothness**

##### **40-1.01D(6)(c)(i) General**

Notify the Engineer 2 business days before performing smoothness testing including IP calibration and verification testing. The notification must include start time and locations by station.

Before testing the pavement smoothness, remove foreign objects from the surface, and mark the beginning and ending station on the pavement shoulder.

Test pavement smoothness using an IP except use a 12-foot straightedge at the following locations:

1. Traffic lanes less than 1,000 feet in length including ramps, turn lanes, and acceleration and deceleration lanes
2. Areas within 15 feet of manholes
3. Shoulders
4. Weigh-in-motion areas
5. Miscellaneous areas such as medians, gore areas, turnouts, and maintenance pullouts

##### **40-1.01D(6)(c)(ii) Straightedge Testing**

Identify locations of areas requiring correction by:

1. Location Number
2. District-County-Route
3. Beginning station or post mile to the nearest 0.01 mile
4. For correction areas within a lane:
  - 4.1. Lane direction as NB, SB, EB, or WB
  - 4.2. Lane number from left to right in direction of travel
  - 4.3. Wheel path as "L" for left, "R" for right, or "B" for both
5. For correction areas not within a lane:
  - 5.1. Identify pavement area (e.g., shoulder, weight station, turnout)
  - 5.2. Direction and distance from centerline as "L" for left or "R" for right
6. Estimated size of correction area

##### **40-1.01D(6)(c)(iii) Inertial Profile Testing**

IP equipment must display a current certification decal with expiration date.

Conduct cross correlation IP verification test in the Engineer's presence before performing initial profiling. Verify cross correlation IP verification test at least annually. Conduct 5 repeat runs of the IP on an authorized test section. The test section must be on an existing concrete pavement surface 0.1 mile long.

Calculate a cross correlation to determine the repeatability of your device under Section 8.3.1.2 of AASHTO R 56 using ProVAL profiler certification analysis with a 3 feet maximum offset. The cross correlation must be a minimum of 0.92.

Conduct the following IP calibration and verification tests in the Engineer's presence each day before performing inertial profiling:

1. Block test. Verify the height sensor accuracy under AASHTO R 57, section 5.3.2.3.
2. Bounce test. Verify the combined height sensor and accelerometer accuracy under AASHTO R-57, section 5.3.2.3.2.
3. DMI test. Calibrate the accuracy of the testing procedure under AASHTO R 56, section 8.4.
4. Manufacturer's recommended tests.

Collect IP data using the specified ProVAL analysis with 250 mm and IRI filters. Comply with the requirements for data collection under AASHTO R 56.

For IP testing, wheel paths are 3 feet from and parallel to the edge of a lane. Left and right are relative to the direction of travel. The IRI is the pavement smoothness along a wheel path of a given lane. The MRI is the average of the IRI values for the left and right wheel path from the same lane.

Operate the IP according to the manufacturer's recommendations and AASHTO R 57 at 1-inch recording intervals and a minimum 4 inch line laser sensor.

Collect IP data under AASHTO R 56. IP data must include:

1. Raw profile data for each lane.
2. ProVAL ride quality analysis report for the international roughness index (IRI) of left and right wheel paths of each lane. Submit in pdf file format.
3. ProVAL ride quality analysis report for the mean roughness index (MRI) of each lane. Submit in pdf file format.
4. ProVAL smoothness assurance analysis report for IRIs of left wheel path. Submit in pdf file format.
5. ProVAL smoothness assurance analysis report for IRIs of right wheel path. Submit in pdf file format.
6. GPS data file for each lane in GPS exchange. Submit in GPS eXchange file format.
7. Manufacturer's recommended IP calibration and verification tests results.
8. AASHTO IP calibration and verification test results including bounce, block, and distance measurement instrument (DMI).

Submit the IP raw profile data in unfiltered electronic pavement profile file (PPF) format. Name the PPF file using the following naming convention:

YYYYMMDD\_TTCCRRR\_D\_L\_W\_S\_X\_PT.PPF

where:

YYYY = year

MM = Month, leading zero

DD = Day of month, leading zero

TT = District, leading zero

CCC = County, 2 or 3 letter abbreviation as shown in section 1-1.08

RRR = Route number, no leading zeros

D = Traffic direction as NB, SB, WB, or EB

L = Lane number from left to right in direction of travel

W = Wheel path as "L" for left, "R" for right, or "B" for both

S = Beginning station to the nearest foot (e.g., 10+20) or beginning post mile to the nearest hundredth (e.g., 25.06) no leading zero

X = Profile operation as "EXIST" for existing pavement, "PAVE" for after paving, or "CORR" for after final surface pavement correction

PT = Pavement type (e.g., "concrete", etc.)

Determine IRIs using the ProVAL ride quality analysis with a 250 mm and IRI filters. While collecting the profile data to determine IRI, record the following locations in the raw profile data:

1. Begin and end of all bridge approach slabs
2. Begin and end of all bridges
3. Begin and end of all culverts visible on the roadway surface

For each 0.1 mile section, your IRI values must be within 10 percent of the Department's IRI values. The Engineer may order you to recalibrate your IP equipment and reprofile. If your results are inaccurate due to operator error, the Engineer may disqualify your IP operator.

Determine the MRI for 0.1-mile fixed sections. A partial section less than 0.1 mile that is the result of an interruption to continuous pavement surface must comply with the MRI specifications for a full section. Adjust the MRI for a partial section to reflect a full section based on the proportion of a section paved.

Determine the areas of localized roughness. Use the ProVAL smoothness assurance with a continuous IRI for each wheel path, 25-foot interval, and 250 mm and IRI filters.

**40-1.01D(6)(c)(iv) Reserved**

**40-1.01D(6)(d)–40-1.01D(6)(h) Reserved**

**40-1.01D(7) Pavement Acceptance**

**40-1.01D(7)(a) Acceptance Testing**

**40-1.01D(7)(a)(i) General**

The Department's acceptance testing includes testing the pavement properties at the minimum frequencies shown in the following table:

Property	Acceptance Testing		Frequency <sup>a</sup>
	CRCP	JPCP	
Modulus of rupture (28 day)	California Test 523		1,000 cu yd
Air content <sup>b</sup>	California Test 504		1 day's paving
Dowel bar placement	--	Measurement <sup>a</sup>	700 sq yd
Tie bar placement	--	Measurement <sup>a</sup>	4,000 sq yd
Thickness	California Test 531		1,200 sq yd
Coefficient of friction	California Test 342		1 day's paving

<sup>a</sup>A single test represents no more than the frequency specified.

<sup>b</sup>Tested only when air entrainment is specified.

Pavement smoothness may be accepted based on your testing in the absence of the Department's testing.

**40-1.01D(7)(a)(ii) Air Content**

If air-entraining admixtures are specified, the Engineer uses a t-test to compare your QC test results with the Department's test results. The t-value for test data is determined using the following equation:

$$t = \frac{|\bar{X}_c - \bar{X}_d|}{S_p \sqrt{\frac{1}{n_c} + \frac{1}{n_d}}} \quad \text{and} \quad S_p^2 = \frac{S_c^2(n_c - 1) + S_d^2(n_d - 1)}{n_c + n_d - 2}$$

where:

- $n_c$  = Number of your quality control tests (minimum of 6 required)
- $n_d$  = Number of Department's tests (minimum of 2 required)



- $\bar{X}_c$  = Mean of your quality control tests  
 $\bar{X}_v$  = Mean of the Department's tests  
 $S_p$  = Pooled standard deviation  
 (When  $n_v = 1$ ,  $S_p = S_c$ )  
 $S_c$  = Standard deviation of your quality control tests  
 $S_v$  = Standard deviation of the Department's tests (when  $n_v > 1$ )

The Engineer compares your QC test results with the Department's test results at a level of significance of  $\alpha = 0.01$ . The Engineer compares the t-value to  $t_{crit}$ , using degrees of freedom showing in the following table:

degrees of freedom ( $nc+nv-2$ )	$t_{crit}$ (for $\alpha = 0.01$ )
1	63.657
2	9.925
3	5.841
4	4.604
5	4.032
6	3.707
7	3.499
8	3.355
9	3.250
10	3.169

If the t-value calculated is less than or equal to  $t_{crit}$ , your quality control test results are verified. If the t-value calculated is greater than  $t_{crit}$ , quality control test results are not verified.

If your quality control test results are not verified, core at least 3 specimens from concrete pavement under section 40-1.03P. The Engineer selects the core locations. The authorized laboratory must test these specimens for air content under ASTM C 457. The Engineer compares these test results with your quality control test results using the t-test method. If your quality control test results are verified based on this comparison, the Engineer uses the quality control test results for acceptance of concrete pavement for air content. If your quality control test results are not verified based on this comparison, the Engineer uses the air content of core specimens determined by the authorized laboratory under ASTM C 457 for acceptance.

#### 40-1.01D(7)(a)(iii) Dowel and Tie Bar Placement

For JPCP, drill cores under section 40-1.03P for the Department's acceptance testing.

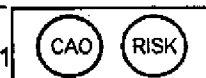
The Engineer identifies which joint and dowel or tie bar are to be tested. Core each day's paving within 2 business days. Each dowel or tie bar test consists of 2 cores, 1 on each bar end to expose both ends and allow measurement.

If the tests indicate dowel or tie bars are not placed within the specified tolerances or if there is unconsolidated concrete around the dowel or tie bars, core additional specimens identified by Engineer to determine the limits of unacceptable work.

#### 40-1.01D(7)(a)(iv) Thickness

Drill cores under section 40-1.03P for the Department's acceptance testing in the primary area, which is the area placed in 1 day for each thickness. Core at locations determined by the Engineer and in the Engineer's presence.

Do not core until any grinding has been completed.



The core specimen diameter must be 4 inches. To identify the limits of concrete pavement deficient in thickness by more than 0.05 foot, you may divide primary areas into secondary areas. The Engineer measures cores under California Test 531 to the nearest 0.01 foot. Core at least 1 foot from existing, contiguous, and parallel concrete pavement not constructed as part of this Contract.

You may request the Engineer make additional thickness measurements and use them to determine the average thickness variation. The Engineer determines the locations with random sampling methods.

If each thickness measurement in a primary area is less than 0.05 foot deficient, the Engineer calculates the average thickness deficiency in that primary area. The Engineer uses 0.02 foot for a thickness difference more than 0.02 foot over the specified thickness.

For each thickness measurement in a primary area deficient by more than 0.05 foot, the Engineer determines a secondary area where the thickness deficiency is more than 0.05 foot. The Engineer determines this secondary area by measuring the thickness of each concrete pavement slab adjacent to the measurement found to be more than 0.05 foot deficient. The Engineer continues to measure the thickness until an area that is bound by slabs with thickness deficient by 0.05 foot or less is determined.

Slabs without bar reinforcement are defined by the areas bound by longitudinal and transverse joints and concrete pavement edges. Slabs with bar reinforcement are defined by the areas bound by longitudinal joints and concrete pavement edges and 15-foot lengths. Secondary area thickness measurements in a slab determine that entire slab's thickness.

The Engineer measures the remaining primary area thickness after removing the secondary areas from consideration for determining the average thickness deficiency.

**40-1.01D(7)(a)(v)–40-1.01D(7)(a)(ix) Reserved**

**40-1.01D(7)(b) Acceptance Criteria**

**40-1.01D(7)(b)(i) General**

Reserved

**40-1.01D(7)(b)(ii) Modulus of Rupture**

For field qualification, the modulus of rupture at no later than 28 days must be at least:

1. 550 psi for each single beam
2. 570 psi for the average of 5 beams

For production, the modulus of rupture for the average of the individual test results of 2 beams aged for 28 days must be at least 570 psi.

**40-1.01D(7)(b)(iii) Air Content**

The air content must be within  $\pm 1.5$  percent of the specified value. If no value is specified, the air content must be within  $\pm 1.5$  percent of the value used for your approved mix design.

**40-1.01D(7)(b)(iv) Bar Reinforcement**

In addition to requirements of Section 52, bar reinforcement must be more than 1/2 inch below the saw cut depth at concrete pavement joints.

**40-1.01D(7)(b)(v) Dowel Bar and Tie Bar Placement**

Tie bar placement must comply with the tolerances shown in the following table:

**Tie Bar Tolerance**

Dimension	Tolerance
Horizontal and vertical skew	5 1/4 inch, max
Longitudinal translation	± 2 inch
Horizontal offset (embedment)	± 2 inch
Vertical depth	1. At least 1/2 inch below the bottom of the saw cut 2. When measured at any point along the bar, not less than 2 inches clear of the pavement's surface and bottom

NOTE: Tolerances are measured relative to the completed joint.

Dowel bar placement must comply with the tolerances shown in the following table:

**Dowel Bar Tolerances**

Dimension	Tolerance
Horizontal offset	±1 inch
Longitudinal translation	±2 inch
Horizontal skew	5/8 inch, max
Vertical skew	5/8 inch, max
Vertical depth	The minimum distance measured from concrete pavement surface to any point along the top of dowel bar must be: DB + 1/2 inch  where: DB = one third of pavement thickness in inches, or the saw cut depth, whichever is greater  The maximum distance below the depth shown must be 5/8 inch.

NOTE: Tolerances are measured relative to the completed joint.

The Engineer determines the limits for removal and replacement.

#### **40-1.01D(7)(b)(vi) Pavement Thickness**

Concrete pavement thickness must not be deficient by more than 0.05 foot.

The minimum thickness is not reduced for specifications that may affect concrete pavement thickness such as allowable tolerances for subgrade construction.

The Engineer determines the areas of noncompliant pavement, the thickness deficiencies, and the limits where removal is required.

Pavement with an average thickness deficiency less than 0.01 foot is acceptable. If the thickness deficiency is 0.01 foot or more and less than 0.05 foot, you may request authorization to leave the pavement in place and accept a pay adjustment. If the deficiency is more than 0.05 foot the pavement must be removed and replaced.

**40-1.01D(7)(b)(vii) Pavement Smoothness**

Where testing with an IP is required, the pavement surface must have:

1. No areas of localized roughness with an IRI greater than 120 in/mi
2. MRI of 60 in/mi or less within a 0.1 mile section

Where testing with a straightedge is required, the pavement surface must not vary from the lower edge of the straightedge by more than:

1. 0.01 foot when the straightedge is laid parallel with the centerline
2. 0.02 foot when the straightedge is laid perpendicular to the centerline and extends from edge to edge of a traffic lane
3. 0.02 foot when the straightedge is laid within 24 feet of a pavement conform

**40-1.01D(7)(b)(viii) Coefficient of Friction**

Initial and final texturing must produce a coefficient of friction of at least 0.30. Do not open the pavement to traffic unless the coefficient of friction is at least 0.30.

**40-1.01D(7)(b)(ix)–40-1.01D(7)(b)(xii) Reserved****40-1.02 MATERIALS****40-1.02A General**

Water for coring must comply with section 90.

Tack coat must comply with section 39.

**40-1.02B Concrete****40-1.02B(1) General**

PCC for pavement must comply with section 90-1 except as otherwise specified.

**40-1.02B(2) Cementitious Material**

Concrete must contain from 505 pounds to 675 pounds cementitious material per cubic yard. The specifications for reducing cementitious material content in section 90-1.02E(2) do not apply.

**40-1.02B(3) Aggregate**

Aggregate must comply with section 90-1.02C except the specifications for reduction in operating range and contract compliance for cleanliness value and sand equivalent specified in section 90-1.02C(2) and section 90-1.02C(3) do not apply.

For coarse aggregate in high desert and high mountain climate regions, the loss must not exceed 25 percent when tested under California Test 211 with 500 revolutions.

For combined aggregate gradings, the difference between the percent passing the 3/8-inch sieve and the percent passing the no. 8 sieve must not be less than 16 percent of the total aggregate.

**40-1.02B(4) Air Entrainment**

The second paragraph of section 90-1.02I(2)(a) does not apply.

For a project shown in the low and south mountain climate regions, add air-entraining admixture to the concrete at the rate required to produce an air content of 4 percent in the freshly mixed concrete.

For a project shown in the high desert and high mountain climate regions, add air-entraining admixture to the concrete at the rate required to produce an air content of 6 percent in the freshly mixed concrete.

**40-1.02B(5)–40-1.02B(8) Reserved****40-1.02C Reinforcement, Bars, and Baskets****40-1.02C(1) Bar Reinforcement**

Bar reinforcement must be deformed bars.

If the project is not shown to be in high desert or any mountain climate region, bar reinforcement must comply with section 52.

If the project is shown to be in high desert or any mountain climate regions, bar reinforcement must be one of the following:

1. Epoxy-coated bar reinforcement under section 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60. Bars must be handled under ASTM D 3963/D 3963M and section 52-2.02C.
2. Low carbon, chromium steel bar complying with ASTM A 1035/A 1035M

#### 40-1.02C(2) Dowel Bars

Dowel bars must be plain bars. Fabricate, sample, and handle epoxy-coated dowel bars under ASTM D 3963/D 3963M and section 52-2.03C except each sample must be 18 inches long.

If the project is not shown to be in high desert or any mountain climate region, dowel bars must be one of the following:

1. Epoxy-coated bars. Bars must comply with ASTM A 615/A 615M, Grade 40 or 60. Epoxy coating must comply with either section 52-2.02B or 52-2.03B.
2. Stainless-steel bars. Bars must be descaled solid stainless-steel bars under ASTM A 955/A 955M, UNS Designation S31603 or S31803.
3. Low carbon, chromium-steel bars under ASTM A 1035/A 1035M.

If the project is shown to be in high desert or any mountain climate region, dowel bars must be one of the following:

1. Epoxy-coated bars. Bars must comply with ASTM A 615/A 615M, Grade 40 or 60. Epoxy coating must comply with section 52-2.03B.
2. Stainless-steel bars. Bars must be descaled solid stainless-steel bars under ASTM A 955/A 955M, UNS Designation S31603 or S31803.

#### 40-1.02C(3) Tie Bars

Tie bars must be deformed bars.

If the project is not shown to be in high desert or any mountain climate region, tie bars must be one of the following:

1. Epoxy-coated bar reinforcement. Bars must comply with either section 52-2.02B or 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60.
2. Stainless-steel bars. Bars must be descaled solid stainless-steel bars under ASTM A 955/A 955M, UNS Designation S31603 or S31803.
3. Low carbon, chromium-steel bars under ASTM A 1035/A 1035M.

If the project is shown to be in high desert or any mountain climate region, tie bars must be one of the following:

1. Epoxy-coated bar reinforcement. Bars must comply with section 52-2.03B except bars must comply with either ASTM A 706/A 706M; ASTM A 996/A 996M; or ASTM A 615/A 615M, Grade 40 or 60.
2. Stainless-steel bars. Bars must be descaled solid stainless-steel bars under ASTM A 955/A 955M, UNS Designation S31603 or S31803.

Fabricate, sample, and handle epoxy-coated tie bars under ASTM D 3963/D 3963M, section 52-2.02, or section 52-2.03.

Do not bend tie bars.

**40-1.02C(4) Dowel and Tie Bar Baskets**

For dowel and tie bar baskets, wire must comply with ASTM A 82/A 82M and be welded under ASTM A 185/A 185M, Section 7.4. The minimum wire-size no. is W10. Use either U-frame or A-frame shaped assemblies.

If the project is not shown to be in high desert or any mountain climate region, baskets may be epoxy-coated, and the epoxy coating must comply with either section 52-2.02B or 52-2.03B.

If the project is shown to be in high desert or any mountain climate region, wire for dowel bar and tie bar baskets must be one of the following:

1. Epoxy-coated wire complying with section 52-2.03B
2. Stainless-steel wire. Wire must be descaled solid stainless-steel. Wire must comply with (1) the chemical requirements in ASTM A 276/A 276M, UNS Designation S31603 or S31803 and (2) the tension requirements in ASTM A 1022/ A 1022M.

Handle epoxy-coated tie bar and dowel bar baskets under ASTM D 3963/D 3963M and either section 52-2.02 or 52-2.03.

Fasteners must be driven fasteners under ASTM F 1667. Fasteners on lean concrete base or HMA must have a minimum shank diameter of 3/16 inch and a minimum shank length of 2-1/2 inches. For asphalt treated permeable base or cement treated permeable base, the shank diameter must be at least 3/16 inch and the shank length must be at least 5 inches.

Fasteners, clips, and washers must have a minimum 0.2-mil thick zinc coating applied by either electroplating or galvanizing.

**40-1.02D Dowel Bar Lubricant**

Dowel bar lubricant must be petroleum paraffin based or a curing compound. Paraffin-based lubricant must be Dayton Superior DSC BB-Coat or Valvoline Tectyl 506 or an approved equal and must be factory-applied. Curing compound must be curing compound no. 3.

**40-1.02E Joint Filler**

Joint filler for isolation joint must be preformed expansion joint filler for concrete (bituminous type) under ASTM D 994.

**40-1.02F Curing Compound**

Curing compound must be curing compound no. 1 or 2.

**40-1.02G Nonshrink Hydraulic Cement Grout**

Nonshrink hydraulic cement grout must comply with ASTM C 1107/C 1107M. Clean, uniform, rounded aggregate filler may be used to extend the grout. Aggregate filler must not exceed 60 percent of the grout mass or the maximum recommended by the manufacturer, whichever is less. Aggregate filler moisture content must not exceed 0.5 percent when tested under California Test 223 or California Test 226. Aggregate filler tested under California Test 202 must comply with the grading shown in the following table:

**Aggregate Filler Grading**

Sieve size	Percentage passing
1/2-inch	100
3/8-inch	85-100
No. 4	10-30
No. 8	0-10
No. 16	0-5

**40-1.02H Temporary Roadway Pavement Structure**

Temporary roadway pavement structure must comply with section 41-1.02E.

**40-1.02I-40-1.02N Reserved****40-1.03 CONSTRUCTION****40-1.03A General**

Aggregate and bulk cementitious material must be proportioned by weight by means of automatic proportioning devices of approved types.

For widenings and lane reconstruction, construct only the portion of pavement where the work will be completed during the same lane closure. If you fail to complete the construction during the same lane closure, construct a temporary pavement structure under section 41-1.

**40-1.03B Water Supply**

Before placing concrete pavement, develop enough water supply.

**40-1.03C Test Strips**

Construct a test strip for each type of pavement with a quantity of more than 2,000 cu yd. Obtain authorization of the test strip before constructing pavement. Test strips must be:

1. 700 to 1,000 feet long
2. Same width as the planned paving, and
3. Constructed using the same equipment proposed for paving

The Engineer selects from 6 to 12 core locations for dowel bars and up to 6 locations for tie bars per test strip. If you use mechanical dowel bar inserters, the test strip must demonstrate they do not leave voids, segregations, or surface irregularities such as depressions, dips, or high areas.

Test strips must comply with the acceptance criteria for:

1. Smoothness, except IP is not required
2. Dowel bars and tie bars placement
3. Pavement thickness
4. Final finishing, except the coefficient of friction is not considered

Allow 3 business days for evaluation. If the test strip is noncompliant, stop paving and submit a plan for changed materials, methods, or equipment. Allow 3 business days for authorization of the plan. Construct another test strip per the authorized plan.

Remove and dispose of noncompliant test strips.

If the test strip is compliant except for smoothness and final finishing, you may grind the surface. After grinding retest the test strip smoothness under section 40-1.01D(6)(c).

If the test strip is compliant for smoothness and thickness, construction of an additional test strip is not required and the test strip may remain in place.

Construct additional test strips if you:

1. Propose different paving equipment including:
  - 1.1. Paver
  - 1.2. Dowel bar inserter
  - 1.3. Tie bar inserter
  - 1.4. Tining
  - 1.5. Curing equipment
2. Change concrete mix proportions

You may request authorization to eliminate the test strip if you use paving equipment and personnel from a Department project (1) for the same type of pavement and (2) completed within the past 12 months. Submit supporting documents and previous project information with your request.

#### **40-1.03D Joints**

##### **40-1.03D(1) General**

Do not bend tie bars or reinforcement in existing concrete pavement joints.

For contraction joints and isolation joints, saw cut a groove with a power-driven saw. After cutting, immediately wash slurry from the joint with water at less than 100 psi pressure.

Keep joints free from foreign material including soil, gravel, concrete, and asphalt. To keep foreign material out of the joint, you may use filler material. Filler material must not react adversely with the concrete or cause concrete pavement damage. After sawing and washing, install filler material that keeps moisture in the adjacent concrete during the 72 hours after paving. If you install filler material, the specifications for spraying the sawed joint with additional curing compound in section 40-1.03K does not apply. If using absorptive filler material, moisten the filler immediately before or after installation.

##### **40-1.03D(2) Construction Joints**

Construction joints must be vertical.

Before placing fresh concrete against hardened concrete, existing concrete pavement, or structures, apply curing compound no. 1 or 2 to the vertical surface of the hardened concrete, existing concrete pavement, or structures and allow it to dry.

At joints between concrete pavement and HMA, apply tack coat between the concrete pavement and HMA.

Use a metal or wooden bulkhead to form transverse construction joints. If dowel bars are described, the bulkhead must allow dowel bar installation.

##### **40-1.03D(3) Contraction Joints**

Saw contraction joints before cracking occurs and after the concrete is hard enough to saw without spalling, raveling, or tearing.

Saw cut using a power saw with a diamond blade. After cutting, immediately wash slurry from the joint with water at less than 100 psi pressure.

Except for longitudinal joints parallel to a curving centerline, transverse and longitudinal contraction joints must not deviate by more than 0.1 foot from either side of a 12-foot straight line.

Cut transverse contraction joints within 0.5 foot of the spacing described. Adjust spacing if needed such that slabs are at least 10 feet long.

For widenings, do not match transverse contraction joints with existing joint spacing or skew unless otherwise described.

Cut transverse contraction joints straight across the full concrete pavement width, between isolation joints and edges of pavement. In areas of converging and diverging pavements, space transverse contraction joints such that the joint is continuous across the maximum pavement width. Longitudinal contraction joints must be parallel with the concrete pavement centerline, except when lanes converge or diverge.

##### **40-1.03D(4) Isolation Joints**

Before placing concrete at isolation joints, prepare the existing concrete face and secure joint filler. Prepare by saw cutting and making a clean flat vertical surface. Make the saw cut the same depth as the depth of the new pavement.

##### **40-1.03E Bar Reinforcement**

Place bar reinforcement under section 52.



**40-1.03F Dowel Bar Placement**

If using curing compound as lubricant, apply the curing compound to dowels in 2 separate applications. Lubricate each dowel bar entirely before placement. The last application must be applied not more than 8 hours before placing the dowel bars. Apply each curing compound application at a rate of 1 gallon per 150 square feet.

Install dowel bars using one of the following methods:

1. Drill and bond bars. Comply with section 41-10.
2. Mechanical insertion. Eliminate evidence of the insertion by reworking the concrete over the dowel bars.
3. Dowel bar baskets. Anchor baskets with fasteners. Use at least 1 fastener per foot for basket sections. Baskets must be anchored at least 200 feet in advance of the concrete placement activity unless your waiver request is authorized. If requesting a waiver, describe the construction limitations or restricted access preventing the advanced anchoring. After the baskets are anchored and before the concrete is placed, cut and remove temporary spacer wires and demonstrate the dowel bars do not move from their specified depth and alignment during concrete placement.

If dowel bars are noncompliant, stop paving activities, demonstrate your correction, and obtain verbal approval from the Engineer.

**40-1.03G Tie Bar Placement**

Install tie bars at longitudinal joints using one of the following methods:

1. Drill and bond bars. Comply with section 41-10.
2. Insert bars. Mechanically insert tie bars into plastic slip-formed concrete before finishing. Inserted tie bars must have full contact between the bar and the concrete. Eliminate evidence of the insertion by reworking the concrete over the tie bars.
3. Threaded couplers. Threaded tie bar splice couplers must be fabricated from deformed bar reinforcement and free of external welding or machining.
4. Tie bar baskets. Anchor baskets at least 200 feet in advance of pavement placement activity. If you request a waiver, describe the construction limitations or restricted access preventing the advanced anchoring. After the baskets are anchored and before paving, demonstrate the tie bars do not move from their specified depth and alignment during paving. Use fasteners to anchor tie bar baskets.

If tie bars are noncompliant, stop paving activities, demonstrate your correction, and obtain verbal approval from the Engineer.

**40-1.03H Placing Concrete****40-1.03H(1) General**

Immediately prior to placing concrete, the surface to receive concrete must be:

1. In compliance with specified requirements, including compaction and elevation tolerances
2. Free of loose and extraneous material
3. Uniformly moist, but free of standing or flowing water

Place concrete pavement with stationary side forms or slip-form paving equipment.

Place consecutive concrete loads within 30 minutes of each other. Construct a transverse construction joint when concrete placement is interrupted by more than 30 minutes. The transverse construction joint must coincide with the next contraction joint location, or you must remove fresh concrete pavement to the preceding transverse joint location.

Place concrete pavement in full slab widths separated by construction joints or monolithically in multiples of full lane widths with a longitudinal contraction joint at each traffic lane line.

Do not retemper concrete.

If the concrete pavement surface width is constructed as specified, you may construct concrete pavement sides on a batter not flatter than 6:1 (vertical:horizontal).

#### **40-1.03H(2) Paving Adjacent to Existing Concrete Pavement**

Where pavement is placed adjacent to existing concrete pavement:

1. Grinding adjacent pavement must be completed before placing the pavement
2. Use paving equipment with padded crawler tracks or rubber-tired wheels with enough offset to prevent damage
3. Match pavement grade with the elevation of existing concrete pavement after grinding.

#### **40-1.03H(3) Concrete Pavement Transition Panel**

For concrete pavement placed in a transition panel, texture the surface with a drag strip of burlap, broom, or spring steel tine device that produces scoring in the finished surface. Scoring must be either parallel or transverse to the centerline. Texture at the time that produces the coarsest texture.

#### **40-1.03H(4) Stationary Side Form Construction**

Stationary side forms must be straight and without defects including warps, bends, and indentations. Side forms must be metal except at end closures and transverse construction joints where other materials may be used.

You may build up side forms by attaching a section to the top or bottom. If attached to the top of metal forms, the attached section must be metal.

The side form's base width must be at least 80 percent of the specified concrete pavement thickness.

Side forms including interlocking connections with adjoining forms must be rigid enough to prevent springing from subgrading and paving equipment and concrete pressure.

Construct subgrade to final grade before placing side forms. Side forms must bear fully on the foundation throughout their length and base width. Place side forms to the specified grade and alignment of the finished concrete pavement's edge. Support side forms during concrete placing, compacting, and finishing.

After subgrade work is complete and immediately before placing concrete, true side forms and set to line and grade for a distance that avoids delays due to form adjustment.

Clean and oil side forms before each use.

Side forms must remain in place for at least 1 day after placing concrete and until the concrete pavement edge no longer requires protection from the forms.

Spread, screed, shape, and consolidate concrete with 1 or more machines. The machines must uniformly distribute and consolidate the concrete. The machines must operate to place the concrete pavement to the specified cross section with minimal hand work.

Consolidate the concrete without segregation. If vibrators are used:

1. The vibration rate must be at least 3,500 cycles per minute for surface vibrators and 5,000 cycles per minute for internal vibrators
2. Amplitude of vibration must cause perceptible concrete surface movement at least 1 foot from the vibrating element
3. Use a calibrated tachometer for measuring frequency of vibration
4. Vibrators must not rest on side forms or new concrete pavement
5. Power to vibrators must automatically cease when forward or backward motion of the paving machine is stopped
6. Uniformly consolidate the concrete across the paving width including adjacent to forms by using high-frequency internal vibrators within 15 minutes of depositing concrete on the subgrade
7. Do not shift the mass of concrete with vibrators.

**40-1.03H(5) Slip-Form Construction**

If slip-form construction is used, spread, screed, shape, and consolidate concrete to the specified cross section with slip-form machines and minimal hand work. Slip-form paving machines must be equipped with traveling side forms and must not segregate the concrete.

Do not deviate from the specified concrete pavement alignment by more than 0.1 foot.

Slip-form paving machines must use high frequency internal vibrators to consolidate concrete. You may mount vibrators with their axes parallel or normal to the concrete pavement alignment. If mounted with axes parallel to the concrete pavement alignment, space vibrators no more than 2.5 feet measured center to center. If mounted with axes normal to the concrete pavement alignment, space the vibrators with a maximum 0.5-foot lateral clearance between individual vibrators.

Each vibrator must have a vibration rate from 5,000 to 8,000 cycles per minute. The amplitude of vibration must cause perceptible concrete surface movement at least 1 foot from the vibrating element. Use a calibrated tachometer to measure frequency of vibration.

**40-1.03I Edge Treatment**

10-30-15

Construct edge treatments as shown. Regrade when required for the preparation of tapered edge areas.

Sections 40-1.03J(2) and 40-1.03J(3) do not apply to tapered edges.

For tapered edges placed after the concrete pavement is complete, concrete may comply with the requirements for minor concrete.

For tapered edges placed after the concrete pavement is complete, install connecting bar reinforcement under section 52.

Saw cutting or grinding may be used to construct tapered edges.

For tapered edges, the angle of the slope must not deviate by more than  $\pm 5$  degrees from the angle shown. Measure the angle from the plane of the adjacent finished pavement surface.

07-19-13

**40-1.03J Finishing****40-1.03J(1) General**

Reserved

**40-1.03J(2) Preliminary Finishing****40-1.03J(2)(a) General**

Preliminary finishing must produce a smooth and true-to-grade finish. After preliminary finishing, mark each day's paving with a stamp. The stamp must be authorized before paving starts. The stamp must be approximately 1 by 2 feet in size. The stamp must form a uniform mark from 1/8 to 1/4 inch deep. Locate the mark 20  $\pm$  5 feet from the transverse construction joint formed at each day's start of paving and 1  $\pm$  0.25 foot from the pavement's outside edge. The stamp mark must show the month, day, and year of placement and the station of the transverse construction joint. Orient the stamp mark so it can be read from the pavement's outside edge.

Do not apply water to the pavement surface before float finishing.

**40-1.03J(2)(b) Stationary Side Form Finishing**

If stationary side form construction is used, give the pavement a preliminary finish by the machine float method or the hand method.

If using the machine float method:

1. Use self-propelled machine floats.

2. Determine the number of machine floats required to perform the work at a rate equal to the pavement delivery rate. If the time from paving to machine float finishing exceeds 30 minutes, stop pavement delivery. When machine floats are in proper position, you may resume pavement delivery and paving.
3. Run machine floats on side forms or adjacent pavement lanes. If running on adjacent pavement, protect the adjacent pavement surface under section 40-1.03L. Floats must be hardwood, steel, or steel-shod wood. Floats must be equipped with devices that adjust the underside to a true flat surface.

If using the hand method, finish pavement smooth and true to grade with manually operated floats or powered finishing machines.

#### **40-1.03J(2)(c) Slip-Form Finishing**

If slip-form construction is used, the slip-form paver must give the pavement a preliminary finish. You may supplement the slip-form paver with machine floats.

Before the pavement hardens, correct pavement edge slump in excess of 0.02 foot exclusive of edge rounding.

#### **40-1.03J(3) Final Finishing**

After completing preliminary finishing, round the edges of the initial paving widths to a 0.04-foot radius. Round transverse and longitudinal construction joints to a 0.02-foot radius.

Before curing, texture the pavement. Perform initial texturing with a burlap drag or broom device that produces striations parallel to the centerline. Perform final texturing with a steel-tined device that produces grooves parallel with the centerline.

Construct longitudinal grooves with a self-propelled machine designed specifically for grooving and texturing pavement. The machine must have tracks to maintain constant speed, provide traction, and maintain accurate tracking along the pavement surface. The machine must have a single row of rectangular spring steel tines. The tines must be from 3/32 to 1/8 inch wide, on 3/4-inch centers, and must have enough length, thickness, and resilience to form grooves approximately 3/16 inch deep. The machine must have horizontal and vertical controls. The machine must apply constant down pressure on the pavement surface during texturing. The machines must not cause raveling.

Construct grooves over the entire pavement width in a single pass except do not construct grooves 3 inches from the pavement edges and longitudinal joints. Final texture must be uniform and smooth. Use a guide to properly align the grooves. Grooves must be parallel and aligned to the pavement edge across the pavement width. Grooves must be from 1/8 to 3/16 inch deep after the pavement has hardened.

For irregular areas and areas inaccessible to the grooving machine, you may hand-construct grooves using the hand method. Hand-constructed grooves must comply with the specifications for machine-constructed grooves.

For ramp termini, use heavy brooming normal to the ramp centerline to produce a coefficient of friction of at least 0.35 determined on the hardened surface under California Test 342.

#### **40-1.03K Curing**

Cure the concrete pavement's exposed area under section 90-1.03B using the waterproof membrane method or curing compound method. If using the curing compound method use curing compound no. 1 or 2. When side forms are removed within 72 hours of the start of curing, also cure the concrete pavement edges.

Apply curing compound with mechanical sprayers. Reapply curing compound to saw cuts and disturbed areas.

#### **40-1.03L Protecting Concrete Pavement**

Protect concrete pavement under section 90-1.03C.

Maintain the concrete pavement surface temperature at not less than 40 degrees F for the initial 72 hours.

Protect the concrete pavement surface from activities that cause damage and reduce texture and coefficient of friction. Do not allow soil, gravel, petroleum products, concrete, or asphalt mixes on the concrete pavement surface.

Construct crossings for traffic convenience. If authorized, you may use RSC for crossings. Do not open crossings until the Department determines that the pavement's modulus of rupture is at least 550 psi under California Test 523 or California Test 524.

Do not open concrete pavement to traffic or use equipment on the concrete pavement for 10 days after paving nor before the concrete has attained a modulus of rupture of 550 psi based on Department's testing except:

1. If the equipment is for sawing contraction joints
2. If authorized, one side of paving equipment's tracks may be on the concrete pavement after a modulus of rupture of 350 psi has been attained, provided:
  - 2.1. Unit pressure exerted on the concrete pavement by the paver does not exceed 20 psi
  - 2.2. You change the paving equipment tracks to prevent damage or the paving equipment tracks travel on protective material such as planks
  - 2.3. No part of the track is closer than 1 foot from the concrete pavement's edge

If concrete pavement damage including visible cracking occurs, stop operating paving equipment on the concrete pavement and repair the damage.

#### **40-1.03M Early Use of Concrete Pavement**

If requesting early use of concrete pavement:

1. Furnish molds and machines for modulus of rupture testing
2. Sample concrete
3. Fabricate beam specimens
4. Test for modulus of rupture under California Test 523

If you request early use, concrete pavement must have a modulus of rupture of at least 350 psi. Protect concrete pavement under section 40-1.03L.

#### **40-1.03N Reserved**

#### **40-1.03O Shoulder Rumble Strip**

10-30-15

Construct shoulder rumble strips by grinding indentations in new concrete pavement.

Do not construct shoulder rumble strips on structures or approach slabs.

Construct rumble strips within 2 inches of the specified alignment. Rumble strip equipment must be equipped with a sighting device enabling the operator to maintain the rumble strip alignment.

Indentations must not vary from the specified dimensions by more than 1/16 inch in depth nor more than 10 percent in length and width.

Concrete pavement must be hardened before grinding rumble strips indentations. Do not construct indentations until the following occurs:

1. 10 days elapse after concrete placement
2. Concrete has developed a modulus of rupture of 550 psi determined under California Test 523,

Grind or remove and replace noncompliant rumble strip indentations at locations determined by the Engineer. Ground surface areas must be neat and uniform in appearance.

Remove grinding residue under section 42-1.03B.

**40-1.03P Drilling Cores**

Drill concrete pavement cores under ASTM C 42/C 42M. Use diamond impregnated drill bits.

Clean, dry, and fill core holes with hydraulic cement grout (nonshrink) or pavement concrete. Coat the core hole walls with epoxy adhesive for bonding new concrete to old concrete under section 95. Finish the backfill to match the adjacent surface elevation and texture.

**40-1.03Q Pavement Repair and Replacement****40-1.03Q(1) General**

If surface raveling or full-depth cracks occur within one year of Contract acceptance, repair or replace the pavement under section 6-3.06.

Repair and replace pavement in the following sequence:

1. Replace pavement
2. Repair spall, ravel, and working cracks
3. Correct smoothness and coefficient of friction
4. Treat partial depth cracks
5. Replace damaged joint seals under section 41-5

In addition to removing pavement for other noncompliance, remove and replace JPCP slabs that:

1. Have one or more full depth crack
2. Have raveled surfaces such that either:
  - 2.1. Combined raveled areas are more than 5 percent of the total slab area
  - 2.2. Single area is more than 4 sq ft

Remove and replace JPCP 3 feet on both sides of a joint with a rejected dowel bar.

**40-1.03Q(2) Spall and Ravel Repair**

Repair spalled or raveled areas that are:

1. Deeper than 0.05 foot
2. Wider than 0.10 foot
3. Longer than 0.3 foot

Repairs must comply with section 41-4 and be completed before opening pavement to traffic.

**40-1.03Q(3) Crack Repair**

Treat partial depth cracks for JPCP under section 41-3.

If the joints are sealed, repair working cracks by routing and sealing. Use a powered rotary router mounted on wheels, with a vertical shaft and a routing spindle that casters as it moves along the crack. Form a reservoir 3/4 inch deep by 3/8 inch wide in the crack. Equipment must not cause raveling nor spalling.

Treat the contraction joint adjacent to the working crack by either:

1. Epoxy resin under ASTM C 881/C 881M, Type IV, Grade 2
2. Pressure injecting epoxy resin under ASTM C 881/C881M, Type IV, Grade 1

**40-1.03Q(4) Smoothness and Friction Correction**

Correct pavement that is noncompliant for:

1. Smoothness by grinding under section 42-3
2. Coefficient of friction by grooving or grinding under section 42

Do not start corrective work until:

1. Pavement has cured 10 days
2. Pavement has at least a 550 psi modulus of rupture
3. Your corrective method is authorized

Correct the entire lane width. Begin and end grinding at lines perpendicular to the roadway centerline. The corrected area must have a uniform texture and appearance.

If corrections are made within areas where testing with an IP is required, retest the entire lane length with an IP under sections 40-1.01D(6)(c) and 40-1.01D(7)(b)(vii).

If corrections are made within areas where testing with a 12-foot straightedge is required, retest the corrected area with a straightedge under sections 40-1.01D(6)(c) and 40-1.01D(7)(b)(vii).

Allow 25 days for the Department's coefficient of friction retesting.

**40-1.03R-40-1.03U Reserved**

**40-1.04 PAYMENT**

The payment quantity for pavement is based on the dimensions shown.

The deduction for pavement thickness deficiency in each primary area is shown in the following table:

<b>Deduction for Thickness Deficiency</b>	
Average thickness deficiency (foot) <sup>a</sup>	Deduction(\$/sq yd)
0.01	0.90
0.02	2.30
0.03	4.10
0.04	6.40
0.05	9.11

<sup>a</sup>Values greater than 0.01 are rounded to the nearest 0.01 foot.

Shoulder rumble strips are measured by the station along each shoulder on which the rumble strips are constructed without deductions for gaps between indentations.

If the initial cores show that dowel bars or tie bars are within alignment tolerances and the Engineer orders more dowel or tie bar coring, the additional cores are paid for as change order work.

The Department does not pay for additional coring to check dowel or tie bar alignment which you request.

If the Engineer accepts a test strip and it remains as part of the paving surface, the test strip is paid for as the type of pavement involved.

If the curvature of a slab affects tie bar spacing and additional tie bars are required, no additional payment is made for the additional tie bars.

Payment for grinding existing pavement is not included in the payment for the type of pavement involved.

**40-2 CONTINUOUSLY REINFORCED CONCRETE PAVEMENT**

**40-2.01 GENERAL**

**40-2.01A Summary**

Section 40-2 includes specifications for constructing CRCP.

Terminal joints include saw cutting, dowel bars, drill and bond dowel bars, support slab, support slab reinforcement, tack coat, and temporary hot mix asphalt.

Expansion joints include polystyrene, support slab, support slab reinforcement, dowel bars, drill and bond dowel bars, and bond breaker.

Wide flange beam terminals include polyethylene foam, support slab, and support slab reinforcement.

Pavement anchors include cross drains, anchor reinforcement, filter fabric, and permeable material.

#### **40-2.01B Definitions**

Reserved

#### **40-2.01C Submittals**

Reserved

#### **40-2.01D Quality Control and Assurance**

##### **40-2.01D(1) General**

Reserved

##### **40-2.01D(2) Testing for Coefficient of Thermal Expansion**

For field qualification, test coefficient of thermal expansion under AASHTO T 336. The coefficient of thermal expansion must not exceed 6.0 microstrain/degree Fahrenheit.

#### **40-2.02 MATERIALS**

##### **40-2.02A General**

Class 1 permeable material, filter fabric, and slotted plastic pipe cross drain as shown for pavement anchors must comply with section 68-3.

##### **40-2.02B Concrete**

Concrete for terminal joints, support slabs, and pavement anchors must comply with section 40-1.02.

##### **40-2.02C Transverse Bar Assembly**

Instead of transverse bar and other support devices, you may use transverse bar assemblies to support longitudinal bar. Bar reinforcement and wire must comply with section 40-1.02C.

##### **40-2.02D Wide Flange Beam**

Wide flange beams and studs must be either rolled structural steel shapes under ASTM A 36/A 36M or structural steel under ASTM A 572/A 572M.

##### **40-2.02E Joints**

Joint seals for wide flange beam terminals must comply with section 51-2.02.

Joint seals for transverse expansion joints must comply with section 51-2.02.

Expanded polystyrene for transverse expansion joints must comply with section 51-2.01B(1).

#### **40-2.03 CONSTRUCTION**

##### **40-2.03A General**

Reserved

##### **40-2.03B Test Strips**

Comply with section 40-1.03C except during the evaluation, the Engineer visually checks reinforcement, dowel and tie bar placement.

##### **40-2.03C Construction Joints**

Transverse construction joints must be perpendicular to the lane line. Construct joints to allow for lap splices of the longitudinal bar. Comply with the lap splice lengths shown for CRCP.

Clean construction joint surfaces before placing fresh concrete against the joint surfaces. Remove surface laitance, curing compound, and other foreign materials.



**40-2.03D Bar Reinforcement**

Place bar reinforcement under section 52-1.03D, except you may request to use plastic chairs. Plastic chairs will only be considered for support directly under the transverse bars. Your request to use plastic chairs must include a sample of the plastic chair, the manufacturer's written recommendations for the applicable use and load capacity, chair spacing, and your calculation for the load on a chair for the area of bar reinforcement sitting on it. Vertical and lateral stability of the bar reinforcement and plastic chairs must be demonstrated during construction of the test strip. Obtain authorization before using the proposed plastic chairs for work after the test strip is accepted.

For transverse bar in a curve with a radius under 2,500 feet, place the reinforcement in a single continuous straight line across the lanes and aligned with the radius point as shown.

**40-2.03E Wide Flange Beams**

Weld stud ends with an electric arc welder completely fusing the studs to the wide flange beam. Replace studs dislodged in shipping or that can be dislodged with a hammer.

**40-2.03F Repair and Replacement****40-2.03F(1) General**

Requirements for repair of cracks under section 40-1.03Q do not apply to CRCP. High molecular weight methacrylate is not to be applied to cracks in CRCP.

New CRCP will be monitored for 1 year from contract acceptance or relief from maintenance, whichever is less. CRCP that develops raveling areas of 6 inches by 6 inches or greater will require partial depth repair under section 6-3.06. CRCP that develops one or more full-depth transverse cracks with faulting greater than 0.25 inch or one or more full-depth longitudinal cracks with faulting greater 0.50 inch will require full depth repair.

**40-2.03F(2) Partial Depth Repair**

Partial depth repair must comply with section 41-4 except:

1. Determine a rectangular boundary which extends 6 inches beyond the damaged area. The limits of saw depth must be between 2 inches from the surface to 1/2 inch above the longitudinal bars.
2. If each length of the repair boundaries is equal to or greater than 3 ft, additional reinforcement is needed for the repair area. Submit a plan for authorization before starting the repair.

**40-2.03F(3) Full Depth Repair****40-2.03F(3)(a) General**

Removal of CRCP must be full depth except for portion of reinforcement to remain. Provide continuity of reinforcement. Comply with section 52-6. Submit a plan for authorization, before starting the repair. Do not damage the base, concrete and reinforcement to remain. Place concrete in the removal area.

**40-2.03F(3)(b) Transverse Cracks**

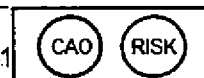
Make initial full-depth transverse saw cuts normal to the lane line a distance of 3 feet on each side of the transverse crack.

**40-2.03F(3)(c) Longitudinal Cracks**

Remove the cracked area normal to the lane line for the full width of the lane a distance of 1 foot beyond the ends of the crack. You may propose alternate limits with your repair plan for authorization.

**40-2.03G Reserved****40-2.04 PAYMENT**

Not Used



**40-3 RESERVED****40-4 JOINTED PLAIN CONCRETE PAVEMENT****40-4.01 GENERAL****40-4.01A Summary**

Section 40-4 includes specifications for constructing JPCP.

**40-4.01B Definitions**

Reserved

**40-4.01C Submittals****40-4.01C(1) General**

Reserved

**40-4.01C(2) Early Age Crack Mitigation System**

At least 24 hours before each paving shift, submit the following information as an informational submittal:

1. Early age stress and strength predictions
2. Scheduled sawing and curing activities
3. Contingency plan if cracking occurs

**40-4.01C(3)–40-4.01C(8) Reserved****40-4.01D Quality Control and Assurance****40-4.01D(1) General**

Reserved

**40-4.01D(2) Quality Control Plan**

The QC plan must include a procedure for identifying transverse contraction joint locations relative to the dowel bars longitudinal center and a procedure for consolidating concrete around the dowel bars.

**40-4.01D(3) Early Age Crack Mitigation System**

For JPCP, develop and implement a system for predicting stresses and strength during the initial 72 hours after paving. The system must include:

1. Subscription to a weather service to obtain forecasts for wind speed, ambient temperatures, humidity, and cloud cover
2. Portable weather station with an anemometer, temperature and humidity sensors, located at the paving site
3. Early age concrete pavement stress and strength prediction plan
4. Analyzing, monitoring, updating, and reporting the system's predictions

**40-4.01D(4)–40-4.01D(9) Reserved****40-4.02 MATERIALS**

Not Used

**40-4.03 CONSTRUCTION****40-4.03A General**

Transverse contraction joints on a curve must be on a single straight line through the curve's radius point. If transverse joints do not align in a curve, drill a full depth 2" diameter hole under ASTM C 42/C 42M where the joint meets the adjacent slab. Fill the hole with joint filler. If joints are not sealed, avoid joint filler material penetration into the joint.

**40-4.03B Repair and Replacement**

If replacing concrete, saw cut and remove to full depth.

Saw cut full slabs at the longitudinal and transverse joints. Saw cut partial slabs at joints and at locations determined by the Engineer. Saw cut must be vertical.

After lifting the slab, paint the cut ends of dowels and tie bars.

Construct transverse and longitudinal construction joints between the new slab and existing concrete. If slabs are constrained at both longitudinal edges by existing pavement, use dowel bars instead of tie bars. For longitudinal joints, offset dowel bar holes from original tie bars by 3 inches. For transverse joints, offset dowel bar holes from the original dowel bar by 3 inches.

Drill and bond bars to the existing concrete. Comply with section 41-10. Clean the faces of joints and underlying base from loose material and contaminants. Coat the faces with a double application of pigmented curing compound under section 28-2.03F. For partial slab replacements, place preformed sponge rubber expansion joint filler at new transverse joints under ASTM D 1752. Place concrete in the removal area.

~~40-4.03C~~–~~40-4.03G~~ Reserved

~~40-4.04~~ PAYMENT

Not Used

**40-5 JOINTED PLAIN CONCRETE PAVEMENT WITH RAPID STRENGTH CONCRETE**

Reserved

**40-6-40-15 RESERVED**

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**41 CONCRETE PAVEMENT REPAIR**

10-30-15

Replace the headings and paragraphs in section 41 with:

10-30-15

**41-1 GENERAL**

**41-1.01 GENERAL**

**41-1.01A Summary**

Section 41-1 includes general specifications for repairing concrete pavement.

Dowel bars must comply with section 40-1.

**41-1.01B Definitions**

Reserved

**41-1.01C Submittals**

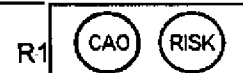
At least 15 days before delivering fast-setting concrete, polyester resin binder, or bonding agent to the job site, submit the manufacturer's recommendations, instructions, MSDS, and certificates of compliance. Notify the Engineer if polyester resin binder will be stored in containers over 55 gallons.

**41-1.01D Quality Control and Assurance**

**41-1.01D(1) General**

Before using polyester concrete:

1. Allow 14 days for sampling and testing of the polyester resin binder
2. Arrange for a representative from the manufacturer to provide training for:
  - 2.1. Cleaning and preparing the area
  - 2.2. Mixing and applying the bonding agent
  - 2.3. Mixing, placing, and curing polyester concrete



Do not use polyester concrete until your personnel and the Department's personnel have been trained.

#### 41-1.01D(2) Reserved

#### 41-1.02 MATERIALS

##### 41-1.02A General

Water for washing aggregates, mixing concrete, curing, and coring must comply with section 90-1.02D.

Use the minimum amount of water to produce workable concrete and comply with the manufacturer's instructions.

##### 41-1.02B Fast-Setting Concrete

Fast-setting concrete must be one of the following:

1. Magnesium phosphate concrete that is either:
  - 1.1. Single component water activated
  - 1.2. Dual component with a prepackaged liquid activator
2. Modified high-alumina based concrete
3. Portland cement based concrete

Fast-setting concrete must be stored in a cool and dry environment.

If used, the addition of retarders must comply with the manufacturer's instructions.

You may use any accelerating chemical admixtures complying with ASTM C494/C494M, Type C and section 90-1.02E.

Fast-setting concrete properties must have the values shown in the following table:

**Fast-Setting Concrete**

Property	Test method	Value
Compressive strength <sup>a</sup> (psi, min)		
at 3 hours	California Test 551	3,000
at 24 hours	California Test 551	5,000
Flexural strength <sup>a</sup> (psi, min, at 24 hours)	California Test 551	500
Bond strength <sup>a</sup> (psi, min, at 24 hours)		
Saturated surface dry concrete	California Test 551	300
Dry concrete	California Test 551	400
Water absorption (% max)	California Test 551	10
Abrasion resistance <sup>a</sup> (g, max, at 24 hours)	California Test 550	25
Drying shrinkage (% max, at 4 days)	ASTM C596	0.13
Water soluble chlorides <sup>b</sup> (% max, by weight)	California Test 422	0.05
Water soluble sulfates <sup>b</sup> (% max, by weight)	California Test 417	0.25
Thermal stability (% min)	California Test 553	90

<sup>a</sup>Perform test with aggregate filler if used.

<sup>b</sup>Test must be performed on a cube specimen, fabricated under California Test 551, cured at least 14 days, and then pulverized to 100% passing the no. 50 sieve.

Aggregate filler may be used to extend prepackaged concrete. Aggregate filler must:

1. Be clean and uniformly rounded.
2. Have a moisture content of 0.5-percent by weight or less when tested under California Test 226.
3. Comply with sections 90-1.02C(2) and 90-1.02C(3).
4. Not exceed 50 percent of the concrete volume or the maximum recommended by the fast-setting concrete manufacturer, whichever is less.

When tested under California Test 202, aggregate filler must comply with the grading in the following table:

Sieve size	Percentage passing
3/8 inch	100
No. 4	50-100
No. 16	0-5

#### 41-1.02C Polyester Concrete

Polyester concrete consists of polyester resin binder and dry aggregate. The polyester resin binder must be an unsaturated isophthalic polyester-styrene copolymer.

Polyester resin binder properties must have the values shown in the following table:

Property	Test method	Value
Viscosity <sup>a</sup> (Pa·s) RVT, No. 1 spindle, 20 RPM at 77 °F	ASTM D2196	0.075-0.200
Specific gravity <sup>a</sup> (77 °F)	ASTM D1475	1.05-1.10
Elongation (%), min) Type I specimen, 0.25 ± 0.03 inch thick Speed of testing = 0.45 inch/minute Condition 18/25/50+5/70: T-23/50	ASTM D638	35
Tensile strength (min, MPa) Type I specimen, 6.3 ± 0.76 mm (0.25 ± 0.03 inch) thick Speed of testing = 11.4 mm/min (0.45 inch/minute) Condition 18/25/50+5/70: T-23/50	ASTM D638  ASTM D618	17.24 (2,500 psi)
Styrene content <sup>a</sup> (%), by weight	ASTM D2369	40-50
Silane coupler (%), min, by weight of polyester resin binder)	—	1.0
PCC saturated surface-dry bond strength at 24 hours and 70 ± 2 °F (psi, min)	California Test 551	500
Static volatile emissions <sup>a</sup> (g/sq m, max)	South Coast Air Quality Management District, Method 309-91 <sup>b</sup>	60

<sup>a</sup>Perform the test before adding initiator.

<sup>b</sup>For the test method, go to:  
<http://www.aqmd.gov/>

Silane coupler must be an organosilane ester, gamma-methacryloxypropyltrimethoxysilane. Promoter must be compatible with suitable methyl ethyl ketone peroxide (MEKP) and cumene hydroperoxide (CHP) initiators.

Aggregate for polyester concrete must comply with sections 90-1.02C(1), 90-1.02C(2), and 90-1.02C(3).

When tested under California Test 202, the combined aggregate grading must comply with one of the gradations in the following table:

**Combined Aggregate Grading**

Sieve size	Percentage passing		
	A	B	C
1/2"	100	100	100
3/8"	83-100	100	100
No. 4	65-82	62-85	45-80
No. 8	45-64	45-67	35-67
No. 16	27-48	29-50	25-50
No. 30	12-30	16-36	15-36
No. 50	6-17	5-20	5-20
No. 100	0-7	0-7	0-9
No. 200	0-3	0-3	0-6

Aggregate retained on the no. 8 sieve must have a maximum of 45 percent crushed particles under California Test 205. Fine aggregate must be natural sand.

The weighted average absorption must not exceed 1 percent when tested under California Tests 206 and 207.

You may submit an alternative grading or request to use manufactured sand as fine aggregate but 100 percent of the combined grading must pass the 3/8 inch sieve. Allow 21 days for authorization.

Polyester concrete must have a minimum compressive strength of 1250 psi at 3 hours and 30 minutes under California Test 551 or ASTM C109.

#### **41-1.02D Bonding Agent**

Bonding agent must comply with the concrete manufacturer's recommendations.

#### **41-1.02E Temporary Pavement Structure**

Temporary pavement structure consists of RSC or aggregate base with HMA. RSC not conforming to the specifications may serve as temporary pavement structure if:

1. The modulus of rupture is at least 200 psi before opening to traffic
2. RSC thickness is greater than or equal to the existing concrete pavement surface layer
3. RSC is replaced during the next paving shift

Aggregate base for temporary pavement structure must comply with the 3/4-inch maximum grading specified in section 26-1.02B.

HMA must comply with the specifications for minor HMA in section 39.

#### **41-1.02F Reserved**

### **41-1.03 CONSTRUCTION**

#### **41-1.03A General**

Repair only the portion of pavement where the work will be completed during the same lane closure. If removal is required, remove only the portion of pavement where the repair will be completed during the same traffic closure. Completion of concrete repair includes curing until the concrete attains the specified minimum properties required before opening the repaired pavement to traffic.

If you fail to complete the concrete pavement repair during the same lane closure, construct temporary pavement before opening the lane to traffic.

Before starting repair work except saw cutting, the equipment, materials, and personnel for constructing temporary pavement structure must be at the job site or an approved location. If HMA can be delivered to the job site within 1 hour, you may request 1-hour delivery as an alternative to having the HMA at the job site.

Maintain the temporary pavement structure and replace it as a first order of work as soon as you resume concrete pavement repair work.

After removing temporary pavement structure, you may stockpile that aggregate base at the job site and reuse it for temporary pavement structure.

#### **41-1.03B Mixing and Applying Bonding Agent**

Mix and apply the bonding agent at the job site under the manufacturer's instructions and in small quantities.

Apply bonding agent after cleaning the surface and before placing concrete.

Apply a thin, even coat of bonding agent with a stiff bristle brush until the entire repair surface is scrubbed and coated with bonding agent.

#### **41-1.03C Mixing Concrete**

##### **41-1.03C(1) General**

Mix concrete in compliance with the manufacturer's instructions. For repairing spalls, mix in a small mobile drum or paddle mixer. Comply with the manufacturer's recommended limits for the quantity of aggregate filler, water, and liquid activator.

Mix the entire contents of prepackaged dual-component magnesium phosphate concrete as supplied by the manufacturer. Use the full amount of each component and do not add water to dual-component magnesium phosphate concrete.

Magnesium phosphate concrete must not be mixed in containers or worked with tools containing zinc, cadmium, aluminum, or copper.

Modified high-alumina based concrete must not be mixed in containers or worked with tools containing aluminum.

##### **41-1.03C(2) Polyester Concrete**

When mixing with resin, the moisture content of the combined aggregate must not exceed 1/2 of the average aggregate absorption when tested under California Test 226.

Proportion the polyester resin and aggregate to produce a mixture with suitable workability for the intended work. Only a minimal amount of resin may rise to the surface after finishing.

##### **41-1.03D Placing Concrete**

The pavement surface temperature must be at least 40 degrees F before placing concrete. You may propose methods to heat the surfaces.

Place magnesium phosphate concrete on a dry surface.

Place portland cement and modified high-alumina concrete on surfaces treated with a bonding agent recommended by the concrete manufacturer. If no bonding agent is recommended by the manufacturer, place concrete on damp surfaces that are not saturated.

Do not retemper concrete. Use dry finishing tools cleaned with water before working the concrete.

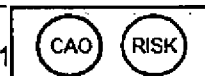
##### **41-1.03E Curing Concrete**

Cure concrete under the manufacturer's instructions. When curing compound is used, comply with section 90-1.03B for curing compound no. 1 or 2.

##### **41-1.03F Reserved**

#### **41-1.04 PAYMENT**

Not Used



## 41-2 SUBSEALING AND JACKING

### 41-2.01 GENERAL

#### 41-2.01A Summary

Section 41-2 includes specifications for filling voids under existing concrete pavement.

#### 41-2.01B Definitions

Reserved

#### 41-2.01C Submittals

Submit shipping invoices with packaged or bulk fly ash and cement.

Before grouting activities begin, submit a proposal for the materials to be used. Include authorized laboratory test data for the grout indicating:

1. Time of initial setting under ASTM C266.
2. Compressive strength results at 1, 3, and 7 days for 10, 12, and 14-second grout efflux times.

If requesting a substitution of grout materials, submit a proposal that includes test data.

#### 41-2.01D Quality Control and Assurance

Reserved

### 41-2.02 MATERIALS

#### 41-2.02A General

Reserved

#### 41-2.02B Grout

Grout must consist of Type II portland cement, fly ash, and water. Use from 2.4 to 2.7 parts fly ash to 1 part portland cement by weight. Use enough water to produce the following grout efflux times determined under California Test 541, Part D:

1. From 10 to 16 seconds for subsealing
2. From 10 to 26 seconds for jacking

Cement for grout must comply with the specifications for Type II portland cement in section 90-1.02B(2).

Fly ash must comply with AASHTO M 295, Class C or Class F. Fly ash sources must be on the Authorized Material List.

You may use chemical admixtures and calcium chloride. Chemical admixtures must comply with section 90-1.02E(2). Calcium chloride must comply with ASTM D98.

Test grout compressive strength under California Test 551, Part 1 at 7-days with 12 seconds efflux time. Follow the procedures for moist cure. The 7-day compressive strength must be at least 750 psi.

#### 41-2.02C Mortar

Mortar must be a prepackaged fast-setting mortar that complies with ASTM C928.

#### 41-2.02D Reserved

### 41-2.03 CONSTRUCTION

#### 41-2.03A General

Drill holes in the pavement, inject grout, plug the holes, and finish the holes with mortar.

Drill holes through the pavement and underlying base to a depth from 15 to 18 inches below the pavement surface. The hole diameter must match the fitting for the grout injecting equipment.



**41-2.03B Injecting Grout****41-2.03B(1) General**

Inject grout within 2 days of drilling holes.

Immediately before injecting grout, clean the drilled holes with water at a minimum pressure of 40 psi. The cleaning device must have at least 4 jets that direct water horizontally at the slab-base interface.

Do not inject grout if the atmospheric or subgrade temperature is below 40 degrees F. Do not inject grout in inclement weather. If water is present in the holes, obtain the Engineer's authorization before injecting grout.

Do not inject grout until at least 2 consecutive slabs requiring subsealing are drilled ahead of the grouting activities.

The grout plant must have a positive displacement cement injection pump and a high-speed colloidal mixer capable of operating from 800 to 2,000 rpm. The injection pump must sustain 150 psi if pumping grout with a 12-second efflux time. A pressure gauge must be located immediately adjacent to the supply valve of the grout hose supply valve and positioned for easy monitoring.

Before mixing, weigh dry cement and fly ash if delivered in bulk. If the materials are packaged, each container must weigh the same.

Introduce water to the mixer through a meter or scale.

Inject grout under pressure until the voids under the pavement slab are filled. The injection nozzle must not leak. Do not inject grout if the nozzle is below the bottom of the slab. Inject grout 1 hole at a time.

Stop injecting grout in a hole if either:

1. Grout does not flow under a sustained pump gauge pressure of 150 psi after 7 seconds and there is no indication the slab is moving.
2. Injected grout rises to the surface at any joint or crack, or flows into an adjacent hole.

Dispose of unused grout within 1 hour of mixing.

**41-2.03B(2) Subsealing**

If a slab raises more than 1/16 inch due to grout injection, stop injecting grout in that hole.

**41-2.03B(3) Jacking**

The positive displacement pump used for grout injection must be able to provide a sustained gauge pressure of 200 psi. Gauge pressures may be from 200 to 600 psi for brief periods to start slab movement.

You may add additional water to initiate pressure injection of grout. Do not reduce the grout efflux time below 10 seconds.

Raise the slabs uniformly. Use string lines to monitor the pavement movement.

Do not move adjacent slabs not specified for pavement jacking. If you move adjacent slabs, correct the grade within the tolerances for final pavement elevation.

**41-2.03B(4) Finishing**

Immediately after removing the injection nozzle, plug the hole with a round, tapered wooden plug. Do not remove plugs until adjacent holes are injected with grout and no grout surfaces through previously injected holes.

After grouting, remove grout from drilled holes at least 4 inches below the pavement surface. Clean holes and fill with mortar. Finish filled holes flush with the pavement surface.

**41-2.03B(5) Tolerances**

The final pavement elevation must be within 0.01 foot of the required grade. If the final pavement elevation is between 0.01 and 0.10 foot higher than the required grade, grind the noncompliant pavement surface under section 42 to within 0.01 foot of the required grade.

If the final pavement elevation is higher than 0.10 foot from the required grade, remove and replace the noncompliant pavement under section 41-9.

**41-2.04 PAYMENT**

The payment quantity for subsealing is calculated by adding the dry weight of cement and fly ash used for the placed grout. The payment quantity for jacking is calculated by adding the dry weight of cement and fly ash used for the placed grout.

The Department does not pay for wasted grout.

The Department does not adjust the unit price for an increase or decrease in the subsealing quantity.

The Department does not adjust the unit price for an increase or decrease in the jacking quantity.

**41-3 CRACK TREATMENT****41-3.01 GENERAL****41-3.01A Summary**

Section 41-3 includes specifications for applying high-molecular-weight methacrylate (HMWM) to concrete pavement surface cracks that do not extend the full slab depth.

**41-3.01B Definitions**

Reserved

**41-3.01C Submittals****41-3.01C(1) General**

Submit HMWM samples 20 days before use.

If sealant is to be removed, submit the proposed removal method at least 7 days before sealant removal. Do not remove sealant until the proposed sealant removal method is authorized.

**41-3.01C(2) Public Safety and Placement Plans**

Before starting crack treatment, submit a public safety plan for HMWM and a placement plan for construction activity as shop drawings.

The public safety and placement plans must identify the materials, equipment, and methods to be used.

In the public safety plan, include the MSDS for each component of HMWM and details for:

1. Shipping
2. Storage
3. Handling
4. Disposal of residual HMWM and containers

If the project is in an urban area adjacent to a school or residence, the public safety plan must also include an airborne emissions monitoring plan prepared by a CIH certified in comprehensive practice by the American Board of Industrial Hygiene. Submit a copy of the CIH's certification. The CIH must monitor the emissions at a minimum of 4 points including the mixing point, the application point, and the point of nearest public contact. At work completion, submit a report by the industrial hygienist with results of the airborne emissions monitoring plan.

The placement plan must include:

1. Crack treatment schedule including coefficient of friction testing

2. Methods and materials including:
  - 2.1. Description of equipment for applying HMWM
  - 2.2. Description of equipment for applying sand
  - 2.3. Gel time range and final cure time for resin

Revise rejected plans and resubmit. With each plan rejection, the Engineer gives revision directions including detailed comments in writing. The Engineer notifies you of a plan's acceptance or rejection within 2 weeks of receiving that plan.

#### **41-3.01C(3) Reserved**

#### **41-3.01D Quality Control and Assurance**

##### **41-3.01D(1) General**

Use test tiles to evaluate the HMWM cure time. Coat at least one 4 by 4 inch smooth glazed tile for each batch of HMWM. Place the coated tile adjacent to the area being treated. Do not apply sand to the test tiles.

Use the same type of crack treatment equipment for testing and production.

##### **41-3.01D(2) Test Area**

Before starting crack treatment, treat a test area of at least 500 square feet within the project limits at a location accepted by the Engineer. Use test areas outside the traveled way if available.

Treat the test area under weather and pavement conditions similar to those expected during crack treatment production.

The Engineer evaluates the test area based on the acceptance criteria. Do not begin crack treatment until the Engineer accepts the test area.

##### **41-3.01D(3) Reserved**

##### **41-3.01D(4) Acceptance Criteria**

The Engineer accepts a treated area if:

1. Corresponding test tiles are dry to the touch
2. Treated surface is tack-free and not oily
3. Sand cover adheres enough to resist hand brushing
4. Excess sand is removed
5. Coefficient of friction is at least 0.30 when tested under California Test 342

#### **41-3.02 MATERIALS**

HMWM consists of compatible resin, promoter, and initiator. HMWM resin may be prepromoted by mixing promoter and resin together before filling containers. Identify prepromoted resin on the container label.

Adjust the gel time to compensate for temperature changes throughout the application.

HMWM resin properties must have the following values:

Property	Test method	Value
Viscosity <sup>a</sup> (cP, max, Brookfield RVT with UL adapter, 50 RPM at 77 °F)	ASTM D2196	25
Specific gravity <sup>a</sup> (min, at 77 °F)	ASTM D1475	0.90
Flash point <sup>a</sup> (°F, min)	ASTM D3278	180
Vapor pressure <sup>a</sup> (mm Hg, max, at 77 °F)	ASTM D323	1.0
Tack-free time (minutes, max, at 77 °F)	Specimen prepared under California Test 551	400
Volatile content <sup>a</sup> (% max)	ASTM D2369	30
PCC saturated surface-dry bond strength (psi, min, at 24 hours and 77 ± 2 °F)	California Test 551	500

<sup>a</sup>Perform the test before adding initiator.

Sand must be commercial quality dry blast sand. At least 95 percent of the sand must pass the no. 8 sieve and at least 95 percent must be retained on the no. 20 sieve when tested under California Test 202.

#### 41-3.02D Reserved

#### 41-3.03 CONSTRUCTION

##### 41-3.03A General

Before applying HMWM, clean the pavement surface by abrasive blasting and blow loose material from visible cracks with high-pressure air. Remove concrete curing seals from the pavement to be treated. The pavement must be dry when blast cleaning is performed. If the pavement surface becomes contaminated before applying the HMWM, clean the pavement surface by abrasive blasting.

If performing abrasive blasting within 10 feet of a lane occupied by traffic, operate abrasive blasting equipment with a concurrently operating vacuum attachment.

During pavement treatment, protect pavement joints, working cracks, and surfaces not being treated.

The equipment applying HMWM must combine the components by either static in-line mixers or by external intersecting spray fans. The pump pressure at the spray bars must not cause atomization. Do not use compressed air to produce the spray. Use a shroud to enclose the spray bar apparatus.

You may apply HMWM manually to prevent overspray onto adjacent traffic. If applying resin manually, limit the batch quantity of HMWM to 5 gallons.

Apply HMWM at a rate of 90 square feet per gallon. The prepared area must be dry and the surface temperature must be from 50 to 100 degrees F while applying HMWM. Do not apply HMWM if the ambient relative humidity is more than 90 percent.

Protect existing facilities from HMWM. Repair or replace existing facilities contaminated with HMWM at your expense.

Flood the treatment area with HMWM to penetrate the pavement and cracks. Apply HMWM within 5 minutes after complete mixing. Mixed HMWM viscosity must not increase. Redistribute excess material with squeegees or brooms within 10 minutes of application. Remove excess material from tined grooves.

Wait at least 20 minutes after applying HMWM before applying sand. Apply sand at a rate of approximately 2 pounds per square yard or until refusal. Remove excess sand by vacuuming or sweeping.

Do not allow traffic on the treated surface until:

1. Treated surface is tack-free and non-oily

2. Sand cover adheres enough to resist hand brushing
3. Excess sand is removed
4. Coefficient of friction is at least 0.30 determined under California Test 342

#### **41-3.04 PAYMENT**

Not Used

### **41-4 SPALL REPAIR**

#### **41-4.01 GENERAL**

##### **41-4.01A Summary**

Section 41-4 includes specifications for repairing spalls in concrete pavement.

##### **41-4.01B Definitions**

Reserved

##### **41-4.01C Submittals**

Reserved

##### **41-4.01D Quality Control and Assurance**

The Engineer accepts spall repairs based on authorized dimensions and visual inspection.

#### **41-4.02 MATERIALS**

Bonding agent must comply with the requirements for HMWM in section 41-3.02 except the tack-free time requirements do not apply and the HMWM must not contain wax.

Caulk must be at least 50 percent silicone, designated as a concrete sealant, and comply with ASTM C834.

Form board must be single-wall, double-face corrugated cardboard or paperboard covered with a bond breaker on each face. For existing joints or cracks less than 45 mils wide, use paperboard.

#### **41-4.03 CONSTRUCTION**

##### **41-4.03A General**

Prepare spall areas by removing concrete and cleaning. Provide compression relief at joints and cracks by using a form board or saw cutting.

Repair spalls using polyester concrete with a bonding agent.

After completing spall repairs do not allow traffic on the repairs for at least 2 hours after the time of final setting under ASTM C403/403M.

##### **41-4.03B Remove Pavement**

The Engineer determines the rectangular limits of unsound concrete pavement. Before removing pavement, mark the saw cut lines and spall repair area on the pavement surface.

Do not remove pavement until the Engineer verbally authorizes the saw cut area.

Use a power-driven saw with a diamond blade.

Remove pavement as shown and:

1. From the center of the repair area towards the saw cut
2. To the full saw cut depth
3. At least 2 inches beyond the saw cut edge to produce a rough angled surface

Produce a rough surface by chipping or other removal methods that do not damage the pavement remaining in-place. Completely remove any saw overcuts. Pneumatic hammers used for concrete removal must weigh 15 lbs or less.

If you damage concrete pavement outside the removal area, enlarge the area to remove the damaged pavement.

If dowel bars are exposed during removal, remove concrete from the exposed surface and cover with duct tape.

#### **41-4.03C Cleaning**

After pavement has been removed, clean the exposed faces of the concrete by:

1. Sand or water blasting. Water blasting equipment must be capable of producing a blast pressure of 3,000 to 6,000 psi.
2. Blowing the exposed concrete area with compressed air free of moisture and oil to remove debris after blasting. Air compressors must deliver air at a minimum of 120 cfm and develop 90 psi of nozzle pressure.

#### **41-4.03D Compression Relief at Joints and Cracks**

##### **41-4.03D(1) Form Board Installation**

Before placing concrete, place the form board to match the existing joint or crack alignment and width. Extend the form board at least 3 inches beyond each end of the repair and at least 1 inch deeper than the repair.

After placing concrete, remove the form board before sealing joints or cracks.

##### **41-4.03D(2) Saw Cut Method**

After cleaning, seal the existing joint or crack and any other exposed cracks with caulk at the bottom and sides of the repair area. Any surface receiving caulk must be clean and dry. Place caulk a minimum of 1/2 inch beyond the edges of the repair area into the existing joint or crack.

Saw cut the polyester concrete to the full depth along the existing joint or crack alignment within 2 hours from time of final setting. Use a power-driven saw with a diamond blade.

#### **41-4.03E–41-4.03I Reserved**

#### **41-4.04 PAYMENT**

Payment is calculated based on the authorized saw cut area.

The Department does not adjust the unit price for an increase or decrease in the spall repair quantity.

### **41-5 JOINT SEALS**

#### **41-5.01 GENERAL**

##### **41-5.01A Summary**

Section 41-5 includes specifications for sealing concrete pavement joints or replacing existing concrete pavement joint seals. Pavement joints include isolation joints.

##### **41-5.01B Definitions**

Reserved

##### **41-5.01C Submittals**

At least 15 days before delivery to the job site, submit a certificate of compliance, MSDS, manufacturer's recommendations, and instructions for storage and installation of:

1. Liquid joint sealant.
2. Backer rods. Include the manufacturer data sheet verifying compatibility with the liquid joint sealant.
3. Preformed compression joint seal. Include the manufacturer data sheet used to verify the seal for the joint dimensions shown.
4. Lubricant adhesive.

Asphalt rubber joint sealant containers must comply with ASTM D6690. Upon delivery of asphalt rubber joint sealant to the job site, submit a certified test report for each lot based on testing performed within 12 months.

Submit a work plan for removing pavement and joint materials. Allow 10 days for authorization. Include descriptions of the equipment and methods for removal of existing pavement and joint material.

#### **41-5.01D Quality Control and Assurance**

##### **41-5.01D(1) General**

Before sealing joints, arrange for a representative from the manufacturer to provide training on cleaning and preparing the joint and installing the liquid joint sealant or preformed compression joint seal. Do not seal joints until your personnel and the Department's personnel have been trained.

The Engineer accepts joint seals based on constructed dimensions and visual inspection of completed seals for voids.

##### **41-5.01D(2) Reserved**

#### **41-5.02 MATERIALS**

##### **41-5.02A General**

Use the type of seal material described.

Silicone or asphalt rubber joint sealant must not bond or react with the backer rod.

##### **41-5.02B Silicone Joint Sealant**

Silicone joint sealant must be on the Authorized Material List.

##### **41-5.02C Asphalt Rubber Joint Sealant**

Asphalt rubber joint sealant must:

1. Be paving asphalt mixed with not less than 10 percent ground rubber by weight. Ground rubber must be vulcanized or a combination of vulcanized and devulcanized materials that pass a no. 8 sieve.
2. Comply with ASTM D6690 for Type II.
3. Be capable of melting at a temperature below 400 degrees F and applied to cracks and joints.

##### **41-5.02D Backer Rods**

Backer rods must:

1. Comply with ASTM D5249:
  - 1.1. Type 1 for asphalt rubber joint sealant
  - 1.2. Type 1 or Type 3 for silicone joint sealant
2. Be expanded, closed-cell polyethylene foam
3. Have a diameter at least 25 percent greater than the saw cut joint width

##### **41-5.02E Preformed Compression Joint Seals**

Preformed compression joint seals must:

1. Comply with ASTM D2628
2. Have 5 or 6 cells, except seals 1/2 inch wide or less may have 4 cells

Lubricant adhesive used to install seals must comply with ASTM D2835.

**41-5.02F–41-5.02K Reserved****41-5.03 CONSTRUCTION****41-5.03A General**

If joint sealing is described for new concrete pavement, do not start joint sealing activities until the pavement has been in place for at least 7 days. Seal new concrete pavement joints at least 7 days after concrete pavement placement if shown.

Remove existing pavement and joint material by sawing, rectangular plowing, cutting, or manual labor. Saw cut the reservoir before cleaning the joint. Use a power-driven saw with a diamond blade.

If you damage a portion of the pavement to remain in place, repair the pavement under section 41-4.

**41-5.03B Joint Cleaning****41-5.03B(1) General**

Clean the joint after removal and any repair is complete before installing joint seal material. Cleaning must be completed no more than 4 hours before installing backer rods, liquid joint seal, or preformed compression seals using the following sequence:

1. Removing debris
2. Drying
3. Sandblasting
4. Air blasting
5. Vacuuming

Clean in 1 direction to minimize contamination of surrounding areas.

**41-5.03B(2) Removing Debris**

Remove debris including dust, dirt, and visible traces of old sealant from the joint after sawing, plowing, cutting, or manual removal. Do not use chemical solvents to wash the joint.

**41-5.03B(3) Drying**

After removing debris, allow the reservoir surfaces to dry or remove moisture and dampness at the joint with compressed air that may be moderately hot.

**41-5.03B(4) Sandblasting**

After the joint is dry, sandblast the reservoir to remove remaining residue using a 1/4-inch diameter nozzle and 90 psi minimum pressure. Do not sandblast straight into the reservoir. Angle the sandblasting nozzle within 1 to 2 inches from the concrete and make at least 1 pass to clean each reservoir face.

**41-5.03B(5) Air Blasting**

After sandblasting, air blast the reservoir to remove sand, dirt, and dust 1 hour before sealing the joint. Use compressed air free of oil and moisture delivered at a minimum rate of 120 cfm and 90 psi nozzle pressure.

**41-5.03B(6) Vacuuming**

After air blasting, use a vacuum sweeper to remove debris and contaminants from the pavement surfaces surrounding the joint.

**41-5.03B(7) Reserved****41-5.03C Installing Liquid Joint Sealant**

Where backer rods are shown, place the rods before installing liquid joint sealant. Place backer rods under the manufacturer's instructions unless otherwise specified. The pavement and reservoir surfaces must be dry and the ambient air temperature must be at least 40 degrees F and above the dew point. The reservoir surface must be free of residue or film. Do not puncture the backer rod.



Immediately after placing the backer rod, install liquid joint sealant under the manufacturer's instructions unless otherwise specified. Before installing, demonstrate that fresh liquid sealant is ejected from the nozzle free of cooled or cured material. For asphalt rubber joint sealant, the pavement surface temperature must be at least 50 degrees F before installing.

Pump liquid joint sealant through a nozzle sized for the width of the reservoir so that liquid joint sealant is placed directly onto the backer rod. The installer must draw the nozzle toward his body and extrude liquid joint sealant evenly. Liquid joint sealant must maintain continuous contact with the reservoir walls during extrusion.

After placing liquid joint sealant, recess it to the depth shown within 10 minutes of installation and before a skin begins to form.

After each joint is sealed, remove excess liquid joint sealant on the pavement surface. Do not allow traffic over the sealed joints until the liquid joint sealant is set, tack free, and firm enough to prevent embedment of roadway debris.

#### **41-5.03D Installing Preformed Compression Joint Seals**

Install preformed compression joint seals using lubricant adhesive as shown and under the manufacturer's instructions.

Install longitudinal seals before transverse seals. Longitudinal seals must be continuous except splicing is allowed at intersections with transverse seals. Transverse seals must be continuous for the entire transverse length of concrete pavement except splices are allowed for widening and staged construction. With a sharp instrument, cut across the longitudinal seal at the intersection with transverse construction joints. If the longitudinal seal does not relax enough to properly install the transverse seal, trim the longitudinal seal to form a tight seal between the 2 joints.

If splicing is authorized, comply with the manufacturer's instructions.

Use a machine specifically designed for preformed compression joint seal installation. The machine must install the seal:

1. To the specified depth
2. To make continuous contact with the joint walls
3. Without cutting, nicking, or twisting the seal
4. Without stretching the seal more than 4 percent

Cut preformed compression joint seal material to the exact length of the pavement joint to be sealed. The Engineer measures this length. After you install the preformed compression joint seal, the Engineer measures the excess length of material at the joint end. The Engineer divides the excess length by the measured cut length to determine the stretch percentage.

Seals must be compressed from 30 to 50 percent of the joint width when complete in place.

#### **41-5.03E Reserved**

#### **41-5.04 PAYMENT**

Not Used

### **41-6 CRACK AND SEAT**

#### **41-6.01 GENERAL**

##### **41-6.01A Summary**

Section 41-6 includes specifications for cracking, seating, and preparing the surface of existing concrete pavement.

##### **41-6.01B Definitions**

Reserved

**41-6.01C Submittals**

Submit each core in a plastic bag or tube for acceptance at the time of sampling. Mark each core with a location description.

**41-6.01D Quality Control and Assurance****41-6.01D(1) General**

If cracking is noncompliant:

1. Stop crack and seat work
2. Modify your equipment and procedures and crack the noncompliant pavement again
3. Construct another test section
4. Take additional core samples to verify compliance
5. Construct an inspection strip if the concrete pavement has HMA on the surface

**41-6.01D(2) Test Section**

The Engineer determines and marks a test section up to 1000 square feet within the crack and seat area shown. Construct the test section and obtain the Engineer's verbal authorization before starting crack and seat work.

Immediately before cracking the test section, apply water to the pavement surface so that cracking can be readily evaluated. Crack the test section and vary impact energy and striking patterns to verify your procedure.

**41-6.01D(3) Coring**

Drill cores at least 6 inches in diameter under ASTM C42 to verify cracking in the Engineer's presence. Take at least 2 cores per test section and 1 core per lane mile for each pavement cracking machine used. The Engineer determines the core locations.

**41-6.01D(4) Reserved****41-6.02 MATERIALS****41-6.02A General**

Use fast-setting or polyester concrete to fill core holes.

**41-6.03 CONSTRUCTION****41-6.03A General**

Reserved

**41-6.03B Cracking**

Crack existing concrete pavement using the procedures and equipment from the authorized test section.

Do not allow flying debris during cracking operations.

Crack existing concrete pavement into segments that nominally measure 6 feet transversely by 4 feet longitudinally. If the existing pavement is already cracked into segments, crack it into equal-sized square or rectangular pieces that nominally measure not more than 6 feet transversely and from 3 to 5 feet longitudinally. Do not impact the pavement within 1 foot of another break line, pavement joint, or edge of pavement.

Cracks must be vertical, continuous, and penetrate the full depth of pavement. Cracks must be within 6 inches of vertical along the full depth of pavement. Do not cause surface spalling over 0.10-foot deep or excessive shattering of the pavement or base.

Cracking equipment must impact the pavement with a variable force in a controlled location. Do not use unguided free-falling weights such as "headache balls."

If the concrete pavement has no more than 0.10 foot of asphalt concrete on the surface, you may crack the pavement without removing the asphalt concrete. After cracking, construct an inspection strip by

removing at least 500 square feet of asphalt concrete at a location determined by the Engineer. Construct additional inspection strips to demonstrate compliance where ordered by the Engineer.

After cracking, allow public traffic on the cracked or initial pavement layer for no more than 15 days.

#### 41-6.03C Seating

Seat cracked concrete by making at least 5 passes over the cracked concrete with either:

1. Oscillating type pneumatic-tired roller at least 4 feet wide. Pneumatic tires must be of equal size, diameter, type, and ply. The tires must be inflated to 60 psi minimum and maintained so that the air pressure does not vary more than 5 psi. The roller's gross static weight must be at least 15 tons.
2. Vibratory pad-foot roller exerting a dynamic centrifugal force of at least 10 tons.

A pass is 1 movement of a roller in either direction at 5 mph or less.

After all segments have been seated, clean loose debris from joints and cracks using compressed air free of moisture and oil.

Reseat any segment of cracked pavement that has not been overlaid within 24 hours of seating.

#### 41-6.03D Surface Preparation

Before opening cracked and seated pavement to traffic or overlaying:

1. Fill joints, cracks, and spalls wider than 3/4 inch and deeper than 1 inch by applying tack coat and placing minor HMA under section 39. Use the no. 4 gradation.
2. Remove all loose debris and sweep the pavement.

#### 41-6.03E Reserved

#### 41-6.04 PAYMENT

Crack and seat existing concrete pavement is measured from the area of pavement cracked and seated. No deduction is made for existing cracked segments. The Department does not pay for HMA used to fill joints, cracks, and spalls.

### 41-7 TRANSITION TAPER

#### 41-7.01 GENERAL

Section 41-7 includes specifications for constructing transition tapers in existing pavement.

#### 41-7.02 MATERIALS

Not Used

#### 41-7.03 CONSTRUCTION

Construct transition tapers by either grinding or removing and replacing the existing concrete. Do not allow flying debris during the construction of tapers.

Grinding must comply with section 42.

Replacement concrete must comply with section 41-9 except place concrete to the taper level shown and finish the surface with a coarse broom.

If the transition taper will be overlaid with HMA that is not placed before opening to traffic and there is a grade difference of more than 0.04 foot, construct a temporary taper by placing minor HMA that complies with section 39. Remove the temporary HMA taper before constructing the transition taper.

#### 41-7.04 PAYMENT

Pavement transition tapers are measured using the dimensions shown. The Department does not pay for temporary HMA tapers.

**41-8 DOWEL BAR RETROFIT**

Reserved

**41-9 INDIVIDUAL SLAB REPLACEMENT WITH RAPID STRENGTH CONCRETE****41-9.01 GENERAL****41-9.01A Summary**

Section 41-9 includes specifications for removing existing concrete pavement and constructing individual slab replacement with rapid strength concrete (ISR—RSC).

**41-9.01B Definitions**

**concrete raveling:** Disintegration of the concrete surface layer from aggregate loss.

**early age:** Any age less than 10 times the time of final setting for concrete determined under ASTM C403/C403M.

**full-depth crack:** Crack that runs from one edge of the concrete slab to the opposite or adjacent side of the slab.

**opening age:** Age when the minimum modulus of rupture specified for opening to traffic and equipment is attained.

**time of final setting:** Elapsed time required to develop a concrete penetration resistance that is at least 4,000 psi under ASTM C403/C403M.

**41-9.01C Submittals****41-9.01C(1) General**

At least 15 days before delivery to the job site, submit manufacturer's recommendations, MSDS and instructions for storage and installation of joint filler material.

At least 45 days before starting ISR—RSC work submit a sample of cement from each proposed lot and samples of proposed admixtures in the quantities ordered by the Engineer.

During ISR—RSC placement operations, submit uniformity reports for hydraulic cement at least once every 30 days to the Engineer and METS, attention Cement Laboratory. Uniformity reports must comply with ASTM C917 except testing age and water content may be modified to suit the particular material.

Except for modulus of rupture tests, submit QC test result forms within 48 hours of the paving shift. Submit modulus of rupture results within:

1. 15 minutes of opening age test completion
2. 24 hours of 3-day test completion

**41-9.01C(2) Quality Control Plan**

If the quantity of ISR—RSC is at least 300 cu yd, submit a QC plan at least 20 days before placing trial slabs. If the quantity of ISR—RSC is less than 300 cu yd, submit proposed forms for RSC inspection, sampling, and testing.

**41-9.01C(3) Mix Design**

At least 10 days before use in a trial slab, submit a mix design. The maximum ambient temperature range for a mix design is 18 degrees F. Submit more than 1 mix design based on ambient temperature variations anticipated during RSC placement. Each mix design must include:

1. Mix design identification number
2. Aggregate source
3. Opening age
4. Aggregate gradation
5. Types of cement and chemical admixtures
6. Mix proportions

7. Maximum time allowed between batching and placing
8. Range of effective ambient temperatures
9. Time of final setting
10. Modulus of rupture development data from laboratory-prepared samples, including tests at:
  - 10.1. 1 hour before opening age
  - 10.2. Opening age
  - 10.3. 1 hour after opening age
  - 10.4. 1 day
  - 10.5. 3 days
  - 10.6. 7 days
  - 10.7. 28 days
11. Shrinkage test data
12. Any special instructions or conditions such as water temperature requirements

#### **41-9.01C(4) Reserved**

#### **41-9.01D Quality Control and Assurance**

##### **41-9.01D(1) General**

Designate a QC manager and assistant QC managers to administer the QC plan. The QC managers must hold current American Concrete Institute (ACI) certification as a Concrete Field Testing Technician-Grade I and a Concrete Laboratory Testing Technician-Grade II, except the assistant QC managers may hold Concrete Laboratory Testing Technician-Grade I instead of Grade II.

The QC manager responsible for the production period involved must review and sign the sampling, inspection, and test reports before submitting them. The QC manager must be present for:

1. Each stage of mix design
2. Trial slab construction
3. Production and construction of RSC
4. Meetings with the Engineer relating to production, placement, or testing

The QC manager must not be a member of this project's production or paving crews, an inspector, or a tester. The QC manager must have no duties during the production and placement of RSC except those specified.

Testing laboratories and equipment must comply with the Department's Independent Assurance Program. At the time of the QC plan submittal, the Department evaluates the quality control samplers and testers.

##### **41-9.01D(2) Just-in-time Training**

Reserved

##### **41-9.01D(3) Quality Control Plan**

Establish, implement, and maintain a QC plan for pavement. The QC plan must describe the organization and procedures used to:

1. Control the production process
2. Determine if a change to the production process is needed
3. Implement a change

The QC plan must include:

1. Names, qualifications, and certifications of QC personnel, including:
  - 1.1. QC manager
  - 1.2. Assistant QC managers
  - 1.3. Samplers and testers
2. Outline of procedure for the production, transportation, placement, and finishing of RSC
3. Outline of procedure and forms for concrete QC, sampling, and testing to be performed during and after RSC construction, including testing frequencies for modulus of rupture

4. Contingency plan for identifying and correcting problems in production, transportation, placement, or finishing RSC including:
  - 4.1. Action limits
  - 4.2. Suspension limits that do not exceed specified material requirements
  - 4.3. Detailed corrective action if limits are exceeded
  - 4.4. Temporary pavement structure provisions, including:
    - 4.4.1. The quantity and location of standby material
    - 4.4.2. Determination of need
5. Location of your quality control testing laboratory and testing equipment during and after paving operations
6. List of the testing equipment to be used, including the date of last calibration
7. Production target values for material properties that impact concrete quality or strength including cleanness value and sand equivalent
8. Outline procedure for placing and testing trial slabs, including:
  - 8.1. Locations and times
  - 8.2. Production procedures
  - 8.3. Placing and finishing methods
  - 8.4. Sampling methods, sample curing, and sample transportation
  - 8.5. Testing and test result reporting
9. Name of source plant with approved Material Plant Quality Program (MPQP)
10. Procedures or methods for controlling pavement quality including:
  - 10.1. Materials quality
  - 10.2. Contraction and construction joints
  - 10.3. Protecting pavement before opening to traffic

#### **41-9.01D(4) Prepaving Conference**

Schedule a prepaving conference and provide a facility to meet with the Engineer.

Prepaving conference attendees must sign an attendance sheet provided by the Engineer. The prepaving conference must be attended by your:

1. Project superintendent
2. Project manager
3. QC manager
4. Workers and your subcontractor's workers, including:
  - 4.1. Foremen
  - 4.2. Concrete plant manager
  - 4.3. Concrete plant operator
  - 4.4. Concrete plant inspectors
  - 4.5. Personnel performing saw cutting and joint sealing
  - 4.6. Paving machine operators
  - 4.7. Inspectors
  - 4.8. Samplers
  - 4.9. Testers

The purpose of the prepaving conference is to familiarize personnel with the project's specifications. Discuss the QC plan and processes for constructing each item of work, including:

1. Production
2. Transportation
3. Trial slabs
4. Pavement structure removal
5. Placement
6. Contingency plan
7. Sampling
8. Testing
9. Acceptance

Do not start trial slabs or paving activities until the listed personnel have attended the prepping conference.

#### **41-9.01D(5) Trial Slabs**

Before starting individual slab replacement work, complete 1 trial slab for each mix design.

Place trial slabs near the job site at a mutually-agreed location that is neither on the roadway nor within the project limits. Trial slabs must be 10 by 20 feet and at least 10 inches thick.

During trial slab construction, sample and split the aggregate for grading, cleanness value, and sand equivalent testing.

Fabricate and test beams under California Test 524 to determine the modulus of rupture values.

Cure beams fabricated for early age testing such that the monitored temperatures in the beams and the slab are always within 5 degrees F of each other.

Monitor and record the internal temperatures of trial slabs and early age beams at intervals of at least 5 minutes. Install thermocouples or thermistors connected to strip-chart recorders or digital data loggers to monitor the temperatures. Temperature recording devices must be accurate to within 2 degrees F. Measure internal temperatures at 1 inch from the top, 1 inch from the bottom, and no closer than 3 inches from any edge until early age testing is completed.

Cure beams fabricated for 3-day testing under California Test 524 except place them into sand at a time that is from 5 to 10 times the time of final setting measured under ASTM C403/403M or 24 hours, whichever is earlier.

Trial slabs must have an opening age modulus of rupture of not less than 400 psi and a 3-day modulus of rupture of not less than 600 psi.

After authorization, remove and dispose of trial slabs and testing materials.

#### **41-9.01D(6) Quality Control Testing**

##### **41-9.01D(6)(a) General**

Provide continuous process control and quality control sampling and testing throughout RSC production and placement. Notify the Engineer at least 2 business days notice before any sampling and testing. Establish a testing facility at the job site or at an authorized location.

Sample under California Test 125.

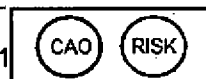
During ISR—RSC placement, sample and fabricate beams for modulus of rupture testing within the first 30 cubic yards, at least once every 130 cu yd, and within the final truckload. Submit split samples and fabricate test beams for the Department's testing unless the Engineer informs you otherwise.

Determine the modulus of rupture at opening age under California Test 524, except beam specimens may be fabricated using an internal vibrator under ASTM C31. Cure beams under the same conditions as the pavement until 1 hour before testing. Test 3 beam specimens in the presence of the Engineer and average the results. A single test represents no more than that day's production or 130 cu yd, whichever is less.

Determine the modulus of rupture at other ages using beams cured and tested under California Test 524 except place them in sand from 5 to 10 times the time of final setting under ASTM C403/C403M or 24 hours, whichever is earlier.

##### **41-9.01D(6)(b) Rapid Strength Concrete**

Your quality control must include testing RSC for the properties at the frequencies shown in the following table:



**RSC Minimum Quality Control**

Property	Test method	Minimum testing frequency <sup>a</sup>
Cleanness value	California Test 227	650 cu yd or 1 per shift
Sand equivalent	California Test 217	650 cu yd or 1 per shift
Aggregate gradation	California Test 202	650 cu yd or 1 per shift
Air content	California Test 504	130 cu yd or 2 per shift
Yield	California Test 518	2 per shift
Slump or penetration	ASTM C143 or California Test 533	1 per 2 hours of paving
Unit weight	California Test 518	650 cubic yards or 2 per shift
Aggregate Moisture Meter Calibration <sup>b</sup>	California Test 223 or California Test 226	1 per shift
Modulus of rupture	California Test 524	Comply with section 41-9.01D(6)(a).

<sup>a</sup>Test at the most frequent interval.

<sup>b</sup>Check calibration of the plant moisture meter by comparing moisture meter readings with California Test 223 or California Test 226 test results

Maintain control charts to identify potential problems and causes. Post a copy of each control chart at a location determined by the Engineer.

Individual measurement control charts must use the target values in the mix proportions as indicators of central tendency.

Develop linear control charts for:

1. Cleanness value
2. Sand equivalent
3. Fine and coarse aggregate gradation
4. Air content
5. Penetration

Control charts must include:

1. Contract number
2. Mix proportions
3. Test number
4. Each test parameter
5. Action and suspension limits
6. Specification limits
7. Quality control test results

For fine and coarse aggregate gradation control charts, record the running average of the previous 4 consecutive gradation tests for each sieve and superimpose the specification limits.

For air content control charts, the action limit is  $\pm 1.0$  percent and the suspension limit is  $\pm 1.5$  percent of the specified values. If no value is specified, apply the air content value used in the approved mix design.

As a minimum, a process is out of control if any of the following occurs:

1. For fine and coarse aggregate gradation, 2 consecutive running averages of 4 tests are outside the specification limits
2. For individual penetration or air content measurements:
  - 2.1. One point falls outside the suspension limit line
  - 2.2. Two points in a row fall outside the action limit line

Stop production and take corrective action for out of control processes or the Engineer rejects subsequent RSC.



Before each day's concrete pavement placement and at intervals not to exceed 4 hours of production, use a tachometer to test and record vibration frequency for concrete consolidation vibrators.

**41-9.01D(6)(c) Reserved**

**41-9.01D(7) Acceptance Criteria**

**41-9.01D(7)(a) General**

The final texture of ISR—RSC must pass visual inspection and have a coefficient of friction of at least 0.30 determined under California Test 342.

Allow at least 25 days for the Department to schedule testing for coefficient of friction. Notify the Engineer when the pavement is scheduled to be opened to traffic.

**41-9.01D(7)(b) Modulus of Rupture**

ISR—RSC is accepted based on your testing for modulus of rupture at opening age and the Department's testing for modulus of rupture at 3 days.

ISR—RSC must have a modulus of rupture at opening age that is at least 400 psi and a modulus of rupture at 3 days that is at least 600 psi.

Calculate the test result as the average from testing 3 beams for each sample. The test result represents 1 paving shift or 130 cu yd, whichever is less.

**41-9.01D(7)(c) Concrete Pavement Smoothness**

The Department tests for concrete pavement smoothness using a 12-foot straightedge. Straightedge smoothness specifications do not apply to the pavement surface placed within 12 inches of existing concrete pavement except parallel to the centerline at the midpoint of a transverse construction joint.

The concrete pavement surface must not vary from the lower edge of a 12-foot straightedge by more than:

1. 0.01 feet when parallel to the centerline
2. 0.02 feet when perpendicular to the centerline extending from edge to edge of a traffic lane

**41-9.01D(7)(d) Cracking and Raveling**

The Engineer rejects an ISR—RSC slab under section 6-3.06 if within 1 year of contract acceptance there is either:

1. Partial or full-depth cracking
2. Concrete raveling consisting of either:
  - 2.1. Combined raveled areas more than 5 percent of each ISR—RSC slab area
  - 2.2. Any single raveled area of more than 4 sq ft

**41-9.01D(8) Reserved**

**41-9.02 MATERIALS**

**41-9.02A General**

Reserved

**41-9.02B Rapid Strength Concrete**

RSC for ISR—RSC must comply with section 90-3.

Use either the 1-1/2 inch maximum or the 1-inch maximum combined grading specified in section 90-1.02C(4)(d).

Air content must comply with the minimum requirements in section 40-1.02B(4).

**41-9.02C–41-9.02D Reserved****41-9.03 CONSTRUCTION****41-9.03A General**

Complete ISR—RSC adjacent to new pavement or existing pavement shown for construction as a 1st order of work. Replace individual slabs damaged during construction before placing final pavement delineation.

**41-9.03B Removing Existing Pavement**

Remove pavement under section 15-2.02. The Engineer determines the exact ISR—RSC limits after overlying layers are removed.

After removing pavement to the depth shown, grade to a uniform plane. Water as needed and compact the material remaining in place to a firm and stable base. The finished surface of the remaining material must not extend above the grade established by the Engineer.

**41-9.03C Placing Dowel Bars**

Drill existing concrete and bond dowel bars under section 41-10 if described. Do not install dowel bars in contraction joints.

**41-9.03D Placing Rapid Strength Concrete**

Do not place RSC if the ambient air temperature is forecast by the National Weather Service to be less than 40 degrees F within 72 hours of final finishing.

Before placing RSC against existing concrete, place 1/4-inch thick commercial quality polyethylene flexible foam expansion joint filler across the original transverse and longitudinal joint faces and extend the full depth of pavement to the top of the base layer. Place the top of the joint filler flush with the top of the pavement. Secure joint filler to the joint face of the existing pavement to prevent the joint filler from moving during the placement of RSC.

Use metal or wood side forms. Wood side forms must not be less than 1-1/2 inches thick. Side forms and connections must be of sufficient rigidity that movement will not occur under forces from equipment or RSC. Clean and oil side forms before each use. Side forms must remain in place until the pavement edge no longer requires the protection of forms.

After you place RSC, consolidate it using high-frequency internal vibrators adjacent to forms and across the full paving width. Place RSC as nearly as possible to its final position. Do not use vibrators for extensive shifting of concrete pavement.

Spread and shape RSC with powered finishing machines supplemented by hand finishing. After you mix and place RSC, do not add water to the surface to facilitate finishing. You may request authorization to use surface finishing additives. Submit the manufacturer's instructions with your request.

Place consecutive concrete loads without interruption. Do not allow cold joints where a visible lineation forms after concrete is placed, sets, and hardens before additional concrete placed.

**41-9.03E Joints****41-9.03E(1) General**

Joints must be vertical.

**41-9.03E(2) Construction Joints**

Before placing fresh concrete against hardened concrete, existing concrete pavement, or structures, apply curing compound no. 1 or 2 to the vertical surface of the hardened concrete, existing concrete pavement, or structures and allow it to dry.

At joints between concrete pavement and HMA, apply tack coat between the concrete pavement and HMA.

**41-9.03E(3) Contraction Joints**

Saw contraction joints before cracking occurs and after the RSC is hard enough to saw without spalling, raveling, or tearing. Cut contraction joints to a minimum of 1/3 the slab depth. Use a power-driven saw with a diamond blade.

Match transverse contraction joints with existing joint spacing and skew unless otherwise described. Where the existing transverse joint spacing in an adjacent lane exceeds 15 feet, construct an additional transverse contraction joint midway between the existing joints.

Cut transverse contraction joints across the full slab replacement width. After cutting, immediately wash slurry from the joint with water at less than 100 psi pressure.

Longitudinal contraction joints must be parallel with the concrete pavement centerline, except when lanes converge or diverge. Transverse and longitudinal contraction joints must not deviate by more than 0.1 foot from either side of a 12-foot straight line. For longitudinal joints parallel to a curved centerline radius less than 7000 feet, compensate for curvature.

Keep joints free from foreign material including soil, gravel, concrete, and asphalt.

**41-9.03F Final Finishing**

After preliminary finishing, round the edges of the initial paving width to a 0.04-foot radius. Round transverse and longitudinal construction joints to a 0.02-foot radius. Mark each ISR—RSC area with a stamp. The stamp mark must show the month, day, and year of placement and contract number. Level the location of the stamp with a steel trowel below the pavement texture. Orient the stamp mark so it can be read from the outside edge of ISR—RSC.

Before curing, texture the pavement. Perform initial texturing with a burlap drag or broom device that produces striations parallel to the centerline. Perform final texturing with a steel-tined device that produces grooves parallel with the centerline.

Tines must be from 3/32 to 1/8 inch wide on 3/4-inch centers and have enough length, thickness, and resilience to form grooves from 1/8 to 3/16 inch deep after the concrete has hardened. Grooves must extend over the entire pavement width except do not construct grooves 3 inches from longitudinal pavement edges or joints.

Final texture must be uniform and smooth. Grooves must be parallel and aligned to the pavement edge across the pavement width. The groove alignment must not vary more than 0.1 foot for every 12 foot length.

Protect RSC under section 90-1.03C.

**41-9.03G Temporary Pavement Structure**

Temporary pavement structure must be RSC or 3-1/2 inch thick HMA over aggregate base.

**41-9.03H Noncompliant Individual Slab Replacement**

Replace an ISR—RSC slab with any of the following:

1. One or more full-depth cracks.
2. Concrete raveling.
3. Noncompliant smoothness except you may request authorization for grinding under section 42 and retesting. Grinding that causes a depression will not be considered. Smoothness must be corrected within 48 hours of placing ISR—RSC.
4. Noncompliant modulus of rupture.

If the modulus of rupture at opening age is at least 400 psi and the modulus of rupture at 3 days is at least 500 psi but less than 600 psi, you may request authorization to leave the ISR—RSC in place and accept the specified deduction.

If pavement is noncompliant for coefficient of friction, groove or grind the pavement under section 42. Comply with section 40-1.03Q(4) and groove or grind before the installation of any required joint seal or edge drains adjacent to the areas to the noncompliant area.

If an ISR—RSC slab has partial depth cracking, treat it with high-molecular-weight methacrylate under section 41-3.

#### **41-9.03I Replace Pavement Delineation**

Replace traffic stripes, pavement markings, and markers that are removed, obliterated, or damaged by ISR—RSC under sections 84 and 85.

#### **41-9.03J–41-9.03K Reserved**

#### **41-9.04 PAYMENT**

Replace base is not included in the payment for individual slab replacement (RSC).

Drill and bond dowel bars are not included in payment for individual slab replacement (RSC).

For individual slab replacement (RSC) with a modulus of rupture at opening age that is at least 400 psi and a modulus of rupture at 3 days that is greater than or equal to 500 psi but less than 550 psi, the Department deducts 10 percent of the payment for individual slab replacement (RSC).

For individual slab replacement (RSC) with a modulus of rupture at opening age that is at least 400 psi and a modulus of rupture at 3 days that is greater than or equal to 550 psi but less than 600 psi, the Department deducts 5 percent of the payment for individual slab replacement (RSC).

### **41-10 DRILL AND BOND BARS**

#### **41-10.01 GENERAL**

##### **41-10.01A Summary**

Section 41-10 includes specifications for drilling, installing, and bonding tie bars and dowel bars in concrete pavement.

##### **41-10.01B Definitions**

Reserved

##### **41-10.01C Submittals**

Submit a certificate of compliance for:

1. Tie bars
2. Dowel bars
3. Dowel bar lubricant
4. Chemical adhesive
5. Epoxy powder coating

At least 15 days before delivery to the job site, submit the manufacturer's recommendations and instructions for storage, handling, and use of chemical adhesive.

##### **41-10.01D Quality Control and Assurance**

###### **41-10.01D(1) General**

Drill and bond bar is accepted based on inspection before concrete placement.

###### **41-10.01D(2) Reserved**

#### **41-10.02 MATERIALS**

##### **41-10.02A General**

Dowel bar lubricant must comply with section 40-1.02D.

Chemical adhesive for drilling and bonding bars must be on the Authorized Material List. The Authorized Material List indicates the appropriate chemical adhesive system for concrete temperature and installation conditions.

Each chemical adhesive system container must clearly and permanently show the following:

1. Manufacturer's name
2. Model number of the system
3. Manufacture date
4. Batch number
5. Expiration date
6. Current International Conference of Building Officials Evaluation Report number
7. Directions for use
8. Storage requirement
9. Warnings or precautions required by state and federal laws and regulations

#### 41-10.02B Reserved

### 41-10.03 CONSTRUCTION

#### 41-10.03A General

Drill holes for bars. Clean drilled holes in compliance with the chemical adhesive manufacturer's instructions. Holes must be dry at the time of placing the chemical adhesive and bars. Use a grout retention ring when drilling and bonding dowel bars. Immediately after inserting the bar into the chemical adhesive, support the bar to prevent movement until chemical adhesive has cured the minimum time recommended by the manufacturer.

Apply dowel bar lubricant to the entire exposed portion of the dowel bar.

If the Engineer rejects a bar installation stop paving, drilling, and bonding activities. Adjust your procedures and obtain the Engineer's verbal authorization before resuming paving, drilling, and bonding.

Cut the rejected bar flush with the pavement joint surface and coat the exposed end of the bar with chemical adhesive. Offset the new hole 3 inches horizontally from the rejected hole's center.

#### 41-10.03B Tie Bar Tolerance

Place tie bars within the tolerances shown in the following table:

**Tie Bar Tolerances**

Dimension	Tolerance
Horizontal skew (horizontal skew: bar length)	1:6
Vertical skew (vertical skew: bar length)	1:6
Longitudinal translation (inch)	±1
Horizontal offset (embedment, inch)	±1
Height relative to the adjacent bar	±1
Vertical Depth (clearance from the pavement surface or bottom, inches, min)	3

#### 41-10.03C Dowel Bar Tolerance

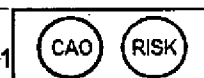
Place dowel bars within the tolerances specified in section 40-1.01D(7)(b)(v).

#### 41-10.03D Reserved

### 41-10.04 PAYMENT

Not Used

### 41-11-41-15 RESERVED



AA

**42 GROOVE AND GRIND CONCRETE**

07-19-13

**Replace the paragraph of section 42-1.01A with:**

Section 42-1 includes general specifications for grooving and grinding concrete.

07-19-13

**Replace the headings and paragraphs in section 42-3 with:**

07-19-13

**42-3.01 GENERAL**

**42-3.01A Summary**

Section 42-3 includes specifications for grinding the surfaces of pavement, bridge decks, and approach slabs.

**42-3.01B Definitions**

Reserved

**42-3.01C Submittals**

Reserved

**42-3.01D Quality Control and Assurance**

Reserved

**42-3.02 MATERIALS**

Not Used

**42-3.03 CONSTRUCTION**

**42-3.03A General**

Grind surfaces in the longitudinal direction of the traveled way and grind the full lane width. Begin and end grinding at lines perpendicular to the roadway centerline.

Grinding must result in a parallel corduroy texture with grooves from 0.08 to 0.12 inch wide and from 55 to 60 grooves per foot of width. Grooves must be from 0.06 to 0.08 inch from the top of the ridge to the bottom of the groove.

Grind with abrasive grinding equipment using diamond cutting blades mounted on a self-propelled machine designed for grinding and texturing concrete pavements.

**42-3.03B Pavement**

Grind existing concrete pavement that is adjacent to an individual slab replacement. Grind the replaced individual slab and all the existing slabs immediately surrounding it. Grind after the individual slab is replaced.

Grind existing concrete pavement that is adjacent to new lanes of concrete pavement. Grind before paving.

After grinding, the existing pavement must comply with requirements for smoothness and coefficient of friction in section 40 except:

1. At the midpoint of a joint or crack, test smoothness with a straightedge. Both sides must have uniform texture.

- 2. Straightedge and inertial profiler requirements do not apply to areas abnormally depressed from subsidence or other localized causes. End smoothness testing 15 feet before and resume 15 feet after these areas.
- 3. Cross-slope must be uniform and have positive drainage across the traveled way and shoulder.

As an alternative to grinding existing concrete pavement, you may replace the existing pavement. The new concrete pavement must be the same thickness as the removed pavement. Replace existing pavement between longitudinal joints or pavement edges and transverse joints. Do not remove portions of slabs.

Replacement of existing concrete pavement must comply with requirements for individual slab replacement in section 41-9.

**42-3.03C Bridge Decks, Approach Slabs, and Approach Pavement**

Grind bridge decks, approach slabs, and approach pavement only if described.

The following ground areas must comply with the specifications for smoothness and concrete cover over reinforcing steel in section 51-1.01D(4):

- 1. Bridge decks
- 2. Approach slabs
- 3. Adjacent 50 feet of approach pavement

After grinding, the coefficient of friction must comply with section 51-1.01D(4).

**42-3.04 PAYMENT**

Grinding existing approach slabs and adjacent 50 feet of approach pavement is paid for as grind existing bridge deck.

The Department does not pay for grinding replacement concrete pavement or for additional grinding to comply with smoothness requirements.

**Add to section 42:**

07-19-13

**42-4-42-9 RESERVED**

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**DIVISION VI STRUCTURES**  
**46 GROUND ANCHORS AND SOIL NAILS**

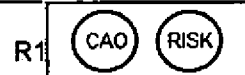
10-30-15

**Replace the 1st paragraph of section 46-1.01C(2) with:**

04-19-13

Submit 5 copies of shop drawings to OSD, Documents Unit. Notify the Engineer of the submittal. Include in the notification the date and contents of the submittal. Allow 30 days for the Department's review. After review, submit from 6 to 12 copies, as requested, for authorization and use during construction.

Shop drawings and calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State.



**Replace the 3rd paragraph of section 46-1.01C(2) with:**

01-18-13

Ground anchor shop drawings must include:

1. Details and specifications for the anchorage system and ground anchors.
2. Details for the transition between the corrugated plastic sheathing and the anchorage assembly.
3. If shims are used during lock-off, shim thickness and supporting calculations.
4. Calculations for determining the bonded length. Do not rely on any capacity from the grout-to-ground bond within the unbonded length.

**Delete the 5th and 6th paragraphs of section 46-1.01C(2).**

01-18-13

**Replace the 4th paragraph of section 46-1.01D(2)(b) with:**

01-18-13

Each jack and its gage must be calibrated as a unit under the specifications for jacks used to tension prestressing steel permanently anchored at 25 percent or more of its specified minimum ultimate tensile strength in section 50-1.01D(3).

**Replace the 3rd paragraph of section 46-1.01D(2)(d) with:**

07-19-13

The Department may verify the test loads using the Department's load cells. If requested, install and support the Department's testing equipment during testing and remove the equipment after testing is complete.

**Add to section 46-1.02:**

07-19-13

**46-1.02C Grout**

Grout must consist of cement and water and may contain an admixture if authorized. Cement must comply with section 90-1.02B(2). Water must comply with section 90-1.02D. Admixtures must comply with section 90, except they must not contain chloride ions in excess of 0.25 percent by weight. Do not exceed 5 gallons of water per 94 lb of cement.

Mix the grout as follows:

1. Add water to the mixer followed by cement and any admixtures or fine aggregate.
2. Mix the grout with mechanical mixing equipment that produces a uniform and thoroughly mixed grout.
3. Agitate the grout continuously until the grout is pumped.
4. Do not add water after the initial mixing.

**Add to section 46-1.03B:**

04-20-12

Dispose of drill cuttings under section 19-2.03B.

**Add to the end of section 46-1.03C:**

07-19-13

Grouting equipment must be:

1. Capable of grouting at a pressure of at least 100 psi



2. Equipped with a pressure gage having a full-scale reading of not more than 300 psi

**Delete the 3rd paragraph of section 46-2.01A.**

07-19-13

**Add to the beginning of section 46-2.01C:**

Submittals for strand tendons, bar tendons, bar couplers, and anchorage assemblies must comply with section 50-1.01C.

07-19-13

**Replace the 1st sentence of the 1st paragraph in section 46-2.01D(2)(a) with:**

Performance test ground anchors as described.

10-30-15

**Replace the 1st sentence of the 1st paragraph in section 46-2.01D(2)(c) with:**

Ground anchors that are performance- or proof-tested must comply with the following:

10-30-15

**Add to section 46-2.01D:**

**46-2.01D(3) Steel**

Strand tendons, bar tendons, bar couplers, and anchorage assemblies must comply with section 50-1.01D.

07-19-13

**46-2.01D(4) Grout**

The Department tests the efflux time of the grout under California Test 541.

**Add to the beginning of section 46-2.02B:**

Strand tendons, bar tendons, and bar couplers must comply with section 50-1.02B.

07-19-13

**Replace the 1st paragraph of section 46-2.02E with:**

The efflux time of the grout immediately after mixing must be at least 11 seconds.

07-19-13

**Replace the 3rd paragraph in section 46-2.03A with:**

Sheathe the tendons in the unbonded length with smooth plastic sheathing that extends into the steel tube of the permanent anchorage assembly. Sheathe the tendons full length with corrugated plastic sheathing.

10-30-15

**Replace the 7th paragraph in section 46-2.03A with:**

10-30-15

Drill the holes for ground anchors in the foundation material deep enough to provide the necessary bonded length beyond the minimum unbonded length shown.

**Add between the 13th and 14th paragraphs of section 46-2.03A:**

07-19-13

If hot weather conditions will contribute to quick stiffening of the grout, cool the grout by authorized methods as necessary to prevent blockages during pumping activities.

**Add between the 1st and 2nd paragraphs of section 46-2.03D:**

07-19-13

Secure the ends of strand tendons with a permanent type anchorage system that:

1. Holds the prestressing steel at a force producing a stress of at least 95 percent of the specified ultimate tensile strength of the steel
2. Permanently secures the ends of the prestressing steel

**Replace the 2nd sentence of the 1st paragraph of section 46-3.02A with:**

07-19-13

The epoxy-coated prefabricated reinforcing bar must comply with section 52-2.03, except the epoxy thickness must be from 10 to 12 mils.

**Replace the 2nd paragraph of section 46-3.02B with:**

07-19-13

Concrete anchors on bearing plates must comply with the specifications for studs in clause 7 of AWS D1.1.

**Delete the 1st paragraph of section 46-3.02E.**

07-19-13

AA

**47 EARTH RETAINING SYSTEMS**

07-18-14

**Replace the 2nd paragraph of section 47-2.01D with:**

02-17-12

Coupler test samples must comply with minimum tensile specifications for steel wire in ASTM A 82/A 82M. Total wire slip must be at most 3/16 inch when tested under the specifications for tension testing of round wire test samples in ASTM A 370.

**Replace "78-80" in the 1st table in the 2nd paragraph of section 47-2.02C with:**

10-19-12

78-100

**Replace the value for the sand equivalent requirement in the 2nd table in the 3rd paragraph of section 47-2.02C with:**

12 minimum

01-20-12

**Replace the 1st paragraph of section 47-2.02E with:**

Steel wire must comply with the specifications for plain wire reinforcement in ASTM A1064/A1064M.  
Welded wire reinforcement must comply with the specifications for plain wire welded wire reinforcement in ASTM A1064/A1064M.

07-18-14

Hooks and bends must comply with the *Building Code Requirements for Structural Concrete* published by ACI.

**Replace section 47-3 with:**

### **47-3 REINFORCED CONCRETE CRIB WALLS**

07-19-13

#### **47-3.01 General**

Section 47-3 includes specifications for constructing reinforced concrete crib walls.

Reinforced concrete crib walls must comply with section 51.

Reinforcement must comply with section 52.

Concrete crib walls consist of a series of rectangular cells composed of interlocking, precast, reinforced concrete headers, stretchers, and blocks.

#### **47-3.02 Materials**

##### **47-3.02A General**

Pads shown to be placed between bearing surfaces must either be (1) neoprene complying with the specifications for strip waterstops in section 51-2.05 or (2) commercial quality no. 30 asphalt felt. The protective board is not required for neoprene pads.

##### **47-3.02B Crib Members**

###### **47-3.02B(1) General**

All members may be manufactured to dimensions 1/8 inch greater in thickness than shown. The thickness of the lowest step must not be less than the dimension shown.

Stretchers may be manufactured 1/2 inch less in length than shown.

When an opening is shown in the face of the wall, special length stretchers and additional headers may be necessary.

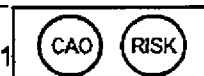
For non-tangent wall alignments, special length stretchers may be required.

For non-tangent wall alignments and at locations where filler blocks are required, special length front face closure members may be required.

###### **47-3.02B(2) Reinforcement**

Reinforcing wire must comply with ASTM A 496/A 496M.

For hoops or stirrups use either (1) reinforcing wire or (2) deformed steel welded wire reinforcement. The size must be equivalent to the reinforcing steel shown. Deformed steel welded wire reinforcement must comply with ASTM A 497/A 497M.



**47-3.02B(3) Concrete**

Concrete test cylinders must comply with section 90-1.01D(5), except when the penetration of fresh concrete is less than 1 inch, the concrete in the test mold must be consolidated by vibrating the mold equivalent to the consolidating effort being used to consolidate the concrete in the members.

Cure crib members under section 51-4.02C.

When removed from forms, the members must present a true surface of even texture, free from honeycombs and voids larger than 1 inch in diameter and 5/16 inch in depth. Clean and fill other pockets with mortar under sections 51-1.02F and 51-1.03E(2).

External vibration resulting in adequate consolidation may be used.

If the Engineer determines that rock pockets are of the extent or character as to affect the strength of the member or to endanger the life of the steel reinforcement, replace the member.

Finish concrete-to-concrete bearing surfaces to a smooth plane. Section 51-1.03F does not apply to concrete crib members.

**47-3.03 Construction**

Place reinforced concrete crib walls to the lines and grades established by the Engineer. The foundation must be accepted by the Engineer before any crib members are placed.

The gap between bearing surfaces must not exceed 1/8 inch.

Where a gap of 1/16 inch to 1/8 inch exists or where shown, place a 1/16-inch pad of asphalt felt or sheet neoprene between the bearing surfaces.

**47-3.04 Payment**

The area of reinforced concrete crib wall is measured on the batter at the outer face for the height from the bottom of the bottom stretcher to the top of the top stretcher and for a length measured from end to end of each section of wall.

**Add between the 3rd and 4th paragraphs of section 47-5.01:**

Reinforcement must comply with section 52.

10-19-12

**Add to section 47-6.01A:**

The alternative earth retaining system must comply with the specifications for the type of wall being constructed.

10-19-12

**Replace "sets" at each occurrence in the 1st paragraph of section 47-6.01C with:**

copies

04-19-13

\*\*\*\*\*



## 48 TEMPORARY STRUCTURES

07-19-13

**Replace "previously welded splice" and its definition in section 48-2.01B with:**

04-19-13

**previously welded splice:** Splice made in a falsework member in compliance with AWS D1.1 or other recognized welding standard before contract award.

**Add to section 48-2.01B:**

07-19-13

**independent support system:** Support system that is in addition to the falsework removal system employing methods of holding falsework from above by winches, hydraulic jacks with prestressing steel, HS rods, or cranes.

**Delete "field" in the 1st sentence of the 5th paragraph of section 48-2.01C(1).**

04-19-13

**Replace Item 1 in the list in the 6th paragraph of section 48-2.01C(1) with:**

04-19-13

1. Itemize the testing, inspection methods, and acceptance criteria used

**Replace "sets" at each occurrence in the 4th paragraph of section 48-2.01C(2) with:**

07-19-13

copies

**Replace the 7th paragraph of section 48-2.01C(2) with:**

09-16-11

If you submit multiple submittals at the same time or additional submittals before review of a previous submittal is complete:

1. You must designate a review sequence for submittals
2. Review time for any submittal is the review time specified plus 15 days for each submittal of higher priority still under review

**Add to section 48-2.01C(2):**

07-19-13

Shop drawings and calculations for falsework removal systems employing methods of holding falsework from above by winches, hydraulic jacks with prestressing steel, HS rods, or cranes must include:

1. Design code used for the analysis of the structural members of the independent support system
2. Provisions for complying with current Cal/OSHA requirements
3. Load tests and ratings within 1 year of intended use of hydraulic jacks and winches
4. Location of the winches, hydraulic jacks with prestressing steel, HS rods, or cranes
5. Analysis showing that the bridge deck and overhang are capable of supporting all loads at all time
6. Analysis showing that winches will not overturn or slide during all stages of loading
7. Location of deck and soffit openings if needed
8. Details of repair for the deck and soffit openings after falsework removal

**Replace the 1st paragraph of section 48-2.01D(2) with:**

04-19-13

Welding must comply with AWS D1.1 or other recognized welding standard, except for fillet welds where the load demands are 1,000 lb or less per inch for each 1/8 inch of fillet weld.

**Replace the 1st through 3rd sentences in the 2nd paragraph of section 48-2.01D(2) with:**

04-19-13

Perform NDT on welded splices using UT or RT. Each weld and any repair made to a previously welded splice must be tested.

**Replace the 3rd paragraph of section 48-2.01D(2) with:**

04-19-13

For previously welded splices, perform and document all necessary testing and inspection required to certify the ability of the falsework members to sustain the design stresses.

**Add to section 48-2.01D(3)(a):**

07-19-13

Falsework removal system employing methods of holding falsework from above and members of the independent support system must support the sum of the actual vertical and horizontal loads due to falsework materials, equipment, construction sequence or other causes, and wind loading. Identifiable mechanical devices used in the falsework removal plan must meet applicable industry standards and manufacturer instructions for safe load carrying capacity. Unidentifiable winches must be capable of carrying twice the design load.

The load used for the analysis of overturning moment and sliding of the winch system must be 150 percent of the design load.

**Add to section 48-2.03D:**

07-19-13

Falsework removal employing methods of holding falsework by winches, hydraulic jacks with prestressing steel, HS rods, or cranes must also be supported by an independent support system when the system is not actively lowering the falsework at vehicular, pedestrian, or railroad traffic openings.

Bridge deck openings used to facilitate falsework removal activities must be formed and located away from the wheel path. The formed openings must be wedge shaped with a 5-inch maximum diameter at the top and a 3-inch maximum diameter at the bottom.

Anchor 10-inch-square aluminum or galvanized steel wire, 1/4-inch-mesh hardware cloth with a 0.025-inch minimum wire diameter firmly to the inside of the soffit openings. Construct a 1/2-inch drip groove to the outside of soffit openings.

Clean and roughen openings made in the bridge deck. Fill the deck openings with rapid setting concrete complying with section 15-5.02.

\*\*\*\*\*

## 49 PILING

07-18-14

**Replace "sets" in the 1st paragraph of section 49-1.01C(2) with:**

copies

04-19-13

**Replace "set" in the 2nd paragraph of section 49-1.01C(2) with:**

copy

04-19-13

**Replace "Load Applied to Pile by Hydraulic Jack(s) Acting at One End of Test Beam(s) Anchored to the Pile" in the 5th paragraph of section 49-1.01D(2) with:**

"Tensile Load Applied by Hydraulic Jack(s) Acting Upward at One End of Test Beam(s)"

07-20-12

**Add to section 49-1.03:**

Dispose of drill cuttings under section 19-2.03B.

04-20-12

**Replace the paragraph of section 49-2.01A(1) with:**

Section 49-2.01 includes general specifications for fabricating and installing driven piles.

Epoxy-coated bar reinforcing steel used for pile anchors must comply with section 52-2.02.

07-19-13

**Replace the 2nd paragraph of section 49-2.01D with:**

Furnish piling is measured along the longest side of the pile from the specified tip elevation shown to the plane of pile cutoff.

01-20-12

**Replace the paragraph of section 49-2.02A(1) with:**

Section 49-2.02 includes specifications for fabricating and installing steel pipe piles.

07-19-13

**Replace the definitions in section 49-2.02A(2) with:**

**shop welding:** Welding performed at a plant on the Department's Authorized Facility Audit List.

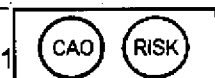
**field welding:** Welding not performed at a plant on the Department's Authorized Facility Audit List.

07-19-13

**Replace item 2 in the list in the paragraph of section 49-2.02A(3)(b) with:**

2. Certified mill test reports for each heat number of steel used in pipe piles being furnished.

07-19-13



**Replace the paragraph of section 49-2.02A(4)(a) with:**

07-19-13

Section 11-3.02 does not apply to shop welds in steel pipe piles fabricated at a facility on the Department's Authorized Facility Audit List.

For groove welds using submerged arc welding from both sides without backgouging, qualify the WPS under Table 4.5 of AWS D1.1.

**Replace "0.45" in the 2nd paragraph of section 49-2.02B(1)(a) with:**

07-19-13

0.47

**Replace the 1st paragraph of section 49-2.02B(1)(b) with:**

07-19-13

Welds must comply with AWS D1.1. Circumferential welds must be CJP welds.

**Delete the 5th paragraph of section 49-2.02B(1)(b):**

07-19-13

**Add to section 49-2.02B(1):**

07-19-13

**49-2.02B(1)(d) Reserved****Replace "4.8.4" in item 2.3 in the list in the 2nd paragraph of section 49-2.02B(2) with:**

07-19-13

4.9.4

**Delete the 3rd paragraph of section 49-2.02C(2).**

07-19-13

**Replace the paragraph of section 49-2.03A(1) with:**

07-19-13

Section 49-2.03 includes specifications for fabricating and installing structural shape steel piles.

**Replace the paragraph of section 49-2.03A(3) with:**

07-19-13

Submit a certified material test report and a certificate of compliance that includes a statement that all materials and workmanship incorporated in the work and all required tests and inspections of this work have been performed as described.

**Replace the 1st paragraph of section 49-2.03B with:**

07-19-13

Structural shape steel piles must comply with ASTM A 36/A 36M, ASTM A 572/A 572M, ASTM A 709/A 709M, or ASTM A 992/A 992M.



**Replace "sets" in the 1st paragraph of section 49-2.04A(3) with:**

copies

04-19-13

**Delete the 1st paragraph of section 49-2.04A(4).**

07-19-13

**Replace the 3rd and 4th paragraphs of section 49-2.04B(2) with:**

Piles in a corrosive environment must be steam or water cured under section 90-4.03.

10-19-12

If piles in a corrosive environment are steam cured, either:

1. Keep the piles continuously wet for at least 3 days. The 3 days includes the holding and steam curing periods.
2. Apply curing compound under section 90-1.03B(3) after steam curing.

**Replace the 1st paragraph of section 49-3.01A with:**

Section 49-3.01 includes general specifications for constructing CIP concrete piles.

07-19-13

**Add to section 49-3.01A:**

Concrete must comply with section 51.

01-20-12

**Replace the 1st paragraph of section 49-3.01C with:**

Except for CIDH concrete piles constructed under slurry, construct CIP concrete piles such that the excavation methods and the concrete placement procedures provide for placing the concrete against undisturbed material in a dry or dewatered hole.

01-20-12

**Replace "Reserved" in section 49-3.02A(2) with:**

dry hole:

1. Except for CIDH concrete piles specified as end bearing, a drilled hole that:
  - 1.1. Accumulates no more than 12 inches of water in the bottom of the drilled hole during a period of 1 hour without any pumping from the hole during the hour.
  - 1.2. Has no more than 3 inches of water in the bottom of the drilled hole immediately before placing concrete.
2. For CIDH concrete piles specified as end bearing, a drilled hole free of water without the use of pumps.

01-20-12

**Replace "Reserved" in section 49-3.02A(3)(a) with:**

If plastic spacers are proposed for use, submit the manufacturer's data and a sample of the plastic spacer. Allow 10 days for review.

01-20-12

**Replace item 5 in the list in the 1st paragraph of section 49-3.02A(3)(b) with:**

10-19-12

- 5. Methods and equipment for determining:
  - 5.1. Depth of concrete.
  - 5.2. Theoretical volume of concrete to be placed, including the effects on volume if casings are withdrawn
  - 5.3. Actual volume of concrete placed

**Add to the list in the 1st paragraph of section 49-3.02A(3)(b):**

01-18-13

- 8. Drilling sequence and concrete placement plan.

**Replace item 2 in the list in the 1st paragraph of section 49-3.02A(3)(g) with:**

01-20-12

- 2. Be sealed and signed by an engineer who is registered as a civil engineer in the State. This requirement is waived for either of the following conditions:
  - 2.1. The proposed mitigation will be performed under the current Department-published version of *ADSC Standard Mitigation Plan 'A' - Basic Repair* without exception or modification.
  - 2.2. The Engineer determines that the rejected pile does not require mitigation due to structural, geotechnical, or corrosion concerns, and you elect to repair the pile using the current Department-published version of *ADSC Standard Mitigation Plan 'B' - Grouting Repair* without exception or modification.

**Replace "49-2.03A(4)(d)" in the 1st paragraph of section 49-3.02A(4)(d)(i) with:**

07-19-13

49-3.02A(4)(d)

**Add to the beginning of section 49-3.02A(4)(d)(ii):**

07-19-13

If the drilled hole is dry or dewatered without the use of temporary casing to control ground water, installation of inspection pipes is not required.

**Replace item 1 in the list in the 1st paragraph of section 49-3.02A(4)(d)(ii) with:**

01-20-12

- 1. Inspection pipes must be schedule 40 PVC pipe complying with ASTM D 1785 with a nominal pipe size of 2 inches. Watertight PVC couplers complying with ASTM D 2466 are allowed to facilitate pipe lengths in excess of those commercially available. Log the location of the inspection pipe couplers with respect to the plane of pile cutoff.

**Add to section 49-3.02A(4)(d)(iv):**

01-20-12

If the Engineer determines it is not feasible to use one of ADSC's standard mitigation plans to mitigate the pile, schedule a meeting and meet with the Engineer before submitting a nonstandard mitigation plan.

The meeting attendees must include your representatives and the Engineer's representatives involved in the pile mitigation. The purpose of the meeting is to discuss the type of pile mitigation acceptable to the Department.

Provide the meeting facility. The Engineer conducts the meeting.

**Replace the 1st paragraph of section 49-3.02B(5) with:**

07-19-13

Grout must consist of cementitious material and water, and may contain an admixture if authorized. Do not exceed 5 gallons of water per 94 lb of cement.

Cementitious material must comply with section 90-1.02B, except SCMs are not required.

Water must comply with section 90-1.02D. If municipally supplied potable water is used, the testing specified in section 90-1.02D is waived.

Admixtures must comply with section 90, except admixtures must not contain chloride ions in excess of 0.25 percent by weight.

Use aggregate to extend the grout as follows:

1. Aggregate must consist of at least 70 percent fine aggregate and approximately 30 percent pea gravel, by weight.
2. Fine aggregate must comply with section 90-1.02C(3).
3. Size of pea gravel must be such that 100 percent passes the 1/2-inch sieve, at least 85 percent passes the 3/8-inch sieve, and not more than 5 percent passes the no. 8 sieve.
4. Minimum cementitious material content of the grout must not be less than 845 lb/cu yd of grout.

Mix the grout as follows:

1. Add water to the mixer followed by cementitious material, aggregates, and any admixtures.
2. Mix the grout with mechanical mixing equipment that produces a uniform and thoroughly mixed grout.
3. Agitate the grout continuously until the grout is pumped.
4. Do not add water after initial mixing.

**Replace section 49-3.02B(8) with:**

01-20-12

**49-3.02B(8) Spacers**

Spacers must comply with section 52-1.03D, except you may use plastic spacers.

Plastic spacers must:

1. Comply with sections 3.4 and 3.5 of the Concrete Reinforcing Steel Institute's *Manual of Standard Practice*
2. Have at least 25 percent of their gross plane area perforated to compensate for the difference in the coefficient of thermal expansion between the plastic and concrete
3. Be of commercial quality

**Add between the 1st and 2nd paragraphs of section 49-3.02C(2):**

07-19-13

For CIDH concrete piles with a pile cap, the horizontal tolerance at the center of each pile at pile cut-off is the larger of 1/24 of the pile diameter or 3 inches. The horizontal tolerance for the center-to-center spacing of 2 adjacent piles is the larger of 1/24 of the pile diameter or 3 inches.

**Add between the 3rd and 4th paragraphs of section 49-3.02C(2):**

07-18-14

If drilling slurry is used during excavation, maintain the slurry level at least 10 feet above the piezometric head.

**Add to section 49-3.02C(4):**

01-20-12

Unless otherwise shown, the bar reinforcing steel cage must have at least 3 inches of clear cover measured from the outside of the cage to the sides of the hole or casing.

Place spacers at least 5 inches clear from any inspection tubes.

Place plastic spacers around the circumference of the cage and at intervals along the length of the cage, as recommended by the manufacturer.

07-19-13

For a single CIDH concrete pile supporting a column:

1. If the pile and the column share the same reinforcing cage diameter, this cage must be accurately placed as shown
2. If the pile reinforcing cage is larger than the column cage and the concrete is placed under dry conditions, maintain a clear horizontal distance of at least 3.5 inches between the two cages
3. If the pile reinforcing cage is larger than the column cage and the concrete is placed under slurry, maintain a clear horizontal distance of at least 5 inches between the two cages

**Replace section 49-3.02C(6) with:**

07-18-13

**49-3.02C(6) Construction Joint**

Section 49-3.02C(6) applies to CIDH concrete piles where a construction joint is shown.

If a permanent steel casing is not shown, you must furnish and install a permanent casing. The permanent casing must:

1. Be watertight and of sufficient strength to prevent damage and to withstand the loads from installation procedures, drilling and tooling equipment, lateral concrete pressures, and earth pressures.
2. Extend at least 5 feet below the construction joint. If placing casing into rock, the casing must extend at least 2 feet below the construction joint.
3. Not extend above the top of the drilled hole or final grade whichever is lower.
4. Not increase the diameter of the CIDH concrete pile more than 2 feet.
5. Be installed by impact or vibratory hammers, oscillators, rotators, or by placing in a drilled hole. Casings placed in a drilled hole must comply with section 49-3.02C(5).

Section 49-2.01A(4)(b) does not apply to permanent casings specified in this section.

**Replace item 3 in the list in the 11th paragraph of section 49-3.02C(8) with:**

07-18-14

3. Maintain the slurry level at least 10 feet above the piezometric head

**Add to section 49-4.01:**

Steel soldier piles must comply with section 49-2.03.

07-19-13

**Replace the headings and paragraphs in section 49-4.02 with:**

Concrete anchors must comply with the specifications for studs in clause 7 of AWS D1.1.

07-19-13

AA

**50 PRESTRESSING CONCRETE**

07-19-13

**Replace "sets" at each occurrence in the 2nd and 3rd paragraphs of section 50-1.01C(3) with:**

04-19-13

copies

**Add to section 50-1.01C(3):**

07-19-13

Include a grouting plan with your shop drawing submittal. The grouting plan must include:

1. Detailed grouting procedures
2. Type, quantity, and brand of materials to be used
3. Type of equipment to be used including provisions for backup equipment
4. Types and locations of grout inlets, outlets, and vents
5. Methods to clean ducts before grouting
6. Methods to control the rate of flow within ducts
7. Theoretical grout volume calculations for each duct
8. Duct repair procedures due to an air pressure test failure
9. Mixing and pumping procedures
10. Direction of grouting
11. Sequence of use of inlets and outlets
12. Procedure for handling blockages
13. Proposed forms for recording grouting information
14. Procedure for secondary grouting
15. Names of people who will perform grouting activities including their relevant experience and certifications

**Add to section 50-1.01C:**

07-19-13

**50-1.01C(5) Grout**

Submit a daily grouting report for each day grouting is performed. Submit the report within 3 days after grouting. The report must be signed by the technician supervising the grouting activity. The report must include:

1. Identification of each tendon
2. Date grouting occurred
3. Time the grouting started and ended
4. Date of placing the prestressing steel in the ducts
5. Date of stressing

6. Type of grout used
7. Injection end and applied grouting pressure
8. Actual and theoretical quantity of grout used to fill duct
9. Ratio of actual to theoretical grout quantity
10. Records of air, grout, and structure surface temperatures during grouting.
11. Summary of tests performed and results, except submit compressive strength and chloride ion test results within 48 hours of test completion
12. Names of personnel performing the grouting activity
13. Summary of problems encountered and corrective actions taken
14. Summary of void investigations and repairs made

**Replace the introductory clause in the 1st paragraph of section 50-1.01C(4) with:**

Submit test samples for the materials shown in the following table to be used in the work:

07-19-13

**Add between "the" and "test samples" in the 1st paragraph of section 50-1.01D(2):**

prestressing steel

07-19-13

**Replace the 3rd paragraph of section 50-1.01D(2) with:**

The Department may verify the prestressing force using the Department's load cells.

10-19-12

**Replace the 3rd paragraph in section 50-1.01D(3) with:**

Each pressure gage must be fully functional and have an accurately reading, clearly visible dial or display. The dial must be at least 6 inches in diameter and graduated in 100 psi increments or less.

07-19-13

**Add between the 5th and 6th paragraphs of section 50-1.01D(3):**

Each jack and its gages must be calibrated as a unit.

07-19-13

**Replace the 6th paragraph in section 50-1.01D(3) with:**

Each jack used to tension prestressing steel permanently anchored at 25 percent or more of its specified minimum ultimate tensile strength must be calibrated by METS within 1 year of use and after each repair. You must:

07-19-13

1. Schedule the calibration of the jacking equipment with METS
2. Mechanically calibrate the gages with a dead weight tester or other authorized means before calibration of the jacking equipment by METS
3. Verify that the jack and supporting systems are complete, with proper components, and are in good operating condition
4. Provide labor, equipment, and material to (1) install and support the jacking and calibration equipment and (2) remove the equipment after the calibration is complete
5. Plot the calibration results

Each jack used to tension prestressing steel permanently anchored at less than 25 percent of its specified minimum ultimate tensile strength must be calibrated by an authorized laboratory within 6 months of use and after each repair.

**Add to section 50-1.01D:**

07-19-13

**50-1.01D(4) Pressure Testing Ducts**

For post-tensioned concrete bridges, pressure test each duct with compressed air after stressing. To pressure test the ducts:

1. Seal all inlets, outlets, and grout caps.
2. Open all inlets and outlets on adjacent ducts.
3. Attach an air compressor to an inlet at 1 end of the duct. The attachment must include a valve that separates the duct from the air source.
4. Attach a pressure gage to the inlet at the end of the duct.
5. Pressurize the duct to 50 psi.
6. Lock-off the air source.
7. Record the pressure loss after 1 minute.
8. If there is a pressure loss exceeding 25 psi, repair the leaks with authorized methods and retest.

Compressed air used to clear and test the ducts must be clean, dry, and free of oil or contaminants.

**50-1.01D(5) Duct Demonstration of Post-Tensioned Members**

Before placing forms for deck slabs of box girder bridges, demonstrate that any prestressing steel placed in the ducts is free and unbonded. If no prestressing steel is in the ducts, demonstrate that the ducts are unobstructed.

If prestressing steel is installed after the concrete is placed, demonstrate that the ducts are free of water and debris immediately before installing the steel.

Before post-tensioning any member, demonstrate that the prestressing steel is free and unbonded in the duct.

The Engineer must witness all demonstrations.

**50-1.01D(6) Void Investigation**

In the presence of the Engineer, investigate the ducts for voids between 24 hours and 72 hours after grouting completion. As a minimum, inspect the inlet and outlet ports at the anchorages and at high points in the tendons for voids after removal. Completely fill any voids found with secondary grout.

**50-1.01D(7) Personnel Qualifications**

Perform post-tensioning field activities, including grouting, under the direct supervision of a technician certified as a level 2 Bonded PT Field Specialist through the Post-Tensioning Institute. Grouting activities may be performed under the direct supervision of a technician certified as a Grouting Technician through the American Segmental Bridge Institute.

**Replace the 6th paragraph of section 50-1.02B with:**

07-19-13

Package the prestressing steel in containers or shipping forms that protect the steel against physical damage and corrosion during shipping and storage.

**Replace the 13th paragraph of section 50-1.02B with:**

07-19-13

Prestressing steel is rejected if surface rust either:

1. Cannot be removed by hand-cleaning with a fine steel wool pad
2. Leaves pits visible to the unaided eye after cleaning

**Replace the 4th paragraph of section 50-1.02C with:**

07-19-13

Admixtures must comply with section 90, except admixtures must not contain chloride ions in excess of 0.25 percent by weight.

**Delete the 5th paragraphs of section 50-1.02C.**

07-19-13

**Add to section 50-1.02C:**

07-19-13

Secondary grout must:

1. Comply with ASTM C 1107
2. Not have a deleterious effect on the steel, concrete, or bond strength of the steel to concrete

**Replace item 9 including items 9.1 and 9.2 in the list in the 1st paragraph of section 50-1.02D with:**

07-19-13

9. Have an inside cross-sectional area of at least 2.5 times the net area of the prestressing steel for multistrand tendons

**Replace "3/8" in Item 10 in the list in the 1st paragraph of section 50-1.02D with:**

07-19-13

1/2

**Delete the 2nd sentences in the 1st paragraph of section 50-1.02E.**

07-19-13

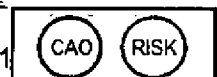
**Replace section 50-1.02F with:**

07-19-13

**50-1.02F Permanent Grout Caps**

Permanent grout caps for anchorage systems of post-tensioned tendons must:

1. Be glass-fiber-reinforced plastic with antioxidant additives. The environmental stress-cracking failure time must be at least 192 hours under ASTM D 1693, Condition C.
2. Completely cover and seal the wedge plate or anchorage head and all exposed metal parts of the anchorage against the bearing plate using neoprene O-ring seals.
3. Have a grout vent at the top of the cap.
4. Be bolted to the anchorage with stainless steel complying with ASTM F 593, alloy 316. All fasteners, including nuts and washers, must be alloy 316.
5. Be pressure rated at or above 150 psi.





**Add to section 50-1.02:**

09-16-11

**50-1.02G Sheathing**

Sheathing for debonding prestressing strand must:

1. Be split or un-split flexible polymer plastic tubing
2. Have a minimum wall thickness of 0.025 inch
3. Have an inside diameter exceeding the maximum outside diameter of the strand by 0.025 to 0.14 inch

Split sheathing must overlap at least 3/8 inch.

Waterproofing tape used to seal the ends of the sheathing must be flexible adhesive tape.

The sheathing and waterproof tape must not react with the concrete, coating, or steel.

**Replace the 2nd paragraph of section 50-1.03A(3) with:**

07-19-13

After installation, cover the duct ends and vents to prevent water or debris from entering.

**Add to section 50-1.03A(3):**

07-19-13

Support ducts vertically and horizontally during concrete placement at a spacing of at most 4 feet.

**Delete "at least" in the 1st paragraph of section 50-1.03B(1).**

07-19-13

**Add to section 50-1.03B(1):**

01-20-12

After seating, the maximum tensile stress in the prestressing steel must not exceed 75 percent of the minimum ultimate tensile strength shown.

**Delete the 1st through 4th paragraphs of section 50-1.03B(2)(a).**

07-19-13

**Replace "temporary tensile strength" in the 7th paragraph of section 50-1.03B(2)(a) with:**

07-19-13

temporary tensile stress

**Add to section 50-1.03B(2)(a):**

07-19-13

If prestressing strand is installed using the push-through method, use guide caps at the front end of each strand to protect the duct from damage.

**Add to the list in the 2nd paragraph of section 50-1.03B(2)(c):**

07-19-13

3. Be equipped with permanent grout caps

**Replace section 50-1.03B(2)(d) with:**

07-19-13

**50-1.03B(2)(d) Bonding and Grouting****50-1.03B(2)(d)(i) General**

Bond the post-tensioned prestressing steel to the concrete by completely filling the entire void space between the duct and the prestressing steel with grout.

Ducts, vents, and grout caps must be clean and free from water and deleterious materials that would impair bonding of the grout or interfere with grouting procedures. Compressed air used for cleaning must be clean, dry, and free of oil or contaminants.

Prevent the leakage of grout through the anchorage assembly by positive mechanical means.

Before starting daily grouting activities, drain the pump system to remove any water from the piping system.

Break down and thoroughly clean the pump and piping system after each grouting session.

After completing duct grouting activities:

1. Abrasive blast clean and expose the aggregate of concrete surfaces where concrete is to be placed to cover and encase the anchorage assemblies
2. Remove the ends of vents 1 inch below the roadway surface

**50-1.03B(2)(d)(ii) Mixing and Proportioning**

Proportion solids by weight to an accuracy of 2 percent.

Proportion liquids by weight or volume to an accuracy of 1 percent.

Mix the grout as follows:

1. Add water to the mixer followed by the other ingredients.
2. Mix the grout with mechanical mixing equipment that produces a uniform and thoroughly mixed grout without an excessive temperature increase or loss of properties of the mixture.
3. Do not exceed 5 gal of water per 94 lb of cement or the quantity of water in the manufacturer's instructions, whichever is less.
4. Agitate the grout continuously until the grout is pumped. Do not add water after the initial mixing.

**50-1.03B(2)(d)(iii) Placing**

Pump grout into the duct within 30 minutes of the 1st addition of the mix components.

Inject grout from the lowest point of the duct in an uphill direction in 1 continuous operation maintaining a one-way flow of the grout. You may inject from the lowest anchorage if complete filling is ensured.

Before injecting grout, open all vents.

Continuously discharge grout from the vent to be closed. Do not close any vent until free water, visible slugs of grout, and entrapped air have been ejected and the consistency of the grout flowing from the vent is equivalent to the injected grout.

Pump the grout at a rate of 16 to 50 feet of duct per minute.

Conduct grouting at a pressure range of 10 to 50 psi measured at the grout inlet. Do not exceed maximum pumping pressure of 150 psi at the grout inlet.

As grout is injected, close the vents in sequence in the direction of flow starting with the closest vent.

Before closing the final vent at the grout cap, discharge at least 2 gal of grout into a clean receptacle.

Bleed all high point vents.

Lock a pressure of 5 psi into the duct by closing the grout inlet valve.

#### **50-1.03B(2)(d)(iv) Weather Conditions**

If hot weather conditions will contribute to quick stiffening of the grout, cool the grout by authorized methods as necessary to prevent blockages during pumping activities.

If freezing weather conditions are anticipated during and following the placement of grout, provide adequate means to protect the grout in the ducts from damage by freezing.

#### **50-1.03B(2)(d)(v) Curing**

During grouting and for a period of 24 hours after grouting, eliminate vibration from contractor controlled sources within 100 feet of the span in which grouting is taking place, including from moving vehicles, jackhammers, large compressors or generators, pile driving activities, soil compaction, and falsework removal. Do not vary loads on the span.

For PC concrete members, do not move or disturb the members after grouting for 24 hours. If ambient temperature drops below 50 degrees F, do not move or disturb the members for 48 hours.

Do not remove or open valves until grout has cured for at least 24 hours.

#### **50-1.03B(2)(d)(vi) Grouting Equipment**

Grouting equipment must be:

1. Capable of grouting at a pressure of at least 100 psi
2. Equipped with a pressure gage having a full-scale reading of not more than 300 psi
3. Able to continuously grout the longest tendon on the project in less than 20 minutes

Grout must pass through a screen with clear openings of 1/16 inch or less before entering the pump.

Fit grout injection pipes, ejection pipes, and vents with positive mechanical shutoff valves capable of withstanding the pumping pressures. Do not remove or open valves until the grout has set. If authorized, you may substitute mechanical valves with suitable alternatives after demonstrating their effectiveness.

Provide a standby grout mixer and pump.

#### **50-1.03B(2)(d)(vii) Grout Storage**

Store grout in a dry environment.

#### **50-1.03B(2)(d)(viii) Blockages**

If the grouting pressure reaches 150 psi, close the inlet and pump the grout at the next vent that has just been or is ready to be closed as long as a one-way flow is maintained. Do not pump grout into a succeeding outlet from which grout has not yet flowed.

When complete grouting of the tendon cannot be achieved by the steps specified, stop the grouting operation.

#### **50-1.03B(2)(d)(ix) Secondary Grouting**

Perform secondary grouting by vacuum grouting under the direct supervision of a person who has been trained and has experience in the use of vacuum grouting equipment and procedures.

The vacuum grouting process must be able to determine the size of the void and measure the volume of grout filling the void.

Vacuum grouting equipment must consist of:

1. Volumeter for the measurement of void volume

- 2. Vacuum pump with capacity of at least 10 cfm and equipped with a flow meter capable of measuring the amount of grout being injected

**50-1.03B(2)(d)(x) Vertical Tendon Grouting**

Provide a standpipe at the upper end of the tendon to collect bleed water and allow it to be removed from the grout. The standpipe must be large enough to prevent the grout elevation from dropping below the highest point of the upper anchorage device. If the grout level drops to the highest point of the upper anchorage device, immediately add grout to the standpipe.

Remove the standpipe after the grout has hardened.

For vertical tendons in excess of 100 feet high or if grouting pressure exceeds 145 psi, inject grout at a higher vent from which grout has already flowed to maintain one-way flow.

**50-1.03B(2)(d)(xi) Vents**

Place vents at the following locations:

- 1. Anchorage areas at both ends of the tendon
- 2. Each high point
- 3. 4 feet upstream and downstream of each crest of a high point
- 4. Each change in the cross section of duct

**Add to section 50-1.03B(2):**

09-16-11

**50-1.03B(2)(e) Debonding Prestressing Strands**

Where shown, debond prestressing strands by encasing the strands in plastic sheathing along the entire length shown and sealing the ends of the sheathing with waterproof tape.

Distribute the debonded strands symmetrically about the vertical centerline of the girder. The debonded lengths of pairs of strands must be equal.

Do not terminate debonding at any one cross section of the member for more than 40 percent of the debonded strands or 4 strands, whichever is greater.

Thoroughly seal the ends with waterproof tape to prevent the intrusion of water or cement paste before placing the concrete.

\*\*\*\*\*

**51 CONCRETE STRUCTURES**

10-30-15

**Replace the paragraphs of section 51-1.01A with:**

10-19-12

Section 51-1 includes general specifications for constructing concrete structures.

Earthwork for the following concrete structures must comply with section 19-3:

- 1. Sound wall footings
- 2. Sound wall pile caps
- 3. Culverts
- 4. Barrier slabs
- 5. Junction structures
- 6. Minor structures
- 7. Pipe culvert headwalls, endwalls, and wingwalls for a pipe with a diameter of 5 feet or greater

Falsework must comply with section 48-2.

Joints must comply with section 51-2.

Elastomeric bearing pads must comply with section 51-3.

Reinforcement for the following concrete structures must comply with section 52:

- 1. Sound wall footings
- 2. Sound wall pile caps
- 3. Barrier slabs
- 4. Junction structures
- 5. Minor structures
- 6. PC concrete members

You may use RSC for a concrete structure only where the specifications allow the use of RSC.

**Replace "sets" in the 1st paragraph of section 51-1.01C(2) with:**

07-19-13

copies

**Replace the 3rd item in the list in the 1st paragraph of section 51-1.01C(4) with:**

10-30-15

- 3. Proposed aggregate gradation

**Replace the heading of section 51-1.01D(4) with:**

04-19-13

**Testing Concrete Surfaces**

**Add to section 51-1.01D(4)(a):**

04-19-13

The Engineer tests POC deck surfaces for smoothness and crack intensity.

**Add to the list in the 1st paragraph of section 51-1.01D(4)(b):**

04-19-13

- 3. Completed deck surfaces, including ramps and landings of POCs

**Replace the 4th paragraph of section 51-1.01D(4)(b) with:**

10-30-15

Except for POCs, surface smoothness is tested using:

- 1. Bridge profilograph under California Test 547. Two profiles are obtained in each lane approximately 3 feet from the lane lines and 1 profile is obtained in each shoulder approximately 3 feet from the curb or rail face. Profiles are taken parallel to the direction of traffic.
- 2. 12-foot-long straightedge placed transversely to traffic.

For POCs, surface smoothness is tested using:

- 1. 12-foot-long straightedge placed parallel to the centerline of the POC
- 2. 6-foot-long straightedge placed perpendicular to the centerline of the POC

**Add between the 5th and 6th paragraphs of section 51-1.01D(4)(b):**

04-19-13

POC deck surfaces must comply with the following smoothness requirements:

1. Surfaces between grade changes must not vary more than 0.02 foot from the lower edge of a 12-foot-long straightedge placed parallel to the centerline of the POC
2. Surface must not vary more than 0.01 foot from the lower edge of a 6-foot-long straightedge placed perpendicular to the centerline of the POC

**Add to section 51-1.01D(4)(d):**

04-19-13

The Engineer measures crack intensity of POC deck surfaces after curing, before prestressing, and before falsework release. Clean the surface for the Engineer to measure surface crack intensity.

In any 100 sq ft portion of a new POC deck surface, if there are more than 10 feet of cracks having a width at any point of over 0.02 inch, treat the deck with methacrylate resin under section 15-5.05. Treat the entire deck width between the curbs to 5 feet beyond where the furthest continuous crack emanating from the 100 sq ft section is 0.02 inch wide. Treat the deck surface before grinding.

**Replace the 2nd paragraph of section 51-1.02B with:**

07-19-13

Except for minor structures, the minimum required 28-day compressive strength for concrete in structures or portions of structures is the compressive strength described or 3,600 psi, whichever is greater.

**Add to section 51-1.03C(2)(c)(i):**

04-20-12

Permanent steel deck forms are only allowed where shown or if specified as an option in the special provisions.

**Replace the 3rd paragraph of section 51-1.03C(2)(c)(ii) with:**

04-20-12

Compute the physical design properties under AISI's *North American Specification for the Design of Cold-Formed Steel Structural Members*.

**Replace the 8th paragraph of section 51-1.03D(1) with:**

10-19-12

Except for concrete placed as pipe culvert headwalls and endwalls, slope paving and aprons, and concrete placed under water, consolidate concrete using high-frequency internal vibrators within 15 minutes of placing concrete in the forms. Do not attach vibrators to or hold them against forms or reinforcing steel. Do not displace reinforcement, ducts, or prestressing steel during vibrating.

**Replace the 11th paragraph of section 51-1.03D(1) with:**

10-30-15

If concrete is inaccessible for adequate consolidation by other means, external vibrators must be used and the forms must be sufficiently rigid to resist displacement or damage.

**Add to section 51-1.03E(5):**

08-05-11

Drill the holes without damaging the adjacent concrete. If reinforcement is encountered during drilling before the specified depth is attained, notify the Engineer. Unless coring through the reinforcement is authorized, drill a new hole adjacent to the rejected hole to the depth shown.

**Replace the 1st sentence of the 1st paragraph of section 51-1.03F(5)(a) with:**

10-30-15

Construct concrete roadway surfaces of structures, approach slabs, sleeper slabs, and adjoining approach pavement, and concrete decks to be covered with another material, to the grade and cross section shown.

**Add to section 51-1.03F(5)(a):**

04-19-13

For approach slabs, sleeper slabs, and other roadway surfaces of concrete structures, texture the roadway surface as specified for bridge deck surfaces in section 51-1.03F(5)(b).

**Replace "Reserved" in section 51-1.03F(5)(b) with:**

07-18-14

**51-1.03F(5)(b)(i) General**

Except for bridge widenings, texture roadway surfaces of bridge decks, approach slabs, and sleeper slabs, and other roadway surfaces of concrete structures longitudinally by grinding and grooving or by longitudinal tining.

For bridge widenings, texture the roadway surfaces longitudinally by longitudinal tining.

04-20-12

In freeze-thaw areas, do not texture PCC surfaces of bridge decks.

**51-1.03F(5)(b)(ii) Grinding and Grooving**

When texturing the deck surface by grinding and grooving, place a 1/4 inch of sacrificial concrete cover on the bridge deck above the finished grade shown. Place items to be embedded in the concrete based on the final profile grade elevations shown. Construct joint seals after completing the grinding and grooving.

Before grinding and grooving, deck surfaces must comply with the smoothness and deck crack treatment requirements.

Grind and groove the deck surface as follows:

1. Grind the surface to within 18 inches of the toe of the barrier under section 42-3. Grinding must not reduce the concrete cover on reinforcing steel to less than 1-3/4 inches.
2. Groove the ground surfaces longitudinally under section 42-2. The grooves must be parallel to the centerline.

**51-1.03F(5)(b)(iii) Longitudinal Tining**

When texturing the deck surface by longitudinal tining, perform initial texturing with a burlap drag or broom device that produces striations parallel to the centerline. Perform final texturing with spring steel tines that produce grooves parallel with the centerline.

The tines must:

1. Be rectangular in cross section
2. Be from 3/32 to 1/8 inch wide on 3/4-inch centers
3. Have enough length, thickness, and resilience to form grooves approximately 3/16 inch deep

Construct grooves to within 6 inches of the layout line of the concrete barrier toe. Grooves must be from 1/8 to 3/16 inch deep and 3/16 inch wide after concrete has hardened.

For irregular areas and areas inaccessible to the grooving machine, you may hand construct grooves. Hand-constructed grooves must comply with the specifications for machine-constructed grooves.

Tining must not cause tearing of the deck surface or visible separation of coarse aggregate at the surface.

**Add to section 51-1.03F:**

04-18-13

**51-1.03F(6) Finishing Pedestrian Overcrossing Surfaces**

Construct deck surfaces, including ramps and landings of POCs to the grade and cross section shown. Surfaces must comply with the specified smoothness, surface texture, and surface crack requirements.

The Engineer sets deck elevation control points for your use in establishing the grade and cross section of the deck surface. The grade established by the deck elevation control points includes all camber allowances. Except for landings, elevation control points include the beginning and end of the ramp and will not be closer together than approximately 8 feet longitudinally and 4 feet transversely to the POC centerline. Landing elevation control points are at the beginning and the end of the landing.

Broom finish the deck surfaces of POCs. Apply the broom finish perpendicular to the path of travel. You may apply water mist to the surface immediately before brooming.

Clean any discolored concrete by abrasive blast cleaning or other authorized methods.

**Replace the paragraphs of section 51-1.04 with:**

10-19-12

If concrete involved in bridge work is not designated by type and is not otherwise paid for under a separate bid item, the concrete is paid for as structural concrete, bridge.

The payment quantity for structural concrete includes the volume in the concrete occupied by bar reinforcing steel, structural steel, prestressing steel materials, and piling.

The payment quantity for seal course concrete is the actual volume of seal course concrete placed except the payment quantity must not exceed the volume of concrete contained between vertical planes 1 foot outside the neat lines of the seal course shown. The Department does not adjust the unit price for an increase or decrease in the seal course concrete quantity.

Structural concrete for pier columns is measured as follows:

1. Horizontal limits are vertical planes at the neat lines of the pier column shown.
2. Bottom limit is the bottom of the foundation excavation in the completed work.
3. Upper limit is the top of the pier column concrete shown.

The payment quantity for drill and bond dowel is determined from the number and depths of the holes shown.



**Replace section 51-2.01B(2) with:**

**51-2.01B(2) Reserved**

04-19-13

**Delete the 4th paragraph of section 51-2.01C.**

04-19-13

**Replace "SSPC-QP 3" in the 1st paragraph of section 51-2.02A(2) with:**

AISC-420-10/SSPC-QP 3

10-19-12

**Replace the 2nd and 3rd paragraphs of section 51-2.02B(3)(b) with:**

04-20-12

Concrete saws for cutting grooves in the concrete must have diamond blades with a minimum thickness of 3/16 inch. Cut both sides of the groove simultaneously for a minimum 1st pass depth of .2 inches. The completed groove must have:

1. Top width within 1/8 inch of the width shown or ordered
2. Bottom width not varying from the top width by more than 1/16 inch for each 2 inches of depth
3. Uniform width and depth

Cutting grooves in existing decks includes cutting any conflicting reinforcing steel.

**Replace the 1st sentence of the 2nd paragraph of section 51-2.02C(3) with:**

10-30-15

Thoroughly clean contact surfaces and the top surface of the seal to within 1/2 inch from either edge immediately before applying the lubricant-adhesive.

**Replace "sets" in the 1st and 2nd paragraphs of section 51-2.02D(1)(c)(ii) with:**

04-19-13

copies

**Replace "set" in the 7th paragraph of section 51-2.02D(1)(c)(ii) with:**

04-19-13

copy

**Add to the 1st paragraph of section 51-2.02D(3):**

04-19-13

POC deck surfaces must comply with section 51-1.03F(6) before placing and anchoring joint seal assemblies.

**Replace "sets" in the 2nd paragraph of section 51-2.02E(1)(c) with:**

04-19-13

copies

**Replace "set" in the 6th paragraph of section 51-2.02E(1)(c) with:**

04-19-13

copy

**Replace the 2nd paragraph of section 51-2.02E(1)(e) with:**

08-05-11

Except for components in contact with the tires, the design loading must be the AASHTO LRFD Bridge Design Specifications Design Truck with 100 percent dynamic load allowance. Each component in contact with the tires must support a minimum of 80 percent of the AASHTO LRFD Bridge Design Specifications Design Truck with 100 percent dynamic load allowance. The tire contact area must be 10 inches measured normal to the longitudinal assembly axis by 20 inches wide. The assembly must provide a smooth-riding joint without slapping of components or tire rumble.

**Replace the 1st sentence of the 6th paragraph of section 51-2.02E(3) with:**

10-30-15

Install each assembly with a watertight, continuous return 6 inches up into barriers at the low side of the deck.

**Replace "sets" in the 1st and 2nd paragraphs of section 51-2.02F(1)(c) with:**

04-19-13

copies

**Replace the paragraph in section 51-2.04A(3) with:**

10-30-15

Submit a certificate of compliance for waterstop material. The certificate of compliance for PVC waterstop must include a statement that the material complies with Item 6 of Army Corps of Engineers CRD-C 572.

**Add between the 1st and 2nd paragraphs of section 51-4.01A:**

10-19-12

Prestressing concrete members must comply with section 50.

**Delete the 2nd paragraph of section 51-4.01A.**

04-20-12

**Replace the 3rd paragraph of section 51-4.01C(2) with:**

04-20-12

For segmental or spliced-girder construction, shop drawings must include the following additional information:

1. Details showing construction joints or closure joints
2. Arrangement of bar reinforcing steel, prestressing tendons, and pressure-grouting pipe
3. Materials and methods for making closures
4. Construction joint keys and surface treatment
5. Other requested information

For segmental girder construction, shop drawings must include concrete form and casting details.

**Replace "sets" in the 1st paragraph of section 51-4.01C(3) with:**

copies

04-19-13

**Delete the 3rd paragraph of section 51-4.01D.**

10-30-15

**Delete the 1st and 2nd paragraphs of section 51-4.02A.**

10-19-12

**Replace the 3rd paragraph of section 51-4.02B(2) with:**

04-20-12

For segmental or spliced-girder construction, materials for construction joints or closure joints at exterior girders must match the color and texture of the adjoining concrete.

**Add to section 51-4.02B(2):**

04-20-12

At spliced-girder closure joints:

1. If shear keys are not shown, the vertical surfaces of the girder segment ends must be given a coarse texture as specified for the top surface of PC members.
2. Post-tensioning ducts must extend out of the vertical surface of the girder segment closure end sufficiently to facilitate splicing of the duct.

For spliced girders, pretension strand extending from the closure end of the girder segment to be embedded in the closure joint must be free of mortar, oil, dirt, excessive mill scale and scabby rust, and other coatings that would destroy or reduce the bond.

**Add to section 51-4.03B:**

04-20-12

The specifications for prestressing force distribution and sequencing of stressing in the post-tensioning activity in 50-1.03B(2)(a) do not apply if post-tensioning of spliced girders before starting deck construction is described. The composite deck-girder structure must be post-tensioned in a subsequent stage.

Temporary spliced-girder supports must comply with the specifications for falsework in section 48-2.

Before post-tensioning of spliced girders, remove the forms at CIP concrete closures and intermediate diaphragms to allow inspection for concrete consolidation.

**Add to section 51-5.01A:**

07-19-13

Structure excavation and backfill must comply with section 19-3.

Treated permeable base must comply with section 29.

**Replace the paragraph in section 51-5.02G with:**

04-18-14

HMA for a temporary roadway structural section must comply with the specifications for minor HMA in section 39.

**Delete the 1st paragraph of section 51-5.03B(3).**

07-19-13

**Delete the 2nd paragraph of section 51-5.03D(1).**

07-19-13

**Add between the 1st and 2nd paragraphs of section 51-7.01A:**

10-19-12

Minor structures include:

- 1. Pipe culvert headwalls and endwalls for a pipe with a diameter less than 5 feet
- 2. Drainage inlets
- 3. Other structures described as minor structures

**Delete the 4th paragraph of section 51-7.01A.**

10-19-12

**Replace the 1st and 2nd paragraphs of section 51-7.01B with:**

10-19-12

Concrete must comply with the specifications for minor concrete.

**Add to section 51:**

10-19-12

**51-8-51-15 RESERVED**

\*\*\*\*\*

**52 REINFORCEMENT**

07-18-14

**Add to section 52-1.01A:**

07-20-12

Splicing of bar reinforcement must comply with section 52-6.

**Replace the 1st and 2nd paragraphs of section 52-1.02B with:**

10-19-12

Reinforcing bars must be deformed bars complying with ASTM A 706/A 706M, Grade 60, except you may use:

- 1. Deformed bars complying with ASTM A 615/A 615M, Grade 60, in:
  - 1.1. Junction structures
  - 1.2. Sign and signal foundations
  - 1.3. Minor structures

- 1.4. Concrete crib members
- 1.5. Mechanically-stabilized-embankment concrete panels
- 1.6. Masonry block sound walls
2. Deformed or plain bars complying with ASTM A 615/A 615M, Grade 40 or 60, in:
  - 2.1. Slope and channel paving
  - 2.2. Concrete barriers Type 50 and 60
3. Plain bars for spiral or hoop reinforcement in structures and concrete piles

**Add to the list in the 3rd paragraph of section 52-1.02B:**

04-20-12

9. Shear reinforcement stirrups in PC girders

**Replace the 9th paragraph of section 52-1.03D with:**

07-18-14

Terminate each unit of spiral reinforcement at both ends by lapping the spiral reinforcement on itself for at least 80 diameters followed by (1) a 135-degree hook with a 6-inch tail hooked around an intersecting longitudinal bar or (2) a mechanical lap splice coupler. Discontinuities in spiral reinforcement may be made only where shown or authorized. The spiral on each side of a discontinuity or a lap splice is a separate unit. Where discontinuities in spiral reinforcement are not allowed, splice the spiral reinforcement. Lap splices in spiral reinforcement must be lapped at least 80 diameters followed by (1) a 135-degree hook with a 6-inch tail hooked around an intersecting longitudinal bar or (2) a mechanical lap splice coupler.

**Add to section 52-5.01D:**

07-18-14

**52-5.01D(4) Quality Assurance Testing**

Secure, identify, and transport QA headed bar reinforcement test samples to METS as specified for splice test samples in section 52-5.01D(3)(b).

The Department tests headed bar reinforcement as specified for QC testing in section 52-5.01D(3)(b).

The Department will notify you of the QA test results for each bundle of 4 test samples of splices within 3 business days after METS receives the bundle unless more than 1 bundle is received on the same day, in which case allow 2 additional business days for each additional bundle received.

**Replace the 6th paragraph of section 52-6.01D(4)(a) with:**

01-18-13

Before performing service splice or ultimate butt splice testing, perform total slip testing on the service splice or ultimate butt splice test samples under section 52-6.01D(4)(b).

**Replace section 52-6.02D with:**

10-21-11

**52-6.02D Ultimate Butt Splice Requirements**

When tested under California Test 670, ultimate butt splice test samples must demonstrate necking as either of the following:

1. For "Necking (Option I)," the test sample must rupture in the reinforcing bar outside of the affected zone and show visible necking.
2. For "Necking (Option II)," the largest measured strain must be at least:



- 2.1. Six percent for no. 11 and larger bars
- 2.2. Nine percent for no. 10 and smaller bars

**Replace the 2nd and 3rd paragraphs of section 52-6.03B with:**

01-18-13

Do not splice the following by lapping:

- 1. No. 14 bars
- 2. No. 18 bars
- 3. Hoops
- 4. Reinforcing bars where you cannot provide a minimum clear distance of 2 inches between the splice and the nearest adjacent bar

AA

**53 SHOTCRETE**

10-30-15

**Replace the 2nd and 3rd paragraphs of section 53-2.01D(1) with:**

10-30-15

Obtain cores for compressive strength testing under ASTM C1604/C1604M. Discard cores that contain bar reinforcement or other obstructions or show evidence of improper coring. Test cores for compressive strength at 28 days under ASTM C1604/C1604M at an authorized laboratory. The compressive strength is the average strength of at least 3 cores that are free from bar reinforcement or other obstructions.

Shotcrete must have a minimum compressive strength of 3,600 psi, unless otherwise described. The shotcrete must attain the minimum compressive strength at 28 days, except 42 days are allowed for shotcrete with a described minimum compressive strength greater than 3,600 psi.

**Replace item 2 in the list in the 4th paragraph of section 53-2.01D(3) with:**

10-30-15

- 2. Obtain 3-inch-diameter cores from the test panel.

**Replace item 4 in the list in the 4th paragraph of section 53-2.01D(3) with:**

10-30-15

- 4. Test cores for compressive strength. Discard cores that show evidence of improper coring.

**Replace the 1st paragraph of section 53-2.01D(4)(a) with:**

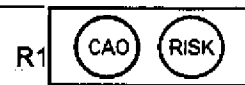
10-30-15

Obtain at least four 3-inch-diameter test cores from each 50 cu yd, or portion thereof, of shotcrete placed each day. Three cores must be free from reinforcement or obstructions. One core must include reinforcement. The Engineer determines each core location.

**Replace the 1st paragraph of section 53-2.01D(4)(b) with:**

10-30-15

Each core must be dense and be free of laminations and sand pockets. Any core with reinforcement must show reinforcement or other obstructions completely encased.



Delete the 1st paragraph of section 53-2.01D(4)(c).

10-30-15

Replace "ASTM C42/C42M" in the 5th paragraph of section 53-2.01D(4)(c) with:

ASTM C1604/C1604M

10-30-15

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**54 WATERPROOFING**

10-30-15

Add between "be" and "3/8 inch" in the 3rd paragraph of section 54-4.02C:

at least

04-20-12

Replace the 2nd paragraph of section 54-4.03A with:

Sweep or air blow the concrete surfaces to receive the seal to clean them of dirt, dust, gravel, loose concrete particles, and other extraneous materials. Remove projections and fill depressions that could damage the membrane.

10-30-15

Delete the 3rd paragraph of section 54-5.01A.

04-18-14

Delete "and HMA" in the 2nd paragraph of section 54-5.03.

04-18-14

Replace the last paragraph of section 54-5.03 with:

Do not allow traffic on the seal until HMA is placed over it.

04-18-14

Add to section 54:

**54-7 SILANE WATERPROOFING TREATMENT**

Reserved

07-19-13

**54-8-54-10 RESERVED**

\*\*\*\*\*

**55 STEEL STRUCTURES**

10-30-15

07-19-13

**Delete the 3rd paragraph in section 55-1.01C(1).****Replace the 3rd sentence of the 4th paragraph in section 55-1.01C(1) with:**

07-19-13

For ASTM F 1554 anchor bolts, include chemical composition and carbon equivalence for each heat of steel.

**Add to section 55-1.01C(1):**

07-19-13

For HS connections, submit a record of which lots are used in each joint as an informational submittal.

**Replace "sets" at each occurrence in the 1st paragraph of section 55-1.01C(2) with:**

04-19-13

copies

**Replace the list in the 2nd paragraph of section 55-1.01C(2) with:**

07-19-13

1. Sequence of shop and field assembly and erection. For continuous members, include proposed steel erection procedures with calculations that show girder capacity and geometry will be correct.
2. Welding sequences and procedures.
3. Layout drawing of the entire structure with locations of butt welded splices.
4. Locations of temporary supports and welds.
5. Vertical alignment of girders at each stage of erection.
6. Match-marking diagrams.
7. Details for connections not shown or dimensioned on the plans.
8. Details of allowed options incorporated in the work.
9. Direction of rolling of plates where orientation is specified.
10. Distortion control plan.
11. Dimensional tolerances. Include measures for controlling accumulated error to meet overall tolerances.
12. Material specification and grade listed on the bill of materials.
13. Identification of tension members and fracture critical members.
14. Proposed deviations from plans, specifications, or previously submitted shop drawings.
15. Contract plan sheet references for details.

**Replace Items 2 and 3 in the list in the 1st paragraph of section 55-1.01C(3) with:**

07-19-13

2. Tension flanges and webs of horizontally curved girders
3. Hanger plates

**Replace the 2nd paragraph of section 55-1.01C(3) with:**

07-19-13

Furnish plates, shapes, or bars with extra length to provide for removal of check samples.



07-19-13

**Delete the 1st and 2nd sentences in the 3rd paragraph of section 55-1.01C(3).**

**Replace the 4th paragraph of section 55-1.01C(3) with:**

07-19-13

Remove material for test samples in the Engineer's presence. Test samples for plates over 24 inches wide must be 10 by 12 inches with the long dimension transverse to the direction of rolling. Test samples for other products must be 12 inches long taken in the direction of rolling with a width equal to the product width.

**Replace the 1st sentence of the 6th paragraph in section 55-1.01C(3) with:**

07-19-13

Results of check testing are delivered to you within 20 days of receipt of samples at METS.

07-19-13

**Delete the 2nd paragraph of section 55-1.01D(1).**

**Replace the 2nd sentence of the 4th paragraph in section 55-1.01D(1) with:**

07-19-13

The calibration must be performed by an authorized repair and calibration center approved by the tool manufacturer.

**Add to section 55-1.01D(1):**

07-19-13

For bolts installed as snug tight, rotational capacity testing and installation tension testing are not required.

In addition to NDT requirements in AWS D1.5, ultrasonically test 25 percent of all main member tension butt welds in material over 1/2 inch thick.

Perform NDT on 100 percent of each pin as follows:

1. MT under ASTM A 788, S 18, with no linear indication allowed exceeding 3 mm
2. UT under ASTM A 788, S 20, level S and level DA in two perpendicular directions

The Engineer determines the location of all NDT testing for welding.

07-19-13

**Delete the 2nd paragraph of section 55-1.01D(3)(a).**

10-30-15

**Delete the 7th paragraph of section 55-1.01D(3)(b)(i).**

**Replace item 5 in the list in the 3rd paragraph of section 55-1.01D(3)(b)(ii) with:**

10-30-15

5. Assembly must not seize before the final rotation in step 9 is attained.

**Replace section 55-1.01D(4)(b) with:**

07-19-13

Perform rotational capacity testing on each rotational capacity lot under section 55-1.01D(3)(b) at the job site before installation.

**Replace the 1st sentence of the 2nd paragraph in section 55-1.01D(4)(c) with:**

07-19-13

Test 3 representative HS fastener assemblies under section 8 of *Specification for Structural Joints Using High-Strength Bolts* of the RCSC.

**Replace the 1st paragraph in section 55-1.01D(4)(d) with:**

07-19-13

Perform fastener tension testing to verify minimum tension in HS bolted connections no later than 48 hours after all fasteners in a connection have been tensioned.

**Replace the 3rd paragraph in section 55-1.01D(4)(d) with:**

07-19-13

Test 10 percent of each type of fastener assembly in each HS bolted connection for minimum tension using the procedure described in section 10 of *Specification for Structural Joints Using High-Strength Bolts* of the RCSC. Check at least 2 assemblies per connection. For short bolts, determine the inspection torque using steps 1 through 7 of "Arbitration of Disputes, Torque Method-Short Bolts" in *Structural Bolting Handbook* of the Steel Structures Technology Center.

**Replace the 1st table in the 1st paragraph of section 55-1.02A(1) with:**

07-19-13

<b>Structural Steel</b>	
Material	Specification
Carbon steel	ASTM A 709/A 709M, Grade 36 or {ASTM A36/A36M} <sup>a</sup>
HS low alloy columbium vanadium steel	ASTM A 709/A 709M, Grade 50 or {ASTM A 992/A 992M or ASTM A 572/A 572M, Grade 50} <sup>a</sup>
HS low alloy structural steel	ASTM A 709/A 709M, Grade 50W or Grade HPS 50W, or {ASTM A 588/A 588M} <sup>a</sup>
HS low alloy structural steel plate	ASTM A 709/A 709M, Grade HPS 70W
High-yield strength quenched and tempered alloy steel plate suitable for welding	ASTM A 709/A 709M, Grade 100, Grade 100W, or Grade HPS 100W, or {ASTM A 514/A 514M} <sup>a</sup>

<sup>a</sup>Grades you may substitute for the equivalent ASTM A 709 steel subject to the modifications and additions specified and to the requirements of ASTM A 709.

Replace the 2nd table in the 1st paragraph of section 55-1.02A(1) with:

07-19-13

Fasteners	
Material	Specification
Steel fastener components for general applications:	
Bolts and studs	ASTM A 307
Anchor bolts	ASTM F 1554 <sup>a</sup>
HS bolts and studs	ASTM A 449, Type 1 <sup>a</sup>
HS threaded rods	ASTM A 449, Type 1 <sup>a</sup>
HS nonheaded anchor bolts	ASTM F 1554, Grade 105, Class 2A <sup>a</sup>
Nuts	ASTM A 563, including appendix X1 <sup>b</sup>
Washers	ASTM F 844
Hardened Washers	ASTM F 436, Type 1, including S1 supplementary requirements
Components of HS steel fastener assemblies for use in structural steel joints:	
Bolts	ASTM A 325, Type 1
Tension control bolts	ASTM F 1852, Type 1
Nuts	ASTM A 563, including appendix X1 <sup>b</sup>
Hardened washers	ASTM F 436, Type 1, Circular, including S1 supplementary requirements
Direct tension indicators	ASTM F 959, Type 325, zinc-coated

<sup>a</sup>Use hardened washers.

<sup>b</sup>Zinc-coated nuts tightened beyond snug or wrench tight must be furnished with a dry lubricant complying with supplementary requirement S2 in ASTM A 563.

Replace the 3rd table in the 1st paragraph of section 55-1.02A(1) with:

07-19-13

Other Materials	
Material	Specification
Carbon steel for forgings, pins, and rollers	ASTM A 668/A 668M, Class D
Alloy steel for forgings	ASTM A 668/A 668M, Class G
Pin nuts	ASTM A 709/A 709M or ASTM A 563, including appendix X1 <sup>a</sup>
Carbon-steel castings	ASTM A 27/A 27M, Grade 65-35, Class 1
Malleable iron castings	ASTM A 47/A 47M, Grade 32510
Gray iron castings	ASTM A 48, Class 30B
Carbon steel structural tubing	ASTM A 500/A 500M, Grade B, ASTM A 501, ASTM A 847/A 847M, or ASTM A 1085
Steel pipe <sup>b</sup>	ASTM A 53, Type E or S, Grade B; ASTM A 106, Grade B; or ASTM A 139, Grade B
Stud connectors	ASTM A 108

<sup>a</sup>Zinc-coated nuts tightened beyond snug or wrench tight must be furnished with a dry lubricant complying with supplementary requirement S2 in ASTM A 563.

<sup>b</sup>Hydrostatic testing will not apply.

**Replace the table in the 1st paragraph in section 55-1.02A(2) with:**

07-19-13

Material complying with ASTM A 709/A 709M	CVN impact value (ft-lb at temperature)
Grade 36	15 at 40 °F
Grade 50 <sup>a</sup> (Thickness up to 2 inches)	15 at 40 °F
Grade 50W <sup>a</sup> (Thickness up to 2 inches)	15 at 40 °F
Grade 50 <sup>a</sup> (Thickness over 2 inches up to 4 inches )	20 at 40 °F
Grade 50W <sup>a</sup> (Thickness over 2 inches up to 4 inches)	20 at 40 °F
Grade HPS 50W <sup>a</sup> (Thickness up to 4 inches)	20 at 10 °F
Grade HPS 70W (Thickness up to 4 inches)	25 at -10 °F
Grade 100 (Thickness of 2-1/2 inches or less)	25 at 0 °F
Grade 100W (Thickness over 2-1/2 inches up to 4 inches)	35 at 0 °F
Grade HPS 100W (Thickness of 2-1/2 inches or less)	25 at -30 °F
Grade HPS 100W (Thickness over 2-1/2 inches up to 4 inches)	35 at -30 °F

<sup>a</sup>If the material yield strength is more than 65,000 psi, reduce the temperature for the CVN impact value 15 degrees F for each increment of 10,000 psi above 65,000 psi.

**Replace the 1st sentence of the 1st paragraph in section 55-1.02A(5) with:**

07-19-13

Steel, gray iron, and malleable iron castings must have continuous fillets cast in place in reentrant angles.

**Delete the 3rd and 4th sentences in the 2nd paragraph in section 55-1.02A(5).**

07-19-13

**Replace the 1st paragraph of section 55-1.02B(1) with:**

07-19-13

Section 55-1.02B(1) applies to work performed at the source and at the job site.

**Replace the 4th paragraph in section 55-1.02B(1) with:**

07-19-13

Ends of girder stiffeners shown as tight-fit must bear on the girder flange with at least point bearing. Local clearances between the end of the stiffener and the girder flange must be at most 1/16 inch.

**Replace the 1st sentence of the 5th paragraph in section 55-1.02B(1) with:**

07-19-13

Fabricate floor beams, stringers, and girders having end connection angles to exact length back to back of connection angles.

**Add to the 7th paragraph in section 55-1.02B(1):**

07-19-13

Use low-stress stamps for fracture critical members and tension members.

**Replace the 2nd sentence of the 9th paragraph in section 55-1.02B(1) with:**

07-19-13

Slightly round edges and sharp corners, including edges marred, cut, or roughened during handling or erection.

**Replace the 3rd paragraph of section 55-1.02B(2) with:**

10-30-15

Instead of machining, you may heat straighten steel slabs not in contact with other metal bearing surfaces if the above tolerances are met.

**Replace item 2 in the list in the 1st paragraph of section 55-1.02B(3) with:**

07-19-13

2. Radius of bend measured to the concave face must comply with *Manual of Steel Construction* of the AISC

**Replace the 1st sentence of the 2nd paragraph in section 55-1.02B(3) with:**

07-19-13

Plates to be bent to a smaller radius than specified in *Manual of Steel Construction* of the AISC must be bent hot.

**Replace the introductory clause of the 2nd paragraph of section 55-1.02B(4) with:**

07-19-13

Threads for pin ends and pin nuts 1-1/2 inches or more in diameter must comply with the following:

**Replace the 1st paragraph of section 55-1.02B(5) with:**

10-30-15

Pins must:

1. Be turned to the dimensions shown
2. Be straight, smooth, and free from flaws
3. Have the final surface produced by a finishing cut

**Replace the 3rd paragraph in section 55-1.02B(5) with:**

07-19-13

Holes for pins must be:

1. True to the diameter specified.
2. At right angles to the member axis.
3. Parallel with each other except for pins where nonparallel holes are required.
4. Smooth and straight with the final surface produced by a finishing cut.

**Replace the 1st paragraph in section 55-1.02B(6)(c) with:**

07-19-13

Bolted connections using HS fastener assemblies must comply with *Specification for Structural Joints Using High-Strength Bolts* of the RCSC.

**Replace the 7th paragraph in section 55-1.02B(6)(c) with:**

07-19-13

For all bolts, thread stickout after tensioning must be at least flush with the outer nut face. At least 3 full threads must be located within the grip of the connection.

**Delete the 3rd paragraph in section 55-1.02B(7)(a).**

07-19-13

**Add to section 55-1.02B(7)(a):**

07-19-13

For welds indicated to be subject to tensile forces that are to receive RT, grind smooth and flush on both sides of welds before testing.

For groove weld surface profiles that interfere with NDT procedures, grind welds smooth and blend with the adjacent material.

For fillet weld surface profiles that interfere with NDT procedures, grind welds and blend the toes smoothly with the adjacent base metal.

**Add to section 55-1.02B(7):**

07-19-13

**55-1.02B(7)(c) Steel Pedestrian Bridges**

Reserved

**Replace the 1st paragraph in section 55-1.02B(9) with:**

07-19-13

Prepare and paint contact surfaces of HS bolted connections before assembly. Thoroughly clean all other surfaces of metal in contact to bare metal before assembly. Remove all rust, mill scale, and foreign material.

**Replace the 1st sentence of the 4th paragraph in section 55-1.02B(9) with:**

07-19-13

Preassemble truss work in lengths of at least 3 abutting panels and adjust members for line and camber.

**Replace the 1st sentence of the 5th paragraph in section 55-1.02B(9) with:**

07-19-13

Preassemble bolted splice joints for plate girders in lengths of at least 3 abutting sections and adjust abutting sections for line and camber.

**Replace the 6th paragraph in section 55-1.02B(9) with:**

07-19-13

Preassemble prepared splice joints for welded girders with abutting members and adjust for line and camber.

**Replace the paragraphs in section 55-1.03C(1) with:**

07-19-13

Reserved

**Replace the 3rd sentence of the 1st paragraph in section 55-1.03C(2) with:**

07-19-13

Attain full bearing on the concrete under bearing assemblies.

**Replace the 3rd paragraph in section 55-1.03C(2) with:**

07-19-13

During welding, protect bearings and bearing surfaces using authorized methods.

**Replace section 55-1.03C(4) with:**

07-19-13

**55-1.03C(4) Continuous Members**

Unless otherwise shown, structural steel girders are designed for continuity in supporting girder dead load. If erection procedures provide girder continuity for dead load, preassemble members with field joints in a no-load condition in a horizontal or an upright condition.

You may erect structural steel girders such that dead load girder continuity is not provided. If erection procedures do not provide girder continuity for dead load:

1. You may increase cross-sectional areas or change grades of steel to provide the specified capacity if authorized.
2. After erection, the erected structure must have a load-carrying capacity at least equal to the structure shown.

\*\*\*\*\*

**56 SIGNS**

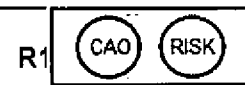
10-30-15

**Replace the 4th paragraph of section 56-3.01A with:**

07-19-13

The types of sign structures include:

1. Truss
2. Bridge mounted
3. Tubular



**Replace the subheadings and paragraphs in section 56-3.01C with:**

10-30-15

**56-3.01C(1) General**

Allow 30 days for the Department's review.

**56-3.01C(2) Shop Drawings**

Submit 2 copies of shop drawings for sign structures. Include:

1. Sign panel dimensions
2. Span lengths
3. Post heights
4. Anchorage layouts
5. Proposed splice locations
6. Snugging and tensioning pattern for anchor bolts and HS bolted connections
7. Details for permanent steel anchor bolt templates
8. Details of clips, eyes, or removable devices for preventing damage to the finished galvanized or painted surfaces used for:
  - 8.1 Securing the sign during shipping
  - 8.2 Lifting and moving during erection

**56-3.01C(3) Quality Control Program**

Submit a QC program for sign structures. Include methods, equipment, and personnel to be used during fabrication and installation.

Submit the QC program with the shop drawing submittal.

**Replace "sets" in the 1st paragraph of section 56-3.01C(2) with:**

04-19-13

copies

**Replace the 1st and 2nd paragraphs of section 56-3.01D(2)(b) with:**

10-30-15

For UT of welded joints with any members less than 5/16 inch thick or tubular sections less than 13 inches in diameter, the acceptance and repair criteria must comply with Clause 6.13.3.1 of AWS D1.1.

For UT of other welded joints, the acceptance and repair criteria must comply with Table 6.3 of AWS D1.1 for cyclically loaded nontubular connections.

**Replace the 4th paragraph of section 56-3.02B with:**

10-30-15

Structural tubing and hollow structural sections must be structural steel complying with ASTM A500/A500M, Grade B or ASTM A1085.

**Delete the 7th paragraph of section 56-3.02K(2).**

07-20-12

**Replace the 1st paragraph of section 56-3.02M(1) with:**

07-19-13

Galvanize all ferrous metal parts of the following sign structure types:

1. Truss



- 2. Bridge mounted
- 3. Tubular

**Add between the 1st and 2nd paragraphs of section 56-3.02M(1):**

04-19-13

Clean and paint all ferrous metal parts of tubular sign structures after galvanizing, including the areas to be covered by sign panels. Do not paint sign structures other than tubular type unless specified in the special provisions.

**Replace the headings and paragraphs in section 56-3.02M(3) with:**

04-19-13

Where specified, clean and paint sign structures under section 59-5.

\*\*\*\*\*

**57 WOOD AND PLASTIC LUMBER STRUCTURES**

10-30-15

**Replace the 2nd and 3rd paragraphs of section 57-2.01B(2) with:**

10-30-15

Structural timber and lumber must be inspected and grade marked under the rules and specifications shown in the following table:

**Replace the 9th paragraph of section 57-2.01B(2) with:**

10-30-15

Glued laminated timbers must comply with ANSI/AITC A190.1 and AITC 117, published by the American Institute of Timber Construction.

**Delete the 2nd and 4th paragraphs of section 57-2.01B(3).**

10-30-15

**Replace "57-2.01C(3)" in the 1st paragraph of section 57-2.01C(3)(a) with:**

10-19-12

57-2.01C(3)

**Add to section 57-2.01C(3)(a):**

10-30-15

Treated timber must be preservative-treated Douglas fir or Hem-fir. Chromated copper arsenate must not be used for preservative treatment.

**Add to section 57-2.02B:**

10-30-15

Chromated copper arsenate must not be used for preservative treatment.

**Replace the 2nd sentence of the 1st paragraph of section 57-2.03B(3) with:**

The wire rope must be furnished with Class A weight zinc-coated wire under ASTM A603.

10-30-15

**Replace "sets" at each occurrence in the 1st paragraph of section 57-3.01C with:**

copies

04-19-13

AA

**58 SOUND WALLS**

04-19-13

10-19-12

**Delete the 3rd paragraph of section 58-1.01.**

**Replace the 1st paragraph of section 58-2.01D(5)(a) with:**

08-05-11

You must employ a special inspector and an authorized laboratory to perform Level 1 inspections and structural tests of masonry to verify the masonry construction complies with section 1704, "Special Inspections," and section 2105, "Quality Assurance," of the 2007 CBC.

10-19-12

**Delete the 1st paragraph of section 58-2.02F.**

**Replace "sets" at each occurrence in the 1st paragraph of section 58-4.01C with:**

copies

04-19-13

AA

**59 PAINTING**

11-15-13

**Replace "SSPC-SP 10" at each occurrence in section 59 with:**

10-19-12

SSPC-SP 10/NACE no. 2

**Replace "SSPC-SP 6" at each occurrence in section 59 with:**

10-19-12

SSPC-SP 6/NACE no. 3

**Replace "SSPC-CS 23.00" at each occurrence in section 59 with:**

10-19-12

SSPC-CS 23.00/AWS C 2.23M/NACE no. 12

**Replace "Specification for Structural Joints Using ASTM A325 or A 490 Bolts" in the 1st paragraph of section 59-2.01C(1) with:**

07-19-13

*Specification for Structural Joints Using High-Strength Bolts*

**Replace "SSPC-QP 3 or AISC SPE, Certification P-1 Enclosed" in item 3 in the list in the 1st paragraph of section 59-2.01D(1) with:**

10-19-12

AISC-420-10/SSPC-QP 3 (Enclosed Shop)

**Replace "Specification for Structural Joints Using ASTM A325 or A 490 Bolts" in the 1st paragraph of section 59-2.02 with:**

07-19-13

*Specification for Structural Joints Using High-Strength Bolts*

**Replace the paragraphs in section 59-2.03A with:**

10-19-12

Clean and paint all exposed structural steel and other metal surfaces.

You must provide enclosures for cleaning and painting structural steel. Cleaning and painting of new structural steel must be performed in an Enclosed Shop as defined in AISC-420-10/SSPC-QP 3. Maintain atmospheric conditions inside enclosures within specified limits.

Except for blast cleaning within closed buildings, perform blast cleaning and painting during daylight hours.

**Add to section 59-2.03B:**

07-19-13

### **59-2.03B(3) Containment Systems**

#### **59-2.03B(3)(a) General**

Construct containment systems when disturbing existing paint systems during bridge rehabilitation.

The containment system must be one of the following:

1. Ventilated containment system
2. Vacuum-shrouded surface preparation equipment and drapes and ground covers
3. Equivalent containment system if authorized

The containment system must contain all water, resulting debris, and visible dust produced when the existing paint system is disturbed.

Properly maintain the containment system while work is in progress and do not change the containment system unless authorized.

Containment systems over railroad property must provide the minimum clearances as specified in section 5-1.20C for the passage of railroad traffic.

**59-2.03B(3)(b) Ventilated Containment Systems****59-2.03B(3)(b)(i) General**

If flexible framing is used, support and fasten it to (1) prevent the escape of abrasive and blast materials due to whipping from traffic or wind and (2) maintain clearances.

If the wind speed reaches 50 mph or greater, relieve the wind pressure on the containment system using an authorized method.

**59-2.03B(3)(b)(ii) Design Criteria**

Scaffolding or supports for the ventilated containment system must not extend below the vertical clearance level nor to the ground line at locations within the roadbed.

For truss-type bridges, all connections of the ventilated containment system to the existing structure must be made through the deck, girder, stringer, or floor beam system. No connections are allowed that will cause bending stresses in a truss member.

The ventilated containment system must comply with section 7-1.02K(6)(e).

The minimum total design load for the ventilated containment system must consist of the sum of the dead and live vertical loads.

Dead and live loads are as follows:

1. Dead load must consist of the actual load of the ventilated containment system
2. Live loads for bridges with only spot blast cleaning work must consist of:
  - 2.1. Uniform load of at least 25 psf applied over the supported area
  - 2.2. Moving concentrated load of 1000 lb to produce maximum stress in the main supporting elements of the ventilated containment system
3. Live loads for bridges with 100 percent blast cleaning to bare metal must consist of:
  - 3.1. Uniform load of at least 45 psf, which includes 20 psf of sand load, applied over the supported area
  - 3.2. Moving concentrated load of 1000 lb to produce maximum stress in the main supporting elements of the ventilated containment system

Assumed horizontal loads do not need to be included in the design of the ventilated containment system.

Maximum allowable stresses must comply with section 48-2.01D(3)(c).

**59-2.03B(3)(b)(iii) Ventilation**

The ventilation system in the ventilated containment system must be of the forced input airflow type with fans or blowers.

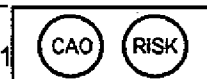
Negative air pressure must be employed within the ventilated containment system and will be verified by visual methods by observing the concave nature of the ventilated containment system while taking into account wind effects or by using smoke or other visible means to observe airflow. The input airflow must be properly balanced with the exhaust capacity throughout the range of operations.

The exhaust airflow of the ventilation system in the ventilated containment system must be forced into wet or dry dust collectors or bag houses.

**Replace item 1 in the list in the 2nd paragraph of section 59-2.03C(1) with:**

10-19-12

1. Apply a stripe coat of undercoat paint on all edges, corners, seams, crevices, interior angles, junctions of joining members, weld lines, and similar surface irregularities. The stripe coat must completely hide the surface being covered. If spot blast cleaning portions of the bridge, apply the stripe coat of undercoat paint before each undercoat and follow with the undercoat as soon as



practical. If removing all existing paint from the bridge, apply the undercoat first as soon as practical and follow with the stripe coat of undercoat paint for each undercoat.

**Replace the heading of section 59-2.03C(2) with:**

04-19-13

**Zinc Coating System**

**Add to section 59-2.03C(2)(a):**

04-19-13

Coatings for new structural steel and connections between new and existing structural steel must comply with the requirements shown in the following table:

<b>Zinc Coating System</b>		
Description	Coating	Dry film thickness (mils)
<b>All new surfaces:</b>		
Undercoat	Inorganic zinc primer, AASHTO M 300 Type I or II	4-8
Finish coat <sup>a</sup>	Exterior grade latex <sup>b</sup> , 2 coats	2 minimum each coat, 4-8 total
Total thickness, all coats		8-14
<b>Connections to existing structural steel:<sup>c</sup></b>		
Undercoat	Inorganic zinc primer, AASHTO M 300 Type I or II	4-8
Finish coat <sup>a</sup>	Exterior grade latex <sup>b</sup> , 2 coats	2 minimum each coat, 4-8 total
Total thickness, all coats		8-14

<sup>a</sup>If no finish coats are described, a final coat of inorganic zinc primer is required.

<sup>b</sup>Exterior grade latex must comply with section 91-2.02 unless otherwise specified.

<sup>c</sup>Includes the following locations:

1. New and existing contact surfaces
2. Existing member surfaces under new HS bolt heads, nuts, or washers
3. Bare surfaces of existing steel after trimming, cutting, drilling, or reaming
4. Areas within a 4-inch radius from the point of application of heat for welding or flame cutting

**Replace "Specification for Structural Joints Using ASTM A325 or A 490 Bolts" in the 7th paragraph of section 59-2.03C(2)(b)(i) with:**

07-19-13

*Specification for Structural Joints Using High-Strength Bolts*

**Add to section 59-2.03C:**

04-19-13

**59-2.03C(3) Moisture-Cured Polyurethane Coating System**

Reserved

**59-2.03C(4) State Specification Paint Waterborne Coating System**

**59-2.03C(4)(a) General**

The State Specification PWB coating system for existing structural steel must comply with the requirements shown in the following table:

<b>State Specification PWB Coating System</b>			
Surface	Description	State Specification PWB Coating	Dry film thickness (mils)
Surfaces cleaned to bare metal <sup>a</sup> :	1st undercoat	145	2-3
	2nd undercoat	146	2-3
	1st finish coat	171	1.5-3
	2nd finish coat	172	1.5-3
	Total thickness, all coats:	--	7-12
Existing painted surfaces to be topcoated:	Undercoat	146	2-3
	1st finish coat	171	1.5-3
	2nd finish coat	172	1.5-3
	Total thickness, new coats	--	5-9

<sup>a</sup>Includes locations of spot blast cleaning

**59-2.03C(4)(b) Finish Coats**

11-15-13

Reserved

**Add to section 59-5.01:**

04-19-13

Where specified, prepare and paint sign structures under sections 59-2 and 59-3.

Instead of submitting proof of the certification complying with SSPC-QP 1, you may submit documentation with the painting quality work plan showing compliance with the requirements in section 3 of SSPC-QP 1.

Instead of submitting proof of the certification complying with SSPC-QP 2, you may submit documentation with the painting quality work plan showing compliance with the requirements in sections 4.2 through 4.4 of SSPC-QP 2, Category A.

Instead of submitting proof of the certification complying with AISC-420-10/SSPC-QP 3 (Enclosed Shop), you may submit documentation with the painting quality work plan showing compliance with the requirements in sections 5 through 18 of AISC-420-10/SSPC-QP3.

**Replace the paragraphs of section 59-5.03 with:**

04-19-13

**59-5.03A General**

You may prepare and paint sign structures before or after erection. After erection, repair damaged paint to the satisfaction of the Engineer.

The total dry film thickness of finish coats on contact surfaces of galvanized HS bolted connections (1) must be from 1 to 4 mils and (2) may be applied in 1 application.

**59-5.03B Undercoating of Ungalvanized Surfaces**

Blast-cleaned surfaces must receive a single undercoat consisting of an inorganic zinc coating as specified in AASHTO M 300, Type I or Type II, except:

1. The first 2 sentences of section 5.6 do not apply
2. Section 5.6.1 does not apply

If you propose to use a coating that is not on the Authorized Material List, submit the required documentation specified in section 5.6 of AASHTO M 300. Allow 30 days for the Engineer's review.

#### **59-5.03C Testing of Inorganic Zinc Coating**

Perform adhesion and hardness testing no sooner than 72 hours after application of the single undercoat of inorganic zinc coating.

#### **59-5.03D Finish Coating**

The exposed area of inorganic zinc coating must receive a minimum of 2 finish coats of exterior grade latex paint.

The 1st finish coat color must match no. 24558 of FED-STD-595. The 2nd finish coat color must match no. 24491 of FED-STD-595. The total dry film thickness of the applications of the 2nd finish coat must be not less than 2 mils.

**Replace section 59-7 with:**

07-19-13

### **59-7 STAINING CONCRETE AND SHOTCRETE**

#### **59-7.01 GENERAL**

##### **59-7.01A General**

##### **59-7.01A(1) Summary**

Section 59-7.01 includes specifications for preparing and staining concrete and shotcrete surfaces using an acid stain.

##### **59-7.01A(2) Definitions**

Reserved

##### **59-7.01A(3) Submittals**

Submit stain manufacturer's product data and application instructions at least 7 days before starting staining activities.

##### **59-7.01A(4) Quality Control and Assurance**

Reserved

##### **59-7.01B Materials**

##### **59-7.01B(1) General**

Reserved

##### **59-7.01B(2) Stain**

Stain must:

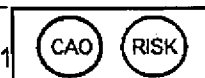
1. Be a water-based solution of inorganic metallic salts
2. Contain dilute acid that penetrates and etches the concrete or shotcrete surface
3. Be a commercial quality product designed specifically for exterior applications
4. Produce abrasion-resistant color deposits

##### **59-7.01B(3) Sealer**

Reserved

##### **59-7.01B(4) Joint Sealing Compound**

Reserved



**59-7.01C Construction****59-7.01C(1) General**

Seal joints between concrete and shotcrete surfaces to be stained and adjacent metal with joint sealing compound before applying the stain.

Test surfaces for acceptance of the stain before applying the stain. Clean surfaces that resist accepting the stain and retest until passing.

Apply the stain under the manufacturer's instructions.

Before staining, the concrete or shotcrete surfaces must be:

1. At least 28 days old
2. Prepared under SSPC-SP 13/NACE no. 6
3. Thoroughly dry

Apply the stain uniformly to avoid excessive rundown. Work the stain into the concrete using a nylon bristle brush in a circular motion.

After the last coat of stain has dried, rinse stained surfaces with water and wet scrub with a stiff bristle nylon brush until the rinse water runs clear. Collect all rinse water.

Protect adjacent surfaces during staining.

Thoroughly cure each application of the stain and correct skips, holidays, thin areas, or other deficiencies before the next application.

Drips, puddles, or other irregularities must be worked into the concrete or shotcrete surface.

**59-7.01C(2) Test Panel**

For staining concrete or shotcrete, stain a test panel complying with section 51-1.01D(3).

For staining sculpted shotcrete, stain a test panel complying with section 53-3.01D(3).

The test panel must be:

1. Stained using the same personnel, materials, equipment and methods to be used in the work
2. Accessible for viewing
3. Displayed in an upright position near the work
4. Authorized for staining before starting the staining work

If ordered, construct additional test panels until a satisfactory color is attained.

The Engineer uses the authorized stained test panel to determine the acceptability of the stained surface.

Dispose of the test panels after the staining work is complete and authorized. Notify the Engineer before disposing of the test panels.

**59-7.01D Payment**

Not Used

**59-7.02 SCULPTED SHOTCRETE AND TEXTURED CONCRETE****59-7.02A General****59-7.02A(1) Summary**

Section 59-7.02 includes specifications for preparing and staining sculpted shotcrete and textured concrete surfaces using an acid stain.

**59-7.02A(2) Definitions**

Reserved



**59-7.02A(3) Submittals****59-7.02A(3)(a) General**

Reserved

**59-7.02A(3)(b) Experience Qualifications**

Submit the following documentation of the staining subcontractor's experience at least 10 days before the preconstruction meeting:

1. Summary of the staining subcontractor's experience that demonstrates compliance with section 59-7.02A(4)(b).
2. List of at least 3 projects completed in the last 5 years that demonstrate the staining subcontractor's ability to stain textured concrete or sculpted shotcrete surfaces similar to the textured concrete or sculpted shotcrete for this project. For each project include:
  - 2.1. Project description
  - 2.2. Name and phone number of the owner
  - 2.3. Staining completion date
  - 2.4. Color photos of the completed stained surface

**59-7.02A(3)(c) Installation Plan**

Submit an installation plan at least 10 days before the preconstruction meeting. The installation plan must include details for preparing and staining the textured concrete or sculpted shotcrete to achieve the required color, including:

1. Number of applications that will be used to apply the stain
2. For each application of the stain, a description of:
  - 2.1. Manufacturer, color, finish, and percentage strength mixture of the stain that will be applied
  - 2.2. Methods and tools that will be used to apply the stain
3. Methods for protecting adjacent surfaces during staining
4. Rinse water collection plan for containing all liquid, effluent, and residue resulting from preparing and staining textured concrete or sculpted shotcrete

**59-7.02A(4) Quality Control and Assurance****59-7.02A(4)(a) General**

Reserved

**59-7.02A(4)(b) Contractor Qualifications**

The staining subcontractor must:

1. Have experience in staining textured concrete or sculpted shotcrete surfaces to simulate the appearance of natural rock formations or stone masonry
2. Have successfully completed at least 3 projects in the past 5 years involving staining of concrete or sculpted shotcrete surfaces similar to the textured concrete or sculpted shotcrete for this project

**59-7.02A(4)(c) Preconstruction Meeting**

Before starting staining activities, conduct a meeting to discuss the installation plan. Meeting attendees must include the Engineer and all staining subcontractors.

**59-7.02B Materials**

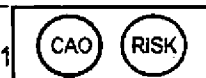
Not Used

**59-7.02C Construction**

Not Used

**59-7.02D Payment**

Prepare and stain concrete and prepare and stain shotcrete are measured by the area of the vertical or sloped wall face stained.



Replace "solider" in the 5th paragraph of section 59-9.03 with:

soldier

04-19-13

Replace section 59-11 with:

**59-11 STAINING GALVANIZED SURFACES**

Reserved

07-19-13

Replace section 59-12 with:

**59-12 ROCK STAINING**

07-19-13

**59-12.01 GENERAL**

**59-12.01A Summary**

Section 59-12 includes specifications for applying stain to the exterior surface of landscape boulders, native rock that has been damaged or scarred, rock energy dissipaters, rock slope protection and gabion surfaces.

**59-12.01B Submittals**

Submit the following:

1. Work plan showing methods to control overspray and spillage, and to protect adjacent surfaces
2. Product data including the manufacturer's product sheet and the instructions for the application of the stain

**59-12.01C Quality Control and Assurance**

**59-12.01C(1) General**

Reserved

**59-12.01C(2) Test Plot**

Apply the stain to a test plot rock area of at least 3 by 3 feet at a location designated by the Engineer. Notify the Engineer at least 7 days before staining the test plot. Prepare and stain the test plot with the same materials, tools, equipment, and methods to be used in staining the final surfaces. Separate test plots are required for staining rock slope protection and native rock.

If ordered, prepare additional test plots. Additional test plots are change order work.

Obtain authorization of the test plot before starting the staining work. Use the authorized test plot as the standard for comparison in determining acceptability of staining. If the test plot is not incorporated into the work and the Engineer determines it is no longer needed, dispose of it.

**59-12.02 MATERIALS**

**59-12.02A General**

Reserved

**59-12.02B Stain**

Reserved

**59-12.03 CONSTRUCTION**

**59-12.03A General**

Reserved



**Replace item 1 in the list in the 3rd paragraph of section 64-1.02E with:**

07-19-13

- 1. If watertight joints are shown, use Type S corrugated polyethylene pipe with gaskets. If watertight joints are not shown, use gasketed joints when specified. Gaskets for Type C corrugated polyethylene pipe must be installed on each side of the joint. Gaskets must comply with ASTM F477 and be factory-installed.

**Replace section 64-2 with:**

10-30-15

**64-2 RESERVED**

AA

**65 CONCRETE PIPE**

07-19-13

**Replace the 2nd paragraph of section 65-1.01 with:**

10-19-12

Concrete pipe includes all necessary elbows, wyes, tees, other branches, concrete collars or tees, and reinforcement.

**Replace section 65-2.02D with:**

07-19-13

**65-2.02D Reserved**

AA

**68 SUBSURFACE DRAINS**

04-18-14

**Replace the 5th paragraph of section 68-4.02E with:**

04-18-14

HMA for backfilling trenches must comply with HMA for miscellaneous areas as specified in section 39.

AA

**70 MISCELLANEOUS DRAINAGE FACILITIES**

07-19-13

**Replace section 70-5.02A(2) with:**

01-20-12

**70-5.02A(2) Plastic Flared End Sections**

Plastic flared end sections must comply with ASTM D 3350.

**Replace "40-1.03N" in item 2.4 of the 1st paragraph of section 70-5.06C with:**

07-19-13

**40-1.03K**

**Replace the 2nd, 3rd, and 4th paragraphs of section 70-7.02B with:**

01-18-13

Before shipping, the exterior surfaces of the casing must be cleaned, primed, and coated to comply with ANSI/AWWA C213 or ANSI/AWWA C214.

Wrapping tape for repairing damaged coating and wrapping field joints and fittings must be a pressure-sensitive PVC or polyethylene tape with a minimum thickness of 50 mils, 2 inches wide.

**Add to section 70-7.03:**

01-18-13

Repair damaged coating on the casing and wrap field joints and fittings with wrapping tape as follows:

1. Before wrapping, thoroughly clean and prime the pipe casing, joints, and fittings under the tape manufacturer's instructions.
2. Wrap the tape tightly with 1/2 uniform lap, free from wrinkles and voids to provide not less than a 100-mil thickness.
3. Wrapping at joints must extend at least 6 inches over adjacent pipe casing coverings. Apply tension such that the tape will conform closely to contours of the joint.

**Add to section 70:**

07-19-13

**70-8-70-15 RESERVED**

\*\*\*\*\*

**DIVISION VIII MISCELLANEOUS CONSTRUCTION  
72 SLOPE PROTECTION**

11-15-13

**Replace the table in the 3rd paragraph of section 72-2.02A with:**

11-15-13

**Rock Material Properties**

Property	California Test	Value
Apparent specific gravity	206	2.5 minimum
Absorption	206	4.2% maximum
Durability Index	229	52 minimum

**Notes:**

Durability absorption ratio (DAR) =  $\text{durability index} / (\% \text{ absorption} + 1)$

If the DAR is greater than 10, the absorption may exceed 4.2%

If the DAR is greater than 24, the durability index may be less than 52

**Replace the row under "Class" in the table in the 1st paragraph of section 72-3.02B with:**

01-20-12

1/2 T	1/4 T	Light	Facing	Cobble
-------	-------	-------	--------	--------

Replace the table in the 2nd paragraph of section 72-3.02B with:

11-15-13

Rock Material Properties		
Property	California Test	Value
Apparent specific gravity	206	2.5 minimum
Absorption	206	4.2% maximum
Durability index	229	52 minimum

Notes:

Durability absorption ratio (DAR) = course durability index/(% absorption + 1)

If the DAR is greater than 10, the absorption may exceed 4.2%

If the DAR is greater than 24, the durability index may be less than 52

Replace the row under "Rock class" in the table in the 2nd paragraph of section 72-3.03E with:

01-20-12

1/2 T	1/4 T	Light	Facing	Cobble
-------	-------	-------	--------	--------

Delete the 5th and 6th paragraphs of section 72-11.01B.

07-19-13

Add to section 72-11.01B:

Expanded polystyrene and premolded expansion joint filler must comply with section 51-2.

01-18-13

Delete the 2nd paragraph of section 72-11.01C(1).

07-19-13

Delete the 7th paragraph of section 72-11.01C(1).

07-19-13

Add between the 7th and 8th paragraphs of section 72-11.01C(1):

07-19-13

Schedule the construction of the slope paving such that the work, including placing and finishing concrete and applying curing compound, is completed on the same day that the work is started.

Replace the 8th paragraph of section 72-11.01C(1) with:

07-19-13

If the Engineer determines that the size of the slope paving is too large to be constructed without an intermediate construction joint, place a joint at an authorized location. Complete a section of concrete bounded by permissible construction joints within the same day.

Replace the 1st paragraph of section 72-11.01C(2) with:

01-18-13

Construct and finish minor concrete slope paving under section 51-1.

**Replace the 3rd paragraph of section 72-11.01C(2) with:**

07-19-13

After striking-off to grade, hand float the concrete with floats that are at least 4 inches wide and 30 inches long. Broom the entire surface with a stiff-bristled broom to produce a uniform surface. Brooming must be done when the surface is sufficiently set to prevent deep scarring and must be accomplished by drawing the broom down the slope, leaving marks parallel to the slope. The Engineer may order you to apply a fine spray of water to the surface immediately before brooming.

**Delete the 3rd paragraph of section 72-11.01D.**

07-19-13

\*\*\*\*\*

### **73 CONCRETE CURBS AND SIDEWALKS**

07-19-13

**Replace the paragraph in section 73-1.01A with:**

07-19-13

Section 73-1 includes general specifications for constructing minor concrete items including concrete curbs, sidewalks, gutter depressions, driveways, island paving, and curb ramps; for installing detectable warning surfaces and precast parking bumpers; and for texturing and coloring concrete surfaces.

\*\*\*\*\*

### **74 PUMPING EQUIPMENT AND CONTROLS**

04-19-13

**Replace the 1st paragraph of section 74-1.01C(3) with:**

04-19-13

Submit at least 5 copies of product data to OSD, Documents Unit. Each copy must be bound together and include an index stating equipment names, manufacturers, and model numbers. Two copies will be returned. Notify the Engineer of the submittal. Include in the notification the date and contents of the submittal.

**Replace the 1st sentence of the 1st paragraph in section 74-2.01D(2) with:**

01-20-12

Drainage pumps must be factory certified under ANSI/HI 14.6.

\*\*\*\*\*

### **75 MISCELLANEOUS METAL**

10-30-15

**Add between 2nd and 3rd paragraphs of section 75-1.03A:**

07-19-13

Fabricate expansion joint armor from steel plates, angles, or other structural shapes. Shape the armor to the section of the concrete deck and match-mark it in the shop. Straighten warped sections of expansion joint armor before placing. Secure the expansion joint armor in the correct position during concrete placement.

**Replace "SSPC-QP 3" in the 3rd paragraph of section 75-1.03E(4) with:**

10-19-12

AISC-420-10/SSPC-QP3

**Replace the 7th paragraph of section 75-1.03F with:**

10-30-15

Before applying any nonskid material, demonstrate the method of application to the Engineer by preparing a 1-sq ft test sample applied on hardboard at least 1/4 inch thick. The nonskid surface must have a total thickness from 1/8–3/16 inch.

**Replace "metal beam guard railing" in the table in the 1st paragraph of section 75-1.05 with:**

07-19-13

guardrail

\*\*\*\*\*

**Replace section 78 with:**

07-20-12

**78 INCIDENTAL CONSTRUCTION**

07-20-12

**78-1 GENERAL**

Section 78 includes specifications for incidental bid items that are not closely associated with other sections.

**78-2-78-50 RESERVED**

\*\*\*\*\*

**80 FENCES**

07-18-14

**Add to section 80-2.02D:**

10-19-12

Vertical stays must:

- 1. Comply with ASTM A641
- 2. Be 12-1/2 gage
- 3. Have a Class 3 zinc coating

**Replace item 1 in the list in section 80-2.02E with:**

10-19-12

Comply with ASTM A 116, Type Z, Grade 60, Class 1



**Add after "galvanized wire" in the 1st paragraph of section 80-2.02F:**

complying with ASTM A 641

10-19-12

**Replace the 3rd and 4th paragraphs of section 80-2.02F with:**

Each staple used to fasten barbed wire and wire mesh fabric to wood posts must:

10-19-12

1. Comply with ASTM F 1667
2. Be at least 1-3/4 inches long
3. Be manufactured from 9-gage galvanized wire

Wire ties used to fasten barbed wire and wire mesh to metal posts must be at least 11-gage galvanized wire complying with ASTM F 626. Clips and hog rings used for metal posts must be at least 9-gage galvanized wire complying with ASTM F 626.

**Replace the 8th through 14th paragraphs of section 80-2.03 with:**

10-19-12

Attach the wire mesh and barbed wire to each post.

Securely fasten tension wires to wood posts. Make a single or double loop around each post at each attachment point and staple the wire to the post. Use wire ties, hog rings, or wire clips to fasten the wires to the metal posts.

Connect each wood brace to its adjacent post with a 3/8 by 4-inch steel dowel. Twist the tension wires until the installation is rigid.

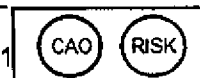
Stretch barbed wire and wire mesh fabric and fasten to each wood or steel end, corner, or gate post. Apply tension according to the manufacturer's instructions using a mechanical stretcher or other device designed for such use. If no tension is specified by the manufacturer, use 250 pounds for the required tension. Evenly distribute the pull over the longitudinal wires in the wire mesh such that no more than 50 percent of the original depth of the tension curves is removed. Do not use a motorized vehicle, truck, or tractor to stretch the wire.

Attach barbed wire and wire mesh fabric to the private-property side of posts. On curved alignments, place the wire mesh and barbed wire on the face of the post against which the normal pull of the wire mesh and wire will be exerted. Terminate the wire mesh and barbed wire at each end, corner, pull, and gate post in the new fence line. Attach wire mesh and barbed wire to each wood or steel end, corner, pull, or gate post by wrapping each horizontal strand around the post and tying it back on itself with at least 4 tightly-wound wraps.

At line posts, fasten the wire mesh to the post at the top and bottom and at intermediate points not exceeding 10 inches apart. Fasten each line of barbed wire to each line post. Use wire ties or clips to fasten the wires to metal posts under the post manufacturer's instructions. Drive staples crosswise with the grain of the wood and pointed slightly downward. Drive staples just short of actual contact with the wires to allow free longitudinal movement of those wires and to prevent damage to the wire's protective coating. Secure all wires to posts to maintain horizontal alignment.

Splices in barbed wire and wire mesh are allowed provided there are no more than 2 splices per 50 feet of fence. Use commercially-available galvanized mechanical wire splices or a wire splice created by tying off wire. Install mechanical wire splices with a tool designed for that purpose under the manufacturer's instructions. Tie off the wire as follows:

1. Carry the ends of each wire 3 inches past the tied-off knot location and wrap around the wire for at least 6 turns in opposite directions.
2. Remove the splice tool and close the space by pulling the end of the wires together.



3. Cut the unused ends of the wire close and neat.

07-18-14

**Delete "resisting moment" and its definition in section 80-3.01B.**

**Add to section 80-3.01B:**

07-18-14

**posts and braces:** Framework that supports the metal fabric for chain link fence. Posts and braces include round and roll-formed cross sections used as line, end, latch, or corner posts and braces.

**Add to section 80-3.01C:**

07-18-14

Submit a certificate of compliance for posts and braces that includes the information specified in ASTM F1043, section 9.

07-18-14

**Delete section 80-3.01D.**

**Replace the 1st paragraph of section 80-3.02B with:**

07-18-14

The base metal for posts and braces must be commercial-quality, weldable steel complying with AASHTO M 181, Type 1, except for the protective coating requirements.

Posts and braces must comply with the strength requirements in ASTM F1043:

- 1. Group IA, regular grade, for round posts
- 2. Group II-L for roll-formed posts and braces

07-18-14

**Delete the 4th through 8th paragraphs of section 80-3.02B.**

**Add between "coating" and "unless" in the 1st sentence of section 80-3.02C:**

07-18-14

or ASTM F1345, Class 2,

\*\*\*\*\*

## **DIVISION IX TRAFFIC CONTROL FACILITIES**

### **83 RAILINGS AND BARRIERS**

10-30-15

**Replace "metal beam guard railing" at each occurrence in sections 83-1.02 and 83-1.03 with:**

07-19-13

midwest guardrail system

**Replace "guard rail" and "guard railing" at each occurrence in sections 83-1.02A and 83-1.02B with:**

guardrail

07-19-13

**Add between "roadway" and ", except" in the 12th paragraph of section 83-1.02A:**

at authorized locations

10-30-15

**Replace the heading of section 83-1.02B with:**

**Midwest Guardrail System**

07-19-13

**Replace the 3rd paragraph of section 83-1.02B with:**

Submit 2 certified copies of mill test reports as an informational submittal for each heat of steel from which the rail elements are formed or fabricated.

10-30-15

**Add between "splices at" and "posts" in the 5th paragraph of section 83-1.02B:**

midspan between

07-19-13

**Replace the 7th paragraph of section 83-1.02B with:**

Construct midwest guardrail system using:

1. Wood or steel line posts.
2. Wood blocks for line posts. You may use plastic blocks for steel line posts where shown.
3. Only 1 type of post and block for any 1 continuous length of guardrail.

10-30-15

**Replace the 9th paragraph of section 83-1.02B with:**

Submit 2 certified copies of mill test reports as an informational submittal for each heat of steel from which the steel posts are formed or fabricated.

10-30-15

**Delete "chromated copper arsenate," in the 1st sentence of the 14th paragraph of section 83-1.02B.**

10-30-15

**Replace "7th paragraph in section 57-2.01B(3)" in the 16th paragraph of section 83-1.02B with:**

1st and 2nd paragraphs in section 57-2.01C(3)(b)

10-30-15

**Replace "Metal rail posts, box spacers, and" in item 1 in the list in the 25th paragraph of section 83-1.02B with:**

Metal box spacers and

07-19-13

**Replace item 4 in the list in the 25th paragraph of section 83-1.02B with:**

- 4. For the connection of guard railing to new bridge railing or barriers, anchor bolt holes must be drilled in the concrete parapet or formed using metal or PVC sleeves.

07-18-14

**Delete items 6 and 7 in the list in the 25th paragraph of section 83-1.02B.**

07-19-13

**Delete "A 441," in item 5 in the list in the 26th paragraph of section 83-1.02B:**

10-30-15

**Add between "mixture" and "specified" in the 27th paragraph of section 83-1.02B:**

for load bearing applications

10-30-15

**Replace "Type WB" at each occurrence in section 83-1.02B(2) with:**

Type WB-31

07-19-13

**Replace "metal" at each occurrence in the 2nd paragraph of section 83-1.02B(2) with:**

rail

10-30-15

**Replace the heading of section 83-1.02B(3) with:**

**Temporary Midwest Guardrail System**

07-19-13

**Replace the 2nd sentence of the 9th paragraph of section 83-1.02D(1) with:**

Posts and balusters must be normal to the profile grade. Transverse to the profile grade, railings must be plumb within a tolerance not to exceed 0.02 foot in 10 feet.

07-18-14

**Replace "80-2.02" in the 2nd paragraph of section 83-1.02E with:**

80-3.02B

10-19-12

**Replace the 3rd paragraph of section 83-1.02G(2) with:**

Stud bolts must comply with the specifications for studs in clause 7 of AWS D1.1.

07-18-14

**Replace the 7th paragraph of section 83-1.02G(2) with:**

10-30-15

For tubular hand railing and tubular lower rail mounted on Type 80SW concrete barrier:

- 1. Resin capsule anchors and threaded rods must comply with section 75-1.03
- 2. Drilling and bonding threaded rods must comply with the specifications for drilling and bonding dowels in section 51-1

**Replace "horizontal" in the 8th paragraph of section 83-1.02G(2) with:**

07-18-14

vertical

**Replace the 10th paragraph of section 83-1.02G(2) with:**

10-30-15

For tubular handrailings on Type 80SW concrete barriers, submit 2 copies of threaded rod layouts before placing barrier reinforcement.

**Delete the 15th paragraph of section 83-1.02I.**

10-30-15

**Replace the 1st sentence of the 1st paragraph of section 83-1.03 with:**

11-15-13

Except for guardrail within the pay limits of a terminal system, a transition railing (Type WB-31), an end anchor assembly, or a rail tensioning assembly, midwest guardrail system is measured along the face of the rail element from end post to end post of the completed railing.

**Add between the 1st and 2nd paragraphs of section 83-2.01:**

10-30-15

Concrete barrier work includes:

- 1. Bar reinforcing steel, including the length that extends from the barrier into decks, walls, and footings
- 2. Constructing steel plate barriers at overhead sign foundations, electroliers, drainage structures, and other locations shown

**Delete the 2nd paragraph of section 83-2.01.**

10-30-15

**Replace "Reserved" in section 83-2.02A with:**

10-30-15

Markers must comply with section 82.

**Replace the 4th paragraph of section 83-2.02B with:**

10-30-15

Use wood blocks with wood and steel posts. You may use plastic blocks with steel posts where shown.

**Replace the 7th paragraph of section 83-2.02B with:**

Threaded rods must comply with ASTM A 307. Anchor bolts must comply with ASTM F 1554, Grade 55. 10-30-15

**Add between the 8th and 9th paragraphs of section 83-2.02B:**

Trim existing median plantings to clear the work area for three beam barrier construction. Dispose of trimmings. 10-30-15

**Replace "metal" at each occurrence in the 3rd paragraph of section 83-2.02B(2) with:**

rail 10-30-15

**Add between "roadway" and ", except" in the 4th paragraph of section 83-2.02B(2):**

at authorized locations 10-30-15

**Replace the 15th paragraph of section 83-2.02D(1) with:**

The tubular handrailing and tubular lower rail for Type 80SW concrete barrier must comply with the specifications for tubular handrailing in section 83-1.02G(2). 10-30-15

**Add to section 83-2.02D(1):**

For a concrete barrier transition: 10-21-11

1. Remove portions of the existing concrete barrier where shown under section 15-3
2. Roughen the contact surface of the existing concrete barrier
3. Drill and bond dowels into the existing concrete barrier under section 51-1

**Replace the 1st paragraph of section 83-2.02D(2) with:**

Construct Type 50 and 60 series concrete barriers of minor concrete, except as follows: 10-30-15

1. Concrete must contain not less than 550 pounds of cementitious material per cubic yard.
2. Maximum size of aggregate used for extruded or slip formed concrete barrier must be no larger than 1-1/2 inches and no smaller than 3/8 inch.
3. If the 3/8-inch maximum size aggregate grading is used to construct extruded or slip formed concrete barrier, the concrete must contain not less than 675 pounds of cementitious material per cubic yard.

**Replace the 2nd paragraph of section 83-2.02D(2) with:**

In non-freeze-thaw areas, concrete for concrete barriers other than Type 50 and 60 series must contain not less than 590 pounds of cementitious material per cubic yard. 10-30-15

**Add to section 83-2.02:**

10-19-12

**83-2.02H-83-2.02M Reserved**

**Add between the 2nd and 3rd paragraphs of section 83-2.03:**

10-30-15

The payment quantity for single three beam barrier is the length measured from end post to end post along the face of the rail element of the installed barrier. The quantity does not include any portion of single three beam barrier within the pay limits of transition railing (Type STB).

**Add to the end of the 4th paragraph of section 83-2.03:**

10-30-15

The quantity does not include any portion of double three beam barrier within the pay limits of transition railing (Type DTB).

**Replace the 10th paragraph of section 83-2.03 with:**

10-30-15

The payment quantity for concrete barriers includes the length of gaps in the concrete barrier where steel plate barrier is attached to the concrete barrier.

AA

**84 TRAFFIC STRIPES AND PAVEMENT MARKINGS**

05-30-14

**Replace section 84-1.01C with:**

05-30-14

**84-1.01C Submittals**

For glass beads used in drop-on applications and in thermoplastic formulations, submit a certificate of compliance and test results for each lot of beads specifying the EPA test methods used and tracing the lot to the specific test sample. The testing for lead and arsenic content must be performed by an independent testing laboratory.

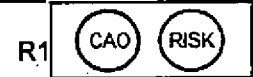
Submit retroreflectivity readings for traffic stripes and pavement markings at locations with deficient retroreflectivity determined by the Engineer.

**84-1.01D Quality Control and Assurance**

Test each lot of glass beads for arsenic and lead under EPA Test Method 3052 and 6010B or 6010C.

Applied traffic stripes and pavement markings must be retroreflective. Within 30 days of applying traffic stripes and pavement markings, the retroreflectivity of the stripes and markings must be a minimum of 250 mcd·m<sup>-2</sup>·lx<sup>-1</sup> for white and 125 mcd·m<sup>-2</sup>·lx<sup>-1</sup> for yellow when measured under ASTM E1710.

The Engineer will perform a nighttime, drive-through, visual inspection of the retroreflectivity of the traffic stripes and pavement markings and notify you of any locations with deficient retroreflectivity. Measure the retroreflectivity of the deficient areas using a retroreflectometer under ASTM E1710 and the sampling protocol specified in ASTM D7585.



**Replace the paragraph in section 84-1.02 with:**

05-30-14

Glass beads applied to paint must comply with State Specification 8010-004.

Glass beads applied to molten thermoplastic material must be Type 2 beads complying with AASHTO M 247. The glass beads must have a coating that promotes adhesion of the beads to thermoplastic.

At least 75 percent of the beads by count must be true spheres that are colorless and do not exhibit dark spots, air inclusions, or surface scratches when viewed under 20X magnification.

Each lot of glass beads used in pavement markings must contain less than 200 ppm each of arsenic and lead when tested under EPA Test Method 3052 and 6010B or 6010C.

**Replace the 1st paragraph in section 84-2.04 with:**

01-20-12

A double extruded thermoplastic traffic stripe consisting of two 4-inch wide yellow stripes is measured as 2 traffic stripes.

A double sprayable thermoplastic traffic stripe consisting of two 4-inch wide yellow stripes is measured as 1 traffic stripe.

**Add to section 84:**

01-20-12

**84-6 THERMOPLASTIC TRAFFIC STRIPES AND PAVEMENT MARKINGS WITH ENHANCED WET NIGHT VISIBILITY**

Reserved

**84-7-84-10 RESERVED**

AA

**86 ELECTRICAL SYSTEMS**

10-17-14

**Replace the paragraphs in section 86-1.01 with:**

07-19-13

Section 86 includes general specifications for constructing and rehabilitating electrical systems.

Electrical systems must comply with the material and installation specifications in section 86-2.

Section 86-3 includes specifications for constructing controller assemblies.

Section 86-4 includes specifications for constructing traffic signal faces, programmed visibility signal faces, pedestrian signal faces, flashing beacons, ramp metering signs, and signal mounting assemblies.

Section 86-5 includes specifications for constructing vehicle detectors and pedestrian push button assemblies.

Section 86-6 includes specifications for constructing lighting systems.

Section 86-7 includes specifications for constructing rehabilitating electrical equipment.

Comply with Part 4 of the *California MUTCD*. Nothing in section 86 is to be construed as to reduce the minimum standards in this manual.

The locations shown for electrical systems are approximate; the Engineer determines the final locations.



**Replace the paragraphs in section 86-1.015 with:**

07-19-13

**actuation:** Actuation as defined in the *California MUTCD*.**channel:** Discrete information path.**controller assembly:** Assembly for controlling a system's operations, consisting of a controller unit and auxiliary equipment housed in a rainproof cabinet.**controller unit:** Part of the controller assembly performing the basic timing and logic functions.**detector:** Detector as defined in the *California MUTCD*.**electrolier:** Assembly of a lighting standard and luminaire.**flasher:** Device for opening and closing signal circuits at a repetitive rate.**flashing beacon control assembly:** Assembly of switches, circuit breakers, terminal blocks, flasher, wiring, and other necessary electrical components housed in a single enclosure for operating a beacon.**inductive loop detector:** Detector capable of being actuated by an inductance change caused by a vehicle passing or standing over the loop.**lighting standard:** Pole and mast arm supporting the luminaire.**luminaire:** Assembly that houses the light source and controls the light emitted from the light source.**magnetic detector:** Detector capable of being actuated by an induced voltage caused by a vehicle passing through the earth's magnetic field.**powder coating:** Coating applied electrostatically using exterior-grade UV-stable polymer powder.**pretimed controller assembly:** Assembly operating traffic signals under a predetermined cycle length.**pull box:** A box with a cover that is installed in an accessible place in a run of conduit to facilitate the pulling in of wires or cables.**signal face:** Signal face as defined in the *California MUTCD*.**signal head:** Signal head as defined in the *California MUTCD*.**signal indication:** Signal indication as defined in the *California MUTCD*.**signal section:** Signal section as defined in the *California MUTCD*.**signal standard:** Pole and mast arm supporting 1 or more signal faces with or without a luminaire mast arm.**traffic-actuated controller assembly:** Assembly for operating traffic signals under the varying demands of traffic as registered by detector actuation.**traffic phase:** Signal phase as defined in the *California MUTCD*.**vehicle:** Vehicle as defined in the *California Vehicle Code*.**Replace the paragraphs in section 86-1.02 with:**

07-19-13

Comply with 8 CA Code of Regs § 2299 et seq.

Electrical equipment must comply with one or more of the following standards:

1. ANSI
2. ASTM
3. EIA
4. NEMA
5. NETA
6. UL
7. Public Utilities Commission, General Order No. 95, "Rules for Overhead Electrical Sign Construction"
8. Public Utilities Commission, General Order No. 128, "Rules for Construction of Underground Electric Supply and Communication Systems"

Materials and workmanship must comply with:

1. FCC rules
2. ITE standards
3. NEC
4. California Electrical Code

Electrical equipment and materials must be NRTL certified wherever applicable.

**Replace the paragraphs in section 86-1.03 with:**

07-19-13

Submit a schedule of values within 15 days after Contract approval.

Determine the quantities required to complete the work. Submit the quantities as part of the schedule of values.

Provide a schedule of values for each lump sum bid item.

Do not include costs for the traffic control system in the schedule of values.

The schedule of values must include the type, size, and installation method for:

1. Foundations
2. Standards and poles
3. Conduit
4. Pull boxes
5. Conductors and cables
6. Service equipment enclosures
7. Telephone demarcation cabinets
8. Vehicle signal heads and hardware
9. Pedestrian signal heads and hardware
10. Push buttons
11. Loop detectors
12. Luminaires and lighting fixtures
13. Materials shown in the quantity tables on plan sheets labeled *E*

**Replace the paragraphs in section 86-1.04 with:**

07-19-13

Within 15 days of Contract approval, submit a list of equipment and materials that you propose to install. Submit the list before shipping equipment or materials to the job site. The list must include the following information:

1. Manufacturer's name
2. Make and model number

3. Month and year of manufacture
4. Lot and serial numbers
5. Dimensions
6. List of components
7. Manufacturer's installation instructions
8. Contract number
9. Your contact information

Supplement the list with 2 copies of the following data:

1. Schematic wiring diagrams
2. Scale drawings of cabinets showing location and spacing of shelves, terminal blocks, and equipment, including dimensions
3. Operation manual

Electrical equipment constructed as shown does not require detailed drawings and diagrams.

Submit 3 sets of computer-generated schematic wiring diagrams for the cabinet.

Place the schematic wiring diagram in a heavy-duty plastic envelope and attach it to the inside of the cabinet door.

Prepare diagrams, plans, and drawings using graphic symbols in IEEE 315, "Graphic Symbols for Electrical and Electronic Diagrams."

**Replace the 5th paragraph of section 86-2.04B(2) with:**

07-19-13

HS bolts, nuts, and flat washers used to connect slip base plates must comply with the requirements for HS fastener assemblies for use in structural steel joints in section 55-1.02A(1) except rotational capacity testing and tension testing are not required.

07-19-13

**Delete the row for standard Type 36-20A in the table in the 6th paragraph of section 86-2.04B(2).**

**Replace the 10th paragraph of section 86-2.04B(2) with:**

07-19-13

Bolted connections attaching signal or luminaire arm to the pole must be considered slip critical. Galvanized faying surfaces of plates on luminaire arm, signal arm, and pole must be roughened by hand using a wire brush before assembly and must comply with requirements for Class C surface conditions for slip-critical connections in *Specification for Structural Joints Using High-Strength Bolts* of the RCSC. Coatings for faying surfaces must comply with the RCSC specification for Class B coatings.

**Replace the 1st sentence of item 8 in the list in the 1st paragraph of section 86-2.04B(3) with:**

07-19-13

During manufacturing, longitudinal seams on vertical tubular members of cantilevered support structures must be within 90 degrees circumferentially of the center of the longest mast arm connection.

07-19-13

**Delete item 15.3 in the list in the 1st paragraph of section 86-2.04B(3).**

**Add between "Exposed" and "conduit" in the 2nd paragraph of section 86-2.05B:**

Type 1

07-19-13

**Replace the 1st sentence of the 10th paragraph of section 86-2.05C with:**

After installing conduit, install the pull tape.

07-19-13

**Replace the 1st sentence of the 15th paragraph of section 86-2.05C with:**

Conduit runs shown to be located behind curbs may be installed in the street within 3 feet of and parallel to the face of the curb by the trenching in pavement method.

11-15-13

**Replace the 1st and 2nd sentences of the 2nd paragraph of section 86-2.05D with:**

Install an expansion-deflection fitting for expansion joints with a 1-1/2-inch movement rating. The fitting must be watertight and include a molded neoprene sleeve, a bonding jumper, and 2 silicon bronze or zinc-plated iron hubs.

07-19-13

**Replace section 86-2.06 with:**

07-19-13

**86-2.06 PULL BOXES****86-2.06A General****86-2.06A(1) Cover Marking**

The cover marking must be clearly defined, uniform in depth, and parallel to either the long or short sides of the cover.

Marking letters must be 1 to 3 inches high.

Before galvanizing steel or cast iron cover, apply marking by one of the following methods:

1. Use cast iron strip at least 1/4 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover with 1/4-inch flathead stainless steel machine bolts and nuts. Peen bolts after tightening.
2. Use sheet steel strip at least 0.027 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover by spot welding, tack welding, or brazing, with 1/4-inch stainless steel rivets or 1/4-inch roundhead stainless steel machine bolts and nuts. Peen bolts after tightening.
3. Bead weld the letters on cover such that the letters are raised a minimum of 3/32 inch.

**86-2.06A(2) Installation and Use**

Space pull boxes no more than 200 feet apart. You may install additional pull boxes to facilitate the work.

You may use a larger standard size pull box than that shown on the plans or specified.

A pull box in ground or sidewalk area must be installed as follows:

1. Embed bottom of the pull box in crushed rock.
2. Place a layer of roofing paper on the crushed rock.
3. Place grout over the layer of roofing paper. Grout must be 0.50 to 1 inch thick and sloped toward the drain hole.
4. Make a 1-inch drain hole in the center of the pull box through the grout and roofing paper.
5. Place grout between the pull box and the pull box extension, and around conduits.

The top of the pull box must be flush with the surrounding grade or the top of an adjacent curb, except in unpaved areas where the pull box is not immediately adjacent to and protected by a concrete foundation, pole, or other protective construction. Place the pull box 1-1/4 inches above the surrounding grade. Where practical, place a pull box shown in the vicinity of curbs or adjacent to a standard on the side of the foundation facing away from traffic. If a pull box is installed in a sidewalk area, adjust the depth of the pull box so that the top of the pull box is flush with the sidewalk.

Reconstruct the sump of an existing pull box if disturbed by your activities. Remove old grout and replace with new if the sump was grouted.

**86-2.06B Non-Traffic Pull Boxes**

Reserved

**86-2.06C Traffic Pull Boxes**

The traffic pull box and cover must comply with ASTM C857, "Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures," for HS20 loading. You must be able to place the load anywhere on the box and cover for 1 minute without causing cracks or permanent deformations.

Frame must be anchored to the box with 1/4 by 2-1/4 inch concrete anchors. Four concrete anchors must be included for No. 3-1/2(T) pull box; one placed in each corner. Six concrete anchors must be included for No. 5(T) and No. 6(T) pull boxes; one placed in each corner and one near the middle of each of the longer sides.

Nuts must be zinc-plated carbon steel, vibration resistant, and have a wedge ramp at the root of the thread.

After installation of traffic pull box, install the steel cover and keep it bolted down when your activities are not in progress at the pull box. When the steel cover is placed for the final time, the cover and Z bar frame must be cleaned of debris and tightened securely.

Steel cover must be countersunk approximately 1/4 inch to accommodate the bolt head. When tightened, the bolt head must not exceed more than 1/8 inch above the top of the cover.

Concrete placed around and under traffic pull boxes must be minor concrete.

**Replace the 11th row in the table in the 1st paragraph of section 86-2.08B with:**

07-19-13

Grounded circuit conductor	Pedestrian push buttons	Wht	Blk	NBR	14
	Signals and multiple lighting	Wht	None	NBR	10
	Flashing beacons and sign lighting	Wht	None	NBR	12
	Lighting control	Wht	None	C-3	14
	Service	Wht	None	NBR	14

**Replace the 1st sentence of the 1st paragraph of section 86-2.08C with:**

07-19-13

Circuit conductors, connectors, and terminals must be UL or NRTL listed and rated for 600 V(ac) operation.

**Add to the beginning of section 86-2.09A:**

Provide enough traffic signal light conductors for functional operation of the signal. Provide 3 spare conductors in all conduits containing traffic signal light conductors.

07-19-13

**Replace the paragraphs in section 86-2.09C with:**

Connectors must be crimp type. Use a manufacturer-recommended tool for connectors and terminals to join conductors. Comply with SAE-AS7928.

07-19-13

Terminate stranded conductors smaller than no. 14 in crimp style terminal lugs.

Terminate field conductors no. 12 and smaller with spade type terminals. Terminate field conductors no. 10 and larger with spade type or ring type terminals.

**Replace the value for resistivity in the table in the 6th paragraph of section 86-2.09E with:**

$25 \times 10^{13} \Omega$  per inch, minimum

07-19-13

**Add between "the" and "head" in the 3rd sentence of the 2nd paragraph of 86-2.09F:**

connector

07-19-13

**Replace "project" in the 3rd paragraph of section 86-2.11A with:**

work

10-19-12

**Replace "Contract" in item 2 in the list in the 11th paragraph of section 86-2.11A with:**

work

10-19-12

**Delete the 12th paragraph of section 86-2.11A.**

07-19-13

**Replace section 86-2.11C with:****86-2.11C Electrical Service for Booster Pumps**

Provide electrical service from the service point to the booster pump.

Furnish conductors, conduit, and pull boxes from the service point to the booster pump.

Do not use Type 3 conduit unless shown otherwise.

07-19-13

**Replace section 86-2.14A with:****86-2.14A General**

Deliver material and equipment for acceptance testing to either METS or a testing location as ordered.

07-19-13

Allow 30 days for testing. The Department notifies you when testing is complete. You must pick up the material or equipment from the test site and deliver it to the job site.

If material or equipment is rejected, allow 30 days for retesting. The retesting period starts when replacement material or equipment is delivered to the test site.

If material or equipment submitted for testing does not comply with the specifications, remove it within 5 business days after you are notified that the equipment is rejected. If equipment is not removed within that period, the Department may ship it to you and deduct the shipping cost.

Testing and quality control procedures for traffic signal controller assemblies must comply with NEMA TS standards for traffic control systems.

**Replace the 2nd paragraph of section 86-3.02A(1) with:**

07-19-13

The Department furnishes the BBS components under section 6-2.03.

**Replace the 9th paragraph of section 86-3.02B with:**

07-19-13

The couplings between the external cabinet and Model 332L cabinet must include a conduit for power connections between the 2 cabinets. Couplings must include:

1. 2-inch nylon-insulated steel chase nipple
2. 2-inch sealing steel locknut
3. 2-inch nylon-insulated steel bushing

07-19-13

**Delete item 1.3 in the list in the 7th paragraph of section 86-3.04A.**

**Replace the 2nd paragraph of section 86-4.01A with:**

07-19-13

The housing must not fail structurally as described in the following table:

**Housing Structural Failure**

Housing type	Test method	Description of structural failure
Metal	California Test 666	Fracture within the housing assembly or deflection of more than half the lens diameter of the signal section during the wind load test.
Plastic	California Test 605	Fracture within the housing assembly or deflection of more than 10 degrees in either the vertical or horizontal plane after the wind load has been removed from the front of the signal face or deflection of more than 6 degrees in either the vertical or horizontal plane after the wind load has been removed from the back of the signal face

**Replace the 1st sentence of section 86-4.01A(1) with:**

07-19-13

Each metal housing must have a metal visor.

**Replace the 1st sentence of section 86-4.01A(2) with:**

07-19-13

Each plastic housing must be molded in 1 piece or fabricated from 2 or more pieces and joined into a single piece.

**Delete item 1 in the list in section 86-4.01D(1)(b).**

07-19-13

**Replace the paragraphs in section 86-4.01D(1)(c)(i) with:**

07-19-13

LED signal modules must be on the Authorized Material List for LED traffic signals.

The Department tests modules under section 86-2.14A, ANSI/ASQ Z1.4, and:

1. California Test 604 for LED and circular LED signal modules
2. California Test 3001 for arrow, U-turn, and bicycle LED signal modules

The LED signal modules submitted for testing must be typical production units. LEDs must be spread evenly across the module.

The Department may test the modules on all parameters specified in section 86-4.01D.

**Replace the 1st and 2nd sentences of the 3rd paragraph of 86-4.01D(2)(b) with:**

07-19-13

The electrical connection for each flashing LED signal module must be 4 secured, color-coded, jacketed copper wires. The wire must comply with the NEC.

**Replace the heading of section 86-4.02 with:**

07-19-13

**PROGRAMMED VISIBILITY VEHICLE SIGNAL SECTION****Replace "face" in the 1st paragraph of section 86-4.02 with:**

07-19-13

section

**Add before the 1st sentence in section 86-4.03A:**

07-19-13

The pedestrian signal face must be Type A.

**Replace the 1st sentence of the 2nd paragraph of section 86-4.03B with:**

07-19-13

The Department tests the pedestrian signal's front screen in a horizontal position with its edges supported.

**Delete items 1 and 4 in the list in section 86-4.03I(1)(b).**

07-19-13



**Replace the paragraphs of section 86-4.03I(1)(c)(i) with:**

07-19-13

The LED PSF module must be on the Authorized Material List for LED traffic signals.

The Department tests LED PSF modules under section 86-2, 14A, ANSI/ASQ Z1.4, and California Test 606.

The LED PSF modules submitted for testing must be representative of typical production units.

The Department may test the modules on all parameters specified in section 86-4.03I.

**Replace item 1 in the list in the 1st paragraph of section 86-4.03I(2) with:**

07-19-13

- 1. Not include reflectors.

**Replace item 6 in the list in the 1st paragraph of section 86-4.03I(2) with:**

07-19-13

- 6. Be able to replace signal lamp optical units and pedestrian signal faces with LEDs.

**Replace the table titled "Chromaticity Standards (CIE Chart)" in the 16th paragraph of section 86-4.03I(2) with:**

07-19-13

**Chromaticity Standards (CIE Chart)**

Upraised hand	X: not greater than 0.659 or less than 0.600 Y: not greater than 0.390 or less than 0.331 Y= 0.990-X
Walking person	X: not greater than 0.440 or less than 0.280 Y: not greater than 0.0483 + 0.7917(X) or less than 0.0983 + 0.7917(X)

**Replace the paragraphs in section 86-4.03J with:**

10-17-14

Reserved

**Add between "beacon" and "must" in the 1st sentence of section 86-4.05:**

07-19-13

signal face

**Delete "face" in item 1 in the list in the 1st paragraph of section 86-4.05.**

07-19-13

**Replace the row for viscosity in the table in the 2nd paragraph of section 86-5.01A(3)(c) with:**

07-19-13

Viscosity, Brookfield Thermosel, no. 27 Spindle, 20 rpm, 190 °C	D 4402	2.5–3.5 Pa·s
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**Replace the paragraph in section 86-5.01A(3)(d) with:**

Use epoxy sealant for repair work in and around sawcuts housing inductive loops.

07-19-13

**Replace "all loop conductors" in the 3rd paragraph of section 86-5.01A(4) with:**

the detector lead-in cable

07-19-13

**Replace "Encase the loop wires" in the 1st sentence of the 3rd paragraph of section 86-5.01A(5) with:**

The loop wires must be encased

07-19-13

**Replace section 86-5.02 with:**

07-19-13

**86-5.02. PUSH BUTTON ASSEMBLIES**

The housing for a push button assembly must be die-cast or permanent mold-cast aluminum. The assembly must be rainproof and shockproof in any weather condition.

The push button's switch must be a single-pole, double-throw switching unit with screw-type terminals rated 15 A at 125 V(ac). The switch must have:

1. Plunger actuator and a U frame to allow recessed mounting in the push button housing
2. Operating force of 3.5 lb
3. Maximum pretravel of 5/64 inch
4. Minimum overtravel of 1/32 inch
5. Differential travel from 0.002 to 0.04 inch
6. 2-inch minimum diameter actuator

Where a push button is attached to a pole, the housing must be shaped to fit the pole's curvature. Use saddles if needed to make a neat and secure fit.

Where a push button is mounted on top of a 2-1/2-inch-diameter post, fit the housing with a slip fitter and use screws to rigidly secure it to the post.

Install the push button and the sign on the crosswalk side of the pole.

Attach the sign on a Type B push button assembly.

For a Type C push button assembly, mount the instruction sign on the same standard as the assembly using 2 straps and saddle brackets.

**Add to section 86-5:**

07-19-13

**86-5.03 ACCESSIBLE PEDESTRIAN SIGNAL**

Reserved

Replace "ithe amp" in item 2 in the list in the 1st paragraph of section 86-6.01A(2) with:

the lamp

07-19-13

\*\*\*\*\*

### DIVISION X MATERIALS 88 GEOSYNTHETICS

07-19-13

Add to section 88-1.01C:

07-19-13

Geosynthetics must be on the DataMine list for geotextiles and geosynthetics at the National Transportation Product Evaluation Program Web site. The product name, manufacturing source, and date of manufacture must be printed every 5 meters along the edge of the material.

Exceptions are:

- 1. Paving mat
- 2. Paving grid, Class 2 and 3
- 3. Biaxial geogrid

Replace the row for hydraulic bursting strength in the table in the 2nd paragraph of section 88-1.02B with:

10-19-12

Puncture strength, lb min	ASTM D 6241	310
Trapezoid tearing strength, lb min	ASTM D 4533	56

Replace the 3rd paragraph in section 88-1.02C with:

10-19-12

Geocomposite wall drain must be from 0.25 to 2 inches thick.

Replace the value for permittivity of woven fabric in the table in the 1st paragraph of section 88-1.02E with:

01-20-12

0.05

Replace the value for apparent size opening of nonwoven fabric in the table in the 1st paragraph of section 88-1.02E with:

01-20-12

0.012

Replace the table in the 1st paragraph of section 88-1.02G with:

01-20-12

**Sediment Filter Bag**

Property	Test	Values	
		Woven	Nonwoven
Grab breaking load, lb, 1-inch grip min, in each direction	ASTM D 4632	200	250
Apparent elongation, percent min, in each direction	ASTM D 4632	10	50
Water flow rate, gal per minute/sq ft min and max average roll value	ASTM D 4491	100-200	75-200
Permittivity, sec <sup>-1</sup> min	ASTM D 4491	1.0	1.0
Apparent opening size, inches max average roll value	ASTM D 4751	0.023	0.012
Ultraviolet resistance, % min retained grab breaking load, 500 hr.	ASTM D 4355	70	70

Replace the table in the 1st paragraph of section 88-1.02H with:

01-20-12

**Temporary Cover**

Property	Test	Values	
		Woven	Nonwoven
Grab breaking load, lb, 1-inch grip min, in each direction	ASTM D 4632	200	200
Apparent elongation, percent min, in each direction	ASTM D 4632	15	50
Water flow rate, gal per minute/sq ft min and max average roll value	ASTM D 4491	4-10	80-120
Permittivity, sec <sup>-1</sup> min	ASTM D 4491	0.05	1.0
Apparent opening size, inches max average roll value	ASTM D 4751	0.023	0.012
Ultraviolet resistance, % min retained grab breaking load, 500 hr.	ASTM D 4355	70	70

Replace section 88-1.02P with:

01-18-13

**88-1.02P Biaxial Geogrid**

Geosynthetics used for biaxial geogrid must be a punched and drawn polypropylene material formed into an integrally formed biaxial grid. When tested under the referenced test methods, properties of biaxial geogrid must have the values shown in the following table:

**Biaxial Geogrid**

Property	Test	Value
Aperture size, inch <sup>a</sup> min and max	Calipered	0.8-1.3 x 1.0-1.6
Rib thickness, inch min	Calipered	0.04
Junction thickness, inch min	Calipered	0.150
Tensile strength, 2% strain, lb/ft <sup>a</sup> min	ASTM D 6637	410 x 620
Tensile strength at ultimate, lb/ft <sup>a</sup> min	ASTM D 6637	1,310 x 1,970
Ultraviolet resistance, percent min retained tensile strength, 500 hours	ASTM D 4355	100
Junction strength, lb/ft <sup>a</sup> min	ASTM D 7737	1,220 x 1,830
Overall flexural rigidity, mg-cm min	ASTM D 7748	750,000
Torsional rigidity at 20 cm-kg, mm-kg/deg <sup>b</sup> min	GRI:GG9	0.65

<sup>a</sup>Machine direction x cross direction<sup>b</sup>Geosynthetic Research Institute, Test Method GG9, *Torsional Behavior of Bidirectional Geogrids When Subjected to In-Plane Rotation***Replace section 88-1.02Q with:**

07-19-13

**88-1.02Q Geosynthetic Bond Breaker**

Geosynthetic bond breaker must be nonwoven; needle punched; not heat treated; polypropylene, polyethylene material.

When tested under the referenced test methods, properties of geosynthetic bond breaker material must have the values shown in the following table:

**Geosynthetic Bond Breaker**

Property	Test	Value
Mass per unit area, oz/sq yd min	ASTM D 5261	14.7
Thickness at 29 psi, mm min	ASTM D 5199	1.0
Tensile strength at ultimate, lbs/ft min	ASTM D 4595	685
Elongation, percent max	ASTM D 4595	130
Permittivity at 2.9 psi, m/s min	ASTM D 5493	0.0001
Hydraulic transmissivity at 29 psi, m/s min	ASTM D 6574	0.0002
Ultraviolet resistance, percent min retained grab breaking load, 500 hours	ASTM D 4355	60

AA

**90 CONCRETE**

07-19-13

**Replace the 3rd paragraph of section 90-1.01C(7) with:**

08-05-11

Submit weighmaster certificates in printed form or, if authorized, in electronic media. Present electronic media in a tab-delimited format on a CD or DVD. Captured data for the ingredients represented by each batch must be line feed carriage return and one line separate record with sufficient fields for the specified data.

**Replace the 3rd paragraph of section 90-3.01C(5) with:**

08-05-11

Production data must be input by hand into a pre-printed form or captured and printed by the proportioning device. Present electronic media containing recorded production data in a tab-delimited format on a CD or DVD. Each capture of production data must be followed by a line feed carriage return with sufficient fields for the specified data.

**Replace the 1st paragraph of section 90-4.01A with:**

07-19-13

Section 90-4 includes specifications for fabricating PC concrete members.

**Replace the paragraphs in section 90-4.01C with:**

07-19-13

**90-4.01C(1) General**

For reports and logs, type or clearly print the name next to the signature of the person signing the report or log.

Submit expansion test data under section 90-4.02, if required.

**90-4.01C(2) Certificates of Compliance**

Submit a certificate of compliance for the cementitious material used in PC concrete members. The certificate must be signed by the PC concrete product manufacturer.

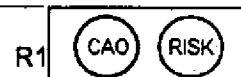
Submit a certificate of compliance for each PC concrete member. The certificate of compliance for tier 1 and tier 2 members must be signed by the QC manager. The certificate of compliance for tier 3 members must be signed by the QC Inspector.

**90-4.01C(3) Precast Concrete Quality Control Plan**

Before performing any precasting activities for tier 1 and tier 2 PC concrete members, submit 3 copies of the project-specific QC plan for the PC plant. The QC plan must supplement the information from the authorized facility audit. Submit a separate QC plan for each plant. Allow 25 days for review.

Each project-specific QC plan must include:

1. Name of the precasting plant, concrete plants, and any testing laboratory to be used.
2. Manual prepared by the precasting plant that includes:
  - 2.1. Equipment description
  - 2.2. Testing procedures
  - 2.3. Safety plan
  - 2.4. Personnel names, qualifications, and copies of certifications
3. QC manager and QC inspector names, qualifications, and copies of certifications.



4. Organizational chart showing QC personnel and their assigned QC responsibilities.
5. Methods and frequencies for performing QC procedures including inspections, material testing, and any survey performed for all components of PC concrete members. Components include prestressing, concrete, grout, reinforcement, steel, miscellaneous metal, and formwork.
6. System for reporting noncompliant PC concrete members to the Engineer.
7. System for identification and tracking repairs and repair methods.
8. Procedure for the reinspection of repaired PC concrete members.
9. Forms for certificates of compliance, daily production logs, and daily reports.

Submit a revised QC plan for any changes to:

1. Concrete plants
2. Material sources
3. Material testing procedures
4. Testing laboratory
5. Procedures and equipment
6. Updated systems for tracking and identifying PC concrete members
7. QC personnel

After authorization, submit 7 copies of each authorized QC plan and make 1 copy available at each location where work is performed.

Allow 7 days for review of a revised QC plan.

#### **90-4.01C(4) Daily Production Log**

The QC inspector must provide reports to the QC manager for each day that precasting activities are performed.

The QC manager must maintain a daily production log of PC activities for each day's precasting. PC activities include setting forms, placing reinforcement, setting prestressing steel, casting, curing, post tensioning, and form release. This daily log must be available at the precasting plant. The daily log must include:

1. Plant location
2. Specific description of casting or related activities
3. Any problems or deficiencies discovered
4. Any testing or repair work performed
5. Names of QC inspectors and the specific QC inspections they performed that day
6. Reports for that day's precasting activities from each QC inspector including before, during, and after precast inspections

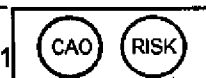
Immediately notify the Engineer when any precasting problems or deficiencies are discovered, and submit the proposed repair or process changes necessary to correct them.

#### **90-4.01C(5) Precast Concrete Report**

Before shipping PC concrete members, submit a PC concrete report. The report must include:

1. Reports of all material tests and any survey checks
2. Documentation that:
  - 2.1. You have evaluated all tests
  - 2.2. You corrected all rejected deficiencies
  - 2.3. Repairs have been reexamined with the required tests and found acceptable
3. Daily production logs
4. Certificates of compliance
5. Documentation of inspections

Each person who performs a material test or survey check must sign the corresponding report and submit the report directly to the QC manager.



**Replace the paragraphs in section 90-4.01D with:**

07-19-13

**90-4.01D(1) General**

Quality control and assurance for PC concrete includes:

1. Your QC program
2. Department's acceptance of PC concrete members

PC concrete members are categorized into the following 4 tiers:

1. Tier 1 consists of:
  - 1.1. Components of bridge structures, including girders, deck panels, bent caps, abutments, slabs, closure wall panels, and piling
  - 1.2. Prestressed pavement
2. Tier 2 consists of:
  - 2.1. Components of earth retaining systems
  - 2.2. Wingwalls
  - 2.3. Types A, B, and C pipe culvert headwalls, endwalls, and wingwalls
  - 2.4. Pavement
  - 2.5. Box culverts
  - 2.6. Sound wall panels and supports
3. Tier 3 consists of:
  - 3.1. Pipes
  - 3.2. Pipe drainage facilities
  - 3.3. Straight and "L" pipe culvert headwalls except those listed under tier 2
  - 3.4. Drainage inlets
  - 3.5. Flared end sections
4. Tier 4 consists of any member not described as tier 1, tier 2, or tier 3

**90-4.01D(2) Quality Control****90-4.01D(2)(a) General**

For tier 1 and tier 2 PC concrete members:

1. Fabricate PC concrete members at a plant on the Authorized Facility Audit List
2. Assign a PC concrete QC manager to the plant
3. Assign a QC inspector who is either registered as a civil engineer in the State or:
  - 3.1. For tier 1, has a Plant Quality Personnel Level II certification from the Precast/Prestressed Concrete Institute
  - 3.2. For tier 2, has a Plant Quality Personnel Level I certification from the Precast/Prestressed Concrete Institute
4. Prepare a PC concrete QC plan
5. Perform PC concrete materials testing
6. Maintain a daily production log
7. Prepare a PC concrete report
8. Prepare a certificate of compliance

For tier 3 PC concrete members:

1. Assign a QC inspector who has one of the following qualifications:
  - 1.1. Registration as a civil engineer in the State.
  - 1.2. Plant Quality Personnel, Level I certification from the Precast/Prestressed Concrete Institute.
  - 1.3. Competency to perform inspection of PC operations. An inspector is competent if the individual has completed training or has experience in PC operations and inspection.
2. Prepare a certificate of compliance





For tier 4 PC concrete members, prepare a certificate of compliance.

For each ASTM test method specified in this section, the material's test result must comply with the requirement specified for the comparable test in section 90 unless otherwise specified.

If curing compound is used, provide certificate of compliance as specified in section 90-1.01C(5).

If PC concrete is manufactured at an established PC concrete plant, a trial batch and prequalification of the materials, mix proportions, mixing equipment, and procedures under section 90-1.01D(5)(b) are not required.

**90-4.01D(2)(b) Quality Control Meeting**

After submitting the PC concrete QC plan, hold a meeting to discuss the requirements for PC concrete QC. The meeting attendees must include the Engineer, the PC concrete QC manager, and a representative from each plant performing PC concrete activities for the Contract.

**90-4.01D(2)(c) Sampling, Testing, and Inspecting**

The QC laboratory testing personnel or the QC inspector must witness sampling. The QC laboratory testing personnel must perform testing.

QC laboratory testing personnel must have the following certifications, as applicable:

1. ACI Strength Testing Technician
2. ACI Concrete Laboratory Testing Technician Level 1
3. ACI Aggregate Testing Technician Level 2

The QC Inspector must perform inspections before, during, and after casting is complete.

QC field testing and inspection personnel must have an ACI Concrete Field Testing Technician, Grade I certification.

For each mix design used for tier 1 and tier 2 PC concrete members, perform sampling and testing at the minimum frequencies shown in the following tables:

**Aggregate QC Tests**

Property	Test method	Minimum testing frequency
Aggregate gradation	ASTM C136	Once per 400 cu yd of concrete cast or once a week, whichever is more frequent
Sand equivalent	ASTM D2419	
Percent fines under 75 microns <sup>a</sup>	ASTM C117	
Moisture content of fine aggregate	ASTM C566, or electronically actuated moisture meter <sup>b</sup>	1-2 times per each day of pour, depending on conditions

<sup>a</sup>Percent fines under 75 microns test replaces the cleanness test in section 90-1.02C with the requirements of 1.5 percent maximum for "Operating Range" and 2.0 percent maximum for "Contract Compliance." The 5th paragraph of section 90-1.02C(2) does not apply.

<sup>b</sup>Electronically actuated moisture meter must be calibrated once per week per ASTM C566.

**Concrete QC Tests**

Property	Test method	Minimum testing frequency
Compressive strength <sup>b</sup>	ASTM C172/C172M, ASTM C31/C31M, and ASTM C39/C39M	Once per 100 cu yd of concrete cast, or every day of casting, whichever is more frequent
Slump	ASTM C143/C143M	
Temperature	ASTM C1064/C1064M	
Density	ASTM C138	Once per 600 cu yd of concrete cast or each week of batching, whichever is more frequent
Air content	ASTM C231/C231M or ASTM C173/C173M <sup>a</sup>	If concrete is air entrained, once for each set of cylinders, and when conditions warrant

<sup>a</sup>ASTM C173/C173M must be used for lightweight concrete.

<sup>b</sup>Cylinders must be 6 by 12 inches.

If concrete is batched at more than 1 plant, perform the tests at each plant.

Cure test cylinders for determining time of prestressing loading in the same manner as the concrete in the member.

Cure test cylinders for determining compliance with 28-day strength requirements in the same manner as the member until completion of the steam curing process followed by a water bath or moist room at 60 to 80 degrees F until tested.

For PC concrete that is steam cured, concrete designated by compressive strength is acceptable if its compressive strength reaches the described 28-day compressive strength in no more than the maximum number of days specified or allowed after the concrete is cast.

**90-4.01D(3) Quality Assurance**

For PC concrete that is steam cured, the Engineer evaluates the compressive strength based on individual tests representing specific portions of production.

**Add between the 1st and 2nd paragraphs of section 90-4.02:**

07-19-13

PC portland cement based repair material must be on the Authorized Material List.

If municipally supplied potable water is used for PC concrete, the testing specified in section 90-1.02D is waived unless requested.

**Add to section 90-4.03:**

07-18-13

For dimensional tolerances of PC concrete members, comply with the Precast/Prestressed Concrete Institute Concrete Institute's *Tolerance Manual for Precast and Prestressed Concrete Construction, MNL 135-00*.

For tier 1 and tier 2 PC concrete members, apply curing compound using power-operated spraying equipment. You may request application by hand spraying for small quantities of PC concrete members. For tier 3 and tier 4 PC concrete members, the application of curing compound may be hand sprayed.

**Replace the item 2 in the list in the 2nd paragraph of section 90-4.03 with:**

07-18-13

2. To prevent moisture loss on the exposed surfaces during the presteaming period, cover the concrete as soon as possible after casting or keep the exposed surfaces wet by fog spray, curing compound, or wet blankets.

AA

**91 PAINT**

10-19-12

**Add to section 91-2:**

10-18-12

**91-2.03 MOISTURE-CURED POLYURETHANE COATING**

Reserved

**Replace "saint" in the 1st paragraph of section 91-4.05 with:**

10-18-12

paint

AA

**92 ASPHALTS**

07-19-13

**Replace "Reserved" in section 92-1.01B with:**

07-19-13

**modified asphalt binder:** Asphalt binder modified with polymers, crumb rubber, or both.

**Replace the row for dynamic shear for original binder in the table in the 1st paragraph of section 92-1.02B with:**

01-20-12

Dynamic shear, Test temperature at 10 rad/s, °C	T 315	58	64	64	64	70
min G*/sin(delta), kPa		1.00	1.00	1.00	1.00	1.00
max G*/sin(delta), kPa		2.00	2.00	2.00	2.00	2.00

**Replace 2nd paragraph of section 92-1.02B with:**

07-19-13

PG modified asphalt binder must comply with the requirements shown in the following table:

<b>PG Modified Asphalt Binder</b>				
Property	AASHTO Test Method	Grade		
		PG 58-34 M	PG 64-28 M	PG 76-22 M
<b>Original Binder</b>				
Flash point, min °C	T 48	230	230	230
Solubility, min %	T 44 <sup>a</sup>	97.5	97.5	97.5 <sup>b</sup>
Viscosity at 135 °C <sup>c</sup> , max, Pa·s	T 316	3.0	3.0	3.0
Dynamic shear, Test temperature at 10 rad/s, °C min G*/sin(delta), kPa	T 315	58 1.00	64 1.00	76 1.00
RTFO test <sup>d</sup> , Mass loss, max, %	T 240	1.00	1.00	1.00
<b>RTFO Test Aged Binder</b>				
Dynamic shear, Test temperature at 10 rad/s, °C min G*/sin(delta), kPa	T 315	58 2.20	64 2.20	76 2.20
Dynamic shear, Test temperature at 10 rad/s, °C max (delta), degree	T 315	80°	80°	80°
Elastic recovery <sup>f</sup> , Test temperature °C min recovery, %	T 301	25 75	25 75	25 65
PAV <sup>g</sup> , temperature, °C	R 28	100	100	110
<b>RTFO Test and PAV Aged Binder</b>				
Dynamic shear, Test temperature at 10 rad/s, °C max G*/sin(delta), kPa	T 315	16 5000	22 5000	31 5000
Creep stiffness, Test temperature, °C max S-value, MPa min M-value	T 313	-24 300 0.300	-18 300 0.300	-12 300 0.300

<sup>a</sup>The Department allows ASTM D 5546 or ASTM D 7753 instead of AASHTO T 44. Particles recovered from ASTM D 5546 or ASTM D 7753 or AASHTO T 44 must be less than 250 µm.

<sup>b</sup>Report only for spray application.

<sup>c</sup>The Engineer waives this specification if the supplier provides written certification the asphalt can be adequately pumped and mixed at temperatures meeting applicable safety standards.

<sup>d</sup>"RTFO Test" means the asphaltic residue obtained using the Rolling Thin Film Oven Test, AASHTO Test Method T 240 or ASTM D 2872. The residue from mass change determination may be used for other tests.

<sup>e</sup>Test temperature is the temperature at which  $G^*/\sin(\delta)$  is 2.2 kPa. A graph of  $\log G^*/\sin(\delta)$  plotted against temperature may be used to determine the test temperature when  $G^*/\sin(\delta)$  is 2.2 kPa. A graph of  $(\delta)$  versus temperature may be used to determine  $\delta$  at the temperature when  $G^*/\sin(\delta)$  is 2.2 kPa. The graph must have at least two points that envelope  $G^*/\sin(\delta)$  of 2.2 kPa and the test temperature must not be more than 6 degree C apart. The Engineer also accepts direct measurement of  $(\delta)$  at the temperature when  $G^*/\sin(\delta)$  is 2.2 kPa.

<sup>f</sup>Tests without a force ductility clamp may be performed.

<sup>g</sup>"PAV" means "Pressure Aging Vessel."

Do not modify PG modified asphalt binder using polyphosphoric acid.

Crumb rubber must be from automobile and truck tires and must be free from contaminants including fabric, metal, minerals, and other nonrubber substances.

PG modified asphalt binder modified with crumb rubber must be homogeneous and must not contain visible particles of crumb rubber.

The supplier of PG modified asphalt binder modified with crumb rubber must:

1. Report the amount of crumb rubber by weight of asphalt binder
2. Certify a minimum of 10 percent of crumb rubber by weight of asphalt binder

\*\*\*\*\*

### 93 LIQUID ASPHALTS

07-19-13

Replace "Celsius" the 1st row in the table in the 8th paragraph of section 93-1.04 with:

07-19-13

Fahrenheit

\*\*\*\*\*

### 94 ASPHALTIC EMULSIONS

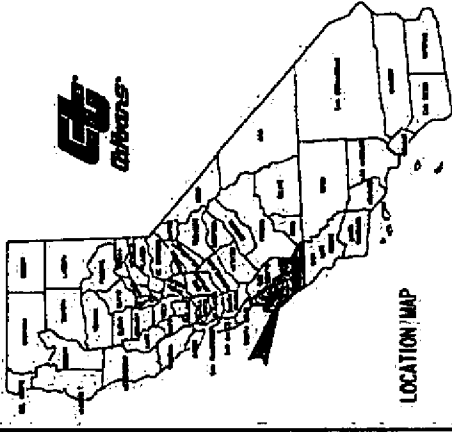
03-21-14

Replace the 1st paragraph of section 94-1.04 with:

03-21-14

Asphaltic emulsion is measured by weight under the specifications requiring its use. If water is added to the asphaltic emulsion, the quantity of asphaltic emulsion is determined before the addition of water.

SHEET NO.	ROUTE	SCALE	SHEET COUNT
05	1, 68	75:1, L4:2	1



**STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
PROJECT PLANS FOR CONSTRUCTION ON  
STATE HIGHWAY  
IN MONTEREY COUNTY  
IN AND NEAR MONTEREY  
AT ROUTE 1/68 SEPARATION  
TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010**

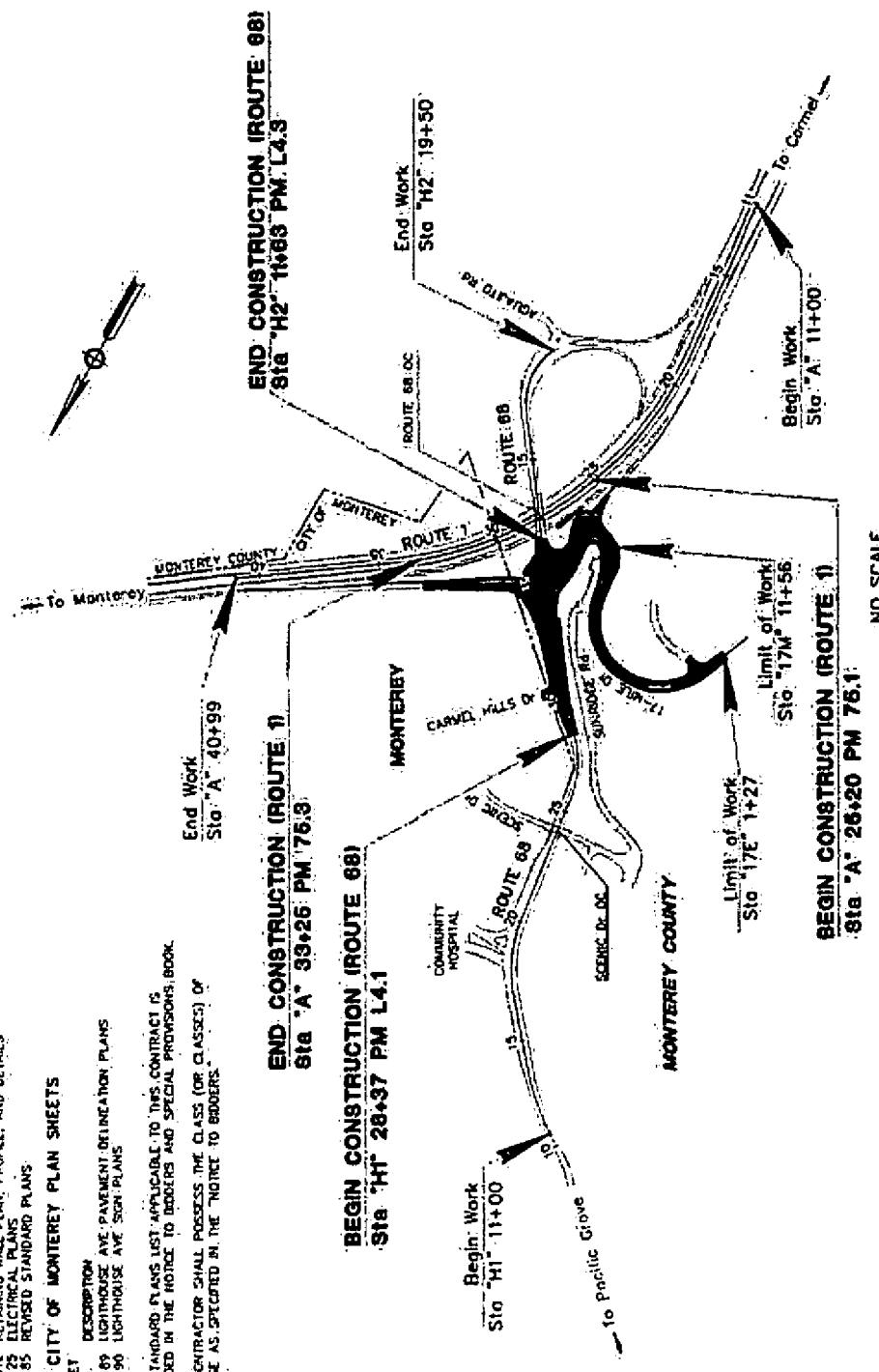
**INDEX OF PLANS**

- 1 TITLE SHEET AND LOCATION MAP
- 2-4 TYPICAL SECTIONS
- 5 KEY MAP, LIRE INDEX, AND SURVEY CONTROL
- 6 LAYOUT
- 7 LAYOUT DEMOLITION PLAN
- 8-12 PROFILE AND SUPER ELEVATION DIAGRAMS
- 13-24 CONSTRUCTION DETAILS
- 30 CONTOUR GRADING
- 31-46 DRAINAGE PLANS, PROFILES, DETAILS, AND QUANTITIES
- 47-48 UTILITY PLAN
- 49 CONSTRUCTION AREA SIGNS
- 50 STAGE CONSTRUCTION/TRAFFIC HANDLING PLANS
- 70-76 PAVEMENT REINDEATION PLANS AND QUANTITIES
- 77-87 SOIL PLANS, DETAILS, AND QUANTITIES
- 88-99 SUMMARY OF QUANTITIES
- 100-102 PLANNING LIST, PLANS, AND DETAILS
- 103-107 IRRIGATION PLANS AND DETAILS
- 108 EROSION CONTROL
- 109-112 RETAINING WALL PLAN, PROFILE, AND DETAILS
- 113-129 ELECTRICAL PLANS
- 128-165 REVISED STANDARD PLANS

**CITY OF MONTEREY PLAN SHEETS**

- SHEET NO. DESCRIPTION
- 186-189 LIGHTHOUSE AVE. PAVEMENT REINDEATION PLANS
- 190 LIGHTHOUSE AVE. SIGN PLANS

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK. THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE NOTICE TO BIDDERS.



NO SCALE

*John Fouché*  
APPROVED AS TO IMPACT ON ENVIRONMENTAL QUALITY FOR THE CITY OF MONTEREY DISTRICT

*John Fouché*  
APPROVED AS TO IMPACT ON ENVIRONMENTAL QUALITY FOR THE CITY OF MONTEREY DISTRICT

DATE: 12-2-15  
PROJECT NO: 05-448004  
SHEET NO: 05-448004-05



CONTRACT NO.	05-448004
PROJECT ID	0500000542
PROJECT NUMBER & PHASE	0500000542



DATE	REVISED BY	DATE	REVISED BY

COUNTY	ROUTE	POST MILE	PLAN SHEET
Mon.	1-68	75.1, LA.2	2 190

REGISTERED ENGINEER	DATE	PROJECT

PLANS APPROVAL DATE	

CITY OF MONTEREY	
943 RESERVE DR. #100	
MONTEREY, CA 93940	

ROUTE 68 & ROUTE 1 SB RAMPS	
DESIGN DESIGNATION	
ADT (2015)	25,400
ADT (2035)	30,000
DHV	3,470
ESAL	1,275,487

51%	
3.2%	
40 MPH	
9.5 (ROUTE 68)	
10 (ROUTE 1 RAMPS)	

PAVEMENT CLIMATE REGION:  
CENTRAL COAST

**NOTES:**

1. DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
2. SUPERELEVATIONS ARE SHOWN ON THE SUPERELEVATION DIAGRAMS.
3. FOR EXACT SLOPES AND GRADES. SEE CONSTRUCTION DETAILS.
4. SEE PLANTING PLANS FOR VEGETATION DETAILS.
5. SEE CONSTRUCTION DETAILS FOR MEDIAN, SPLITTER ISLAND, TRUCK APRON, AND CENTRAL ISLAND DETAILS.
6. SEE CONSTRUCTION DETAILS FOR CURB TYPES AND LIMITS.
7. LANE WIDTHS VARY. SEE LAYOUTS, CONSTRUCTION DETAILS, AND PAVEMENT DELINEATION PLANS FOR DETAILS.
8. FOR ALL SECTIONS R-VALUE EQUALS 10.0.

**STRUCTURAL SECTION**

ROADWAY  
 1. 0.95" HMA (TYPE A)  
 2. 1.75" CLASS 2 AB  
 3. 0.87" MINOR CONCRETE  
 4. 0.50" CLASS 2 AB

TRUCK APRON  
 1. 0.87" MINOR CONCRETE  
 2. 0.50" CLASS 2 AB

SEWER WALK  
 1. 0.50" CLASS 2 AB

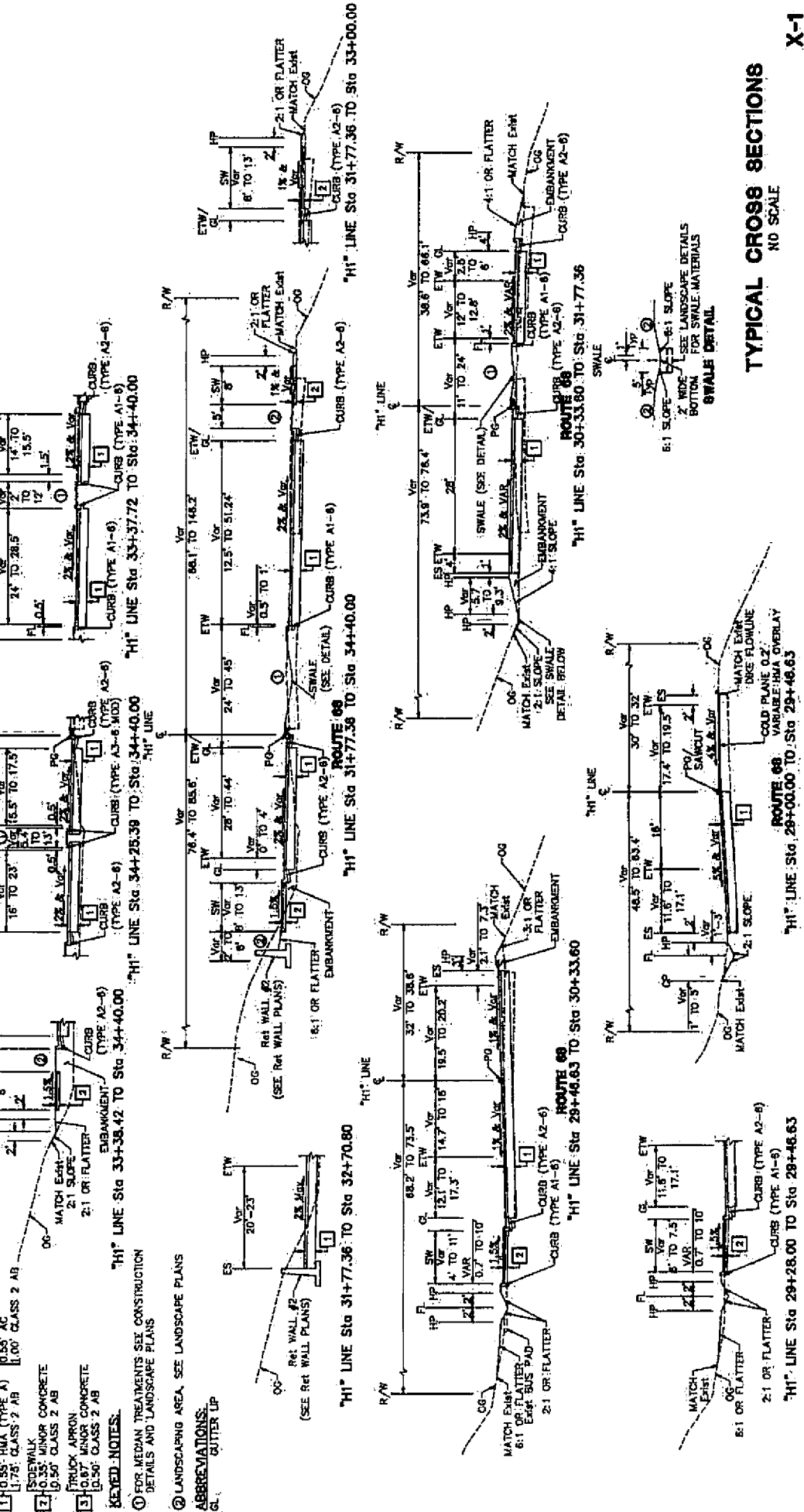
**KEYED NOTES:**

1. FOR MEDIAN TREATMENTS SEE CONSTRUCTION DETAILS AND LANDSCAPE PLANS

2. LANDSCAPING AREA. SEE LANDSCAPE PLANS

**ABBREVIATIONS:**

GL. GUTTER UP



### TYPICAL CROSS SECTIONS NO SCALE

X-1  
PROJECT NUMBER & PHASE  
ETS 090000842

NOT

CAO RISK

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 RONALD C. BOYLE  
 CHECKED BY  
 DATE REVISED BY

BORDER LAST REVISED 7/2/2010

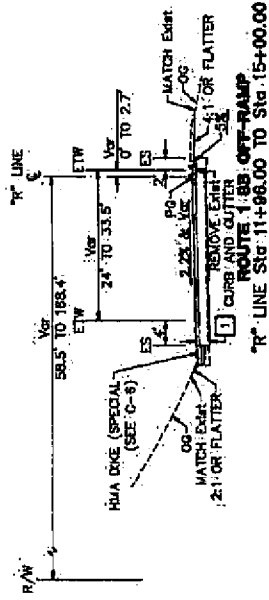
DATE	COUNTY	ROUTE	POST MILE	POST MILE
05	Mon	1, 66	75.1, L&C	3, 190

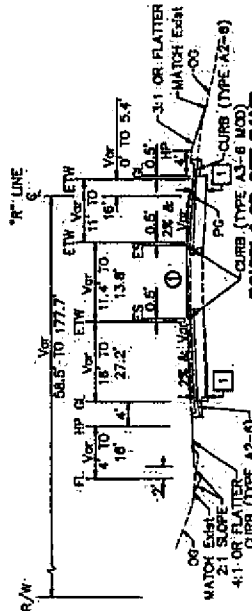
REGISTERED CIVIL ENGINEER	DATE
	04/27/17

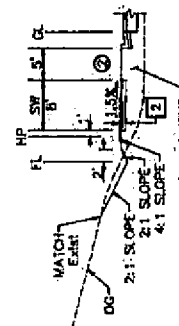
PLANS APPROVAL DATE	04/27/17
CITY OF MONTEREY	540 PACIFIC STREET
MONTEREY, CA 93940	



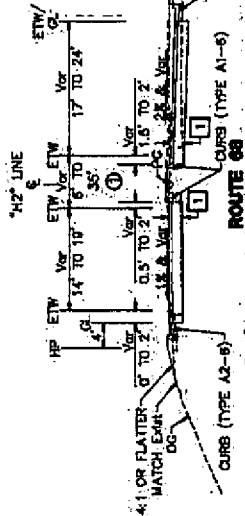
"R" LINE Sta 11+96.00 TO Sta 11+98.00



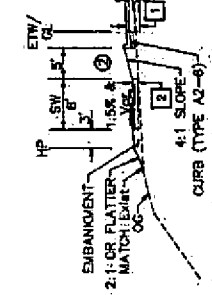
"R" LINE Sta 10+81.51 TO Sta 11+86.00



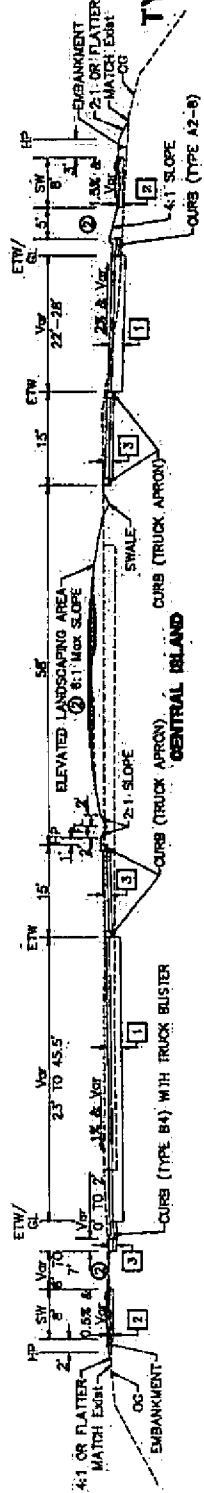
"R" LINE Sta 10+81.51 TO Sta 11+38.61



"H2" LINE Sta 10+75.52 TO Sta 11+63.00



"H2" LINE Sta 10+75.52 TO Sta 11+20.10



"H2" LINE Sta 11+22.87 TO Sta 11+63.00

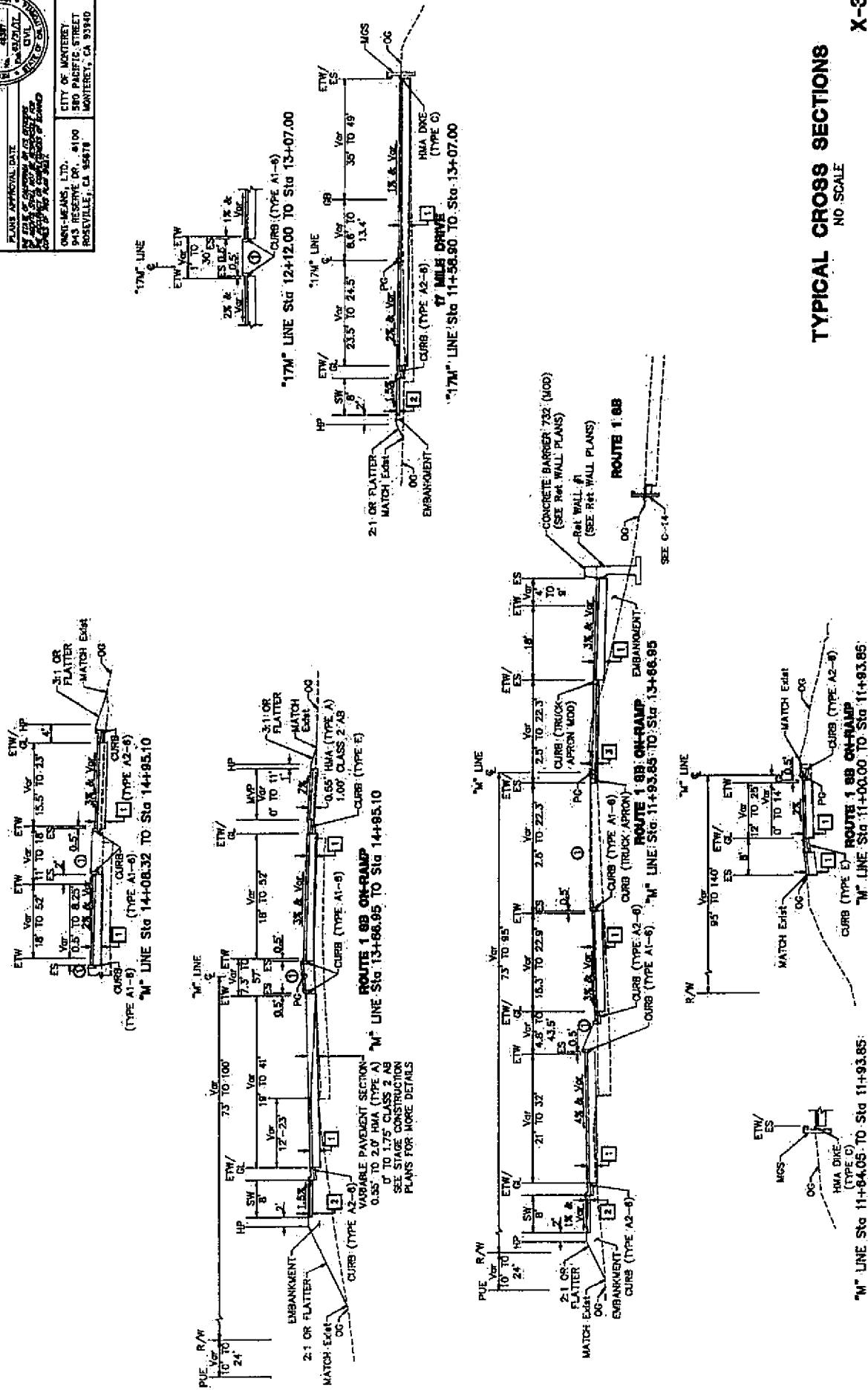
TYPICAL CROSS SECTIONS  
NO SCALE

X-2



NO.	COUNTY	ROUTE	TOTAL LENGTH	POST MILES
05	Mon	1-68	75.1, L-4.2	4 190

REGISTERED ENGINEER DATE: \_\_\_\_\_  
 PLANS APPROVAL DATE: \_\_\_\_\_  
 CITY OF MONTEREY, CALIFORNIA  
 CIVIL ENGINEER  
 48377  
 943 RESERVE DR., #100  
 ROSEVILLE, CA 95678  
 MONTEREY, CA 93940

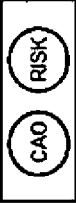


**TYPICAL CROSS SECTIONS**  
NO SCALE

X-3

PROJECT NUMBER & PHASE ETS 050000942

NIT



SCALE: 1" = 20' HORIZONTAL  
1" = 4' VERTICAL

Agreement #: Ag-5377 - Page 497 of 791

REVISED 7/2/2010

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G. BOYLE	CHECKED BY	DATE REVISION
BOYLE				

DIST.	COUNTY	ROUTE	TOTAL LENGTH	DATE
05	Mon	1, 68	751.14.2	5 190

REGISTERED CIVIL ENGINEER  
DATE: 03/27/17

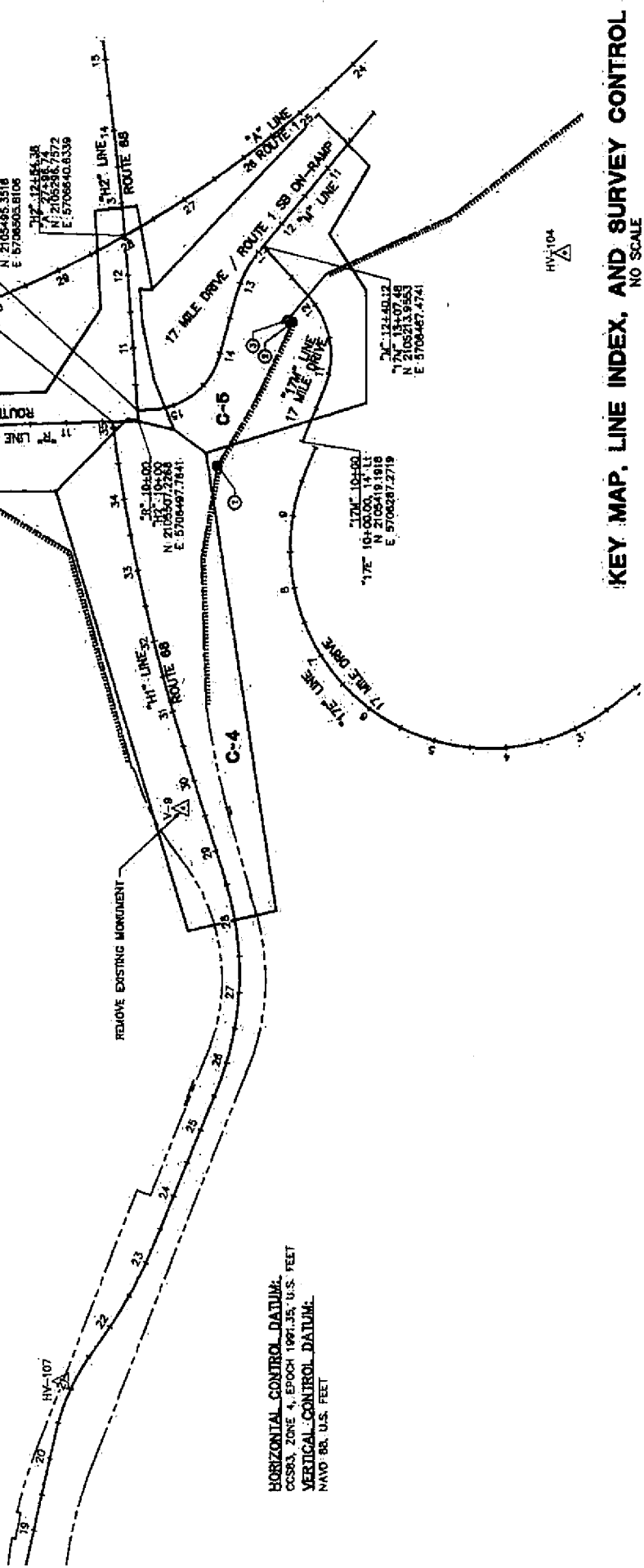
PLANS APPROVAL DATE: 03/27/17

CITY OF MONTEREY  
380 PACIFIC STREET  
MONTEREY, CA 93940

- NOTE:**
- FOR COMPLETE PROJECT CONTROL AND MONUMENTATION DATA, SEE THE SURVEY RECORDS ON FILE AT THE DISTRICT OFFICE.
  - FOR ALIGNMENT LINE DATA AND PROFILES, SEE SHEETS L-1, P-1, P-2, P-3, AND P-4.
  - SEE SURVEY RECORDS ON FILE AT THE DISTRICT OFFICE FOR 'A' LINE ALIGNMENT AND PROFILE DATA.
- LEGEND:**
- EXISTING MONUMENT
  - PLACE SURVEY MONUMENT (TYPE A)

**SUPPLEMENTAL SURVEY CONTROL**

MONUMENT	NORTHING	EASTING	ELEVATION	DESCRIPTION
V-9	-	-	587.91	1" DIG. IRON PIPE
HV-104	2105013.75	5706101.70	471.27	RAILROAD SPIKE
HV-107	2106706.81	5705927.75	644.16	RAILROAD SPIKE
HV-108	2108256.07	5706790.47	623.01	RAILROAD SPIKE
①	2105908.67	5706372.67	558.72	PLACE PER CALTRANS STD A74 (TYPE A)
②	2105953.26	5706365.62	550.82	PLACE PER CALTRANS STD A74 (TYPE A)
③	2105283.78	5706387.49	551.48	PLACE PER CALTRANS STD A74 (TYPE A)



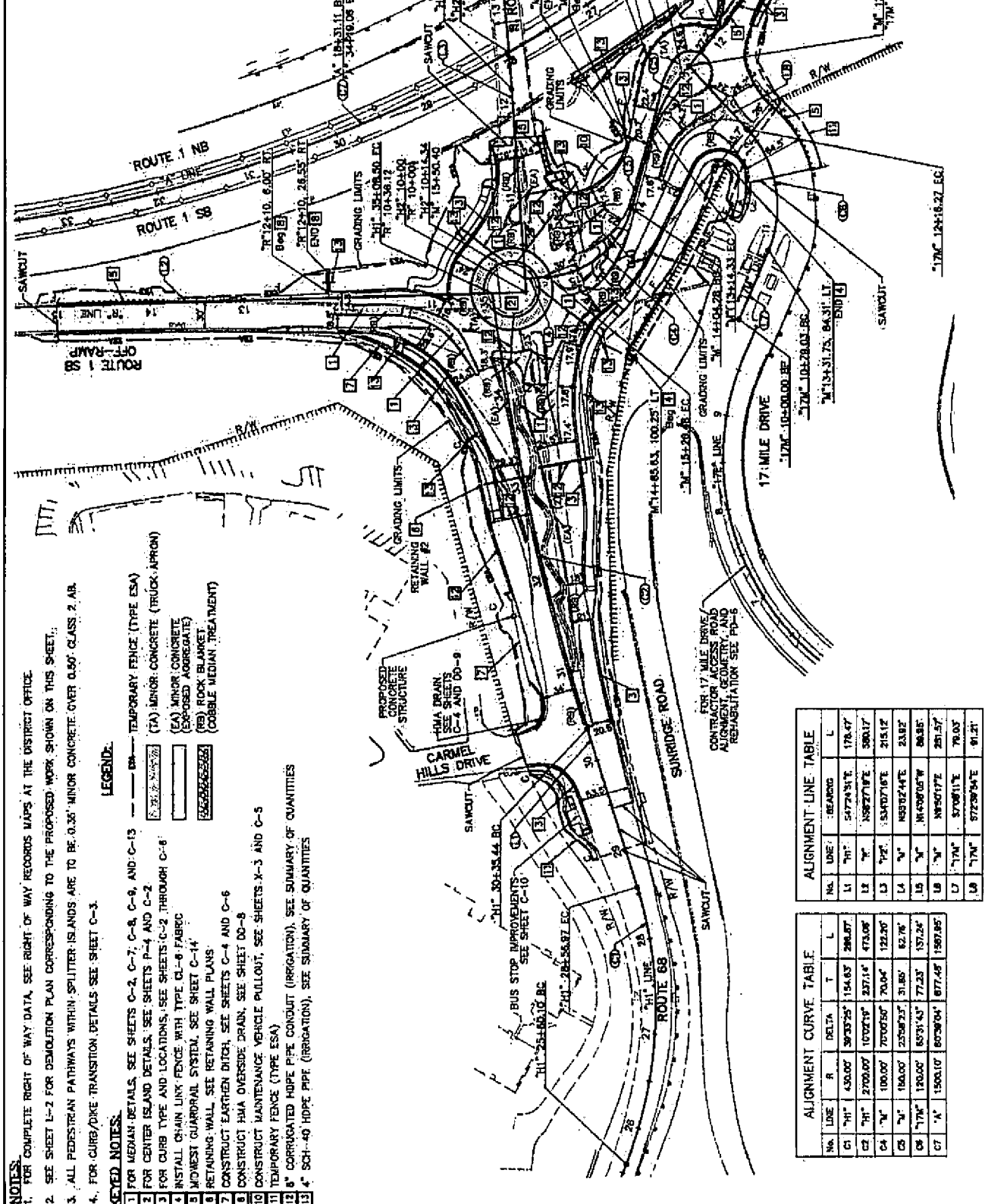
**KEY MAP, LINE INDEX, AND SURVEY CONTROL**  
NO SCALE

K-1

COUNTRY	ROUTE	TOTAL PROJECT	SHEET NUMBER
Mon	1, 6B	751, 14, 2	6 190

REGISTERED CIVIL ENGINEER  
DATE: 03/27/01  
PLANS APPROVAL DATE: 03/27/01

STATE OF CALIFORNIA  
DIVISION OF HIGHWAYS  
COUNTY OF MONTEREY  
CITY OF MONTEREY  
943 RESERVE DR. #100  
MONTEREY, CA 95070



- NOTES:**
- FOR COMPLETE RIGHT OF WAY DATA, SEE RIGHT OF WAY RECORDS MAPS AT THE DISTRICT OFFICE.
  - SEE SHEET L-2 FOR DEMOLITION PLAN CORRESPONDING TO THE PROPOSED WORK SHOWN ON THIS SHEET.
  - ALL PEDESTRIAN PATHWAYS WITHIN SPLITTER ISLANDS ARE TO BE 0.35" MINOR CONCRETE OVER 0.50" CLASS 2 A.B.
  - FOR CURB/DIKE TRANSITION DETAILS, SEE SHEET C-3.
- KEYED NOTES:**
- FOR MEDIAN DETAILS, SEE SHEETS C-2, C-7, C-8, C-9, AND C-13
  - FOR CENTER ISLAND DETAILS, SEE SHEETS P-4 AND C-2
  - FOR CURB TYPE AND LOCATIONS, SEE SHEETS C-2 THROUGH C-8
  - INSTALL CHAIN LINK FENCE WITH TYPE CL-6 FABRIC
  - MIDWEST GUARDRAIL SYSTEM, SEE SHEET C-14
  - RETAINING WALL, SEE RETAINING WALL PLANS
  - CONSTRUCT EARTHEN DITCH, SEE SHEETS C-4 AND C-6
  - CONSTRUCT HMA OVERSIDE DRAIN, SEE SHEET D0-8
  - CONSTRUCT MAINTENANCE VEHICLE PULLOUT, SEE SHEETS X-3 AND C-5
  - TEMPORARY FENCE (TYPE ESA)
  - CORROGATED HDPE PIPE CONDUIT (IRRIGATION), SEE SUMMARY OF QUANTITIES
  - 4" SCH-40 HDPE PIPE (IRRIGATION), SEE SUMMARY OF QUANTITIES

- LEGEND:**
- TEMPORARY FENCE (TYPE ESA)
  - MINOR CONCRETE (TRUCK APPROX)
  - MINOR CONCRETE (EXPOSED AGGREGATE)
  - ROCK BLANKET
  - COBBLE MEDIAN TREATMENT

**ALIGNMENT CURVE TABLE**

Sta	LINE	R	DELTA	T	L
C1	"1"	430.00'	39°33'55"	154.63	296.67'
C2	"1"	2700.00'	102°21'50"	237.14'	474.08'
C4	"1"	100.00'	70°00'50"	70.04'	122.35'
C5	"1"	150.00'	55°00'25"	31.85'	62.76'
C6	"1"	120.00'	60°31'43"	77.23'	137.24'
C7	"1"	1500.00'	60°26'04"	877.45'	1592.85'

**ALIGNMENT LINE TABLE**

Sta	LINE	BEARING	L
L1	"1"	S47°24'31"E	178.47'
L2	"1"	N85°27'16"E	590.17'
L3	"1"	S34°07'16"E	215.12'
L4	"1"	N85°02'44"E	23.82'
L5	"1"	N14°00'07"W	98.85'
L6	"1"	N85°01'72"E	291.57'
L7	"1"	S70°01'11"E	78.00'
L8	"1"	S72°28'04"E	91.21'

LAYOUT SCALE 1"=50'

DATE	NO.	BY	REVISION
05	1	MB	75.1, 14.2
05	2	MB	75.1, 14.2
05	3	MB	75.1, 14.2
05	4	MB	75.1, 14.2
05	5	MB	75.1, 14.2
05	6	MB	75.1, 14.2
05	7	MB	75.1, 14.2
05	8	MB	75.1, 14.2

**NOTE:**

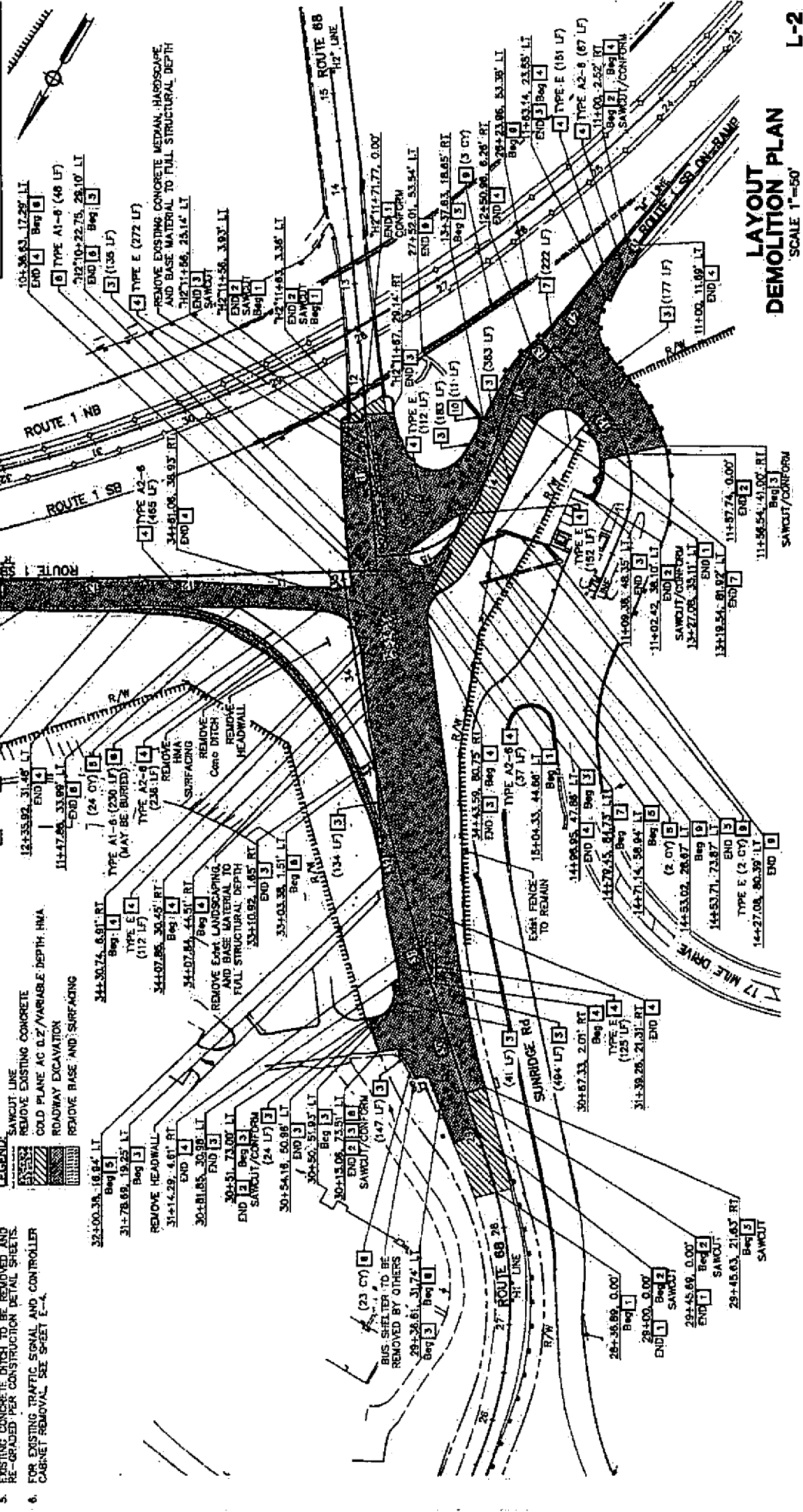
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT HIGHWAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR TREE REMOVAL, SEE CONSTRUCTION DETAIL TREE REMOVAL PLAN.
- ANY DAMAGE TO EXISTING IRRIGATION SYSTEMS AND LANDSCAPE AREAS BEYOND LIMITS OF WORK AS A RESULT OF CONSTRUCTION IMPROVEMENTS SHALL BE REPAIRED/REPLACED AT THE CONTRACTOR'S EXPENSE.
- SEE LAYOUT SHEET FOR PROPOSED CHAIN LINK FENCE LOCATION.
- EXISTING CONCRETE DITCH TO BE REMOVED AND RE-GRADED PER CONSTRUCTION DETAIL SHEETS.
- FOR EXISTING TRAFFIC SIGNAL AND CONTROLLER CABINET REMOVAL, SEE SHEET E-4.

**KEYED NOTES:**

- COLD PLANE AC 0.2" VARIABLE HMA OVERLAY
- ROADWAY EXCAVATION
- REMOVE AC DIKE
- REMOVE CURB AND GUTTER
- REMOVE CONCRETE DITCH
- REMOVE CURB
- REMOVE CHAIN LINK FENCE
- REMOVE BASE AND SURFACING (AC SIDEWALK)
- REMOVE AC DITCH
- REMOVE OVERSIDE DRAIN

**LEGEND:**

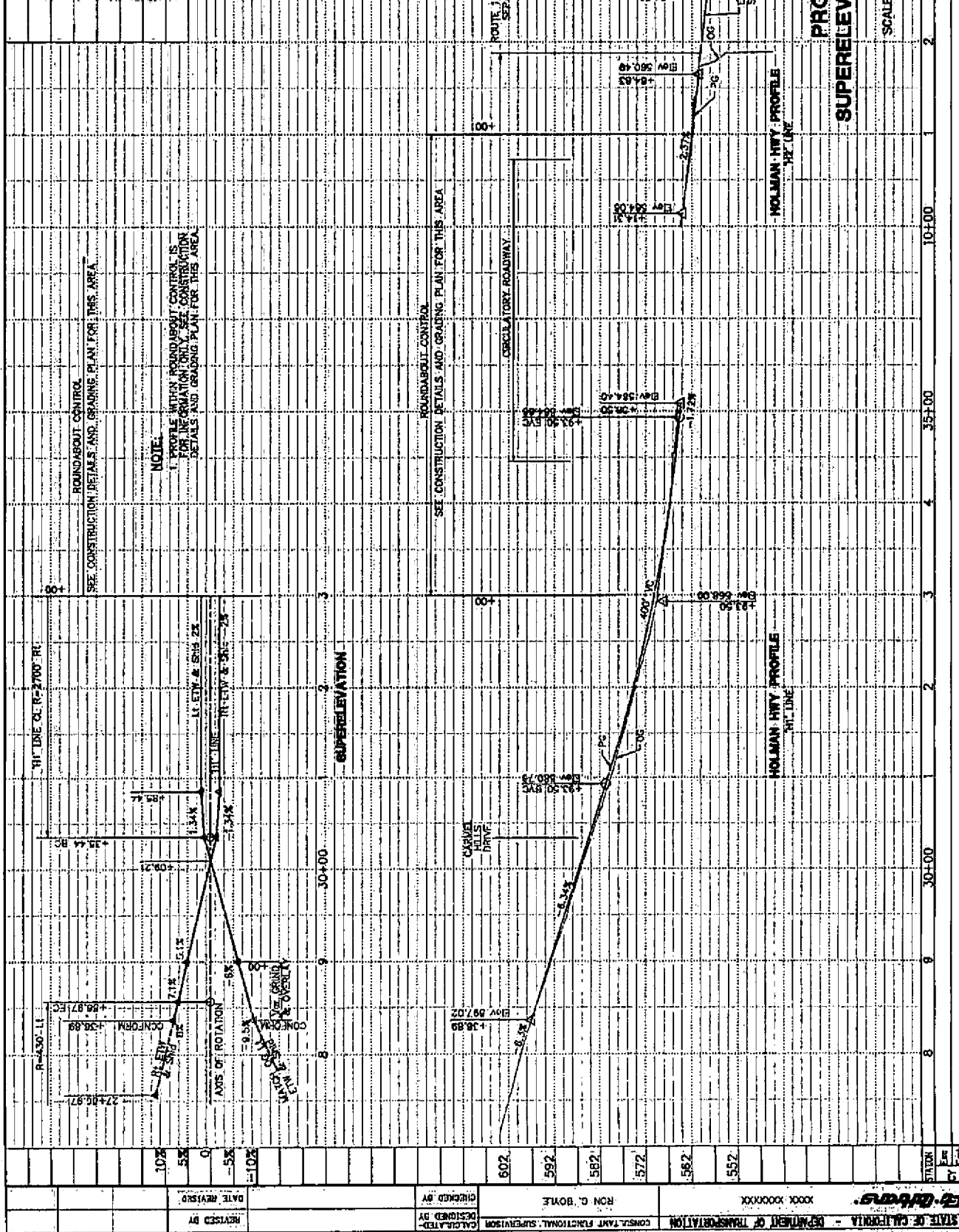
- SAW-CUT LINE
- REMOVE EXISTING CONCRETE
- COLD PLANE AC 0.2" VARIABLE DEPTH HMA
- ROADWAY EXCAVATION
- REMOVE BASE AND SURFACING



**LAYOUT PLAN**  
**DEMOLITION PLAN**  
 SCALE 1"=50'

FILE NO.	COUNTY	ROUTE	TOTAL PROJECT MILES
05	MON.	68-1	L-2, 75-1
REGISTERED CIVIL ENGINEER VANDERBILT UNIVERSITY SARASOTA, FLORIDA NO. 0707/AT CIVIL ENGINEER			

PLANS APPROVAL DATE: 08/27/11  
 CITY OF MONTEREY  
 943 RESERVE DR.  
 ROSELVILLE, CA 95940



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION CONSULTANT PROJECT NO. SUPERVISOR	PROJECT NUMBER: 4 PHASE	MT
DESIGNED BY: RON C. BOYLE	SCALE: 1"=50' Vert 1"=10'	CAO RISK
CHECKED BY:	PROJECT NUMBER: 4 PHASE	0500000542
DATE REVISION:	DATE: 7/3/2010	Agreement #: Ag-5377 - Page 501 of 791
STATION	10+00	TOTAL
502	592	592
572	562	552

**STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION**  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 XXXX XXXXXXX

**DATE REVISED** 7/7/2010

**REVISION** 1

**DESIGNED BY** RON C. BOYLE

**CHECKED BY**

**DATE REVISED**

**DESIGNED BY**

**CHECKED BY**

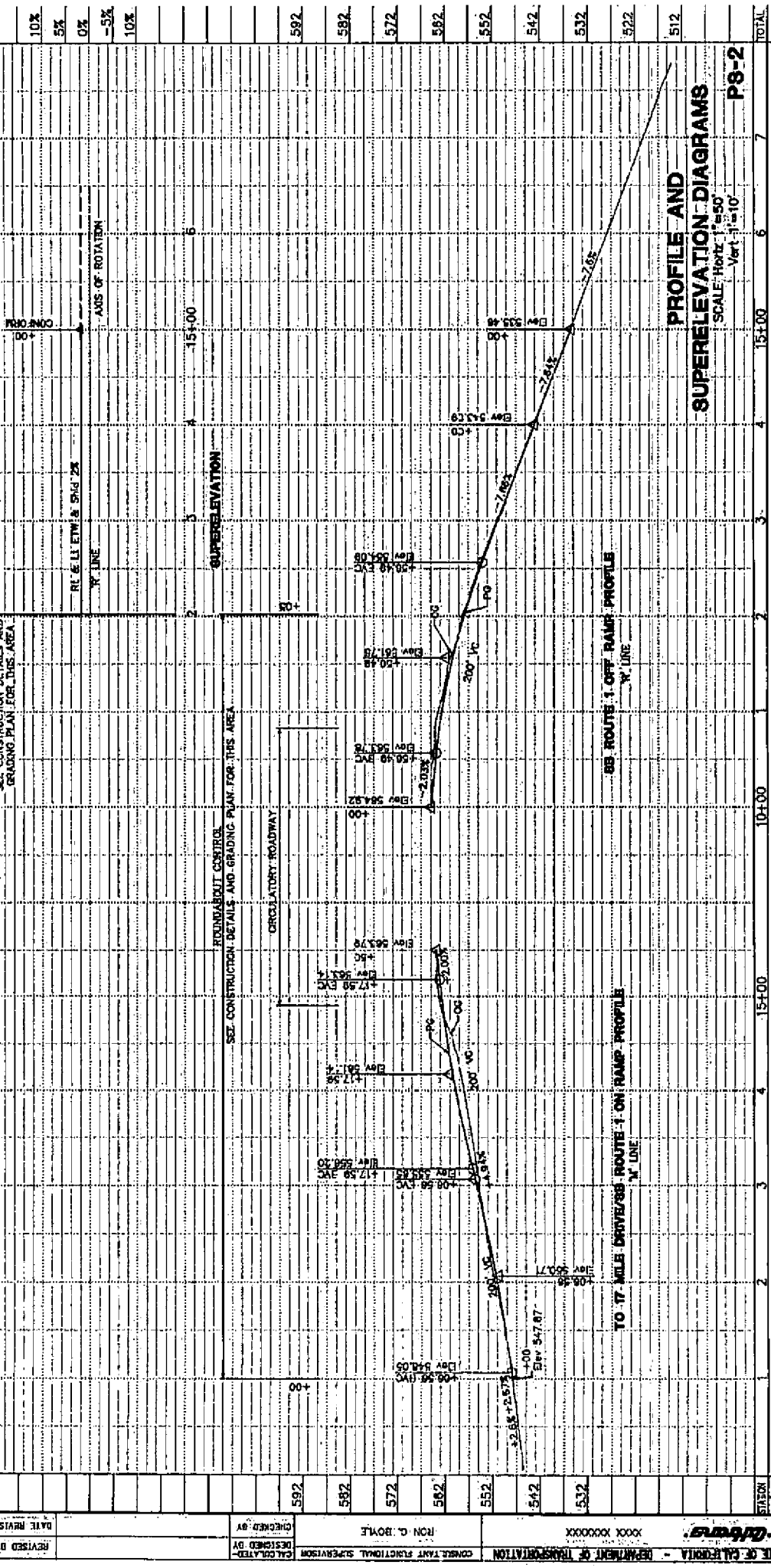
**DATE REVISED**

**REGISTERED CIVIL ENGINEER**  
**DATE** 11/27/07  
**NO.** 44587  
**EXPIRES** 11/27/10

**PLANS APPROVAL DATE**

**OFFICE OF THE REGISTERED PROFESSIONAL ENGINEER & ARCHITECT**  
**STATE OF CALIFORNIA**  
**1505 MARKET STREET, SUITE 100**  
**BERKELEY, CA 94704**

**CITY OF MONTEREY**  
**943 PIERCE ST.**  
**MONTEREY, CA 93940**



**STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION**  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 XXXX XXXXXXX

**DATE REVISED** 7/7/2010

**REVISION** 1

**DESIGNED BY** RON C. BOYLE

**CHECKED BY**

**DATE REVISED**

**DESIGNED BY**

**CHECKED BY**

**DATE REVISED**

**PROJECT NUMBER & PHASE** NT

**RELATIVE HORIZONTAL SCALE** 1"=10' HORIZONTAL

**PROJECT NUMBER & PHASE** NT

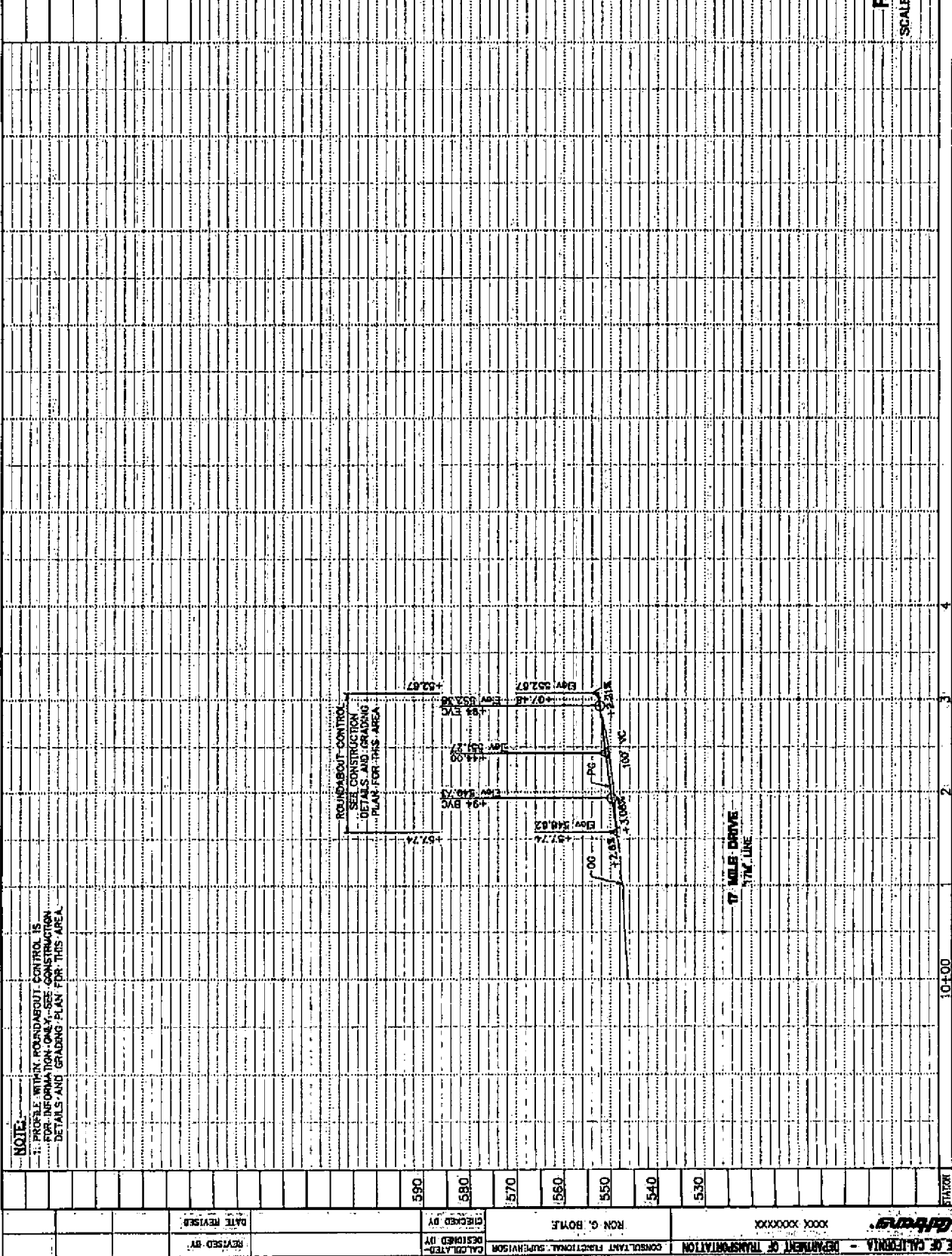
**CAO**

**RISK**

**Agreement #: Ag-5377 - Page 502 of 791**

**0500000542**

DATE	QUANTITY	ROUTE	DATE PROJECT	SHEET NUMBER
05	MON	68.1	1.4.2.75.1	10
REGISTERED CIVIL ENGINEER DATE: 11/24/11 CIVIL 4837 STATE OF CALIFORNIA BOARD OF PROFESSIONAL ENGINEERS				
PLANS APPROVAL DATE: _____ CITY OF MONTEREY 943 RESERVE DR. #100 ROSELVILLE, CA 95070				



STATION	10+00	2	3	4	TOTAL
Exc					
CY					
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION CONSULTANT FRACTIOMAL SUPERVISOR CHECKED BY: RGN G. BOYLE DATE REVISION: _____ REVISION: _____ DATE REVISION: _____					
PROJECT NUMBER & PHASE: 0500000542 Agreement #: Ag-5377 - Page 503 of 791 CAO RISK					

STATE	COUNTY	ROUTE	TOTAL LENGTH	DATE	SCALE
CA	MON	68.1	14.2	75.1	11 190
REGISTERED CIVIL ENGINEER DATE: 1/10/09 CIVIL No. 44577 No. 44721					
PLANS APPROVAL DATE: DATE: 1/10/09 CIVIL No. 44577 No. 44721					
CITY OF MONTREY 526 PIERCE ST MONTREY, CA 93940					

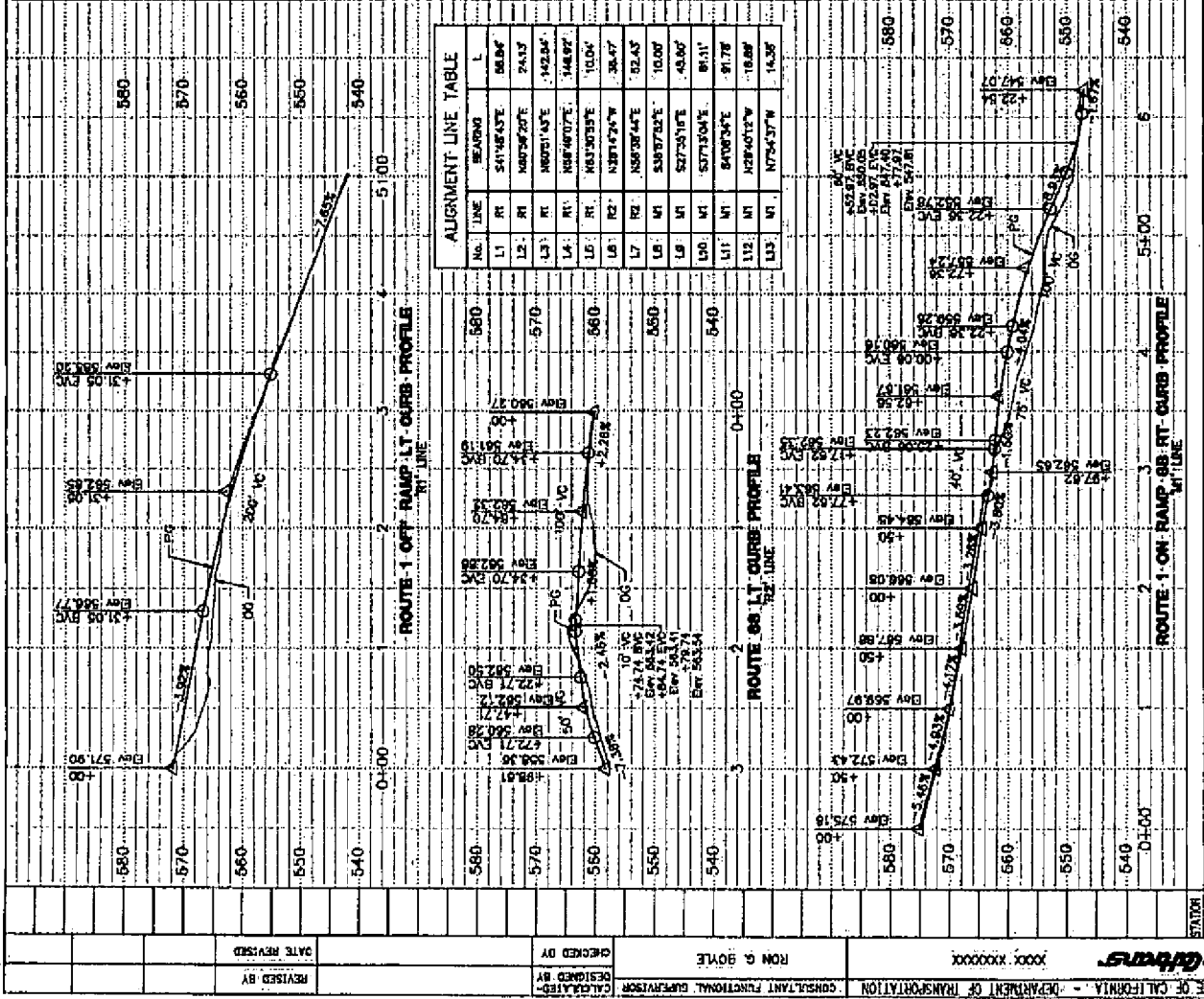
NOTES:  
 1. CURB PROFILES SHOWN ON THIS SHEET ARE BASED ON THE PROPOSED GUTTER LIP. SEE PROFILE LOCATION DETAIL ON SHEET P-5.  
 2. FOR CURB TYPE AND LOCATIONS, SEE CONSTRUCTION DETAILS.

ALIGNMENT CURVE TABLE

CURVE LINE	R	DELTA	T	L
C1	167.70	107.20	15.00	28.07
C2	372.54	497.98	15.00	31.16
C3	282.00	103.78	24.25	43.37
C4	170.00	51.00	36.50	104.88
C5	92.00	87.33	23.87	46.00
C6	230.00	91.99	20.37	40.87
C7	68.00	47.50	26.00	54.00
C8	4.00	127.77	7.25	8.54
C9	118.00	25.40	30.04	58.94
C10	125.00	92.28	10.25	20.48
C11	133.00	69.78	10.38	20.87
C12	234.00	22.25	48.30	91.41
C13	35.00	371.28	16.51	33.75
C14	175.00	23.97	36.85	72.25
C15	208.00	358.44	10.33	20.87
C16	32.00	100.00	68.88	72.89
C17	22.00	14.87	4.84	9.87
C18	32.70	20.45	8.85	19.09

ALIGNMENT LINE TABLE

LINE	BEARING	L
L1	S11°48'45"E	58.04
L2	N80°58'20"E	24.13
L3	N80°11'45"E	142.84
L4	N89°40'07"E	148.97
L5	N83°30'25"E	10.06
L6	N87°17'24"E	38.47
L7	N85°38'44"E	52.45
L8	N59°57'32"E	10.00
L9	N27°50'10"E	48.00
L10	N37°13'04"E	81.31
L11	S40°08'45"E	91.78
L12	N2°40'17"E	18.89
L13	N75°43'37"E	14.25



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 DESIGNED BY: ROM S. BOYLE  
 CHECKED BY:  
 DATE REVISOR:  
 REVISOR:  
 STATION: Sta. 0+00 to 5+00  
 PROJECT NUMBER & PHASE: 0500000542  
 TOTAL: 11 190  
 RISK: CAO RISK  
 AGREEMENT #: Ag-5377 - Page 504 of 791  
 BORDER LAST REVISED 7/7/2010  
 LICENSE NO. 44577



DATE	COUNTY	ROUTE	POST MILE	SECTION	SHEET	TOTAL SHEETS
05/11/00	MON	68.1	14.2	75.1	12	190

REGISTERED CIVIL ENGINEER	DATE	APPROVAL DATE
(Signature)		

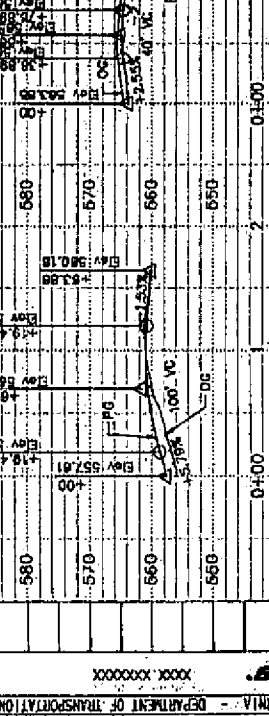
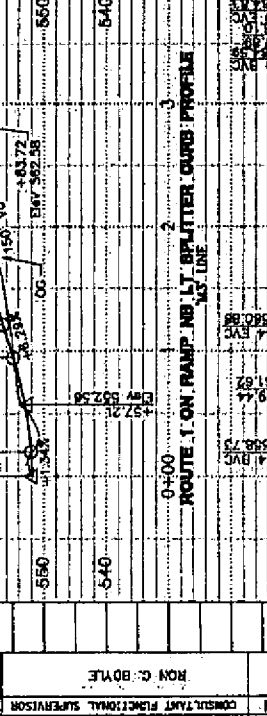
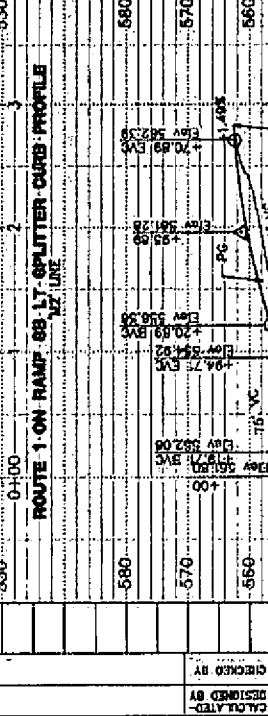
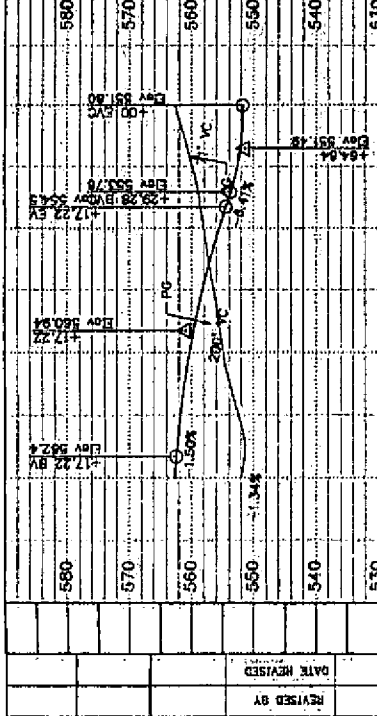
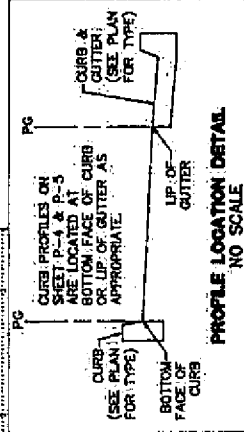
PLANS APPROVAL DATE	CITY OF MONTEREY
	500 PINE ST.
	MONTEREY, CA 93940

NOTES:

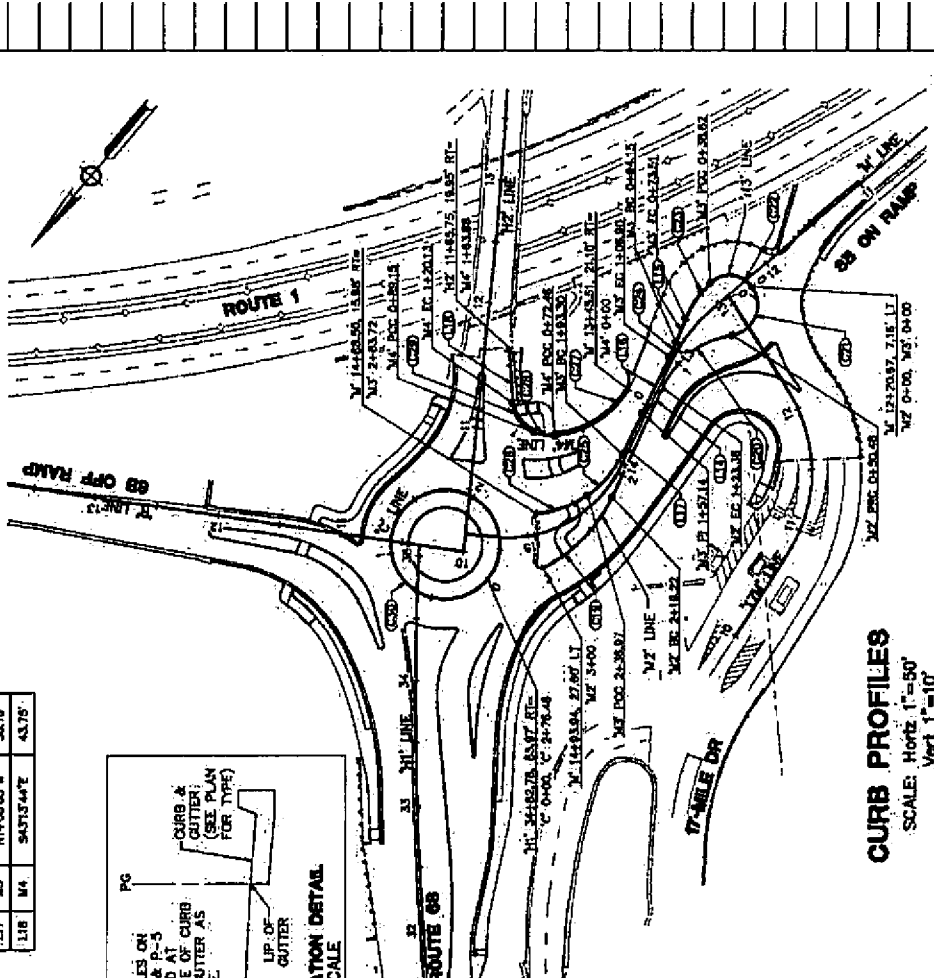
- CURB PROFILES SHOWN ON THIS SHEET ARE BASED ON THE PROPOSED BOTTOM FACE OF CURB AND GUTTER UP. SEE PROFILE LOCATION DETAIL.
- FOR CURB TYPE AND LOCATIONS, SEE CONSTRUCTION DETAILS.

LINE	BEARING	L
M1	N157°00'W	80.78'
M2	N179°00'W	20.84'
M3	N147°00'W	50.24'
M4	N147°00'W	35.16'
M5	S43°13'44"E	45.75'

CURVE LINE	R	DELTA	T	L
C19	M2	170.00'	37°34'18"	40.78'
C20	M2	75.00'	88°41'44"	38.82'
C21	M2	25.00'	119°28'13"	30.73'
C22	M3	22.50'	68°17'52"	28.02'
C23	M3	84.50'	33°29'23"	17.70'
C24	M3	200.00'	3°00'00"	6.37'
C25	M3	65.00'	27°28'12"	23.33'
C26	M3	65.00'	29°26'08"	23.33'
C27	M4	75.00'	67°20'22"	38.34'
C28	M4	38.00'	25°00'38"	6.48'
C29	M4	27.00'	65°44'13"	17.45'
C30	C	44.00'	348°17'45"	5.29'



STATION	ELEVATION	PROFILE
0+00	530.00	RT-CURB
0+100	540.00	RT-CURB
0+200	550.00	RT-CURB
0+300	560.00	RT-CURB
0+400	570.00	RT-CURB
0+500	580.00	RT-CURB



**CURB PROFILES**  
SCALE: Horiz 1"=50'  
Vert 1"=10'

DATE	COUNTY	ROUTE	POST MILE	SECTION	SHEET	TOTAL SHEETS
05/11/00	MON	68.1	14.2	75.1	12	190

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
CONSULTANT FLEETMAN SUPERVISOR  
RON C. BOYLE  
CHECKED BY  
DATE REVISION

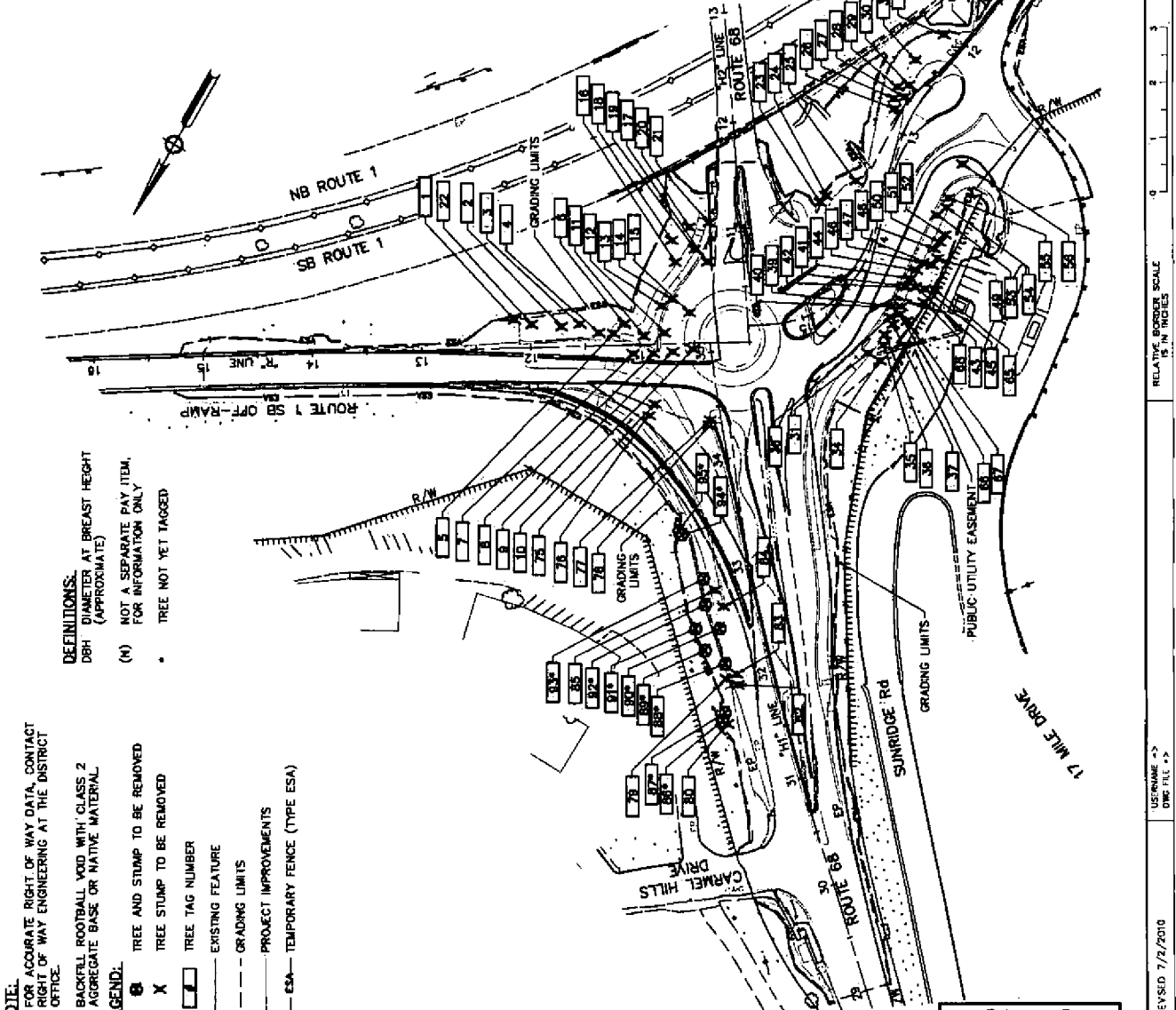
CAO RISK

PROJECT NUMBER & PHASE  
0500000542

Agreement #: Ag-5377 - Page 505 of 791

COUNTY: Mon ROUTE: 1, 68 TOTAL PROJECT: 75.1, 1.4, 2 SHEET TOTAL: 13 190  
 DATE: 05  
 REGISTERED CIVIL ENGINEER: *David Johnson*  
 LICENSE NO.: 10000  
 DATE: 01-01-00  
 CITY OF MONTEREY: 943 RESERVE DR., #100 MONTEREY, CA 93940  
 PROJECT: 580 PACIFIC STREET  
 DATE: 01-01-00  
 SCALE: 1"=50'  
 PROJECT NUMBER & PHASE: EFTS 0500000542

TREE STUMP REMOVAL				TREE STUMP REMOVAL							
TREE TAG No.	DESCRIPTION	TRUNK DBH (IN) (INCHES)	REMOVE STUMP (EA)	REMOVE TREE (EA)	APPROX BACKFILL VOLUME (CY) (N)	TREE TAG No.	DESCRIPTION	TRUNK DBH (IN) (INCHES)	REMOVE STUMP (EA)	REMOVE TREE (EA)	APPROX BACKFILL VOLUME (CY) (N)
1	PINE	16	1	1	0.4	44	PINE	18	1	1	0.4
2	PINE	24	1	1	0.7	45	PINE	18	1	1	0.4
3	UNKNOWN	6.7, 3	1	1	0.4	46	PINE	18	1	1	0.4
4	UNKNOWN	6	1	1	0.1	47	PINE	18	1	1	0.4
5	PINE	8.16, 22	1	1	2.8	48	PINE	18	1	1	0.4
6	PINE	20	1	1	0.5	49	PINE	18	1	1	0.4
7	CEANOTHUS	6	1	1	0.1	50	PINE	12	1	1	0.2
8	OAK	6	1	1	0.1	51	PINE	8	1	1	0.1
9	OAK	12	1	1	0.2	52	PINE	16	1	1	0.4
10	OAK	17	1	1	0.4	53	PINE	12, 12, 13	1	1	1.7
11	PITTSPORIUM	17	1	1	0.4	54	PINE	18	1	1	0.4
12	PITTSPORIUM	19	1	1	0.5	55	PINE	20	1	1	0.5
13	PINE	20	1	1	0.5	56	PINE	15	1	1	0.3
14	PINE	22	1	1	0.8	57	PINE	18	1	1	0.4
15	OAK	9	1	1	0.1	58	PINE	8, 8	1	1	0.4
16	PINE	16	1	1	0.4	59	PINE	12	1	1	0.2
17	OAK	12	1	1	0.2	60	PINE	9	1	1	0.1
18	PINE	16	1	1	0.4	61	PINE	12	1	1	0.2
19	PINE	16	1	1	0.4	62	PINE	12	1	1	0.2
20	PINE	16	1	1	0.4	63	PINE	12	1	1	0.2
21	OAK	6.8	1	1	0.2	64	PINE	18	1	1	0.4
22	UNKNOWN	10	1	1	0.2	65	PINE	18	1	1	0.4
23	PINE	17	1	1	0.4	66	PINE	8, 8	1	1	0.4
24	PINE	18	1	1	0.4	67	PINE	12	1	1	0.2
25	OAK	9	1	1	0.1	68	PINE	12	1	1	0.2
26	OAK	6	1	1	0.1	69	PINE	9	1	1	0.1
27	OAK	6	1	1	0.1	70	OAK	12, 28	1	1	2
28	PINE	24	1	1	0.7	71	OAK	21	1	1	0.6
29	UNKNOWN	8	1	1	0.1	72	PINE	20	1	1	0.5
30	UNKNOWN	10	1	1	0.1	73	PINE	12	1	1	0.2
31	PINE	10	1	1	0.2	74	PINE	12	1	1	0.2
32	PINE	15	1	1	0.3	75	OAK	18	1	1	0.4
33	PINE	15	1	1	0.3	76	PINE	12	1	1	0.2
34	PINE	18	1	1	0.4	77	OAK	21	1	1	0.6
35	PINE	15	1	1	0.3	78	PINE	20	1	1	0.5
36	PINE	12	1	1	0.2	79	OAK	9	1	1	0.1
37	PINE	18	1	1	0.4	80	OAK	12, 28	1	1	2
38	PINE	20	1	1	0.5	81	PINE	22	1	1	0.6
39	PINE	20	1	1	0.5	82	PINE	12	1	1	0.2
40	PINE	20	1	1	0.5	83	PINE	18	1	1	0.4
41	PINE	8	1	1	0.1	84	PINE	18	1	1	0.4
42	PINE	18	1	1	0.4	85	OAK	7	1	1	0.1
43	PINE	27	1	1	0.8	86	OAK	7	1	1	0.1
					TOTALS			70	10	35.3	

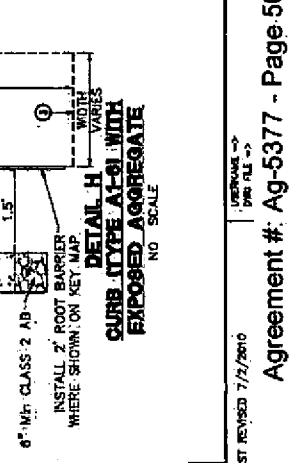
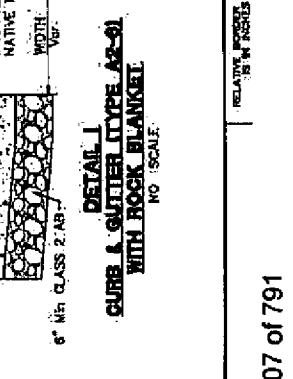
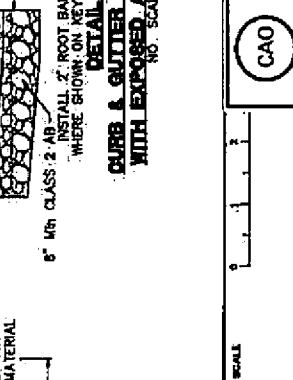
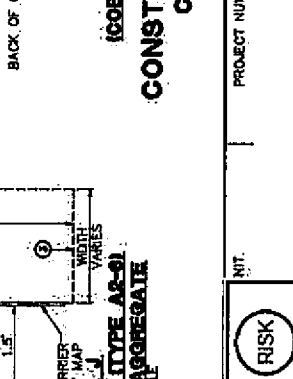
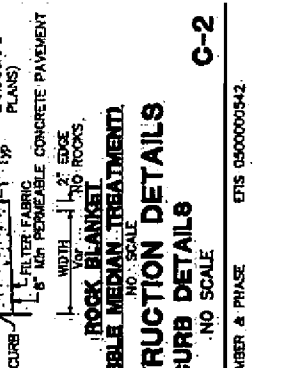
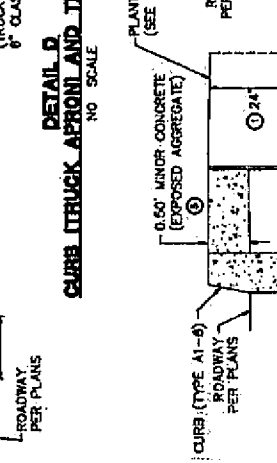
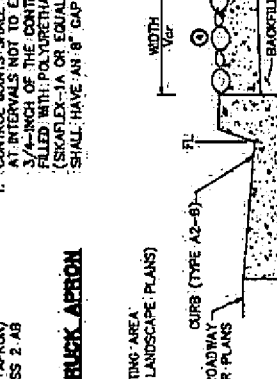
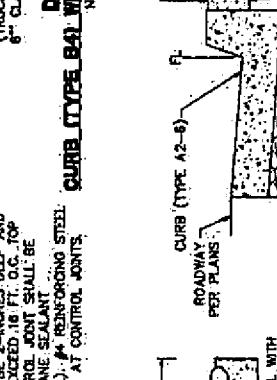
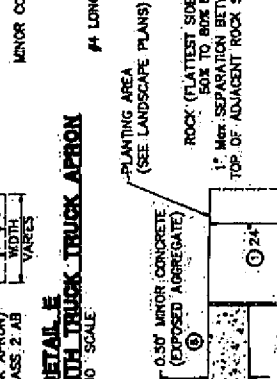
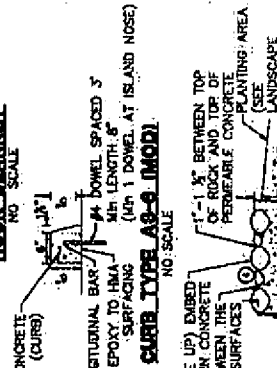
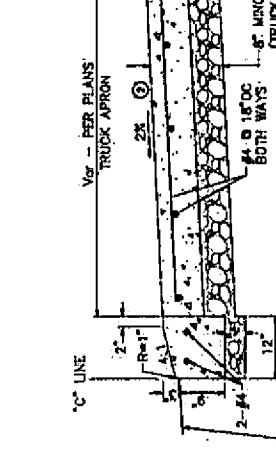
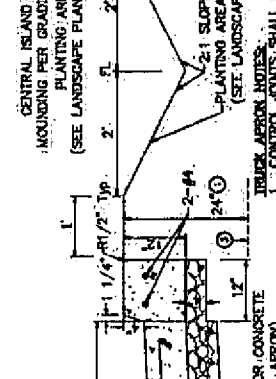
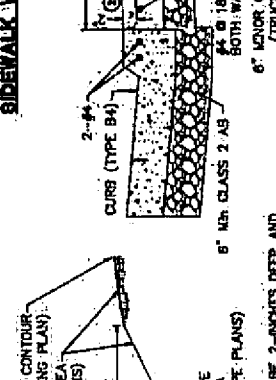
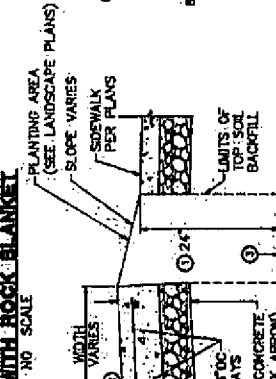
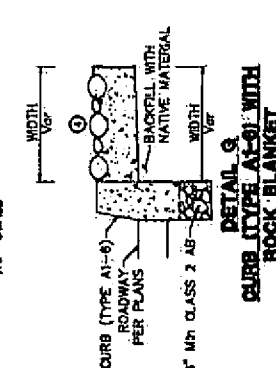
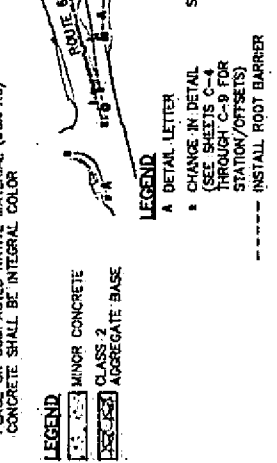
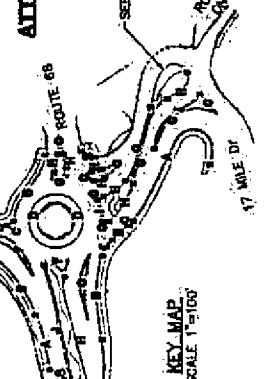
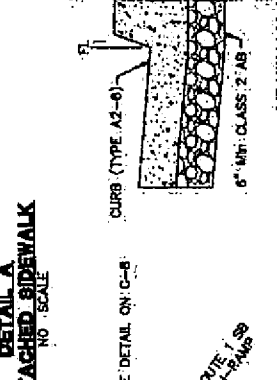
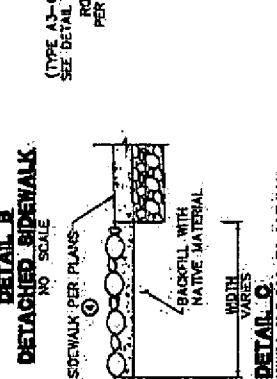
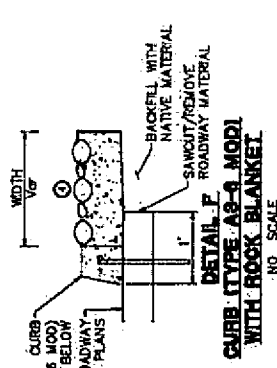
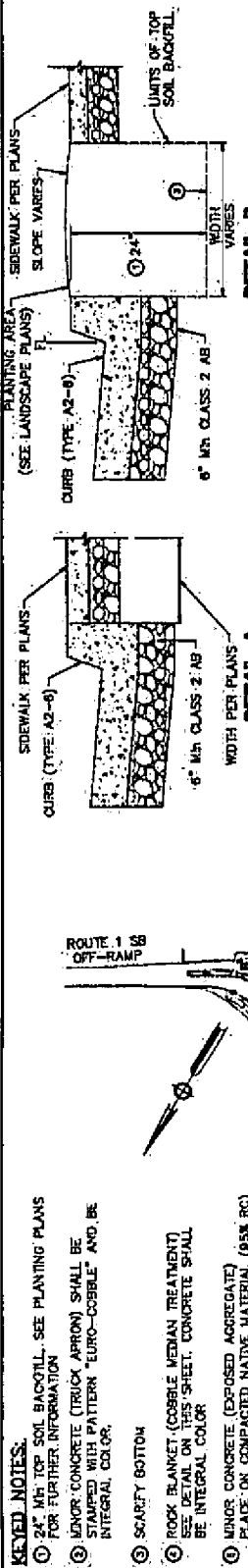


**NOTE:**  
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.  
 2. BACKFILL ROOTBALL VOID WITH CLASS 2 AGGREGATE BASE OR NATIVE MATERIAL.  
**LEGEND:**  
 (O) TREE AND STUMP TO BE REMOVED  
 (X) TREE STUMP TO BE REMOVED  
 [ ] TREE TAG NUMBER  
 [ ] EXISTING FEATURE  
 [ ] GRADING LIMITS  
 [ ] PROJECT IMPROVEMENTS  
 [ ] TEMPORARY FENCE (TYPE ESA)

**CONSTRUCTION DETAILS**  
**TREE STUMP REMOVAL**  
 SCALE: 1"=50'  
 C-1

TREE TAG No. NOT USED: 57-64, 68-74, 81

NO.	QUANTITY	ROUTE	POST MILES	PERCENTAGE	TOTAL PERCENTAGE
05	Mon	1, 68	75.1, 1.4, 2	14	190



**KEYED NOTES:**  
 1. 24" MIN. TOP SOIL BACKFILL. SEE PLANTING PLANS FOR FURTHER INFORMATION.  
 2. MINOR CONCRETE (TRUCK APRON) SHALL BE STAMPED WITH PATTERN "EURO-COBBLE" AND BE INTEGRAL COLOR.  
 3. SCARIFY BOTTOM.  
 4. ROCK BLANKET (COBBLE MEDIUM TREATMENT) SEE DETAIL ON THIS SHEET. CONCRETE SHALL BE INTEGRAL COLOR.  
 5. MINOR CONCRETE (EXPOSED AGGREGATE) PLACE ON COMPACTED NATIVE MATERIAL (65% RC) CONCRETE SHALL BE INTEGRAL COLOR.

**LEGEND**  
 A DETAILED LETTER  
 B CHANGE IN DETAIL (SEE DETAILS C OR STATION/OFFSETS)  
 --- INSTALL ROOT BARRIER

**TRUCK APRON NOTES:**  
 1. CONTROL JOINTS SHALL BE 2-INCHES DEEP AND AT INTERVALS NOT TO EXCEED 16 FT. O.C. TOP 3/4-INCH OF THE CONTROL JOINT SHALL BE FILLED WITH POLYURETHANE SEALANT (SKAPLEX-1A OR EQUAL). #4 REINFORCING STEEL SHALL HAVE AN 8" GAP AT CONTROL JOINTS.

**TRUCK APRON NOTES:**  
 1. CONTROL JOINTS SHALL BE 2-INCHES DEEP AND AT INTERVALS NOT TO EXCEED 16 FT. O.C. TOP 3/4-INCH OF THE CONTROL JOINT SHALL BE FILLED WITH POLYURETHANE SEALANT (SKAPLEX-1A OR EQUAL). #4 REINFORCING STEEL SHALL HAVE AN 8" GAP AT CONTROL JOINTS.

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DATE REVISION	REVISION

DESIGNED BY	RONALD G. BOYLE
CHECKED BY	

CONSULTANT FUNCTIONAL SUPERVISOR	
DESIGNED BY	

STATE OF FLORIDA	DEPARTMENT OF TRANSPORTATION

PROJECT NUMBER & PHASE	ETS 0500005942

NO.	COUNTY	ROUTE	POST MILEAGE	SHEET NO.	TOTAL SHEETS
05	Mon	1, 98	75.1, 64.2	15	180

DATE REVISION	BY

DESIGNED BY	REVISION

APPROVED BY	DATE

PROJECT TITLE	CITY OF MONTEREY

CONTRACT NO.	

CONTRACTOR	

ENGINEER	

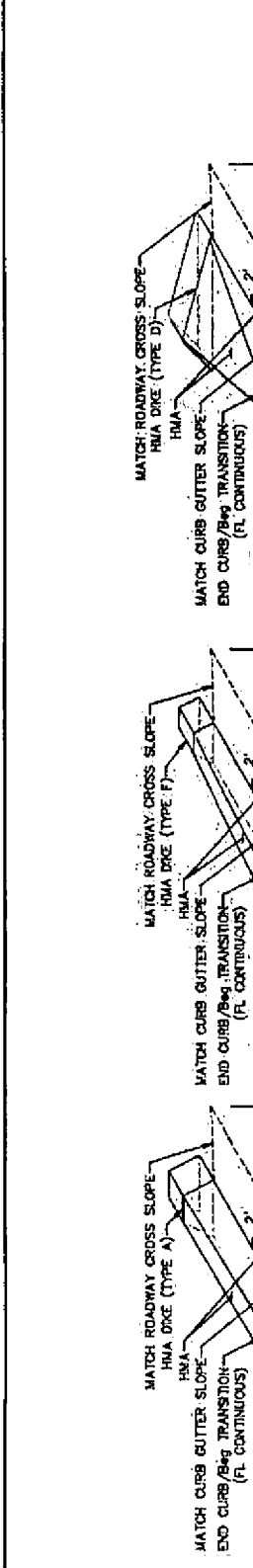
  

PROJECT LOCATION	

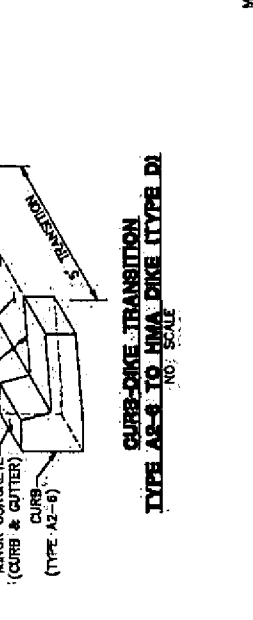
  

DATE	

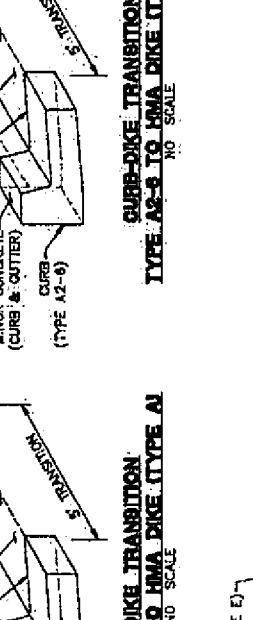
  

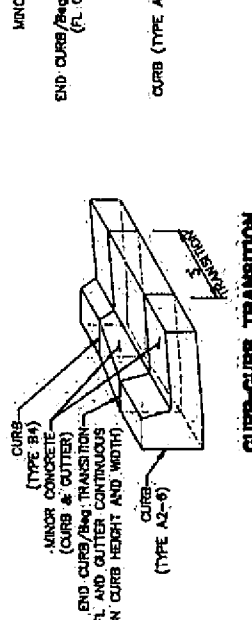
**CURB-DIKE TRANSITION TYPE A1 TO HMA DIKE (TYPE A)**  
NO SCALE



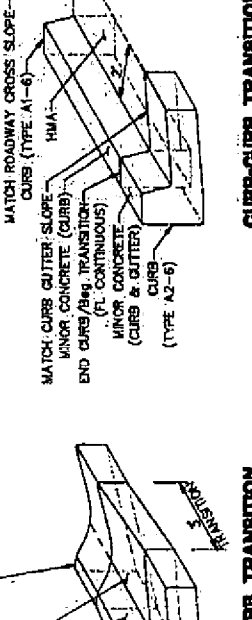
**CURB-DIKE TRANSITION TYPE A2-6 TO HMA DIKE (TYPE F)**  
NO SCALE



**CURB-DIKE TRANSITION TYPE A2-6 TO HMA DIKE (TYPE F)**  
NO SCALE



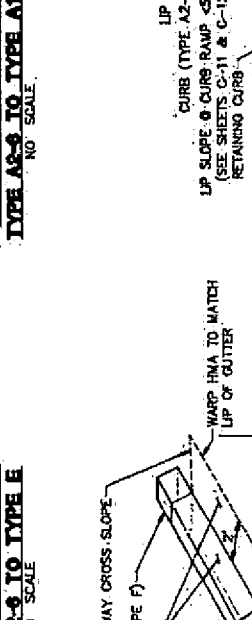
**CURB-DIKE TRANSITION TYPE A2-6 TO HMA DIKE (TYPE D)**  
NO SCALE



**CURB-DIKE TRANSITION TYPE A2-6 TO TYPE B4**  
NO SCALE



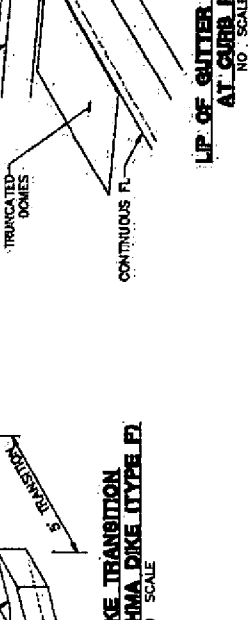
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NO SCALE



**CURB-CURB TRANSITION TYPE E TO HMA DIKE (TYPE F)**  
NO SCALE



**LIP OF GUTTER TRANSITION AT CURB RAMPS**  
NO SCALE



**CURB-CURB TRANSITION TYPE A1-6 TO TYPE B4**  
NO SCALE

DATE REVISION BY

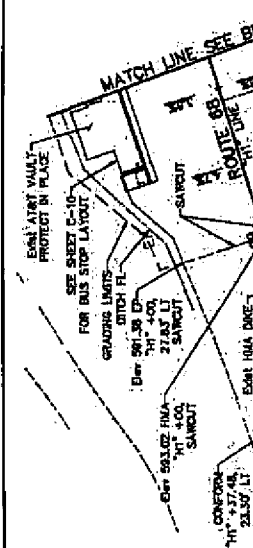
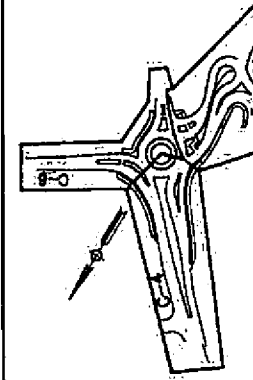
DESIGNED BY

DESIGNED BY

DESIGNED BY

DESIGNED BY

DATE	05	COUNTY	Mon	ROUTE	1. 88	TOTAL SHEETS	78.1, 1.4.2	SHEET NUMBER	18	TOTAL SHEETS	190
REGISTERED CIVIL ENGINEER	D. M. WILSON		DATE		APPROVED		CITY OF MONTEREY		943 RESERVE DR. #100 MONTEREY, CA 93940		

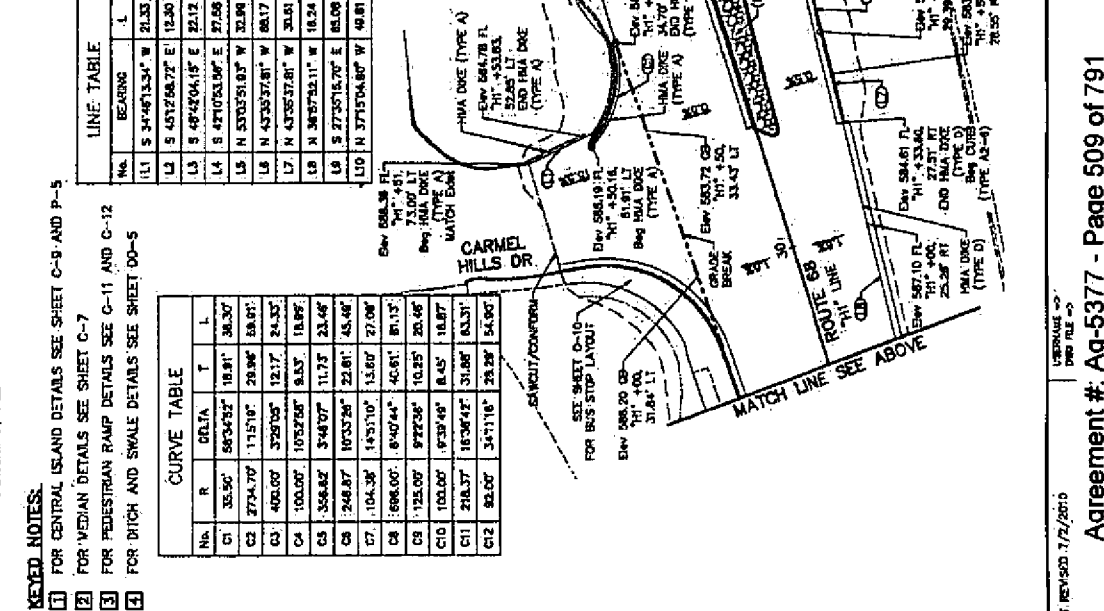
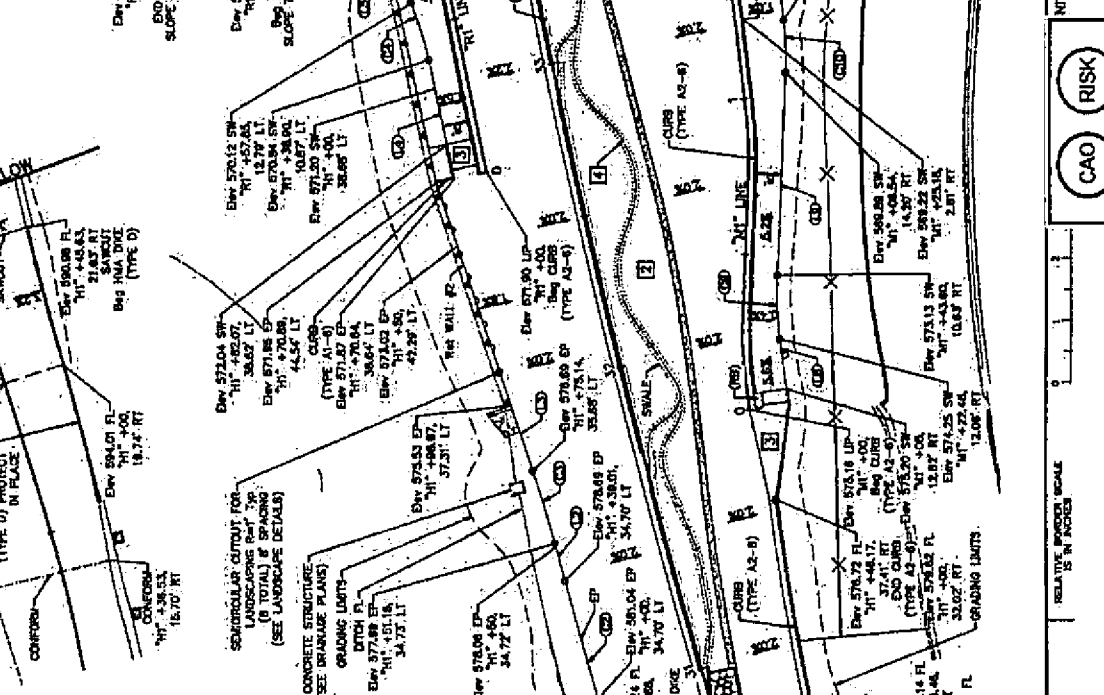
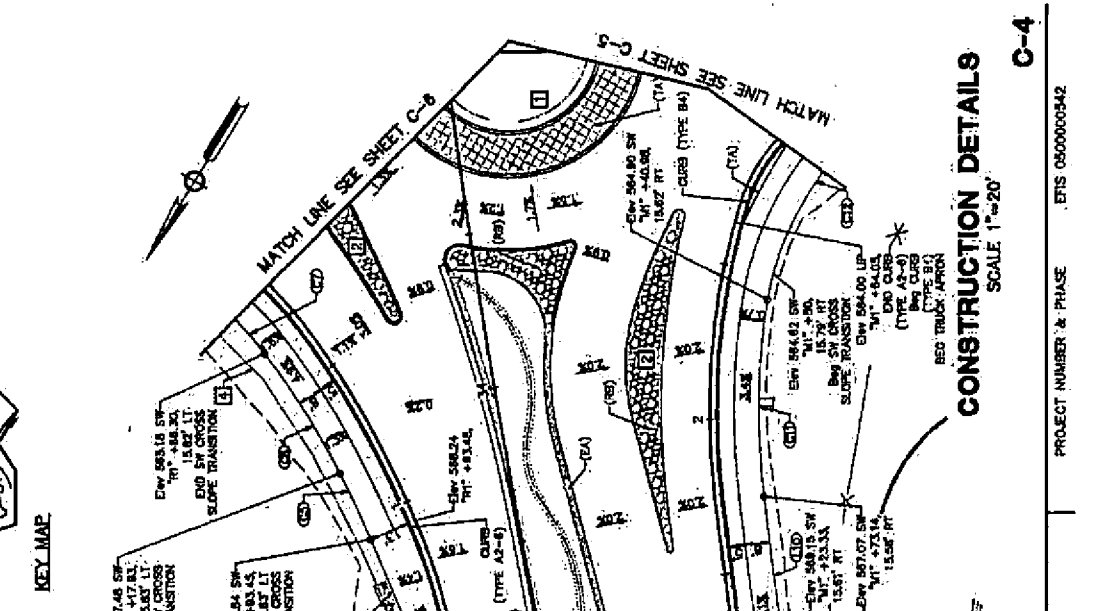


**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR "RT" AND "M" LINE ALIGNMENT AND PROFILE SEE SHEET P-1.
- FOR DITCH TYPICAL SECTION SEE SHEET 90-2.

**LEGEND:**

- GRADE BREAK
- BC, EC, POC, PRO, POINT
- (1A) MINOR CONCRETE (TRUCK APPROX)
- (1B) MINOR CONCRETE (EXPOSED AGGREGATE)
- (1C) ROCK BLANKET (COBBLE MEDIUM TREATMENT)
- RETAINING WALL



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G. BOYLE
CHECKED BY	DESIGNED BY	
REVISIONS	DATE REVISION	

DATE	COUNTY	ROUTE	POST MILE	SHEET NO.	TOTAL SHEETS
06	Mon	178B	75.1, L.A.2	17	190

REGISTERED CIVIL ENGINEER  
 DATE  
 CITY OF MONTEREY  
 COUNTY OF SAN BENITO  
 MONTEREY, CA 93940

- KEYED NOTES:**
- 1 FOR SPALTER ISLAND DETAILS, SEE SHEET C-8
  - 2 FOR SPALTER ISLAND DETAILS, SEE SHEET C-13
  - 3 FOR SPALTER ISLAND DETAILS, SEE SHEET C-9
  - 4 FOR PEDESTRIAN RAMP DETAILS SEE SHEETS C-11 AND C-12
  - 5 FOR MIDWEST QUADRANTAL DETAILS SEE SHEET C-14

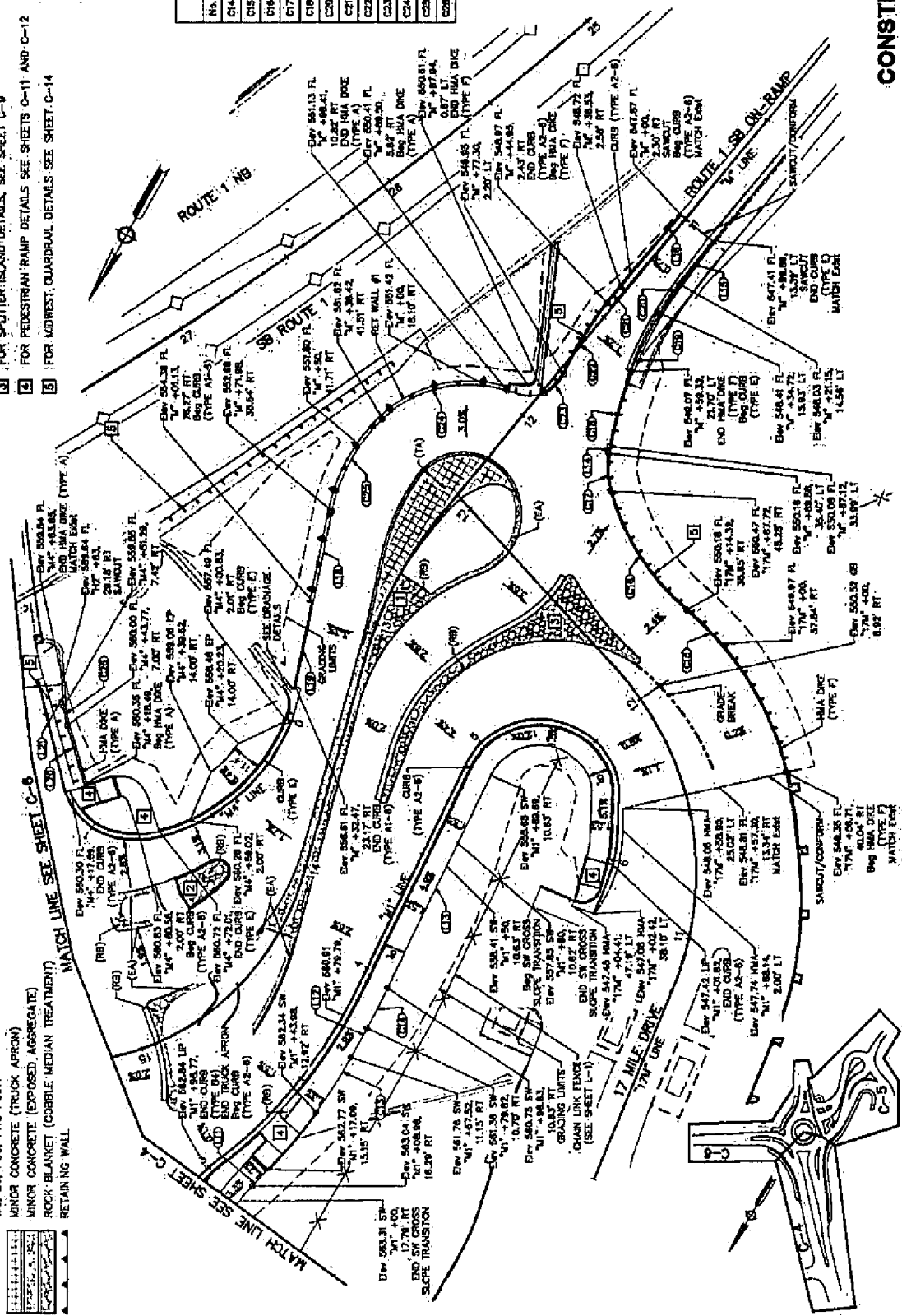
- NOTES:**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - FOR "M" AND "N" LINE ALIGNMENT AND PROFILE, SEE SHEET P-3 AND P-4.
- LEGEND:**
- GRADE BREAK
  - ROC. EG. POC. PRG. POINT
  - MINOR CONCRETE (TRUCK APRON)
  - MINOR CONCRETE (EXPOSED AGGREGATE)
  - ROCK BLANKET (COBBLE MEDIUM TREATMENT)
  - RETAINING WALL

**CURVE TABLE**

No.	R	DELTA	T	L
C14	308.62	31.534°	8.71'	17.41'
C15	128.00	38.702°	38.50'	78.48'
C16	34.00	33.542°	28.68'	58.64'
C17	23.00	25.441°	7.54'	14.83'
C18	148.37	8.1433°	12.78'	25.44'
C20	8.00	87.070°	8.75'	13.39'
C21	48.00	10.302°	4.51'	8.89'
C22	183.31	8.783°	13.89'	27.74'
C23	16.00	41.518°	5.74'	10.98'
C24	48.00	81.580°	78.49'	52.97'
C25	88.00	34.282°	25.50'	41.88'
C26	40.00	10.481°	3.78'	7.54'

**LINE TABLE**

No.	BEARING	L
L1	S 135°22'00" W	8.84
L12	N 05°34'30" W	13.01
L13	S 43°03'30" E	6.11
L14	N 18°49'54" W	2.84
L15	N 101°70'00" W	38.63
L17	S 101°72'30" W	4.27
L18	S 101°51'00" E	38.29
L19	S 101°51'00" E	33.72
L20	S 45°27'30" E	25.32
L21	S 34°38'24" E	12.50

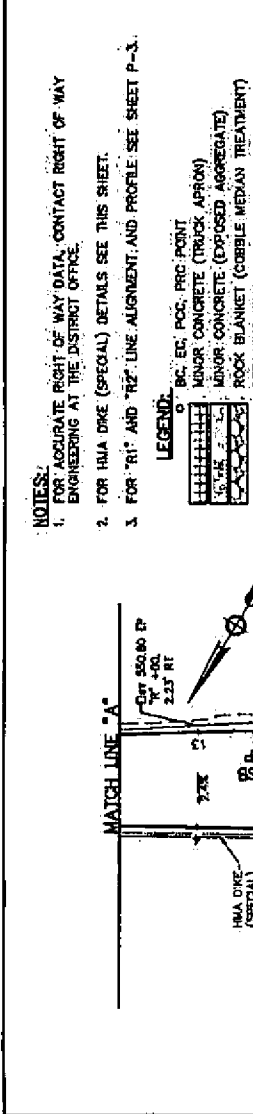
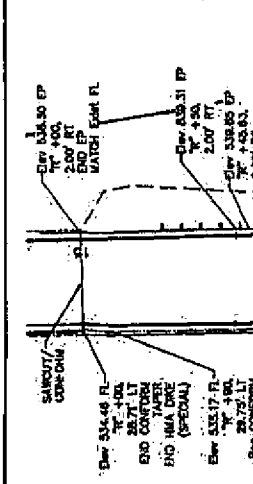


**CONSTRUCTION DETAILS**  
SCALE 1"=20'

NO.	COUNTY	ROUTE	TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
05	Mon	1, 68	751, 142	18	180

REGISTERED CIVIL ENGINEER  
 DATE: 11/21/11  
 CITY: MONTEREY  
 943 RESERVE DR. #100  
 ROSELVILLE, CA 95078

APPROVAL DATE: 11/21/11  
 CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA 95740



- NOTES:**
- FOR ACCURATE RIGHT-OF-WAY DATA, CONTACT RIGHT-OF-WAY ENGINEERING AT THE DISTRICT OFFICE.
  - FOR HMA DIKE (SPECIAL) DETAILS SEE THIS SHEET.
  - FOR "R1" AND "R2" LINE ALIGNMENT AND PROFILE SEE SHEET P-3.

- LEGEND:**
- BC, EC, PC, PCC POINT
  - MINOR CONCRETE (TRUCK APRON)
  - MINOR CONCRETE (EXPOSED AGGREGATE)
  - ROCK BLANKET (COBBLE MEDIUM TREATMENT) RETAINING WALL

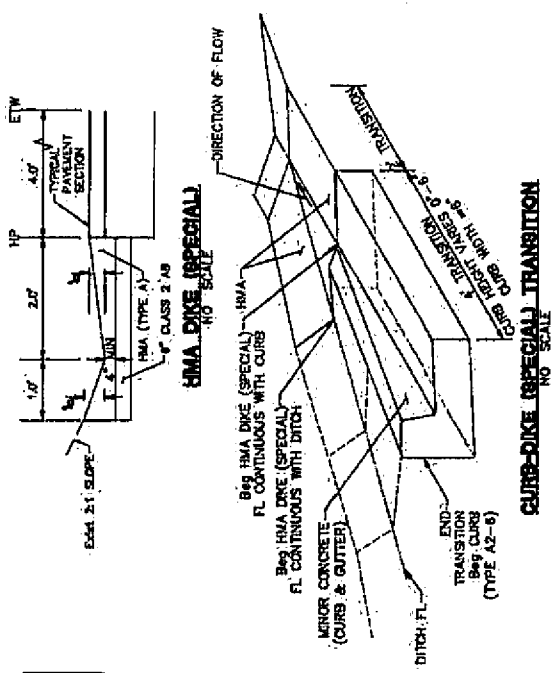
- KEYED NOTES:**
- FOR SPITTER ISLAND DETAILS SEE SHEET C-7.
  - FOR CENTRAL ISLAND DETAILS SEE SHEET C-9 AND P-5
  - FOR SPITTER ISLAND DETAILS SEE SHEET C-8
  - FOR PEDESTRIAN RAMP DETAILS SEE C-11 AND C-12

**CURVE TABLE**

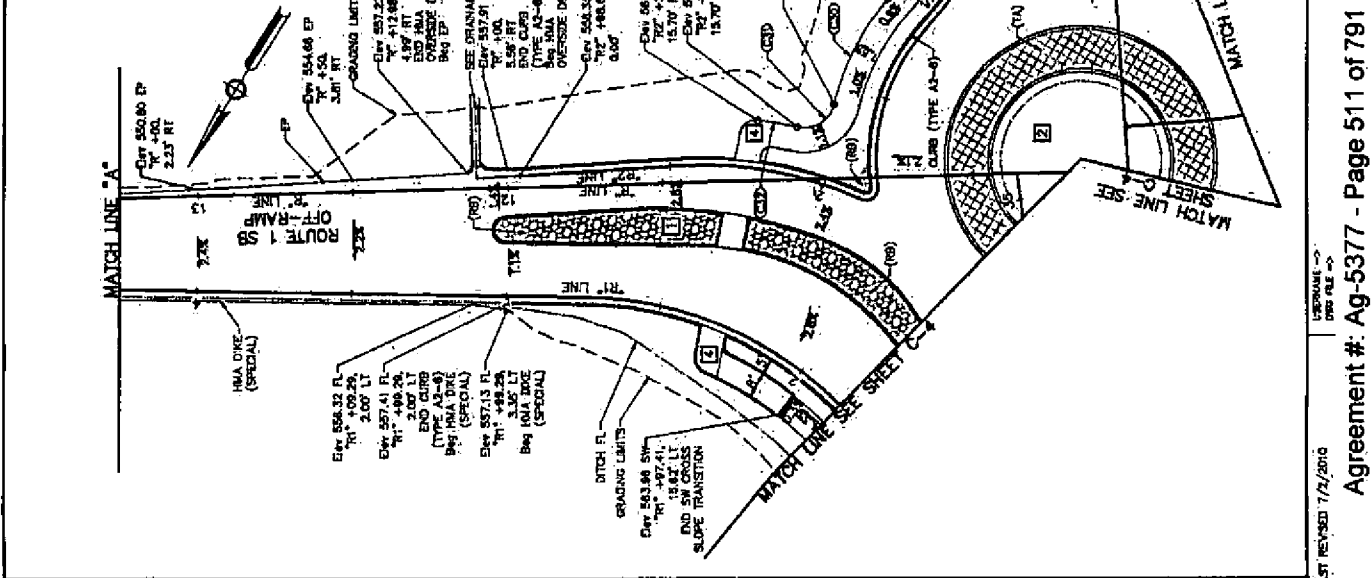
Sta.	R	DELTA	T	L
C27	60.00'	171°02'	13.06'	28.06'
C28	78.30'	171°54'	8.89'	17.84'
C29	234.30'	91°12'	18.87'	37.85'
C30	61.70'	271°35'	19.79'	38.83'
C31	10.00'	89°29'18"	8.94'	18.05'
C32	133.70'	83°13'32"	6.45'	12.89'

**LINE TABLE**

No.	BRANDING	L	S.1
122	S. STITCHES	5	5.41



**CONSTRUCTION DETAILS**  
 SCALE: 1"=20'



DESIGNED BY	RONALD C. BOYLE
CHECKED BY	
DATE REVISED	

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 B. CHONG

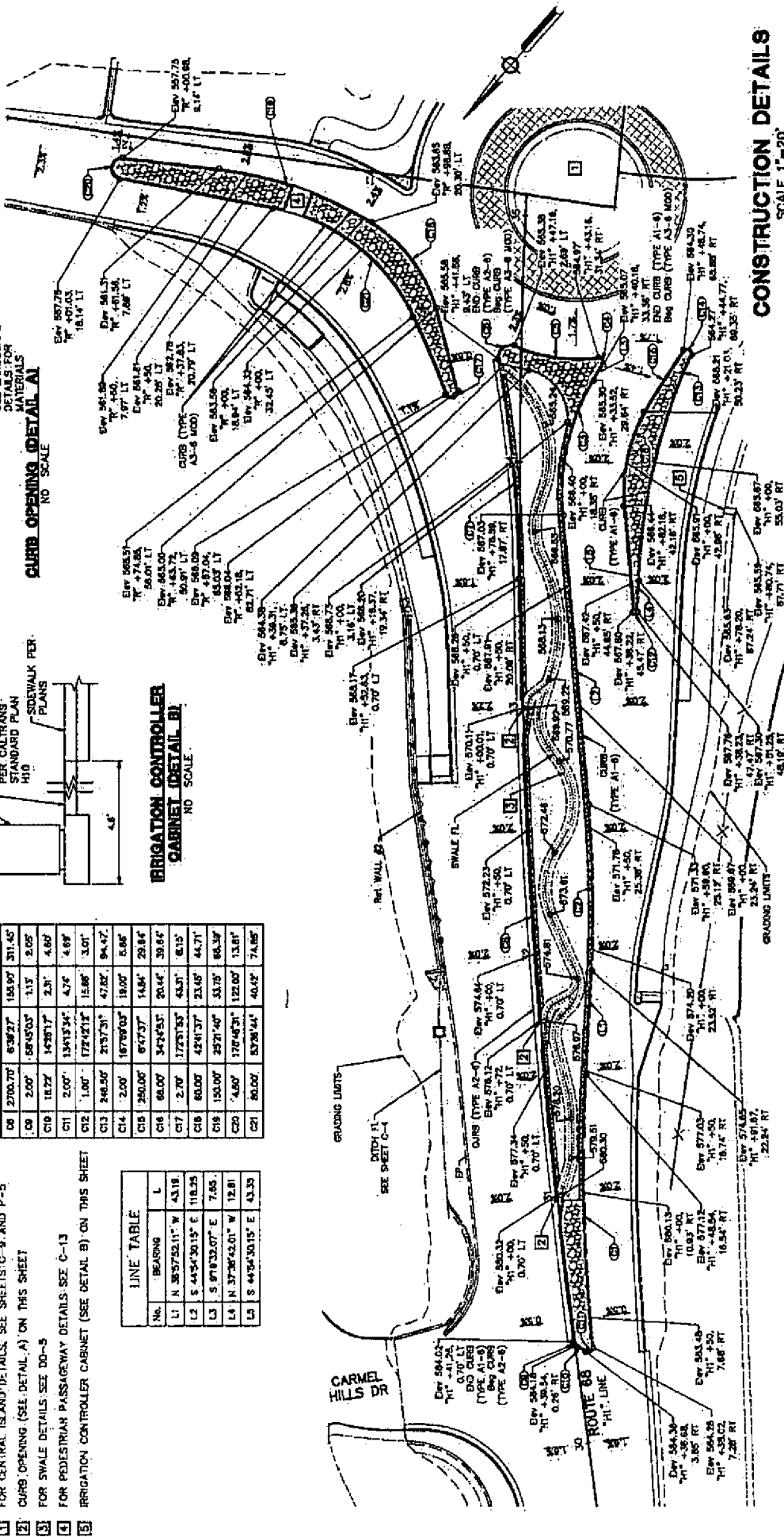
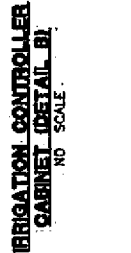
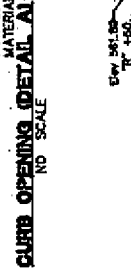
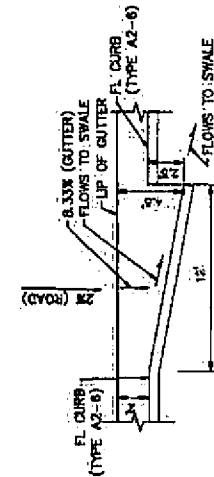
DATE	COUNTY	ROUTE	POST MILE	SHEET NO.	TOTAL SHEETS
05	Mon	1, 68	75.1, 1.4, 2	19	190

REGISTERED CIVIL ENGINEER  
 DATE 1/10/75  
 PROJECT NO. 68-00000542  
 CITY OF MONTEREY  
 380 PACIFIC STREET  
 MONTEREY, CA 93940

No.	R	DELTA	T	L
C1	771.00'	84°08'	53.37'	110.92'
C2	488.50'	7°06'30"	53.70'	87.45'
C3	80.00'	38°07'18"	24.58'	58.84'
C4	2.00'	127°28'43"	4.08'	4.45'
C5	87.00'	20°37'57"	17.72'	34.85'
C6	5.00'	122°47'07"	9.17'	10.72'
C7	552.00'	8°18'15"	44.82'	89.84'
C8	2700.70'	6°39'27"	158.90'	311.45'
C9	2.00'	158°45'03"	3.13'	3.28'
C10	18.72'	14°38'17"	2.31'	4.80'
C11	2.00'	134°15'34"	4.75'	4.89'
C12	1.00'	175°12'11"	15.88'	3.01'
C13	248.50'	21°37'31"	47.82'	94.47'
C14	2.00'	167°09'03"	19.00'	5.86'
C15	250.00'	6°47'37"	14.84'	29.84'
C16	80.00'	34°24'53"	20.44'	39.64'
C17	2.70'	172°51'53"	6.31'	6.15'
C18	80.00'	42°41'37"	23.68'	44.71'
C19	150.00'	25°21'40"	33.70'	60.30'
C20	4.80'	170°48'31"	122.80'	13.81'
C21	80.00'	83°28'44"	40.42'	74.86'

No.	BEARING	L
L1	N 28°57'52.11" W	43.18
L2	S 44°54'30.15" E	118.23
L3	S 87°19'32.07" E	7.65
L4	N 37°36'42.01" W	12.81
L5	S 44°54'30.15" E	43.29

- NOTES:**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - ALL STATIONS AND ELEVATIONS ARE TO FLOWLINE.
  - FOR DITCH TYPICAL SECTION SEE SHEET DD-2.
- LEGEND:**
- B.C. LOC. POC, PRC POINT
  - MINOR CONCRETE (TRUCK APPROX)
  - ▨ MINOR CONCRETE (EXPOSED AGGREGATE)
  - ▩ ROCK BLANKET (COBBLE MEDIUM TREATMENT)
- KEYED NOTES:**
- FOR CENTRAL ISLAND DETAILS, SEE SHEETS C-8 AND P-5
  - CURB OPENING (SEE DETAIL A) ON THIS SHEET
  - FOR SWALE DETAILS, SEE DD-5
  - FOR PEDESTRIAN PASSAGEWAY DETAILS, SEE C-13
  - IRRIGATION CONTROLLER CABINET (SEE DETAIL B) ON THIS SHEET



**CONSTRUCTION DETAILS**  
SCALE 1"=20'



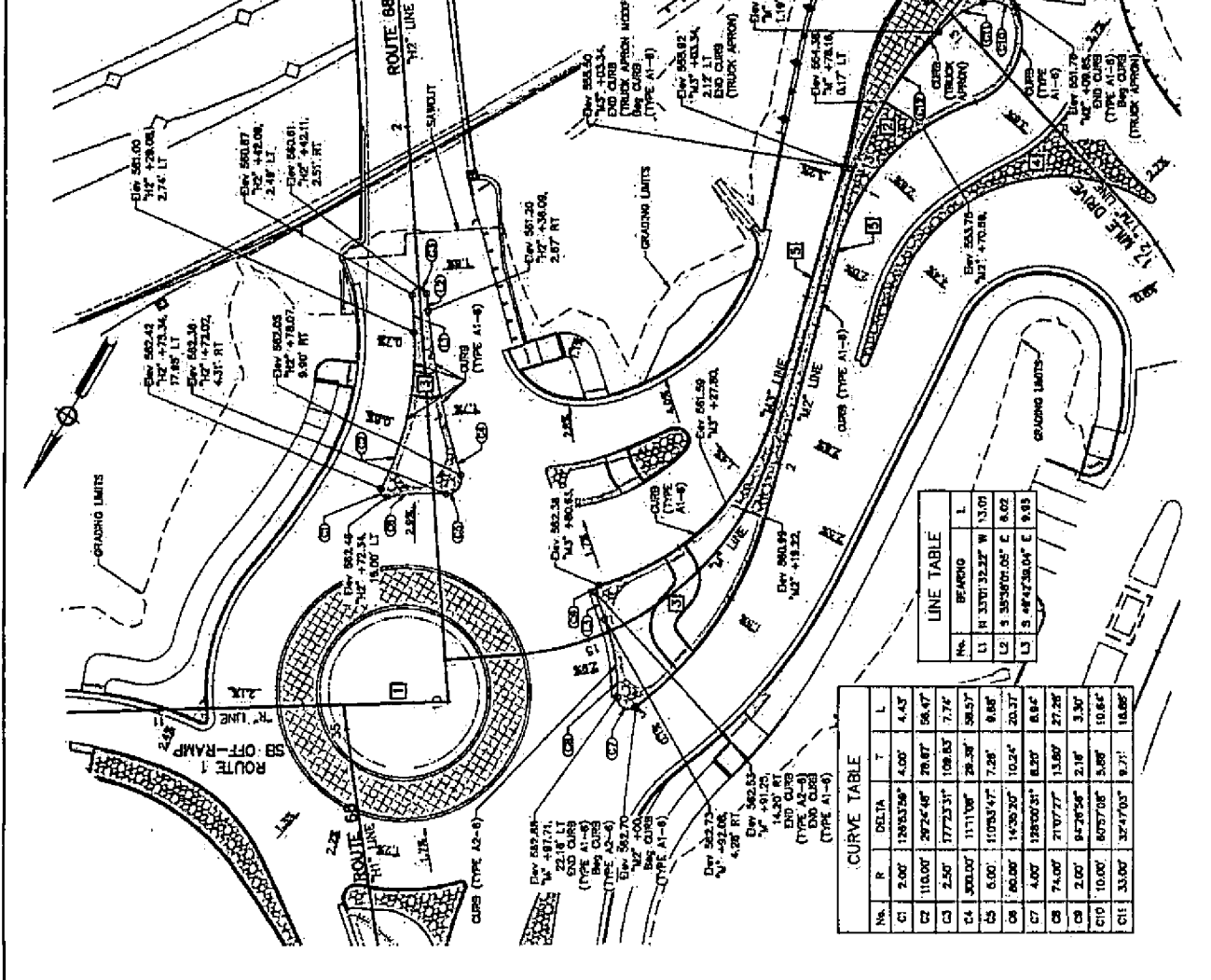
DATE	COUNTY	ROUTE	POST MILE	POST MILE
05	Mon	1: 68	75.1, L&2	20 190

UNIVERSITY OF CALIFORNIA  
 REGISTERED CIVIL ENGINEER  
 DATE: 1/1/73  
 PROJECT NO. 5377

PLANS APPROVAL DATE: \_\_\_\_\_  
 CITY OF MONTEREY  
 943 RESERVE DR. #100  
 MONTEREY, CA 93940

**NOTES:**  
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.  
 2. ALL STATIONS AND ELEVATIONS ARE TO CURB FLOWLINE.  
 3. FOR "1/2" AND "3/4" LINE ALIGNMENT AND PROFILE SEE P-4.

**LEGEND:**  
 O BC-EC, POC, PRC POINT  
 [Pattern] MINOR CONCRETE (TRUCK APRON)  
 [Pattern] MINOR CONCRETE (EXPOSED AGGREGATE)  
 [Pattern] ROCK BLANKET (COBBLE MEDIUM TREATMENT)  
**KEYED NOTE:**  
 1 FOR CENTRAL ISLAND DETAILS, SEE SHEETS C-9 AND P-5  
 2 FOR SPUTTER ISLAND DETAILS, SEE SHEET C-13  
 3 FOR PEDESTRIAN PASSAGE WAY DETAILS, SEE SHEET C-13  
 4 FOR SPUTTER ISLAND DETAILS, SEE SHEET C-9  
 5 FOR CURB ALIGNMENT DETAILS, SEE SHEET P-4

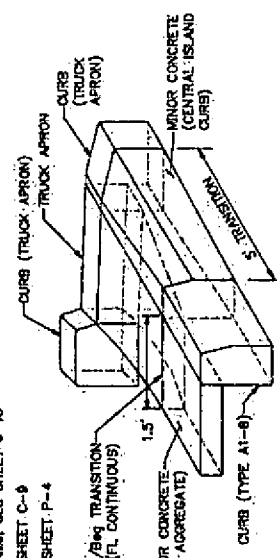


**LINE TABLE**

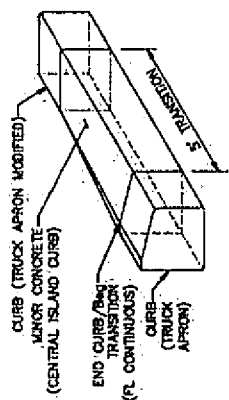
No.	BEARING	L
L1	S 33°13'22.27" W	13.01
L2	S 35°50'01.05" E	8.02
L3	S 48°47'58.04" E	9.85

**CURVE TABLE**

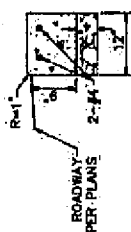
No.	R	DELTA	T	L
C1	2.00'	128°53'58"	4.00'	4.45'
C2	110.00'	29°24'48"	29.87'	66.47'
C3	2.50'	177°23'31"	109.85'	7.74'
C4	300.00'	111°11'08"	29.28'	98.57'
C5	6.00'	110°58'47"	7.28'	8.88'
C6	60.00'	143°30'20"	10.24'	20.37'
C7	4.00'	128°00'31"	8.20'	8.84'
C8	74.00'	210°7'77"	13.80'	27.28'
C9	2.00'	94°20'58"	2.18'	3.30'
C10	10.00'	80°57'08"	5.88'	10.64'
C11	33.00'	32°47'03"	9.71'	18.88'



**CURB-CURB TRANSITION TYPE A1-6 TO TRUCK APRON**  
 NO SCALE



**CURB-CURB TRANSITION TRUCK APRON TO TRUCK APRON MODIFIED**  
 NO SCALE



**CURB (TRUCK APRON MODIFIED)**  
 NO SCALE

**CONSTRUCTION DETAILS**  
 SCALE 1"=20'

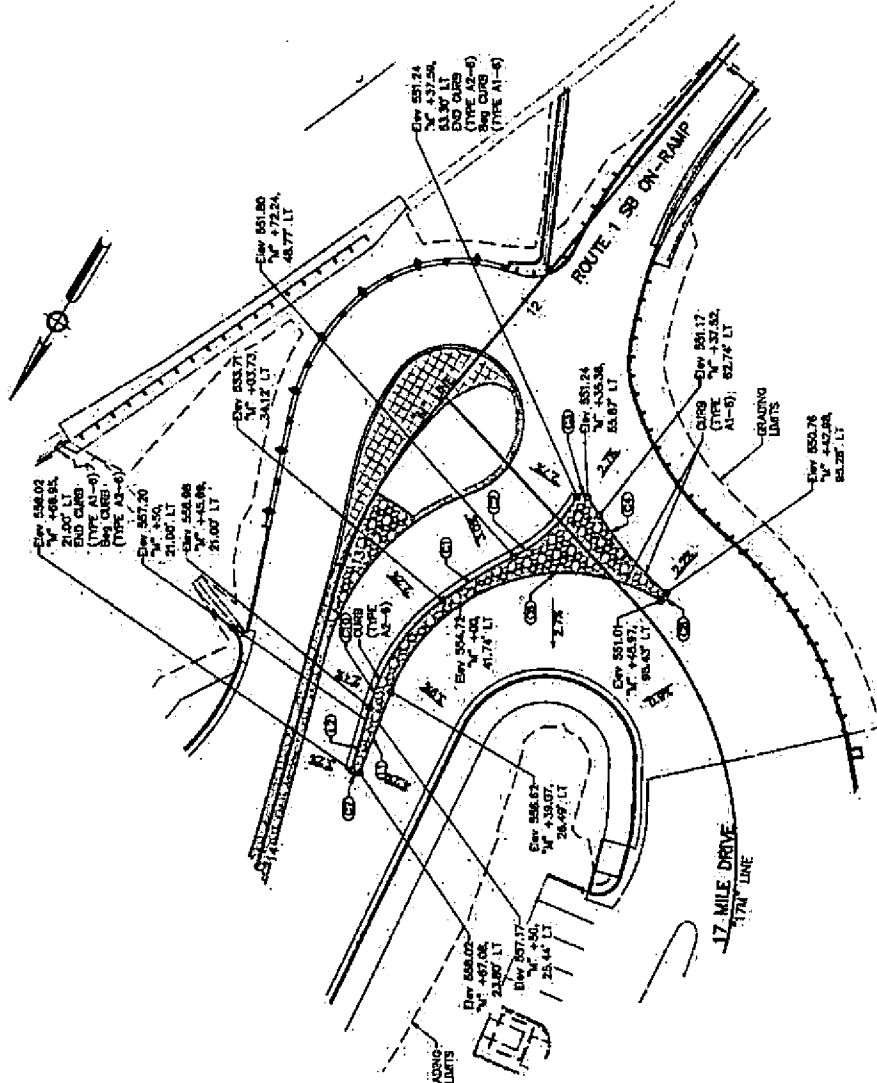
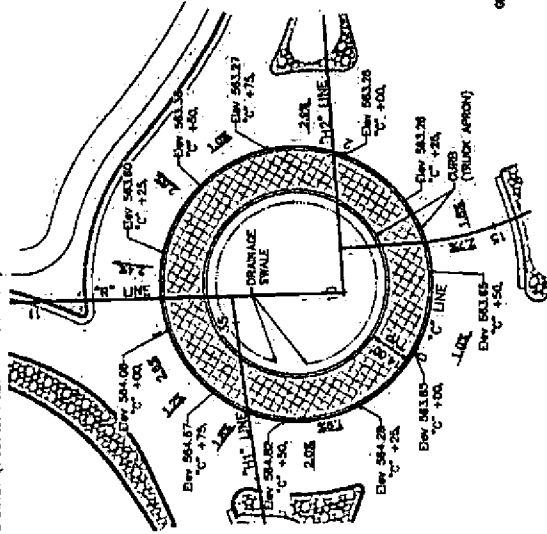
DATE	COUNTY	ROUTE	POST MILE	POST MILE	POST MILE
05	Mon	1, 68	75.1, 14.7	21	190

REGISTERED CIVIL ENGINEER DATE: 11/20/73  
 PLANS APPROVAL DATE: 11/20/73  
 CITY OF MONTEREY  
 510 PACIFIC STREET  
 MONTEREY, CA 93940

**NOTES:**  
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.  
 2. ALL STATIONS AND ELEVATIONS ARE TO CURB-FLOWLINE.

**LEGEND:**

- DC, EC, POC, PRC POINT
- ▨ MINOR CONCRETE (TRUCK APRON)
- ▨ MINOR CONCRETE (EXPRESSED AGGREGATE)
- ▨ ROCK BLANKET (COBBLE MEDIAN TREATMENT)



**LINE TABLE**

No.	Bearing	L
L1	S 8°35'55.87" E	28.14
L2	N 41°00'05.50" W	21.28

**CURVE TABLE**

No.	R	DELTA	T	L
C1	148.00'	107°27'	18.57'	27.06'
C2	48.00'	33°20'07"	14.57'	26.51'
C3	2.00'	116°48'24"	3.25'	4.08'
C4	120.00'	15°47'35"	18.64'	33.06'
C5	1.50'	170°07'42"	17.22'	4.45'
C6	90.00'	100°10'22"	71.72'	104.80'
C7	1.40'	174°30'30"	28.18'	4.28'
C10	65.00'	37°27'35"	22.04'	42.50'

**CONSTRUCTION DETAILS**  
 SCALE: 1"=20'

C-9

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT: RICHARDSON SUPERVISOR  
 DESIGNED BY: RONALD C. BOYLE  
 CHECKED BY: [Blank]  
 DATE REVISION: [Blank]  
 REVISION: [Blank]

RELATIVE PAPER SCALE  
 0 1 2  
 IN



PROJECT NUMBER & PHASE  
 ETS 0600000542

DATE: 7/2/2010  
 DRAWING NO: 514 OF 791

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 ROYAL G. BOYLE  
 CHECKED BY  
 DATE REVISED BY  
 DATE REVISED BY

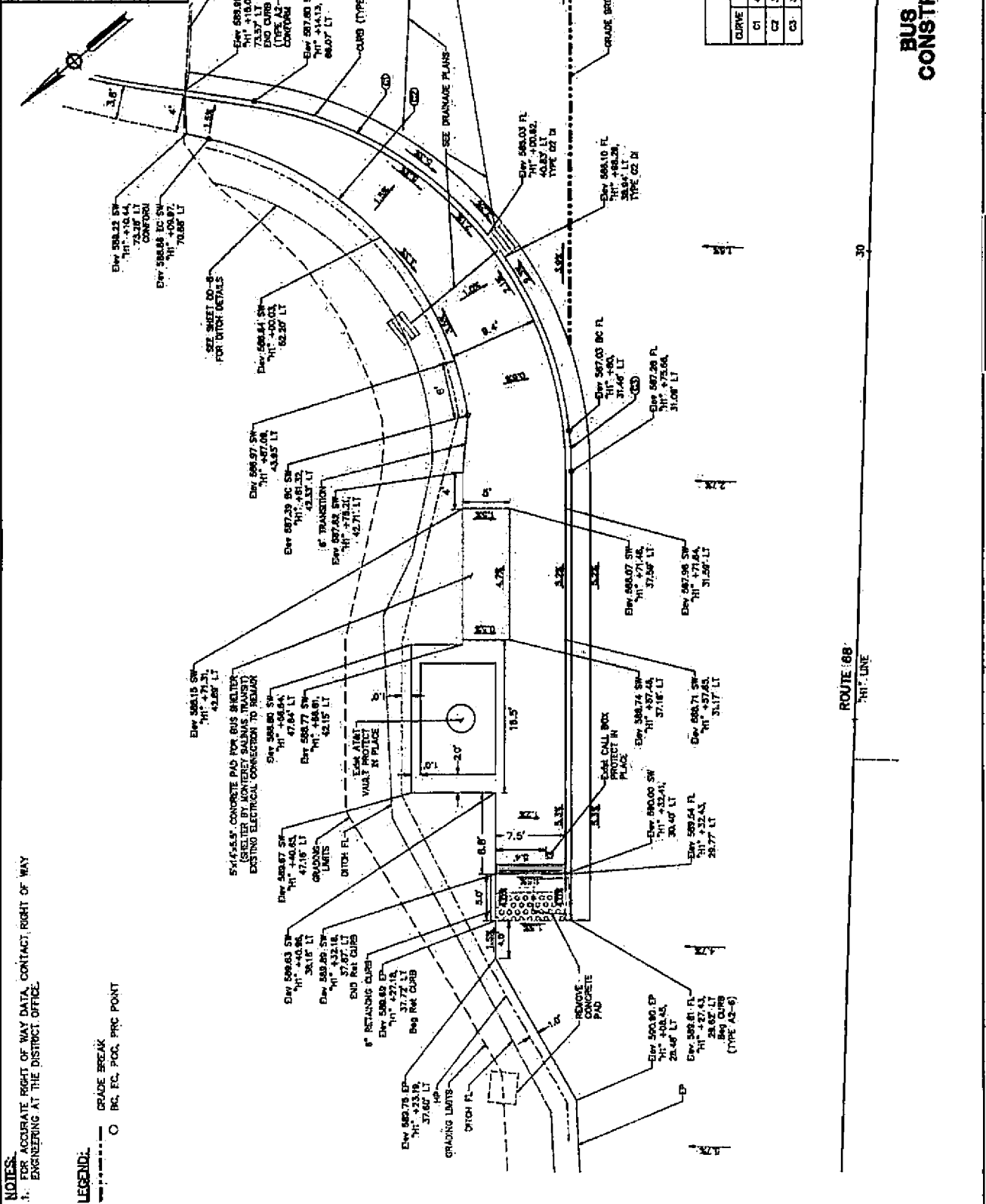
**NOTES:**  
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

PLANS APPROVAL DATE: \_\_\_\_\_  
 CITY OF MONTEREY  
 943 RESERVE DR., #100  
 ROSELVILLE, CA 95078

ONR-MEANS, LTD.  
 1545 W. MONTEREY BLVD.  
 MONTEREY, CA 95033

REGISTERED CIVIL ENGINEER

SHEET NO.	TOTAL SHEETS	DATE
05	1	75.1, 14.2
		22
		180



**LEGEND:**  
 ○ RC, EC, POC, PRC POINT  
 --- GRADE BREAK

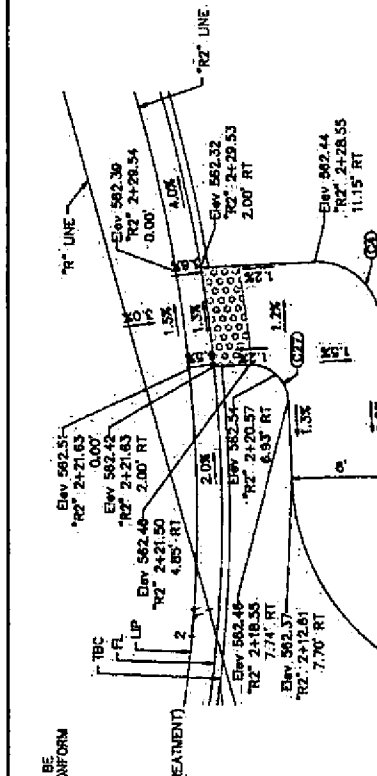
CURVE	R	DELTA	T	L
C1	40.00'	74°49'48"	30.80'	52.24'
C2	35.00'	88°23'11"	24.44'	42.95'
C3	30.84'	87°18'18"	2.18'	4.38'

**BUS STOP LAYOUT  
 CONSTRUCTION DETAILS**  
 SCALE: 1"=5'

DIST.	COUNTY	ROUTE	POST MILE PROJECT	POST MILE	SHEET NO.	TOTAL SHEETS
05	Mon	1, 68	75.1, LA.2	23	190	

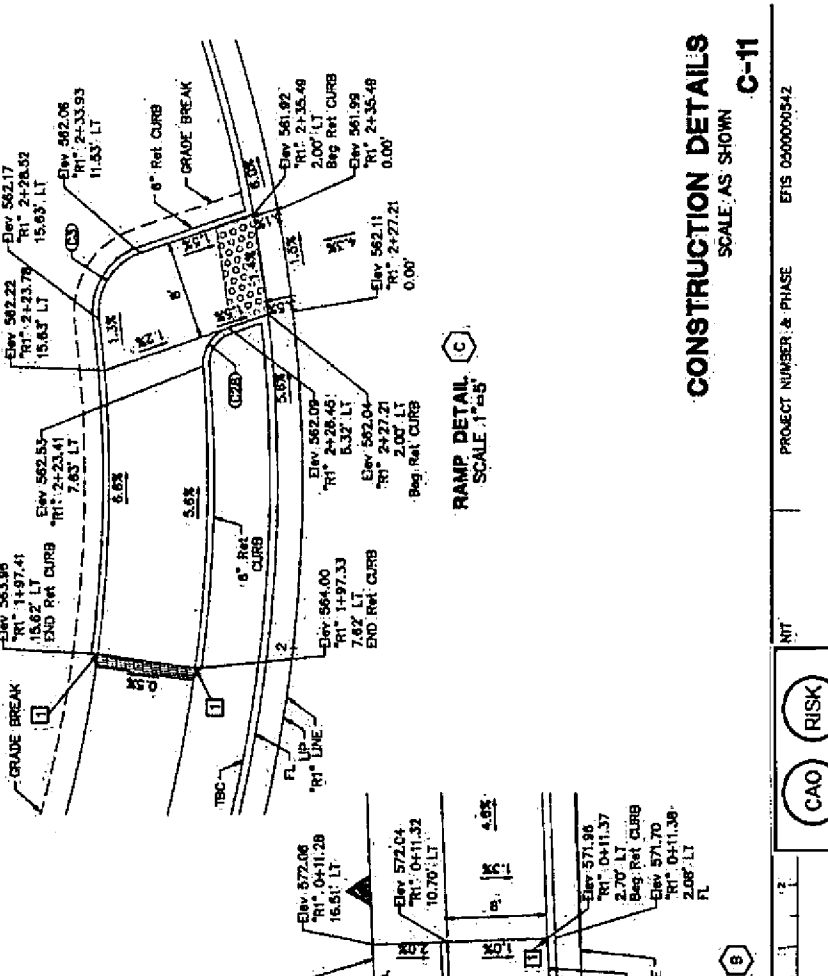
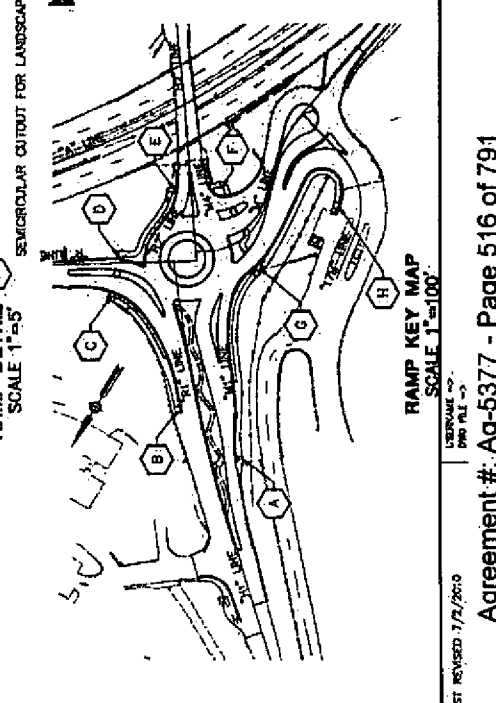
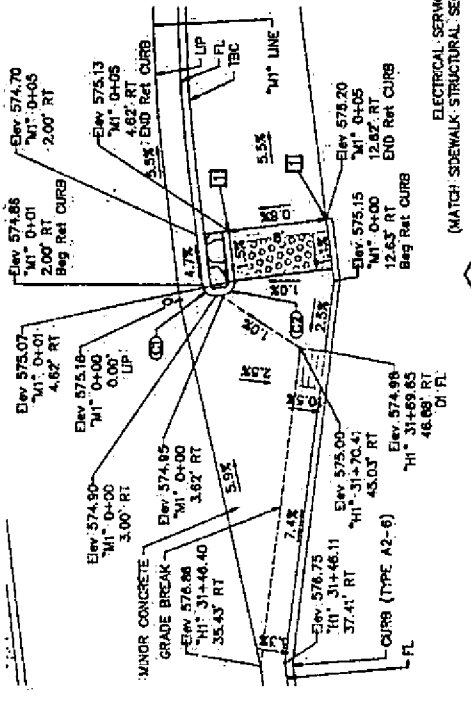
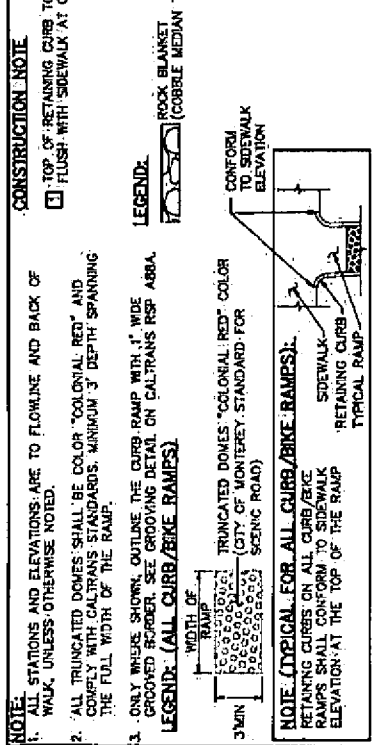
  

REGISTERED CIVIL ENGINEER  
 DATE \_\_\_\_\_  
 PLANS APPROVAL DATE \_\_\_\_\_  
 CITY OF MONTEREY  
 4100 MONTEREY STREET  
 MONTEREY, CA 95060



**CURVE TABLE**

No.	R	DELTA	T	L
C1	1.00'	90.0000°	1.00'	1.57'
C2	1.00'	90.0000°	1.00'	1.67'
C3	8.00'	78.1800°	4.07'	8.85'
C4	8.00'	89.9844°	4.88'	7.59'
C5	3.00'	90.0000°	3.00'	4.71'
C6	3.00'	75.9147°	2.54'	3.97'



**CURVE TABLE**

No.	R	DELTA	T	L
C1	1.00'	90.0000°	1.00'	1.57'
C2	1.00'	90.0000°	1.00'	1.67'
C3	8.00'	78.1800°	4.07'	8.85'
C4	8.00'	89.9844°	4.88'	7.59'
C5	3.00'	90.0000°	3.00'	4.71'
C6	3.00'	75.9147°	2.54'	3.97'

DATE	COUNTY	ROUTE	POST MILE	POST MILE	POST MILE
05	Mon	1, 68	75.1, 1.4, 2.	24	190

DESIGNED BY	CHECKED BY	DATE
REVISIONS		

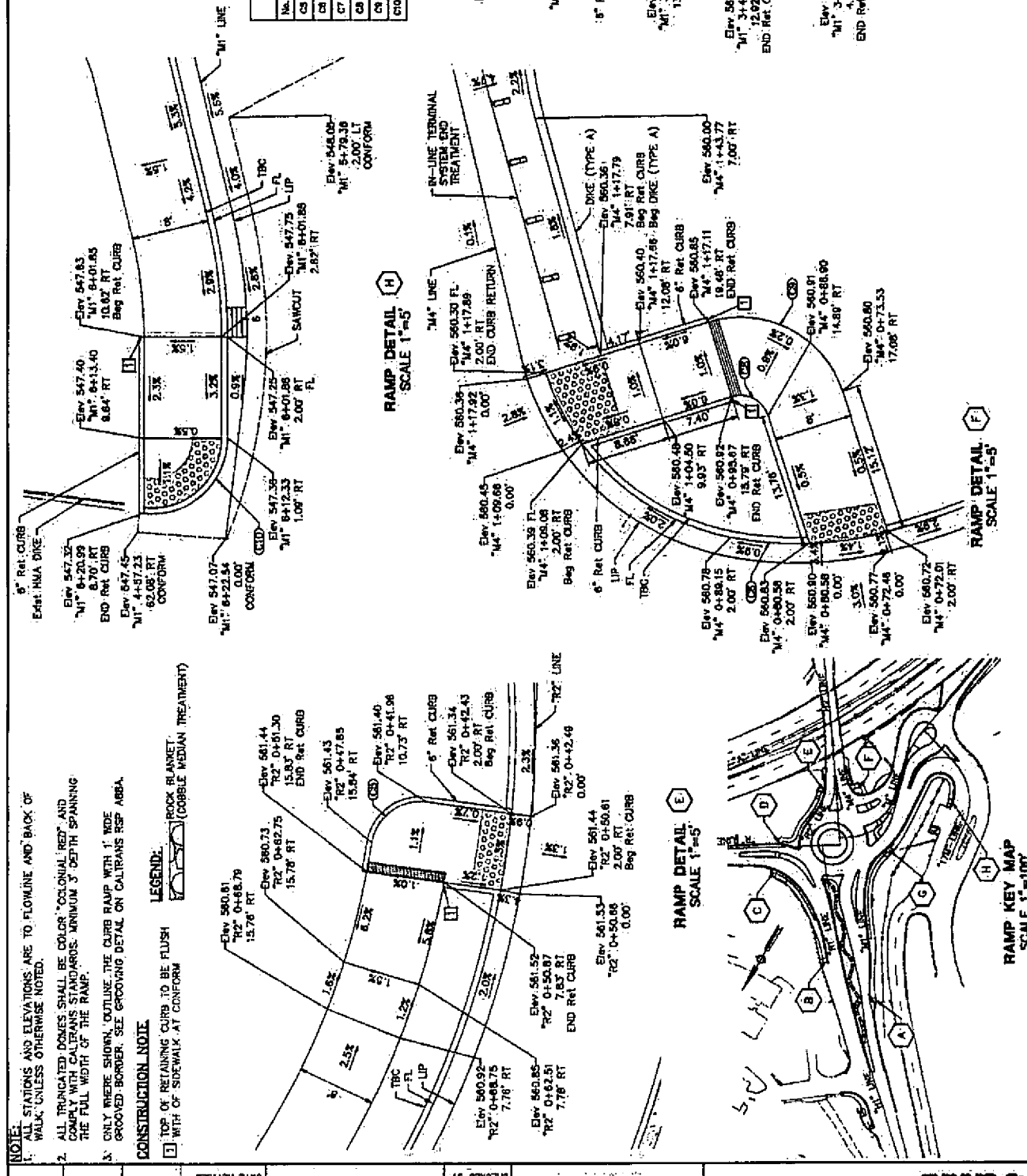
APPROVED	DATE

CITY OF MONTEREY	843 RESERVE DR. #100	MONTEREY, CA 93940
OWNER/MEANS: LTD.		

**CURVE TABLE**

Sta	R	Delta	T	L
CS	3.00'	89°43'51"	4.98'	7.83'
CS	35.00'	200°28'	8.03'	15.81'
CS	25.00'	194°55'	1.04'	2.07'
CS	3.00'	86°12'48"	2.88'	4.87'
CS	11.00'	89°12'48"	10.88'	17.13'
CS	7.70'	84°17'48"	8.30'	12.87'



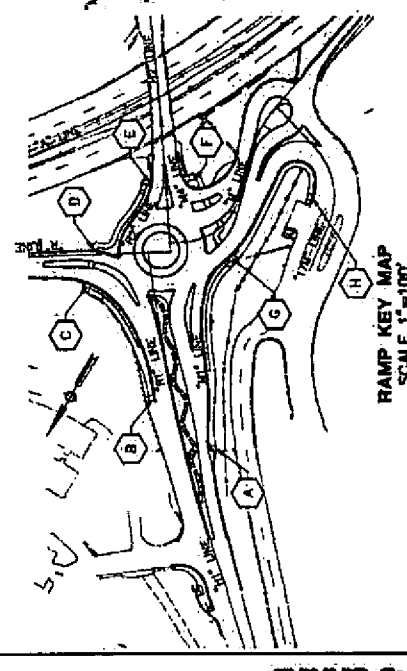
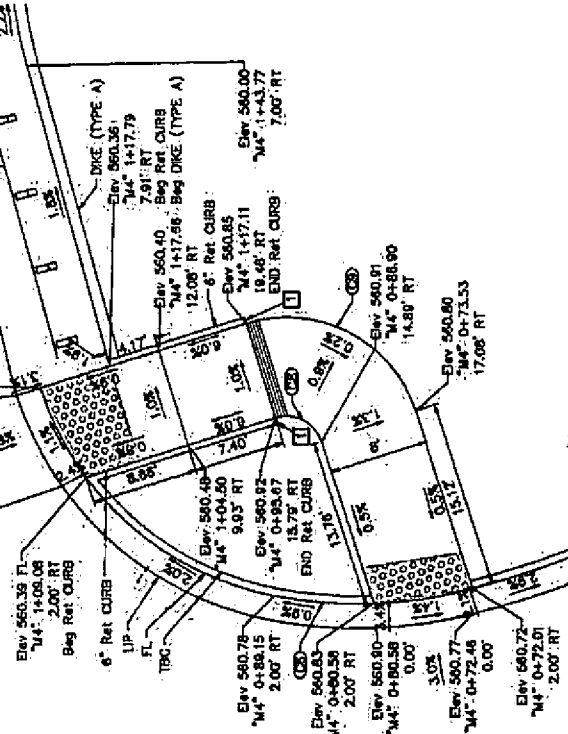
**NOTE:**

- ALL STATIONS AND ELEVATIONS ARE TO FLOWLINE AND BACK OF WALK, UNLESS OTHERWISE NOTED.
- ALL TRUNCATED CORNERS SHALL BE CORDED "OCCLUSION BENT" AND COMPLY WITH CALIFORNIA STANDARDS. MINIMUM 3' DEPTH SPANNING THE FULL WIDTH OF THE RAMP.
- ONLY WHERE SHOWN, OUTLINE THE CURB RAMP WITH 1" RISE GROOVED BORDER. SEE GROOVING DETAIL ON CALTRANS RSP ABBA.

**CONSTRUCTION NOTE:**

[ ] TOP OF RETAINING CURB TO BE FLUSH WITH SIDEWALK AT CONFORM

[ ] ROCK BLANKET (COBBLE MEDIUM TREATMENT)



**CONSTRUCTION DETAILS**  
SCALE AS SHOWN

**C-12**

Exhibit A.2

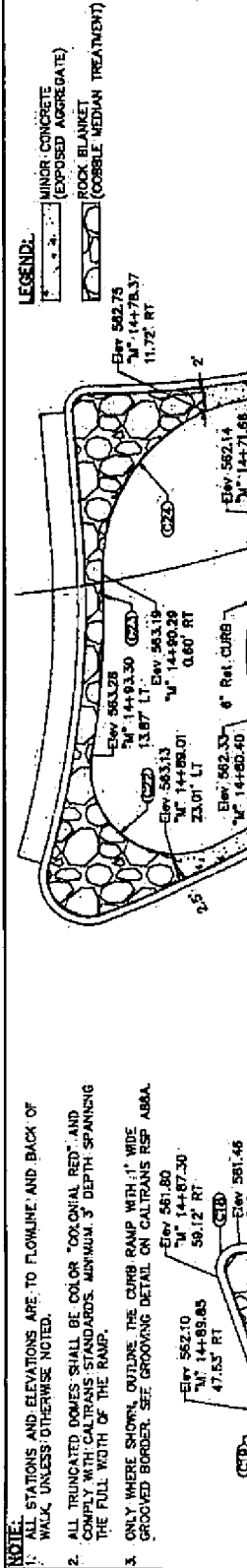
NO.	COUNTY	ROUTE	POST MILE	SECTION	DATE
05	Mon	1.88	75.1, 14.2	25	190

REGISTERED CIVIL ENGINEER  
 DATE: 11/29/75  
 CIVIL ENGINEER: [Signature]

APPROVAL DATE: 11/29/75  
 CIVIL ENGINEER: [Signature]

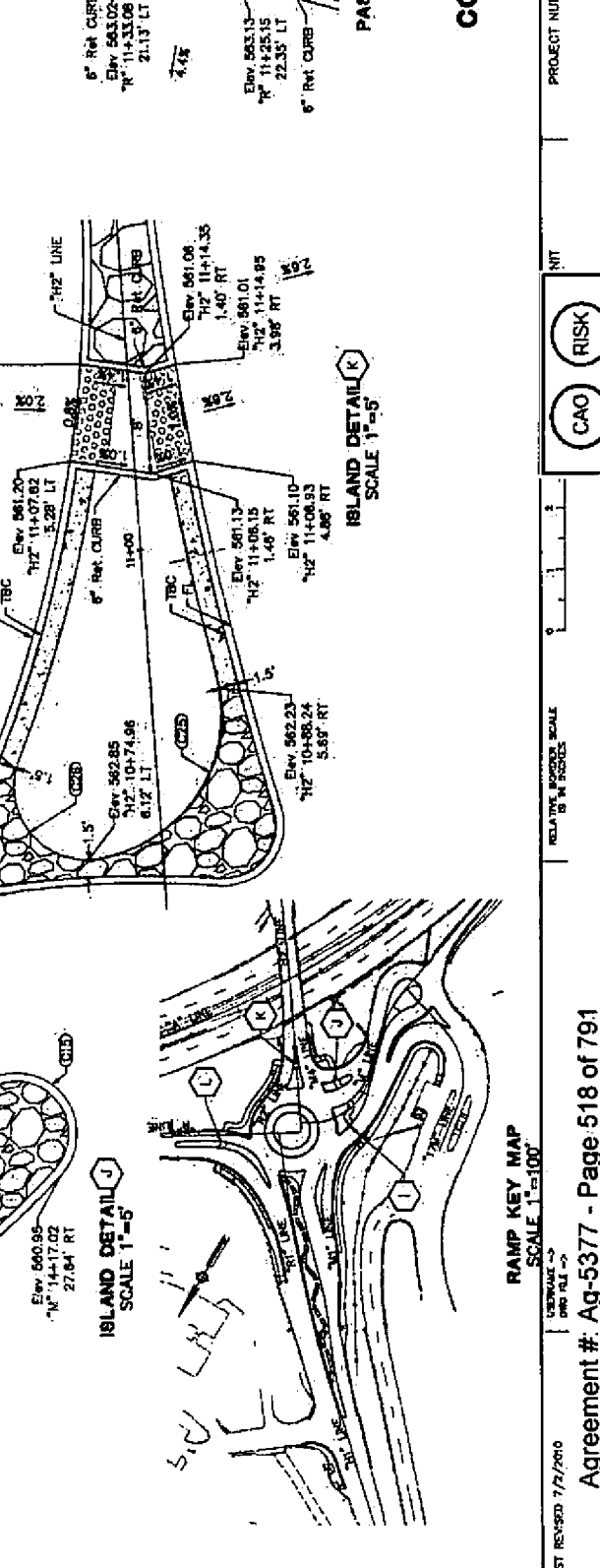
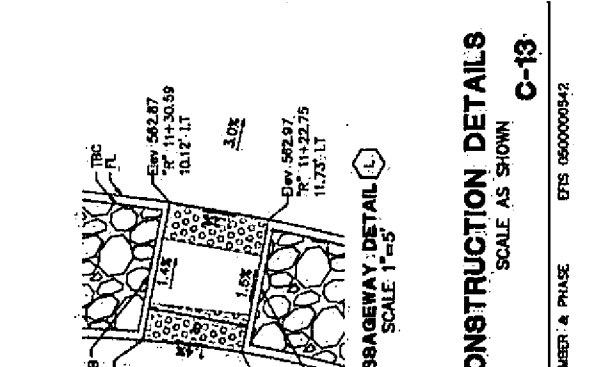
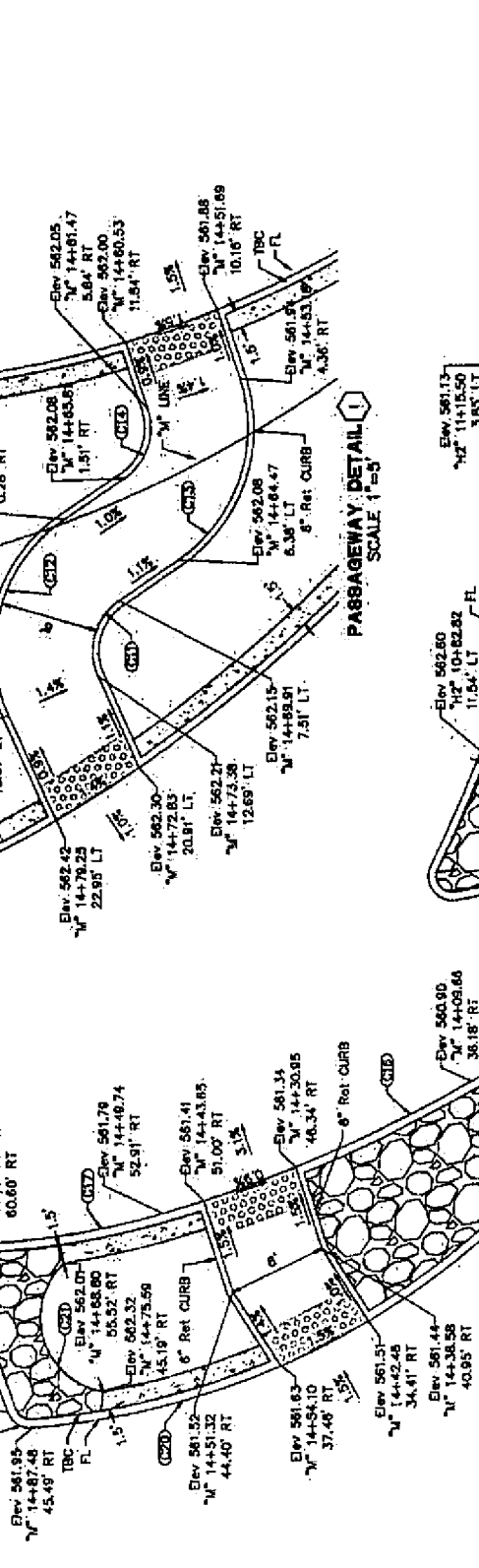
ENGINEER OF RECORD: [Signature]

CITY OF MONTEREY  
 943 RESERVE DR. #100  
 ROOSEVELT, CA 95078



DESIGNED BY	RONALD C. BOYLE
CHECKED BY	[Signature]
DATE REVISION	

NO.	R	DELTA	T	L
C11	5.00'	80°00'42"	4.87'	8.98'
C12	13.00'	80°00'42"	10.01'	18.15'
C13	13.00'	77°58'38"	9.87'	18.79'
C14	5.00'	77°58'38"	3.77'	8.48'
C15	5.00'	182°00'56"	34.17'	54.25'
C16	108.00'	142°00'07"	13.88'	21.57'
C17	67.35'	175°00'07"	7.83'	15.70'
C18	2.00'	108°53'54"	2.88'	3.77'
C19	2.00'	74°03'14"	1.51'	2.56'
C20	65.00'	47°00'08"	53.13'	47.85'
C21	6.00'	130°39'25"	13.06'	13.86'
C22	7.00'	125°53'27"	13.71'	15.38'
C23	78.12'	117°02'25"	7.45'	14.85'
C24	14.00'	83°33'08"	12.43'	20.33'
C25	12.00'	99°26'30"	14.18'	23.83'
C26	8.00'	112°09'30"	8.82'	11.75'



DESIGNED BY	RONALD C. BOYLE
CHECKED BY	[Signature]
DATE REVISION	

**NOTE:**

- ALL STATIONS AND ELEVATIONS ARE TO FLOWLINE AND BACK OF WALK, UNLESS OTHERWISE NOTED.
- ALL TRUNCATED DORIES SHALL BE COLOR "CORONAL RED" AND COMPLY WITH CALTRANS STANDARDS. MINIMUM 3" DEPTH SPANNING THE FULL WIDTH OF THE RAMP.
- ONLY WHERE SHOWN, OUTSIDE THE CURB RAMP WITH 1" WIDE GROOVED BORDER. SEE GROOVING DETAIL ON CALTRANS RSP ASBA.

LEGEND:  
 MINOR CONCRETE (EXPOSED AGGREGATE)  
 ROCK BLANKET (COBBLE MEDIUM TREATMENT)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SPECIFICATION

Agreement #: Ag-5377 - Page 518 of 791

CONSTRUCTION DETAILS  
 SCALE AS SHOWN

PROJECT NUMBER & PHASE: ETS 0600000942

DATE: 7/2/2000

REVISION: 100%

SCALE: 1"=5'

SCALE: 1"=5'

SCALE: 1"=5'

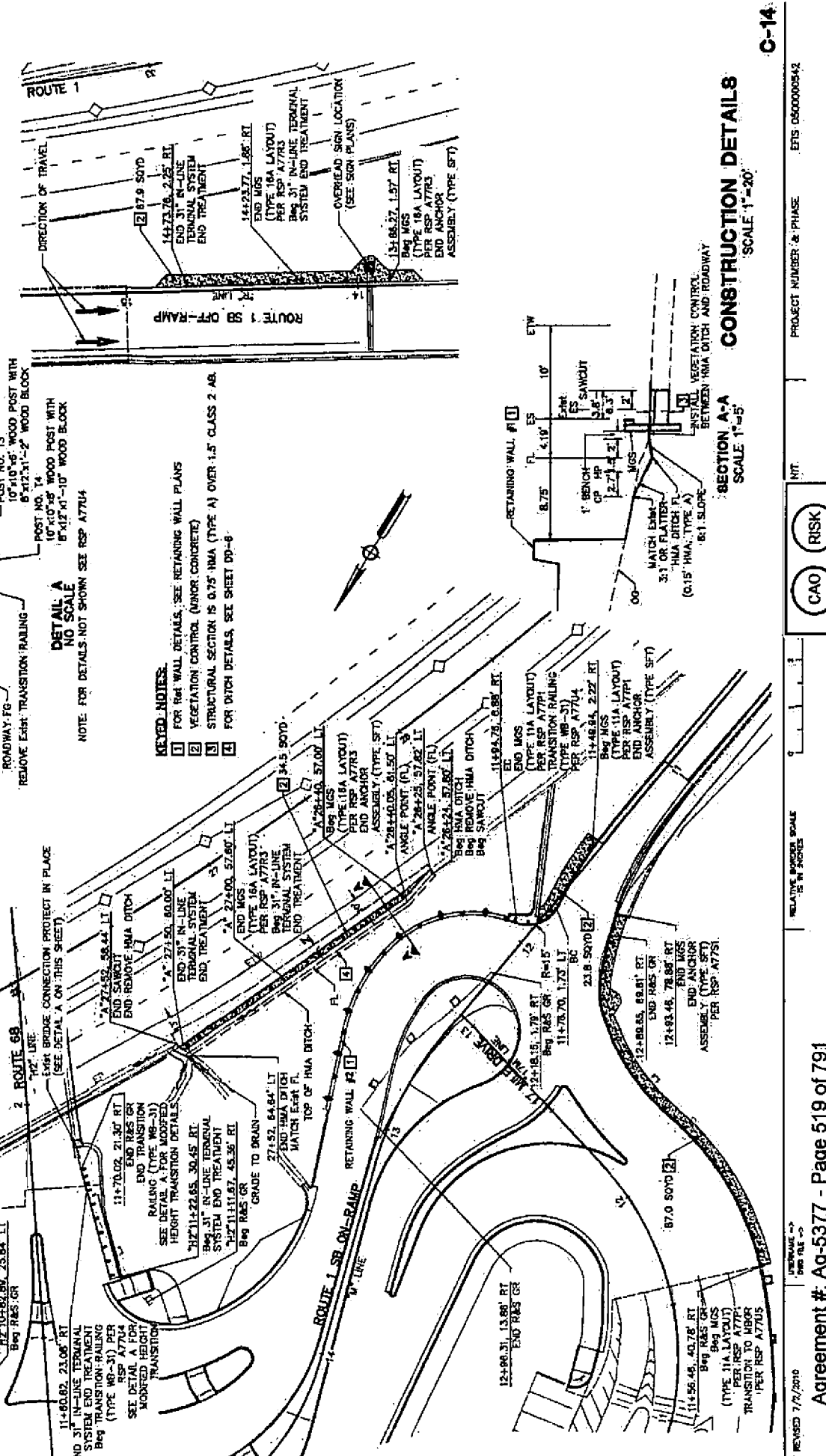
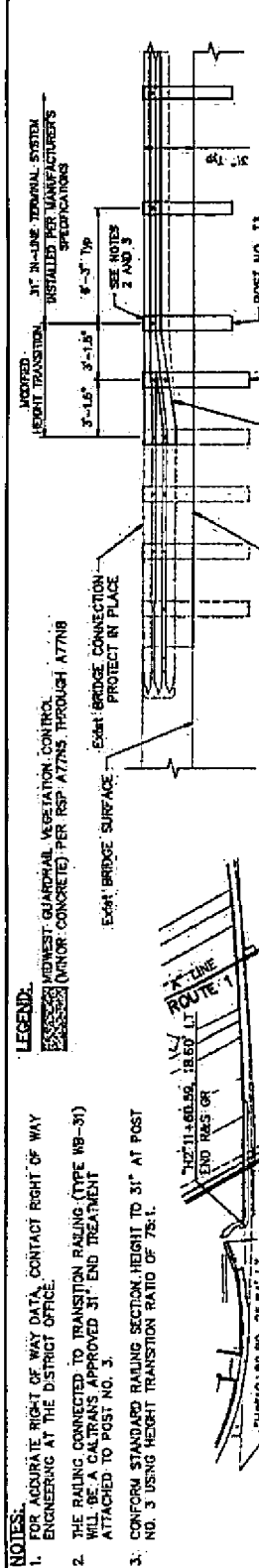
SCALE: 1"=5'

SCALE: 1"=100'

CAO RISK

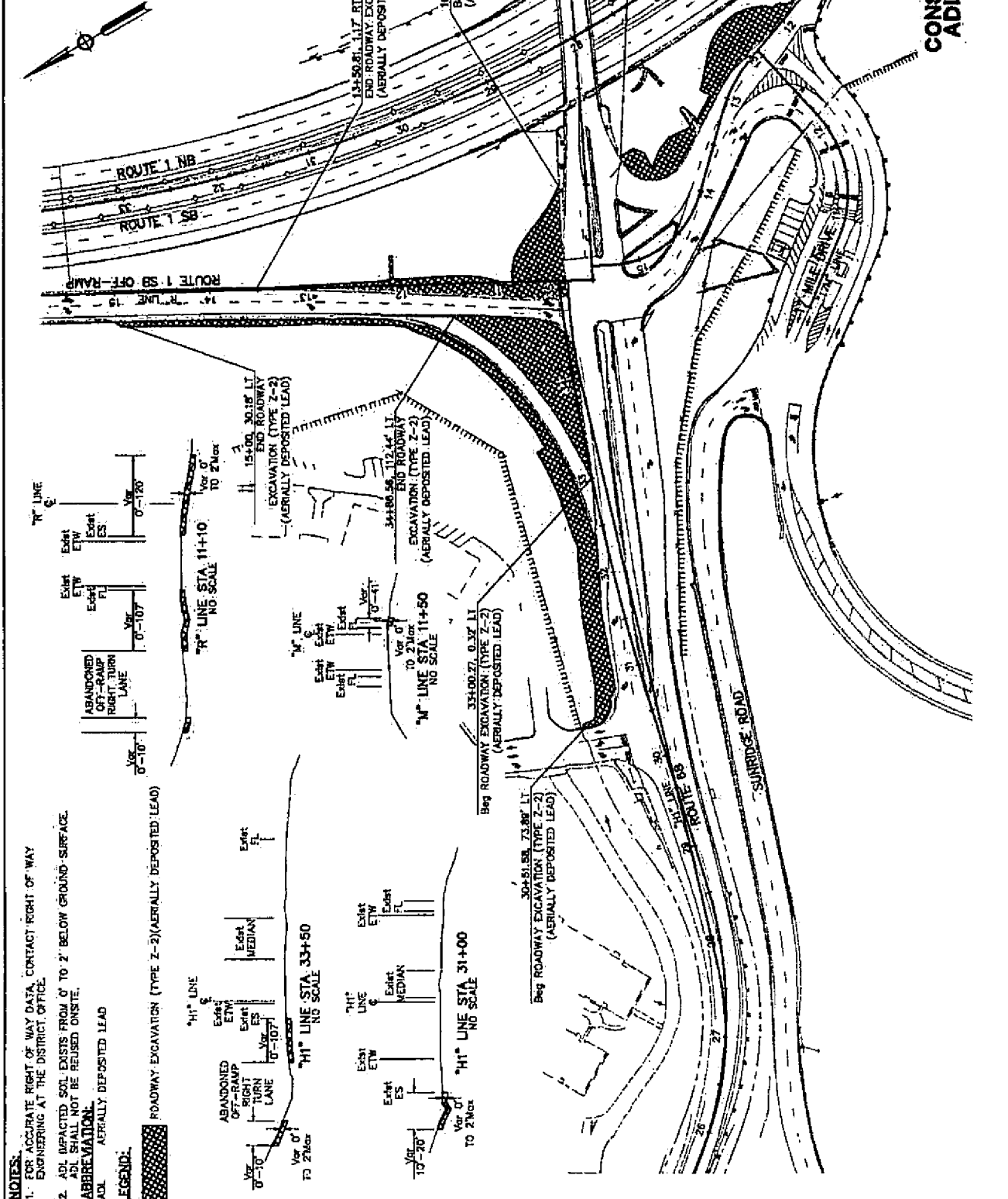
NO.	COUNTY	ROUTE	DATE	TOTAL ACRES	DATE
06	Mon	1, 68	7.5.1, 1.4.2	28	190

REGISTERED CIVIL ENGINEER  
 DATE: 7.5.1, 1.4.2  
 CIVIL  
 CITY OF MONTEREY  
 943 RESERVE DR., #100  
 MONTEREY, CA 93940



DATE	QUANTITY	PRICE	TOTAL AMOUNT	SHEET NO.	TOTAL SHEETS
05	Mon	1.68	75.1, L4-2	27	190

REGISTERED CIVIL ENGINEER  
 DATE: 11/24/83  
 CITY OF MONTEREY  
 943 RESERVE DR. #100  
 ROSEVILLE, CA. 95678



**NOTES:**  
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.  
 2. ADL IMPACTED SOIL EXISTS FROM 0' TO 2' BELOW GROUND SURFACE. ADL SHALL NOT BE REUSED ON-SITE.  
**ABBREVIATION:**  
 ADL AERIALY DEPOSITED LEAD  
**LEGEND:**  
 ROADWAY EXCAVATION (TYPE Z-2) (AERIALY DEPOSITED LEAD)  
 ABANDONED OFF-RAMP TURN LANE  
 \*HIT\* LINE  
 \*R\* LINE

**CONSTRUCTION DETAILS**  
**ADL REMOVAL LIMITS**  
 SCALE 1"=50'  
 C-15

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	DESIGNED BY	RONALD C. BOYLE	CHECKED BY	
REVISIONS	DATE REVISION				



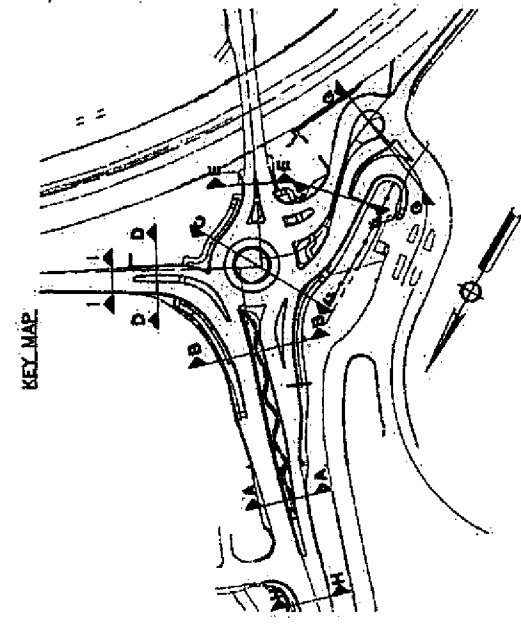
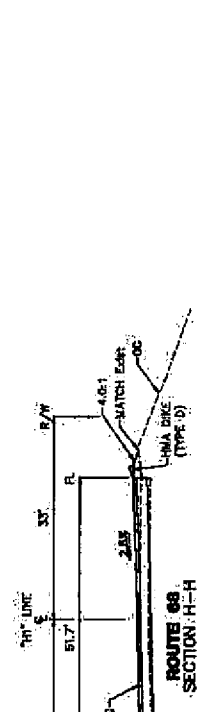
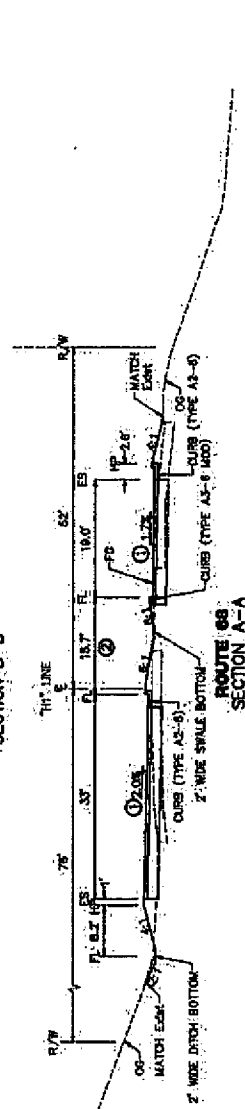
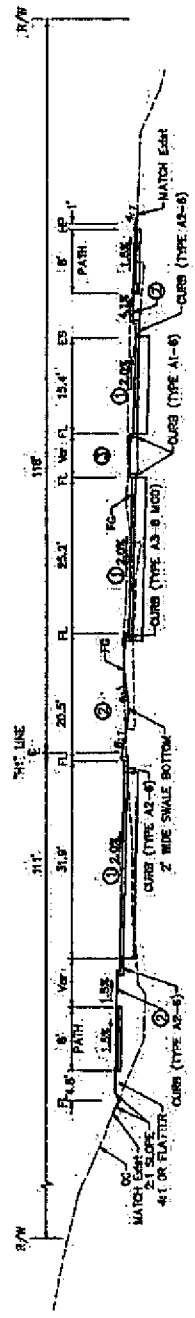
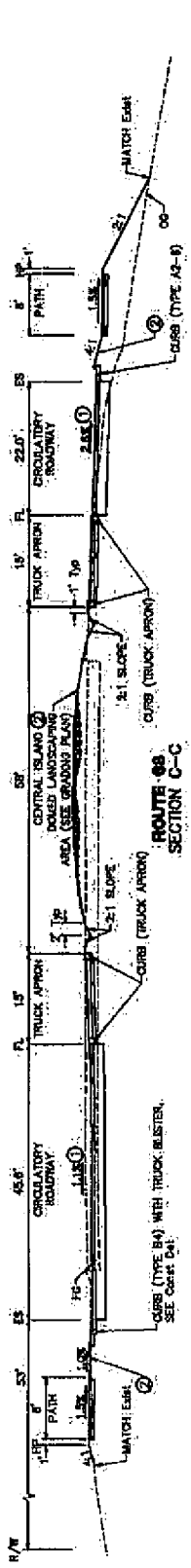
DATE	COUNTY	ROUTE	TOTAL PROJECT	SHEET NUMBER
05	Mon	1, 68	75.1, LA.2	28
REGISTERED CIVIL ENGINEER DATE: 11/15/00 CITY OF MONTEREY, CA 93940				
PLANS APPROVAL DATE: CITY OF MONTEREY, CA 93940 340 PACIFIC STREET MONTEREY, CA 93940				

**ABBREVIATIONS:**  
 CAO CURB AND GUTTER  
 CB GRADE BREAK

- NOTES:**
1. FOR PAVEMENT STRUCTURAL SECTIONS SEE TYPICAL SECTIONS.
  2. SUPERELEVATIONS ARE SHOWN ON THE SUPERELEVATION DIAGRAMS.
  3. FOR EXACT SLOPES AND GRADES, SEE CONSTRUCTION DETAILS AND GRADING PLAN.
  4. SEE PLANTING PLANS FOR VEGETATION DETAILS.

**KEYED NOTES:**

- ① SLOPES VARY BETWEEN SECTIONS  
SEE CONSTRUCTION DETAILS FOR FURTHER INFORMATION
- ② LANDSCAPING AREA, SEE PLANTING PLANS
- ③ ROCK BLANKET (COBBLE MEDIUM TREATMENT) SEE C-2



**CONSTRUCTION DETAILS:  
 ROADWAY CROSS SECTIONS**  
 NO SCALE

C-16

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G. BOYLE	CHECKED BY	DATE REVISION
ES-Designs	DESIGNED BY			

DATE	COUNTY	ROUTE	SHEET NO.	TOTAL SHEETS	DATE
05	Mon	1, 68	75, 1, 1, 4, 2	29	190

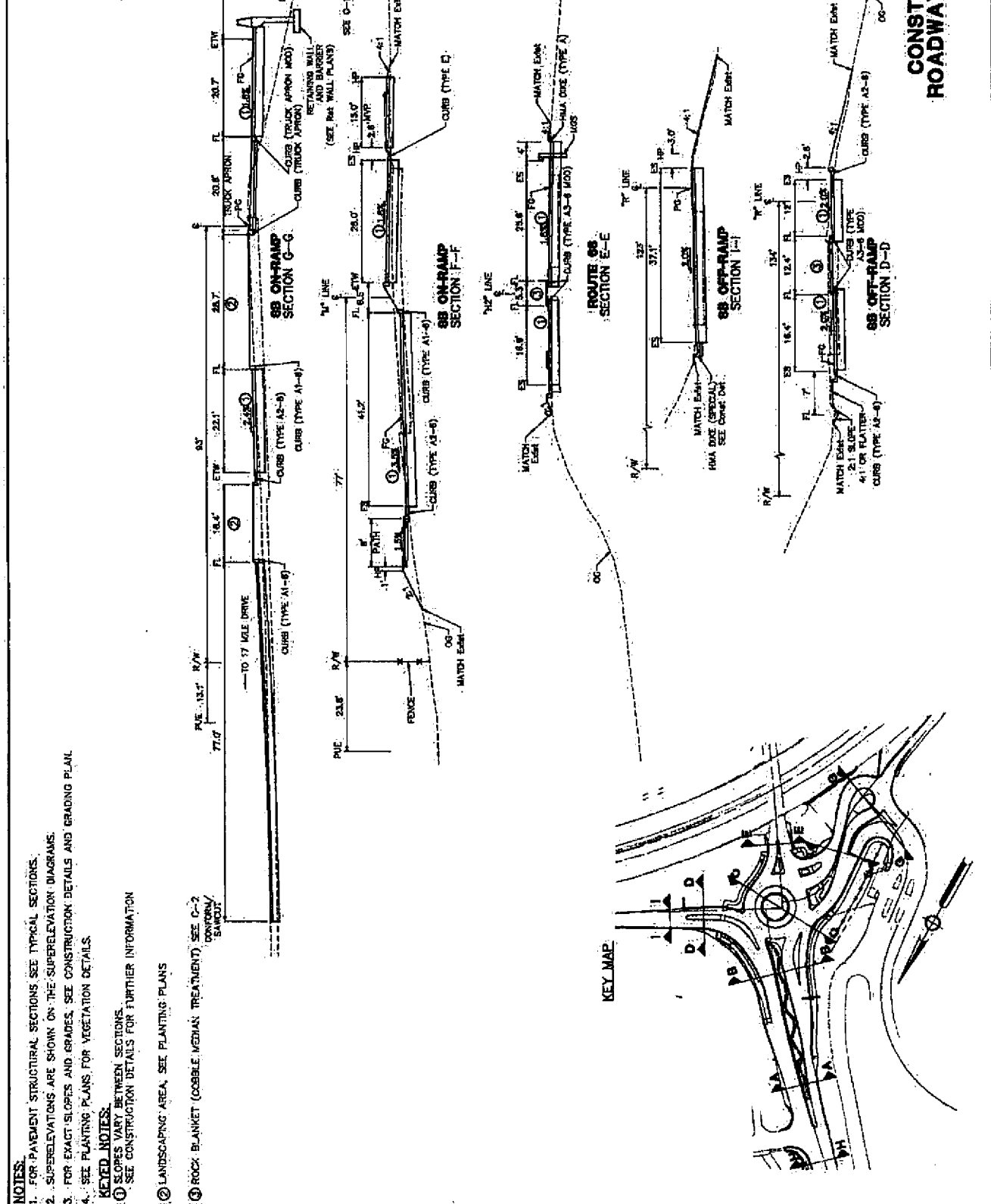
DESIGNED BY	CHECKED BY	DATE
RONALD G. BOYLE	RONALD G. BOYLE	7/2/2010

PROJECT NO.	DATE
Ag-5377	7/2/2010

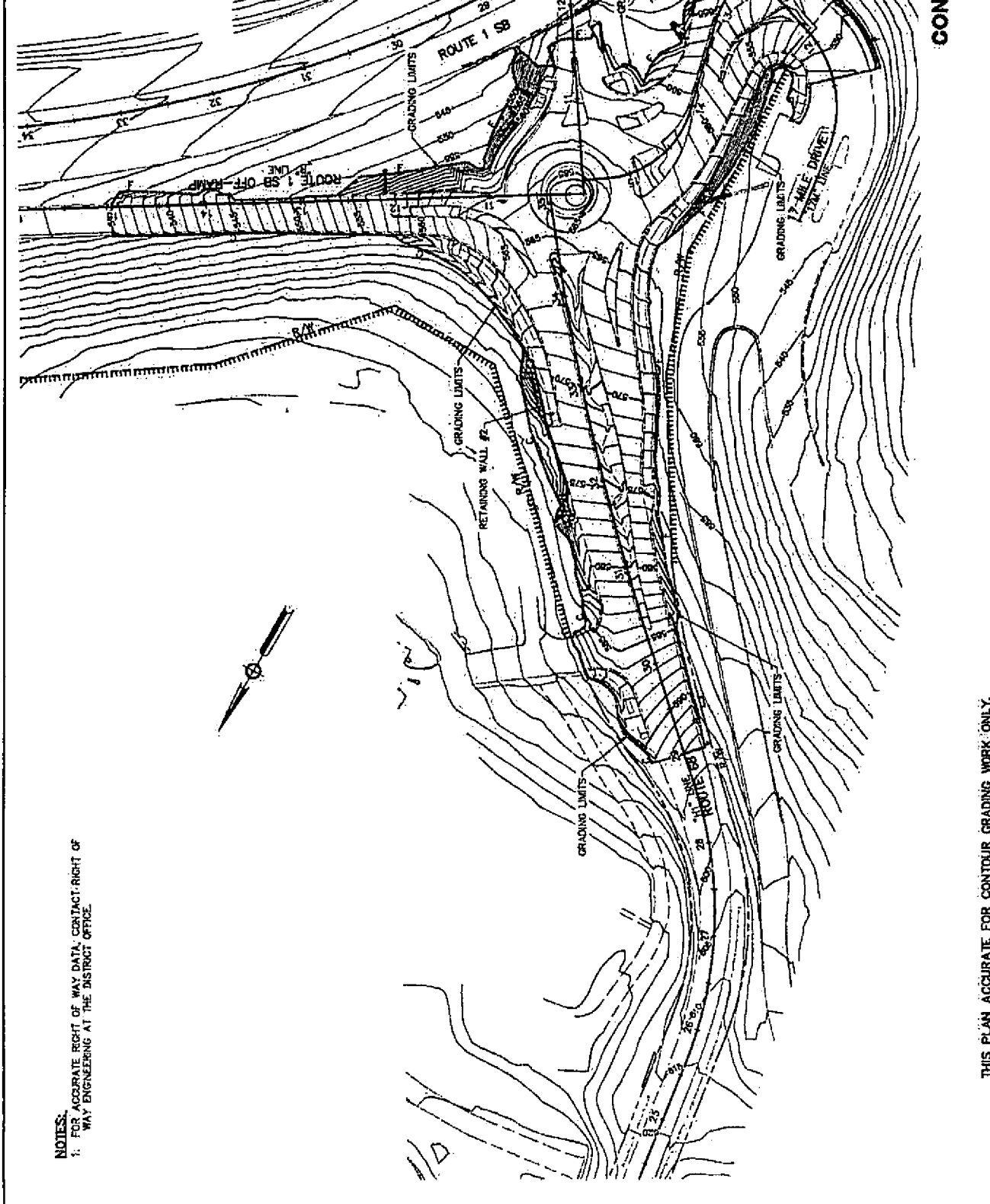
  

OWNER	ENGINEER
CITY OF MONTEREY 380 PACIFIC STREET MONTEREY, CA 95040	URS 380 PACIFIC STREET MONTEREY, CA 95040



DATE	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
05	Mon	1, 68	75.1, 14.2	36	100

**STANIS**  
 REGISTERED CIVIL ENGINEER  
 DATE: \_\_\_\_\_  
 PLANS APPROVAL DATE: \_\_\_\_\_  
 CITY OF MONTEREY  
 943 RESERVE DR. #100  
 ROSEVILLE, CA 95678

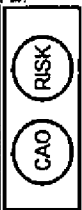


**NOTES:**  
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

**CONTOUR GRADING**  
 SCALE 1"=50'

G-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 RONALD C. BOYLE  
 CHECKED BY: \_\_\_\_\_  
 DESIGNED BY: \_\_\_\_\_  
 DATE REVISED: \_\_\_\_\_  
 REVISIONS: \_\_\_\_\_  
 THIS PLAN ACCURATE FOR CONTOUR GRADING WORK ONLY.  
 PROJECT NUMBER & PHASE: ETS 08000094-2  
 AGREEMENT #: Ag-5377 - Page 523 of 791  
 LAST REVISED: 7/2/2010



RELATIVE GRADE SCALE  
 1" = 20' HIGHER TO LOWER

DATE	PROJECT	SHEET NO.	TOTAL SHEETS
05/19/01	75.1, L.A.2	31	190

REGISTERED CIVIL ENGINEER	DATE
PLANS APPROVAL DATE	

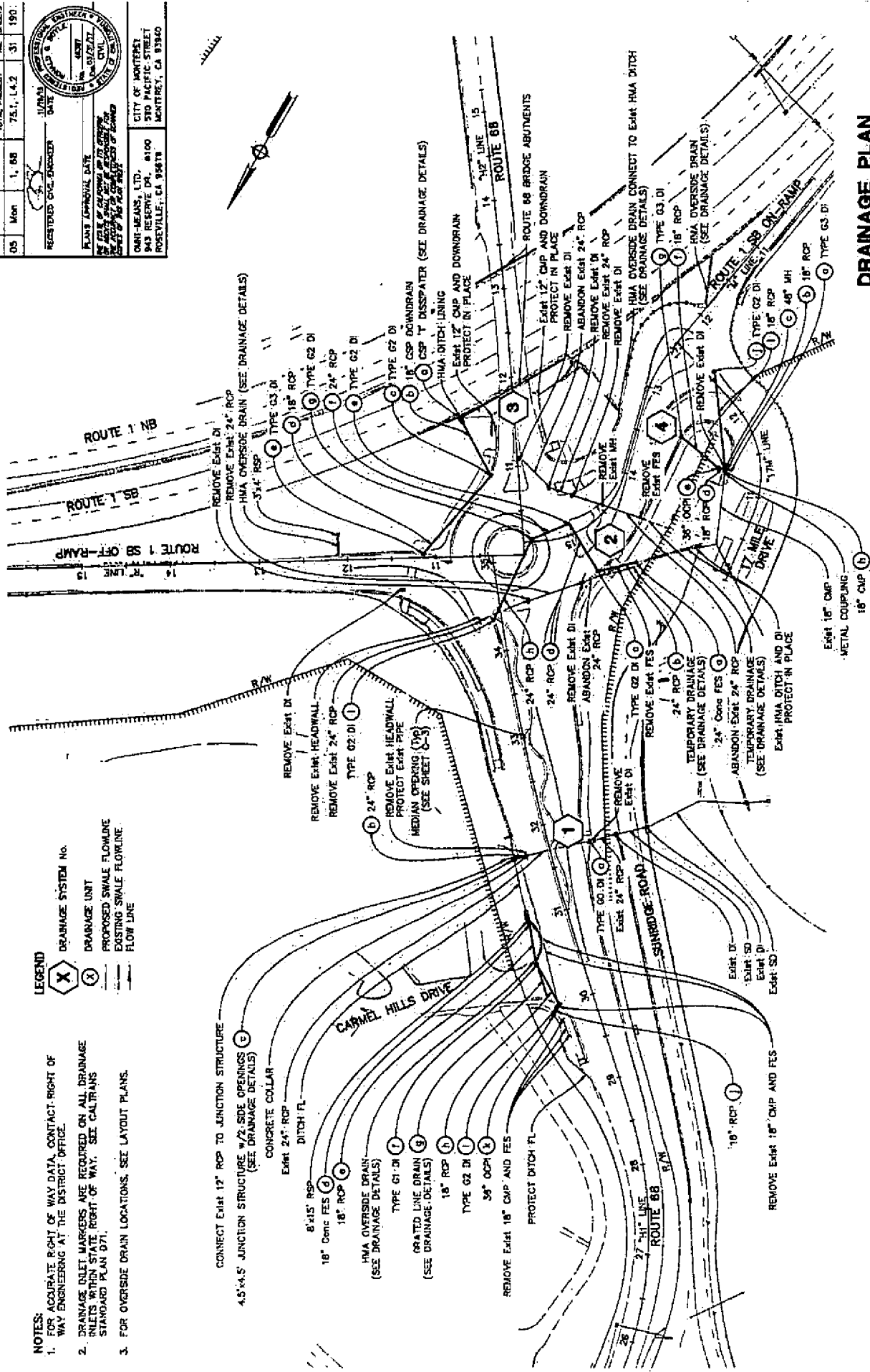
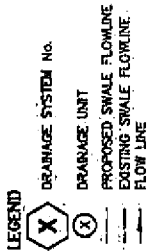
  

CITY OF MONTEREY	DATE
4837	05/19/01

CONTRACT NO.	CITY OF MONTEREY
943	370 PACIFIC STREET
ROSEVILLE, CA 95678	MONTEREY, CA 93940

- NOTES:**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - DRAINAGE INLET MARKERS ARE REQUIRED ON ALL DRAINAGE LINES WITHIN STATE RIGHT OF WAY. SEE CALTRANS STANDARD PLAN D71.
  - FOR OVERSIDE DRAIN LOCATIONS, SEE LAYOUT PLANS.



**DRAINAGE PLAN**  
SCALE 1"=50'

DATE	REVISED BY	DESIGNED BY	CHECKED BY	STATION
		RON C. BOYLE		585
				580
				575
				570
				565
				560
				TOTAL

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
CONSULTANT FLUCTUATIONAL SUPERVISOR

DATE REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

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REVISIONS

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REVISIONS

NOTES:  
1- DRAINAGE INLETS AND MANHOLES SHOWN INCLUDE BASE, CONCRETE THICKNESS, USE FL. ELEVATIONS FOR PIPE LAYOUT.  
2- ALL UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION.  
3- ALL STATION, OFFSETS, AND CORRESPONDING SHOWN LEADER LINES ARE TO THE CENTER OF BOX (GOB) OR FLOW LINE AT CURB (FLC) UNLESS OTHERWISE SHOWN.

PLANS APPROVAL DATE: 11/28/21  
REGISTERED CIVIL ENGINEER: [Signature]  
CITY OF MONTEREY: 545 PIERCE ST. MONTEREY, CA 93940

OWN: MEANS, LTD. #100 ROSSVILLE, CA 95871

4.5'x6.5' JUNCTION BOX W/2 SIDE DRAININGS  
31+71.13 "H" LINE 41.95' LL  
TOP OF BOX Elev: 577.73'  
SIDE OPENING FL Elev: 575.90' AND 574.80'  
(SEE DRAINAGE DETAILS)

ABANDONED TELEPHONE LINE  
VERIFY IN FIELD  
POTHOLE PER NOTE 2

TOP OF PIPE Elev = (571.64)  
VERIFY IN FIELD  
POTHOLE PER NOTE 2  
EARTH ACTIVE GAS LINE PROTECT IN PLACE

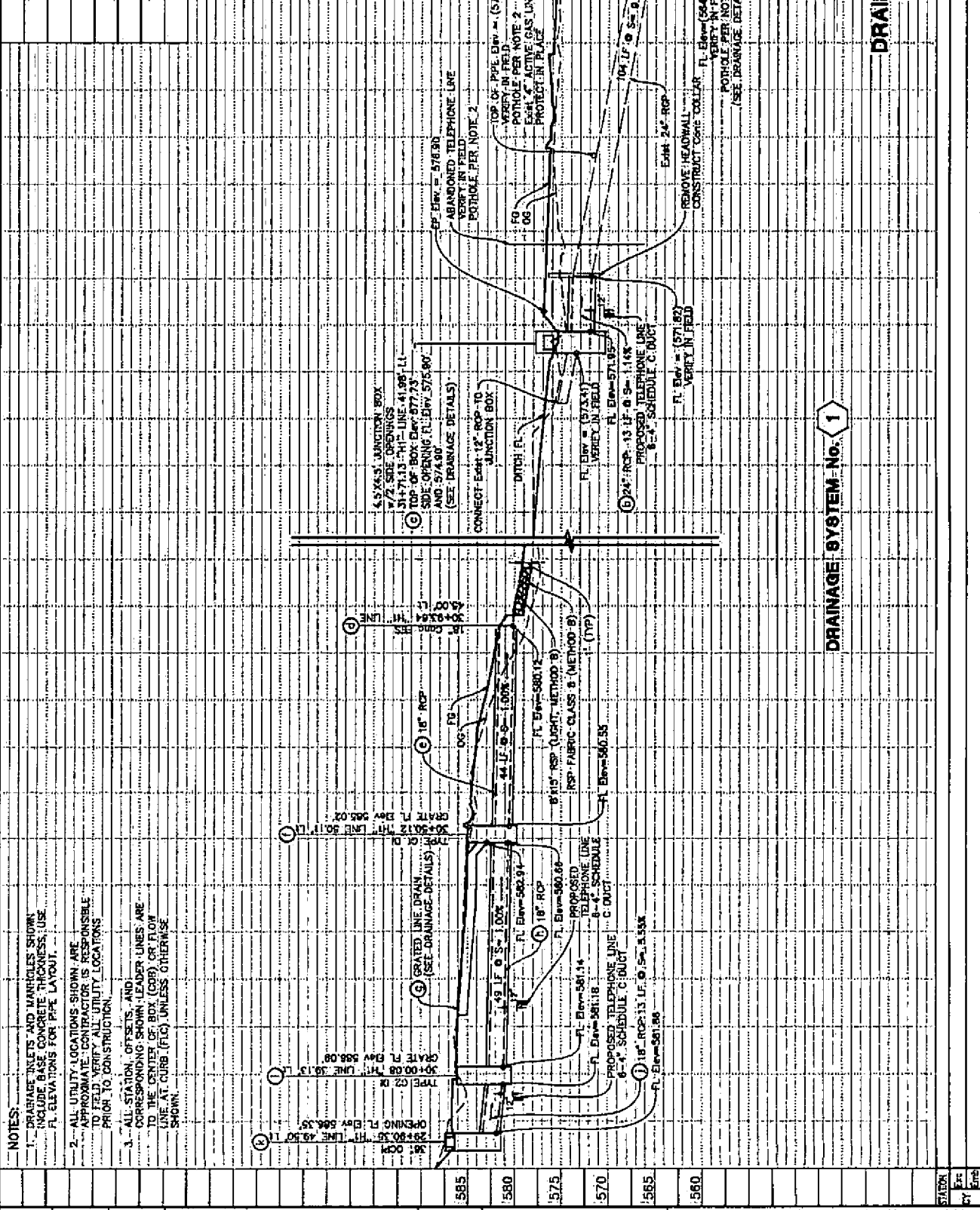
REMOVE HEADWALL - CONSTRUCT CONC. COLLAR  
FL Elev = (564.89)  
VERIFY IN FIELD  
POTHOLE PER NOTE 2 (SEE DRAINAGE DETAILS)

FL Elev = (571.82)  
VERIFY IN FIELD

FL Elev = (561.84)  
VERIFY IN FIELD

FL Elev = (566.35)  
VERIFY IN FIELD

FL Elev = (560.91)  
VERIFY IN FIELD



DRAINAGE SYSTEM - No. 1

DRAINAGE PROFILES

SCALE: Horiz 1"=10' Vert 1"=5'

DP-1

PROJECT NUMBER & PHASE: 0500000542

CAO RISK

Agreement #: Ag-5377 - Page 525 of 791

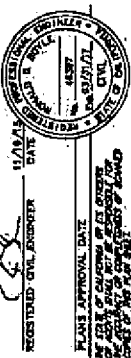
DATE LAST REVISED: 7/1/2010



DATE	REVISED BY	DATE	REVISED BY
DESIGNED BY XXXX, XXXXXXXX CONSULTANT FLORIANCA, SUPERVISOR RON C. BOYLE		CHECKED BY _____	
STATION 540 545 550 555 560 565		TOTAL SHEETS 34 SHEET NO. 190	

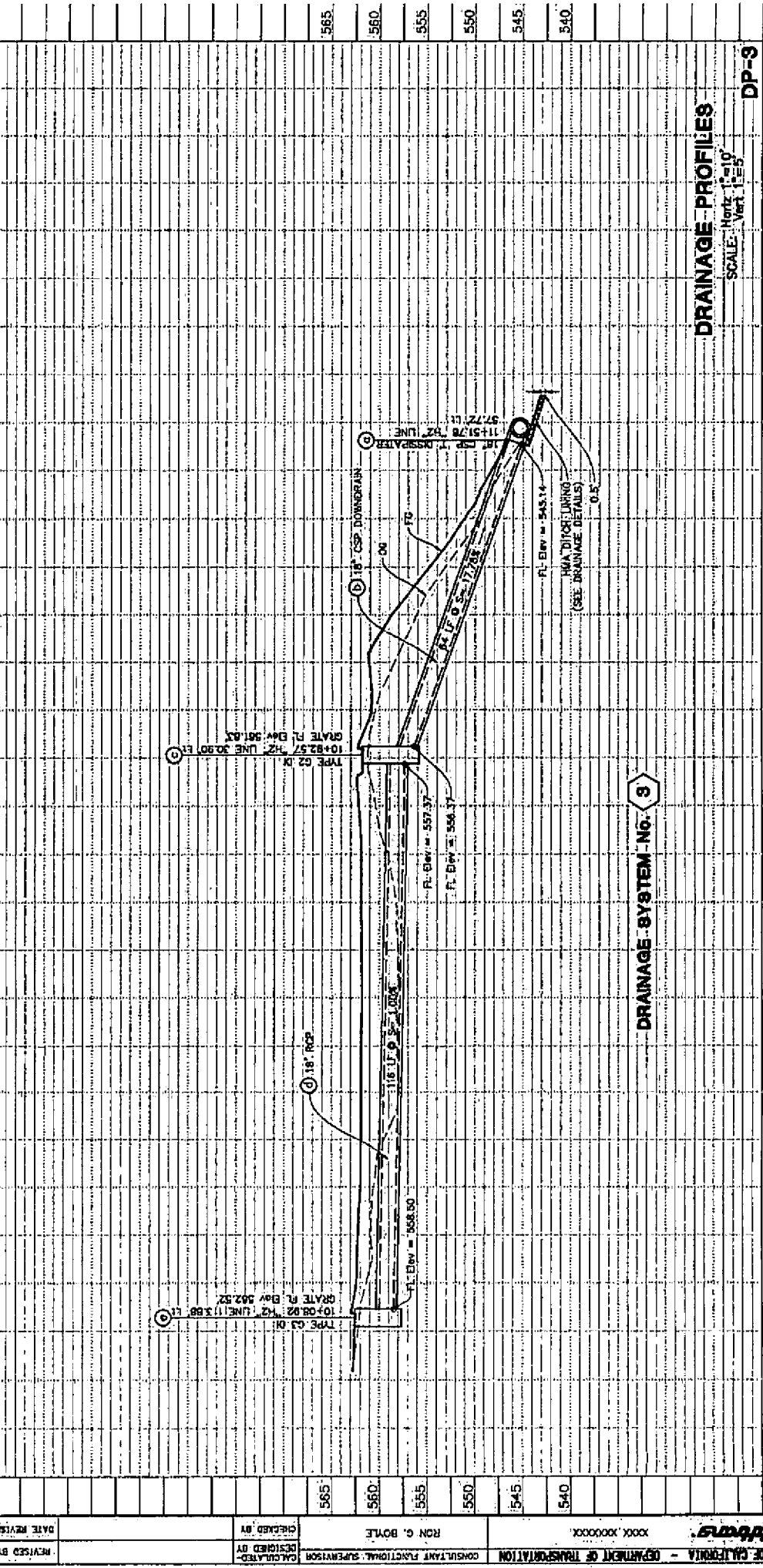
**NOTES:**

- 1- DRAINAGE INLETS AND MANHOLES SHOWN INCLUDE BASE CONCRETE THICKNESS. USE F. ELEVATIONS FOR PIPE LAYOUT.
- 2- ALL UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION.
- 3- ALL STATION OFFSETS AND CORRESPONDING SHOWN LEADER LINES ARE TO THE CENTER OF BOX (CXB) OR FLOW LINE AT CURB (F.C) UNLESS OTHERWISE SHOWN.



REGISTERED CIVIL ENGINEER  
 DATE 11/20/11  
 LICENSE NO. 4837  
 MECHANICAL  
 STATE OF CALIFORNIA  
 RON C. BOYLE  
 4837

CITY OF MONTEREY  
 943 RESERVE DR., #100  
 ROSSVILLE, CA 95811  
 MONTEREY, CA 93940



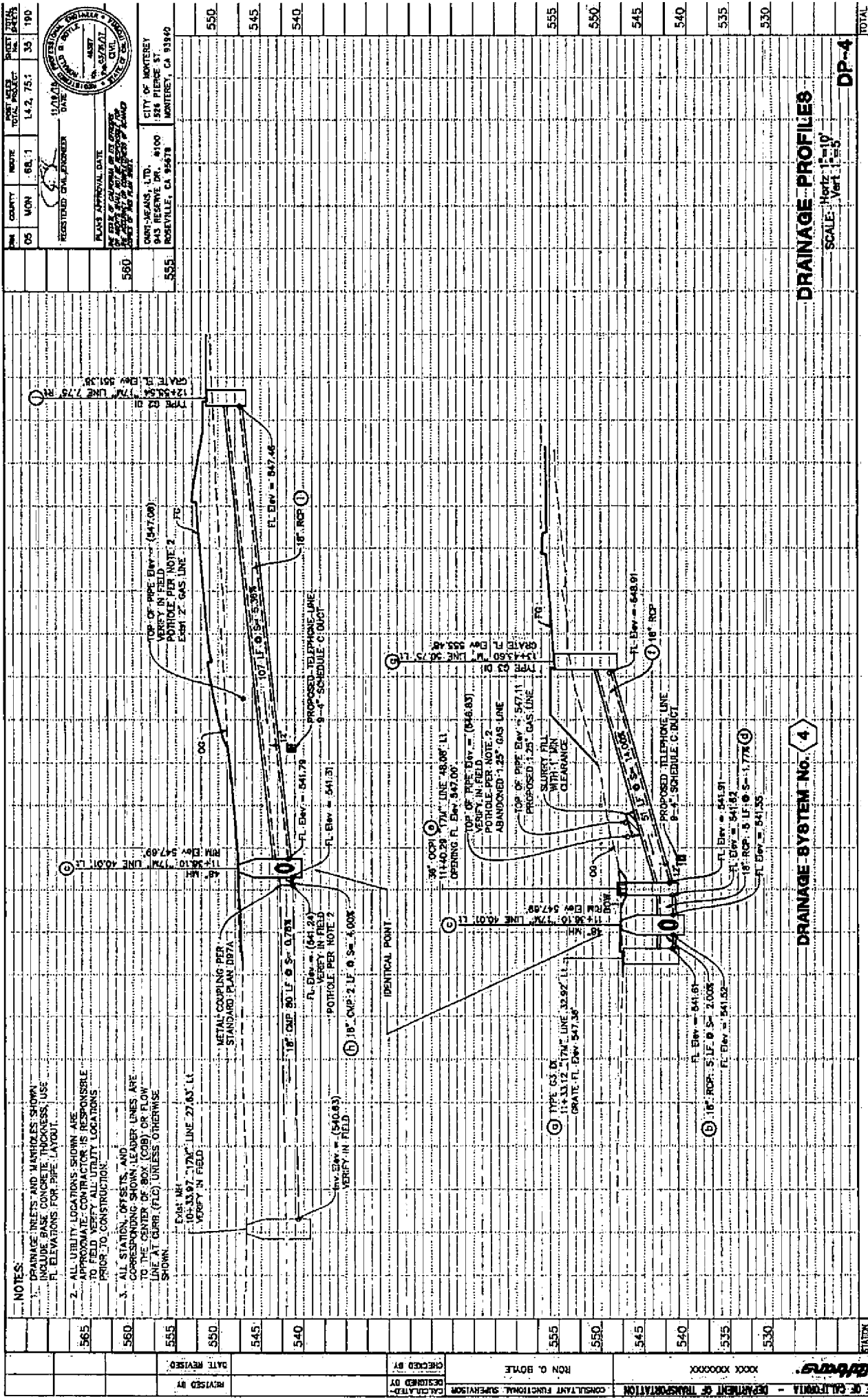
**DRAINAGE SYSTEM No. 3**

**DRAINAGE PROFILES**

SCALE: Horiz. 1"=10'  
 Vert. 1"=5'

**DP-3**

TOTAL



**NOTES:**  
 1. DRAINAGE INLETS AND MANHOLES SHOWN INCLUDE BASE CONCRETE THICKNESS, USE FL ELEVATIONS FOR PIPE LAYOUT.  
 2. ALL UTILITY LOCATIONS SHOWN ARE APPROXIMATE; CONTRACTOR IS RESPONSIBLE TO VERIFY FIELD UTILITY LOCATIONS PRIOR TO CONSTRUCTION.  
 3. ALL STATION OFFSETS AND CORRESPONDING SHOWN LEADER LINES ARE TO THE CENTER OF BOX (COB) OR FLOW LINE AT CURB (FLO) UNLESS OTHERWISE SHOWN.  
 4. EXIST. 18" CMP 2 LF @ S = 4.00%  
 5. EXIST. 18" CMP 2 LF @ S = 4.00%  
 6. EXIST. 18" CMP 2 LF @ S = 4.00%  
 7. EXIST. 18" CMP 2 LF @ S = 4.00%  
 8. EXIST. 18" CMP 2 LF @ S = 4.00%  
 9. EXIST. 18" CMP 2 LF @ S = 4.00%  
 10. EXIST. 18" CMP 2 LF @ S = 4.00%  
 11. EXIST. 18" CMP 2 LF @ S = 4.00%  
 12. EXIST. 18" CMP 2 LF @ S = 4.00%  
 13. EXIST. 18" CMP 2 LF @ S = 4.00%  
 14. EXIST. 18" CMP 2 LF @ S = 4.00%  
 15. EXIST. 18" CMP 2 LF @ S = 4.00%  
 16. EXIST. 18" CMP 2 LF @ S = 4.00%  
 17. EXIST. 18" CMP 2 LF @ S = 4.00%  
 18. EXIST. 18" CMP 2 LF @ S = 4.00%  
 19. EXIST. 18" CMP 2 LF @ S = 4.00%  
 20. EXIST. 18" CMP 2 LF @ S = 4.00%

STATION	DATE REVISION	REVISION BY	DESCRIPTION
565			
560			
555			
550			
545			
540			
535			
530			
<b>DRAINAGE SYSTEM No. 4</b>			
<b>DRAINAGE PROFILES</b>			
SCALE: Horiz. 1" = 10' Vert. 1" = 5'			
<b>DP-4</b>			
<b>TOTAL</b>			

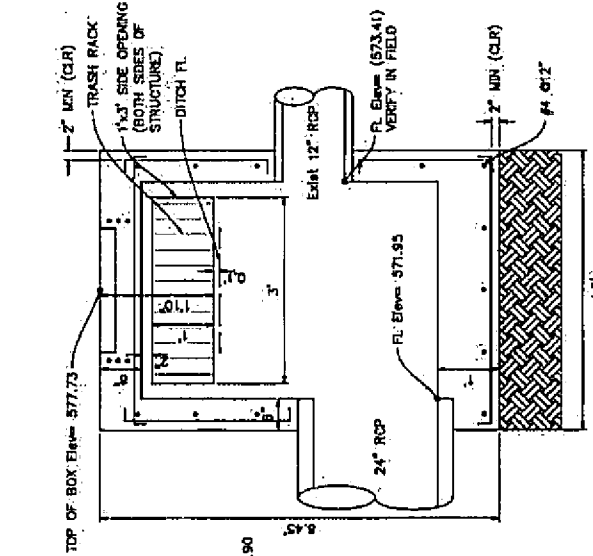


DATE	COUNTY	ROUTE	TOTAL PROJECT	SHEET NUMBER
05	Mon	1, 68	75.1, L-2	36

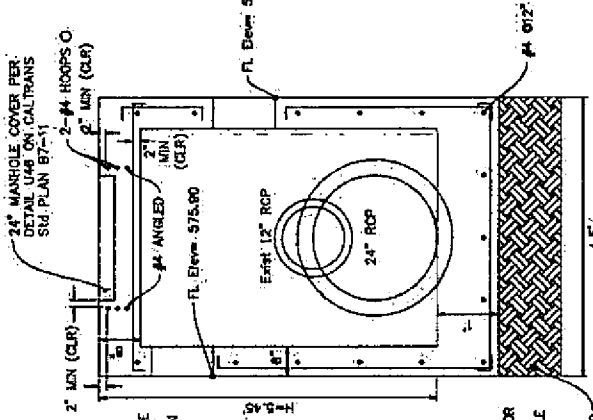
REGISTERED ENGINEER  
 DATE: 11/20/11  
 PROJECT NO: 03/20/11  
 CIVIL  
 CITY OF MONTEREY  
 943 RESERVE DR. #100  
 ROSEVILLE, CA 95678  
 MON-HEANS, LTD.  
 1500 PACIFIC STREET  
 MONTEREY, CA 93940

**NOTES:**

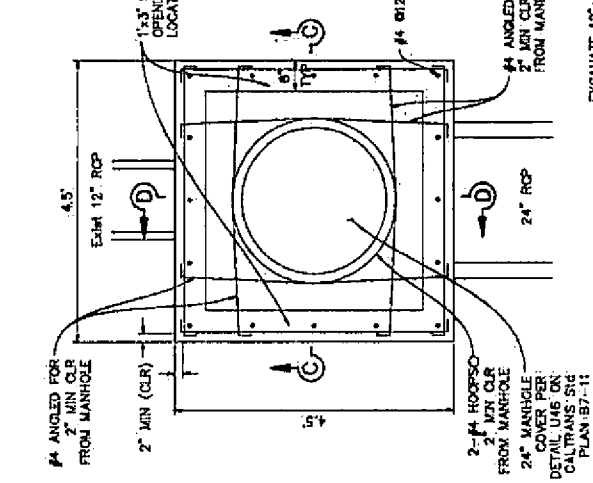
- WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L & T SHALL CORRESPOND WITH THE LARGER OF THE TWO PIPE DIAMETERS.
- JOIN PIPES AT INVERTS.
- FOR DETAILS NOT SHOWN, REFER TO STANDARD PLANS D93A TO D93C.



SECTION D-D



SECTION C-C

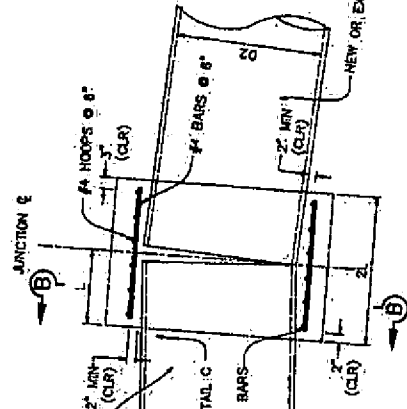


PLAN

**4.5x4.5 JUNCTION STRUCTURE 1**  
NO SCALE

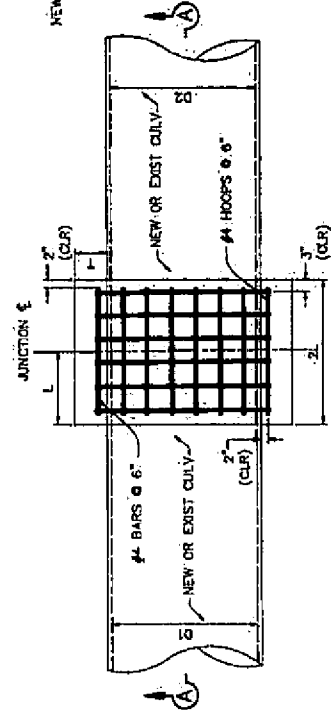
TABLE D

D	L (MIN)	T (MIN)
1'-6"	1'-0"	6"
2'-0"	1'-0"	6"
3'-0"	1'-6"	6"
4'-0"	1'-6"	6"
4'-6"	1'-6"	6"
5'-0"	2'-0"	1'-0"
5'-6"	2'-0"	1'-0"
6'-0"	2'-0"	1'-0"



SECTION A-A

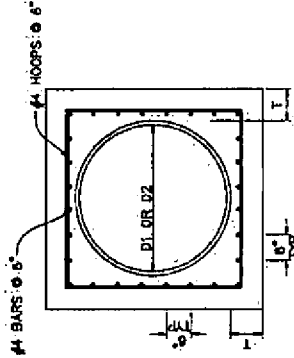
NOTE: BEND BOTTOM BARS AS NECESSARY TO MAINTAIN 2" CLEARANCE



PLAN

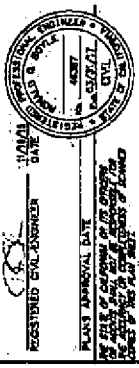
**CONCRETE COLLAR**  
NO SCALE

SECTION B-B

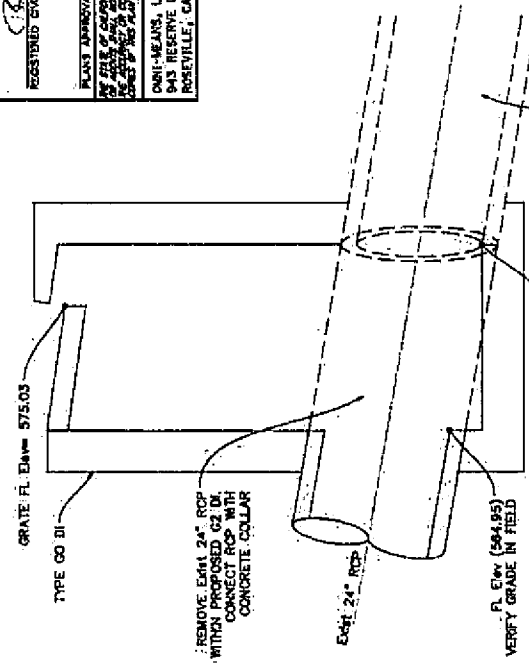


**DRAINAGE DETAILS**

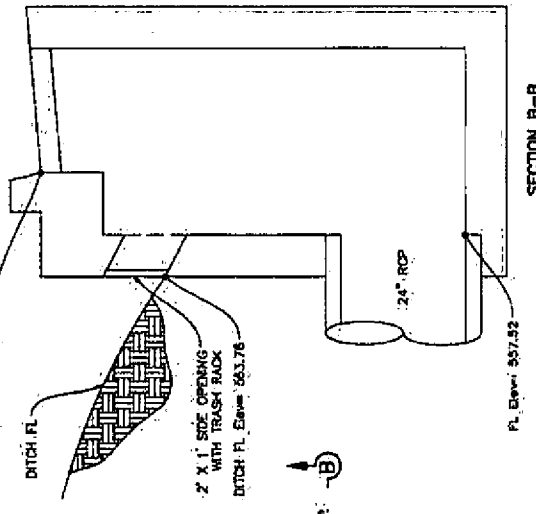
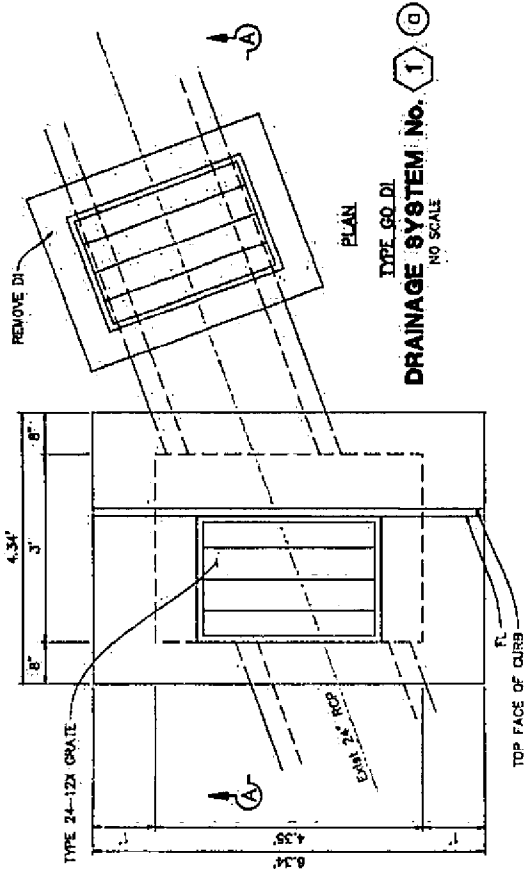
DATE	COUNTY	ROUTE	POST MILE	SECTION	SHEET NO.	TOTAL SHEETS
05	Mon	1	68	751, L&2	37	190



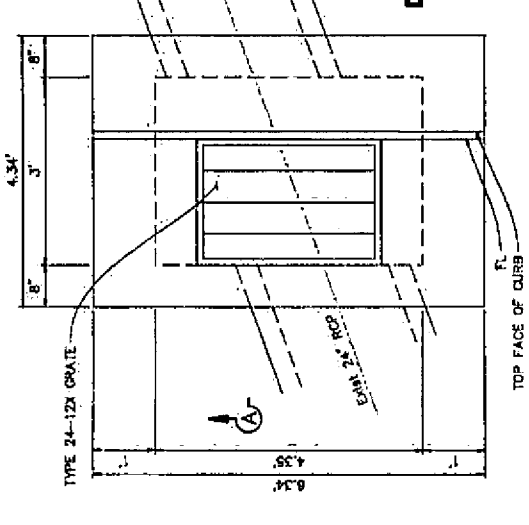
PLANS APPROVAL DATE: 04/27/01  
 REGISTERED CIVIL ENGINEER  
 CITY OF MONTEREY  
 510 PACIFIC STREET  
 MONTEREY, CA 93940



NOTES:  
 1. FOR DETAILS NOT SHOWN, REFER TO STANDARD PLANS D63A TO D63C.



TYPE G2 DI  
 DRAINAGE SYSTEM No. 2  
 NO SCALE

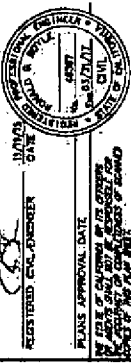


TYPE G2 DI  
 DRAINAGE SYSTEM No. 2  
 NO SCALE

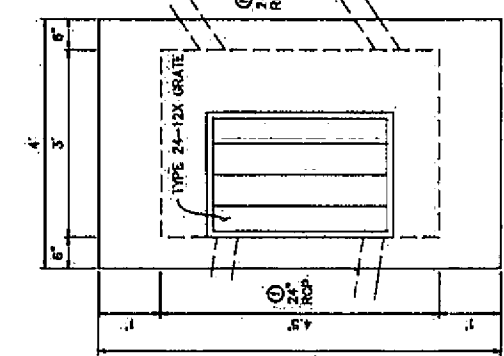
DRAINAGE DETAILS

DD-2

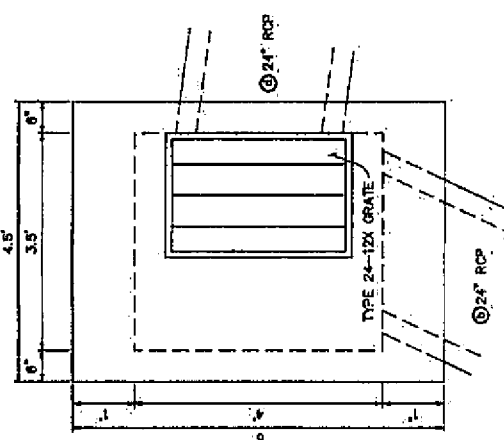
NO.	QUANTITY	ROUTE	DATE	TOTAL	PERCENT
05	Mon	1, 6B	75.1, L4.2	38	100



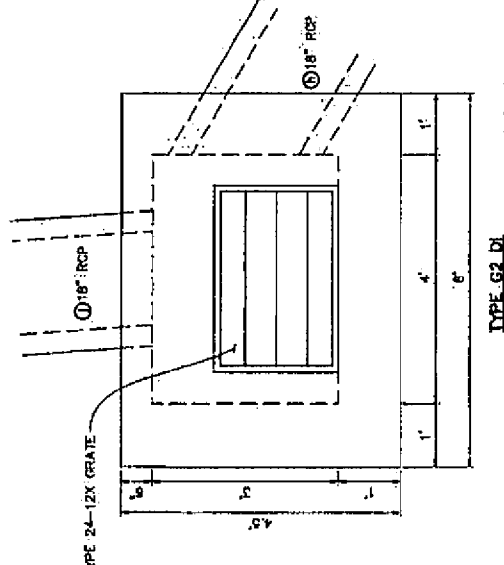
REGISTERED CIVIL ENGINEER  
 JAMES S. GALT  
 45977  
 CIVIL  
 STATE OF CALIFORNIA  
 CITY OF MONTEREY  
 943 RESERVE DR. #100  
 ROSEVILLE, CA 95678  
 MONTEREY, CA 93940



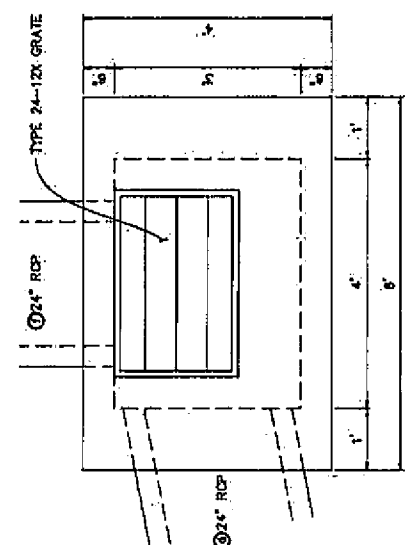
TYPE G2 DL  
**DRAINAGE SYSTEM No. 1**  
 NO SCALE



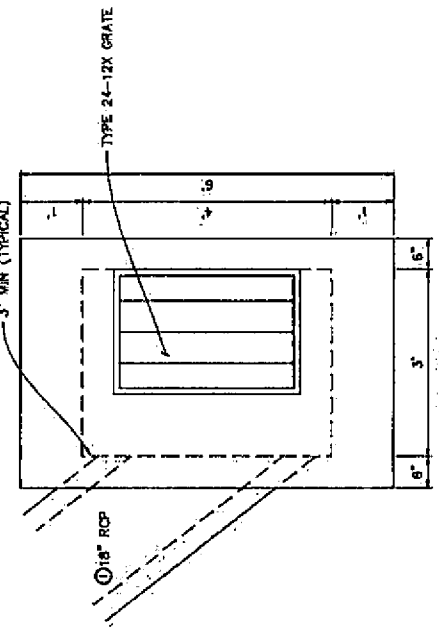
TYPE G2 DL  
**DRAINAGE SYSTEM No. 2**  
 NO SCALE



TYPE G2 DL  
**DRAINAGE SYSTEM No. 3**  
 NO SCALE



TYPE G2 DL  
**DRAINAGE SYSTEM No. 4**  
 NO SCALE



TYPE G2 DL  
**DRAINAGE SYSTEM No. 5**  
 NO SCALE

NOTES:  
 1. FOR DETAILS NOT SHOWN, REFER TO STANDARD PLANS D93A TO D93C.

**DRAINAGE DETAILS:**

DD-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 RONALD C. BOWLE  
 CHECKED BY  
 DATE REVISED  
 REVISIONS BY

RELATIVE NUMBER SCALE  
 0 1 2 3 4 5 6 7 8 9 10  
 IN FEET

PROJECT NUMBER & PHASE  
 ETS 0500000542

CAO RISK

Agreement #: Ag-5377 - Page 531 of 791

ORDER LAST REVISED 7/7/2010

DATE	COUNTY	ROUTE	POST MILES	SHEET TOTAL
06	Mon	1, 60	73.1, 14.2	36 of 190

REGISTERED CIVIL ENGINEER DATE

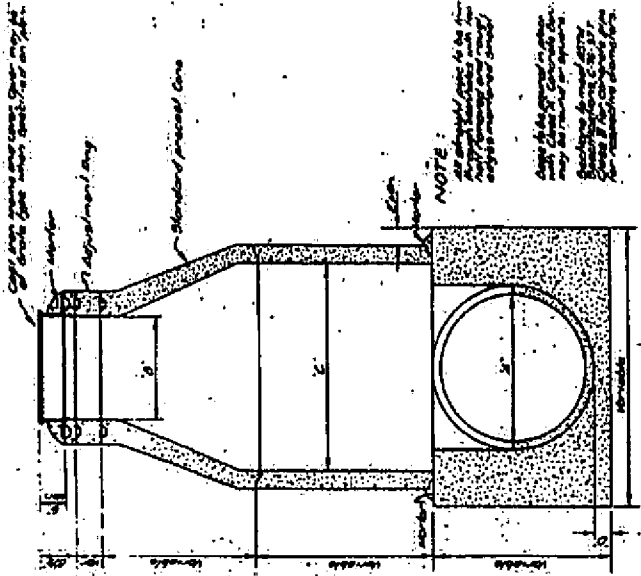
PLANS APPROVAL DATE

CITY OF MONTEREY  
540 PACIFIC STREET  
MONTEREY, CA 93940



**NOTES:**

- FOR DETAILS NOT SHOWN, REFER TO STANDARD PLANS DSR# TO DSR#.



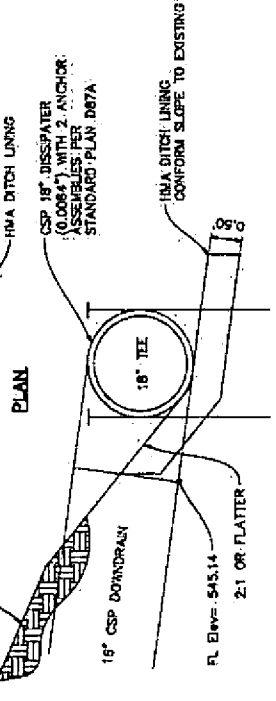
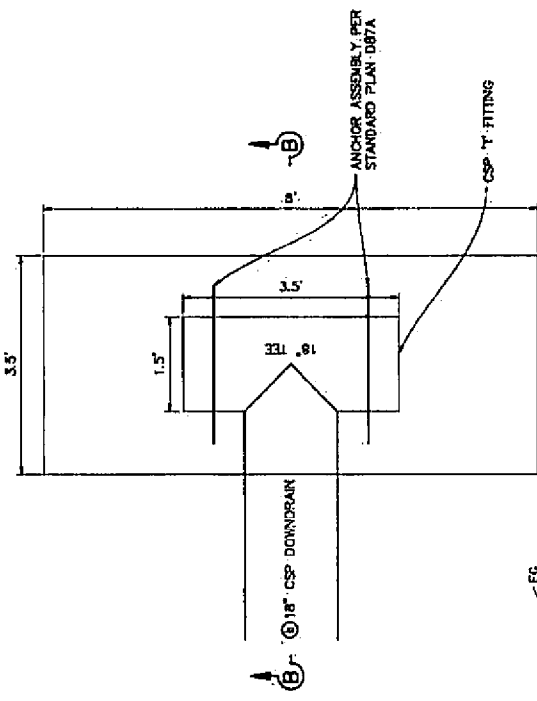
MEMBER	LENGTH	THICKNESS
A	0	0
B	34"	40"
C	34"	40"
D	34"	40"
E	34"	40"

MONTEREY COUNTY  
STANDARD DETAILS  
DRAINAGE SYSTEM No. 4

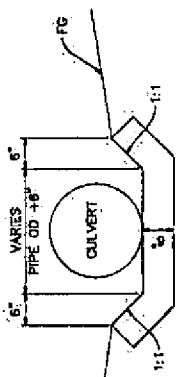
DATE: 10/19/00

BY: RCB

48" MANHOLE (TYPE COUNTY)  
DRAINAGE SYSTEM No. 4



CSP T DISSIPATER  
DRAINAGE SYSTEM No. 9



**STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION**  
**CONSULTANT FUNCTIONAL SUPERVISOR**  
 RONALD C. BOYE

**CHECKED BY**  
 [Signature]

**DATE REVISION**

NO.	DESCRIPTION	DATE
01	ISSUED FOR PERMITS	05/27/17
02	ISSUED FOR PERMITS	05/27/17
03	ISSUED FOR PERMITS	05/27/17
04	ISSUED FOR PERMITS	05/27/17
05	ISSUED FOR PERMITS	05/27/17

**REGISTERED CIVIL ENGINEER**  
 DATE: 05/27/17  
 NO.: 44377  
 CIVIL  
 STATE OF CALIFORNIA

**PLANS APPROVAL DATE**  
 DATE: 05/27/17  
 NO.: 44377  
 CIVIL  
 STATE OF CALIFORNIA

**CITY OF MONTEREY**  
 943 RESERVE DR. #100  
 MONTEREY, CA 93940

**CITY OF MONTEREY**  
 943 RESERVE DR. #100  
 MONTEREY, CA 93940

**NOTE:**  
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.  
 2. FOR "RT" LINE ALIGNMENT AND PROFILE SEE SHEET P-4.

**LEGEND:**

- GRADE BREAK
- EXPOSED AGGREGATE MINOR CONCRETE (TRUCK APRON)
- EXPOSED AGGREGATE MINOR CONCRETE (MEDIAN PAVING)
- ROCK BLANKET (CORSELE MEDIAN TREATMENT)

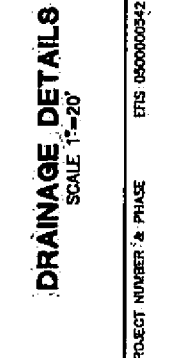
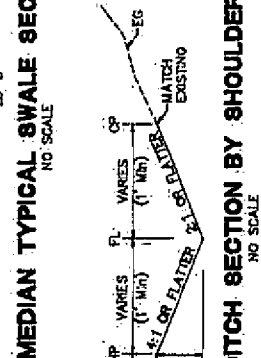
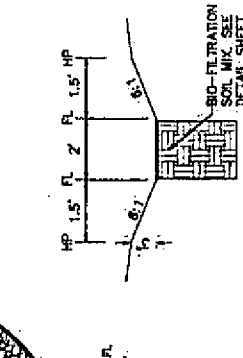
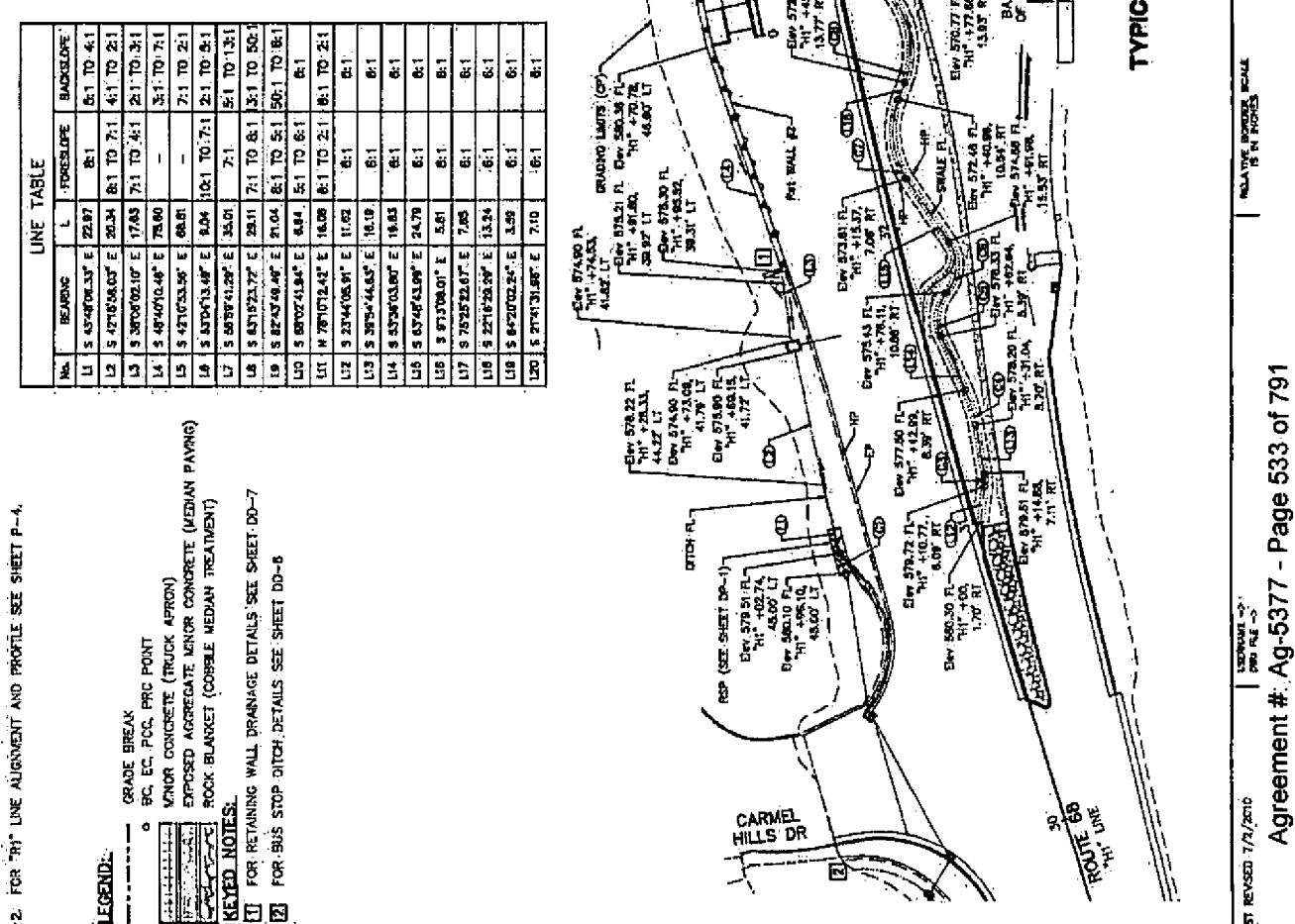
**KEYED NOTES:**  
 [1] FOR RETAINING WALL DRAINAGE DETAILS SEE SHEET DD-7  
 [2] FOR BUS STOP DITCH DETAILS SEE SHEET DD-8

**LINE TABLE**

Sta.	Bearing	L	Fore Slope	Back Slope
L1	S 45°40'04.37" E	22.87	6:1	6:1 TO 4:1
L2	S 27°18'08.07" E	20.34	8:1 TO 7:1	4:1 TO 2:1
L3	S 30°07'02.10" E	17.63	7:1 TO 4:1	2:1 TO 3:1
L4	S 49°40'10.48" E	78.80	—	3:1 TO 7:1
L5	S 47°17'53.95" E	68.81	—	7:1 TO 2:1
L6	S 37°07'13.48" E	8.04	10:1 TO 7:1	2:1 TO 2:1
L7	S 45°39'41.29" E	35.01	2:1	5:1 TO 13:1
L8	S 43°19'21.77" E	28.11	7:1 TO 8:1	13:1 TO 50:1
L9	S 82°43'48.49" E	21.04	8:1 TO 5:1	50:1 TO 8:1
L10	S 89°02'41.84" E	4.84	5:1 TO 6:1	6:1
L11	N 78°10'12.47" E	16.09	6:1 TO 2:1	6:1 TO 2:1
L12	S 27°44'10.91" E	11.02	6:1	6:1
L13	S 39°54'44.57" E	16.19	6:1	6:1
L14	S 33°58'10.87" E	18.83	6:1	6:1
L15	S 63°48'43.99" E	24.79	6:1	6:1
L16	S 87°398.01" E	5.61	6:1	6:1
L17	S 75°25'22.87" E	7.85	6:1	6:1
L18	S 27°18'28.39" E	13.24	6:1	6:1
L19	S 84°20'02.24" E	3.59	6:1	6:1
L20	S 27°41'31.88" E	7.10	6:1	6:1

**CURVE TABLE**

No.	R	Delta	T	L
C1	2745.00'	0°08'28"	3.36'	6.76'
C2	18.00'	19°07'39"	2.13'	4.24'
C3	60.00'	13°41'10"	6.00'	11.92'
C4	14.00'	61°56'25"	8.39'	15.11'
C5	14.00'	73°03'08"	10.18'	17.81'
C6	29.00'	52°41'44"	14.38'	28.67'
C7	29.00'	89°21'05"	18.81'	33.31'
C8	20.00'	53°08'53"	10.00'	18.55'
C9	60.00'	4°03'53"	23.07'	44.04'
C10	30.00'	42°32'50"	11.71'	23.33'
C11	42.00'	71°03'37"	29.89'	53.09'



**DRAINAGE DETAILS**  
 SCALE 1"=20'

CAO RISK

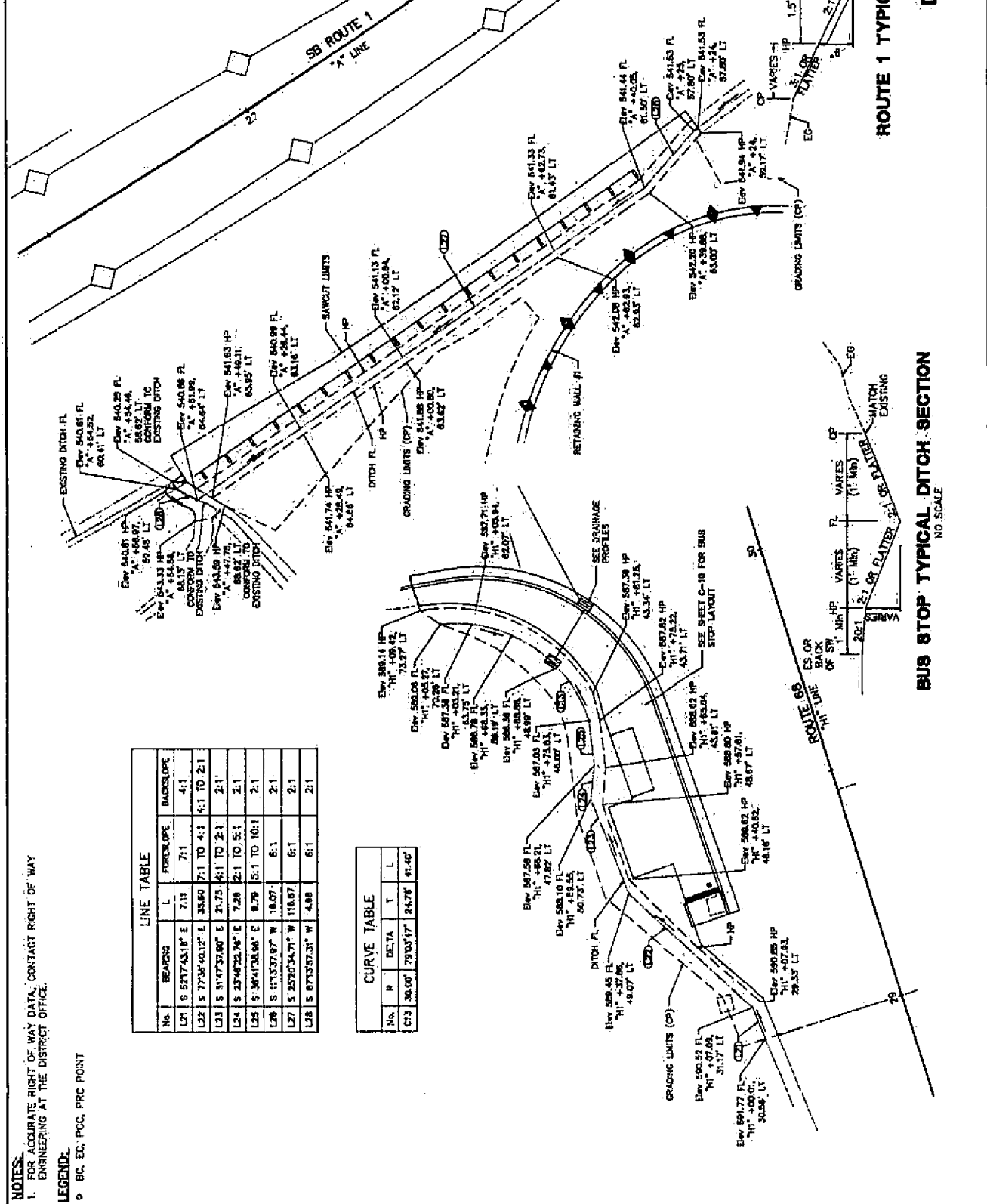
DATE	05	MON	1, 68	751, LA.2	41	190
COUNTY	SANTA CLAY					
ROUTE	751, LA.2					
PROJECT	SANTA CLAY					
NO.	190					

REGISTERED CIVIL ENGINEER	DATE	APPROVAL DATE
PLANS APPROVAL DATE		

CITY OF MONTEREY	340 MONTEREY STREET	MONTEREY, CA 93940
DMR-HEAMS, LTD.	8100	
340 MONTEREY STREET		
ROSEVILLE, CA 95678		



**NOTES:**

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

**LEGEND:**

- BC, EC, FCC, PRC POINT

**LINE TABLE**

Nk.	BEARINGS	L	PERCENTAGE	BACKSLOPE
L21	S 52°17'43.18" E	7.10	7:1	4:1
L22	S 77°35'40.12" E	33.60	7:1 TO 4:1	4:1 TO 2:1
L23	S 11°47'33.80" E	21.75	4:1 TO 2:1	2:1
L24	S 23°46'23.74" E	7.28	2:1 TO 5:1	2:1
L25	S 30°41'38.64" E	9.79	5:1 TO 10:1	2:1
L26	S 11°33'37.87" W	16.07	6:1	2:1
L27	S 25°20'34.71" W	118.87	6:1	2:1
L28	S 87°33'57.31" W	4.88	6:1	2:1

**CURVE TABLE**

Nk.	R	DELTA	T	L
C13	30.00'	79°03'57"	24.78'	41.40'

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	DESIGNED BY	RONALD G. BOYLE
CHECKED BY	DATE REVISION	REVISION	

**ROUTE 1 TYPICAL DITCH SECTION**  
 NO. SCALE

**BUS STOP TYPICAL DITCH SECTION**  
 NO. SCALE

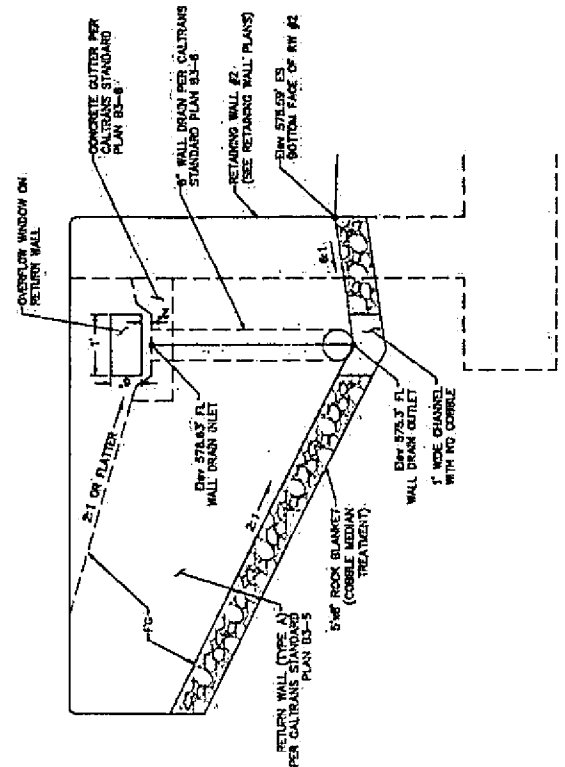
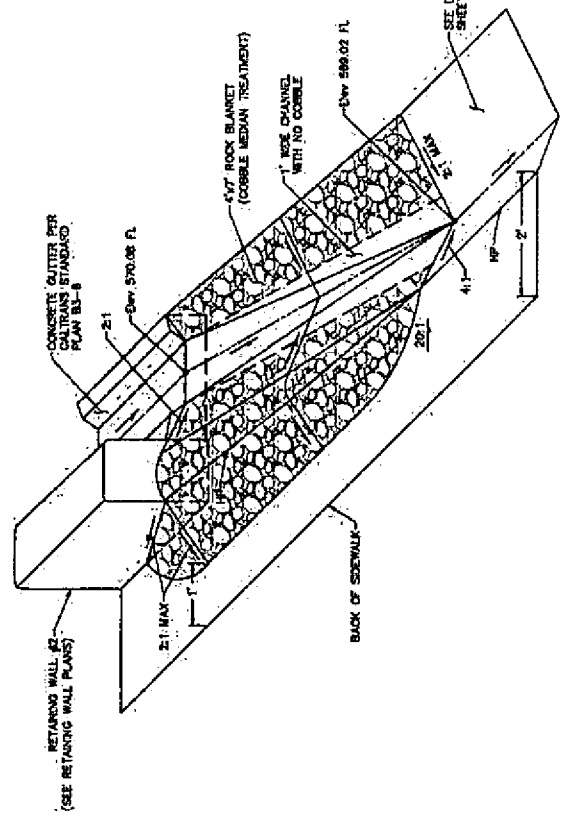
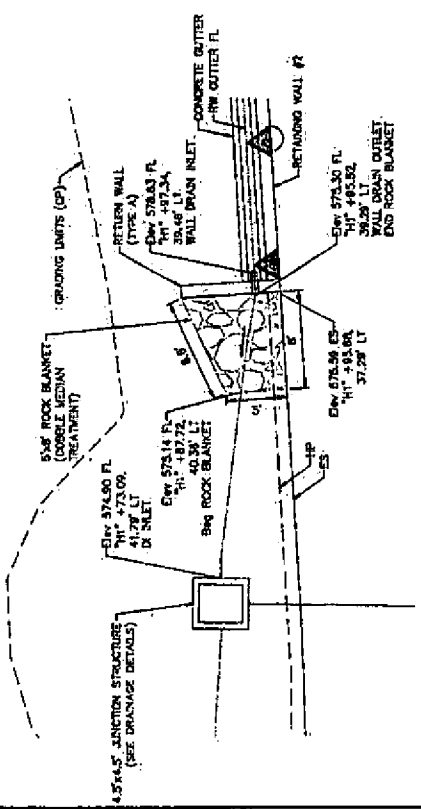
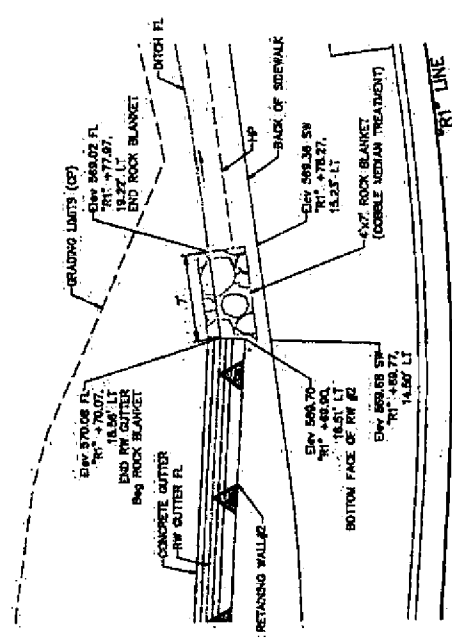
**DRAINAGE DETAILS**  
 SCALE 1"=5'10"

PROJECT NUMBER & PHASE: EFS 090000542  
 DD-68

Agreement #: Ag-5377 - Page 534 of 791

DATE	COUNTY	ROUTE	POST MILES	POST MILE	POST MILE
05	Mon	1: 88	75.1, 14.2	42	190

REGISTERED CIVIL ENGINEER  
DATE: 11/20/04  
PROJECT NO. 05377  
CITY OF MONTEREY  
943 RESERVE DR. #100  
ROOSEVELT, CA 95040

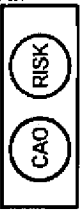


RETAINING WALL #2 EAST SECTION  
NO SCALE


RETAINING WALL #2 WEST SECTION  
NO SCALE

DRAINAGE DETAILS  
SCALE 1"=5'

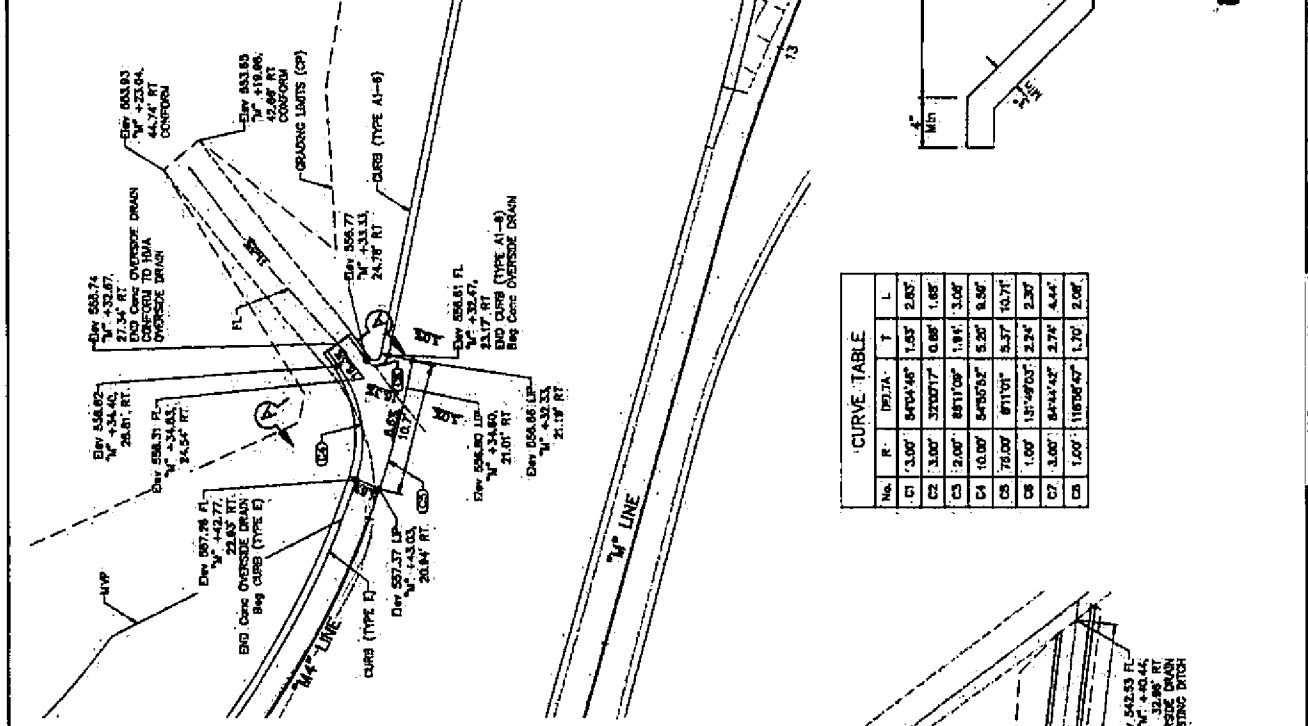
DD-7



DATE	05	COUNTY	Mon	ROUTE	1, 68	SHEET	43
APPROVAL DATE	11/20/13	REGISTERED CIVIL ENGINEER					

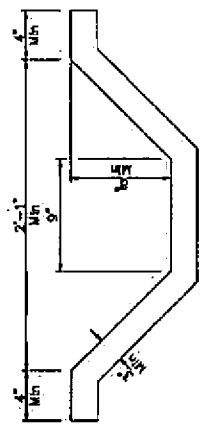
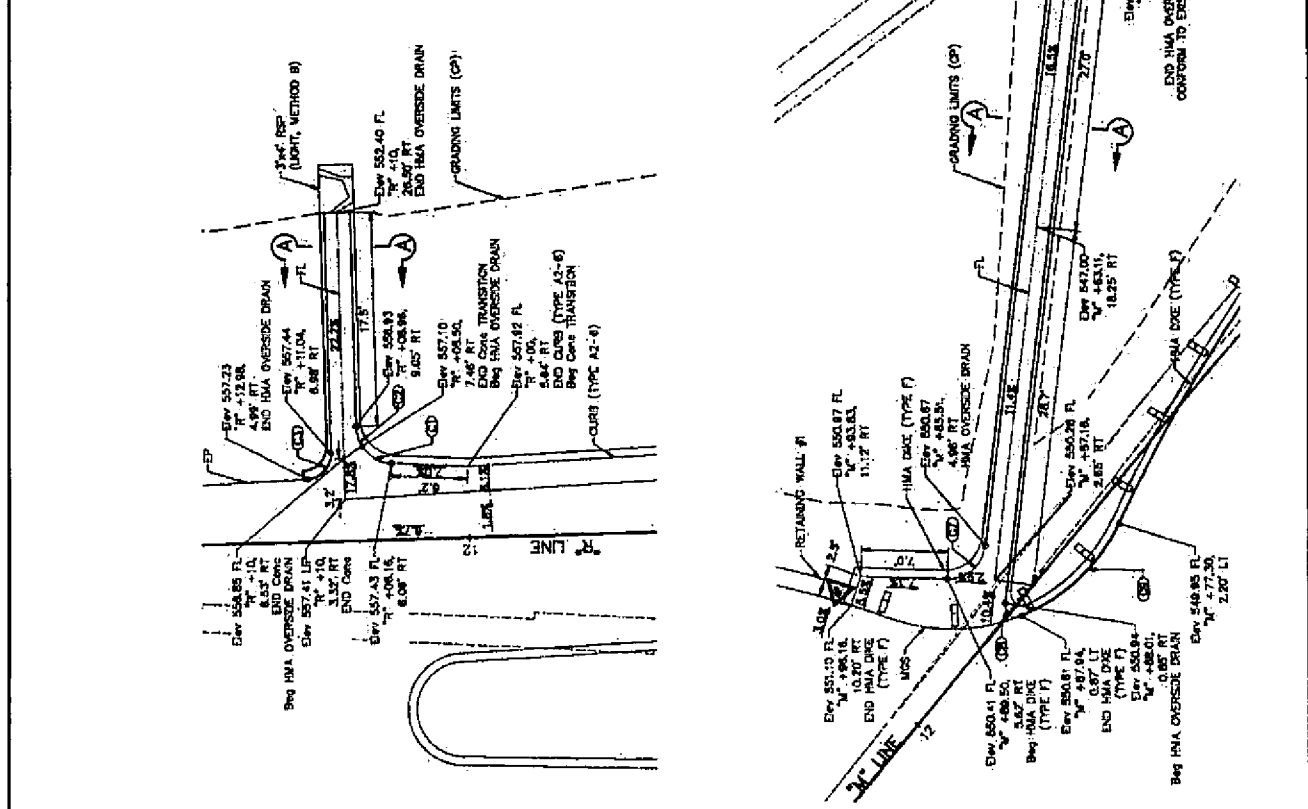


CITY OF MONTEREY  
 4100 PASCIFIC STREET  
 MONTEREY, CA 93940



CURVE TABLE

No.	R.	PICTA.	T	L
C1	3.00'	84°04'46"	1.85'	2.85'
C2	3.00'	37°00'17"	0.88'	1.88'
C3	2.00'	88°11'06"	1.81'	3.00'
C4	10.00'	84°50'53"	5.20'	9.50'
C5	70.00'	81°10'	3.37'	10.71'
C6	1.00'	15°49'03"	2.24'	2.30'
C7	3.00'	84°44'42"	2.78'	4.44'
C8	1.00'	116°58'57"	1.70'	2.06'



SECTION A-A  
NO SCALE

**DRAINAGE DETAILS**  
SCALE: 1"=5'

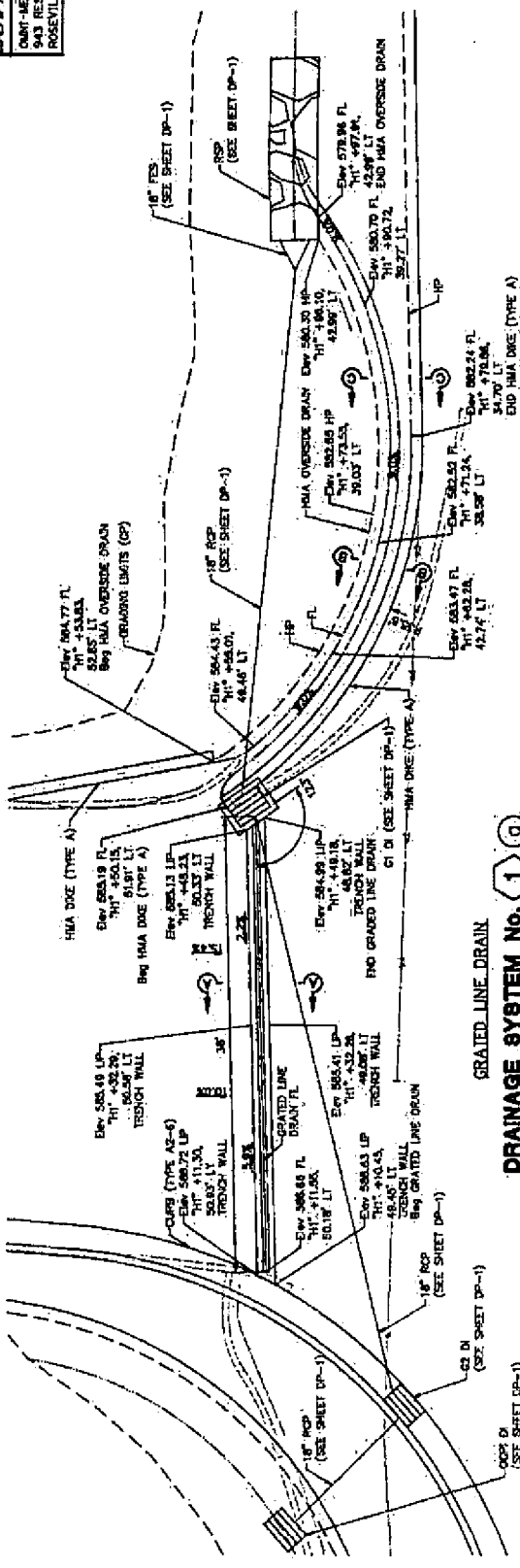
DESIGNED BY	RONALD C. BOYLE
CHECKED BY	
DATE REVISION	

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FRACTIONAL SUPERVISOR

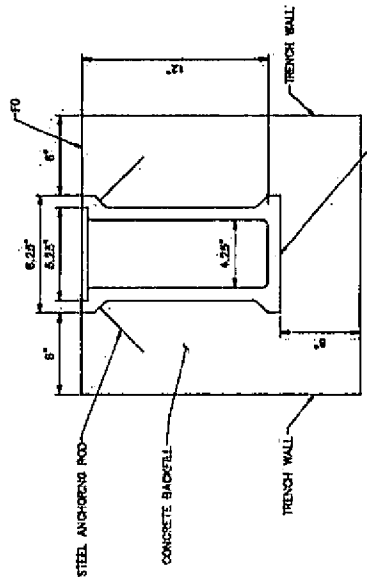


DATE	QUANTITY	REVISION	DATE	BY
05	1	88	75.1.14.2	44
190				

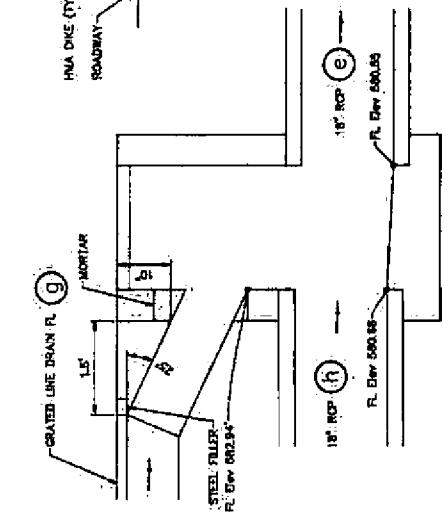
REGISTERED CIVIL ENGINEER  
DATE: 05/29/21  
CITY OF MONTEREY  
943 RESERVE DR., #100  
ROOSEVILLE, CA 95678



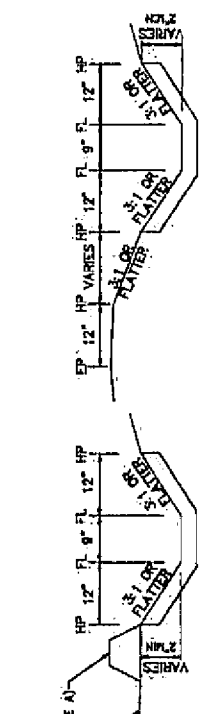
GRADED LINE DRAIN  
DRAINAGE SYSTEM No. 1



SECTION A-A  
GRADED LINE DRAIN  
NO SCALE



SECTION B-B  
HMA OVERSIDE DRAIN  
NO SCALE



SECTION C-C  
HMA OVERSIDE DRAIN  
NO SCALE

TYPE G1.D1  
DRAINAGE SYSTEM No. 1

DRAINAGE DETAILS  
SCALE 1\"/>

DD-9

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD C. BOYLE	CHECKED BY	DATE REVISION
	DESIGNED BY			
	REVISED BY			

ORDER LAST REVISED 7/2/2010

Agreement #: Ag-5377 - Page 537 of 791

PROJECT NUMBER & PHASE: ETS: 050000542

CAO RISK

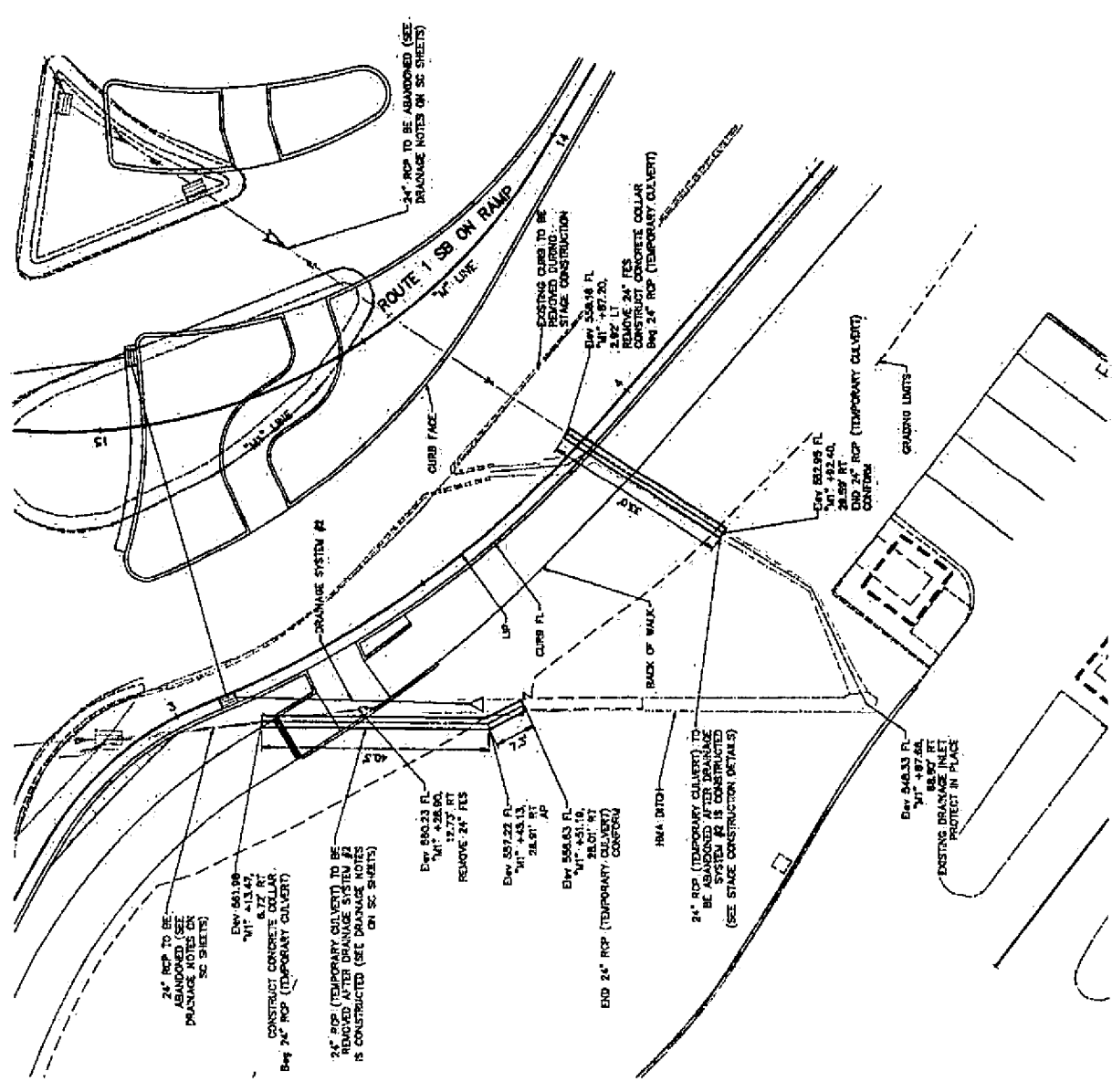
DATE	COUNTY	ROUTE	TOTAL PROJECT	SHEET NUMBER
05	Mon	1, 68	761, L.4.2	45, 190

REGISTERED CIVIL ENGINEER	DATE	PLANS APPROVAL DATE

CITY OF MONTEREY	4437
843 RESERVE DR.	4437/AT
ROSEVILLE, CA 95478	



- NOTES:**
1. SEE SHEET DD-1 FOR CONCRETE COLLAR DETAILS.
  2. ELEVATIONS SHOWN ON THIS SHEET ARE EXISTING. VERIFY ELEVATIONS IN FIELD.

**STAGE 1: TEMPORARY DRAINAGE FACILITIES  
DRAINAGE DETAILS**  
SCALE 1"=10'

DD-10



DATE	COUNTY	ROUTE	TOTAL SHEETS	SHEET NO.
05	Mon	1, 80	75.1, L4.2	47 190

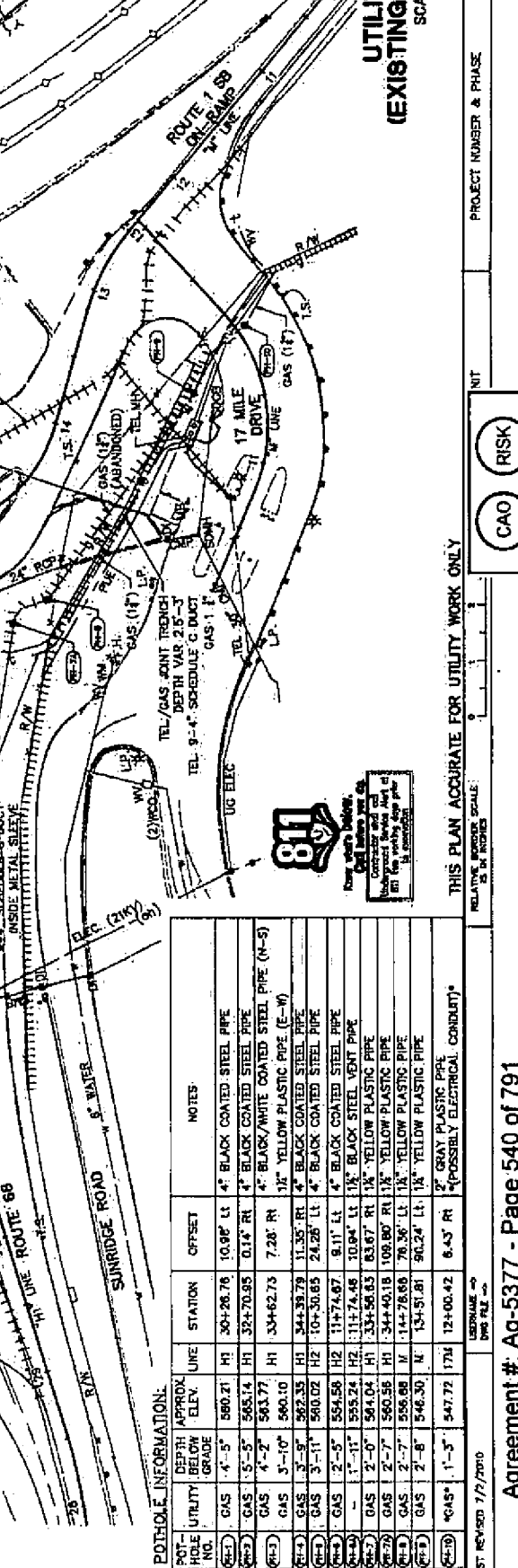
REGISTERED CIVIL ENGINEER  
 DATE: 4/28/77  
 CITY OF MONTEREY  
 3401 PACIFIC STREET  
 MONTEREY, CA 95018

**GENERAL NOTES: (ALL UTILITY SHEETS)**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- THESE UTILITY PLANS DEPICT EXISTING UTILITY LOCATIONS. ONLY AT BEGINNING OF CONSTRUCTION. ALL LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY EXACT LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION.
- SEE DRAINAGE SHEETS FOR PROPOSED STORM DRAIN INFORMATION.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND CONTACTING ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION.
- ALL VALVES AND MANHOLES WITHIN THE PROJECT LIMITS SHALL BE ADJUSTED TO GRADE AS NEEDED.
- UTILITY OWNERSHIP:  
 TELEPHONE: AT&T  
 ELECTRIC: P&G  
 WATER: CALIFORNIA AMERICAN WATER  
 STORM DRAIN: CITY OF MONTEREY  
 CABLE TV: COMCAST
- SEE ELECTRICAL PLANS FOR SIGNAL EQUIPMENT AND SIGNAL PULL BOX REMOVAL.

**ABBREVIATIONS**  
 CATV CABLE TELEVISION  
 CONC CONCRETE  
 COP CORRUGATED METAL PIPE  
 DRAMNULET  
 EP EDGE OF PAVEMENT  
 ELEC ELECTRICAL  
 FH FIRE HYDRANT  
 G GAS  
 KV KILOVOLT  
 LP LIGHT POLE  
 MH MANHOLE  
 OH OVERHEAD LINE  
 PROP PROPOSED  
 RCP REINFORCED CONCRETE PIPE  
 SD STORM DRAIN  
 SDOB STORM DRAIN CATCH BASIN  
 T TELEPHONE  
 T.S. TRAFFIC SIGNAL  
 UG UNDERGROUND  
 W WATER  
 WCO WATER OUT OFF VALVE  
 WM WATER MAIN  
 WY WATER VALVE

**LEGEND**  
 UTILITY POLE  
 DIRECTION OF FLOW  
 POT-HOLE LOCATION  
 UTILITY LINE  
 CABLE TV  
 ELECTRIC (OH)  
 GAS (ABANDONED)  
 STORM DRAIN  
 TELEPHONE (ABANDONED)  
 WATER



**POT-HOLE INFORMATION:**

POT-HOLE NO.	DEPTH UTILITY BELOW GRADE	LINE	STATION	OFFSET	NOTES
(E-1)	4'-5"	H1	301+26.76	10.98' L1	4" BLACK COATED STEEL PIPE
(E-2)	5'-5"	H1	321+70.95	0.14' R1	4" BLACK/WHITE COATED STEEL PIPE (N-S)
(E-3)	4'-2"	H1	334+62.73	7.28' R1	12" YELLOW COATED STEEL PIPE (E-W)
(E-4)	3'-9"	H1	344+39.79	11.35' R1	4" BLACK COATED STEEL PIPE
(E-5)	3'-11"	H2	107+30.65	24.28' L1	4" BLACK COATED STEEL PIPE
(E-6)	2'-5"	H2	114+74.67	8.11' L1	4" BLACK COATED STEEL PIPE
(E-7)	1'-11"	H2	114+74.65	10.94' L1	1 1/2" BLACK STEEL VENT PIPE
(E-8)	2'-0"	H1	334+58.83	63.67' R1	1 1/2" YELLOW PLASTIC PIPE
(E-9)	2'-7"	H1	344+40.18	108.80' R1	1 1/2" YELLOW PLASTIC PIPE
(E-10)	2'-7"	N	144+78.68	78.36' L1	1 1/2" YELLOW PLASTIC PIPE
(E-11)	2'-8"	N	134+51.81	90.24' L1	1 1/2" YELLOW PLASTIC PIPE
(E-12)	1'-5"	H1	124+06.42	6.43' R1	2" GRAY PLASTIC PIPE (POSSIBLY ELECTRICAL CONDUIT)

**UTILITY PLAN (EXISTING CONDITIONS)**  
 SCALE 1"=40'

PROJECT NUMBER & PHASE: ETS 0500000542  
 U-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 DESIGNED BY: RONALD O. BOYLE  
 CHECKED BY: [Signature]

811  
 Have each hole marked with a 4" x 4" x 1/2" metal plate with the number of the hole on it.

THIS PLAN ACCURATE FOR UTILITY WORK ONLY  
 RELATIVE HORIZONTAL SCALE: AS SHOWN  
 VERTICAL SCALE: AS SHOWN

DATE	COUNTRY	ROUTE	POST MILES	TOTAL SHEETS
05	Mon	1, 88	75.1 (4.2)	48 (190)

APPROVED FOR CONSTRUCTION	DATE
<i>[Signature]</i>	7/2/2020

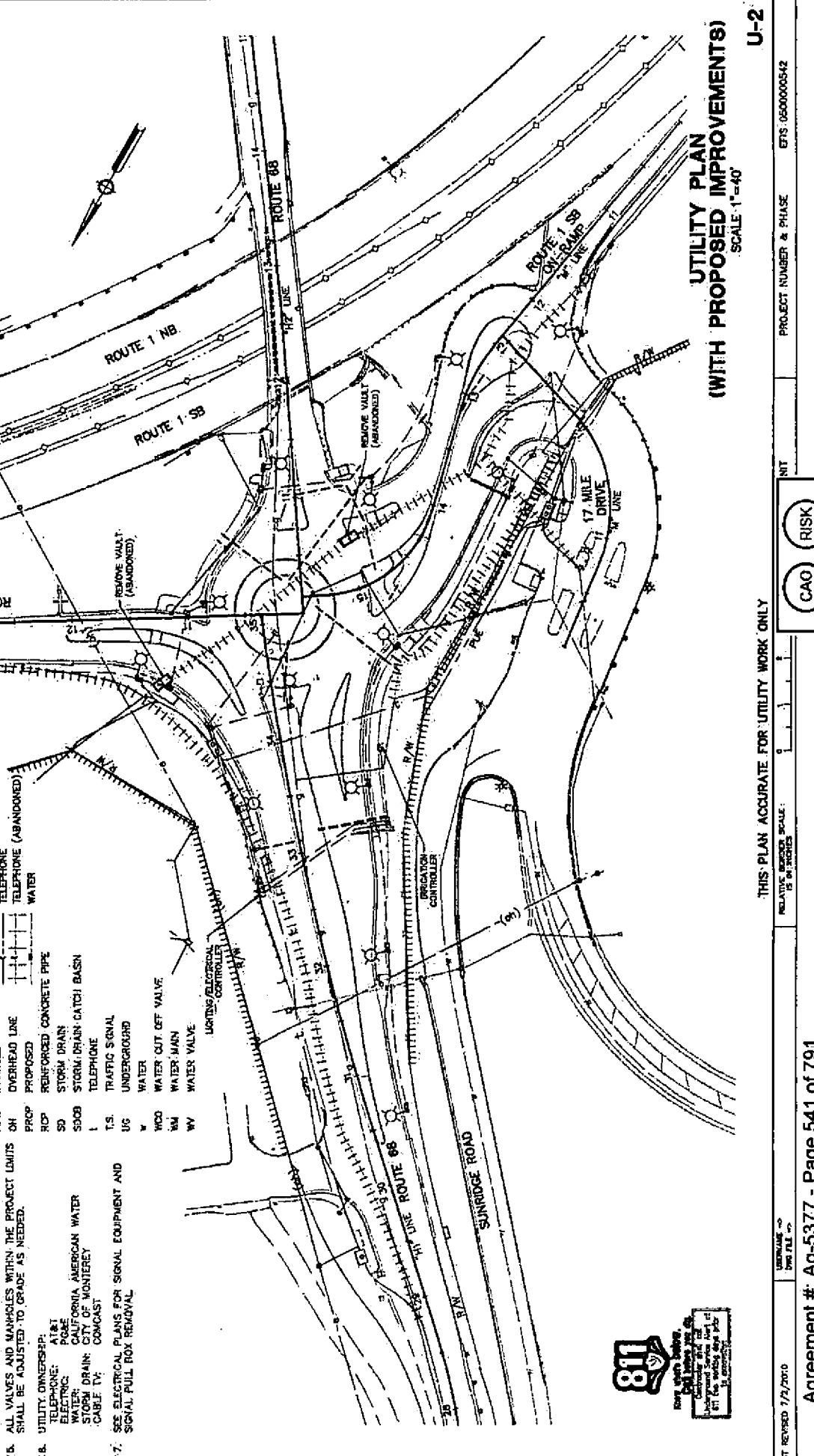
  

PLANS APPROVAL DATE	CITY OF MONTEREY
7/2/2020	340 PACIFIC STREET
FOR THE CITY OF MONTEREY	MONTEREY, CA 95060

REVISIONS	DATE	REVISIONS

CHECKED BY	RONALD G. BOYLE
DESIGNED BY	
CALCULATED BY	



**GENERAL NOTES: (ALL UTILITY SHEETS)**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- THESE UTILITY PLANS DEPICT UTILITY LOCATIONS AT BEGINNING OF CONSTRUCTION. ALL LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY EXACT LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION.
- SEE DRAINAGE SHEETS FOR PROPOSED STORM DRAIN INFORMATION.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND CONTRACTING ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION.
- ALL VALVES AND MANHOLES WITHIN THE PROJECT LIMITS SHALL BE ADJUSTED TO GRADE AS NEEDED.
- UTILITY OWNERS:
  - TELEPHONE: P&T
  - ELECTRIC: PG&E
  - WATER: CALIFORNIA AMERICAN WATER
  - STORM DRAIN: CITY OF MONTEREY
  - CABLE TV: COMCAST
- SEE ELECTRICAL PLANS FOR SIGNAL EQUIPMENT AND SIGNAL PULL BOX REMOVAL.

**ABBREVIATIONS**

CATV CABLE TELEVISION  
 CONC CONCRETE  
 CMP CORRUGATED METAL PIPE  
 DI DRAIN INLET  
 EP EDGE OF PAVEMENT  
 ELEC ELECTRICAL  
 F.H. FIRE HYDRANT  
 G GAS  
 KV KILOVOLT  
 L.P. LOW POINT  
 M.H. MANHOLE  
 OH OVERHEAD LINE  
 PROP PROPOSED  
 RCP REINFORCED CONCRETE PIPE  
 SD STORM DRAIN  
 SDOB STORM DRAIN CATCH BASIN  
 T TELEPHONE  
 T.S. TRAFFIC SIGNAL  
 UC UNDERGROUND  
 W WATER  
 WCO WATER CUT OFF VALVE  
 WM WATER MAIN  
 WV WATER VALVE

**LEGEND**

PROPOSED STORM DRAIN  
 PROPOSED CONDUIT/IRRIGATION CROSSOVER (SEE LAYOUT PLANS)  
 PROPOSED CONDUIT (SEE ELECTRICAL PLANS)  
 UTILITY POLE  
 DIRECTION OF FLOW

**LINE UTILITY**

only  
 CABLE TV  
 ELECTRIC (OH)  
 GAS (ABANDONED)  
 STORM DRAIN  
 TELEPHONE (ABANDONED)  
 WATER

**UTILITY PLAN (WITH PROPOSED IMPROVEMENTS)**  
 SCALE: 1"=40'

THIS PLAN ACCURATE FOR UTILITY WORK ONLY

RELATIVE NUMBER SCALE: 1"=10' HORIZONTAL

PROJECT NUMBER & PHASE: ETS 0500000542

U-2

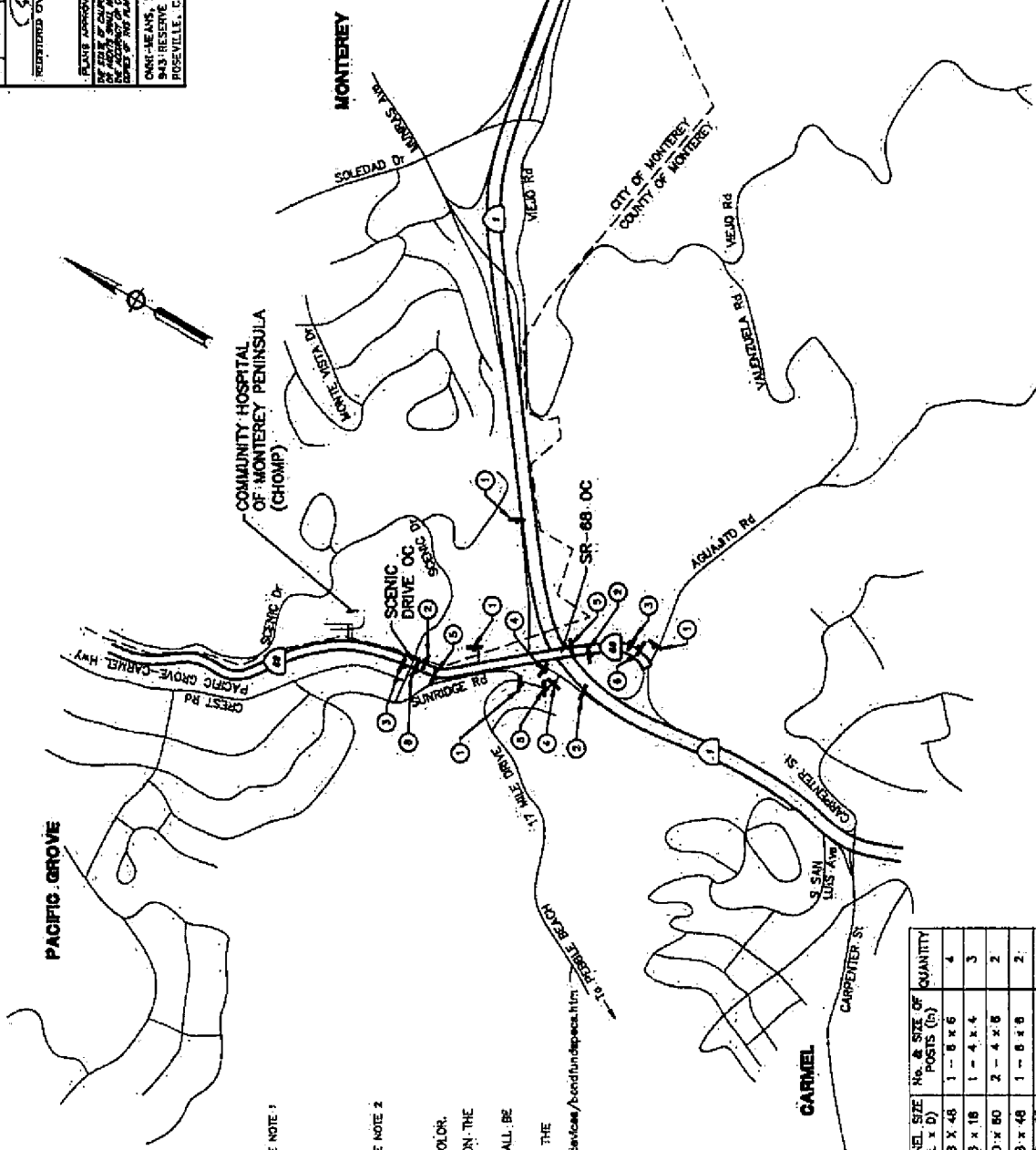
CAO RISK

Agreement #: Ag-5377 - Page 541 of 791

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 CHECKED BY: RONALD G. BOYLE  
 DATE REVISION: 7/2/2020

NO.	COUNTY	ROUTE	POST MILES	POST MILES	POST MILES
08	Mon	1, 68	75.1	14.2	49 190

REGISTERED CIVIL ENGINEER  
 DATE: 12/15/11  
 PLAN APPROVAL DATE: 12/15/11  
 CITY OF MONTEREY  
 540 PACIFIC STREET  
 MONTEREY, CA 93940



**NOTES:**

- THIS PLAN IS ACCURATE FOR CONSTRUCTION AREA SIGN WORK ONLY.
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- SIGN LOCATIONS ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER.
- FOR ADDITIONAL CONSTRUCTION AREA SIGNS SEE DETOUR PLAN.

**LEGEND:**

- CONSTRUCTION AREA SIGN
- CONSTRUCTION AREA SIGN No.

**PROJECT FUNDING SIGN**

STATE TRANSPORTATION BOARD FUNDS AT WORK

CITY LOGO

CALTRANS LOGO

HOLMAN HIGHWAY ROUTE 68 ROUNDABOUT PROJECT

YEAR OF COMPLETION: 2025

SLOW FOR THE COME HOME

- CITY LOGO SHALL BE PAINTED WITH THE APPROPRIATE COLOR.
- THE YEAR OF COMPLETION OF PROJECT CONSTRUCTION ON THE OVERLAY IS SPECIFIED IN THE SPECIAL PROVISIONS.
- EXCEPT AS OTHERWISE SHOWN, THE LEGEND OF SIGN SHALL BE SLACK ON A WHITE BACKGROUND.
- USE TYPE 1 SIGN. DETAILS AND DIMENSIONS WILL BE ON THE CALTRANS HO TRAFFIC OPERATIONS WEBSITE: <http://www.dot.ca.gov/hq/traffic/engtrng/control-database/condfontspec.htm>

SIGN No.	SIGN CODE	SIGN MESSAGE	PANEL SIZE (L x D)	No. & SIZE OF POSTS (h)	QUANTITY
1	W20-1	ROAD WORK AHEAD	48 x 48	1 - 8 x 6	4
2	G20-2	END ROAD WORK	36 x 18	1 - 4 x 4	3
3	W20-1	ROAD WORK AHEAD	60 x 60	2 - 4 x 6	2
4	C44	TRUCKS ENTERING/EXITING	48 x 48	1 - 8 x 8	2
5	W11-1	BICYCLE (SHARE)	36 x 36	1 - 4 x 6	3
6	W16-1P	SHARE THE ROAD	18 x 24	1 - 4 x 6	3
7	PFS	PROJECT FUNDING SIGN	132 x 102	2 - 6 x 6	2
<b>TOTAL</b>					<b>18</b>

**CONSTRUCTION AREA SIGNS**  
 SCALE 1"=500'

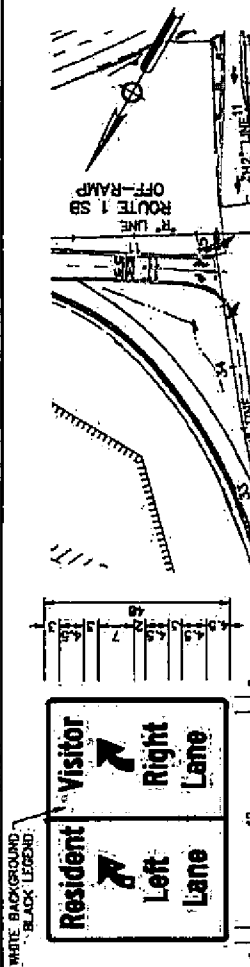
C8-1

DATE	ROUTE	POST MILEAGE	POST MILEAGE
05	Mon	1.58	75.1, 1.4, 2.1, 50, 180

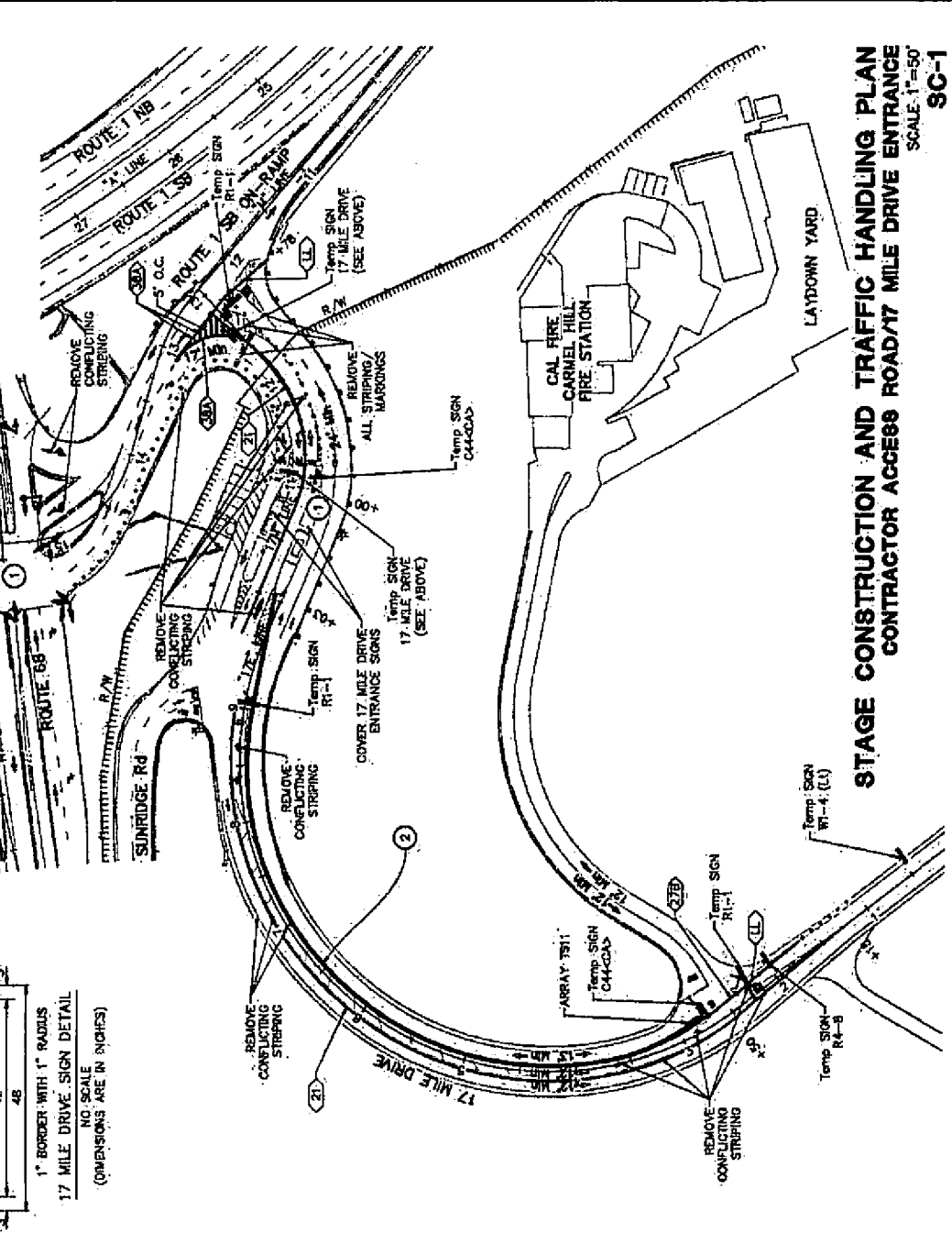
REGISTERED CIVIL ENGINEER  
 STATE OF CALIFORNIA  
 CIVIL ENGINEER  
 NO. 48747  
 EXPIRES 12/31/2012

PLANS APPROVAL DATE: 05/11/2010

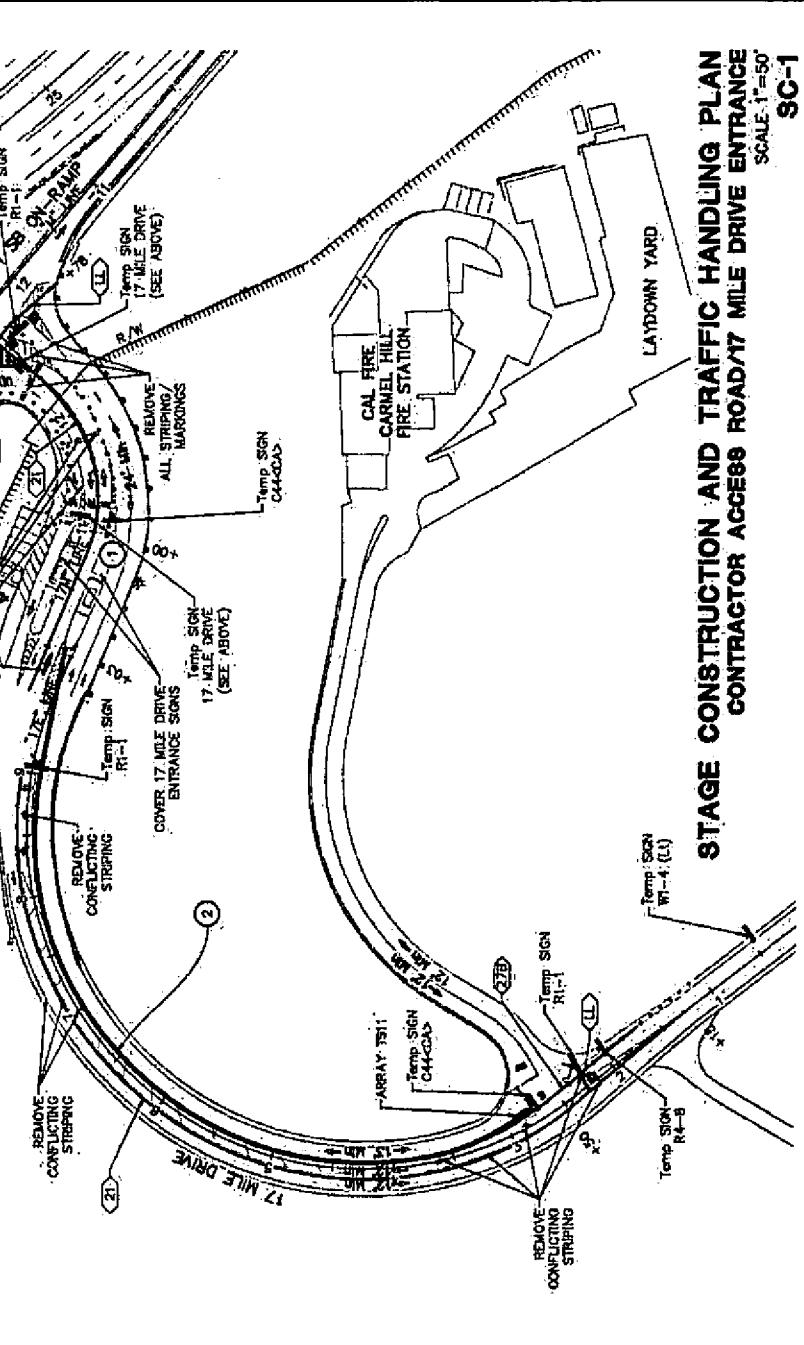
CITY OF MONTEREY  
 540 PACIFIC STREET  
 MONTEREY, CA 95678



- NOTES (ALL STAGE CONSTRUCTION SHEETS):**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - CONTRACTOR TO MAINTAIN DRIVEWAY ACCESS DURING CONSTRUCTION.
  - REMOVE ALL CONFLICTING SIGNING AND STRIPING PRIOR TO TEMPORARY DELINEATION.
  - ALL TEMPORARY RAIBRIS (TYPE K) SHALL BE STAKED PER CALTRANS SIG T38. CONTRACTORS SHALL PRESERVE A 10' WIDE PAVED LANE DURING CLOSURES TO ACCOMMODATE EMERGENCY TRANSPORT VEHICLES.
  - USE COLD MIX TRANSITIONS AT PAVEMENT JOINTS TO TRANSITION BETWEEN NEW AND OLD.
  - PROTECT EXISTING SIGNAL BOXES USING TRENCH PLATES WHEN INSIDE. TEMPORARY TRAVELED WAY (EXISTING SIGNALS REMOVED AFTER STAGE 3).
  - INSTALL ROADSIDE SIGNS PER SIGN PLAN WHERE CONSTRUCTION OCCURS. COVER THE SIGN PANELS WITH BLACK PLASTIC COVER UNTIL APPLICABLE TO TRAFFIC MOVEMENTS OR AS DIRECTED BY THE ENGINEER.
  - CURB RAMPS SHALL BE ADA COMPLIANT THROUGHOUT CONSTRUCTION. SEE PEDESTRIAN RAMP DETAIL FOR PAVEMENT TRANSITIONS AT PEDESTRIAN RAMPS.
  - SPECIFIC WORK CALLED OUT ON STAGE CONSTRUCTION SHEETS (SEEDED NOTES) ARE INTENDED TO ASSIST THE CONTRACTOR IN DETERMINING THE ADDITIONAL WORK REQUIRED DURING THIS STAGE AND IS NOT A COMPREHENSIVE LIST OF ALL WORK THAT IS REQUIRED OR MAY BE COMPLETED DURING SAID STAGE.



- KEYED NOTES (THIS SHEET ONLY):**
- EXISTING SIGNAL AND LANE OPERATIONS MAINTAINED. MODIFY 17 MILE DRIVE ENTRANCE DELINEATION.
  - PREPARE CONTRACTOR ACCESS ROAD TO THE FIRE STATION LAYDOWN YARD.
- ABBREVIATIONS:**  
 O.C. ON CENTER



- LEGEND (ALL STAGE CONSTRUCTION SHEETS):**
- CONSTRUCT THIS STAGE
  - DIRECTION OF TRAFFIC
  - TEMPORARY TRAFFIC STRIPE (PAINT)
  - CHANGE IN TEMPORARY STRIPE DETAIL
  - TEMPORARY 12" LIMIT LINE/CROSSWALK (PAINT)
  - TEMPORARY TYPE IV PAVEMENT MARKINGS (PAINT)
  - TEMPORARY TYPE VI PAVEMENT MARKINGS (PAINT)
  - TEMPORARY TYPE I (18") PAVEMENT MARKING (PAINT)
  - TEMPORARY "YIELD" PAVEMENT MARKING (PAINT)
  - TEMPORARY "STOP" PAVEMENT MARKING (PAINT)
  - TEMPORARY "RESIDENT" PAVEMENT MARKING (PAINT) SEE PD-1
  - TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) SEE PD-1
  - CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.
  - TEMPORARY RAIBRIS (TYPE K)
  - TEMPORARY CRASH CUSHION (ARRAY I-11)
  - TEMPORARY CRASH CUSHION (ABSORB 360)
  - TYPE III BARRICADE
  - TRAFFIC CONE PLACED 10' O.C.
  - TEMPORARY PORTABLE STOP SIGN (RT-1) LOCATION
  - TEMPORARY ROADSIDE SIGN LOCATION

**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**CONTRACTOR ACCESS ROAD/17 MILE DRIVE ENTRANCE**  
 SCALE: 1"=50'  
**SC-1**

DATE	1. 68	PROJECT NO.	761-142	SHEET NO.	51	TOTAL SHEETS	190
COUNTY	Mon	DATE	761-142	DATE	51	DATE	190
<p style="text-align: center;"> </p>							
<p>                 REGISTERED CIVIL ENGINEER                  RAYMOND J. BOYLE                  14572                  CIVIL ENGINEERING                  STATE OF CALIFORNIA             </p>							
<p>                 ENGINE TERMINAL DATE:                  DATE OF EXPIRATION OF LICENSE:                  DATE OF EXPIRATION OF LICENSE:                  DATE OF EXPIRATION OF LICENSE:                  DATE OF EXPIRATION OF LICENSE:             </p>							
<p>                 CITY OF MONTEREY                  943 RESERVE DR., #100                  MONTEREY, CA 95030             </p>							

**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SC-1.

**REMOVED NOTES (THIS SHEET ONLY):**

- EXISTING SIGNAL AND LANE OPERATIONS MAINTAINED, EXCEPT 17 MILE DRIVE ENTRANCE/EXIT (SEE SC-1 FOR DETAILS).
- CONSTRUCTION: RETAINING WALL, GUTTER, SIDEWALK, DRAINAGE, ROADWAY BASE MATERIAL, AND PAVING (12" MP) EXCLUDING FINAL LIFT. SEE SC-3 FOR STAGE 1 NIGHT WORK.

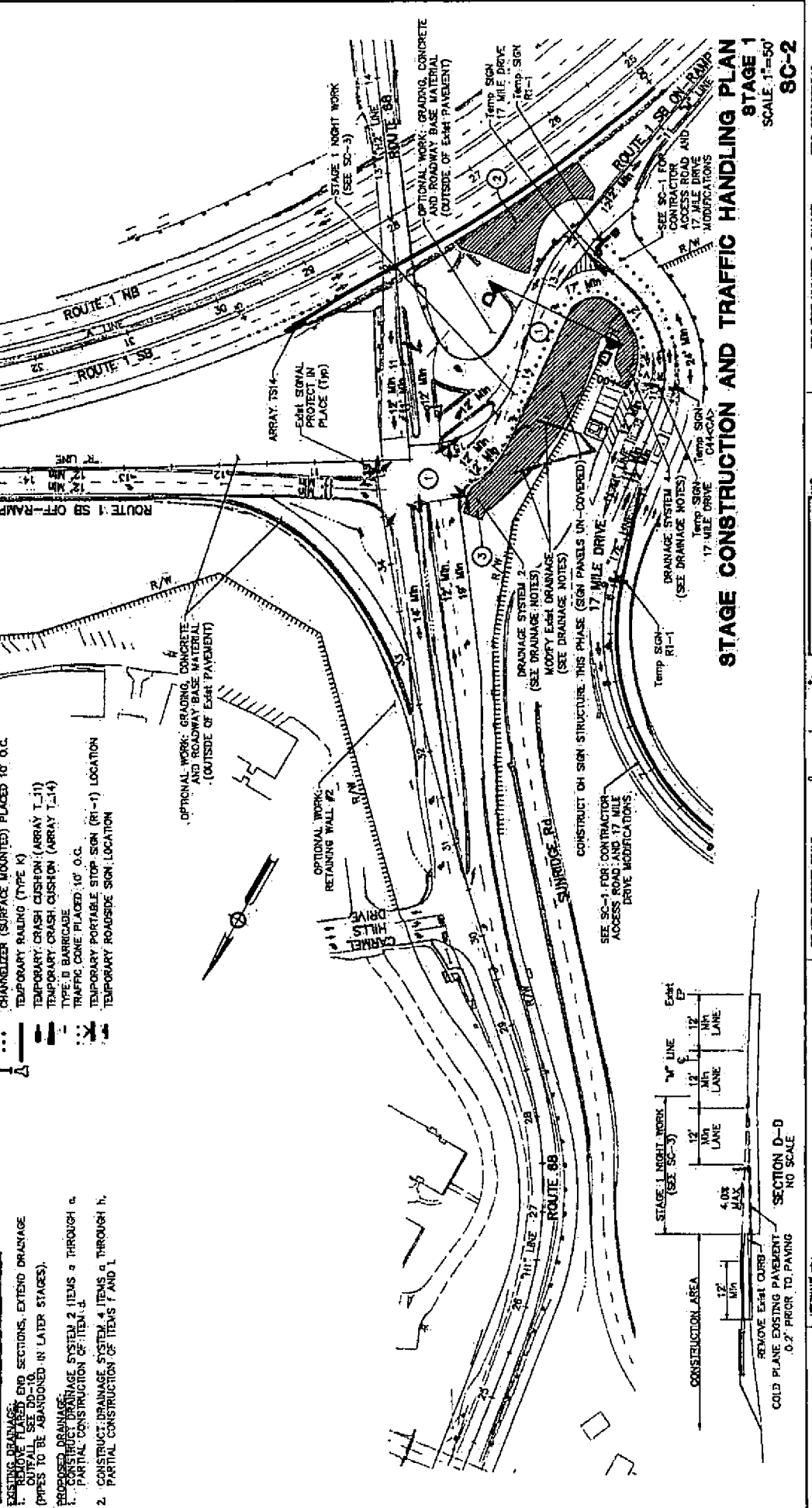
**DRAINAGE NOTES (THIS SHEET ONLY):**

EXISTING DRAINAGE: END SECTIONS, EXTEND DRAINAGE TO EXISTING PAVED DRIVEWAYS (NOTES TO BE ABANDONED IN LATER STAGES).

PROPOSED DRAINAGE:

- CONSTRUCT DRAINAGE SYSTEM 2 ITEMS a THROUGH g.
- PARTIAL CONSTRUCTION OF ITEM d.
- CONSTRUCT DRAINAGE SYSTEM 4 ITEMS a THROUGH h.
- PARTIAL CONSTRUCTION OF ITEMS f AND 1.

DESIGNED BY	DATE REVISED
DESIGNED BY	DATE REVISED
DESIGNED BY	DATE REVISED
DESIGNED BY	DATE REVISED
DESIGNED BY	DATE REVISED
DESIGNED BY	DATE REVISED



CHECKED BY	DATE REVISED
CHECKED BY	DATE REVISED
CHECKED BY	DATE REVISED
CHECKED BY	DATE REVISED
CHECKED BY	DATE REVISED
CHECKED BY	DATE REVISED

**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 1**  
 SCALE: 1"=50'  
**8C-2**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONSULTANT FUNCTIONAL SUPERVISOR

DESIGNED BY

ROMALD G. BOYLE

PROJECT NUMBER & PHASE

NT

PROJECT NUMBER & PHASE

NT

CAO

RISK

ROBERT LAST REVISED 7/7/2010

UPGRADE TO

NO SCALE

SECTION D-D

NO SCALE

Agreement #: Ag-5377 - Page 544 of 791



DATE	NO.	REVISED BY	DATE	NO.	REVISED BY
08	1	1.65	75.4.14.2	52	190

COUNTY: MONTEPELIER  
 DISTRICT: 1  
 PROJECT: 545 OF 791  
 SHEET: 52 OF 190

APPROVED: [Signature]  
 DATE: 1/20/75  
 TITLE: CIVIL ENGINEER

CITY OF MONTEPELIER  
 545 OF 791 PROJECT  
 843 RESERVE DR. #100  
 ROSEVILLE, CA 95678

**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SC-1.

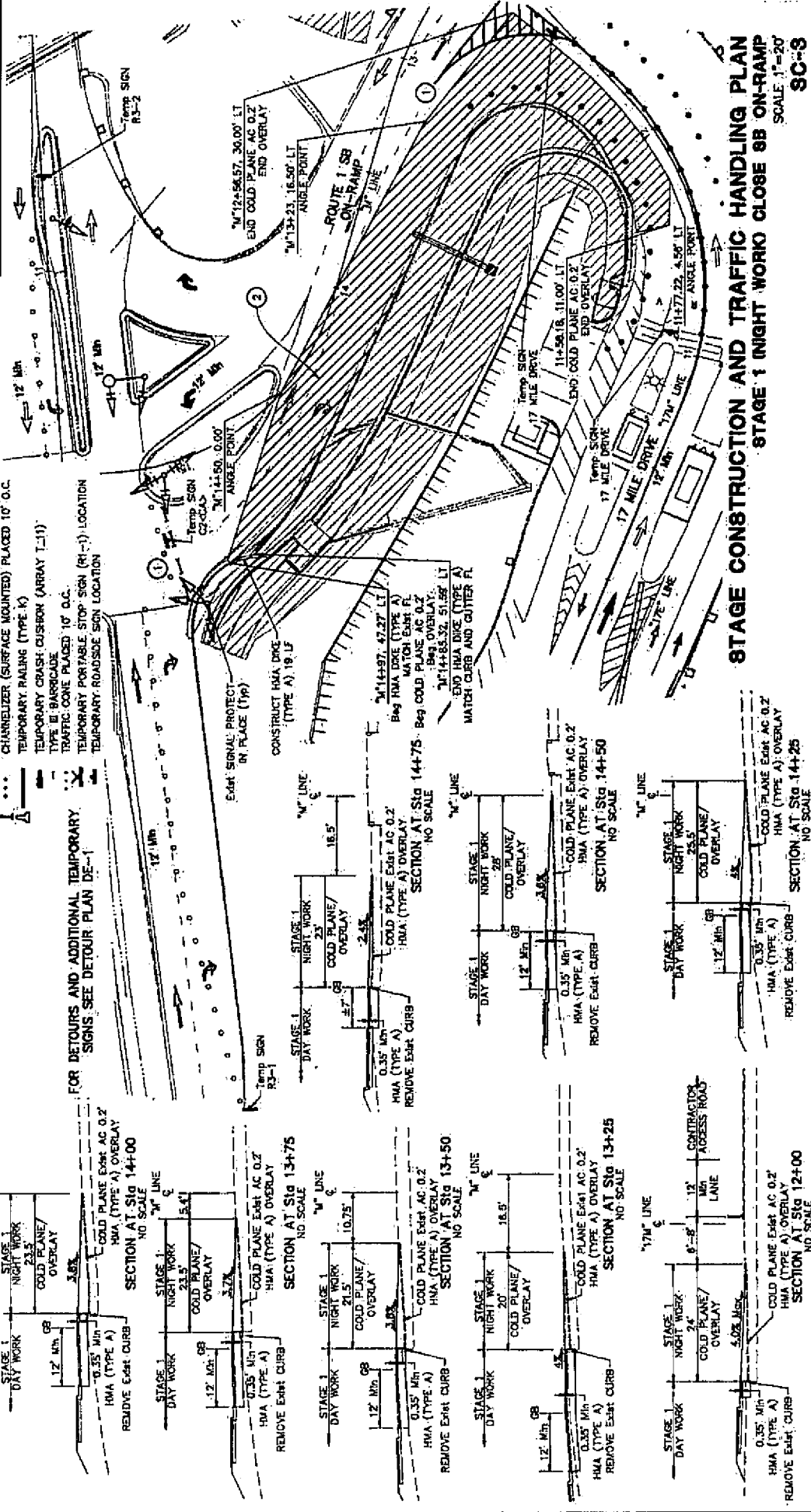
**KEYED NOTES (THIS SHEET ONLY):**

- CLOSE SB ON-RAMP AND 17 MILE DRIVE ENTRANCE.
- STAGE 1 (NIGHT WORK) CONSTRUCTION: COLD PLANE 0.2, PAVING PROVIDE 4% MAX CROSS SLOPE IN TRAVELED WAY.

**LEGEND:**

- CONSTRUCT THIS STAGE
- DIRECTION OF TRAFFIC
- TEMPORARY TRAFFIC STRIPE (PAINT)
- CHANGE IN TEMPORARY STRIPE DETAIL
- TEMPORARY 12" LIMB LINE/CROSSWALK (PAINT)
- TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)
- TEMPORARY TYPE I (16") PAVEMENT MARKING (PAINT)
- TEMPORARY "STOP" PAVEMENT MARKING (PAINT)
- TEMPORARY "RESIDENT" PAVEMENT MARKING (PAINT)
- TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) (SEE PD-1)
- TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) (SEE PD-1)
- CHANNELIZER (SURFACE MOUNTED) PLACED 10" O.C.
- TEMPORARY RAILING (TYPE K)
- TEMPORARY CRASH CUSHION (ARRAY T-11)
- TYPE III BARRICADE
- TRAFFIC CONE PLACED 10' O.C.
- TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION
- TEMPORARY ROADSIDE SIGN LOCATION

**FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS: SEE DETOUR PLAN DE-1**



**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 1 NIGHT WORK CLOSE SB ON-RAMP**  
 SCALE: 1"=20'  
**SC-3**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT/FUNCTIONAL SUPERVISOR: RONALD G. BOWLE  
 CHECKED BY: [Signature]  
 DATE: 1/20/75

PROJECT NUMBER & PHASE: 545 OF 791  
 DRAWING NO.: 52 OF 190

BINDER LAST REVISED: 7/2/2010

CAO RISK

DATE	06	COUNTY	Mon	ROUTE	1, 68	POST MILE	76.1, 14.2	SHEET NO.	33	TOTAL SHEETS	150
REGISTERED CIVIL ENGINEER											
PLANS APPROVAL DATE	11/11/06 CITY OF MONTEREY 540 PACIFIC STREET MONTEREY, CA 93940										

**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SC-1.
- CONTACT CALTRANS TRAFFIC ELECTRICAL OPERATIONS (805-549-3048) ONE WEEK PRIOR TO WB BRIDGE CLOSURE.

**KEYED NOTES (THIS SHEET ONLY):**

- CLOSE WB ROUTE 68 NB TRAFFIC RIGHT-TURN ONLY.
- CONSTRUCTION: REMOVE EXISTING MEDIAN, PLACE ROADWAY BASE, MATERIAL, AND PAVING EXCLUDING FINAL LFT. SEE SO-5 FOR STAGE 2 NIGHT WORK.

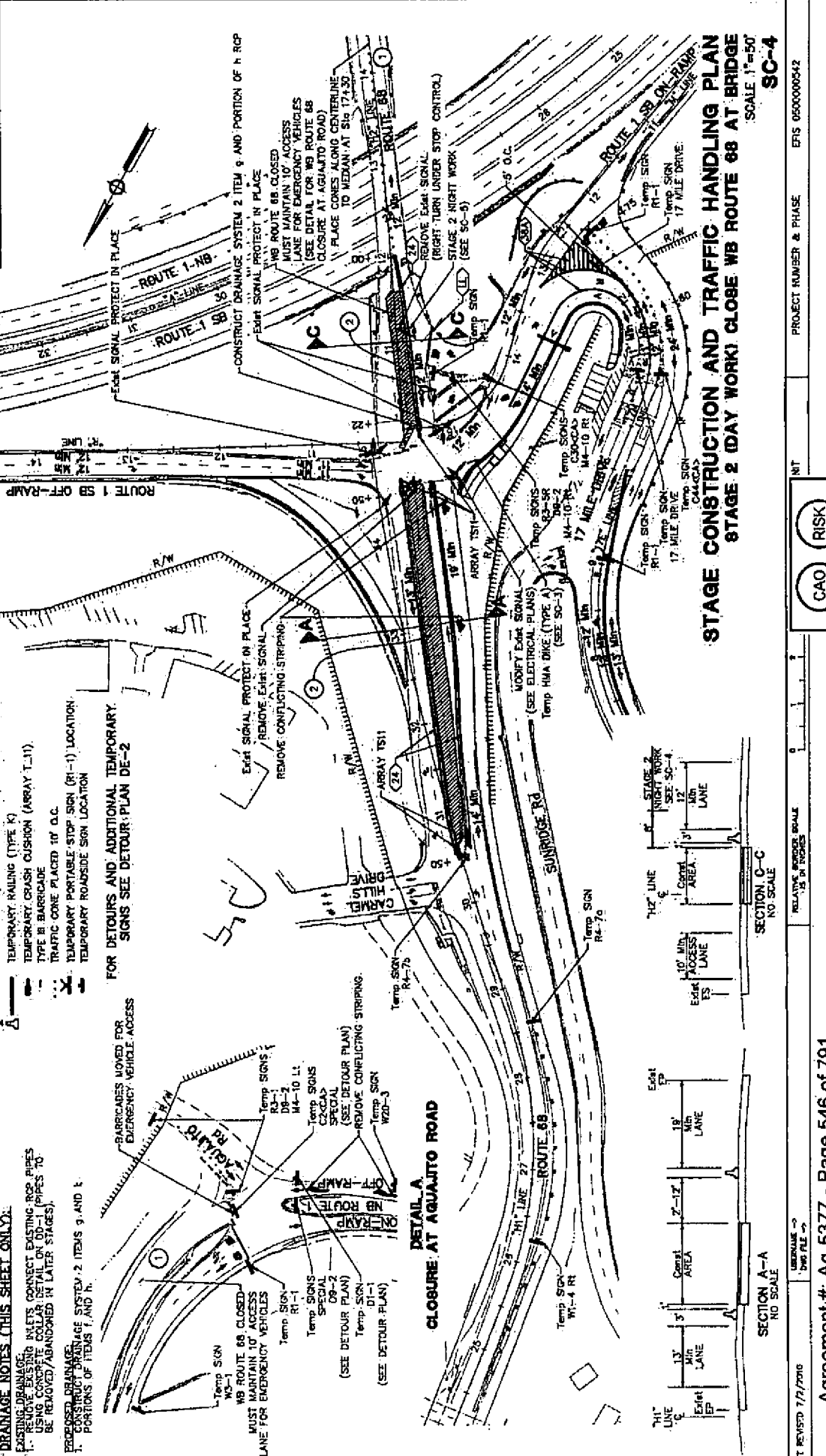
**DRAINAGE NOTES (THIS SHEET ONLY):**

- EXHIBIT DRAINAGE SYSTEM 2 ITEMS 9, AND 1. USING CONCRETE COLLAR DETAIL ON D1-1 (PILES TO BE REMOVED/ABANDONED IN LATER STAGES).
- PORTIONS OF ITEMS 9, AND 1.

**LEGEND:**

- CONSTRUCT THIS STAGE
- DIRECTION OF TRAFFIC
- TEMPORARY TRAFFIC STRIPE (PAINT)
- TEMPORARY 12" LIMIT LINE/CROSSWALK (PAINT)
- TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)
- TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)
- TEMPORARY "STOP" PAVEMENT MARKING (PAINT)
- TEMPORARY "VISION" PAVEMENT MARKING (PAINT) SEE PD-1
- TEMPORARY "MUSTON" PAVEMENT MARKING (PAINT) SEE PD-1
- CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.
- TEMPORARY RAILING (TYPE K)
- TEMPORARY CRASH CUSHION (ARRAY T-11)
- TYPE B BARRICADE
- TRAFFIC CONE PLACED 10' O.C.
- TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION.
- TEMPORARY ROADSIDE SIGN LOCATION

**FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS SEE DETOUR PLAN DE-2**



**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 2 (DAY WORK) CLOSE WB ROUTE 68 AT BRIDGE**  
 SCALE 1"=50'

SC-4

PROJECT NO.	17824
DATE	9/12/00
DESIGNED BY	CAO
CHECKED BY	BOYLE
DATE REVISION	
REVISION	

REGISTERED CIVIL ENGINEER  
 STATE OF CALIFORNIA  
 NO. 44887  
 EXPIRES 12/31/07

CITY OF MONTEREY  
 943 RESERVE DR., #100  
 MONTEREY, CA 95678

**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERS AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SC-1.
- CONTACT CALTRANS TRAFFIC ELECTRICAL OPERATIONS (805-549-3048) ONE WEEK PRIOR TO NB BRIDGE CLOSURE.

**KEYED NOTES (THIS SHEET ONLY):**

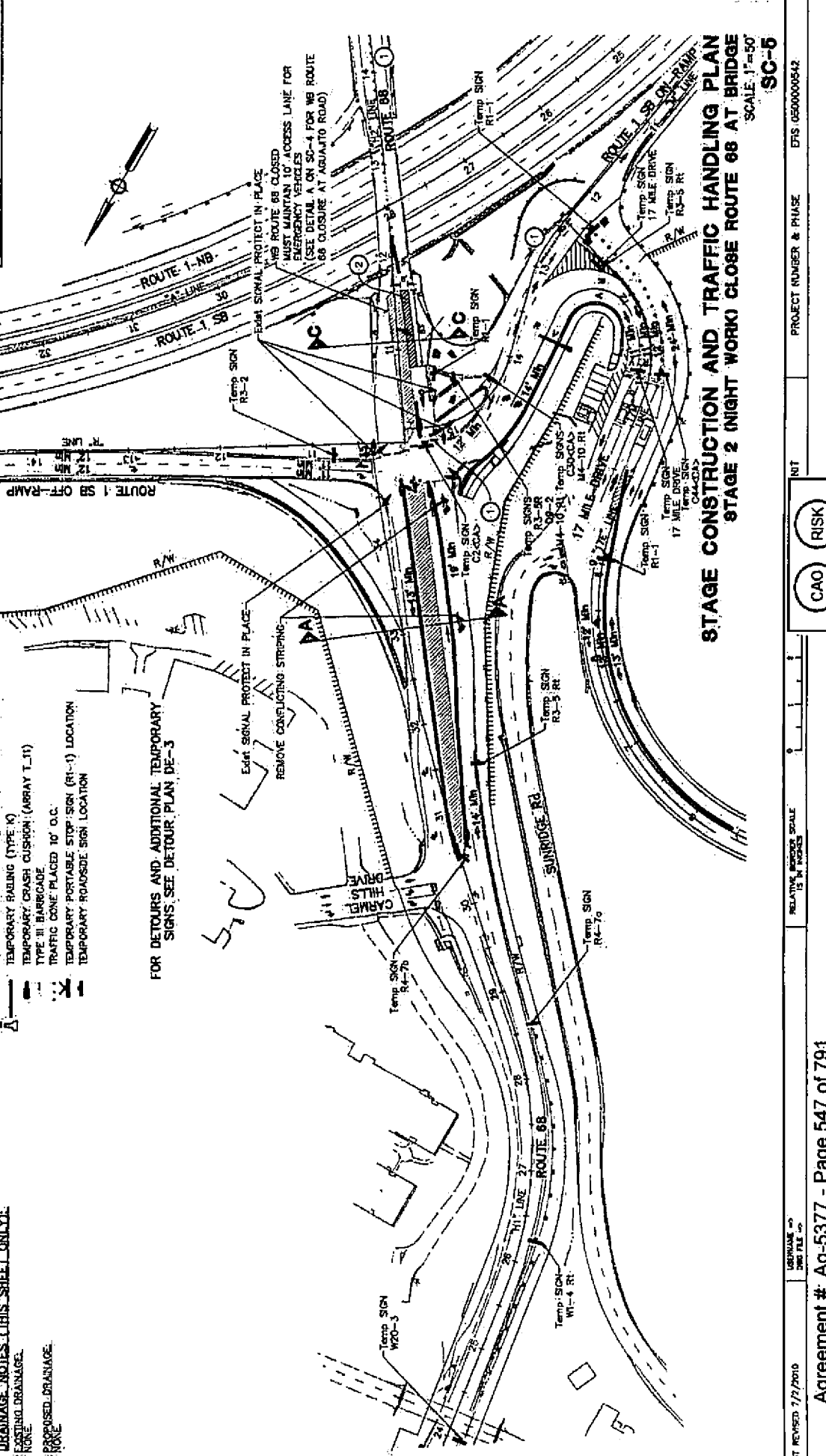
- CLOSE WB AND EB ROUTE 68.
- CONSTRUCTION, EXCAVATION, PLACE ROADWAY BASE MATERIAL, AND PAVING EXCLUDING FINAL LEFT.

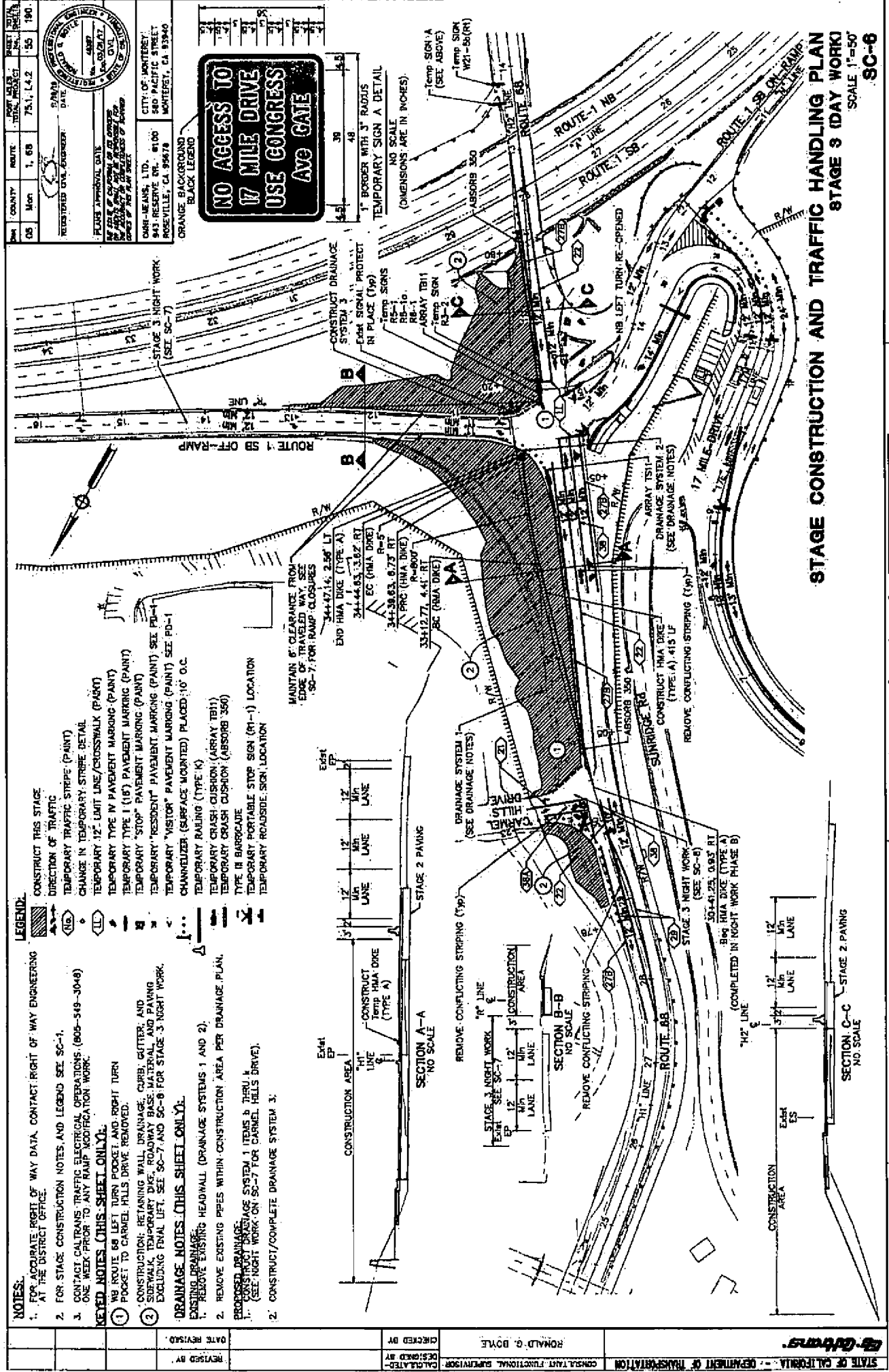
**DRAINAGE NOTES (THIS SHEET ONLY):**

- EXISTING DRAINAGE: NONE
- PROPOSED DRAINAGE: NONE

**LEGEND:**

- CONSTRUCT THIS STAGE
- DIRECTION OF TRAFFIC
- TEMPORARY TRAFFIC STROBE (PAINT)
- TEMPORARY 12" LIMIT LINE / CROSSWALK (PAINT)
- TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)
- TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)
- TEMPORARY STOP PAVEMENT MARKING (PAINT)
- TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) SEE PD-1
- TEMPORARY "RESIDENT" PAVEMENT MARKING (PAINT) SEE PD-1
- CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.
- TEMPORARY RAILING (TYPE X)
- TEMPORARY CRASH CUSHION (ARRAY T-1)
- TYPE III BARRIAGE
- TRAFFIC CONE PLACED 10' O.C.
- TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION
- TEMPORARY ROADSIDE SIGN LOCATION





**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES, AND LEGEND SEE SC-1.
- CONTACT CALTRANS TRAFFIC ELECTRICAL OPERATIONS (805-349-3046) ONE WEEK PRIOR TO ANY RAMP MODIFICATION WORK.

**KEYED NOTES (THIS SHEET ONLY):**

- NB ROUTE 68 LEFT TURN POCKET AND RIGHT TURN POCKET TO CARMEL HILLS DRIVE REMOVED.
  - CONSTRUCTION: RETAINING WALL, DRAINAGE, CURB, GRITER, AND SIDEWALK, TEMPORARY DIRT, ROADWAY BASE, MATERIAL, AND PAVING EXCLUDING FINAL LIFT. SEE SC-7 AND SC-8 FOR STAGE 3 NIGHT WORK.
- DRAINAGE NOTES (THIS SHEET ONLY):**
- EXISTING DRAINAGE:
- REMOVE EXISTING HEADWALL (DRAINAGE SYSTEMS 1 AND 2).
  - REMOVE EXISTING PIPES WITHIN CONSTRUCTION AREA PER DRAINAGE PLAN.
- PROPOSED DRAINAGE:
- CONSTRUCT DRAINAGE SYSTEM 1 ITEMS b THRU h. (SEE NIGHT WORK ON SC-7 FOR CARMEL HILLS DRIVE).
  - CONSTRUCT/COMPLETE DRAINAGE SYSTEM 3.

**LEGEND:**

- CONSTRUCT THIS STAGE
- DIRECTION OF TRAFFIC
- TEMPORARY TRAFFIC STRIPE (PAINT)
- CHANGE IN TEMPORARY STRIPE DETAIL
- TEMPORARY 12" LIMIT LINE/CROSSWALK (PAINT)
- TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)
- TEMPORARY TYPE I (1B) PAVEMENT MARKING (PAINT)
- TEMPORARY "STOP" PAVEMENT MARKING (PAINT)
- TEMPORARY "RESIDENT" PAVEMENT MARKING (PAINT) SEE PD-1
- TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) SEE PD-1
- CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.
- TEMPORARY RAILING (TYPE K)
- TEMPORARY CRASH CUSHION (ARRAY TBT)
- TEMPORARY CRASH CUSHION (ABSORB 350)
- TYPE II BARRICADE
- TEMPORARY PORTABLE STOP SIGN (M-1) LOCATION
- TEMPORARY ROADSIDE SIGN LOCATION

**BLACK LEGEND:**

DATE REVISION	REVISION BY	CHECKED BY	DESIGNED BY

**NO ACCESS TO 17 MILE DRIVE USE CONGRESS AVE GATE**

ORANGE BACKGROUND BLACK LEGEND

NO SCALE

1" BORDER WITH 3" RADIIUS

TEMPORARY SIGN A DETAIL

(DIMENSIONS ARE IN INCHES)

DATE	7/21/2010
PROJECT	761.1, L4.2
ROUTE	1, 68
COUNTY	Alameda
CITY	MONTEREY

REGISTERED CIVIL ENGINEER

DATE: 7/21/2010

PROJECT: 761.1, L4.2

ROUTE: 1, 68

COUNTY: ALAMEDA

CITY: MONTEREY

843 RESERVE DR., #100  
ROSEVILLE, CA 95640

**KEYED NOTES (THIS SHEET ONLY)**

- LANE CLOSURE PER RSP T10
- CONSTRUCTION: EXCAVATION, ROADWAY BASE MATERIAL, CURB AND GUTTER
- SB OFF-RAMP CLOSED (EXCEPT FOR EMERGENCY ACCESS)
- ROADWAY BASE MATERIAL, PAVING EXCLUDING FINAL LIFT, HMA DIKE
- LANE CLOSURE PER RSP T10
- CONSTRUCTION: OVERHEAD SIGN AND GUARDRAIL
- SB OFF-RAMP CLOSED (EXCEPT FOR EMERGENCY ACCESS)
- CONSTRUCTION: EXCAVATION, ROADWAY BASE MATERIAL, PAVING EXCLUDING FINAL LIFT
- DRAINAGE HOLES (THIS SHEET ONLY)
- REMOVE EXISTING PIPES WITHIN CONSTRUCTION AREA PER DRAINAGE PLAN
- PROPOSED DRAINAGE SYSTEM, 2 ITEM 4 (CONNECT TO RSP PLACED IN STAGE 2)
- RAMP CLOSURE PER RSP T14

**LEGEND**

CONSTRUCT THIS STAGE

DIRECTION OF TRAFFIC

TEMPORARY TRAFFIC STRIPE (PAINT)

CHANGE IN TEMPORARY STRIPE DETAIL

TEMPORARY 12" LIMIT LINE (PAINT)

TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)

TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)

CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.

TEMPORARY RAILING (TYPE K)

TEMPORARY CRASH CUSHION (ARRAY, TBH)

TYPE II BARRICADE

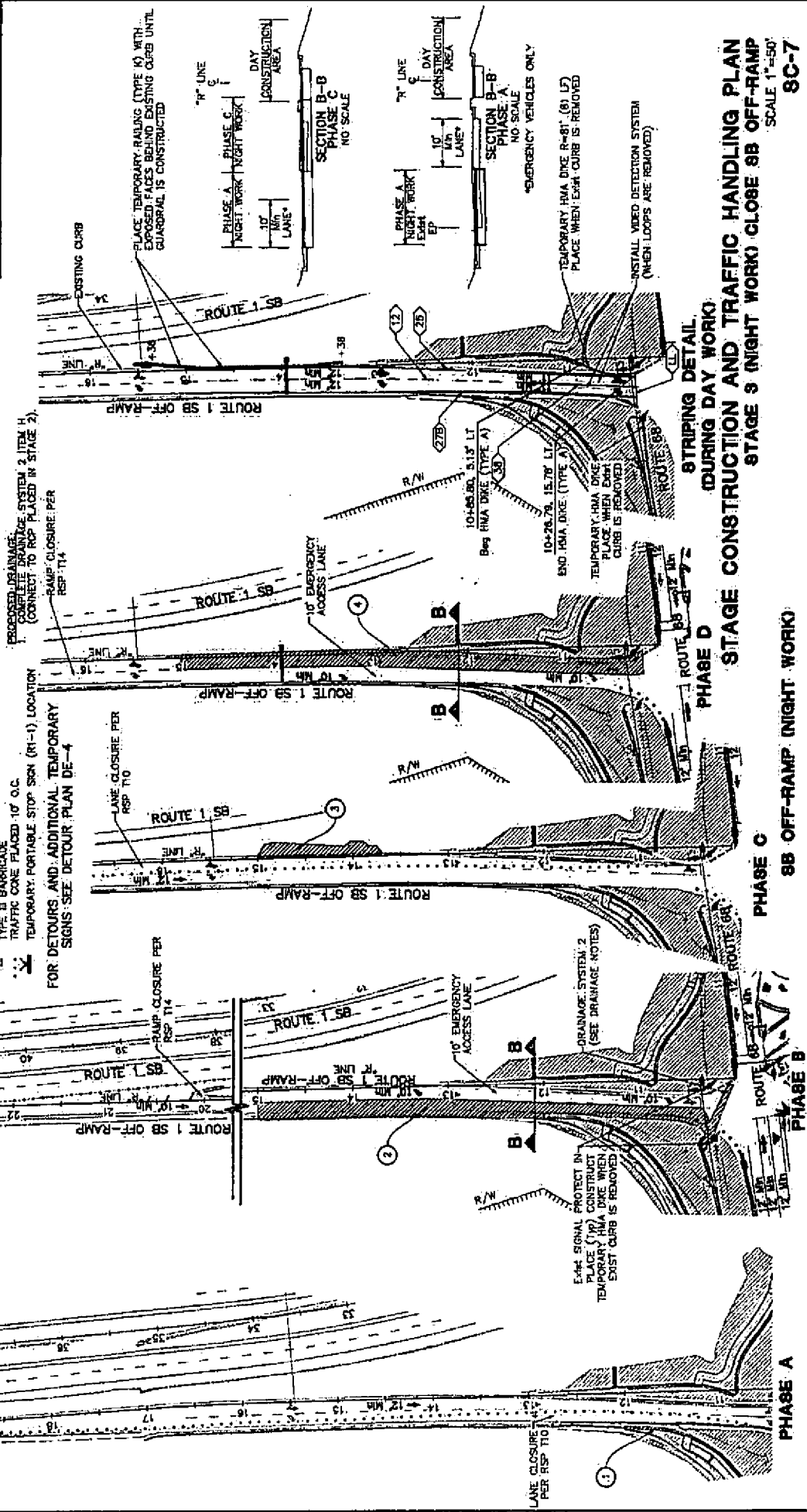
TRAFFIC CONE PLACED 10' O.C.

TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION

FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS: SEE DETOUR PLAN DE-4

**NOTES**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT OFFICE OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET SC-1.
- CONTRACTOR TO PROVIDE SMOOTH TRANSITIONS AT LAKE SHEDS BY GRADING OR CONFORM PAVING. MAXIMUM GRADE DIFFERENTIAL BETWEEN LAKE SHEDS IS 0.15'.
- CONTACT CALTRANS TRAFFIC ELECTRICAL OPERATIONS (800-549-3049) ONE WEEK PRIOR TO ANY RAMP MODIFICATION WORK.



DESIGNED BY	RONALD G. BOYLE
CHECKED BY	RONALD G. BOYLE
DATE REVISED	
REVISY BY	

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONSULTANT FUNCTIONAL SUPERVISOR

CONTRACTOR

**STAGING DETAIL DURING DAY WORK**

**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**

**STAGE 3 (NIGHT WORK) CLOSE SB OFF-RAMP**

SCALE: 1"=50'

SC-7

PROJECT NUMBER & PHASE: 0600006542

NT

CAO RISK

RELATIVE BORDER SCALE: 1" = 10' BORDERS

DATE LAST REVISED: 7/21/2010

AGREEMENT # Ag-5377 - Page 549 of 791

DATE	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
05	Mon	1, 68	75.1; 1.4, 2	57	190

REGISTERED CIVIL ENGINEER  
 DATE: \_\_\_\_\_  
 BOARD OF CALIFORNIA REGISTERED PROFESSIONAL ENGINEERS & SURVEYORS  
 CIVIL ENGINEERING DIVISION

ONI-MEANS, LTD.  
 943 RESERVE DR. #100  
 ROSEVILLE, CA 95678

CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA 93940

**KEYED NOTES (THIS SHEET ONLY):**  
 CARMEL HILLS DRIVE REDUCED TO ONE LANE  
 CONSTRUCTION: EXCAVATION, ROADWAY BASE MATERIAL  
 DRAINAGE, PAVING EXCLUDING FINAL LIFT

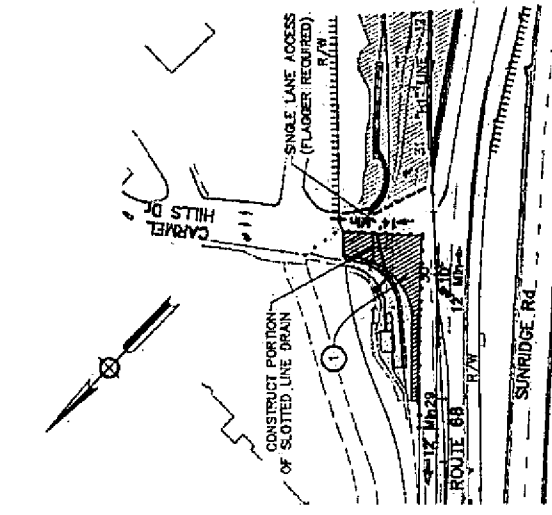
**DRAINAGE NOTES (THIS SHEET ONLY):**  
 EXISTING DRAINAGE: PIPES WITHIN CONSTRUCTION AREA PER  
 DRAINAGE PLAN  
 PROPOSED DRAINAGE:  
 1. CONSTRUCT DRAINAGE SYSTEM: 1 ITEMS • THRU L.

**LEGEND:**

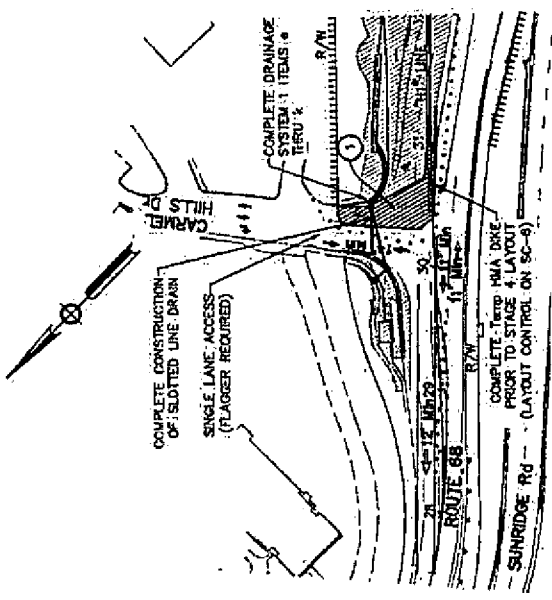
CONSTRUCT THIS STAGE  
 DIRECTION OF TRAFFIC  
 TEMPORARY TRAFFIC STRIPE (PAINT)  
 CHANGE IN TEMPORARY STRIPE DETAIL  
 TEMPORARY 12" LIMIT LINE (PAINT)  
 TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)  
 TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)  
 TEMPORARY "STOP" PAVEMENT MARKING (PAINT)  
 CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.  
 TEMPORARY RAILING (TYPE K)  
 TYPE B BARRICADE  
 TRAFFIC CONE PLACED 10' O.C.  
 TEMPORARY PORTABLE STOP SIGN (R-1) LOCATION

**NOTES:**  
 1. OBTAIN ACCURATE RIGHT OF WAY DATA, CONTACT  
 RIGHT OF WAY ENGINEERING AT THE DISTRICT  
 OFFICE.  
 2. FOR STAGE CONSTRUCTION NOTES AND LEGEND  
 SEE SHEET SC-1.  
 3. CONTRACTOR TO PROVIDE SMOOTH TRANSITIONS  
 AT LANE SHIFTS BY GRINDING OR CONFORM  
 PAVING. MAXIMUM GRADE DIFFERENTIAL  
 BETWEEN LANE SETS IS 0.15."

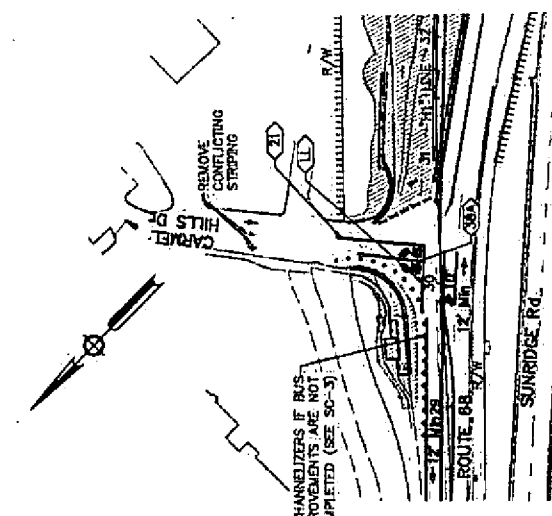
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	ROMALD O. BOYLE	CHECKED BY	DATE REVISED
RD-Designs	DESIGNED BY			



PHASE A



PHASE B



STRIPING DETAIL: IDURING DAY WORK

**CARMEL HILLS DRIVE NIGHT WORK**  
**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 3 NIGHT WORK**  
 SCALE 1"=50'

SC-8

DATE	COUNTY	ROUTE	POST MILE	POST MILE
05	Mon.	1, 68	75.1; L4.2	58, 190

REGISTERED CIVIL ENGINEER  
 PLEASE APPROVAL DATE  
 CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA 93940

CHARTREUSE, LTD.  
 943 REEVES DR., #100  
 ROSELVILLE, CA 95878

CONSTRUCT THIS STAGE  
 DIRECTION OF TRAFFIC  
 CHANGE IN TEMPORARY STRIPE DETAIL  
 TEMPORARY 12" LIMIT LINE/CROSSWALK (PAINT)  
 TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)  
 TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)  
 TEMPORARY STOP PAVEMENT MARKING (PAINT)  
 TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT)  
 TEMPORARY "RESIDENT" PAVEMENT MARKING (PAINT) SEE PD-1  
 TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) SEE PD-1  
 CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.  
 TEMPORARY RAILING (TYPE K)  
 TEMPORARY CRASH CURB/SLASHION (ARRAY TB11)  
 TEMPORARY CRASH CURB/SLASHION (ABSORB. 336)  
 TYPE III BARRICADE  
 TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION  
 TEMPORARY ROADSIDE SIGN LOCATION

FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS SEE DETOUR PLAN DE-5

SECTION C-C  
 NO SCALE

SECTION D-D  
 NO SCALE

STAGE 4 NIGHT WORK - SEE SC-10

DATE REVISOR

DESIGNED BY

CHECKED BY

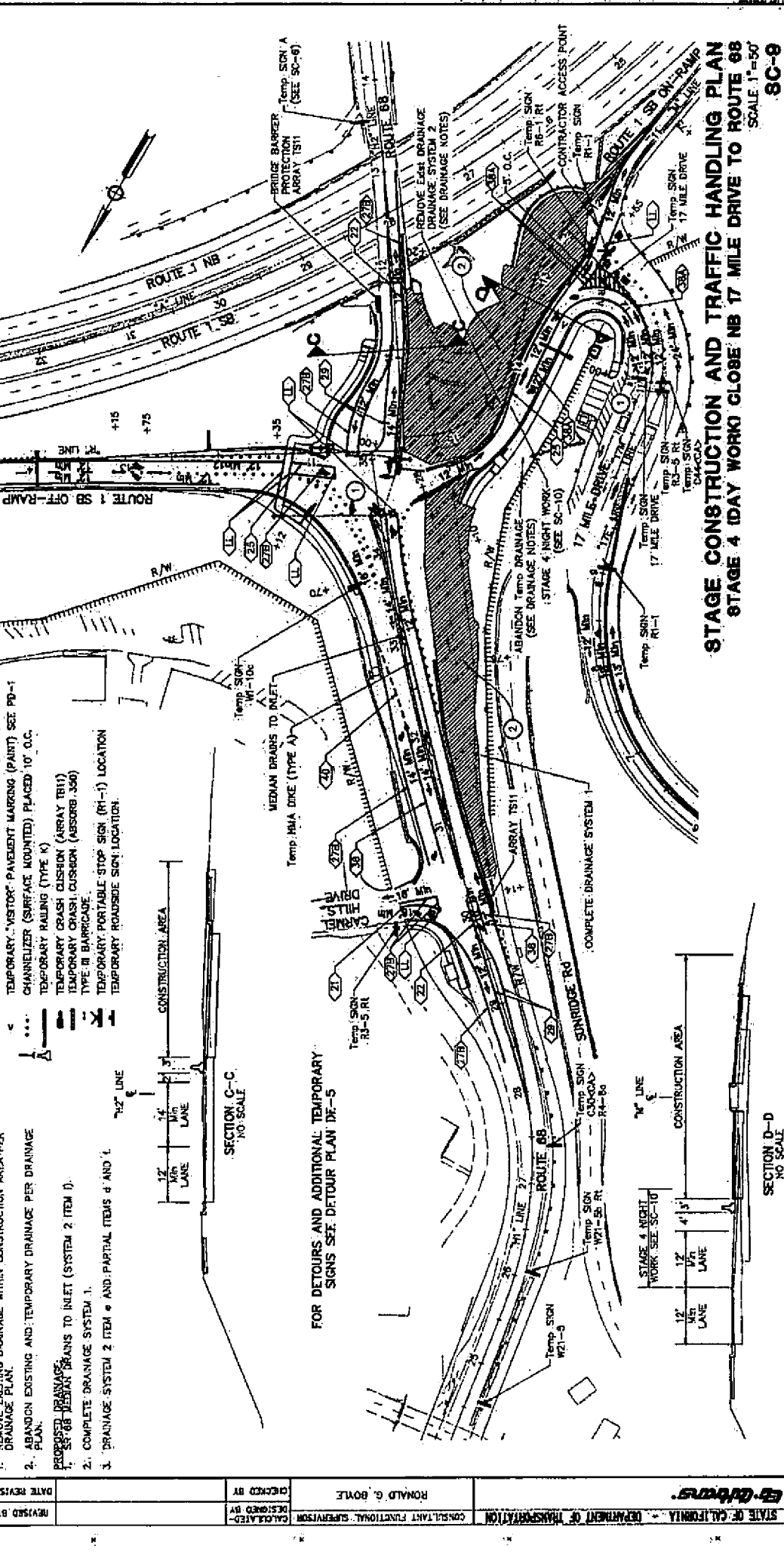
CALCULATED BY

DESIGNED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

RONALD G. BOYLE



**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 4 IDAY WORK GLOBE NB 17 MILE DRIVE TO ROUTE 68**  
 SCALE: 1"=50'

8C-9

PROJECT NUMBER & PHASE: EFTS 050000542

DATE: 7/2/2010

SCALE: 1"=50'

CAO RISK

Agreement #: Ag-5377 - Page 551 of 791

DATE	COUNTY	ROUTE	POST MILE	SHEET NO.	TOTAL SHEETS
06	Mon	1, 68	75.1; 1.4, 2	59	190

REGISTERED CIVIL ENGINEER

DATE: 04/27/07

PROJECT NO. 0600000542

CITY OF MONTEREY  
580 PACIFIC STREET  
MONTEREY, CA 93940

**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET SC-1.

**KEYED NOTES (THIS SHEET ONLY):**

① CLOSE SB ON-RAMP FROM SR 68, 17 MILE DRIVE EXT. RIGHT TURN ONLY.  
CONSTRUCTION: EXCAVATION, DRAINAGE, ROADWAY, BASE MATERIAL, AND PAVING EXCLUDING FINAL LIFT.

**DRAINAGE NOTES (THIS SHEET ONLY):**

① COMPLETE DRAINAGE SYSTEM 2 ITEM 4.

**LEGEND:**

CONSTRUCT THIS STAGE

DIRECTION OF TRAFFIC

TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)

TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)

TEMPORARY TYPE I (18") PAVEMENT MARKING (PAINT)

TEMPORARY "STOP" PAVEMENT MARKING (PAINT)

TEMPORARY "RESIDENT" PAVEMENT MARKING (PAINT) SEE PD-1

TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) SEE PD-1

TEMPORARY PORTABLE STOP SIGN (RT-1) LOCATION

TEMPORARY RAILING (TYPE K)

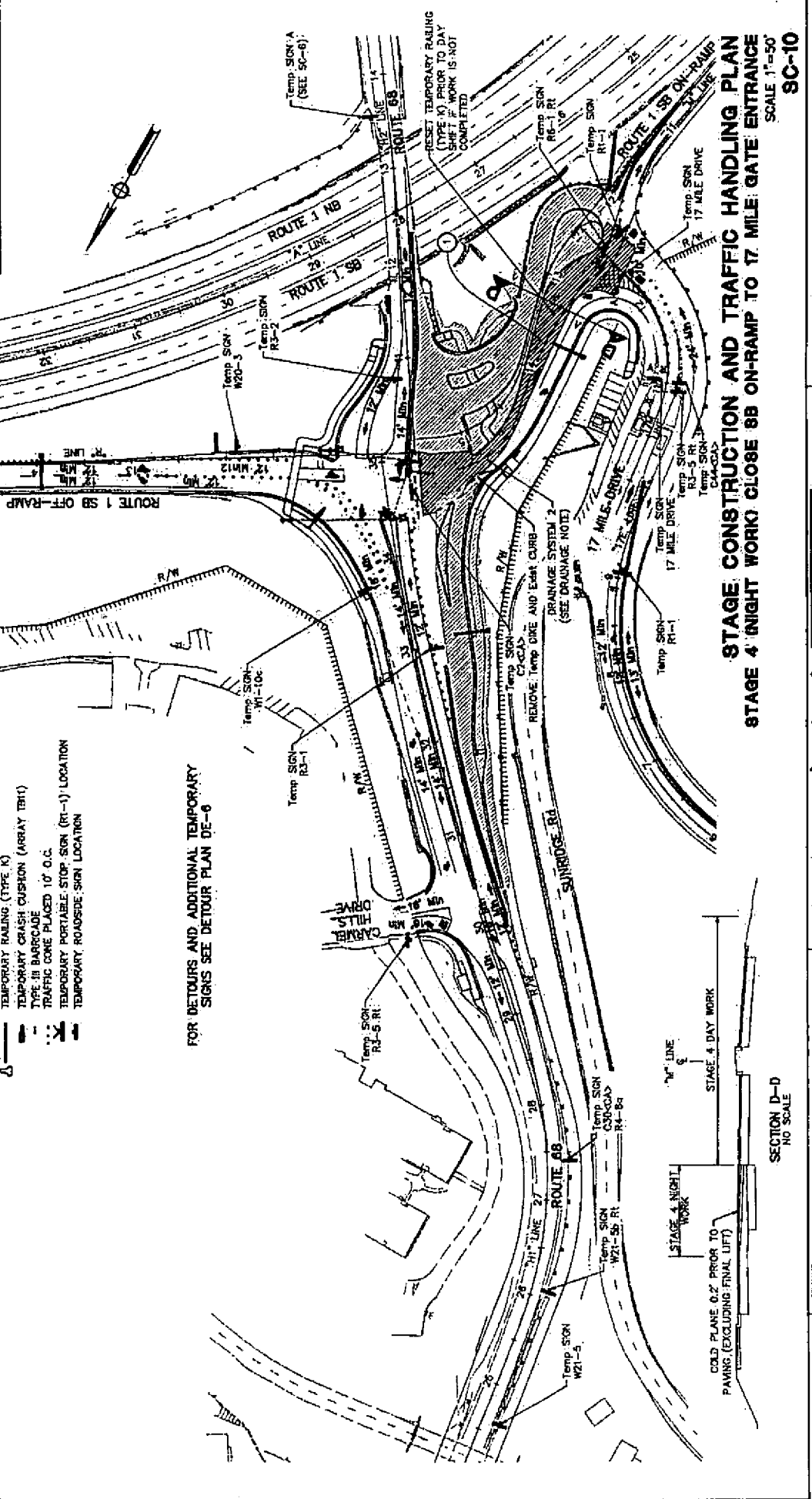
TEMPORARY CRASH CUSHION (ARRAY TBT)

TYPE III BARRICADE

TRAFFIC CONE PLACED 10' O.C.

TEMPORARY PORTABLE STOP SIGN (RT-1) LOCATION

TEMPORARY ROADSIDE SIGN LOCATION



FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS SEE DETOUR PLAN DE-6

**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 4 NIGHT WORK CLOSE SB ON-RAMP TO 17 MILE GATE ENTRANCE**  
 SCALE 1"=50'  
**SC-10**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	DESIGNED BY	DATE REVISION
	RONALD G. BOYLE	CREATED BY	
		REVISION	

REVISION: 02  
DATE: 04/27/07

PROJECT NUMBER & PHASE: EFS 0500000542

SCALE: 1"=50'

SECTION D-D  
NO SCALE

RELATIVE BORDER SCALE: 1"= 16 FEET

DATE: 04/27/07

PROJECT NUMBER & PHASE: EFS 0500000542

CAO RISK



NO.	COUNTY	ROUTE	POST MILE	STATION	DATE	SCALE
00	Mon	1, 65	75.1	U.A.2	80	180

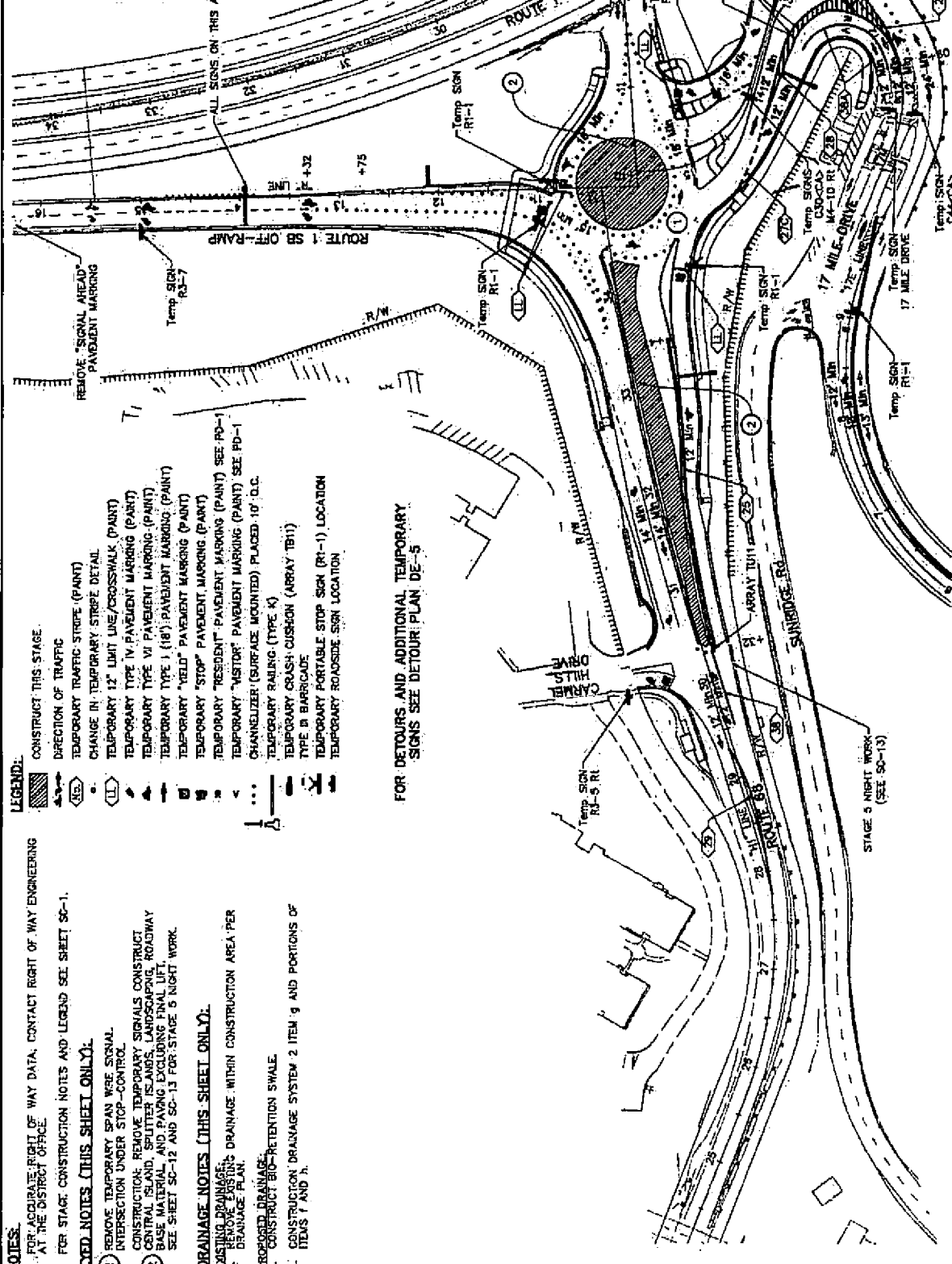
REGISTERED CIVIL ENGINEER	DATE	APPROVED DATE

PLANS APPROVED DATE	
BY	
FOR FILE OF DIVISION OF HIGHWAYS	
DATE OF PRELIMINARY PLAN	
DATE OF PRELIMINARY PLAN	

CITY OF MONTEREY	590 PACIFIC STREET
CONTRACTORS, LTD.	843 RESERVE DR.
ROSEVILLE, CA 95748	MONTEREY, CA 93940



- LEGEND:**
- CONSTRUCT THIS STAGE.
  - DIRECTION OF TRAFFIC
  - TEMPORARY TRAFFIC STRIPE (PAINT)
  - CHANGE IN TEMPORARY STRIPE DETAIL
  - TEMPORARY 12" LIMIT LINE/CROSSWALK (PAINT)
  - TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)
  - TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)
  - TEMPORARY TYPE I (18") PAVEMENT MARKING (PAINT)
  - TEMPORARY "WELD" PAVEMENT MARKING (PAINT)
  - TEMPORARY "STOP" PAVEMENT MARKING (PAINT)
  - TEMPORARY "RESIDENT" PAVEMENT MARKING (PAINT) SEE PD-1
  - TEMPORARY "MOTOR" PAVEMENT MARKING (PAINT) SEE PD-1
  - TEMPORARY "ASTROT" PAVEMENT MARKING (PAINT) SEE PD-1
  - CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.
  - TEMPORARY CRASH CUSHION (ARRAY TB-1)
  - TYPE B BARRICADE
  - TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION
  - TEMPORARY ROADSIDE SIGN LOCATION

FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS SEE DETOUR PLAN DE-5

- NOTES:**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET SC-1.
- KEYED NOTES (THIS SHEET ONLY):**
- REMOVE TEMPORARY SPAN WIRE SIGNAL INTERSECTION UNDER STOP-CONTROL.
  - CONSTRUCTION, REMOVE TEMPORARY SIGNALS CONSTRUCT SIGNAL AND PAVEMENT MARKINGS EXCLUDING FINAL UTILITY BASE MATERIAL AND FINISH EXCLUDING FINAL UTILITY. SEE SHEET SC-12 AND SC-13 FOR STAGE 5 NIGHT WORK.
- DRAINAGE NOTES (THIS SHEET ONLY):**
- EXISTING DRAINAGE:  
 1. REMOVE EXISTING DRAINAGE WITHIN CONSTRUCTION AREA PER DRAINAGE PLAN.  
 2. CONSTRUCT BIO-RETENTION SWALE.
- PROPOSED DRAINAGE:  
 1. CONSTRUCTION DRAINAGE SYSTEM 2 ITEM 'g' AND PORTIONS OF ITEMS 'f' AND 'h'.

**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 5 PHASE A (DAY WORK)**  
 SCALE: 1"=50'  
**SC-11**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT/FUNCTIONAL SUPERVISOR	RONALD G. BOYLE	CHECKED BY	
DESIGNED BY			DATE REVISION	
REVISION				

ORDER LAST REVISED: 7/2/2010

UNBIDNABLE TO SPEC FILE

RELATIVE BORDER SCALE: 1" = 50' FEET

PROJECT NUMBER & PHASE: ERS 050000542

UNIT: INT

CAO RISK

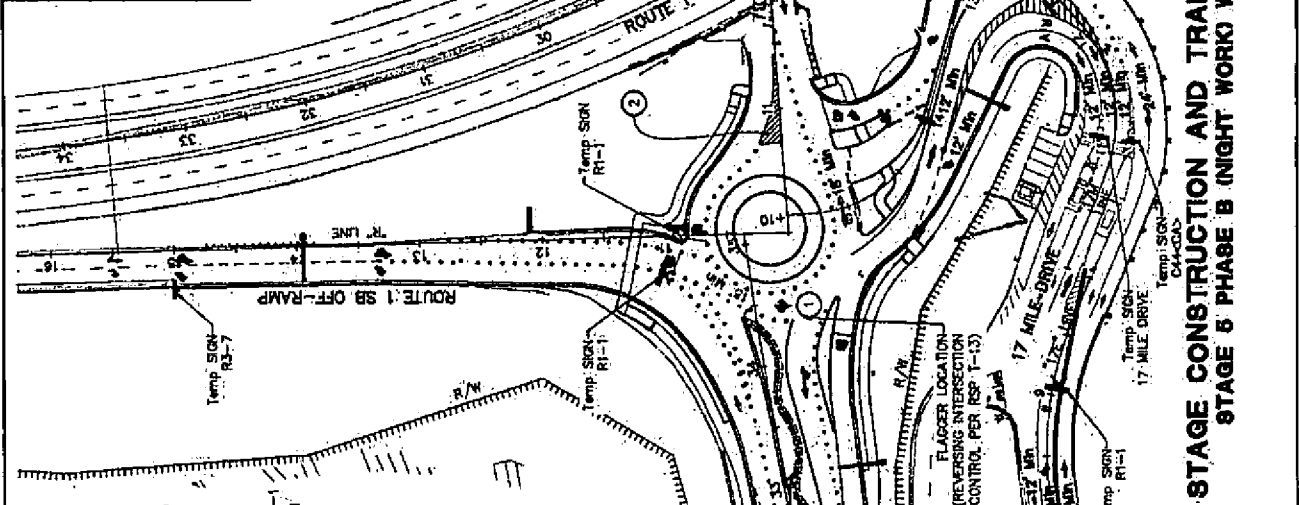
Agreement #: Ag-5377 - Page 553 of 791

NO.	DATE	BY	REVISION
05	Mon 1, 68	75.1, L.A.2	\$1 190.

REGISTERED CIVIL ENGINEER  
DATE: 11/22/67  
NO. 48387

PLANS APPROVAL DATE: 11/22/67  
NO. 48387

CITY OF MONTEREY  
580 PACIFIC STREET  
MONTEREY, CA 93940



**LEGEND:**

- CONSTRUCT THIS STAGE
- DIRECTION OF TRAFFIC
- TEMPORARY TRAFFIC STRIPE (PAINT)
- CHANGE IN TEMPORARY STRIPE DETAIL
- TEMPORARY 12" LIMIT LINE/CROSSWALK (PAINT)
- TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)
- TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)
- TEMPORARY TYPE I (18") PAVEMENT MARKING (PAINT)
- TEMPORARY "YIELD" PAVEMENT MARKING (PAINT)
- TEMPORARY "STOP" PAVEMENT MARKING (PAINT)
- TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) SEE: PD-1
- TEMPORARY "RESIDENT" PAVEMENT MARKING (PAINT) SEE: PD-1
- TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) SEE: PD-1
- TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION
- TEMPORARY ROADSIDE SIGN LOCATION
- CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.
- TEMPORARY RAILING (TYPE K)
- TEMPORARY CRASH COURSE (ARRAY: TB11)
- TYPE III BARRICADE
- FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS SEE DETOUR PLAN DE-5

**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET SC-1.

**KEYED NOTES (THIS SHEET ONLY):**

- INTERSECTION UNDER REVERSING TRAFFIC CONTROL.
- CONSTRUCTION SPURTER ISLAND, LANDSCAPING, ROADWAY BASE MATERIAL AND PAVING EXCLUDING FINAL LEFT. SEE SHEET SC-10 FOR DAY WORK. SEE SC-12 FOR ADDITIONAL STAGE 5 NIGHT WORK.

**DRAINAGE NOTES (THIS SHEET ONLY):**

- CONSTRUCTING DRAINAGE WITHIN CONSTRUCTION AREA PER DRAINAGE PLAN.
- PROPOSED DRAINAGE: NONE.

**STAGE 5 CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 5 PHASE B (NIGHT WORK) WITH REVERSING CONTROL**  
 SCALE: 1"=50'  
**8C-12**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 DESIGNED BY: RONALD G. DOYLE  
 CHECKED BY: [Signature]  
 DATE REVISION: 7/2/2010

PROJECT NUMBER & PHASE: [Blank]  
 NIT  
 CAO RISK

RELATIVE PROJECT SCALE: 1"=50' IN FEET  
 0 1 2 3 4 5 6 7 8 9 10

AGREEMENT # Ag-5377 - Page 554 of 791  
 ETS 0500006542

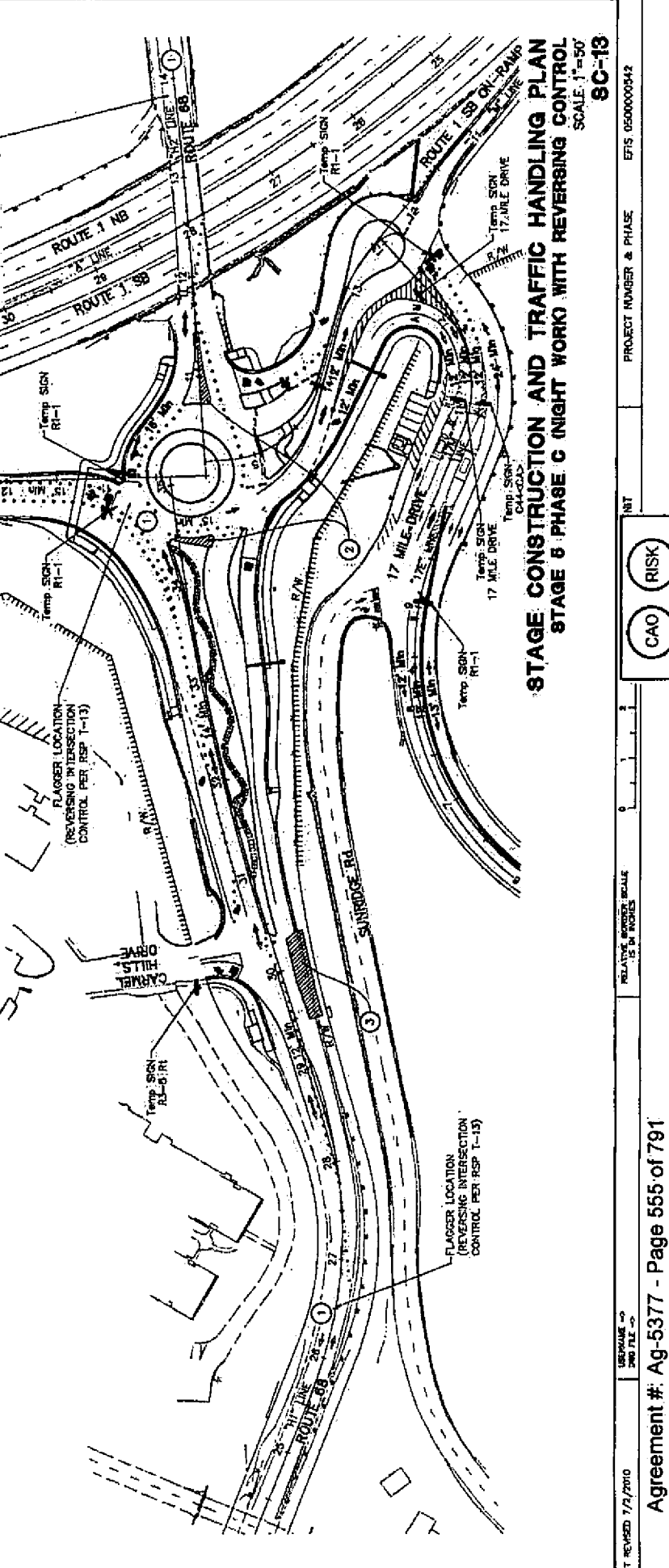
DATE	1/18/83	PROJECT NO.	4587
DESIGNED BY	DATE	CITY OF MONTEREY	540 PACIFIC STREET
MONTEREY, CA 95040			

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G. BOYLE	CHECKED BY
DATE REVISION	REVISION BY		

**NOTES:**  
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.  
 2. FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET SC-1.  
**KEYED NOTES (THIS SHEET ONLY):**  
 ① INTERSECTION UNDER REVERSING TRAFFIC CONTROL.  
 ② CONSTRUCTION: SPILTTER ISLAND, LANDSCAPING, ROADWAY BASE MATERIAL, AND PAVING EXCLUDING FINAL LIFT. SEE SHEET SC-10 FOR DAY WORK.  
 ③ CONSTRUCTION: RECONSTRUCT STRUCTURAL SECTION EXCLUDING FINAL LIFT, HWA DIKE.

**LEGEND:**  
 CONSTRUCT THIS STAGE  
 DIRECTION OF TRAFFIC  
 TEMPORARY 12" LIMIT LINE/CROSSWALK (PAINT)  
 TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)  
 TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)  
 TEMPORARY TYPE I (18") PAVEMENT MARKING (PAINT)  
 TEMPORARY "YIELD" PAVEMENT MARKING (PAINT)  
 TEMPORARY "STOP" PAVEMENT MARKING (PAINT)  
 TEMPORARY "RESIDENT" PAVEMENT MARKING (PAINT) SEE PD-1  
 TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) SEE PD-1  
 CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.  
 TEMPORARY RAILING (TYPE K)  
 TEMPORARY CRASH CUSHION (ARRAY TB1)  
 TRAFFIC CONE PLACED 10' O.C.  
 TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION  
 TEMPORARY ROADSIDE SIGN LOCATION

**FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS SEE DETOUR PLAN DE-5**



DATE	NO.	COUNTY	ROUTE	POST MILE	SHEET NO.	TOTAL SHEETS
06	101	Mon	1, 98	75.1, L.A.2	63	190

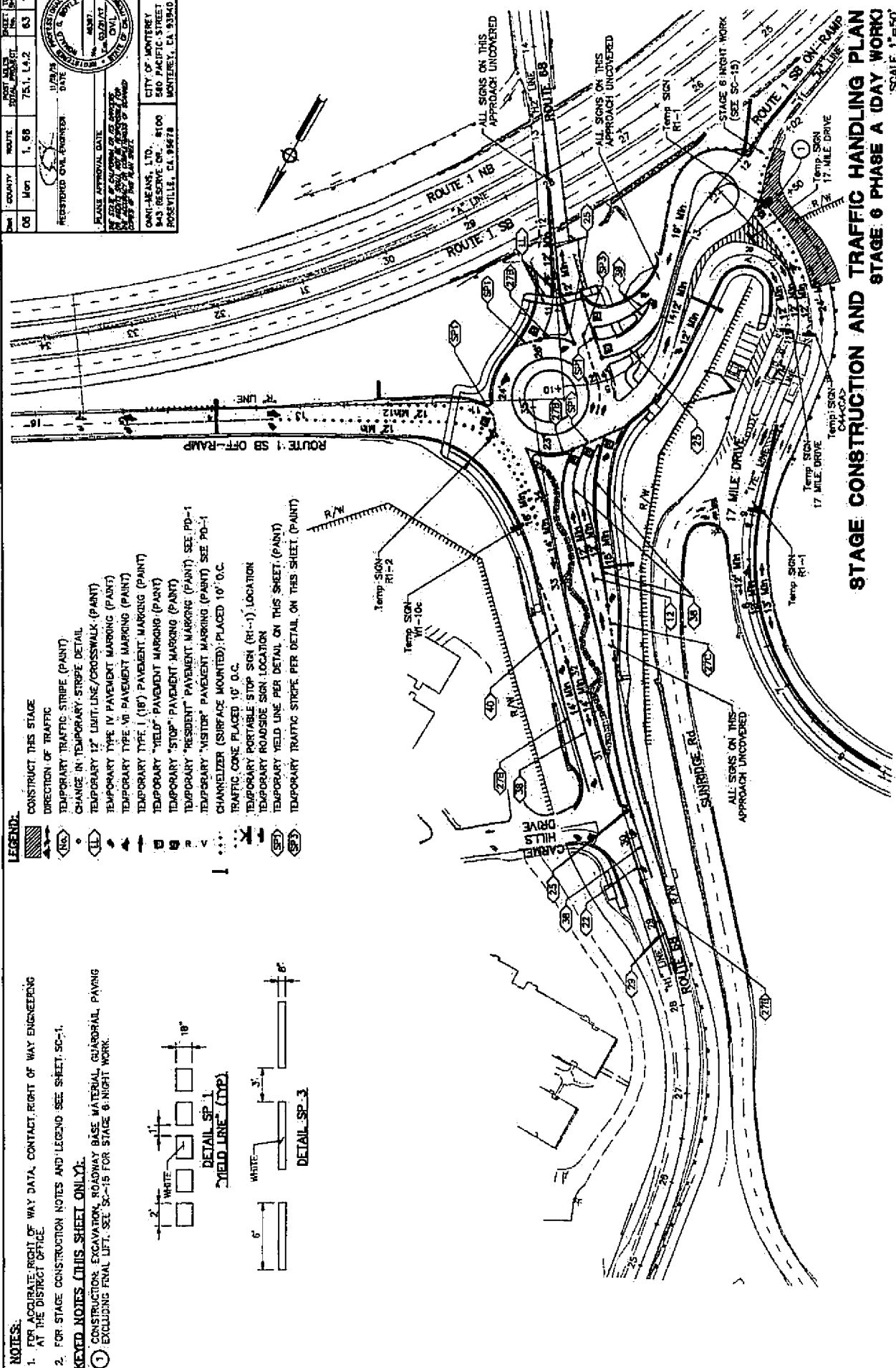
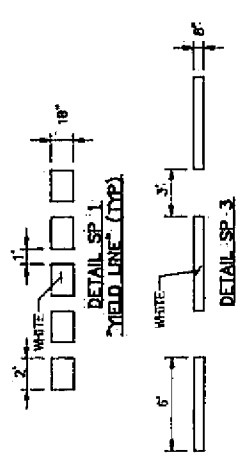
REGISTERED CIVIL ENGINEER	DATE	PLANE APPROVAL DATE

CITY OF MONTEREY	843 RESERVE ST.	MONTEREY, CA 93940
ONITE-HEARS, LTD.	843 RESERVE ST.	MONTEREY, CA 93940

- LEGEND.**
- CONSTRUCT THIS STAGE
  - DIRECTION OF TRAFFIC
  - TEMPORARY TRAFFIC STRIPE (PAINT)
  - CHANGE IN TEMPORARY STRIPE DETAIL
  - TEMPORARY 12" LIMIT LINE/CROSSWALK (PAINT)
  - TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)
  - TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)
  - TEMPORARY TYPE I (18") PAVEMENT MARKING (PAINT)
  - TEMPORARY "WELD" PAVEMENT MARKING (PAINT)
  - TEMPORARY "STOP" PAVEMENT MARKING (PAINT)
  - TEMPORARY "RESIDENT" PAVEMENT MARKING (PAINT) SEE PD-1
  - TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) SEE PD-1
  - CHANNELIZER (SURFACE MOUNTED): PLACED 10' O.C.
  - TRAFFIC CONE PLACED 10' O.C.
  - TEMPORARY PORTABLE STOP SIGN (R1-1): LOCATION
  - TEMPORARY ROADSIDE SIGN LOCATION
  - TEMPORARY YIELD LINE PER DETAIL ON THIS SHEET (PAINT)
  - TEMPORARY TRAFFIC STRIPE PER DETAIL ON THIS SHEET (PAINT)

- NOTES:**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET SC-1.
- KEYED NOTES (THIS SHEET ONLY):**
- CONSTRUCTOR: EXCAVATION, ROADWAY BASE MATERIAL, GUARDRAIL, PAVING EXCLUDING FINAL LIFT. SEE SC-15 FOR STAGE 6: NIGHT WORK.



**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 6 PHASE A (DAY WORK)**  
 SCALE: 1"=50'

8C-14

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G. BOYLE	CHECKED BY	DATE REVISED
REVISIONS	DESIGNED BY		DATE REVISED	

REPORT LAST REVISED 7/2/2010

UPGRADE →  
DMS FILE →

PROJECT NUMBER & PHASE: ETS 050000542

INT

RELATIVE HORIZONTAL SCALE: 1"=25.0' HORIZONTAL

CAO

RISK

Agreement #: Ag-5377 - Page 556 of 791

DATE	COUNTY	ROUTE	MILE POST	SECTION
08	Mar.	1. 65	75.1: 1.42	84 190

APPROVED DATE	APPROVED BY

CITY OF MONTEREY
580 PACIFIC STREET
943 RESERVE DR. #100
POWERSVILLE, CA 95478

**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET 50-1.

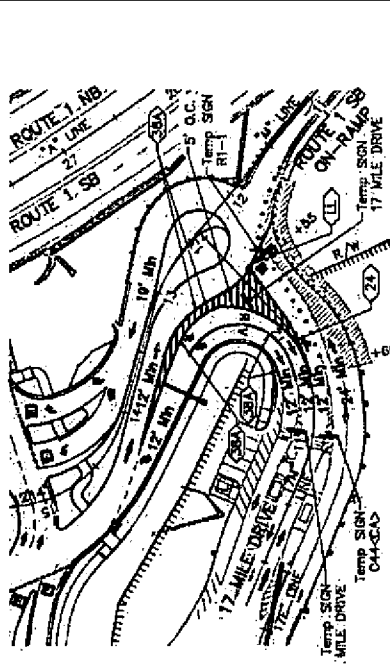
**NOTED NOTES (THIS SHEET ONLY):**

- PHASE B NIGHT WORK: 17 MILE DRIVE ENTRANCE AND SB ON-RAMP ACCESS CONSTRUCTION, EXCAVATION, COMPLETE DRAINAGE SYSTEM, 4. ROADWAY BASE MATERIAL PAVING EXCLUDING FINAL LFT.
- PHASE C NIGHT WORK: 17 MILE DRIVE EXIT AND SB ON-RAMP CLOSED, 17 MILE DRIVE ENTRANCE ONE LANE CONSTRUCTION, EXCAVATION, ROADWAY BASE MATERIAL, MEDIAN SB ON-RAMP CURBS, PAVING EXCLUDING FINAL LFT.

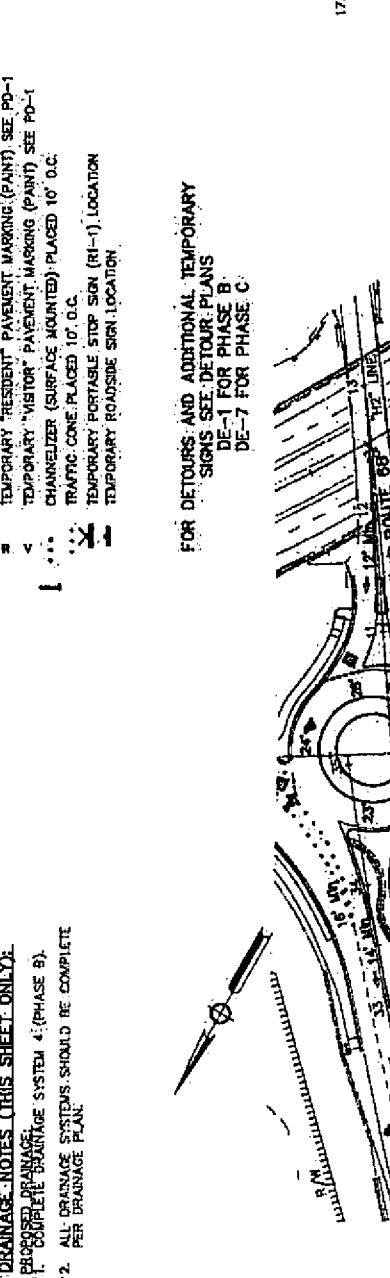
**DRAINAGE NOTES (THIS SHEET ONLY):**

- COMPLETE DRAINAGE SYSTEM 4 (PHASE B).
- ALL DRAINAGE SYSTEMS SHOULD BE COMPLETE PER DRAINAGE PLAN.

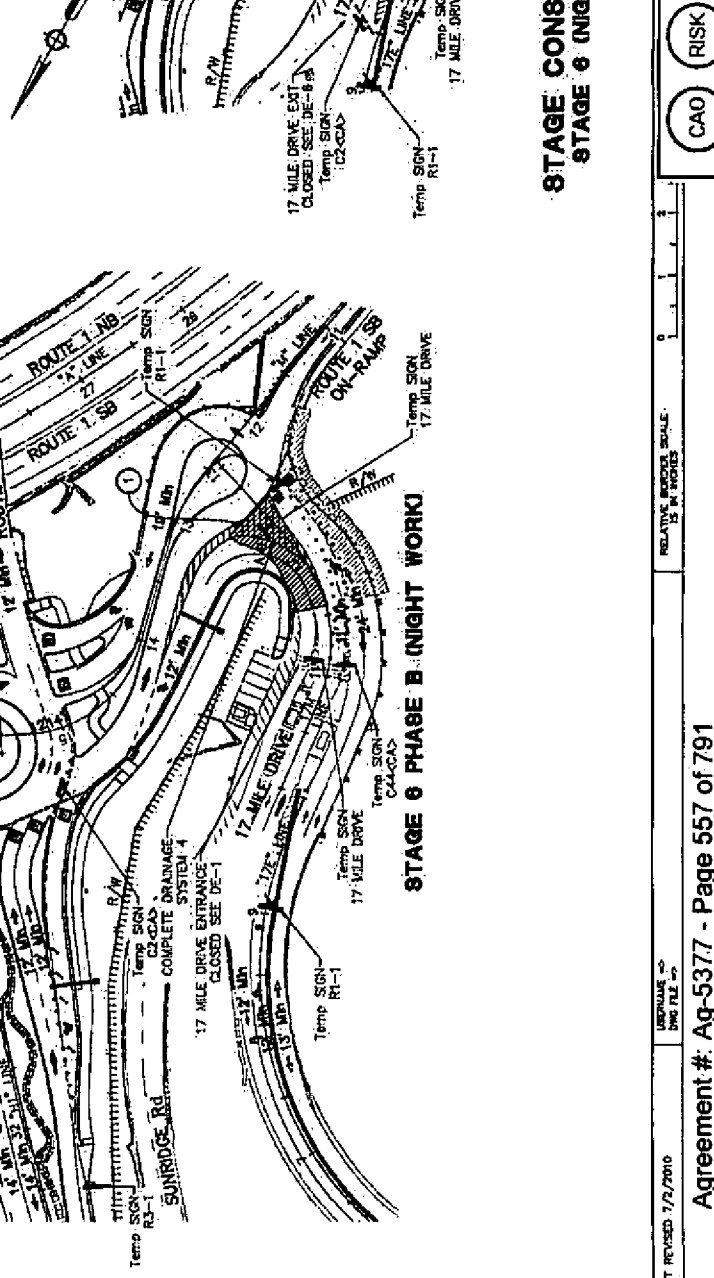
DESIGNED BY	REVISOR
RONALD G. BOYLE	
CHECKED BY	DATE REVISOR



**STRIPING DAY WORK**



**STAGE 6 PHASE B (NIGHT WORK)**



**STAGE 6 PHASE C NIGHT WORK**

**STAGE 6 CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 6 (NIGHT WORK) CLOSE 17 MILE GATE EXIT/88 ON-RAMP**

SCALE: 1"=50'

8C-16

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G. BOYLE
DESIGNED BY	CHECKED BY	
REVISOR	DATE REVISOR	

REVISIONS: LAST REVISED: 7/2/2010

UNAPPROVED - THIS FILE

PROJECT NUMBER & PHASE: 8C-16

UNIT: INCHES

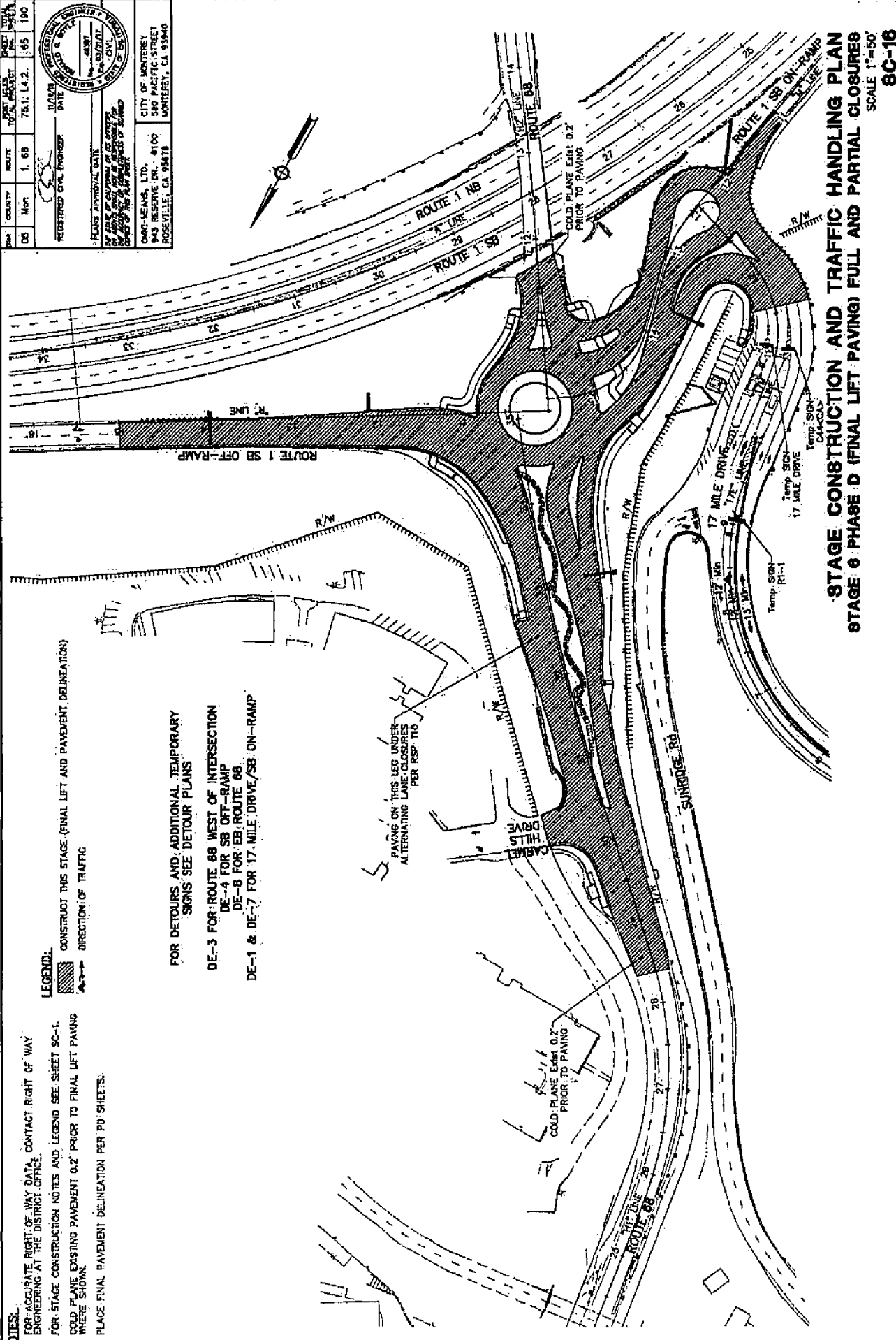
RELATIVE HORIZONTAL SCALE: 1" = 50'

VERTICAL SCALE: 1" = 5'

CAO RISK

Agreement #: Ag-5377 - Page 557 of 791

Sheet	ROUTE	TOTAL SHEETS	DATE
06	1, 6B	76.1, L4.2	65 190
REGISTERED CIVIL ENGINEER	DATE	CITY OF MONTREY, CALIFORNIA	
FLOWER APPROVAL DATE		CITY OF MONTREY, CALIFORNIA	
OMC-LEANS, LTD. 4100 843 RESERVE DR. #100 ROSELIE, CA 94818			



**NOTES:**

- FOR ACCURATE RIGHT-OF-WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET SC-1.
- COLD PLANE EXISTING PAVEMENT 0.2' PRIOR TO FINAL LIFT PAVING WHERE SHOWN.
- PLACE FINAL PAVEMENT DELINEATION PER PD SHEETS.

**LEGEND:**

CONSTRUCT THIS STAGE (FINAL LIFT AND PAVEMENT DELINEATION) DIRECTION OF TRAFFIC

FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS SEE DETOUR PLANS

DE-3 FOR ROUTE 68 WEST OF INTERSECTION  
 DE-4 FOR SB OFF-RAMP  
 DE-8 FOR EB ROUTE 68  
 DE-1 & DE-7 FOR 17 MILE DRIVE/SB ON-RAMP

PAVING ON THIS LEG UNDER ALTERNATING LANE CLOSURES PER RSP T10

**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 6: PHASE D (FINAL LIFT PAVING) FULL AND PARTIAL CLOSURES**  
 SCALE 1"=50'

9C-16

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	DESIGNED BY	RODOLFO G. BOYLE	CHECKED BY		DATE REVISAD	
PROJECT NUMBER & PHASE	ETIS 0600006542	DATE LAST REVISED	7/2/2010	UNREVIEWED	NO FILE	AGREEMENT # - Page 558 of 791	
RELATIVE HORIZONTAL SCALE:	1" = 4' HORIZES	PROJECT NUMBER & PHASE		ETIS 0600006542		NIT	
CAO		RISK					

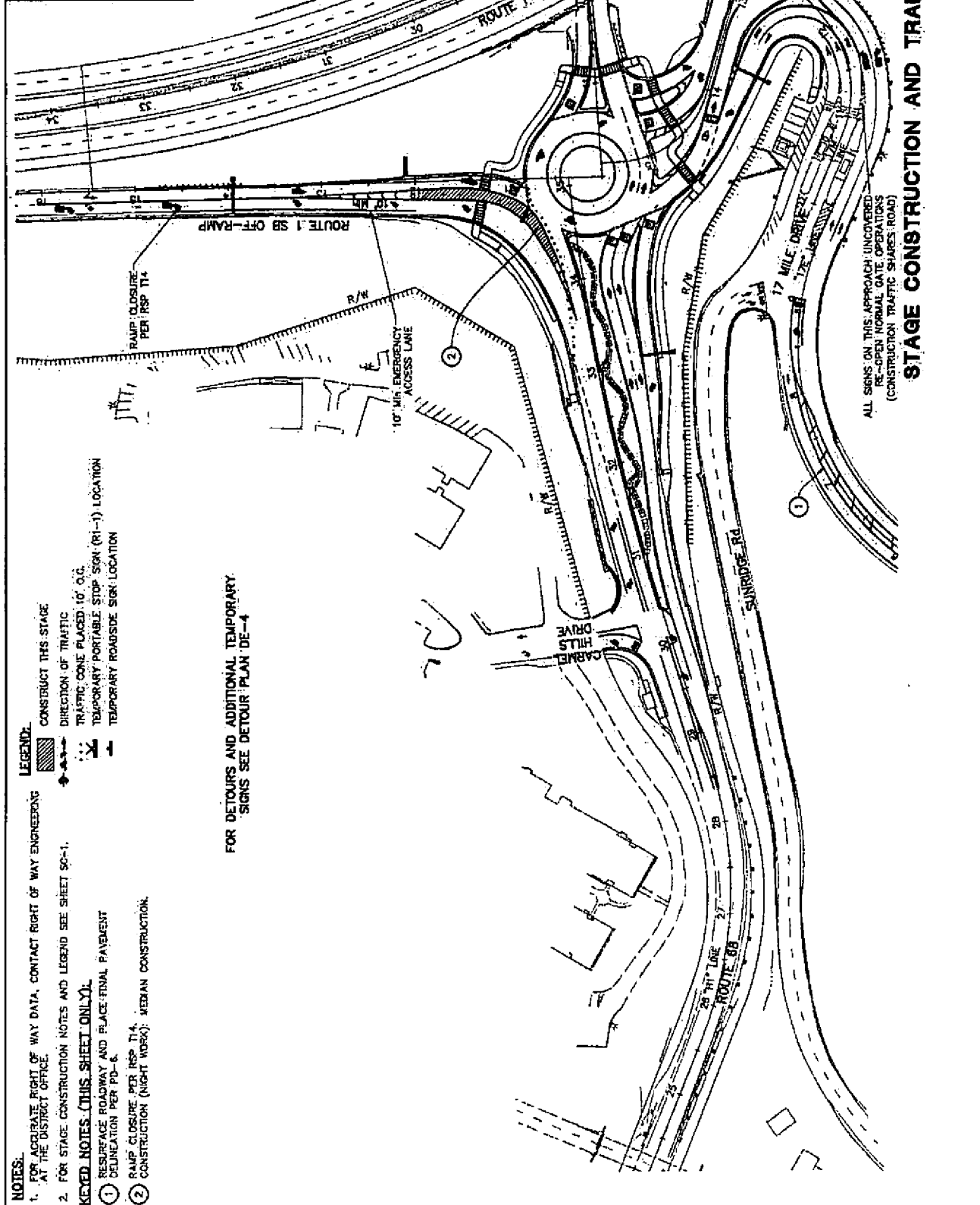
DATE	ROUTE	COUNTY	PROJECT NO.	SHEET NO.
05	1, 68	Mon	75.1, L.A.2	160

REGISTERED CIVIL ENGINEER	DATE	PROJECT NO.

APPROVAL DATE	CITY OF MONTEREY
	340 PACIFIC STREET
	MONTEREY, CA 95020



REVISOR	DATE REVISOR
DESIGNED BY	CHECKED BY
	RONALD D. BOME

FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS SEE DETOUR PLAN DE-4

**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 7 NIGHT WORK**  
 SCALE: 1"=50'  
**8C-17**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT: FUNCTIONAL SUPERVISOR  
 CONTRACT NO. 75.1, L.A.2  
 SHEET NO. 160

DATE REVISOR: 1/2/2010  
 REVISION: 00

PROJECT NUMBER & PHASE: EFS 0500000542

CAO RISK

DATE	COUNTY	ROUTE	TOTAL SHEETS	SHEET NUMBER
05	Mon	1, 6B	78.1 (4.2)	190

REGISTERED CIVIL ENGINEER	DATE
	01/04/00

PLANS APPROVAL DATE	CITY OF MONTEREY
	04/06/00

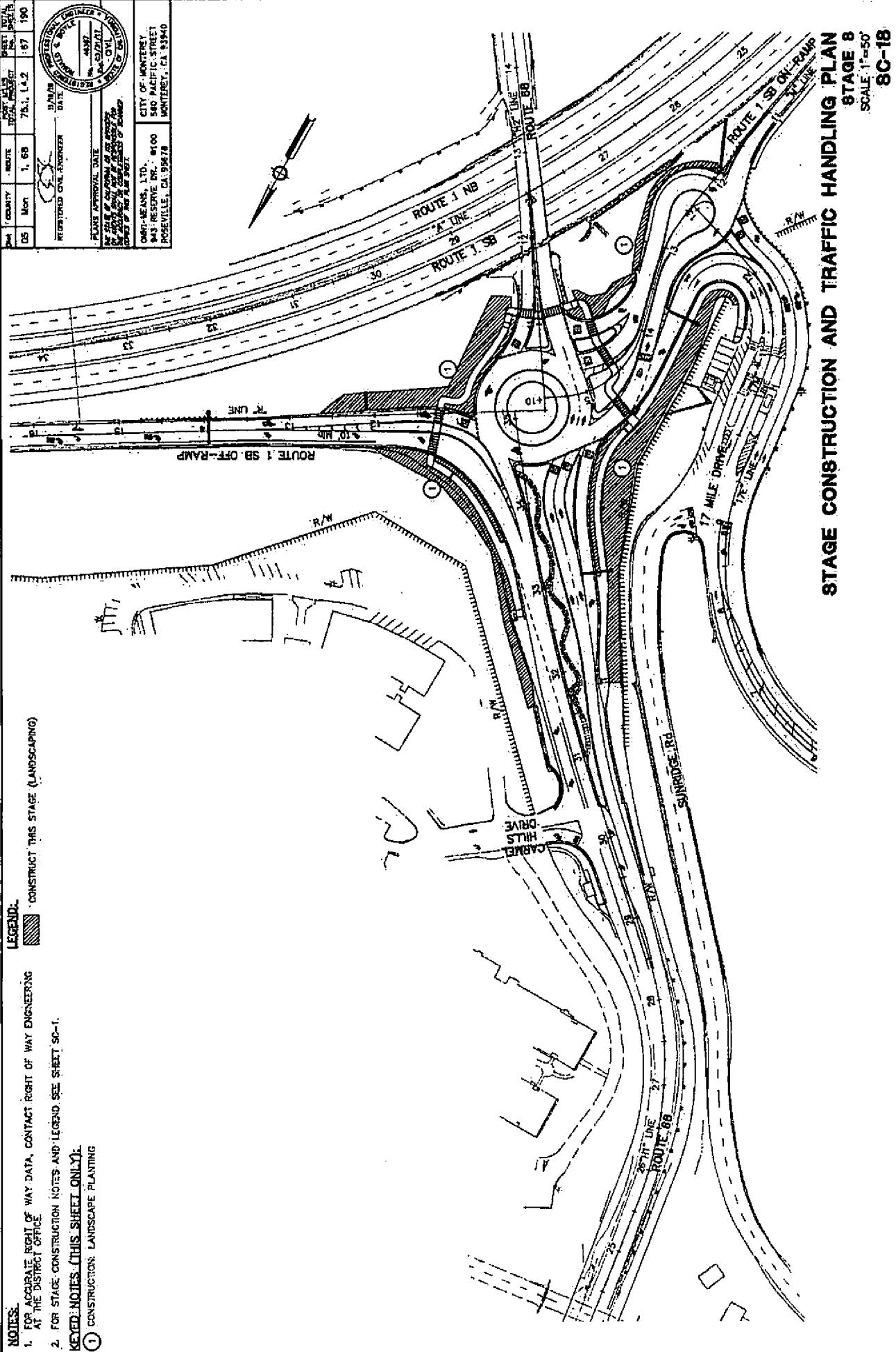
  

OWNER: BEANS, LTD. 843 RESERVE DR. ROSELVILLE, CA 95968	CITY OF MONTEREY 840 PACIFIC STREET MONTEREY, CA 93940
---	--

**LEGEND:**  
 CONSTRUCT THIS STAGE (LANDSCAPING)

- NOTES:**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - FOR STAGE CONSTRUCTION NOTES AND LEGEND, SEE SHEET 90-1.
- KEYED NOTES: (THIS SHEET ONLY):**
- ① CONSTRUCTION: LANDSCAPE PLANTING

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT: FUNCTIONAL SUPERVISOR	PREPARED BY:	DATE REVISION:
	RONALD G. BOYLE	CHECKED BY:	



**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 8**  
 SCALE: 1"=50'  
**80-18**

PROJECT NUMBER & PHASE: ETS 0500000542

UNIT: INT

RELATIVE HORIZONTAL SCALE: 1"=100'

DATE: 7/2/2010

REVISION: 0

AGREEMENT # Ag-5377 - Page 560 of 791

CAO RISK



Exhibit A.2

PROJECT SHEET NO. 190, COUNTY: Mon, ROUTE: 1, 68, 75.1, 14.2, REGISTERED CIVIL ENGINEER, PLANS APPROVAL DATE, CITY OF MONTEREY, 580 PACIFIC STREET, MONTEREY, CA 93940

Table with columns: SHEET NO., LINE, STATION, DETAIL NO., TEMPORARY TRAFFIC STRIPE MARKER (PAINT), TEMPORARY PAVEMENT MARKING (PAINT), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE PAVEMENT MARKER, REMOVE PAINTED TRAFFIC STRIPE, REMOVE PAINTED TRAFFIC STRIPE, REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), TEMPORARY TRAFFIC STRIPE MARKER (PAINT), TEMPORARY PAVEMENT MARKING (PAINT), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE PAVEMENT MARKER, REMOVE PAINTED TRAFFIC STRIPE, REMOVE PAINTED TRAFFIC STRIPE, REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE).

Table with columns: SHEET NO., LINE, STATION, DETAIL NO., TEMPORARY TRAFFIC STRIPE MARKER (PAINT), TEMPORARY PAVEMENT MARKING (PAINT), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE PAVEMENT MARKER, REMOVE PAINTED TRAFFIC STRIPE, REMOVE PAINTED TRAFFIC STRIPE, REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), TEMPORARY TRAFFIC STRIPE MARKER (PAINT), TEMPORARY PAVEMENT MARKING (PAINT), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE PAVEMENT MARKER, REMOVE PAINTED TRAFFIC STRIPE, REMOVE PAINTED TRAFFIC STRIPE, REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE).

Table with columns: SHEET NO., LINE, STATION, DETAIL NO., TEMPORARY TRAFFIC STRIPE MARKER (PAINT), TEMPORARY PAVEMENT MARKING (PAINT), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE PAVEMENT MARKER, REMOVE PAINTED TRAFFIC STRIPE, REMOVE PAINTED TRAFFIC STRIPE, REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), TEMPORARY TRAFFIC STRIPE MARKER (PAINT), TEMPORARY PAVEMENT MARKING (PAINT), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE PAVEMENT MARKER, REMOVE PAINTED TRAFFIC STRIPE, REMOVE PAINTED TRAFFIC STRIPE, REMOVE YELLOW THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE), REMOVE THERMOPLASTIC TRAFFIC STRIPE (HAZARDOUS WASTE).

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION, CONSULTANT/FUNCTIONAL SUPERVISOR: RONALD G. BOYLE, CHECKED BY: [Signature], DESIGNED BY: [Signature], BORDER LAST REVISED 7/2/2010, USER NAME: <>>, DWG FILE: <>>, PROJECT NUMBER & PHASE: ETIS 0500000542, UNIT: 1, 2, 3, 0 1 2 3 4 5 6 7 8 9 INCHES, RELATIVE BORDER SCALE: 1/8" IN INCHES, STAGE CONSTRUCTION AND TRAFFIC HANDLING QUANTITIES, NO SCALE, SCQ-1

Sheet No.	05	County	Mon	Route	1, 68	Post Miles	75.1, L.A.2	Project No.	69	Total Sheets	180
REGISTERED CIVIL ENGINEER	DATE		11/24/82		PROJECT NO.		69		TOTAL SHEETS		
PLANS APPROVAL DATE		11/24/82		PROJECT NO.		69		TOTAL SHEETS			
CITY OF MONTEREY		943 RESERVE DR.		9100		MONTEREY, CA 93940					

SHEET NO.	LINE	STATION	TEMPORARY TRAFFIC CONTROL ITEMS					TEMPORARY HMA DRAIN (TYPE A)
			TEMPORARY RAILING (TYPE K) (LF)	CHANNELIZER (SURFACE MOUNTED) (EA)	TEMPORARY CRASH CUSHION (TYPE A) (EA)	TEMPORARY CRASH CUSHION (ABSORBE 300) (EA)	TYPE III BARRIAGE (EA)	
SC-1	17E	1+15-10+00	700	40	11		2	
	17M	1+400-12+78		40				
	17LM	1+100-15+00						
SC-2	A	25+00-30+15	440	10	14		2	
SC-4	H1	30+50-34+50	740	6	44		6	
	H2	10+22-12+00	180		11			4
	M	14+60-15+00						3
	M	AGUAJITO ROAD						7
SC-5	H2	10+22-11+82	140				2	
	M	14+50-15+00					6	
SC-6	H1	28+78-30+23	300	7	11	1	5	415
	H1	31+55-34+05	160	6	11	1	3	
	H2	10+23-11+60						
SC-7	R	20+00-21+00					3	
	R	20+00-21+00					3	
	R	11+26-11+88	200		11			61
	R	13+36-15+36						
SC-8	H1	29+75-30+23		10				
SC-9	H1	30+14-32+78	260	32	11			
	R1H1	13+15-13+70		20				
	R	11+36-12+78		15				
	H2	10+00-12+20	220		11	2	3	
	M	10+75-15+28	460		11	1	3	
	17M	11+00-12+55		34				
SC-10	M	15+50					4	
SC-11	H1R	30+82-13+82	500	2	11			
	R1H2	12+75-17+30		70				
	17M	11+80-12+55		20				
SC-12	H2M	NIGHT WORK					5	
SC-13	17M	NIGHT WORK					8	
SC-14	17M	12+50-13+02		10				
SC-15	H1	30+00-30+00		18				10
	17M	PHASE A RESET		10				
	17E	PHASE A RESET						3
	17M	PHASE A RESET		28				
SC-17	17E	PHASE A RESET			11			
	17E	PHASE A RESET			185	5	74	485
		TOTAL	4120	427	185	5	74	485

STAGE CONSTRUCTION AND TRAFFIC HANDLING QUANTITIES  
NO SCALE

SCQ-2

PROJECT NUMBER & PHASE: EFTS 0500000542 UNIT: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
CONSULTANT: RONALD G. BOYLE  
CHECKED BY: [Signature]  
DESIGNED BY: [Signature]  
REVISIONS: [Table]  
Agreement #: Ag-5377 Page 562 of 791  
CAO RISK  
BORDER LAST REVISED 7/2/2010

**STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION**  
**CONSULTANT FUNCTIONAL SUPERVISOR**  
**DESIGNED BY:** RONALD G. DOYLE  
**CHECKED BY:**  
**DATE:**  
**REVISIONS:**

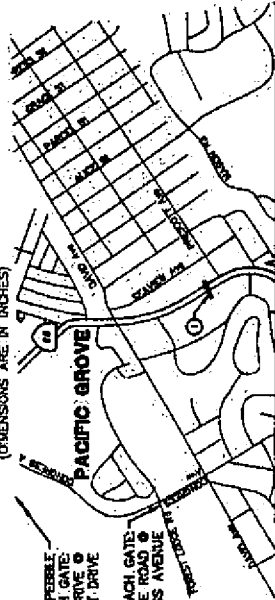
**CITY OF MONTEREY**  
 580 PACIFIC STREET  
 MONTEREY, CA 93940  
 ORANGE BACKGROUND BLACK LEGEND

**REGISTERED CIVIL ENGINEER**  
 DATE: 1/27/79  
 No. 82-118  
 CIVIL

**ROUTE:** 1, 66  
**COUNTY:** Mer  
**POST MILEAGE:** 75.1, L4.2, 70, 190.  
**PILOT POINT:**

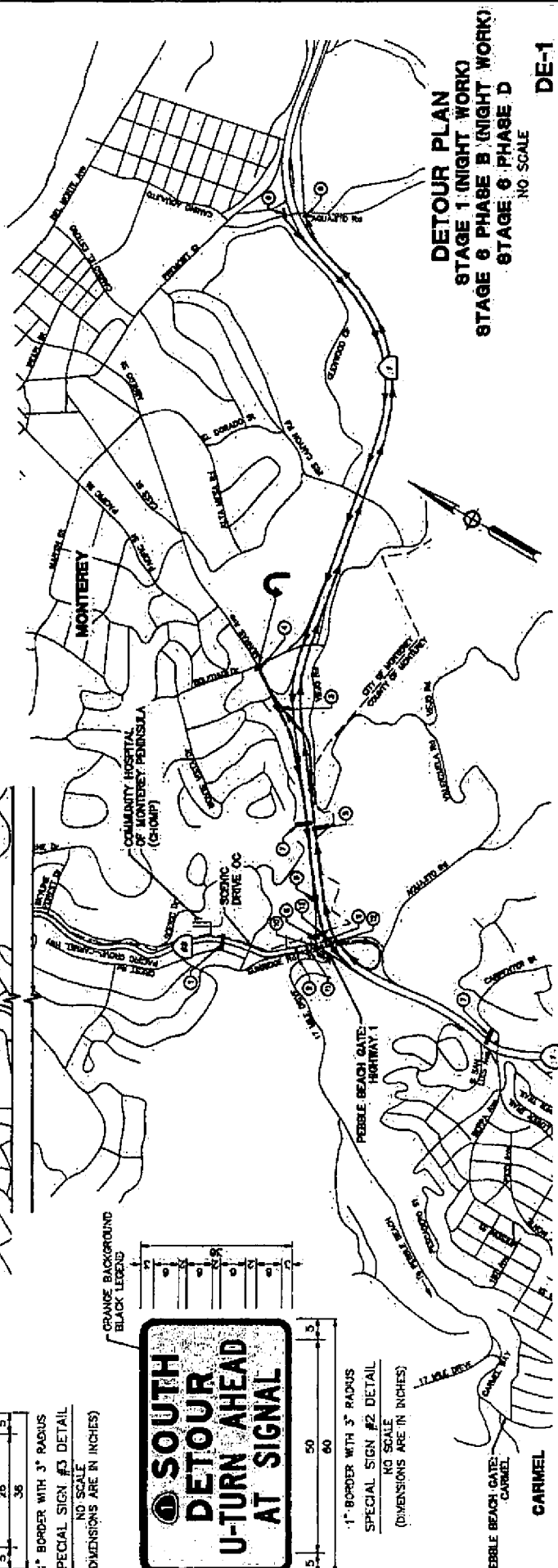
SIGN No.	SIGN CODE	SEAN MESSAGE	PANEL SIZE (L x D)	No. & SIZE OF POSTS (in)	QUANTITY
1	POMS	PANEL 1: SB ON RAMP CLOSED / USE NB ON RAMP EXIT ROUTE. PANEL 2: USE NB ON RAMP EXIT / AT MURRAS	54 x 42	2 - 4 x 4	2
2	SPECIAL #1	"SOUTH/DETOUR/ U-TURN AHEAD/ AT SIGNAL"	60 x 30	2 - 4 x 4	1
3	SPECIAL #2	"SOUTH/DETOUR/ U-TURN AHEAD/ AT SIGNAL"	30 x 36	1 - 4 x 6	1
4	POMS	PANEL 1: DETOUR / DETOUR EXIT / EXT3989 / ADULTAIO PANEL 2: ROUTE 1 (SHEILD) DETOUR (LI ARROW) PANEL 3: "17 MILE DR GATE CLOSED"	81 x 10.5 81 x 15 48 x 16	1 - 4 x 6	2
5	SPECIAL #4	"GATE CLOSED/ AT 17 MILE DR/ ACCESS FROM CONGRESS AVE"	48 x 36	1 - 4 x 6	2
6	C19-CAS	"ROAD CLOSED"	36 x 36	1 - 4 x 4	1
7	C2-CAS	"ROAD CLOSED"	36 x 24	BARRICADE	1
8	R3-1	"NO RIGHT TURN (SYMBOL)"	24 x 24	1 - 4 x 4	1
9	R3-2	"NO LEFT TURN (SYMBOL)"	24 x 24	1 - 4 x 4	1
10	M4-BA	"END DETOUR"	24 x 18	1 - 4 x 4	1

1" BORDER WITH 3" RADIUS  
 SPECIAL SIGN #1 DETAIL  
 NO SCALE  
 (DIMENSIONS ARE IN INCHES)



1" BORDER WITH 3" RADIUS  
 SPECIAL SIGN #2 DETAIL  
 NO SCALE  
 (DIMENSIONS ARE IN INCHES)

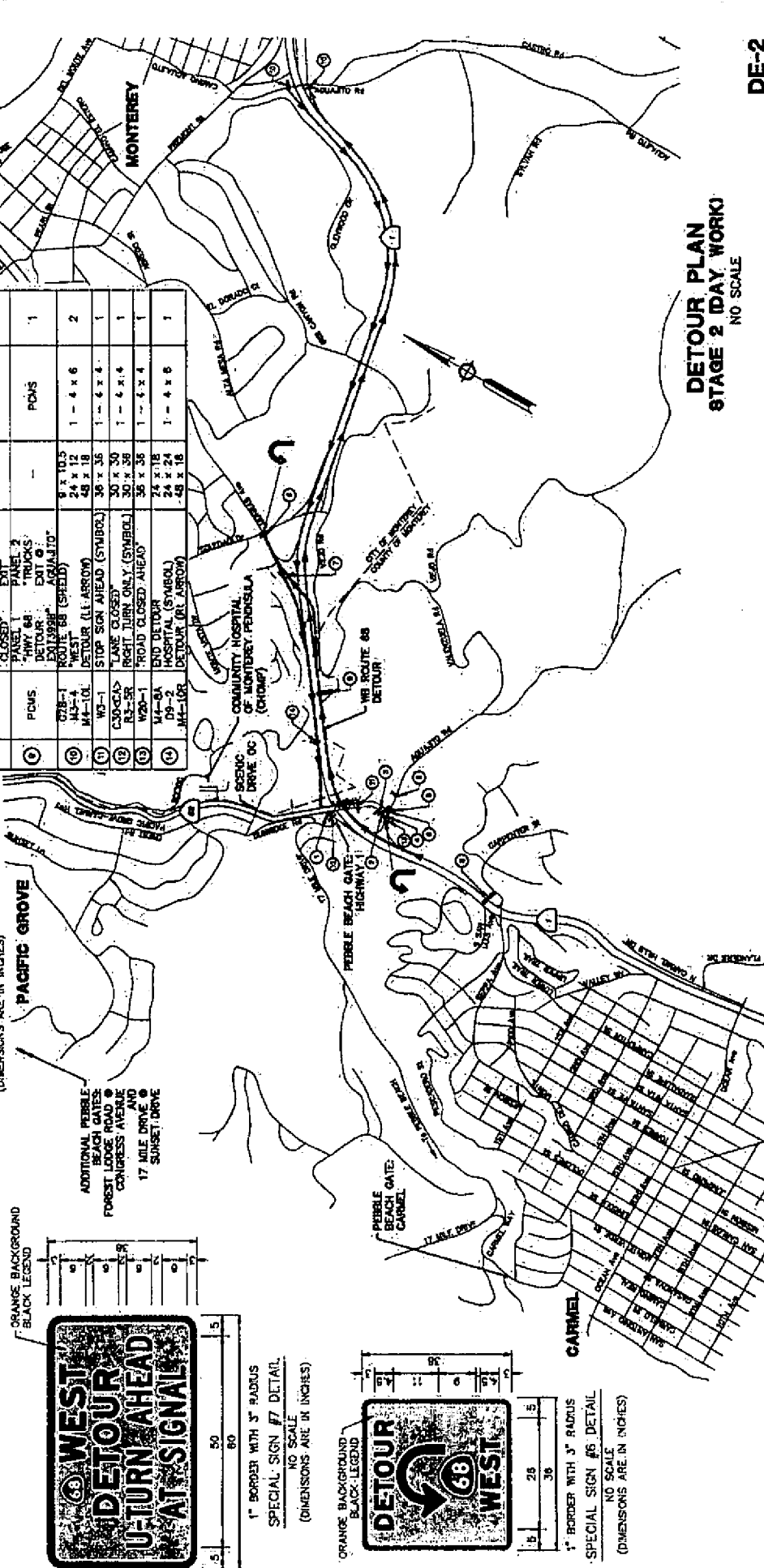
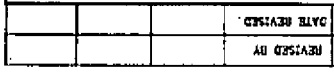
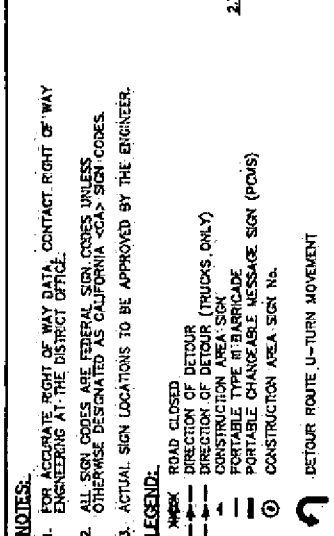
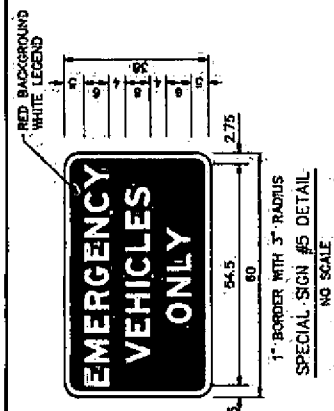
1" BORDER WITH 3" RADIUS  
 SPECIAL SIGN #3 DETAIL  
 NO SCALE  
 (DIMENSIONS ARE IN INCHES)



**DETOUR PLAN**  
**STAGE 1: NIGHT WORK**  
**STAGE 6 PHASE B (NIGHT WORK)**  
**STAGE 6 PHASE D**  
 NO SCALE  
**DE-1**

PROJECT NO.	190
DATE	7/1
PROJECT NAME	75.1, 14.2
COUNTY	Mon
ROUTE	1, 68
DESIGNED BY	David Johnson
DATE	7/1
APPROVED BY	[Signature]
CITY OF MONTEREY	540 PACIFIC STREET
	MONTEREY, CA 93940

SIGN No.	SIGN CODE	SIGN MESSAGE	PANEL SIZE (L x D)	No. & SIZE OF POSTS (G)	QUANTITY
1	R3-SR	HOSPITAL (SYMBOL)	30 x 36	1 - 4 x 6	1
2	D9-2	DETOUR (SYMBOL)	24 x 24	1 - 4 x 6	1
3	M4-LR	DETOUR (SYMBOL)	48 x 18	1 - 4 x 6	1
4	C3-CAS	ROAD CLOSED	36 x 24	BARRICADE	1
5	SPECIAL #6	EMERGENCY VEH. ONLY	60 x 36	1 - 4 x 4	1
6	R1-1	"STOP"	30 x 36	1 - 4 x 4	1
7	O1-1	"AGUAJITO" (RI. ARROW)	72 x 18	2 - 4 x 4	1
8	R3-1	NO RIGHT TURN (SYMBOL)	36 x 24	1 - 4 x 6	2
9	D9-2	HOSPITAL (SYMBOL)	24 x 24	1 - 4 x 6	2
10	M4-LR	DETOUR (SYMBOL)	48 x 18	1 - 4 x 6	2
11	SPECIAL #7	HOSPITAL (SYMBOL) U-TURN	36 x 36	1 - 4 x 6	2
12	D9-2	HOSPITAL (SYMBOL) U-TURN	24 x 24	2 - 4 x 4	1
13	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
14	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
15	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
16	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
17	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
18	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
19	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
20	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
21	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
22	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
23	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
24	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
25	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
26	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
27	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
28	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
29	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
30	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
31	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
32	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
33	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
34	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
35	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
36	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
37	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
38	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
39	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
40	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
41	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
42	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
43	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
44	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
45	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
46	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
47	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
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61	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
62	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
63	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
64	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
65	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
66	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
67	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
68	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
69	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
70	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
71	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
72	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
73	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
74	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
75	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
76	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
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78	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
79	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
80	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
81	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
82	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
83	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
84	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
85	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
86	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
87	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
88	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
89	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
90	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
91	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
92	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
93	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
94	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
95	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
96	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
97	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
98	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
99	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1
100	PCHS	RIGHT TURN WITH MESSAGE	24 x 24	PCHS	1



**DETOUR PLAN**  
**STAGE 2 (DAY WORK)**  
NO SCALE

DE-2

**STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION**

CONSULTANT FUNCTIONAL SUPERVISOR: \_\_\_\_\_  
 CHECKED BY: RONALD G. BOYLE  
 DATE REVISION: \_\_\_\_\_

**PROJECT INFORMATION**

PROJECT NO.: 66-00000542  
 SHEET NO.: 72 OF 140  
 COUNTY: MONTEREY  
 ROUTE: 1, 68  
 DATE: 7.6.1, 4.2, 7.2, 14.0

**DESIGNER INFORMATION**

DESIGNER: Daniel Johnson  
 DATE: 7/6/68  
 REGISTERED CIVIL ENGINEER: No. 600-18

**APPROVALS**

APPROVED: \_\_\_\_\_  
 DATE: \_\_\_\_\_

**PROJECT LOCATION**

CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA 93940

**WB ROUTE 68 DETOUR SIGNS**

SIGN No.	SIGN CODE	SIGN MESSAGE	PANEL SIZE (L x D)	No. & SIZE OF POSTS (ft)	QUANTITY
1	R3-SR	RIGHT TURN ONLY	30 x 36	1 - 4 x 6	1
2	M4-10R	DETOUR (RT. ARROW)	48 x 18	1 - 4 x 6	1
3	C2-CAS	ROAD CLOSED	36 x 24	BARRICADE	1
4	01-1	"AQUILATIO" (RT. ARROW)	72 x 18	2 - 4 x 4	1
5	R3-1	NO RIGHT TURN (SYMBOL)	36 x 24	1 - 4 x 6	1
6	D8-2	HOSPITAL (SYMBOL)	24 x 24	1 - 4 x 6	2
7	SPECIAL #7	WEST/DETOUR (U-TURN) HOSPITAL (SYMBOL)	36 x 36	1 - 4 x 6	1
8	P0MS	PANEL 1: "Hwy 68" "USE BRIDGE" "MURRAS" "EXIT" "CLOSED"	24 x 24	PCMS	1
9	P0MS	PANEL 2: "Hwy 68" "USE BRIDGE" "MURRAS" "EXIT" "CLOSED"	24 x 24	PCMS	1
10	G2B-1	"WEST" (SHIELD)	9 x 10.5	1 - 4 x 4	2
11	M4-10L	DETOUR (LT. ARROW)	24 x 12	1 - 4 x 4	1
12	W20-3	"ROAD CLOSED AHEAD"	36 x 36	1 - 4 x 4	1
13	M4-5A	END DETOUR	24 x 18	1 - 4 x 6	1
14	D8-2	HOSPITAL (SYMBOL)	24 x 24	1 - 4 x 6	1
15	M4-10R	DETOUR (RT. ARROW)	48 x 18	1 - 4 x 6	1

**EB ROUTE 68/17 MILE DRIVE DETOUR SIGNS**

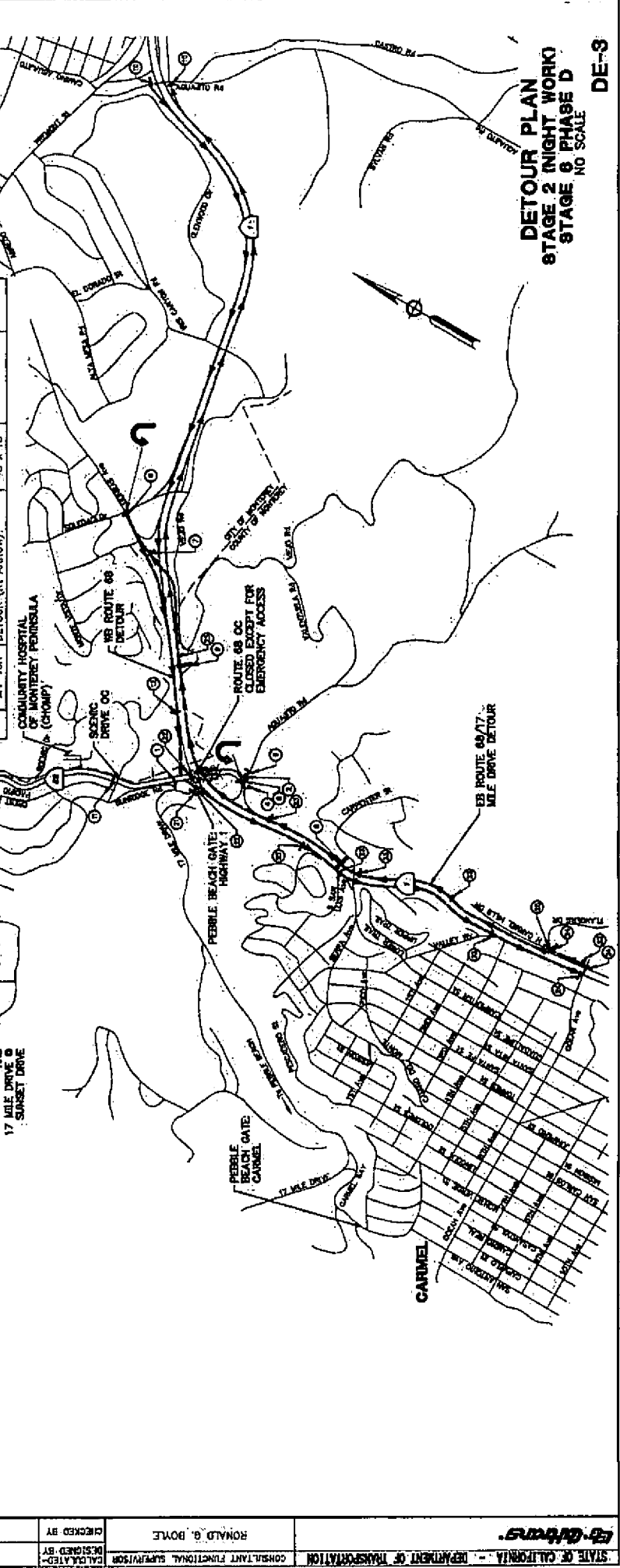
SIGN No.	SIGN CODE	SIGN MESSAGE	PANEL SIZE (L x D)	No. & SIZE OF POSTS (ft)	QUANTITY
1	R3-SR	RIGHT TURN ONLY	30 x 36	1 - 4 x 6	1
2	M4-10R	DETOUR (RT. ARROW)	48 x 18	1 - 4 x 6	1
3	C2-CAS	"ROAD CLOSED"	36 x 24	BARRICADE	2
4	D8-2	HOSPITAL (SYMBOL)	24 x 24	1 - 4 x 6	7
5	G2B-1	"WEST" (SHIELD)	9 x 10.5	1 - 4 x 4	3
6	M4-10L	DETOUR (LT. ARROW)	24 x 12	1 - 4 x 4	2
7	D8-2	HOSPITAL (SYMBOL)	24 x 24	1 - 4 x 6	2
8	M4-10R	DETOUR (RT. ARROW)	48 x 18	1 - 4 x 6	2

**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT OFFICE OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- ALL SIGN CODES ARE FEDERAL SIGN CODES UNLESS OTHERWISE DESIGNATED AS CALIFORNIA CODES.
- ACTUAL SIGN LOCATIONS TO BE APPROVED BY THE ENGINEER.
- FOR "SPECIAL SIGNS" #5, #6, AND #7 SEE SHEET DE-2.

**LEGEND:**

- MARK ROAD CLOSED
- DIRECTION OF DETOUR
- CONSTRUCTION OF DETOUR (TRUCKS ONLY)
- PORTABLE CHANGEABLE MESSAGE SIGN
- CONSTRUCTION AREA SIGN NO.
- DETOUR ROUTE U-TURN MOVEMENT



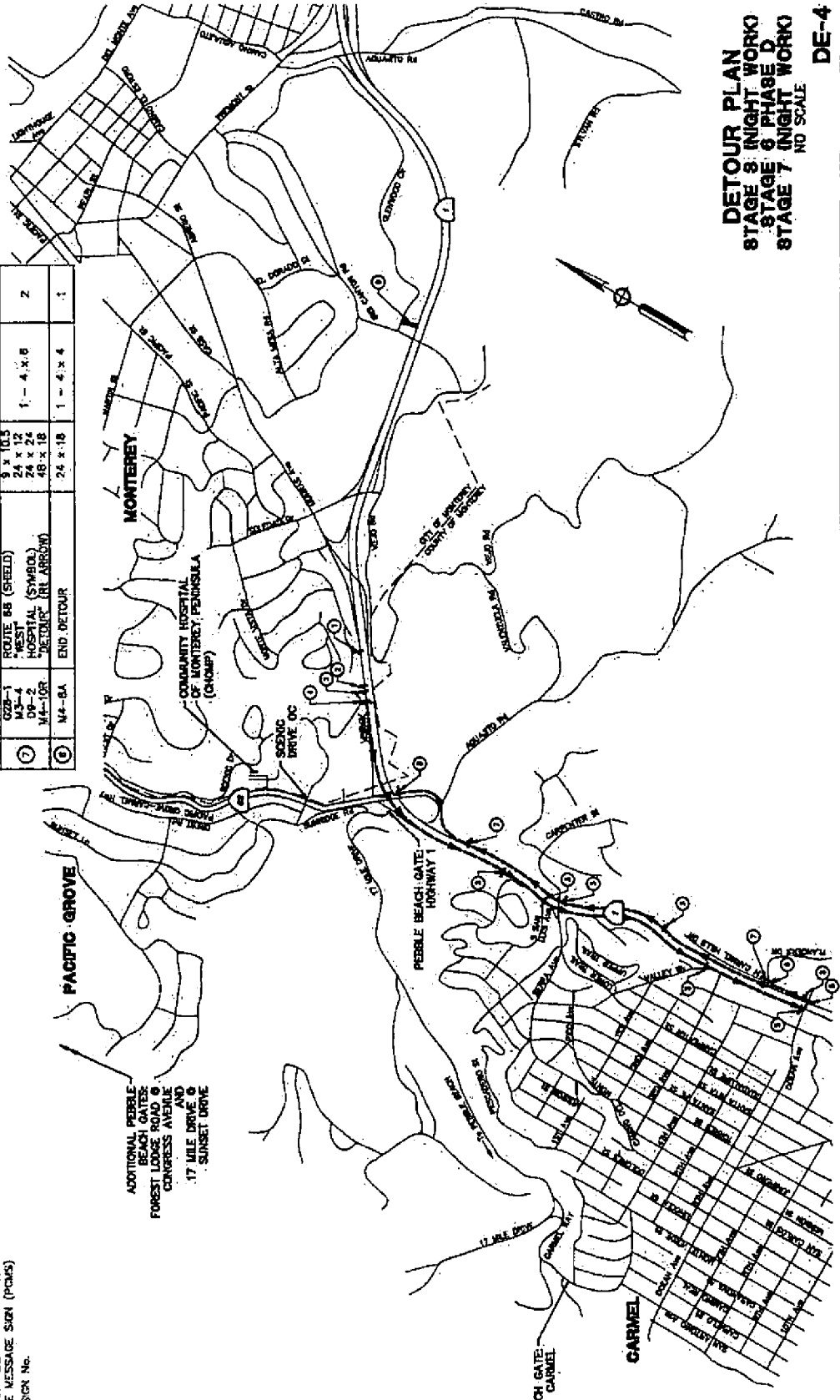
**DETOUR PLAN**  
**STAGE 2 NIGHT WORK**  
**PHASE D**  
 NO SCALE  
**DE-9**

SHEET NO. 10716  
 TOTAL SHEETS 10716, 10717, 10718, 10719  
 COUNTY: MONTEREY  
 ROUTE: 1, 88  
 DATE: 7.6.1, 1.4.2, 7.3, 190  
 REGISTERED CIVIL ENGINEER: Daniel Johnson  
 PLAN APPROVAL DATE: \_\_\_\_\_  
 CITY OF MONTEREY, CALIFORNIA  
 540 PACIFIC STREET  
 MONTEREY, CA 95578

SIGN No.	SIGN CODE	SIGN MESSAGE	PANEL SIZE (L x D)	No. & SIZE OF POSITS (No.)	QUANTITY
1	C19-CAS	RAMP CLOSED AHEAD	48 x 48	1 - 4 x 6	1
2	S08-4-CAS	RAMP CLOSED*	48 x 60	1 - 4 x 6	1
3	S08-CAS	"DETOUR" (UP ARROW) HOSPITAL (SYMBOL)	36 x 36 24 x 24	1 - 4 x 6	7
4	SPECIAL #0	EMERGENCY VEHICLES ONLY	60 x 36	BARRICADE	1
5	G28-1 M3-4 D8-2 M4-10L	ROUTE 88 (SHIELD) WEST HOSPITAL (SYMBOL) "DETOUR" (LT ARROW)	9 x 10.5 24 x 12 24 x 24 48 x 18	1 - 4 x 6	3
6	PCMS	PANEL 1: "USE" "OFF RAMP CLOSED" ROUTE PANEL 2: "USE" "OFF RAMP CLOSED" ROUTE	-	PCMS	1
7	G28-1 M3-4 D8-2 M4-10R	ROUTE 88 (SHIELD) WEST HOSPITAL (SYMBOL) "DETOUR" (RT ARROW)	9 x 10.5 24 x 12 24 x 24 48 x 18	1 - 4 x 6	2
8	M4-8A	END DETOUR	24 x 18	1 - 4 x 4	1

- NOTES:**
- FOR ACQUISITION, RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - ALL SIGN CODES ARE FEDERAL SIGN CODES UNLESS OTHERWISE DESIGNATED AS CALIFORNIA "CAS" SIGN CODES.
  - ACTUAL SIGN LOCATIONS TO BE APPROVED BY THE ENGINEER.
  - FOR "SPECIAL #0" SIGN DETAILS SEE SHEET DE-2.

- LEGEND:**
- ROAD CLOSED
  - DIRECTION OF DETOUR
  - CONSTRUCTION AREA SIGN
  - PORTABLE TYPE BARRICADE
  - PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
  - CONSTRUCTION AREA SIGN No.



**DETOUR PLAN**  
 STAGE 3: NIGHT WORK  
 STAGE 6: PHASE D  
 STAGE 7: NIGHT WORK  
 NO SCALE

DE-4



DATE	05/11/2011	COUNTY	Mon	ROUTE	1, 66	TOTAL PROJECT MILES	75.1, 1.4, 2	DATE	7.4, 190
DESIGNED BY	David K. Lee	DATE	07/29/11	PROJECT NO.	0500000542	PROJECT NAME	DETOUR PLAN	SCALE	NO SCALE
CHECKED BY		DATE		PROJECT NO.		PROJECT NAME		SCALE	

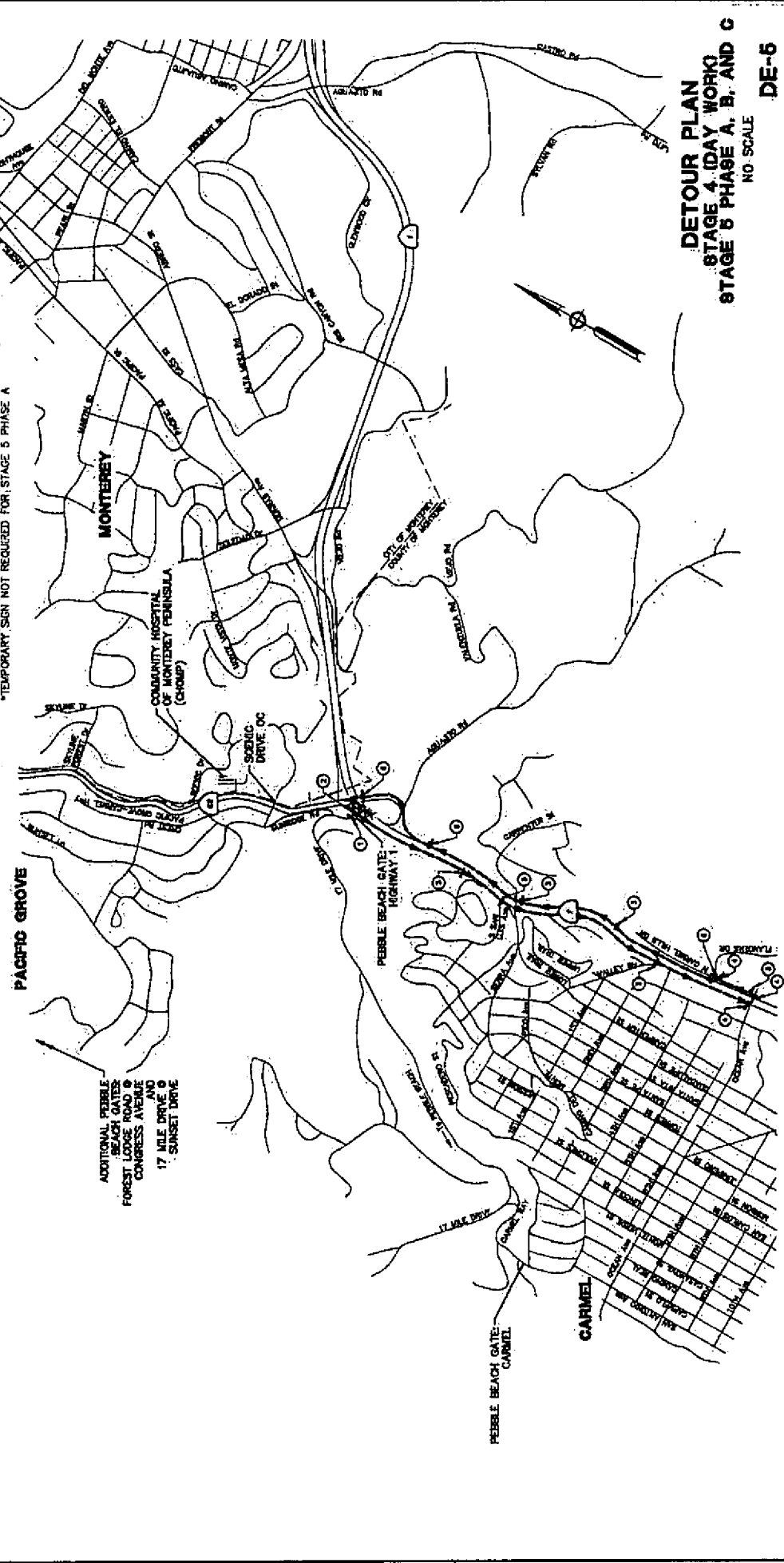
SIGN NO.	SIGN CODE	SIGN MESSAGE	PANEL SIZE (L x D)	NO. & SIZE OF POSTS (Ø)	QUANTITY
1	R13-3R	RIGHT TURN ONLY	30 x 36	1 - 4 x 6	1
2	H13-1R	HOSPITAL (SYMBOL)	24 x 24	1 - 4 x 6	1
3	D13-1R	DETOUR (RIGHT ARROW)	48 x 18	1 - 4 x 6	1
4	R12-1A	ROAD CLOSED	36 x 24	1 - 4 x 6	1
5	S12-1A	DETOUR (UP ARROW)	36 x 36	1 - 4 x 6	1
6	H12-1A	HOSPITAL (SYMBOL)	24 x 24	1 - 4 x 6	1
7	D12-1A	DETOUR (L.I. ARROW)	48 x 18	1 - 4 x 6	1
8	R12-1A	DETOUR (R.I. ARROW)	48 x 18	1 - 4 x 6	1
9	M1-1A	END DETOUR	24 x 18	1 - 4 x 4	1

NOTES:

- FOR ACCURATE 'RIGHT OF WAY' DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- ALL SIGN CODES ARE FEDERAL SIGN CODES UNLESS OTHERWISE DESIGNATED AS CALIFORNIA (CAS) SIGN CODES.
- ACTUAL SIGN LOCATIONS TO BE APPROVED BY THE ENGINEER.

LEGEND:

- ROAD CLOSED
- DIRECTION OF DETOUR
- CONSTRUCTION AREA SIGN
- PORTABLE TYPE "B" BARRICADE
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- CONSTRUCTION AREA SIGN NO.



**DETOUR PLAN**  
**STAGE 4, 5 DAY WORK**  
**STAGE 6 PHASE A, B, AND C**  
 NO SCALE  
**DE-6**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	ROMAN G. BOYLE	CHECKED BY	DATE REVISION
PROJECT NUMBER & PHASE	INT	PROJECT NUMBER & PHASE	CAO	RISK
REVISIONS	REVISIONS	REVISIONS	REVISIONS	REVISIONS

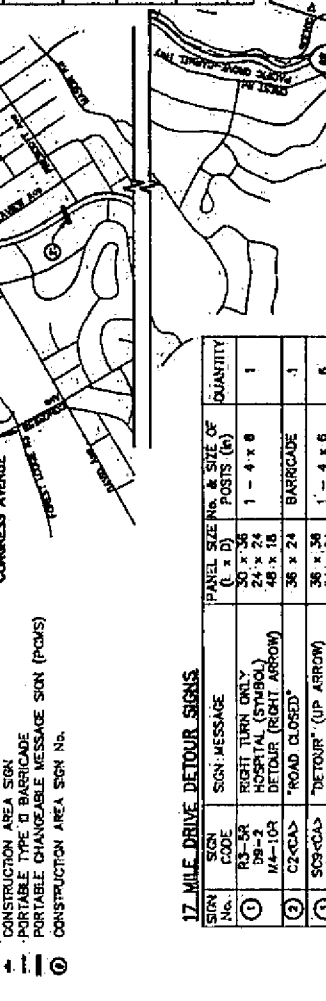
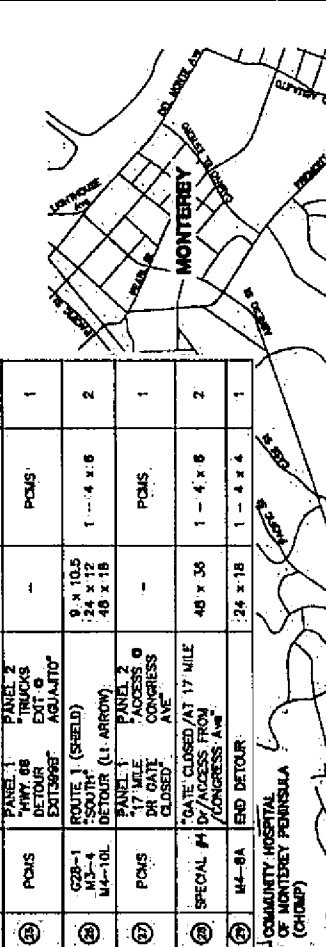
SHEET NO. 105  
 COUNTY Monterey  
 DATE 1. 68  
 PROJECT 75.1, 1.4.2  
 SCALE 1/4" = 1'

REGISTERED CIVIL ENGINEER  
 DATE  
 REGISTERED CIVIL ENGINEER

CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA 95960

SIGN No.	SIGN CODE	SIGN MESSAGE	PANEL SIZE (L x D)	No. & SIZE OF POSTS (h)	QUANTITY
21	POMS	PANEL 1 "HWY SB ON RAMP CLOSED"	-	POMS	2
22	SPECIAL #1	"SB ON RAMP CLOSED / USE NB ON RAMP EXT AT MUNRAS"	54 x 42	2 - 4 x 4	1
23	SPECIAL #2	"SOUTH/DETOUR / U-TURN AHEAD AT SIGNAL"	60 x 30	2 - 4 x 4	1
24	SPECIAL #3	"DETOUR U-TURN (SYMBOL)"	38 x 38	1 - 4 x 6	1
25	POMS	PANEL 1 "HWY 68 TRUCKS DETOUR EXITS 9987"	-	POMS	1
26	G2B-1 M3-4 M4-10L	ROUTE 1 (SHIELD) "SOUTH" DETOUR (LI. ARROW)	9 x 10.5 24 x 12 48 x 18	1 - 4 x 6	2
27	POMS	PANEL 2 "17 MILE DRIVE ACCESS DR GATE CLOSED"	-	POMS	1
28	SPECIAL #4	"GATE CLOSED AT 17 MILE DRIVE / ACCESS FROM CONGRESS AVE"	48 x 36	1 - 4 x 6	2
29	M4-8A	END DETOUR	24 x 18	1 - 4 x 4	1

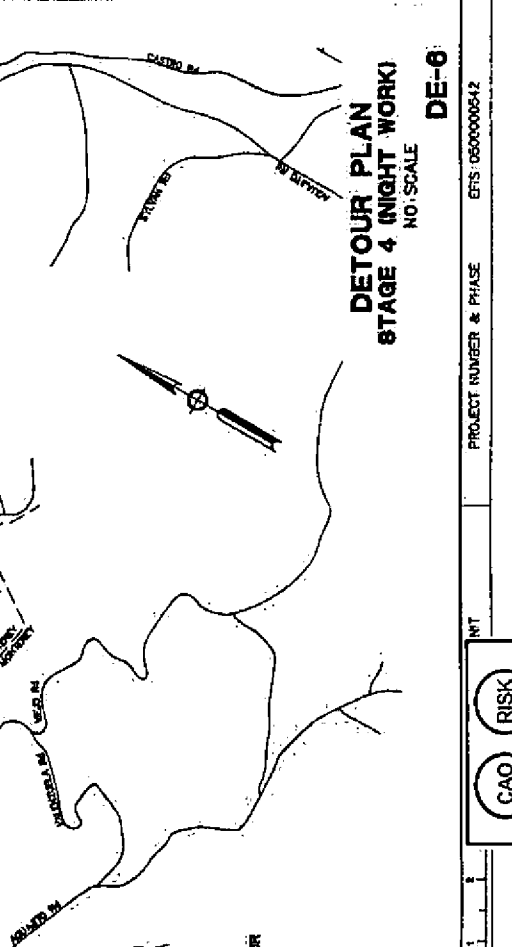
**SB ROUTE 1 DETOUR SIGNS:**  
 SIGN No. SIGN CODE SIGN MESSAGE PANEL SIZE (L x D) No. & SIZE OF POSTS (h) QUANTITY  
 21 POMS PANEL 1 "HWY SB ON RAMP CLOSED" - POMS 2  
 22 SPECIAL #1 "SB ON RAMP CLOSED / USE NB ON RAMP EXT AT MUNRAS" 54 x 42 2 - 4 x 4 1  
 23 SPECIAL #2 "SOUTH/DETOUR / U-TURN AHEAD AT SIGNAL" 60 x 30 2 - 4 x 4 1  
 24 SPECIAL #3 "DETOUR U-TURN (SYMBOL)" 38 x 38 1 - 4 x 6 1  
 25 POMS PANEL 1 "HWY 68 TRUCKS DETOUR EXITS 9987" - POMS 1  
 26 G2B-1 M3-4 M4-10L ROUTE 1 (SHIELD) "SOUTH" DETOUR (LI. ARROW) 9 x 10.5 24 x 12 48 x 18 1 - 4 x 6 2  
 27 POMS PANEL 2 "17 MILE DRIVE ACCESS DR GATE CLOSED" - POMS 1  
 28 SPECIAL #4 "GATE CLOSED AT 17 MILE DRIVE / ACCESS FROM CONGRESS AVE" 48 x 36 1 - 4 x 6 2  
 29 M4-8A END DETOUR 24 x 18 1 - 4 x 4 1



**17 MILE DRIVE DETOUR SIGNS**

SIGN No.	SIGN CODE	SIGN MESSAGE	PANEL SIZE (L x D)	No. & SIZE OF POSTS (h)	QUANTITY
30	R3-SR	RIGHT TURN ONLY	30 x 36	1 - 4 x 8	1
31	D8-2	HOSPITAL (SYMBOL)	24 x 24	1 - 4 x 8	1
32	M4-10R	DETOUR (RIGHT ARROW)	48 x 18	1 - 4 x 8	1
33	C2-CAS	"ROAD CLOSED"	36 x 24	BARRICADE	1
34	S2C-CAS	"DETOUR" (UP ARROW)	36 x 24	1 - 4 x 6	6
35	D9-2	HOSPITAL SYMBOL	24 x 24	1 - 4 x 8	3
36	G2B-1	ROUTE 68 (SHIELD)	9 x 10.5	1 - 4 x 8	1
37	D8-2	HOSPITAL (SYMBOL)	24 x 24	1 - 4 x 8	1
38	M4-10L	"DETOUR" (LI. ARROW)	48 x 18	1 - 4 x 8	2
39	G2B-1	ROUTE 68 (SHIELD)	9 x 10.5	1 - 4 x 6	2
40	D8-2	HOSPITAL (SYMBOL)	24 x 24	1 - 4 x 6	1
41	M4-10R	"DETOUR" (RI. ARROW)	48 x 18	1 - 4 x 4	1
42	M4-8A	END DETOUR	24 x 18	1 - 4 x 4	1

**NOTES:**  
 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.  
 2. ALL SIGN CODES ARE FEDERAL SIGN CODES UNLESS OTHERWISE DESIGNATED AS CALIFORNIA C-CAS SIGN CODES.  
 3. ACTUAL SIGN LOCATIONS TO BE APPROVED BY THE ENGINEER.  
 4. FOR "SPECIAL SIGNS" #1, #2, #3, AND #4 SEE DE-1, DE-2, DE-3, DE-4, DE-5, DE-6, DE-7, DE-8, DE-9, DE-10, DE-11, DE-12, DE-13, DE-14, DE-15, DE-16, DE-17, DE-18, DE-19, DE-20, DE-21, DE-22, DE-23, DE-24, DE-25, DE-26, DE-27, DE-28, DE-29, DE-30, DE-31, DE-32, DE-33, DE-34, DE-35, DE-36, DE-37, DE-38, DE-39, DE-40, DE-41, DE-42, DE-43, DE-44, DE-45, DE-46, DE-47, DE-48, DE-49, DE-50, DE-51, DE-52, DE-53, DE-54, DE-55, DE-56, DE-57, DE-58, DE-59, DE-60, DE-61, DE-62, DE-63, DE-64, DE-65, DE-66, DE-67, DE-68, DE-69, DE-70, DE-71, DE-72, DE-73, DE-74, DE-75, DE-76, DE-77, DE-78, DE-79, DE-80, DE-81, DE-82, DE-83, DE-84, DE-85, DE-86, DE-87, DE-88, DE-89, DE-90, DE-91, DE-92, DE-93, DE-94, DE-95, DE-96, DE-97, DE-98, DE-99, DE-100.



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 CHECKED BY  
 REVISIONS BY  
 DATE REVISION

R. G. BOYLE  
 R. G. BOYLE

PROJECT NUMBER & PHASE  
 PROJECT NUMBER & PHASE  
 PROJECT NUMBER & PHASE

ETS 050000642  
 DE-6  
 DETOUR PLAN  
 STAGE 4 (NIGHT WORK)  
 NO. SCALE

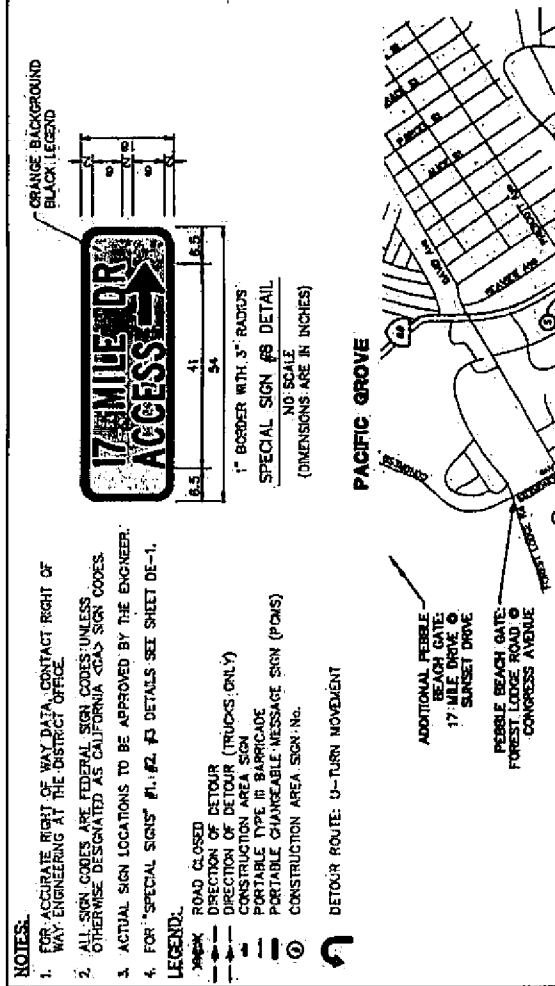
CAO RISK

Agreement #: Ag-5377 - Page 568 of 791

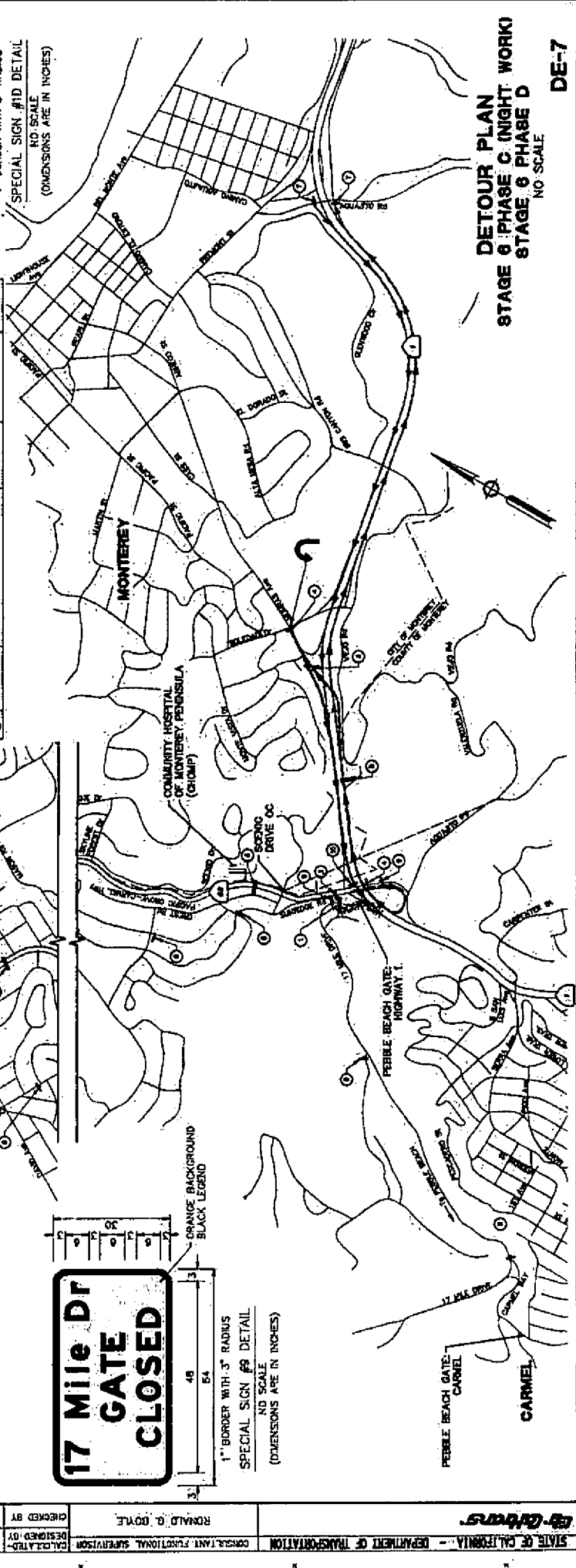


DATE	1/18/88	ROUTE	78.1, 14.2, 178, 190	PANEL TOTALS	NO. SHEETS
DESIGNED BY	DAVID J. BOYLE	COUNTY	MON	NO. PANELS	178
CHECKED BY	DAVID J. BOYLE	PROJECT NO.	78.1, 14.2, 178, 190	NO. SHEETS	178
DATE REVISION		REGISTERED CIVIL ENGINEER		DATE	

SIGN NO.	SIGN CODE	SIGN MESSAGE	PANEL SIZE (L x W x D)	NO. & SIZE OF POSTS (ft)	QUANTITY
1	PCMS	PANEL 1 "17 MILE DR." GATE CLOSED	54 x 42	2 - 4 x 4	1
2	SPECIAL #1	"ON RAMP CLOSED" "USE NB ON RAMP EXIT" "AT MURRAS"	54 x 18	2 - 4 x 4	1
3	SPECIAL #2	"SOUTH DETOUR/SIGNAL" "U-TURN AHEAD/AT SIGNAL"	60 x 30	2 - 4 x 4	1
4	SPECIAL #3	"DETOUR-U-TURN (S/SHOULDER)" "SYMBOL/SOUTH"	36 x 36	1 - 4 x 6	2
5	PCMS	PANEL 1 "Hwy 58" "ON RAMP ROUTE" CLOSED	-	PCMS	2
6	PCMS	PANEL 2 "Hwy 58" "TRUCKS" "EXTENDING" "AHEAD"	-	PCMS	1
7	G28-1 M3-4 M4-10L	ROUTE 1 (SHIELD) "SOUTH" DETOUR (LT ARROW)	9 x 10.5 24 x 12 46 x 18	1 - 4 x 6	2
8	SPECIAL #4	"17 MILE DR./GATE" CLOSED	54 x 30	1 - 4 x 6	6
9	SPECIAL #5	"SB ON RAMP CLOSED" "USE NB ON RAMP EXIT" "AT MURRAS"	54 x 42	2 - 4 x 4	1
10	M4-9A	END DETOUR	24 x 18	1 - 4 x 4	1



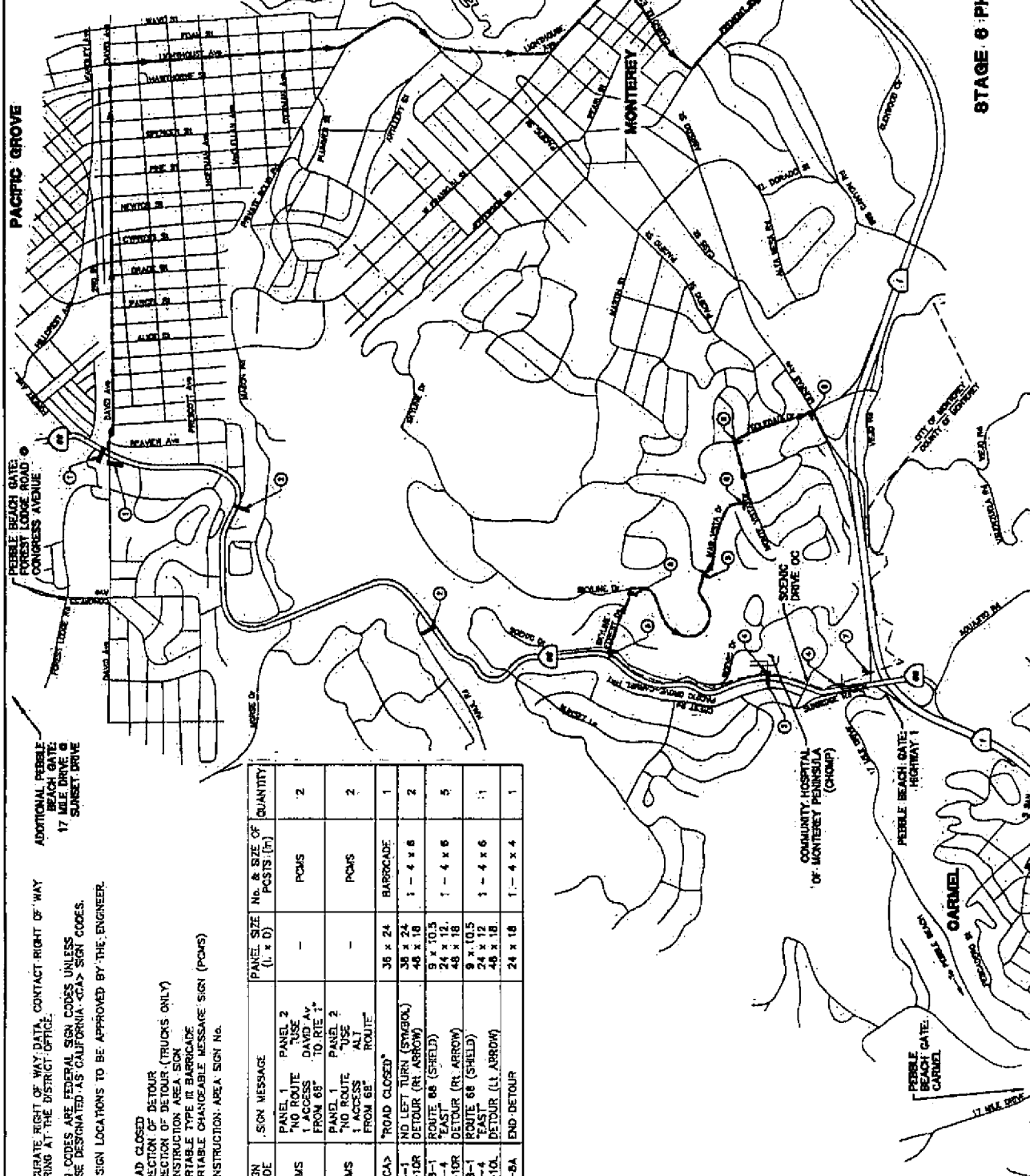
REVISED BY	DATE REVISION
DESIGNED BY	DESIGNED BY
CHECKED BY	CHECKED BY



**PLANS APPROVAL DATE**  
 DATE: 7.5.1.14.2  
 REGISTERED CIVIL ENGINEER: David Johnson  
 PROJECT NO: 05  
 SHEET NO: 177  
 TOTAL SHEETS: 190  
 COUNTY: Monterey  
 ROUTE: 1, 68  
 PROJECT TITLE: PEPPER BEACH GATE, BEACH GATE, 17 MILE DRIVE & SUNSET DRIVE

**PLANS APPROVAL DATE**  
 DATE: 7.5.1.14.2  
 REGISTERED CIVIL ENGINEER: David Johnson  
 PROJECT NO: 05  
 SHEET NO: 177  
 TOTAL SHEETS: 190  
 COUNTY: Monterey  
 ROUTE: 1, 68  
 PROJECT TITLE: PEPPER BEACH GATE, BEACH GATE, 17 MILE DRIVE & SUNSET DRIVE

**CITY OF MONTEREY**  
 380 PACIFIC STREET  
 MONTEREY, CA 93940



- NOTES:**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - ALL SIGN CODES ARE FEDERAL SIGN CODES UNLESS OTHERWISE DESIGNATED AS CALIFORNIA - (CA) - SIGN CODES.
  - ACTUAL SIGN LOCATIONS TO BE APPROVED BY THE ENGINEER.
- LEGEND:**
- ROAD CLOSED
  - DIRECTION OF DETOUR (TRUCKS ONLY)
  - CONSTRUCTION AREA SIGN
  - PORTABLE TYPE BARRIAGE
  - PORTABLE CHANGEABLE MESSAGE SIGN (POMS)
  - CONSTRUCTION AREA SIGN NO.

SIGN NO.	SIGN CODE	SIGN MESSAGE	PANEL SIZE (L x W)	NO. & SIZE OF POSTS (IN)	QUANTITY
1	POMS	PANEL 1 NO ROUTE DIVERGENCE FROM 68 TO RTE 1	-	POMS	2
2	POMS	PANEL 2 "NO ROUTE DIVERGENCE FROM 68 TO RTE 1"	-	POMS	2
3	C2-CA	"ROAD CLOSED"	36 x 24	BARRIAGE	1
4	R3-1	"NO LEFT TURN (STAGIONA)"	36 x 24	1 - 4 x 6	2
5	M4-10R	DETOUR (RI. ARROW)	48 x 18	1 - 4 x 6	5
6	G2B-1	ROUTE 68 (SHIELD)	9 x (10.5)	1 - 4 x 6	5
7	M3-4	DETOUR (RI. ARROW)	24 x 12	1 - 4 x 6	1
8	G2B-1	ROUTE 68 (SHIELD)	9 x (10.5)	1 - 4 x 6	1
9	M3-4	DETOUR (LI. ARROW)	24 x 12	1 - 4 x 6	1
10	M4-10L	DETOUR (LI. ARROW)	48 x 18	1 - 4 x 6	1
11	M4-6A	END DETOUR	24 x 18	1 - 4 x 4	1

**DETOUR PLAN**  
**STAGE 6 PHASE D (EB ROUTE 68 DETOUR)**  
 NO SCALE

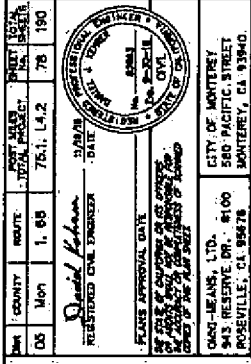
DE-8



DATE	1. 88	ROUTE	1. 88	PROJECT NO.	78
DESIGNED BY	1. 88	DATE	7/21, 1/4, 2	PROJECT NO.	190

**DESIGNER:** Daniel Johnson  
 REGISTERED CIVIL ENGINEER  
 515/878-1111  
 1000 S. GARDEN AVENUE, SUITE 100  
 ANAHEIM, CALIFORNIA 92805

**APPROVAL:**  
 CITY OF MONTEREY  
 543 RESERVE DR., #100  
 ROSELLE, CA 95078



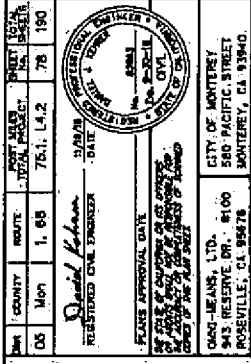
**MONTEREY BAY**  
**MONTEREY REGIONAL AIRPORT**

**DETOUR PLAN**  
**ALTERNATIVE ROUTES**  
 SCALE 1"=1000'  
**DE-9**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL DESCRIPTION	DESIGNED BY	REVISOR	DATE REVISOR
		RONALD G. BOYLE		

**LEGEND:**  
 - - - - - PROPOSED DETOUR ROUTE  
 - - - - - ALTERNATIVE ROUTE  
 (1) ALTERNATIVE ROUTE #

**ALTERNATIVE ROUTE DESCRIPTIONS:**  
 (1) MONTEZ AVENUE TO SOLEDAD DRIVE TO MONTE VISTA TO MAR VISTA DRIVE TO SKYLARK DRIVE TO SKYLARK FOREST DRIVE  
 (2) FREMONT STREET TO CAMINO EL ESTERO TO DEL MONTE AVENUE TO LIGHTHOUSE AVENUE TO DAVID AVENUE  
 (3) DEL MONTE AVENUE TO LIGHTHOUSE AVENUE TO DAVID AVENUE  
 (4) AGUAJITO ROAD TO FREMONT STREET  
 (5) AGUAJITO ROAD TO MORILLAN ROAD TO OLIVAST STREET  
 (6) OCEAN AVENUE TO SAN ANTONIO AVENUE TO GABRIEL AVENUE



PACIFIC GROVE  
 MONTEREY  
 CARMEL  
 MONTEREY REGIONAL AIRPORT

SCENIC DRIVE, OC  
 PEBBLE BEACH GATE: HIGHWAY 1  
 PEBBLE BEACH GATE: CARMEL

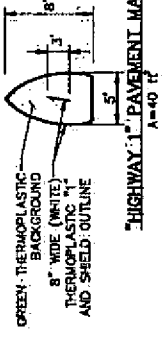
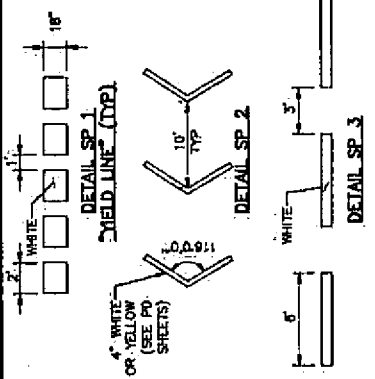
BORDER LAST REVISED 7/27/2010  
 UTM ZONE 10N  
 PROJECT NUMBER & PHASE: ETS 0500000542  
 NIT  
 RISK  
 CAO

Agreement #: Ag-5377 - Page 571 of 791

Sheet No.	DATE	BY	SCALE	TOTAL SHEETS	SHEET NO.
05	1. 88	75.1	L.4.2	79	180

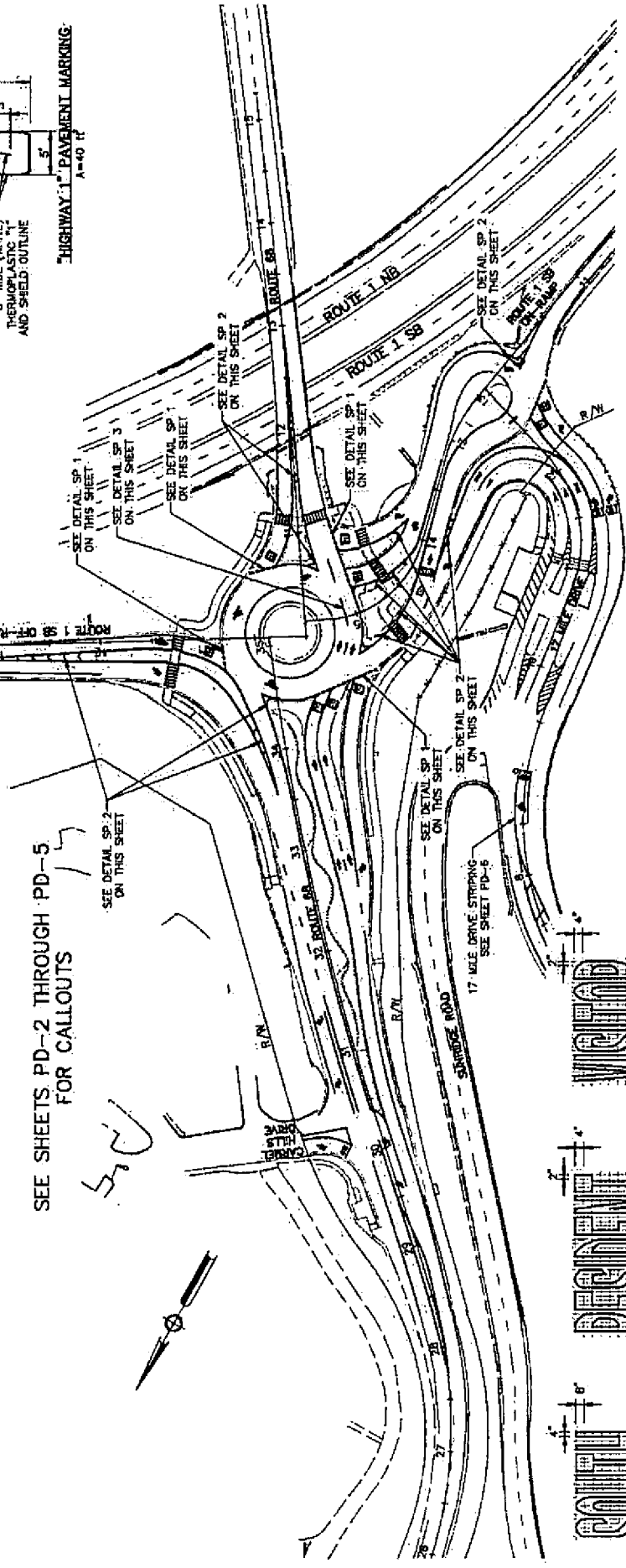
  

REGISTERED CIVIL ENGINEER	DATE
PLANS APPROVAL DATE	
CITY OF MONTREY 943 RESERVE DR. #100 ROSELVILLE, CA 95478	



- NOTES (ALL PD SHEETS)**
- 1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT-OF-WAY ENGINEERING AT THE DISTRICT OFFICE.
- LEGEND:**
- (X) THERMOPLASTIC TRAFFIC STRIPE
  - (X) EXISTING TRAFFIC STRIPE
  - (L) THERMOPLASTIC PAVEMENT MARKING (LIMIT LINE)
  - (CP) THERMOPLASTIC PAVEMENT MARKING (CROSSWALK)
  - (CH) THERMOPLASTIC PAVEMENT MARKING (CROSSWALK) (SEE DETAIL ON PD-6)
  - (ST) YIELD LINE PAVEMENT MARKING PER DETAIL ON THIS SHEET
  - (ST) TRAFFIC STRIPE PER DETAIL ON THIS SHEET
  - (ST) 4" YELLOW DIAGONAL TRAFFIC STRIPE (SEE DETAIL ON PD-6)
  - (L) LIMIT OF STRIPING PATTERN
  - (A) ANGLE POINT
  - (T) TANGENT POINT
  - (H) TYPE H PAVEMENT MARKER AT MEDIAN NOSE (3 MARKERS EACH LOCATION)
- FOR CALLOUTS:**
- STOP THERMOPLASTIC PAVEMENT MARKING
  - YIELD THERMOPLASTIC PAVEMENT MARKING
  - ONLY THERMOPLASTIC PAVEMENT MARKING
  - KEEP THERMOPLASTIC PAVEMENT MARKING
  - CLEAR THERMOPLASTIC PAVEMENT MARKING
  - SOUTH THERMOPLASTIC PAVEMENT MARKING
  - NORTH THERMOPLASTIC PAVEMENT MARKING
  - LEFT THERMOPLASTIC PAVEMENT MARKING
  - RIGHT THERMOPLASTIC PAVEMENT MARKING
  - RESIDENT THERMOPLASTIC PAVEMENT MARKING
  - VISITOR THERMOPLASTIC PAVEMENT MARKING
  - TYPE I (10') ARROW THERMOPLASTIC PAVEMENT MARKING
  - TYPE IV ARROW THERMOPLASTIC PAVEMENT MARKING
  - TYPE VI ARROW THERMOPLASTIC PAVEMENT MARKING
  - HIGHWAY 1 THERMOPLASTIC PAVEMENT MARKING
  - DELIMITER (CLASS 1, TYPE F)
  - OBJECT MARKER (CLASS 1, TYPE K-1)

SEE SHEETS PD-2 THROUGH PD-5 FOR CALLOUTS



**PAVEMENT DELINEATION**  
SCALE 1"=50'


PD-1

THIS PLAN ACCURATE FOR PAVEMENT DELINEATION ONLY

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	REVISIONS	DATE
ROBERT LAST REVISED 7/1/2010	RONALD G. BOYLE		

CAO RISK

NO.	ROUTE	TOTAL LENGTH	SHEET NUMBER
06	Mon 1, 08	761, 14.2	80 / 190

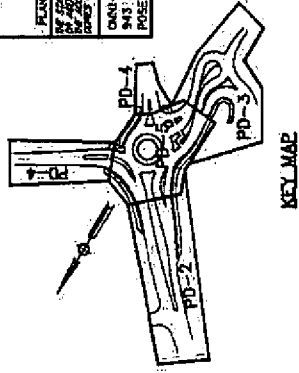
REGISTERED CIVIL ENGINEER: 

DATE: 7/27/2010

PLANS APPROVAL DATE: \_\_\_\_\_

CITY OF MONTEREY  
943 RESERVE DR. #100  
POSEVILLE, CA 95678

MONTEREY, CA 93840

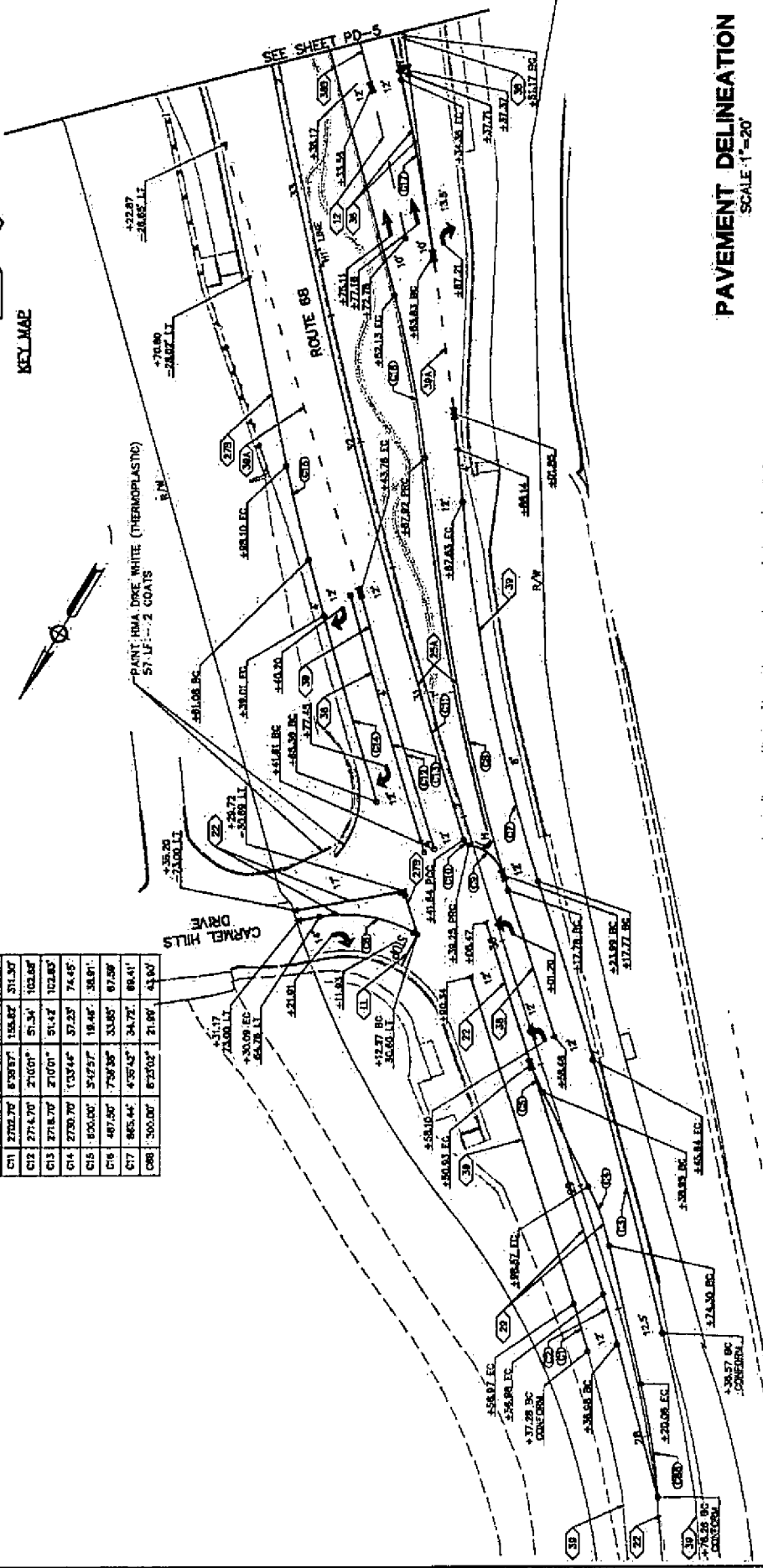


**CURVE TABLE**

No.	R.	DELTA	T	L
C1	42.50'	270°45'	8.48'	18.96'
C2	444.30'	2°35'12"	9.00'	10.80'
C3	3451.70'	2°02'14"	61.37'	122.73'
C4	1003.30'	1°53'45"	12.23'	24.34'
C5	85.80'	100°1'48"	8.17'	16.34'
C6	704.00'	120°0'12"	74.88'	149.35'
C7	718.00'	107°0'50"	85.47'	170.94'
C8	112.22'	82°29'10"	10.43'	20.86'
C9	2702.70'	8°58'07"	158.82'	317.50'
C10	2774.70'	2°10'01"	51.34'	102.68'
C11	2718.70'	1°33'44"	37.23'	74.45'
C12	800.00'	5°42'57"	19.46'	38.91'
C13	487.50'	4°55'42"	24.72'	49.44'
C14	500.00'	8°25'02"	21.89'	43.78'

**NOTE:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR PAVEMENT DELINEATION NOTES AND LEGEND, SEE SHEET PD-1.



**PAVEMENT DELINEATION**  
SCALE: 1"=20'

PD-2

THIS PLAN ACCURATE FOR PAVEMENT DELINEATION ONLY

CAO RISK

RELATIVE BENCH SCALE: 1"=100'

Agreement #: Ag-5377 - Page 573 of 791

DATE LAST REVISED 7/27/2010

PROJECT NUMBER & PHASE: ETS 0500006542

DESIGNED BY	RODOLFO G. BOYLE
CHECKED BY	
DATE REVISED	

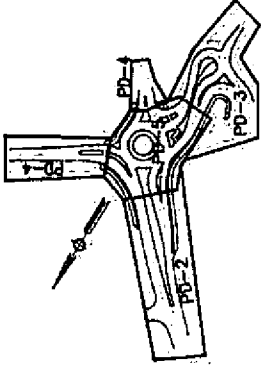
NO.	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
05	Mon	1, 68	75.1, 1.4, 2	81	190

REGISTERED CIVIL ENGINEER

DATE: 11/27/07

SCALE: 1" = 20'

CITY OF MONTEREY  
943 RESERVE DR. #100  
ROSSVILLE, CA 95078

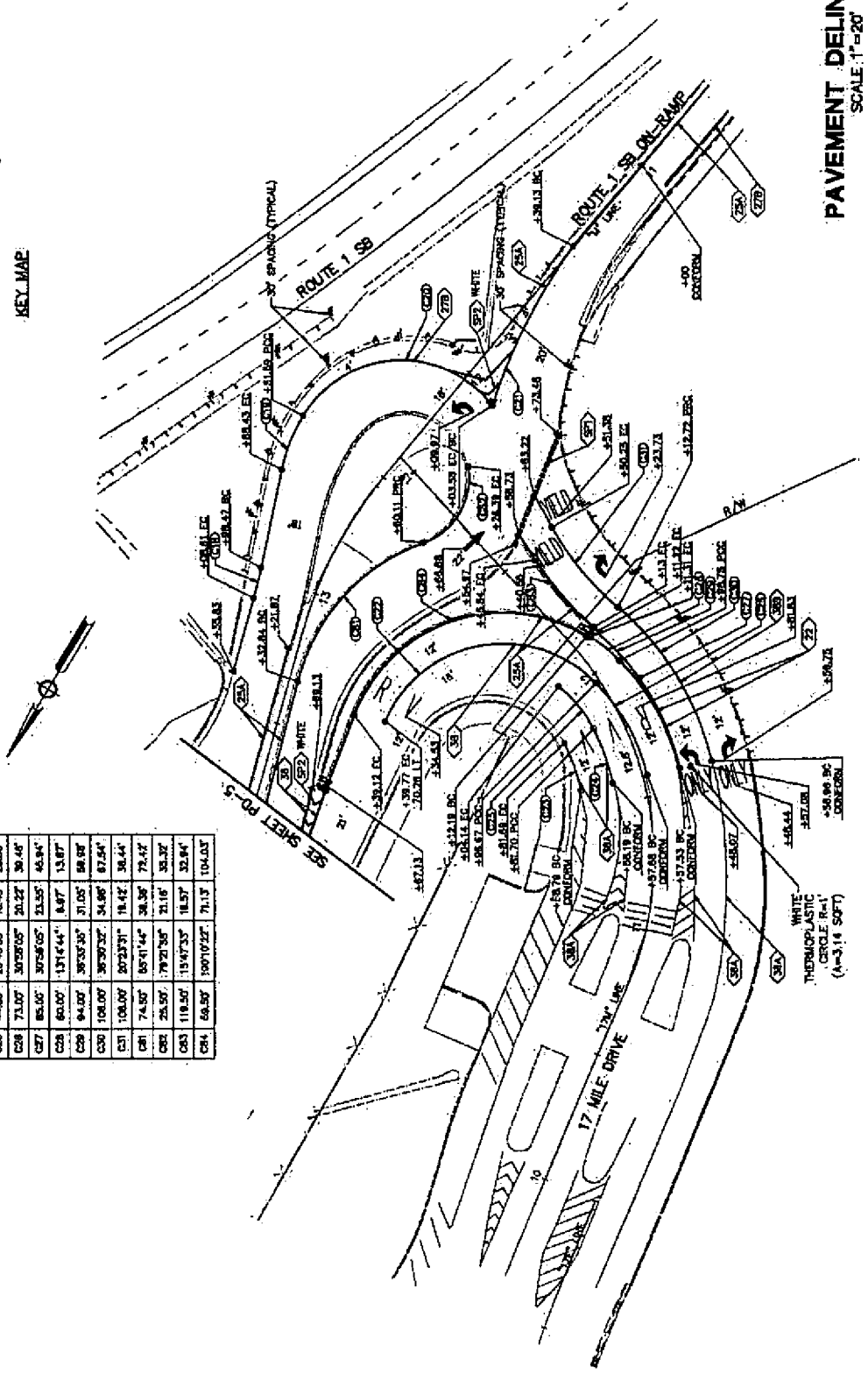


SEE SHEET PD-5

NO.	R.	DELTA	T	L
C18	182.00'	3°40'37"	5.64'	51.68'
C19	83.00'	19°35'37"	10.06'	21.54'
C20	43.00'	107°28'00"	61.08'	62.90'
C21	230.00'	17°16'05"	33.42'	86.33'
C22	48.00'	112°04'10"	71.28'	63.89'
C23	78.00'	153°01'5"	8.31'	18.24'
C24	50.00'	13°38'33"	10.74'	21.38'
C25	44.00'	85°43'37"	10.45'	20.53'
C26	71.00'	30°59'05"	20.22'	36.48'
C27	85.00'	37°58'05"	33.50'	44.94'
C28	62.00'	131°4'44"	8.87'	13.87'
C29	94.00'	38°35'30"	31.05'	66.07'
C30	108.00'	38°39'32"	34.96'	87.54'
C31	108.00'	202°33'31"	18.42'	38.44'
C32	74.50'	85°41'44"	38.36'	79.12'
C33	25.50'	78°21'38"	21.16'	33.32'
C34	118.50'	15°47'33"	18.37'	32.94'
C35	59.50'	100°10'22"	71.17'	104.03'

**NOTE.**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR PAVEMENT DELINEATION NOTES AND LEGEND SEE SHEET PD-1.



**PAVEMENT DELINEATION**  
SCALE: 1"=20'

PD-3

PROJECT NUMBER & PHASE: E75 0500000542

THIS PLAN ACCURATE FOR PAVEMENT DELINEATION ONLY

CAO RISK

RELATIVE BRIDGE SCALE: 1" = 10' HIGHER

Agreement #: Ag-5377 - Page 574 of 791

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G. BOYLE	CHECKED BY
DATE REVISION	REVISION BY		

DATE	COUNTY	ROUTE	MILE	POST MILE	POST MILE
08	Mer.	1, 68	75.1	1.4.2	82 190

REGISTERED CIVIL ENGINEER  
 DATE: 11/27/75  
 EXPIRES: 11/27/80  
 CIVIL ENGINEER - 11111  
 CIVIL ENGINEER - 11111

PLANS APPROVAL DATE: 11/27/75  
 BY: [Signature]  
 CIVIL ENGINEER - 11111  
 CIVIL ENGINEER - 11111

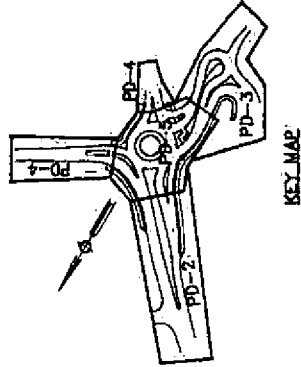
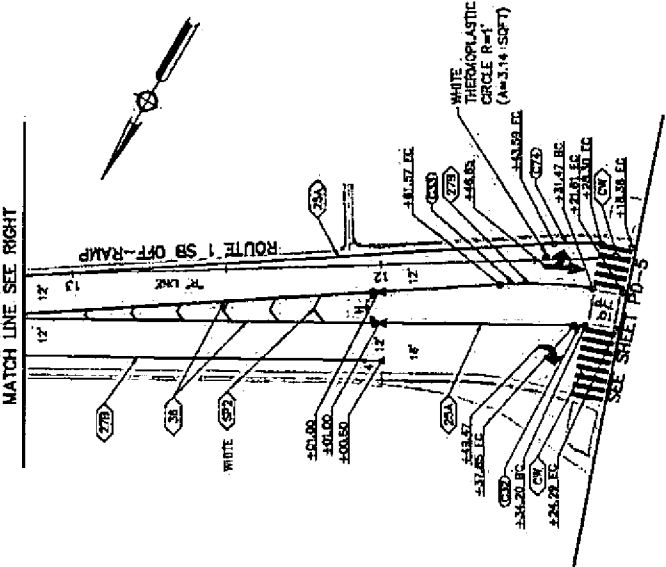
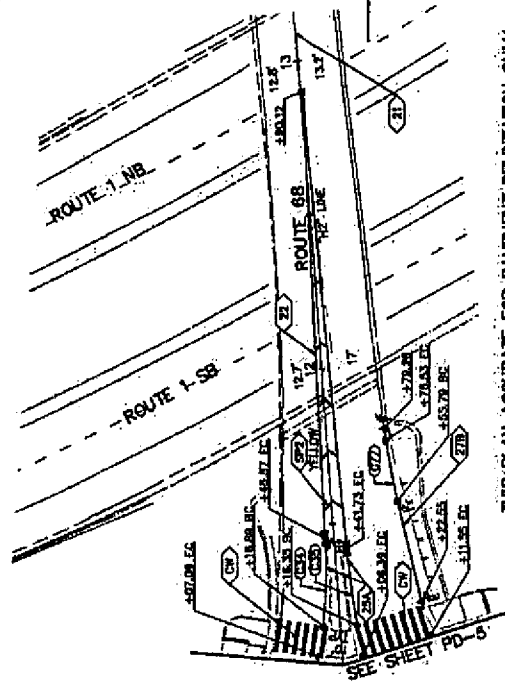
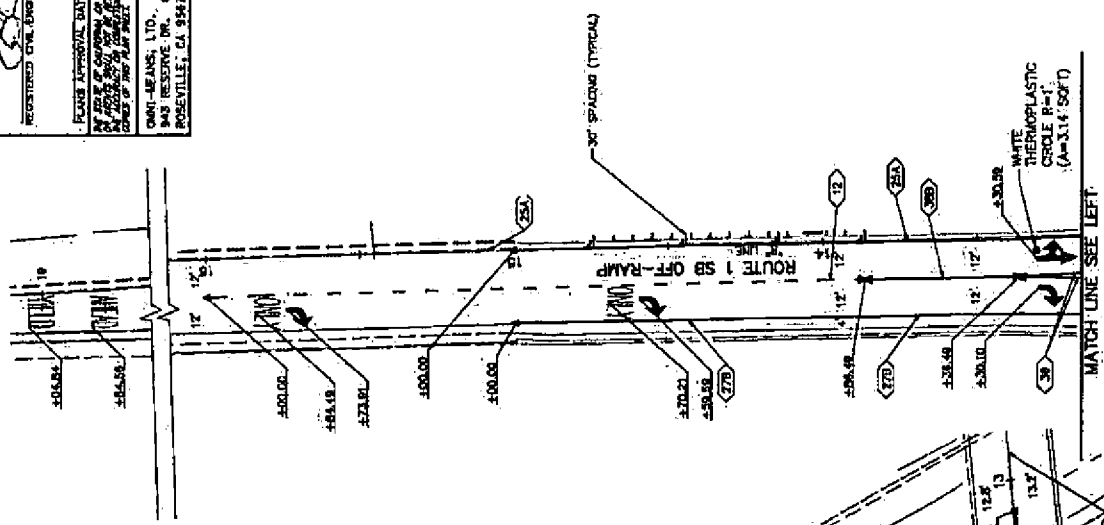
CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA 93940

CARTER-LEANS, LTD., 6100  
 843 RESERVE DR.,  
 ROSEVILLE, CA 95678

**NOTE:**  
 FOR ACCURATE RIGHT OF WAY DATA, CONTACT  
 1. RIGHT OF WAY ENGINEERING AT THE DISTRICT  
 OFFICE.  
 2. FOR PAVEMENT DELINEATION NOTES AND LEGEND  
 SEE SHEET PD-1.

**CURVE TABLE**

No.	R	DELTA	T	L
C22	78.00'	27°07'08"	1.83'	3.86'
C23	150.50'	17°30'27"	13.16'	32.83'
C24	188.86'	8°01'35"	14.48'	28.85'
C25	309.87'	4°42'23"	12.75'	23.45'
C74	117.80'	7°06'06"	7.88'	15.34'
C77	850.00'	8°07'24"	11.84'	23.68'



**PAVEMENT DELINEATION**  
 SCALE: 1"=20'

PD-4

THIS PLAN ACCURATE FOR PAVEMENT DELINEATION ONLY

PROJECT NUMBER & PHASE: 0500000542  
 NT  
 CAO RISK  
 RELATIVE BINDER SCALE: 1"=16" INCHES  
 BINDER LAST REVISED: 7/2/2010  
 URBANVILLE AND FILE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	ROMAN G. DOYLE
DESIGNED BY:	CHECKED BY:	
REVISOR:	DATE REVISED:	

NO.	COUNTY	SHEETS	TOTAL SHEETS	SHEET NO.
05	Mon	1, 68	75, 1, 4, 2	83, 180

REGISTERED CIVIL ENGINEER  
DATE: 11/28/73  
NO. 23787/73

PLANS APPROVAL DATE: \_\_\_\_\_  
BY: \_\_\_\_\_  
OF THE STATE OF CALIFORNIA  
COUNTY OF MONTEREY

CAO-HEANS, LTD. 6100  
843 RESERVE DR.  
ROSELILLE, CA 95078

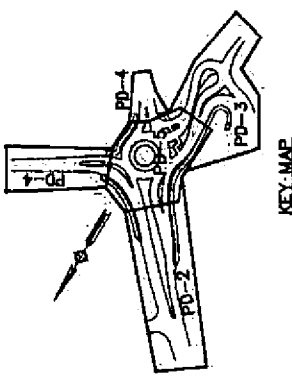
CITY OF MONTEREY  
540 PACIFIC STREET  
MONTEREY, CA 95030

**CURVE TABLE**

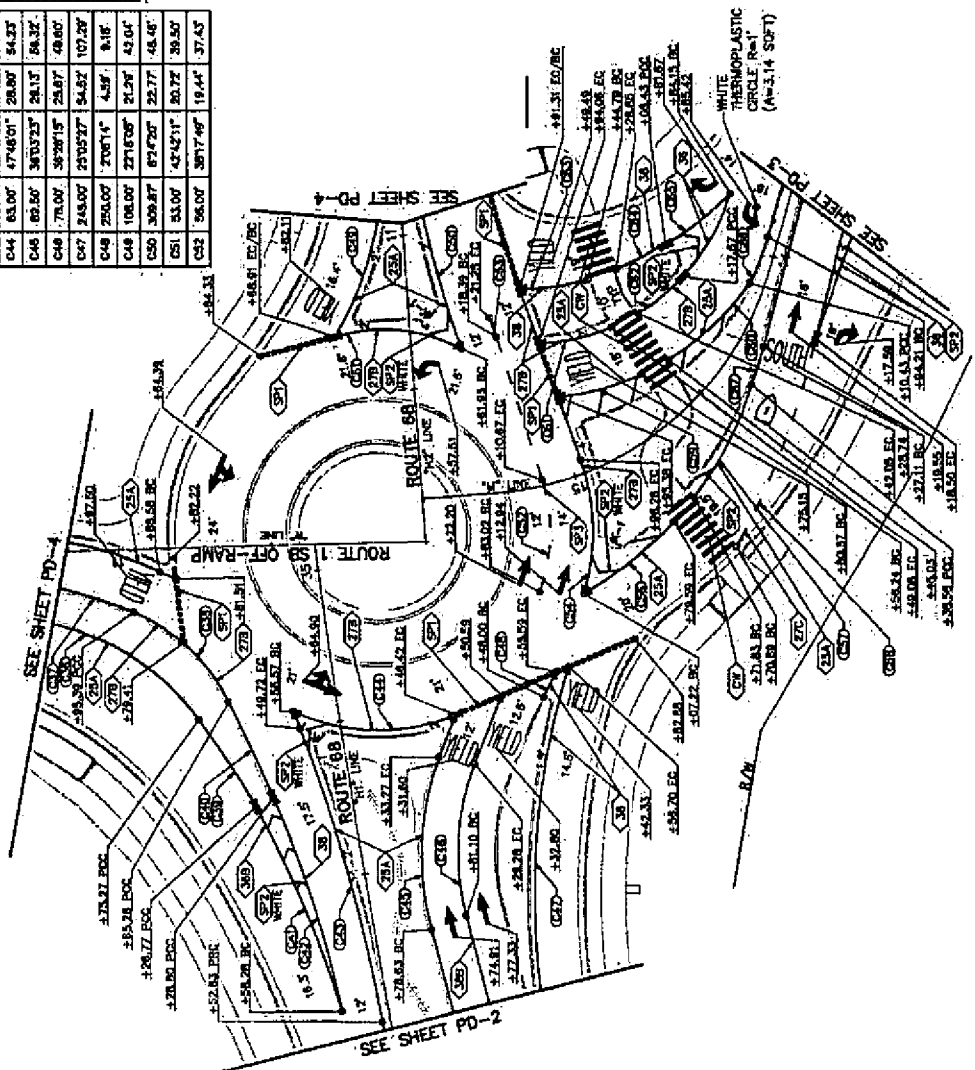
No.	R	DELTA	T	L
C53	297.87	114.54	5.33	6.46
C54	70.00	30.5038	23.15	44.71
C55	116.84	16.511	10.20	38.08
C56	113.16	20.9150	20.84	41.22
C57	244.21	15.4224	34.44	73.43
C58	85.00	19.0550	14.30	28.35
C59	89.58	23.1140	10.38	24.22
C60	87.00	20.4246	12.24	24.22
C61	87.00	42.3059	26.07	48.72
C62	88.87	16.7879	8.88	18.87
C63	108.70	7.5311	7.48	14.86
C64	108.70	17.5613	13.33	28.33
C65	84.80	10.8138	9.03	16.02
C66	120.65	8.0638	8.47	12.87

**CURVE TABLE**

No.	R	DELTA	T	L
C39	78.50	43.9477	31.91	60.89
C37	154.50	19.9501	13.84	27.89
C38	80.50	4.7201	2.83	3.86
C39	396.50	4.8248	17.02	34.02
C40	800.50	8.7501	17.28	34.56
C41	394.00	11.8234	33.19	72.15
C42	374.00	11.0144	34.03	71.81
C43	550.00	9.1813	44.78	88.31
C44	63.00	47.4801	28.80	54.33
C45	65.50	30.5233	28.13	54.32
C46	70.00	38.2815	25.87	49.80
C47	245.00	23.8277	34.82	107.28
C48	250.00	7.0814	4.58	8.18
C49	108.00	27.8307	22.27	43.48
C51	53.00	42.4211	20.72	39.50
C52	56.00	38.1746	19.44	37.43



**NOTE:**  
1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.  
2. FOR PAVEMENT DELINEATION NOTES AND LEGEND SEE SHEET PD-1.



**PAVEMENT DELINEATION**  
SCALE: 1"=20'

PD-5

PROJECT NUMBER & PHASE EFS 0600008342

THIS PLAN ACCURATE FOR PAVEMENT DELINEATION ONLY

RELATIVE PROPORTION SCALE 1"=15' HORIZONTAL

USE VALUE →  
DOW FILE →

REVISIONS  
CHECKED BY: \_\_\_\_\_  
DESIGNED BY: \_\_\_\_\_  
CALCULATED BY: \_\_\_\_\_  
CONSULTANT FUNCTIONAL SUPERVISOR: \_\_\_\_\_  
RONALD G. BOYLE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

BOYD LAST REVISED 7/2/7010

CAO RISK

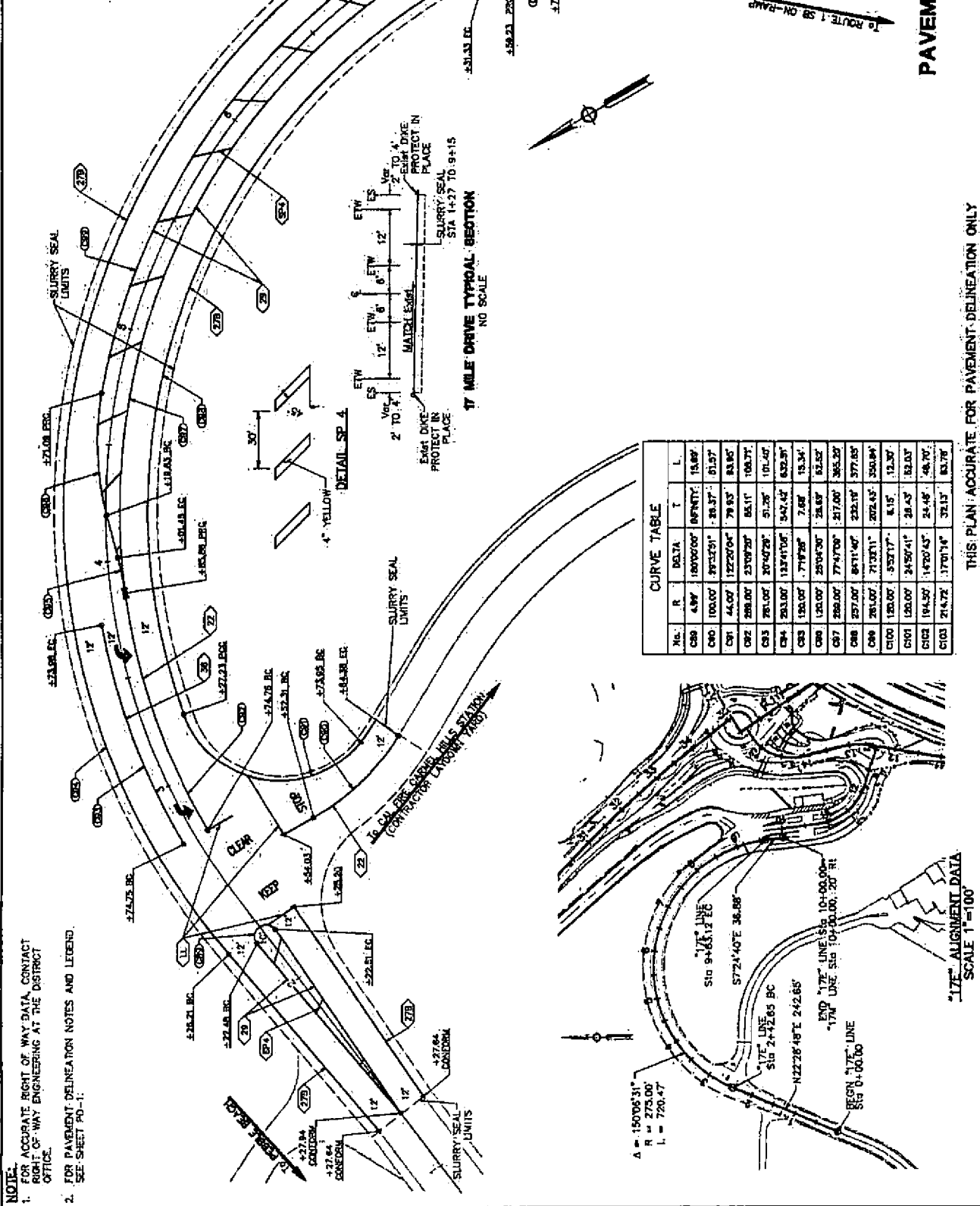


NO.	ROUTE	TOTAL LENGTH	POST MILEAGE
05	Mon 1, 68	7A.1, L.4.2:	84, 190.

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

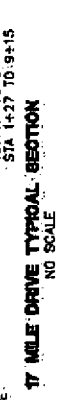
CITY OF MONTEREY  
945 RESERVE DR. #100  
MONTEREY, CA 94040



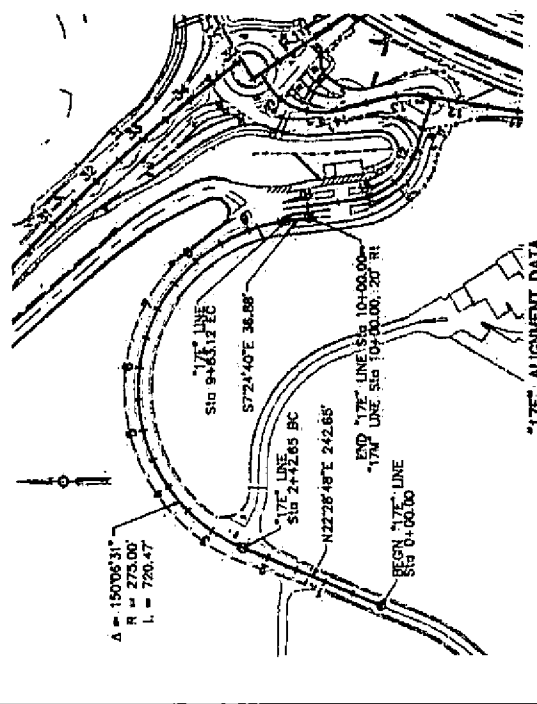
PAVEMENT DELINEATION  
SCALE: 1"=20'

PD-6

- NOTE:
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT-OF-WAY ENGINEERING AT THE DISTRICT OFFICE.
  - FOR PAVEMENT DELINEATION NOTES AND LEGEND, SEE SHEET PD-1.



No.	R	DELTA	T	L
C88	489'	100°00'00"	INFINITY	15.00'
C90	100.00'	29°32'31"	28.37'	51.97'
C91	44.00'	122°20'04"	79.83'	83.85'
C92	288.00'	23°09'20"	85.11'	108.37'
C93	281.00'	20°47'28"	51.25'	101.45'
C94	283.00'	113°41'06"	94.24'	632.97'
C95	128.00'	77°28'	7.68'	15.34'
C96	125.00'	25°04'30"	24.89'	52.52'
C97	282.00'	77°47'00"	21.00'	365.20'
C98	237.00'	84°11'40"	32.15'	577.05'
C99	283.00'	71°33'11"	202.45'	350.84'
C100	125.00'	53°21'17"	8.15'	12.30'
C101	120.00'	24°50'41"	28.43'	52.03'
C102	194.50'	142°20'43"	24.48'	48.70'
C103	214.72'	170°17'	35.13'	83.79'



THIS PLAN ACCURATE FOR PAVEMENT DELINEATION ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
CONSULTANT FUNCTIONAL SUPERVISOR  
RONALD G. ROYLE  
CHECKED BY  
DATE REVISY









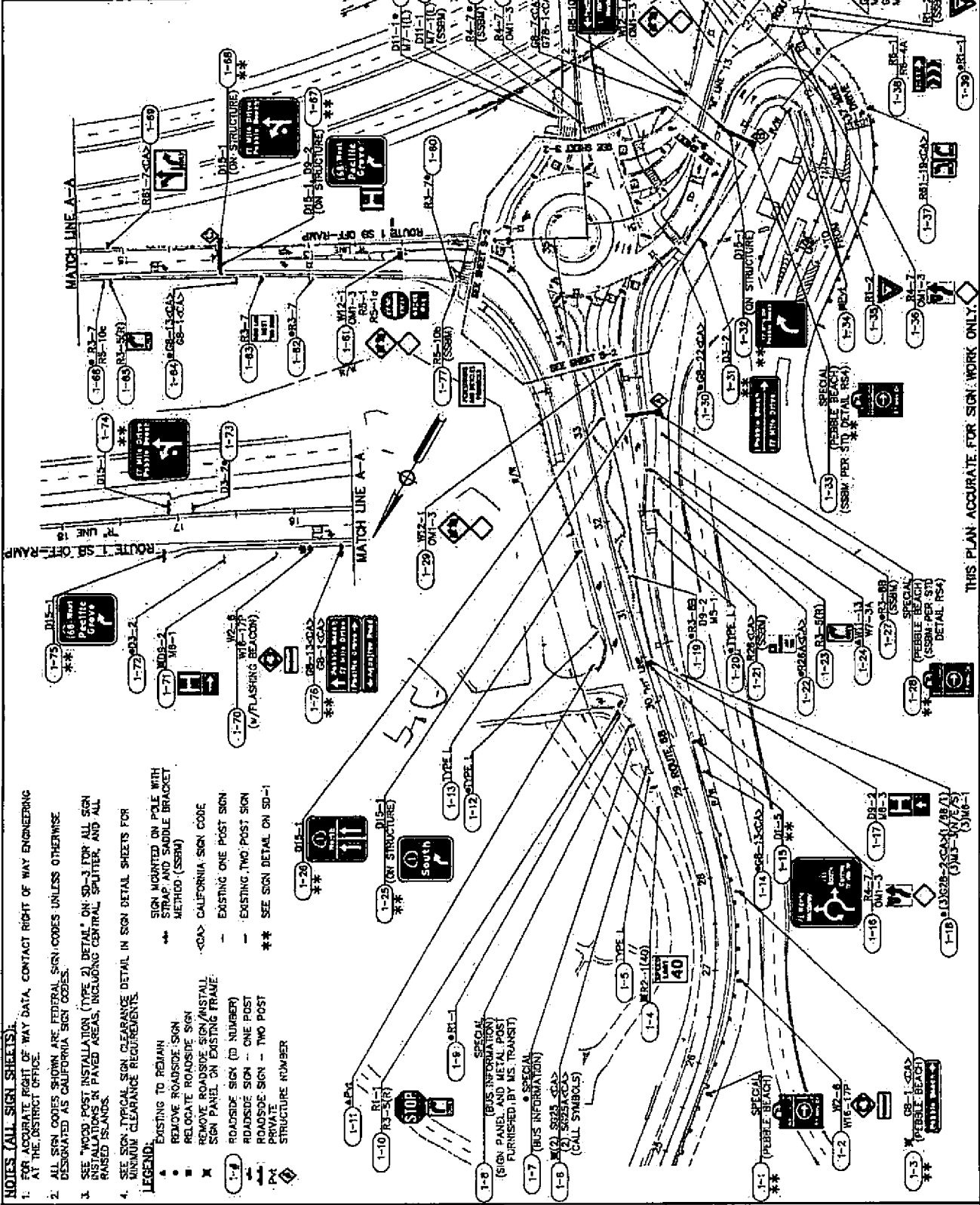
DATE	COUNTY	ROUTE	POST MILE	SHEET NO.	TOTAL SHEETS
05	Men	1, 68	75.1, L4.2	89	190

APPROVED	DATE	BY
	08/29/87	R. G. BOYLE

REGISTERED CIVIL ENGINEER

CITY OF MONTEREY  
 843 RESERVE DR. #100  
 ROSEVILLE, CA 95678



**NOTES (ALL SIGN SHEETS)**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- ALL SIGN CODES SHOWN ARE FEDERAL SIGN CODES UNLESS OTHERWISE DESIGNATED AS CALIFORNIA SIGN CODES.
- SEE "WOOD" POST INSTALLATION (TYPE 2) DETAIL ON SD-3 FOR ALL SIGN INSTALLATIONS IN PAVED AREAS, INCLUDING CENTRAL SPALTER, AND ALL RAISED ISLANDS.
- SEE SIGN TYPICAL SIGN CLEARANCE DETAIL IN SIGN DETAIL SHEETS FOR MINIMUM CLEARANCE REQUIREMENTS.

**LEGEND:**

- EXISTING TO REMAIN
- REMOVE ROADSIDE SIGN
- RELOCATE ROADSIDE SIGN
- REMOVE ROADSIDE SIGN/INSTALL SIGN PANEL ON EXISTING FRAME
- ROADSIDE SIGN (D NUMBER)
- ROADSIDE SIGN - ONE POST
- PRIVATE ROADSIDE SIGN - TWO POST
- STRUCTURE NUMBER

- SIGN MOUNTED ON POLE WITH STRAP AND SADDLE BRACKET METHOD (SSBM)
- CALIFORNIA SIGN CODE
- EXISTING ONE POST SIGN
- EXISTING TWO POST SIGN
- SEE SIGN DETAIL ON SD-1

- SPECIAL (BUS INFORMATION) (SIGN PANEL AND METAL POST FURNISHED BY MS TRANSIT)
- SPECIAL (BUS INFORMATION) (CALL SYMBOLS)
- SPECIAL (PEBBLE BEACH) (SSBM PER STRIP DETAIL RSA)
- SPECIAL (PEBBLE BEACH) (DETAIL RSA)

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 CHECKED BY: RONALD G. BOYLE  
 DATE REVISED:

THIS PLAN ACCURATE FOR SIGN WORK ONLY.

RELATIVE NUMBER SCALE

PROJECT NUMBER & PHASE: EFIS 060000542

UNIT: INCHES

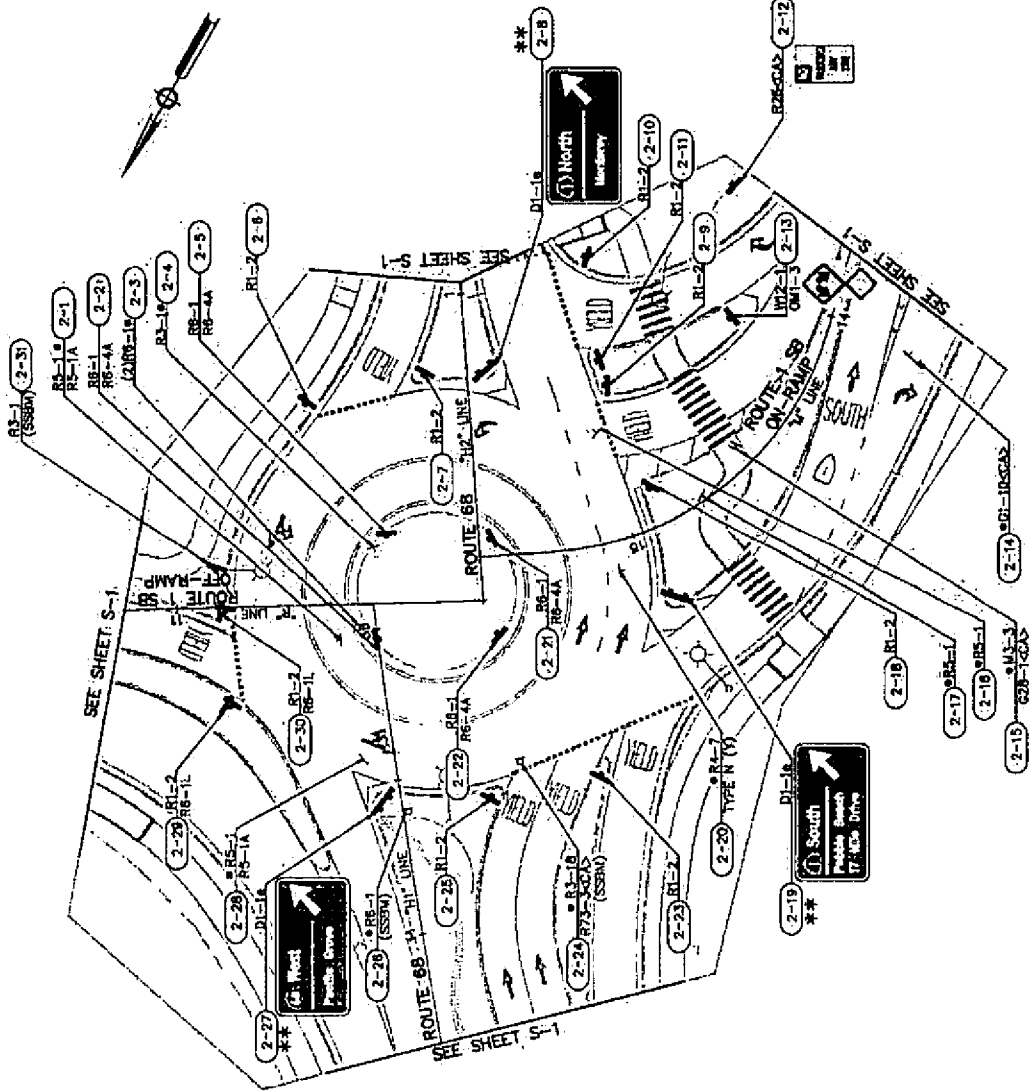
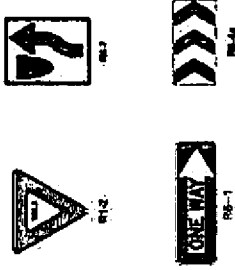
SCALE: 1"=50'

**SIGN PLAN**

**8-1**

NO.	05	COUNTY	Mon	ROUTE	1, 66	POST MILE	75.1, L4.2	SHEET NO.	89	TOTAL SHEETS	150
REGISTERED CIVIL ENGINEER:											
PLANS APPROVAL DATE: _____ CITY OF MONTEREY 580 PACIFIC STREET MONTEREY, CA 93940											

STANDARD SIGN LEGEND:



**SIGN PLAN**  
SCALE: 1"=20'

8-2



NO.	DATE	BY	REVISION
05	1. 88	75.1; L4-2	90 190

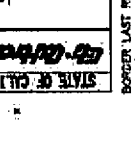
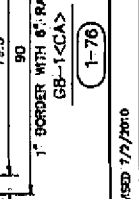
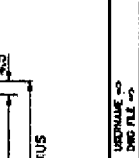
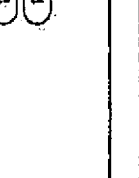
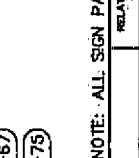
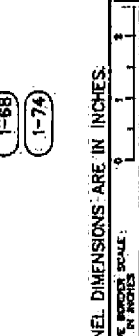
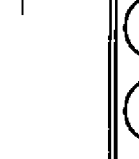
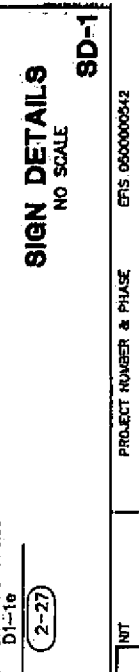
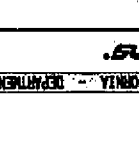
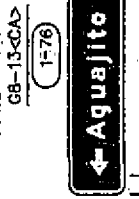
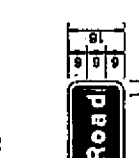
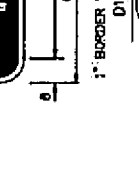
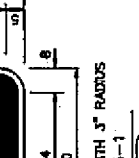
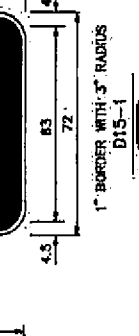
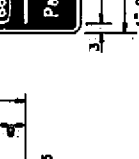
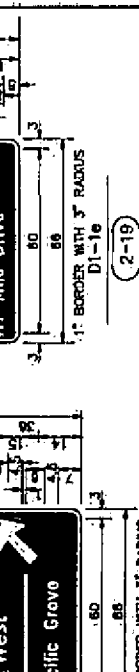
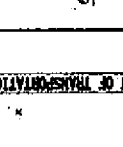
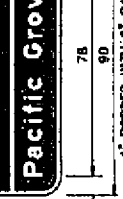
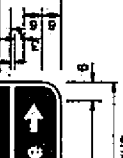
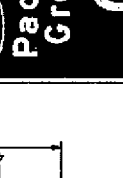
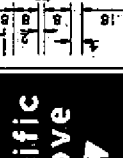
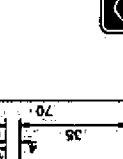
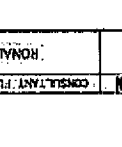
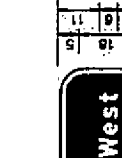
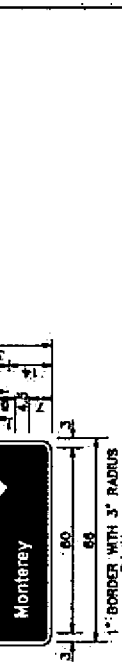
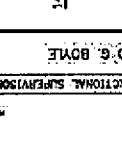
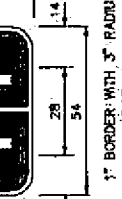
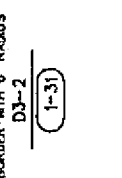
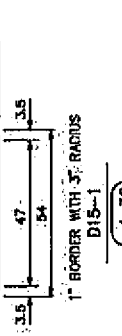
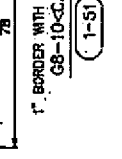
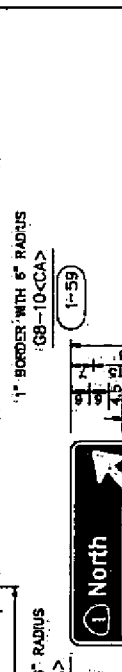
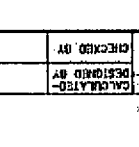
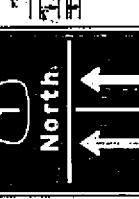
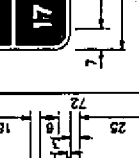
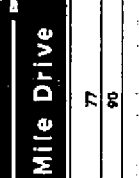
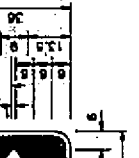
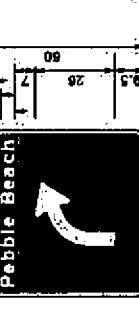
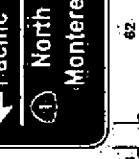
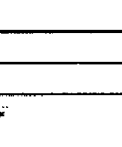
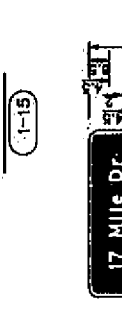
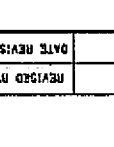
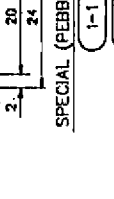
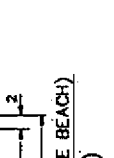
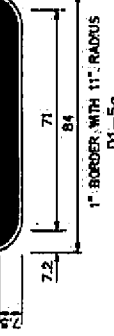
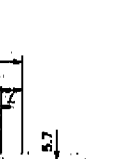
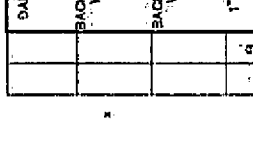
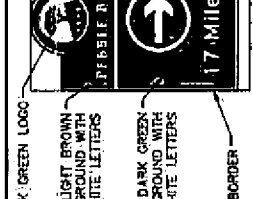
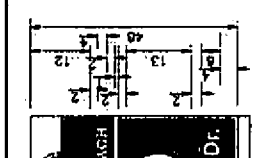
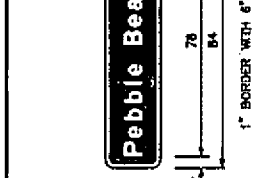
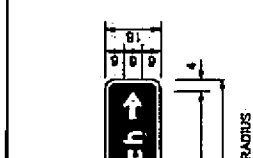
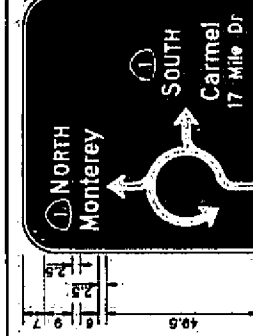
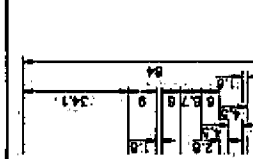
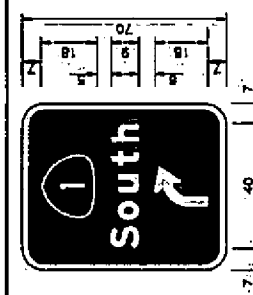
APPROVED BY: [Signature]

DATE: [Blank]

PLANS APPROVAL DATE: [Blank]

BY THE OFFICE OF THE ASSISTANT ATTORNEY GENERAL, DEPARTMENT OF TRANSPORTATION

CITY OF MONTEREY  
 DON-HELMES, LTD. 9100  
 943 RESERVE DR. MONTEREY, CA 93940



**SIGN DETAILS**  
 NO SCALE  
**8D-1**

NOTE: ALL SIGN PANEL DIMENSIONS ARE IN INCHES.  
 RELATIVE BORDER SCALE: 1" = 15" INCHES

DESIGNED BY: [Blank]	CHECKED BY: [Blank]	DATE REVISION: [Blank]
DESIGNED BY: [Blank]	CHECKED BY: [Blank]	DATE REVISION: [Blank]

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR  
 RONALD E. BOYLE

PROJECT NUMBER & PHASE: [Blank] NT

CAO RISK

Agreement #: Ag-5377 - Page 583 of 791

BORDER LAST REVISED 7/7/2010

USPS MAIL PERMIT NO. 1000 MONTEREY, CA 93940

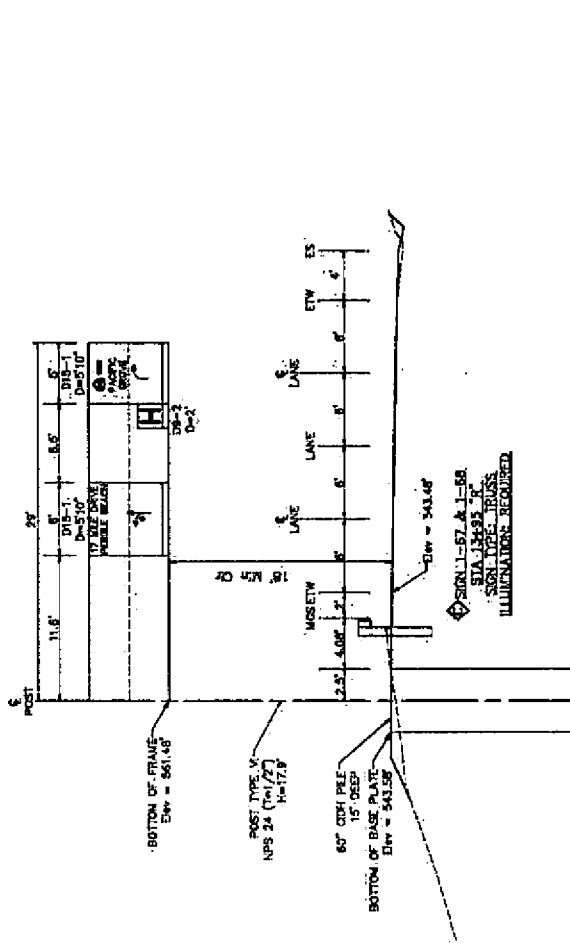
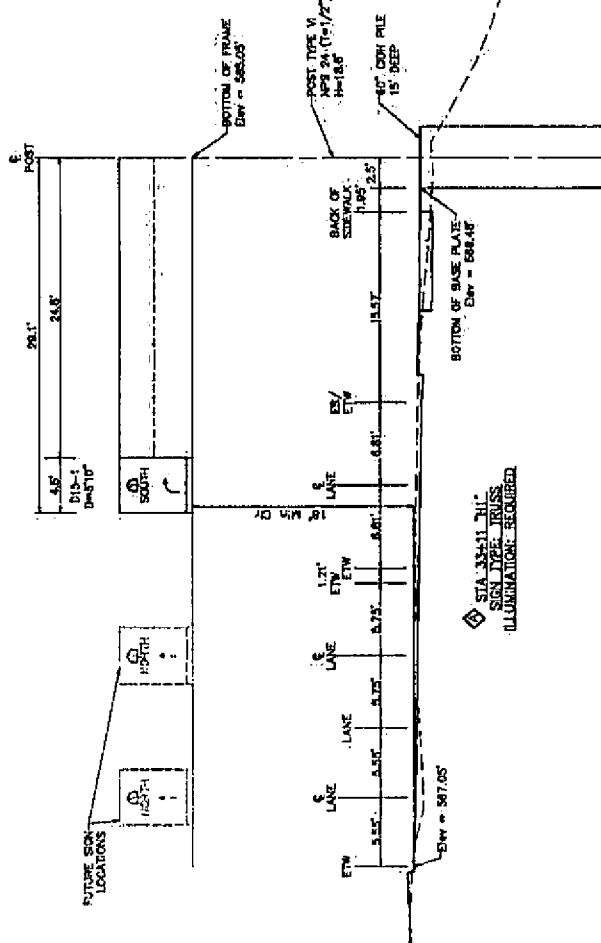
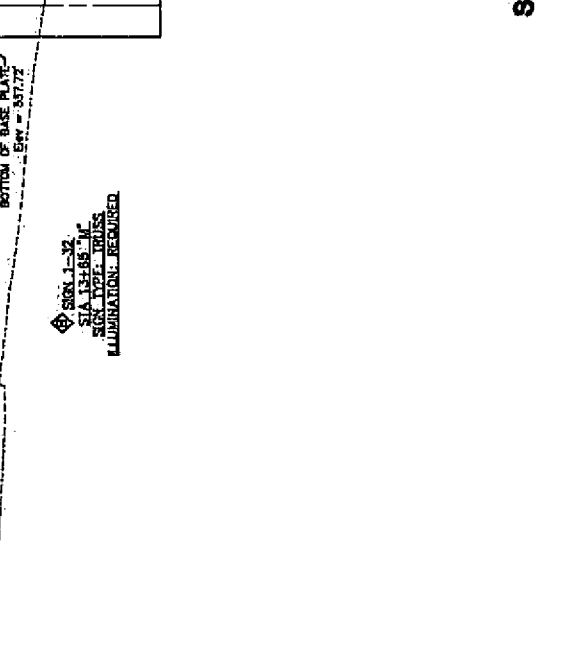
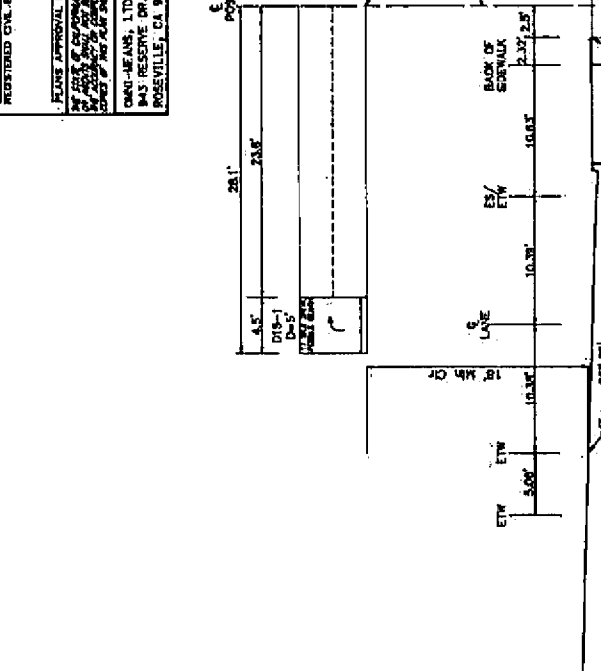
DATE	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS
05	Mon	1, 66	75.1, L.A.2	91 190

REGISTERED CIVIL ENGINEER	DATE	PLANS APPROVAL DATE
		4-18-97

OWNER	CITY OF MONTEREY
ADDRESS	845 RESERVE DR. #100
CITY	MONTEREY, CA 93940



**9D-2**

**SIGN DETAILS**

NO SCALE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT: RAYSON CONSULTANTS  
 DESIGNED BY: RONALD G. BOYLE  
 CHECKED BY:  
 DATE REVISD:  
 REVISD BY:

DATE: 1/2/2010

REVISIONS: NONE

PROJECT NUMBER & PHASE: ETS 0500000542

NO. 1

CAO RISK

RELATIVE HORIZONTAL SCALE: 1" = 15' HORIZONTAL

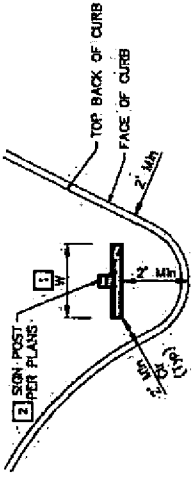
AGREEMENT #: Ag-5377 - Page 584 of 791



DATE	QUANTITY	NOTE	POST CLASS	PROJECT TOTAL
05	Mon	1. 63	75.1: 1.4.2	92 190

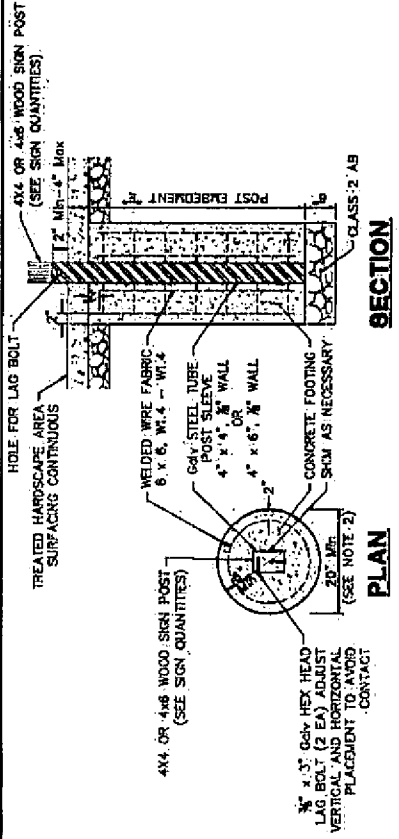


REGISTERED CIVIL ENGINEER  
 PLANS APPROVAL DATE: 11/28/75  
 CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA 93940



**TYPICAL SIGN CLEARANCE DETAIL**  
 NO SCALE

- NOTES:**
- ALL SIGNS MUST HAVE A MINIMUM 2' CLEARANCE FROM THE EDGE OF THE SIGN PANEL TO THE FACE OF CURB, UNLESS RESTRICTIVE CONDITIONS HAVE BEEN IDENTIFIED OR AS DIRECTED BY THE ENGINEER.
  - THE FOLLOWING SIGNS HAVE RESTRICTIVE CONDITIONS AND CLEARANCE TO THE FACE OF CURB CAN BE REDUCED TO:
    - 1. SIGNS: 1-28, 1-3A, 1-50, 1-53, AND 2-23.
- KEYED NOTES:**
- SIGN PANEL WIDTH VARIES. SEE SIGN QUANTITY SHEETS FOR WIDTHS OF INDIVIDUAL PANELS.
  - PLACE SIGN PER PLAN AND POST OPENING DETAIL (ON THIS SHEET)



**SECTION**

**PLAN**

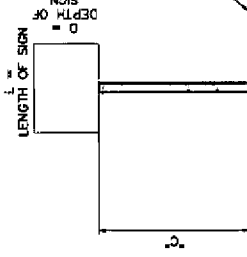
**POST SLEEVE**  
 NO SCALE

- NOTE:**
- REFER TO STANDARD PLAN #52 FOR EMBEDMENT DEPTH.
  - CONCRETE FOOTING DIAMETER TO PROVIDE MINIMUM 6" BETWEEN O.D. OF POST SLEEVE AND O.D. OF CONCRETE FOOTING.
  - STEEL TUBE POST SLEEVE TO PROTRUDE BETWEEN 2' MIN AND 4" MAX ABOVE FINISHED GRADE.

DATE REVISION BY	REVISION BY	CHECKED BY	DESIGNED BY	APPROVED BY
			RONALD G. BOYLE	

**SIGN DETAILS**  
 NO SCALE  
**SD-3**

SHEET NO.	38	TOTAL SHEETS	190
COUNTY	Mon	ROUTE	73.1, 14.2
PROJECT	1/14/95 REGISTERED CIVIL ENGINEER DATE 04/27/17		
CITY OF MONTREY	MONTREY, CA 95040		
REGISTERED CIVIL ENGINEER	1/14/95 REGISTERED CIVIL ENGINEER DATE 04/27/17		
PLANS APPROVAL DATE	04/27/17		
SEAL OF CALIFORNIA REGISTERED CIVIL ENGINEER NO. 44887			
DANI-MEANS, LTD., #100 MONTECITO PLACE, MONTREY, CA 95040			



### SIGN "C" DIMENSION DETAIL

NO SCALE

- NOTES:
- ALL SIGN PANEL DIMENSIONS ARE IN INCHES.
  - (N) - NOT A SEPARATE PAY ITEM.
  - THE DIMENSION "C" IS MEASURED FROM THE BOTTOM OF THE SIGN PANEL TO THE PROJECTED ELEVATION AT ADJACENT EDGE OF TRAVELED WAY. WHEN THERE ARE MORE THAN ONE PANEL IT'S MEASURED FROM THE BOTTOM OF THE BOTTOM PANEL.
  - SEE CALTRANS STANDARD PLAN RST FOR MORE INFORMATION

### ROADSIDE SIGN QUANTITIES

SIGN No	SIGN CODE	EXISTING SIGN TO REMAIN (N)	REMOVE ROADSIDE SIGN (EA)	TREATED WOOD WASTE (LB)	RELOCATE ROADSIDE SIGN (EA)	INSTALL SIGN ON EXISTING FRAME (EA)	ROADSIDE SIGN		PANEL SIZE (N)			POST SIZE AND LENGTH (N)			REMARKS
							ONE POST (EA)	TWO POST (EA)	L (IN)	D (IN)	W (IN)	H (IN)	4" x 4" (LF)	4" x 6" (LF)	
1-1	SPECIAL						1		24	48		7	15		PEBBLE BEACH
1-2	W2-6								30	36		7	15		PEBBLE BEACH
1-3	W16-17B						1		54	18		7	15		40 mph
1-4	R2-1		1	40		1			24	30		7	15		CALL BOX
1-5	TYPE L		2	40		2			6	24		7	15		BUS STOP (PHONE AND KEY SYMBOLS)
1-6	(2)SG25-CA<		2	40		2			30	30		7	15		BUS STOP (PANEL AND POST FURNISHED BY MS TRANSIT)
1-7	(2)SG28-CA<		2	40		2			30	30		7	15		
1-8	SPECIAL		1	40		1			30	30		7	15		
1-9	R1-1		1	40		1			30	30		7	15		
1-10	R1-1		1	40		1			30	30		7	15		
1-11	R3-5<		1	40		1			30	36		7	15		
1-12	PRIVATE								8	24		2	9		
1-13	TYPE L		1	40		1			8	24		2	9		
1-14	GR-1XCA>		1	40		1			24	30		7	15		SALINAS-MONTREY MILE DRIVE CARNEL ROUNDABOUT GUIDE SIGN
1-15	D1-5		1	40		1			18	18		7	15		
1-16	R4-7		1	40		1			24	30		7	15		
1-17	DM1-3		1	40		1			21	24		7	14		
1-18	DM1-3		1	40		1			21	15		7	14		
1-19	(1)SG25-CA>		1	40		1			12	18		7	14		SLIGHT POLE No. 004184
1-20	TYPE L		1	40		1			30	36		7	14		
1-21	R2R(CA)		1	40		1			54	70		7	19		HIGHWAY 1 SOUTH (ON STRUCTURE)
1-22	R2R(CA)		1	40		1			54	72		7	19		HIGHWAY 1 NORTH
1-23	R3-5<		1	40		1			24	48		7	13		SSBM
1-24	W11-13		1	40		1			30	30		3	11		PEBBLE BEACH (ON SIGN STRUCTURE)
1-25	W17-3A		1	40		1			18	18		3	11		PEBBLE BEACH DRIVE (TWO POST)
1-26	D15-1		1	40		1			30	36		7	13		PEBBLE BEACH 1/7 MILE DRIVE
1-27	R3-8B		1	40		1			64	60		7	12		17 MILE DRIVE/PEBBLE BEACH (ON STRUCTURE)
1-28	SPECIAL						1		24	48		7	12		PEBBLE BEACH (ON SIGN STRUCTURE) PRIVATE ROAD
1-29	W12-5		1	40		1			36	32		7	13		
1-30	DM1-3		1	40		1			24	30		7	13		
1-31	DM1-3		1	40		1			18	18		7	12		
1-32	D15-1		1	40		1			36	32		7	13		
1-33	SPECIAL						1		24	30		7	13		
1-34	PRIVATE								18	18		4	12		
1-35	R1-2		1	40		1			36	32		7	13		
1-36	R4-7		1	40		1			24	30		7	13		
1-37	DM1-3		1	40		1			18	18		7	13		
1-38	DM1-3		1	40		1			36	30		7	14		
1-39	R8-1		1	40		1			48	24		4	12		
1-40	R9-4A		1	40		1			48	24		4	12		
1-41	R1-1		1	40		1			36	32		7	13		
1-42	R1-2		1	40		1			48	30		7	13		SLIGHT POLE No. 004262
1-43	GR2-CA>		1	40		1			24	12		4			
1-44	M1-3		1	40		1			12	12		4			
1-45	GR2-2-CA>		1	40		1			21	15		7	15		
1-46	M4-1		1	40		1			36	36		7	15		
1-47	GR2-CA>		1	40		1			36	36		7	15		
1-48	M1-3		1	40		1			21	15		7	15		
1-49	GR2-2-CA>		1	40		1			36	36		7	15		
1-50	M1-2		20	600		11	15	2	4		8	133	75	59	

Agreement #: Ag 537 Page 586 of 791

REVISIONS:

DESIGNED BY: RONALD G. BOYLE  
CHECKED BY: [Signature]

CALCULATED BY: [Signature]  
SUPERVISOR: [Signature]

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
CONSULTANT: UPLIGHT

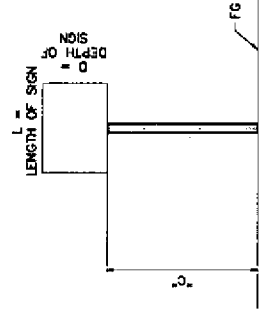
UNIT: 0 1 2 3  
RELATIVE BORDER SCALE: 0 1 2 3  
PROJECT NUMBER & PHASE: EFIS 0500000542

NO SCALE  
**SIGN QUANTITIES**  
SG-1

USE NAME & DIM FILE >>>  
BORDER LAST REVISED 1/17/2010

CAO RISK

SHEET NO.	75.1, L4-2	TOTAL SHEETS	94
COUNTY	MON	ROUTE	1, 68
DATE	7/21/11	PROJECT	75.1, L4-2
REGISTERED CIVIL ENGINEER			
PLANS APPROVAL DATE	11/11/11 DATE CITY OF MONTEREY 590 PACIFIC STREET MONTEREY, CA 93940		



**SIGN "C" DIMENSION DETAIL**  
NO SCALE

- NOTES:**
1. ALL SIGN PANEL DIMENSIONS ARE IN INCHES.
  2. (N) = NOT A SEPARATE PAY ITEM.
  3. THE DIMENSION "C" IS MEASURED FROM THE BOTTOM OF THE SIGN PANEL TO THE PROJECTED ELEVATION AT ADJACENT EDGE OF TRAVELED WAY. WHEN THERE ARE MORE THAN ONE PANEL, IT'S MEASURED FROM THE BOTTOM OF THE BOTTOM PANEL.
  4. SEE CALTRANS STANDARD PLAN RSI FOR MORE INFORMATION.

**SIGN QUANTITIES**  
NO SCALE **SG-2**

SIGN No.	SIGN CODE	EXISTING SIGN TO REMAIN (N)	REMOVE ROADSIDE SIGN (EA)	TREATED WOOD WASTE (LB)	RELOCATE ROADSIDE SIGN (EA)	INSTALL SIGN PANEL ON EXISTING FRAME (EA)	ROADSIDE SIGN		PANEL SIZE (IN)			POST SIZE AND LENGTH (IN)			POST SLEEVE (EA)	"C" DIM (IN)	REMARKS
							ONE POST (EA)	TWO POST (EA)	L	D	4"x4" (LF)	4"x6" (LF)	6"x6" (LF)				
1-44	GB-2-CA>		1	40			1		24	30	18						
1-45	GB-2-CA>		1	40			1		24	30	18						
1-46	GB-13-CA>		1	40					24	30	18						
1-47	TYPE N		4	40					24	30	18						
1-48	(A) TYPE L		1	40					24	30	18						
1-50	WB-2		1	40					24	30	18						
1-51	WB-1		1	40					24	30	18						
1-52	GB-10-CA>		1	40					24	30	18						
1-53	GB-7-CA>		1	40					24	30	18						
1-54	R4-7		1	40					24	30	18						
1-55	DM-1		1	40					24	30	18						
1-56	M7-1L		1	40					24	30	18						
1-57	D11-1		1	40					24	30	18						
1-58	M7-8		1	40					24	30	18						
1-59	GB-10-CA>		1	40					24	30	18						
1-60	R3-7		1	40					24	30	18						
1-61	WB-1		1	40					24	30	18						
1-62	WB-2		1	40					24	30	18						
1-63	WB-3		1	40					24	30	18						
1-64	WB-4		1	40					24	30	18						
1-65	WB-5		1	40					24	30	18						
1-66	WB-6		1	40					24	30	18						
1-67	WB-7		1	40					24	30	18						
1-68	WB-8		1	40					24	30	18						
1-69	WB-9		1	40					24	30	18						
1-70	WB-10		1	40					24	30	18						
1-71	WB-11		1	40					24	30	18						
1-72	WB-12		1	40					24	30	18						
1-73	WB-13		1	40					24	30	18						
1-74	WB-14		1	40					24	30	18						
1-75	WB-15		1	40					24	30	18						
1-76	WB-16		1	40					24	30	18						
1-77	WB-17		1	40					24	30	18						
2-1	WB-18		1	40					24	30	18						
Σ TOTAL (THIS SHEET)		1	21	680	0	7	9	4	3	3	87	136	0				

DATE	COUNTY	ROUTE	POST MILES	TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
05	Mon	1, 68	75.1, LA.2	95	95	180

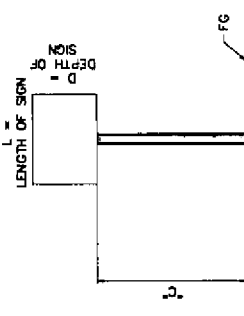
  

REGISTERED CIVIL ENGINEER	DATE	PLANS APPROVAL DATE

OMNI-MEANS, LTD.	CITY OF MONTEREY
945 RESERVE DR. #100	580 PACIFIC STREET
ROSELVILLE, CA 95678	MONTEREY, CA 93940

SIGN No.	SIGN CODE	EXISTING SIGN TO REMAIN (R)	REMOVE ROADSIDE SIGN (EA)	TREATED WOOD WASTE (LB)	RELOCATE ROADSIDE SIGN (EA)	INSTALL SIGN PANEL ON EXISTING FRAME (EA)	ROADSIDE SIGN		PANEL SIZE (IN)		POST SLEEVE (EA)	"C" DIM (N)	POST SIZE AND LENGTH (IN)			REMARKS
							ONE POST (EA)	TWO POST (EA)	L (IN)	D (IN)			4"x4" (LF)	4"x6" (LF)	6"x6" (LF)	
2-2	RS-1						1		36	12		4		12		
2-3	RS-4A		1	40					48	24		4		12		
2-4	RS-1		1	40					36	36		7	14			
2-5	RS-4A								36	36		7	14			
2-6	R1-2						1		66	36	2	4	21			NORTH-MONTEREY
2-7	R1-2								36	36		7	14			
2-8	D1-18								12	18		7	12			
2-9	R1-2								36	36		7	14			
2-10	R1-2								36	36		7	14			
2-11	R1-2								36	36		7	14			
2-12	R2B-CAP								36	36		2	10			PEBBLE BEACH#17 MILE DRIVE
2-13	OM1-3								36	36						
2-14	G1-10-CAP		1	80												
2-15	G2B-1-CAP		1	40												
2-16	TYPE (Y)															
2-17	RS-1		1	40					36	36		7	14			
2-18	RS-1		1	40					66	42	2	4	21			SOUTHPEBBLE BEACH#17 MILE DRIVE
2-19	D1-18						1									
2-20	R4-7		1	40					36	36		7	14			
2-21	RS-1								36	12		4		12		
2-22	RS-4A								48	24		4		12		
2-23	RS-4A								36	12		4		12		
2-24	RS-1		1	40					48	24		7	14			
2-25	R7S1-CAP		1	40					36	36		7	14			SSBM
2-26	R1-2								36	36		7	14			
2-27	D1-18		1	40					66	36	2	4	21			SSBM
2-28	RS-1A		1	40					36	36		7	14			WESTPACIFIC GROVE
2-29	RS-1L								36	36		2	14			
2-30	R1-2								36	12		1	2	14		
2-31	RS-1L								36	36		2	14			
3-1	W4-2(L)		1	40					24	24		7				
3-2	W4-2(L)		1	40					30	30		7				
SUB-TOTAL (THIS SHEET)			12	520	0	0	18	3	1	24	30	7	14	253	48	0
3-TOTAL (SHEET 504-1)			20	600	1	11	15	2	4	6	133	75	59			
3-TOTAL (SHEET 504-2)			21	680	0	7	9	4	3	3	87	138	0			
TOTAL			53	1800	1	18	42	9	8	27	473	261	59			

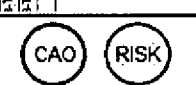


**SIGN "C" DIMENSION DETAIL**  
NO SCALE

NOTES:  
 1. ALL SIGN PANEL DIMENSIONS ARE IN INCHES.  
 2. (N) = NOT A SEPARATE PAY ITEM.  
 3. THE DIMENSION "C" IS MEASURED FROM THE BOTTOM OF THE SIGN PANEL TO THE PROJECTED ELEVATION AT ADJACENT EDGE OF TRAVELED WAY. WHEN THERE ARE MORE THAN ONE PANEL ITS MEASURED FROM THE BOTTOM OF THE BOTTOM PANEL.  
 4. SEE CALTRANS STANDARD PLAN RS1 FOR MORE INFORMATION

**SIGN QUANTITIES**  
NO SCALE

**SG-3**



DIST.	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
05	Mon	1-68	75.1, L4.2	96	180

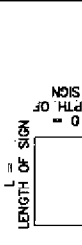
REGISTERED CIVIL ENGINEER	DATE
PLANS APPROVAL DATE	

STATE OF CALIFORNIA	DATE
DATE OF CONTRACT	
DATE OF REVISION	
DATE OF THIS PLAN SHEET	

CONTRACTOR'S OFFICE	CITY
4413 RESERVE PK.	4100
ROSEVILLE, CA 95678	MONTEREY, CA 95940



**SIGN "C" DIMENSION DETAIL**  
NO SCALE

- NOTES:
- ALL SIGN-PANEL DIMENSIONS ARE IN INCHES.
  - (N) = NOT A SEPARATE PAY ITEM.
  - THE DIMENSION "C" IS MEASURED FROM THE BOTTOM OF THE SIGN PANEL TO THE PROJECTED ELEVATION AT ADJACENT EDGE OF TRAVELED WAY. WHEN THERE ARE MORE THAN ONE PANEL, IT'S MEASURED FROM THE BOTTOM OF THE BOTTOM PANEL.
  - SEE CALTRANS STANDARD PLAN RS1 FOR MORE INFORMATION.

**SIGN PANEL QUANTITIES**  
NO SCALE

**89-4**

SIGN CODE	SIGN MESSAGE OR DESCRIPTION	SIGN SIZE (L X D) (ft)	PANEL AREA (SQFT)	NUMBER OF PANELS	BACKGROUND SHEETING COLOR	REFLECTIVE SHEETING TYPE	SHEETING COLOR	LEGEND		PROTECTIVE OVERLAY PREMIUM	FURNISH SINGLE SHEET ALUMINUM SIGN		REMARKS
								FRAMED (SOFT)	UNFRAMED (SOFT)		FRAMED (SOFT)	UNFRAMED (SOFT)	
D1-16	PEBBLE BEACH LOGO) PEBBLE BEACH 17 MILE DRIVE	24x46	8.00	3	GREEN W/BLACK	IV	WHITE	IX	X	24.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-1, 1-26, 1-33
D1-16	HWY 1 NORTH/MONTEREY	66x36	16.50	1	GREEN	IV	WHITE	IX	X	16.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 2-8
D1-16	HWY 1 SOUTH/PEBBLE BEACH/17 MILE DRIVE	66x36	16.50	1	GREEN	IV	WHITE	IX	X	16.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 2-19
D1-5	HWY 88 WEST/PACIFIC GROVE	66x36	16.50	1	GREEN	IV	WHITE	IX	X	16.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 2-27
D3-2	ROUNDABOUT GUIDE SIGN	60x84	48.00	1	GREEN	IV	WHITE	IX	X	48.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-15
D3-2	PEBBLE BEACH/17 MILE DRIVE	60x36	22.50	1	GREEN	IV	WHITE	IX	X	22.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-31
D8-2	HOSPITAL (SYMBOL)	28x24	4.00	3	BLUE	IV	WHITE	IX	X	12.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-17, 1-71
D15-1	BIKE ROUTE (SYMBOL AND TEXT)	24x18	3.00	3	GREEN	IV	WHITE	IX	X	9.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-55, 1-57, 1-58
D15-1	HWY 1 SOUTH	54x70	26.25	1	GREEN	IV	WHITE	IX	X	26.25	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-25
D15-1	HWY 1 NORTH	54x70	26.25	1	GREEN	IV	WHITE	IX	X	26.25	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-26
D15-1	17 MILE DRIVE/PEBBLE BEACH	54x60	22.50	1	GREEN	IV	WHITE	IX	X	22.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-32
D15-1	HWY 88 WEST/PACIFIC GROVE	60x70	28.17	2	GREEN	IV	WHITE	IX	X	56.34	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-67, 1-75
D15-1	17 MILE DRIVE/PEBBLE BEACH	72x70	35.00	2	GREEN	IV	WHITE	IX	X	70.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-68, 1-74
G8-1	PEBBLE BEACH	64x18	10.50	1	GREEN	IV	WHITE	IX	X	10.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-3
G8-1	AGUAJITO ROAD	90x18	11.25	1	GREEN	IV	WHITE	IX	X	11.25	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-64
G8-10	PACIFIC GROVE/PEBBLE BEACH/17 MILE DRIVE	84x42	24.50	1	GREEN	IV	WHITE	IX	X	24.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-59
G8-10	PACIFIC GROVE/HWY 1 NORTH/MONTEREY	78x48	26.00	1	GREEN	IV	WHITE	IX	X	26.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-51
G8-10	PEBBLE BEACH/17 MILE DRIVE/PACIFIC GROVE	90x42	26.25	1	GREEN	IV	WHITE	IX	X	26.25	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-64
G28-2	HWY 1 (SYMBOL)	12x12	1.00	3	GREEN	IV	WHITE	IX	X	3.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-43, 1-44, 1-45
G62	FREWAY ENTRANCE	48x30	10.00	2	GREEN	IV	WHITE	IX	X	20.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-43, 1-44
S626	CALL BOX	30x36	7.50	1	BLUE	IV	WHITE	IX	X	7.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-8
S626	CALL BOX (SYMBOL/WEY PAD (SYMBOL))	30x30	7.50	1	BLUE	IV	WHITE	IX	X	7.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-6
TYPE L	WHITE OBJECT MARKER	8x24	1.33	2	WHITE	IV	BLACK	IX	X	2.66	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-5, 1-13
M3-3	SOUTH	24x12	2.00	2	WHITE	IV	BLACK	IX	X	4.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-46
M3-3	NORTH	24x12	2.00	2	WHITE	IV	BLACK	IX	X	4.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-43, 1-44
M6-1	RIGHT ARROW	21x15	2.19	1	BLUE	IV	WHITE	IX	X	2.19	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-71
M6-2	DOWN LEFT ARROW	21x15	2.19	3	WHITE	IV	BLACK	IX	X	6.57	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-43, 1-44, 1-45
M6-3	UP ARROW	21x15	2.19	1	BLUE	IV	WHITE	IX	X	2.19	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-17
M7-1L	LEFT ARROW	12x9	0.75	2	GREEN	IV	WHITE	IX	X	1.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-55, 1-57
M7-1R	UP AND RIGHT ARROW	12x9	0.75	1	GREEN	IV	WHITE	IX	X	0.75	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-58
OW-13	YELLOW MARKER	18x18	2.25	7	YELLOW	IV	WHITE	IX	X	15.75	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-16, 1-28, 1-36, 1-50, 1-53, 1-61, 2-13
R1-1	STOP	30x30	6.25	1	RED	IV	WHITE	IX	X	6.25	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-10
R1-2	YIELD	36x36	5.00	12	WHITE	IV	RED	IX	X	60.37	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-35, 1-40, 2-2, 2-7, 2-9, 2-10, 2-11, 2-12, 2-13, 2-22, 2-23, 2-28, 2-30
R2-1	40 mph	24x30	5.00	1	WHITE	IV	BLACK	IX	X	5.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-4
R3-1	RIGHT TURN PROHIBITED	24x24	4.00	1	WHITE	IV	BLACK	IX	X	4.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-231
R3-5R	ONLY	30x36	7.50	3	WHITE	IV	BLACK	IX	X	22.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-10, 1-28, 1-66
R3-7	RIGHT LANE MUST TURN RIGHT	30x30	6.25	1	WHITE	IV	BLACK	IX	X	6.25	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-63
R4-1	DO NOT PASS	24x30	5.00	2	WHITE	IV	BLACK	IX	X	10.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 3-1, 3-2
R4-7	KEEP RIGHT (SYMBOL)	24x30	5.00	3	WHITE	IV	BLACK	IX	X	15.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-18, 1-36, 1-53
R5-1	DO NOT ENTER	36x36	8.00	1	RED	IV	WHITE	IX	X	8.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-61
R5-1A	WORKING WAY	36x24	6.00	1	RED	IV	WHITE	IX	X	6.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-61
R6-10B	PEDESTRIAN AND BICYCLE PROHIBITED	30x18	3.75	1	WHITE	IV	BLACK	IX	X	3.75	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-77
R6-1	ONE WAY	36x12	3.00	7	WHITE	IV	BLACK	IX	X	21.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-77
R6-4A	TRIPLE CHEVRON (SYMBOL)	48x24	6.00	5	WHITE	IV	BLACK	IX	X	30.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-38, 2-2, 2-3, 2-21, 2-22, 2-26, 2-30
R6-4	NO PARKING ANYTIME	12x18	1.50	2	WHITE	IV	BLACK	IX	X	4.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-38, 2-2, 2-3, 2-21, 2-22, 2-26, 2-30
R6-7	THRU LEFT - RIGHT TURN ONLY	36x30	7.50	1	WHITE	IV	BLACK	IX	X	7.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-38, 2-2, 2-3, 2-21, 2-22, 2-26, 2-30
R6-19	LEFT TURN ONLY - RIGHT TURN ONLY	36x30	7.50	1	WHITE	IV	BLACK	IX	X	7.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-21, 2-12
R6-19	CIRCULAR INTERSECTION (SYMBOL)	36x30	7.50	1	WHITE	IV	BLACK	IX	X	7.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-37
W6-4	MERGE AHEAD (SYMBOL)	36x36	9.00	2	YELLOW	IV	BLACK	IX	X	18.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-2, 1-70
W1-1	MERGE (SYMBOL)	36x36	9.00	1	YELLOW	IV	BLACK	IX	X	9.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-42
W4-2(L)	DOUBLE ARROW SIGN	30x30	6.25	2	YELLOW	IV	BLACK	IX	X	12.50	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 3-1, 3-2
W2-1	ROUNDABOUT	30x30	6.25	4	YELLOW	IV	BLACK	IX	X	25.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-28, 1-50, 1-61, 2-13
W16-17P	ROUNDABOUT	24x12	2.00	2	YELLOW	IV	BLACK	IX	X	4.00	0.0637 (SOFT)	0.0637 (SOFT)	SIGN 1-2, 1-70
		TOTAL			377.00	116.00	204.00	144.00					

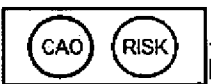
COUNTY: Mon ROUTE: 1, 68 TOTAL PROJECT: 75.1, L.4.2 SHEET TOTAL: 197  
 SHEETS: 190  
 REGISTERED CIVIL ENGINEER: [Signature] DATE: 03/21/70  
 PROFESSIONAL ENGINEER - CIVIL  
 NO. 43387  
 STATE OF CALIFORNIA  
 PLANS APPROVAL DATE: 03/21/70  
 BY: [Signature]  
 IN ACCORDANCE WITH THE PROVISIONS OF THE CALIFORNIA PROFESSIONAL ENGINEERING ACT OF 1967 AND THE RULES OF THE BOARD OF PROFESSIONAL ENGINEERS AND ARCHITECTS OF THE STATE OF CALIFORNIA  
 CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA 93940

SIGN NO.	SIGN LETTER	SINGLE FACED	BACKGROUND				LEGEND		OVERHEAD SIGN QUANTITIES					
			SHEETING COLOR	RETROREFLECTIVITY	ASTM TYPE	SHEETING COLOR	RETROREFLECTIVITY	ASTM TYPE	GRAPHTI FLOW (PREMIUM)	FURNISH LAMINATED PANEL SIGN (TYPE A)	PANEL SIZE (m x m)	FURNISH SIGN STRUCTURE (TRUSS)	INSTALL SIGN STRUCTURE (TRUSS)	80' CIDH CONCRETE PILE SIGN FOUNDATION
1-25	A	X	GREEN	VII	VI	WHITE	VII	X	26.25	54 x 70	13850	13850	15	
1-32	B	X	GREEN	VII	VII	WHITE	VII	X	22.50	54 x 60	15860	15860	15	
1-67	C	X	GREEN	VII	VII	WHITE	VII	X	29.17	60 x 70	13790	13790	15	
1-68	C	X	BLUE	VII	VII	WHITE	VII	X	4.00	24 x 24	13790	13790	15	
			GREEN	VII	VII	WHITE	VII	X	35.00	72 x 70	41220	41220	45	
TOTAL											116.92	41220	41220	45

**OVERHEAD SIGN STRUCTURE QUANTITIES**  
NO SCALE

**SG-5**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT/FUNCTIONAL SUPERVISOR: RONALD G. BOYLE  
 DESIGNED BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_  
 CALCULATED BY: \_\_\_\_\_  
 REVISIONS: \_\_\_\_\_  
 DATE REVISION: \_\_\_\_\_  
 AGREEMENT #: AG-5377 Page 590 of 791



**STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION**

CONSULTANT FUNCTIONAL SUPERVISOR: **RONALD G. BOYLE**

CHECKED BY: \_\_\_\_\_

DATE REVISION: \_\_\_\_\_

REVISION BY: \_\_\_\_\_

**CAO RISK**

PROJECT: **75.1, L4.2**

ROUTE: **1, 68**

COUNTY: **Mon**

SHEET NO: **98**

TOTAL SHEETS: **98**

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE: **02/21/07**

SCALE: **AS SHOWN**

CITY OF MONTEREY  
580 PACIFIC STREET  
ROSELVILLE, CA 95078

LINE	STATION	EARTHWORK QUANTITIES				EXPORT (CY)
		REMOVE BASE AND SURFACING (CY)	ROAD PAVEMENT (CY)	ROADWAY EXCAVATION (CY)	ROADWAY EXCAVATION (CY)	
H1	26+36.53 - 34+00.00	24	406	3157	1225	1108
H2	11+05.00 - 11+06.10	18	865	1324	488	305
R	11+00.00 - 14+00.00			1159	458	1237
M	11+00.00 - 14+00.00			198	25	173
H1	11+02.42 - 12+15.00			42		42
A	26+22.12 - 27+13.48			1150		575
OVER EXCAVATION AT MEDIANS STAGE 4 NIGHT WORK		1135				3730
TOTAL		24	1562	7895	2171	6338

LINE	STATION	STRUCTURAL SECTION QUANTITIES				SLURRY SEAL (TON)
		PAVEMENT AREA (SQ FT)	HMA TYPE A (CY)	HMA TYPE B (CY)	AGGREGATE BASE (CY)	
H1	26+00.00 - 34+25.00	40,830	832	1985	2847	
H2	10+80.00 - 11+03.00	4,700	96	154	306	
R	11+00.00 - 15+00.00	14,520	286	590	942	
M	11+00.00 - 14+00.00	27,515	645	1135	1518	
H1	11+02.42 - 12+30.00	5,105	104	211	331	
A	26+02.00 - 27+13.48	862	24	49	48	
MAINTENANCE VEHICLE PULLOUT		415	10	21	18	
TOTAL		38,000				28

WALL NO.	STRUCTURE EXCAVATION (RETAINING WALL)		STRUCTURE BACKFILL		BAR REINFORCING (STEEL)		CONCRETE (GOLDEN GRANITE)		CONCRETE (GOLDEN GRANITE)		CONCRETE (GOLDEN GRANITE)		CONCRETE (GOLDEN GRANITE)		CONCRETE (GOLDEN GRANITE)		CONCRETE (GOLDEN GRANITE)	
	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)
1	225	25	84	14210	1857	558	134	145	145	145	145	145	145	145	145	145	145	145
2	610	210	140	22630	1500													
TOTALS		835	465	224	36740	3157	358	134	145	145	145	145	145	145	145	145	145	145

LINE	STATION	MINOR CONCRETE QUANTITIES				TOTAL (MINOR CONCRETE)
		TYPE A1-B	TYPE A2-B	TYPE A3-B MOD	TYPE A4-B	
H1	26+28.00 - 30+15.07					
H1M1	30+33.00 - 0+20.00					
R1	0+00.00 - 2+00.29					
H1	30+36.88 - 34+07.19					
H1	33+37.22 - 34+08.74					
R	10+55.04 - 12+12.98					
CENTRAL ISLAND						
M2	0+00 - 2+01.25					
M	12+35.36 - 13+08.08					
M	11+00.00 - 11+59.32					
M	13+01.13 - 14+18.49					
M	14+07.16 - 14+08.85					
H2	10+72.34 - 11+03.36					
R2	0+15.03 - 12+00.00					
TOTALS		48.6	22.3	4.8	5.4	77.1
TOTAL (MINOR CONCRETE)						28

EARTHWORK QUANTITIES		STRUCTURAL SECTION QUANTITIES		MINOR CONCRETE QUANTITIES		RETAINING WALL QUANTITIES	
415	107	28	65	133	107	4	4
3730	6338	28	55	133	28	4	4

LINE	STATION	MINOR CONCRETE QUANTITIES				TOTAL (MINOR CONCRETE)
		TYPE A1-B	TYPE A2-B	TYPE A3-B MOD	TYPE A4-B	
H1	26+28.00 - 30+15.07					
H1M1	30+33.00 - 0+20.00					
R1	0+00.00 - 2+00.29					
H1	30+36.88 - 34+07.19					
H1	33+37.22 - 34+08.74					
R	10+55.04 - 12+12.98					
CENTRAL ISLAND						
M2	0+00 - 2+01.25					
M	12+35.36 - 13+08.08					
M	11+00.00 - 11+59.32					
M	13+01.13 - 14+18.49					
M	14+07.16 - 14+08.85					
H2	10+72.34 - 11+03.36					
R2	0+15.03 - 12+00.00					
TOTALS		48.6	22.3	4.8	5.4	77.1
TOTAL (MINOR CONCRETE)						28

LINE	STATION	MINOR CONCRETE QUANTITIES				TOTAL (MINOR CONCRETE)
		TYPE A1-B	TYPE A2-B	TYPE A3-B MOD	TYPE A4-B	
H1	26+28.00 - 30+15.07					
H1M1	30+33.00 - 0+20.00					
R1	0+00.00 - 2+00.29					
H1	30+36.88 - 34+07.19					
H1	33+37.22 - 34+08.74					
R	10+55.04 - 12+12.98					
CENTRAL ISLAND						
M2	0+00 - 2+01.25					
M	12+35.36 - 13+08.08					
M	11+00.00 - 11+59.32					
M	13+01.13 - 14+18.49					
M	14+07.16 - 14+08.85					
H2	10+72.34 - 11+03.36					
R2	0+15.03 - 12+00.00					
TOTALS		48.6	22.3	4.8	5.4	77.1
TOTAL (MINOR CONCRETE)						28

**SUMMARY OF QUANTITIES**

NO SCALE

**Q-1**

PROJECT NUMBER & PHASE: **EFIS 0500000542**

UNIT: **0 1 2 3**

RELATIVE BORDER SCALE: **15 IN INCHES**

USER NAME: **-->**

DWG FILE: **-->**

NOT A SEPARATE PAY ITEM. FOR INFORMATION ONLY.

BORDER LAST REVISED: 1/22/2010

DATE	05	COUNTY	Mon	ROUTE	1, 68	POST MILES TOTAL PROJECT	75.1, L4.2	SHEET NO.	99	TOTAL SHEETS	190
REGISTERED CIVIL ENGINEER	DATE		3/18/03		PROJECT		75.1, L4.2		SHEET NO. 99		
PLANS APPROVAL DATE	DATE		3/18/03		PROJECT		75.1, L4.2		SHEET NO. 99		
CITY OF MONTEREY			943 RESERVE DR., #100			MONTEREY, CA 93940			OMNI-MEANS, LTD.		

LINE	STATION	REMOVE ASPHALT CONCRETE DIKE	REMOVE CURB AND GUTTER	REMOVE CURB	REMOVE CONCRETE (DITCH)	REMOVE CONCRETE (DITCH)	REMOVE CONCRETE (DITCH)	REMOVE CONCRETE (DITCH)	REMOVE CONCRETE (DITCH)	REMOVE OVERSIDE	REMOVE CHAIN LINK FENCE	REMOVE SALVAGE GUARDRAIL	REMOVE TREATED WOOD WASTE (GUARDRAIL)	REMOVE DEVIATOR
H1	29+36.61 - 30+15.06	147												
H1	29+45.63 - 34+43.59	484												
H1	30+51.00 - 30+54.18	24												
H1	30+50.00 - 30+61.85	41												
H1	31+78.89 - 33+19.97	134												
R	12+81.49 - 15+00.00	219												
H2	10+22.75 - 11+56.00	135												
17M	11+69.39 - 14+08.85	363												
M	13+37.63 - 11+67.00	163												
17M	11+58.54 - 11+63.14	177												
H1	30+67.33 - 31+39.28	125												
H1	34+07.84 - 34+61.06	112												
H1	34+30.74 - 12+35.97	236												
H1	34+43.59 - 14+08.85	37												
R	10+38.69 - 15+00.00	465												
H2	10+22.00 - 11+60.00	272												
M	14+45.00 - 15+20.00	152												
M	14+56.00 - 15+20.00	112												
M	11+00.00 - 12+50.08	131												
M	11+00.00 - 11+63.14	67												
H1	33+03.38 - 11+47.68	230												
H1	10+38.69 - 10+22.75	48												
H1	32+00.38 - 12+81.49	24												
M	14+53.71 - 14+71.14	2												
A	29+29.98 - 27+52.01	3												
M	13+19.54 - 14+79.45	11												
H2	10+82.89 - 11+60.59	78												
H2	11+11.67 - 11+63.00	56												
17M	11+58.46 - 12+89.65	178												
M	12+18.15 - 12+86.31	63												
LH	111+46.87 - 114+48.87	39												
TOTAL		1917	1729	278	28	5	11	222	383	378	39			

LINE	STATION	CHAIN LINK FENCE (CL-6)	MINORST GUARDRAIL SYSTEM (WOOD POST)	ALTERNATIVE IN-LINE TERMINAL SYSTEM	GUARDRAIL END ANCHOR ASSEMBLY (TYPE 9FT)	TRAINING RAILING (TYPE MB-3)	VEGETATION CONTROL (MINOR CONCRETE)	PLACE HMA (TYPE A)	PLACE HMA (TYPE B)	PLACE HMA (TYPE C)	PLACE HMA (TYPE D)	PLACE HMA (SPECIAL)	PLACE HOT MIX ASPHALT (US AREA)	PLACE ASPHALT (US AREA)	HMA (HMA DITCH)	HMA (HMA DRAIN IN)
M	13+31.75 - 14+65.63	225	62	1	1	34.5										
A	29+40.00 - 27+50	175	1	1	1	87.0										
17M	11+58.46 - 11+94.78	51	1	1	1	23.8										
H2	11+22.65 - 11+70.02	38	1	1	1	67.9										
H1	30+51.00 - 30+53.83						211									
H1	30+50.16 - 30+78.85						37									
M	11+44.50 - 11+98.41						46									
M	11+44.50 - 11+98.41						10									
17M	11+69.71 - 11+58.32						180									
H1	29+45.63 - 30+33.60						44									
R	0+08.36 - 0+15.03						89									
A	29+24.00 - 27+52.00						52									
M	11+39.78 - 11+87.16						0.8									
M	13+22.26 - 13+34.83						0.7									
R	12+10						301									
TOTAL		225	328	3	4	213	123	224	89	301	52	9				

TEMPORARY LARGE SEDIMENT BARRIER	TEMPORARY FENCE (TYPE ESA)	TEMPORARY CHECK DAM (TYPE 1)	TEMPORARY CHECK DAM (TYPE 2)	TEMPORARY DRAINAGE INLET PROTECTION (TYPE 1)	TEMPORARY DRAINAGE INLET PROTECTION (TYPE 2)	TEMPORARY HYDRAULIC WALL (BONDED FIBER MATRIX)
1,820	3,350	450	365	12	1,820	2,600

\* QUANTITIES ESTIMATED BASED ON SWOR REQUIREMENTS. NOTE: TEMPORARY DRAINAGE INLET PROTECTION TYPE 6A AND 6B SHALL NOT BE USED

LOCATION	CORROGATED HIGH DENSITY POLYETHYLENE PIPE		WATER LINE CROSSOVER SIZE
	LI	RT	
H1	32+00.33+00	X	34
H1	33+10	X	48
H1	33+15	X	60
H1	33+15	X	1.1
H1	34+50	X	34
H2	10+50	X	65
H2	10+65	X	111
H2	11+06	X	42
M	13+15	X	75
M	14+70	X	33
M	14+75	X	34
M	14+75	X	38
M	13+30	X	156
TOTAL			814

LINE	IRRIGATION SLEEVES	
	LI	RT
H1	33+62	X
H1	11+35	X
R	12+05	X
H2	10+54	X
M	14+85	X
M	14+82	X
M	14+75	X
M	14+00	X
M	13+30	X
TOTAL		115

# SUMMARY OF QUANTITIES

NO SCALE

**G-2**

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





**PLANT LIST**

NOTE: "code" INDICATES ABBREVIATIONS USED ON PLANTING PLANS.

CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	PLANT GROUP	HOLE SIZE	BASIN TYPE	MULCH	SOIL AMEND.	COMMERCIAL FERTILIZER	STAKING	PLANTING LIMITS
ARB HY2	6	Arbutus x 'Marina' Standard Trunk	Strawberry Tree	No. 5	24" Box K	See Detail	1	1 CF	2.5 CF	4 PK	3	As shown on Plans
ARB HYB	1	Arbutus x 'Marina' Multi-Trunk Specimen	Multi-Trunk Strawberry Tree	No. 5	48" Box K	See Detail	1	2 CF	5.0 CF	6 PK	4	
CER FOR	11	Cercis canadensis 'Forest Pansy' TM Standard Trunk	Forest Pansy Eastern Redbud	No. 5	24" Box K	See Detail	1	1 CF	2.5 CF	4 PK	3	

**MITIGATION TREES**

CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	PLANT GROUP	HOLE SIZE	BASIN TYPE	MULCH	SOIL AMEND.	COMMERCIAL FERTILIZER	STAKING	PLANTING LIMITS
PIN RAD	81	Pinus radiata From Locally Grown Nursery	Monterey Pine	No. 5	B	See Detail	2	6 CF	18 CF	2 PK	-	
QUE AGR	90	Quercus agrifolia	Coast Live Oak	Linear	M	See Detail	2	3 CF	.15 CF	1 PK	-	

**SHRUBS**

CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	PLANT GROUP	HOLE SIZE	BASIN TYPE	MULCH	SOIL AMEND.	COMMERCIAL FERTILIZER	STAKING	PLANTING LIMITS
ARC HOW	79	Arctostaphylos densiflora 'Howard Hickman'	Howard Hickman Manzanita	No. 1	A	See Detail	2	3 CF	.13 CF	1 PK	-	
BER ROS	51	Berberis thunbergii 'Rose Glow'	Rose Glow Barberry	No. 5	B	See Detail	2	NA	18 CF	2 PK	-	
CEA CON	146	Ceanothus x 'Concha'	Concha California Lilac	No. 1	A	See Detail	2	3 CF	.15 CF	1 PK	-	
HET ARB	42	Heteromeles arbutifolia	Toyon	No. 1	A	See Detail	2	3 CF	.15 CF	1 PK	-	
PHO CR2	11	Phoridium tenax 'Cream Delight'	Cream Delight New Zealand Fax	No. 5	B	See Detail	2	NA	18 CF	2 PK	-	
ROS DIWA	200	Rosaemimus officinalis 'Prostratus'	Dwarf Rosemary	No. 1	A	See Detail	2	NA	.13 CF	1 PK	-	

**VINES/PALMS**

CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	PLANT GROUP	HOLE SIZE	BASIN TYPE	MULCH	SOIL AMEND.	COMMERCIAL FERTILIZER	STAKING	PLANTING LIMITS
PAR TRI	30	Parthenocissus tricuspidata	Boston Ivy	No. 1	A	See Detail	2	3 CF	.13 CF	1 PK	-	

**GROUND COVERS**

CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT.	PLANT GROUP	HOLE SIZE	BASIN TYPE	MULCH	SOIL AMEND.	SPACING	COMMERCIAL FERTILIZER	STAKING	PLANTING LIMITS
FES ELI	322	Festuca cinerea 'Elijah's Blue'	Elijah's Blue Fescue	No. 1	A	See Detail	2	NA	.13 CF	1 PK	-	4 oz Per Sid Detail	
LEY CAN	189	Leymus condensatus 'Canyon Pinus'	Canyon Pinus Native Blue Rye	No. 1	A	See Detail	2	NA	.13 CF	36" o.c.	-	-	
LOM BRE	470	Lomandra longifolia 'Breca'	Dwarf Mat Rush	No. 1	A	See Detail	2	NA	.13 CF	36" o.c.	-	-	
MYO WHI	34	Myoporum x 'White' Piece 4-ft. back from metal edge	Myoporum	No. 1	A	See Detail	2	NA	.13 CF	36" o.c.	-	-	
STA SIL	104	Stachys byzantina 'Silver Carpet'	Silver Carpet Lamb's Ears	No. 1	A	See Detail	2	NA	.13 CF	17" o.c.	-	-	
ZAU CAL	368	Zauschneria californica 'Bert's Bluff'	Bert's Bluff California Fuchsia	No. 1	A	See Detail	2	NA	.13 CF	24" o.c.	-	-	

**PLANTING LIMITS**

As shown on Plans

**APPLICABLE WHEN CIRCLED**

- QUANTITIES SHOWN ARE "PER PLANT", UNLESS SHOWN AS "SOFT" OR "50YD APPLICATION RATES"
- SEE DETAILS FOR MODIFIED BASIN TYPES. BASIN MULCH IS ONLY REQUIRED IN PERIMETER PLANTINGS IRRIGATED BY DRIFTLINE RINGS, NOT AROUND PLANTS LOCATED IN MEDIANS, PARKWAYS OR THE CENTRAL ISLAND.
- TREE STAKE REQUIRED.
- PROVIDE PHOTOGRAPHS AND DESCRIPTION OF SIZE OF TREE BEFORE DELIVERING TO SITE

**LANDSCAPE MATERIALS SCHEDULE**

SYMBOL	DESCRIPTION	QTY	DETAIL
1	Gravel Mulch - Beach Pebbles, "Pebble Screen" Rock Mulch - 1/2" size with filter fabric between soil and pebbles. Spread to a depth of 5".	183 sf (20 SY)	
2	Wood Bark Mulch - Spread to a depth of 3-inches in all planter areas identified. EXCEPT Do not place bark mulch in the bottom of winding swales in large median.	12,373 sf (115 CY)	
3	Small Rock Slope Protection 3/4" size cobble: Grey River Run Cobble Rock Mulch, with filter fabric between soil and rock. See Landscape Details.	342 sf (37 SY)	
4	Edging (Metal) Aluminum Landscape Edge Material. See Landscape Details.	210 lf	
5	Imported Detritation Soil - A combination of a special Soil Mix and Gravel Sub-base (per specials). See Landscape Detail.	898 sf (66 cu yd soil mix & 33 CY Gravel Sub-base)	
6	Small Rock Slope Protection - 6" size cobble Check Dam: Grey River Run Cobble Rock Mulch. See landscape details.	33 sf (4 SY)	
7	Imported Top Soil, Backfill in overexcavated planter areas (see Civil Construction Details) and backfill/mounding in Central Island (see Grading Plans)	14,963 sf (1108 CY)	

**PLANT LIST AND DETAILS**

NO SCALE

THIS PLAN ACCURATE FOR PLANTING WORK ONLY. PL-1

PROJECT NUMBER & PHASE 0500000542

CU

DRIVER BY: SAR (JOB FILE: 17713101)

RELATIVE BORDER SCALE 15 IN INCHES

BORDER LAST REVISED 3/1/2007

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONSULTANT: SENIOR LANDSCAPE ARCHITECT

SCOTT A. ROBERTSON

DESIGNED BY

SCOTT A. ROBERTSON

REVISIONS

CHECKED BY


DATE

Page 893 of 893

Agreement # Ag-237

CAO RISK

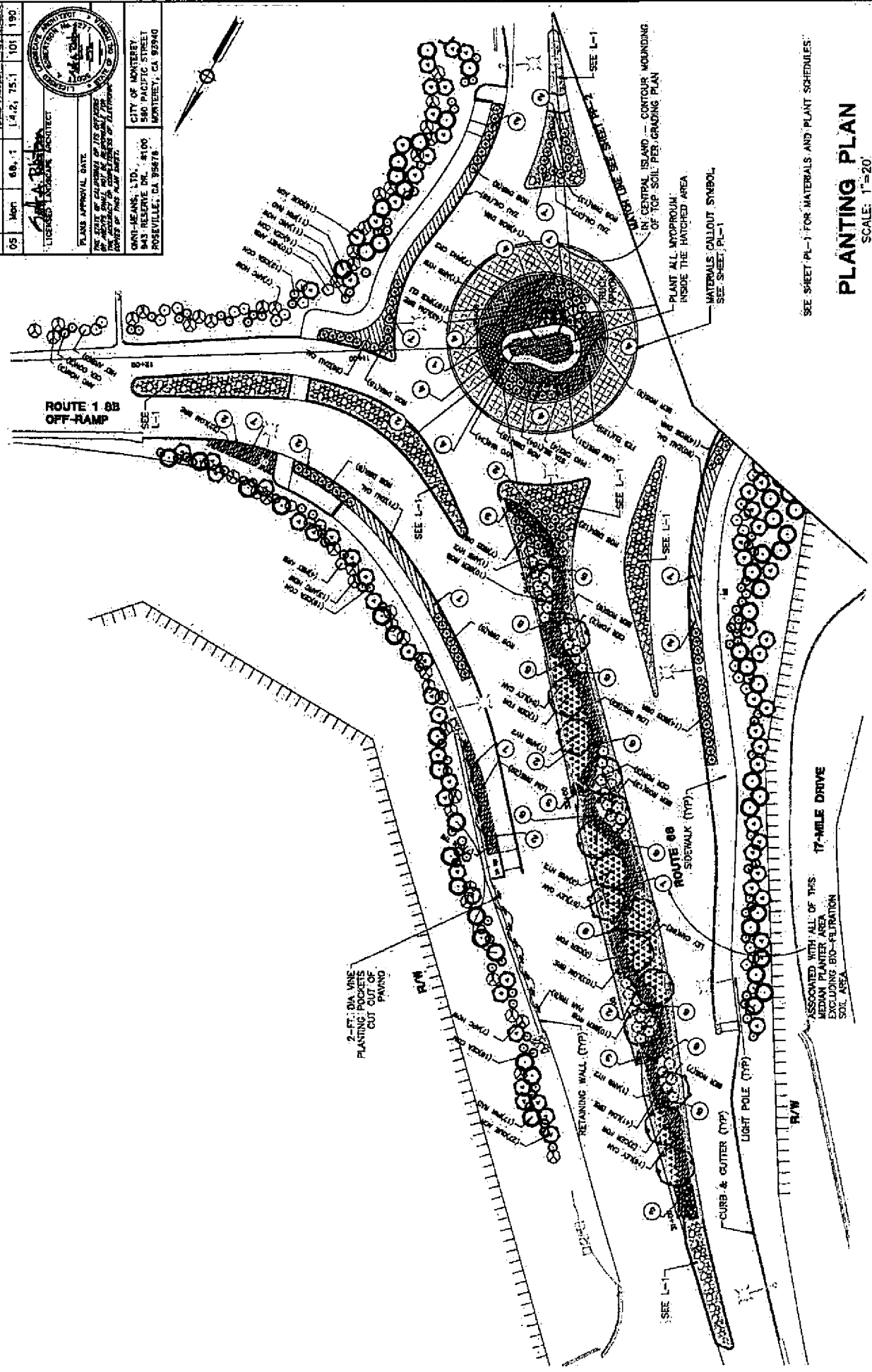
DATE	COUNTY	ROUTE	POST MILE	SHEET NUMBER	TOTAL SHEETS
05	Mon	68, 1	[4.2, 75.1]	101	190


  
 LICENSED LANDSCAPE ARCHITECT

PLANS APPROVAL DATE: \_\_\_\_\_

THE STATE OF CALIFORNIA OFFICE OF THE STATE ARCHITECT  
 1601 MARKET STREET, SUITE 1000  
 SAN FRANCISCO, CALIFORNIA 94102

CITY OF MONTREY  
 540 PACIFIC STREET  
 MONTREY, CA 93940



SEE SHEET PL-1 FOR MATERIALS AND PLANT SCHEDULES.

# PLANTING PLAN

SCALE: 1"=20'

THIS PLAN ACCURATE FOR PLANTING WORK ONLY.

PP-1


PROJECT NUMBER & PHASE 0500000542

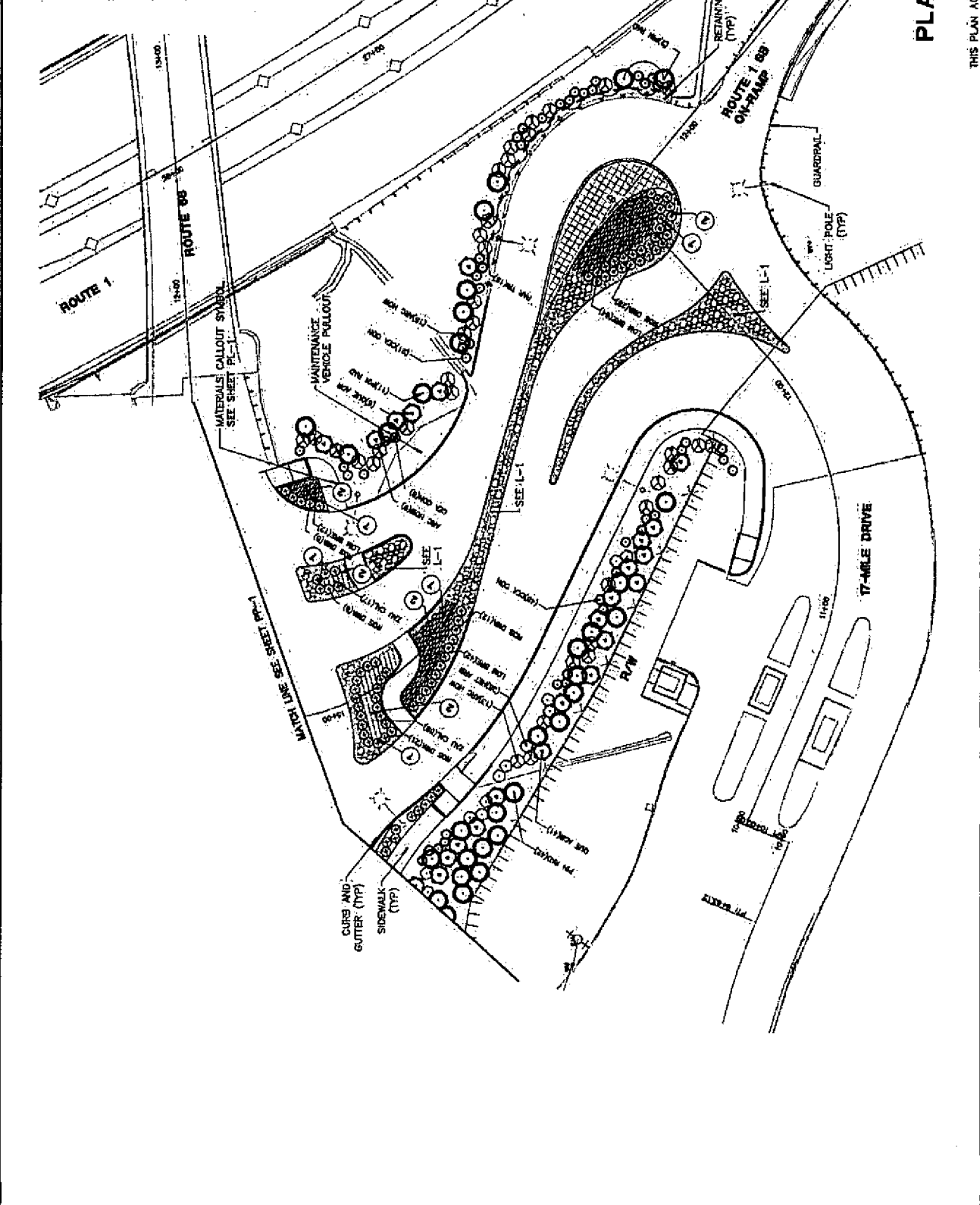
CAO RISK

RELATIVE HATCH SCALE  
1/8" = 1' HATCHES

BORDER LAST REVISED 3/1/2007

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT SENIOR LANDSCAPE ARCHITECT	SCOTT A. ROBERTSON	DATE REVISED	REVISION
DESIGNED BY	SCOTT A. ROBERTSON	DATE REVISED	REVISION	
CHECKED BY	SCOTT A. ROBERTSON	DATE REVISED	REVISION	
CALCULATED BY	SCOTT A. ROBERTSON	DATE REVISED	REVISION	

DIST	COUNTY	ROUTE	TOTAL PROJECT	SHEET NUMBER
09	Mon	69, 1	1, 4, 2, 3, 5, 1	102
				
PLANS APPROVAL DATE: _____ THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION THE DIVISION OF HIGHWAYS COUNTY OF SAN BENITO DISTRICT				
CITY OF MONTEREY 580 PACIFIC STREET MONTEREY, CA 93940				



**PLANTING PLAN**  
SCALE: 1"=20'

THIS PLAN ACCURATE FOR PLANTING WORK ONLY.

PP-2

PROJECT NUMBER & PHASE 0500000542

CU

RI

CAO RISK

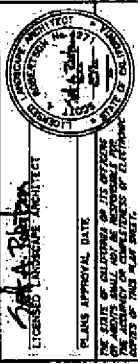
SEE SHEET PL-1

Agreement # Ag-537.7 - Page 595 of 791

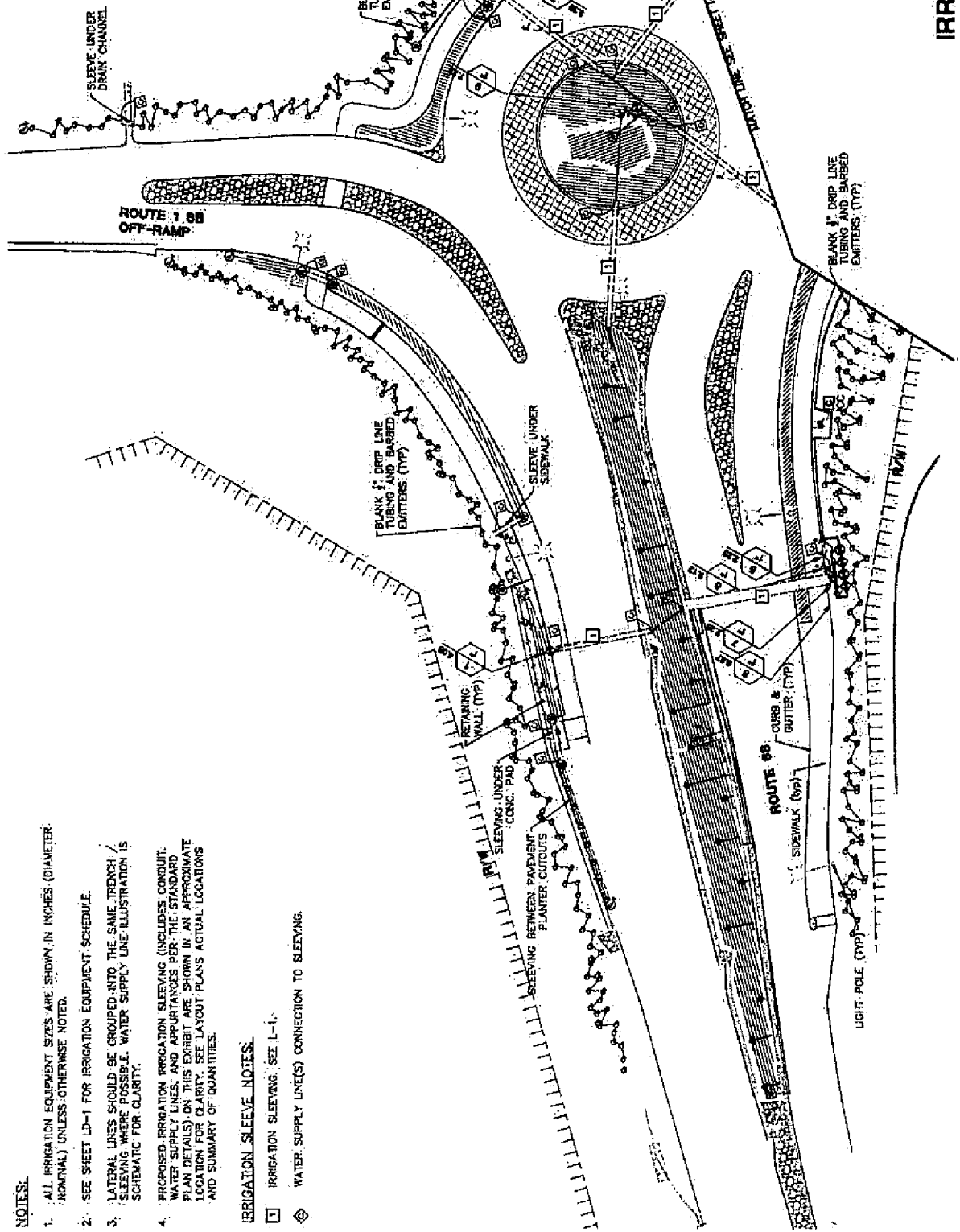
ORDER LAST REVISED 5/1/2007

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT: SHORR LANDSCAPE ARCHITECT	DESIGNED BY: SCOTT A. ROBERTSON	REVIEWED BY:
ES GROUP	SCOTT A. ROBERTSON	CHECKED BY: SCOTT A. ROBERTSON	DATE REVISED:

DIST.	COUNTY	ROUTE	POST MILE	SHEET NUMBER
05	Mon	69, 1	E.4.2, 75.1	103 190



PLANS APPROVAL DATE: 10/15/2017  
 THE SEAL OF CALIFORNIA OF THE ENGINEER  
 OF ANY STATE SHALL NOT BE A SUBSTITUTE FOR THE  
 LICENSE OF THE ENGINEER OF THAT STATE.  
 CONI-JEANS, LTD.  
 943 RESERVE DR., #100  
 ROSEVILLE, CA 95748  
 AS THE DESIGN ARCHITECT, WATER COURTESY  
 OF THE COUNTY OF SACRAMENTO. WATER COURTESY  
 ORDINANCE AND APPLIED THEM ACCORDINGLY FOR THE  
 PRESENT USE OF WATER IN THE IRRIGATION DESIGN PLAN.



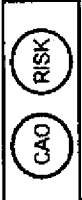
- NOTES:**
- ALL IRRIGATION EQUIPMENT SIZES ARE SHOWN IN INCHES (DIAMETER NOMINAL) UNLESS OTHERWISE NOTED.
  - SEE SHEET LD-1 FOR IRRIGATION EQUIPMENT SCHEDULE.
  - LATERAL LINES SHOULD BE GROUPED INTO THE SAME TRENCH / SLEEVING WHERE POSSIBLE. WATER SUPPLY LINE ILLUSTRATION IS SCHEMATIC FOR CLARITY.
  - PROPOSED IRRIGATION IRRIGATION SLEEVING (INCLUDES CONDUIT, WATER SUPPLY LINES, AND APPURTANCES PER THE STANDARD PLAN DETAILS) ON THIS EXHIBIT ARE SHOWN IN AN APPROXIMATE LOCATION FOR CLARITY. SEE LAYOUT PLANS ACTUAL LOCATIONS AND SUMMARY OF QUANTITIES.

**IRRIGATION SLEEVE NOTES:**

- IRRIGATION SLEEVING, SEE L-1.
- ◇ WATER SUPPLY LINE(S) CONNECTION TO SLEEVING.

**IRRIGATION PLAN**  
 SCALE: 1"=20'

THIS PLAN ACCURATE FOR IRRIGATION WORK ONLY. PROJECT NUMBER & PHASE: 0500000342



RELATIVE NUMBER SCALE  
 1" = 15' IN HORIZONTAL

BORDER LAST REVISED 3/1/2007

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT SENIOR LANDSCAPE ARCHITECT	SCOTT A. ROBERTSON	DESIGNED BY	SCOTT A. ROBERTSON	REVIEWED BY	SCOTT A. ROBERTSON	DATE REVIEWED	
			CHECKED BY	SCOTT A. ROBERTSON				

DIST	COUNTY	ROUTE	TRAIL MILELET	PROJECT NUMBER
05	Mon	68, 1	L-2, 75-1	104 190

**LIEDER'S LANDSCAPE ARCHITECT**

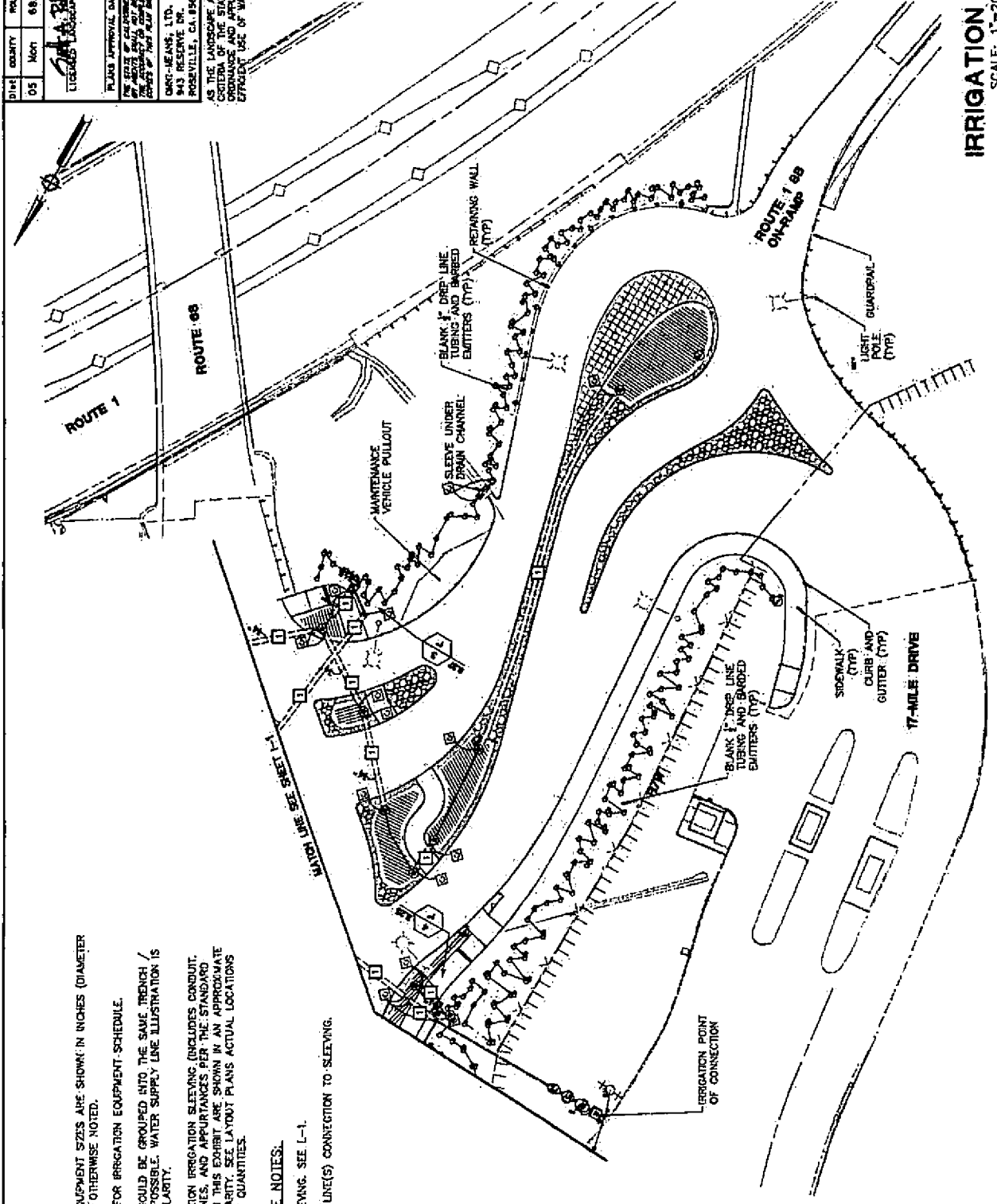
PLANS APPROVAL DATE: \_\_\_\_\_

THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

DMG-HEANS, LTD.  
843 RESERVE DR. #100  
ROSEVILLE, CA 95678

CITY OF MONTEREY  
540 PACIFIC STREET  
MONTEREY, CA 93940

AS THE LANDSCAPE ARCHITECT I HAVE COMPLIED WITH THE  
CALIFORNIA PROFESSIONAL LANDSCAPE ARCHITECTURE ACT  
ORDINANCE AND AFFIRMED THEM ADOPTED FOR THE  
EFFICIENT USE OF WATER IN THE IRRIGATION DESIGN PLAN.



- NOTES:**
1. ALL IRRIGATION EQUIPMENT SIZES ARE SHOWN IN INCHES (DIAMETER NOMINAL) UNLESS OTHERWISE NOTED.
  2. SEE SHEET LD-1 FOR IRRIGATION EQUIPMENT SCHEDULE.
  3. LATERAL LINES SHOULD BE GROUPED INTO THE SAME TRENCH / SLEEVING WHERE POSSIBLE. WATER SUPPLY LINE ILLUSTRATION IS SCHEMATIC FOR CLARITY.
  4. PROPOSED IRRIGATION SLEEVING (INCLUDES CONDUIT, WATER SUPPLY LINES, AND APPURTANCES PER THE STANDARD PLAN DETAILS) ON THIS EXHIBIT ARE SHOWN IN AN APPROXIMATE LOCATION FOR CLARITY. SEE LAYOUT PLANS ACTUAL LOCATIONS AND SUMMARY OF QUANTITIES.
- IRRIGATION SLEEVE NOTES:**
- IRRIGATION SLEEVING. SEE L-1.
  - ◇ WATER SUPPLY LINE(S) CONNECTION TO SLEEVING.

**IRRIGATION PLAN**  
SCALE: 1"=20'

THIS PLAN ACCURATE FOR IRRIGATION WORK ONLY.

PROJECT NUMBER & PHASE 0500000542

CU

BT

VERTICAL CURVE SCALE  
1"=10' IN THICKNESS

BORDER LAST REVISED 3/1/2007

Agreement # Ag-5377 - Page 597 of 791

CAO RISK

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT SENIOR LANDSCAPE ARCHITECT	CHECKED BY	SCOTT A. ROBERTSON
DESIGNED BY	SCOTT A. ROBERTSON	DATE REVISED	

DATE	COUNTY	ROUTE	POST MILES	SHEET TOTALS
05	MON	66, 1	L 4-2, 75-1	105 190
LITERLAND LANDSCAPE ARCHITECT PLANS APPROVAL DATE: 11/25/2015 THE STATE OF CALIFORNIA OR ITS OFFICERS OR EMPLOYEES SHALL NOT BE RESPONSIBLE FOR THE CONSEQUENCES OF ANY ERRORS OR OMISSIONS.				
CHMO-MEYERS, LTD. 943 RESERVE DR., #100 ROSEVILLE, CA 95678 CITY OF MONTEREY 500 PACIFIC STREET MONTEREY, CA 93940				

AS THE LANDSCAPE ARCHITECT I HAVE COMPLIED WITH THE CRITERIA OF THE STATE MODEL WATER EFFICIENT ORDINANCE AND APPLIED THEM ACCORDINGLY FOR THE EFFICIENT USE OF WATER IN THE IRRIGATION DESIGN PLAN.

**VALVE SCHEDULE**

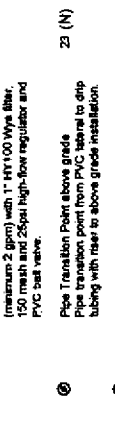
NUMBER	MODEL	SIZE	TYPE	WIRE	PSI @ P.O.C.	GPM	PRECIP.
1	1" Drip Valve Assembly Unit	1"	Area for Dripline	277.6	54.87	4.03	0.37 in/h
2	1" Drip Valve Assembly Unit	1"	Area for Dripline	266.8	42.78	3.39	0.37 in/h
3	1" Drip Valve Assembly Unit	1"	Area for Dripline	200.1	50.71	2.28	0.37 in/h
4	1" Drip Valve Assembly Unit	1"	Area for Dripline	78.7	43.85	2.25	0.37 in/h
5	1" Remote Control Valve	1"	Backflow	78.6	32.81	2.25	7.05 in/h
6	1" Remote Control Valve	1"	Backflow	88.9	33.32	2.25	7.85 in/h
7	1" Drip Valve Assembly Unit	1"	Area for Dripline	83.4	48.80	6.87	0.37 in/h
8	1" Drip Valve Assembly Unit	1"	Area for Dripline	183.1	43.08	7.73	0.37 in/h
9	Common Wire			689.3			

**CRITICAL ANALYSIS**

Generated: 2015-08-07 15:36  
 P.O.C NUMBER: 01  
 Water Source Information: 115 Static PSI at 017-3-14 per Cal Water  
 FLOW AVAILABLE  
 Water Meter Size: 1"  
 Flow Available: 37.50 gpm  
 PRESSURE AVAILABLE  
 Static Pressure at P.O.C: 115.00 psi  
 Elevation Change: 33.00 ft  
 Service Line Size: 1 1/2"  
 Length of Service Line: 26.00 ft  
 Pressure Available: 100.00 psi  
 DESIGN ANALYSIS  
 Maximum Station Flow: 9.37 gpm  
 Flow Available at P.O.C: 37.50 gpm  
 Residual Flow Available: 28.13 gpm  
 Critical Station: 3  
 Design Pressure: 30.00 psi  
 Elevation Loss: 0.00 psi  
 Friction Loss: 5.50 psi  
 Leakage Loss: 14.37 psi  
 Loss for Backflow Preventer Valve: 50.70 psi  
 Pressure Req. at Critical Station: 0.69 psi  
 Loss for Main Line: 8.91 psi  
 Loss for P.O.C to Valve Elevation: 5.20 psi  
 Loss for Backflow: 12.32 psi  
 Loss for Water Meter: 2.94 psi  
 Loss for Water Meter: 79.40 psi  
 Pressure Available: 30.00 psi  
 Residual Pressure Available: 20.00 psi

**IRRIGATION EQUIPMENT SCHEDULE**

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
1	Tree Well Sprinkler Assembly 3/8" long assembly with 0.25 GPM bubbler, Check Valve, 1/2" swing joint for connection to lateral pipe -30 PSI Operating Pressure	10
2	1" Drip Valve Assembly Unit 1" Remote Control Valve 1" Remote Control Valve 1" Drip Valve Assembly Unit 1" Drip Valve Assembly Unit 1" Drip Valve Assembly Unit 1" Drip Valve Assembly Unit Common Wire	7
3	Pipe Transition Point above grade PVC transition point from PVC lateral to drip tubing with riser to above grade installation.	23 (N)
4	Manual Flush Valve Manual flush valve at low point of dripline irrigation	15
5	1-GPH EMITTER Drip emitter 1-GPH Single Outlet Emitter, Self-Flushing, Pressure Compensating (2) per 5-gal. (1) per 1-gal and liners	541
6	Area to Receive Dripline 1/2" Drip Line Tubing In-Line Pressure Compensating Landscape Dripline with 1/2" Check Valve (0.6GPM) at 18 PSI. Do not use in areas spread at 23.0' apart with emitters offset for triangular pattern. UV Resistant 30 PSI Operating pressure.	9,446 s.f. (N)
7	1" Remote Control Valve 1" Electric Remote Control Valves	2
8	Remote Control Master Valve 1" Remote Control Valve sized per Water Meter - normally open	1
9	Backflow Preventer Assembly 1" Reduced Pressure Backflow Preventer Assembly in Enclosure Sized per Water Meter	1
10	Irrigation Controller in Cabinet 2-station Solenoid Irrigation Controller Expansion Valve Sensing and Water Management Capabilities	1
11	Flow Sensor Flow Sensor compatible with controller, Schedule 40 Sensor Body, 24 VAC, 2 amp.	1
12	Water Meter 1" 1 1/2 Static PSI as of 7-3-14 per Cal Water	1
13	Injection Lateral Line, PVC Schedule 40 PVC Schedule 40 Irrigation lateral pipe -3/4" in size	1,794 ft
14	Blank 1/2" poly drip tubing connecting Irrigation Lateral Line, Blank 1/2" Poly Tubing	2,845 ft
15	Injection Mainline: PVC Schedule 40 PVC Schedule 40 Irrigation mainline pipe 1" size	689 ft
16	Pipe Sleeve Irrigation conduit	816 ft



DESIGNED BY	SCOTT A. ROBERTSON
CHECKED BY	SCOTT A. ROBERTSON

DATE	08/07/15
PROJECT	AG 517

CALCULATED BY	SCOTT A. ROBERTSON
CONSULTANT SENIOR LANDSCAPE ARCHITECT	SCOTT A. ROBERTSON

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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CAO	RISK
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AGREEMENT #	AG 517
PAGE	588 OF 608

**LANDSCAPE DETAILS**  
NO SCALE

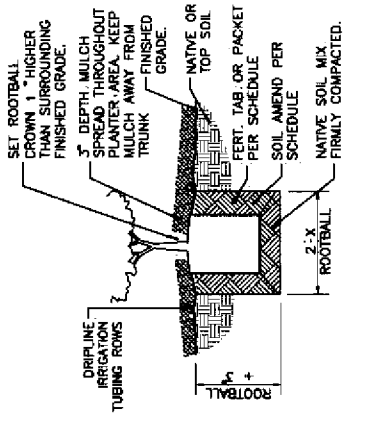
LD-1



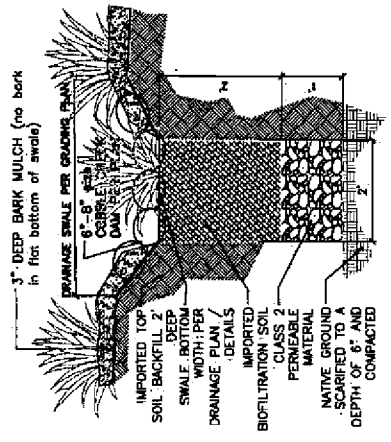
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
05	Mon	68, 1	L4.2, 75.1	107	190



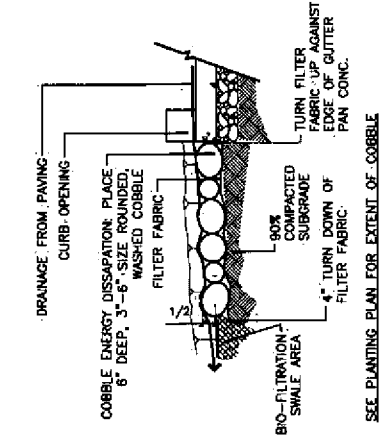
**LIGERANO AND ASSOCIATES ARCHITECT**  
 PLANS APPROVAL DATE: \_\_\_\_\_  
 THE STATE OF CALIFORNIA BY ITS OFFICERS  
 OF AGENCY SHALL NOT BE RESPONSIBLE FOR  
 THE ACCURACY OR COMPLETENESS OF THE INFORMATION  
 CONTAINED IN THESE PLANS.  
 CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA 93940



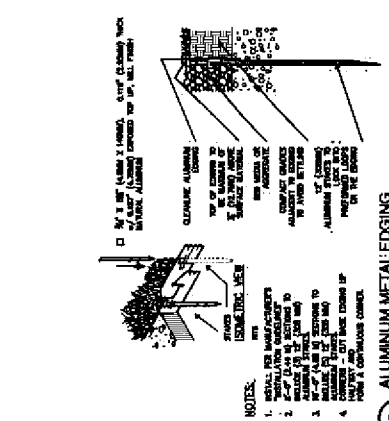
**1** SMALL ROCK SLOPE PROTECTION  
 1" = 1'-0"  
 200403-02



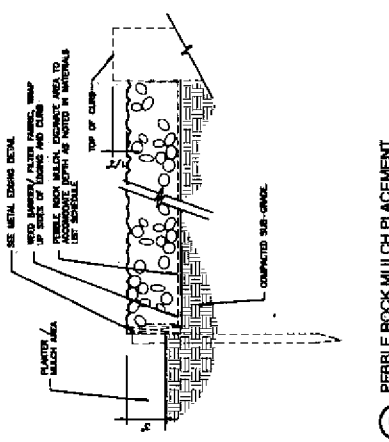
**2** BIO-FILTRATION SWALE SOIL MEDIA  
 1" = 1'-0"  
 200403-03



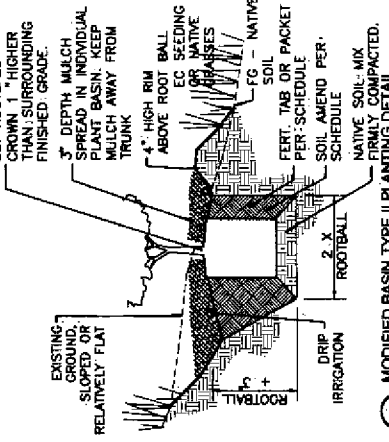
**3** PLANTING DETAIL - WHERE DRIPLINE USED  
 NOT TO SCALE



**4** MODIFIED BASIN TYPE II PLANTING DETAIL  
 1" = 1'-0"  
 200303-15-00



**5** PEBBLE ROCK MULCH PLACEMENT  
 3" = 1'-0"  
 200403-01



**6** ALUMINUM METAL EDGING  
 3" = 1'-0"  
 200403-01

DESIGNED BY	SCOTT A. ROBERTSON
REVISOR	SCOTT A. ROBERTSON
CHECKED BY	SCOTT A. ROBERTSON
CALCULATED BY	SCOTT A. ROBERTSON

Agreement #: Ag-51 / Page 500 of 698  
 CONSULTANT: SCOTT A. ROBERTSON  
 CONSULTANT: SCOTT A. ROBERTSON

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 BORDER LAST REVISED 3/1/2007

CAO RISK  
 PROJECT NUMBER & PHASE: 0500000542  
 SHEET NO.: 11871-1000  
 DATE: 11/2007

**LANDSCAPE DETAILS**  
 NO SCALE  
**LD-3**

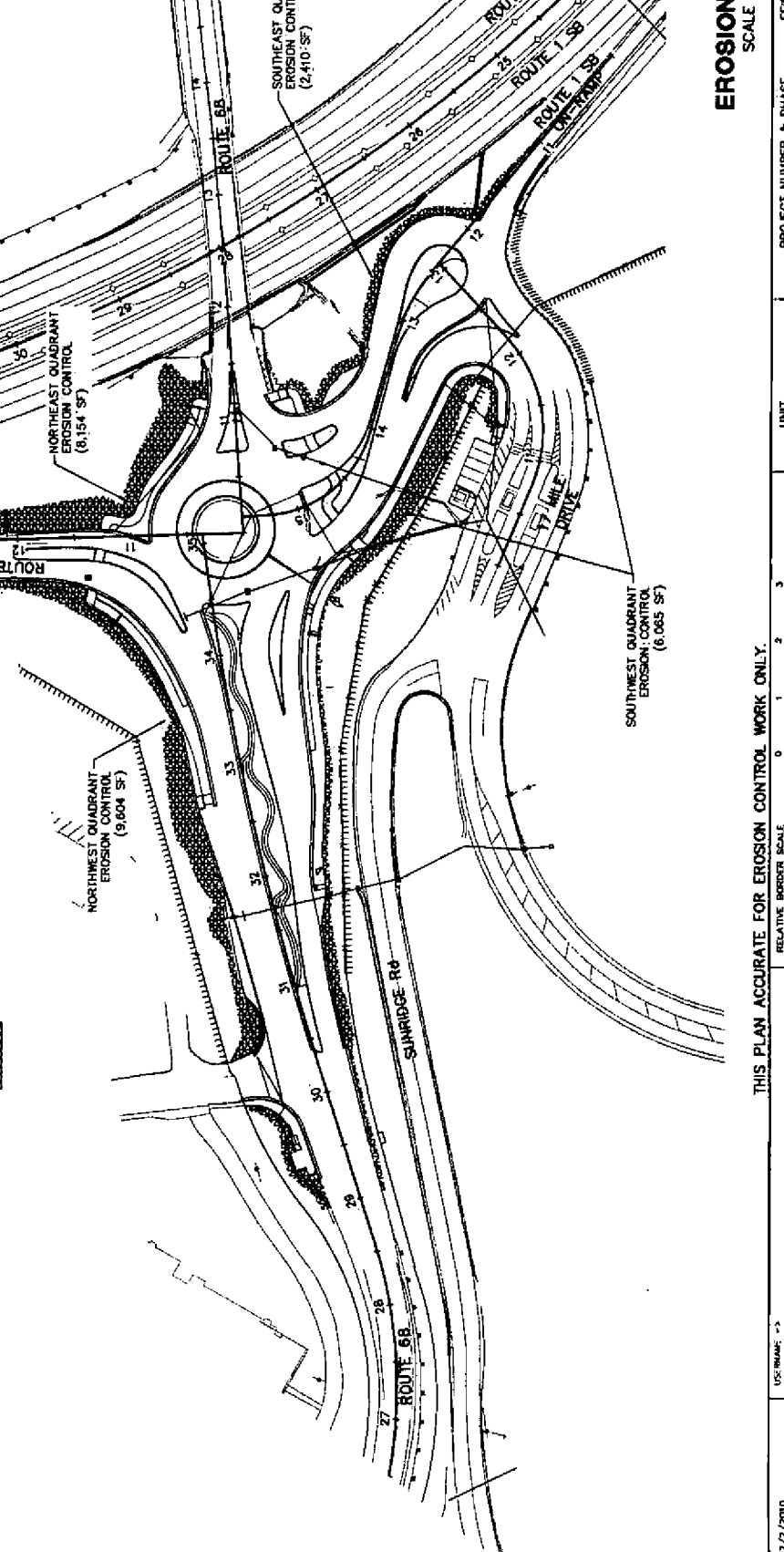


DATE	05	COUNTY	Mon	ROUTE	1, 68	TOTAL PROJECT	78.1, LA-2	SHEET NO.	108	TOTAL SHEETS	190
DESIGNED BY	REVISOR	CHECKED BY	DATE	PROJECT	DATE	APPROVAL	DATE				
PLANS APPROVAL DATE: _____ THE SEAL OF THE BOARD OF PROFESSIONAL ENGINEERS OF THE STATE OF CALIFORNIA IS HEREBY APPLIED TO THESE PLANS IN FULL COMPLIANCE WITH THE PROVISIONS OF THE ENGINEERING ACT OF 1907 AS AMENDED.											
CITY OF MONTEREY 943 RESERVE DR. #100 ROSEVILLE, CA 95678											

BOTANICAL NAME (COMMON NAME)	PERCENT. GERMINATION (MINIMUM)	POURD PURE LIVE SEED PER ACRE (SLOPE MEASUREMENT)
ACHILLEA MILEFOLIUM	60	1
BRASSICA RAPA (CABBAGE)	90	12
ELIMIS (ELIMIS)	90	7
ESCHSCHOLIA CALIFORNICA (WILD PINK)	85	3
CALIFORNIA POPPY	85	4
POBEDIA BRASCHARTHERIUM (DEADWON BARELY)	80	2
LAVIA FLATYLOSSA (TIBET TIPS)	80	3
BRASSICA RAPA (CABBAGE)	85	2
BRASSICA RAPA (CABBAGE)	85	4
SALVIA MELTERA (BLACK SAGE)	80	8
VELUXIA MICROSTACHYS		

SEQUENCE	MATERIAL	DESCRIPTION	TYPE	APPLICATION RATE	REMARKS
STEP 1	COMPOST	COMPOST	MIX 1	273 CY/ACRE	3" THICK
STEP 2	HYDROSEED	FIBER TACKLER	WOOD POSTILLUM	1500 LB/ACRE	
STEP 3	ROLLED EROSION CONTROL PRODUCT	NETTING	TYPE A		

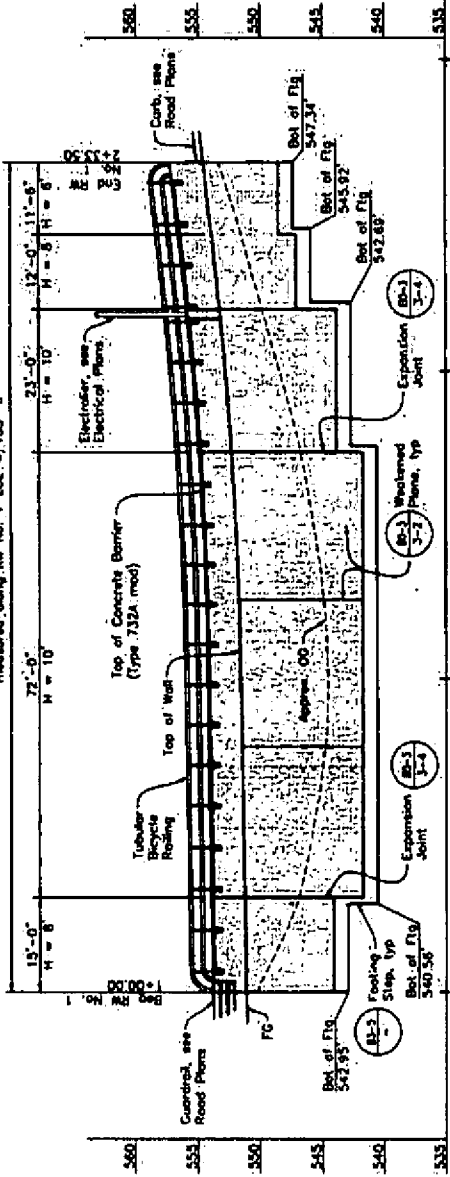
LOCATION	COMPOST (SOFT)	HYDROSEED (SOFT)	RECP (NETTING) (SQFT)
NW QUADRANT	9,604	9,604	9,604
NE QUADRANT	8,154	8,154	8,154
SW QUADRANT	6,065	6,065	6,065
SE QUADRANT	2,410	2,410	2,410
TOTAL	26,233	26,233	26,233



**INDEX TO PLANS**

- TITLE  
 NO. RETAINING WALL, NO. 1, GENERAL PLAN  
 2. RETAINING WALL, NO. 2, GENERAL PLAN  
 3. RETAINING WALL, DETAILS

Total length of Retaining wall, Type 1, (Comp 1)  
 measured along RW No. 1, L.O.L. = 133.58'

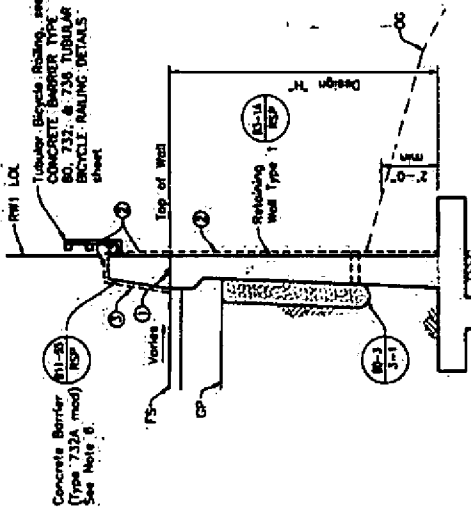


**DEVELOPED ELEVATION**

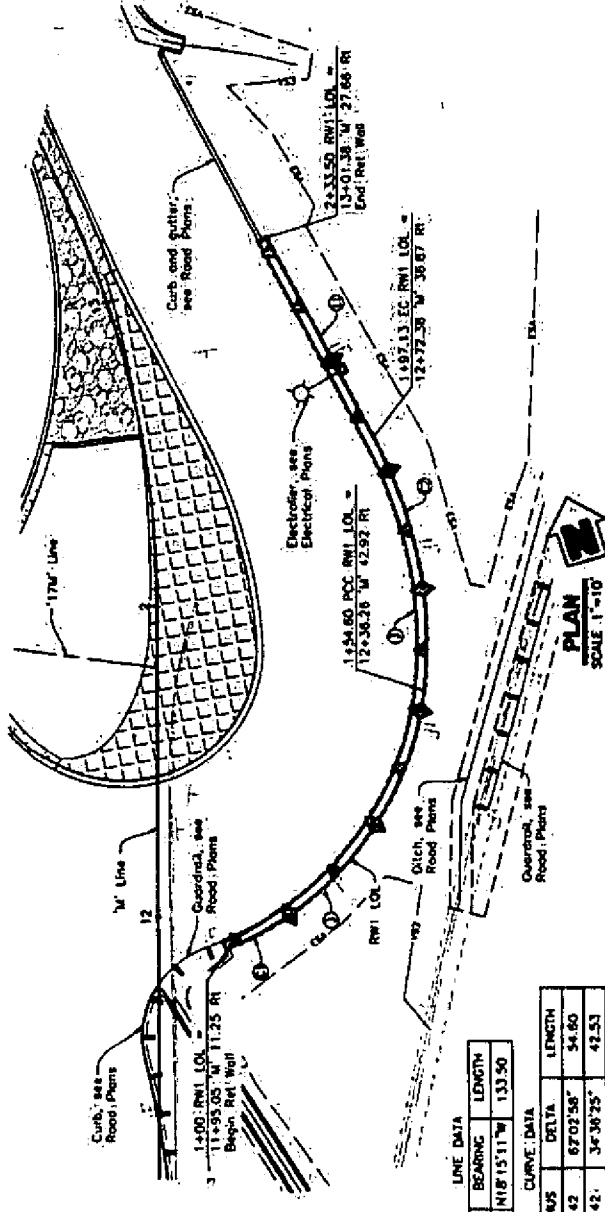
SCALE: HORIZ: 1"=10'  
 VERT: 1"=5'

**TYPICAL SECTION**

NO SCALE



- NOTES:  
 1. These plans shall incorporate the 2010 State Standard Specifications and the 2010 State Standard Plans.  
 2. These plans occur for the retaining wall only. See Road Plans for additional notes and details not noted.  
 3. The Contractor shall verify, controlling field dimensions before ordering or fabricating any materials.  
 4. Utility locations shown are approximate. For utility relocations, see Utility Plans.  
 5. For FS grades at top of wall, see Road Plans.  
 6. Modification to Concrete Barrier (Type 732A mod) includes removal of recess at front face of barrier as shown.  
 7. All surfaces to include Golden Granite Concrete Surface Texture, must be solid stoned.
- ① 2 in. Dia. (Sch. 40 PVC) Formed Opening (Street Light)  
 ② Golden Granite Concrete Surface Texture  
 ③ Modified Golden Granite Concrete Surface Texture, see "Concrete Barrier Type 732 Mod" detail on RETAINING WALL DETAILS sheet  
 E- Electrical Plans  
 AS-11 100 - Indicates Callouts standard plan sheet no.  
 100 - Indicates detail no.



LINE DATA

No.	BEARING	LENGTH	RADIUS	DELTA	LENGTH
1	N18°15'11"W	133.50			
2					
3					

CURVE DATA

No.	RADIUS	DELTA	LENGTH
1	50.42	67°07'58"	34.80
2	70.42	34°38'25"	42.53

PREPARED FOR THE  
**STATE OF CALIFORNIA**  
 DEPARTMENT OF TRANSPORTATION

PROJECT NO. 050000242  
 CLU. 05 44890  
 DATE 10/20/05

DESIGNED BY: [Signature]  
 CHECKED BY: [Signature]  
 DRAWN BY: [Signature]


PROJECT NO. 050000242  
 CLU. 05 44890  
 DATE 10/20/05

DESIGNED BY: [Signature]  
 CHECKED BY: [Signature]  
 DRAWN BY: [Signature]

CAO (RISK)

DATE	COUNTY	ROUTE	STATION	POST MILE	SECTION
15	MON	1	68	75.1, 14.2	110

REGISTERED STRUCTURAL ENGINEER

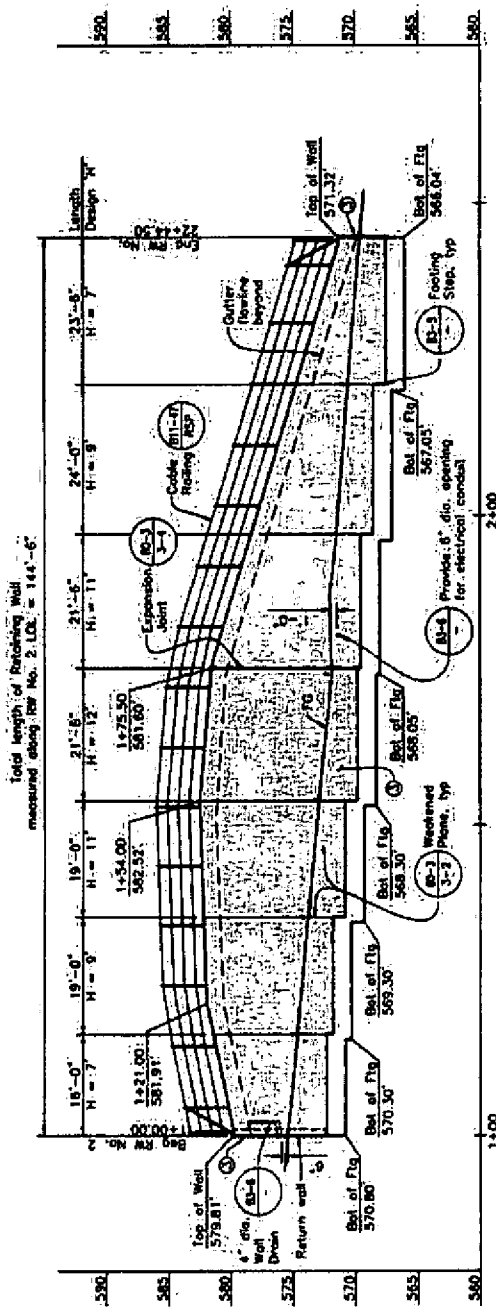


PROJECT INFORMATION: DATE, CITY OF HOLMAN, PROJECT NO. 660000042, SHEET NO. 110 OF 190

**CALTRANS 2010 STANDARD PLANS**

- A10A APPROXIMATIONS (SHEET 1 OF 2)
- A10B ABBREVIATIONS (SHEET 2 OF 2)
- A10C LINES AND SYMBOLS (SHEET 1 OF 3)
- A10D LINES AND SYMBOLS (SHEET 2 OF 3)
- A10E LINES AND SYMBOLS (SHEET 3 OF 3)
- A10F LIMITS OF PAYMENT FOR EXCAVATION AND BACKFILL, BRIDGE SURCHARGE AND WALL BRIDGE DETAILS
- BO-1 RETAINING WALL DETAILS NO. 1
- BO-2 RETAINING WALL DETAILS NO. 2
- BO-3 RETAINING WALL DETAILS NO. 3
- BO-4 RETAINING WALL DETAILS NO. 4
- BO-5 RETAINING WALL DETAILS NO. 5
- BO-6 RETAINING WALL DETAILS NO. 6
- BO-7 RETAINING WALL DETAILS NO. 7
- BO-8 RETAINING WALL DETAILS NO. 8
- BO-9 RETAINING WALL DETAILS NO. 9
- BO-10 RETAINING WALL DETAILS NO. 10
- BO-11 RETAINING WALL DETAILS NO. 11
- BO-12 RETAINING WALL DETAILS NO. 12
- BO-13 RETAINING WALL DETAILS NO. 13
- BO-14 RETAINING WALL DETAILS NO. 14
- BO-15 RETAINING WALL DETAILS NO. 15
- BO-16 RETAINING WALL DETAILS NO. 16
- BO-17 RETAINING WALL DETAILS NO. 17
- BO-18 RETAINING WALL DETAILS NO. 18
- BO-19 RETAINING WALL DETAILS NO. 19
- BO-20 RETAINING WALL DETAILS NO. 20
- BO-21 RETAINING WALL DETAILS NO. 21
- BO-22 RETAINING WALL DETAILS NO. 22
- BO-23 RETAINING WALL DETAILS NO. 23
- BO-24 RETAINING WALL DETAILS NO. 24
- BO-25 RETAINING WALL DETAILS NO. 25
- BO-26 RETAINING WALL DETAILS NO. 26
- BO-27 RETAINING WALL DETAILS NO. 27
- BO-28 RETAINING WALL DETAILS NO. 28
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- BO-30 RETAINING WALL DETAILS NO. 30
- BO-31 RETAINING WALL DETAILS NO. 31
- BO-32 RETAINING WALL DETAILS NO. 32
- BO-33 RETAINING WALL DETAILS NO. 33
- BO-34 RETAINING WALL DETAILS NO. 34
- BO-35 RETAINING WALL DETAILS NO. 35
- BO-36 RETAINING WALL DETAILS NO. 36
- BO-37 RETAINING WALL DETAILS NO. 37
- BO-38 RETAINING WALL DETAILS NO. 38
- BO-39 RETAINING WALL DETAILS NO. 39
- BO-40 RETAINING WALL DETAILS NO. 40
- BO-41 RETAINING WALL DETAILS NO. 41
- BO-42 RETAINING WALL DETAILS NO. 42
- BO-43 RETAINING WALL DETAILS NO. 43
- BO-44 RETAINING WALL DETAILS NO. 44
- BO-45 RETAINING WALL DETAILS NO. 45
- BO-46 RETAINING WALL DETAILS NO. 46
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- BO-57 RETAINING WALL DETAILS NO. 57
- BO-58 RETAINING WALL DETAILS NO. 58
- BO-59 RETAINING WALL DETAILS NO. 59
- BO-60 RETAINING WALL DETAILS NO. 60
- BO-61 RETAINING WALL DETAILS NO. 61
- BO-62 RETAINING WALL DETAILS NO. 62
- BO-63 RETAINING WALL DETAILS NO. 63
- BO-64 RETAINING WALL DETAILS NO. 64
- BO-65 RETAINING WALL DETAILS NO. 65
- BO-66 RETAINING WALL DETAILS NO. 66
- BO-67 RETAINING WALL DETAILS NO. 67
- BO-68 RETAINING WALL DETAILS NO. 68
- BO-69 RETAINING WALL DETAILS NO. 69
- BO-70 RETAINING WALL DETAILS NO. 70
- BO-71 RETAINING WALL DETAILS NO. 71
- BO-72 RETAINING WALL DETAILS NO. 72
- BO-73 RETAINING WALL DETAILS NO. 73
- BO-74 RETAINING WALL DETAILS NO. 74
- BO-75 RETAINING WALL DETAILS NO. 75
- BO-76 RETAINING WALL DETAILS NO. 76
- BO-77 RETAINING WALL DETAILS NO. 77
- BO-78 RETAINING WALL DETAILS NO. 78
- BO-79 RETAINING WALL DETAILS NO. 79
- BO-80 RETAINING WALL DETAILS NO. 80
- BO-81 RETAINING WALL DETAILS NO. 81
- BO-82 RETAINING WALL DETAILS NO. 82
- BO-83 RETAINING WALL DETAILS NO. 83
- BO-84 RETAINING WALL DETAILS NO. 84
- BO-85 RETAINING WALL DETAILS NO. 85
- BO-86 RETAINING WALL DETAILS NO. 86
- BO-87 RETAINING WALL DETAILS NO. 87
- BO-88 RETAINING WALL DETAILS NO. 88
- BO-89 RETAINING WALL DETAILS NO. 89
- BO-90 RETAINING WALL DETAILS NO. 90
- BO-91 RETAINING WALL DETAILS NO. 91
- BO-92 RETAINING WALL DETAILS NO. 92
- BO-93 RETAINING WALL DETAILS NO. 93
- BO-94 RETAINING WALL DETAILS NO. 94
- BO-95 RETAINING WALL DETAILS NO. 95
- BO-96 RETAINING WALL DETAILS NO. 96
- BO-97 RETAINING WALL DETAILS NO. 97
- BO-98 RETAINING WALL DETAILS NO. 98
- BO-99 RETAINING WALL DETAILS NO. 99
- BO-100 RETAINING WALL DETAILS NO. 100

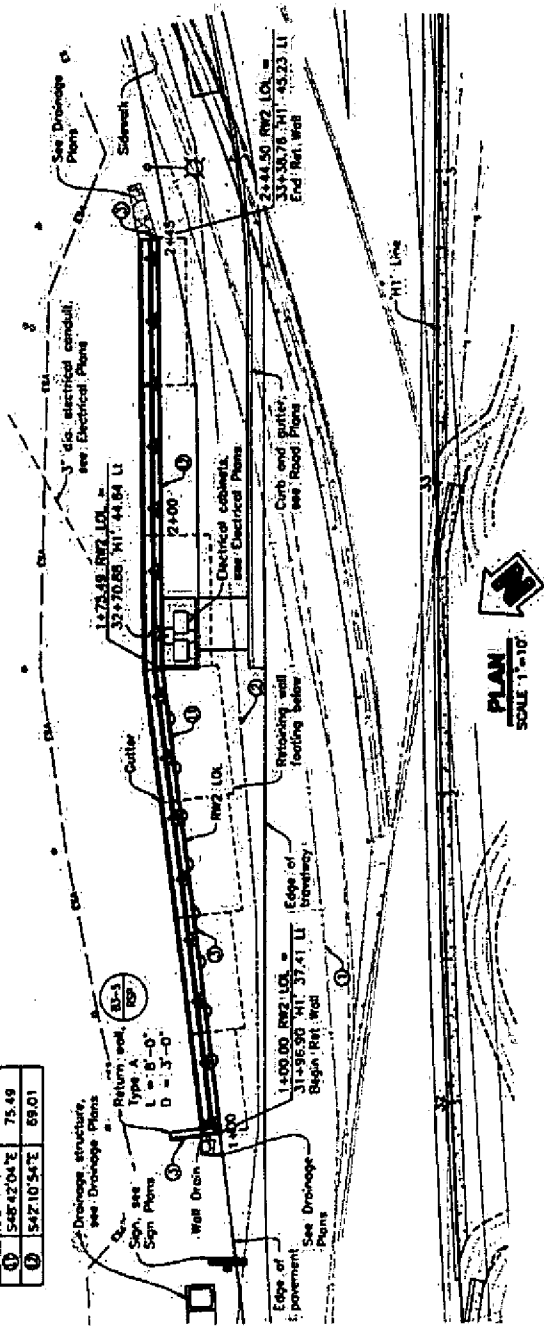
- NOTES:**
- See RETAINING WALL NO. 1 GENERAL PLAN for general notes.
  - For Retaining Wall No. 2 Typical Section, see RETAINING WALL DETAILS sheet.
  - All surfaces to receive Golden Granite Concrete Surface Texture must be acid stained.
- ① Existing telephone to be removed; see Utility Plans
- ② Telephone, see Utility Plans
- ③ Golden Granite Concrete Surface Texture
- ⊖ Indicates street lighting; see Electrical Plans
- ⊕ Indicates Catwalk standard.
- ⊖⊕ Indicates detail no.



**DEVELOPED ELEVATION**

SCALE: Horiz: 1"=10'  
Vert: 1"=5'

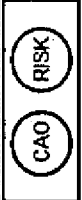
LINE DATA	BEARING	LENGTH
①	S48°42'04"E	75.49
②	S47°10'54"E	89.01



**PLAN**

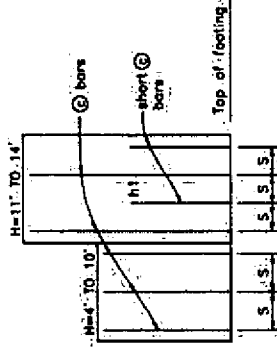
SCALE: 1"=10'

<p>PREPARED FOR THE <b>STATE OF CALIFORNIA</b> DEPARTMENT OF TRANSPORTATION</p>		<p>PROJECT NO. 660000042</p>	<p>PROJECT SHEET NO. 110 OF 190</p>
<p>DATE: 11-14-04</p>	<p>PROJECT NO. 660000042</p>	<p>PROJECT SHEET NO. 110 OF 190</p>	<p>PROJECT SHEET NO. 110 OF 190</p>
<p>DESIGNED BY: [Signature]</p>	<p>CHECKED BY: [Signature]</p>	<p>APPROVED BY: [Signature]</p>	<p>DATE: 11-14-04</p>



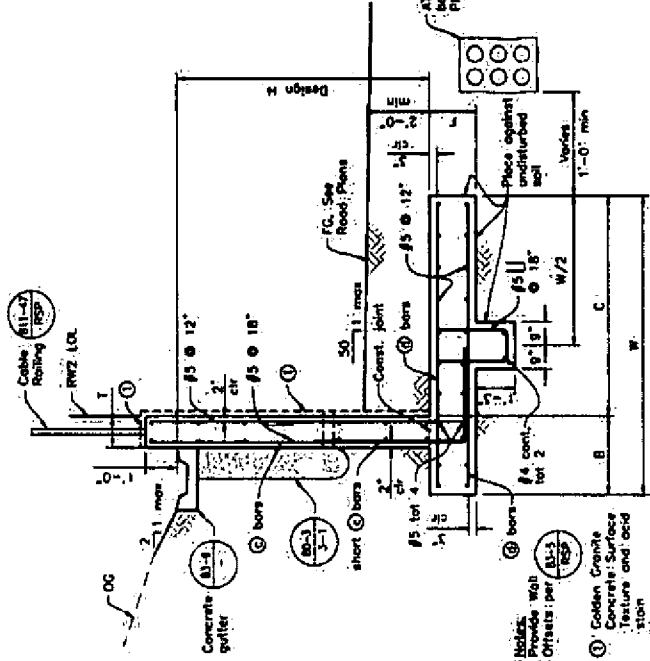
**RETAINING WALL No. 2**  
**TABLE OF REINFORCING STEEL, DIMENSIONS AND DATA**

DESIGN	H	7'-0"	9'-0"	11'-0"	12'-0"
W	7'-0"	8'-8"	10'-6"	11'-6"	12'-6"
C	4'-6"	6'-0"	8'-0"	9'-0"	10'-0"
B	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"
F	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"
T	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
BATTER					
SPACING "S"	9"	8"	8"	8"	8"
①	#6	#6	#7	#7	#7
②	#5	#6	#7	#7	#8
H1			6'-0"	6'-0"	6'-0"

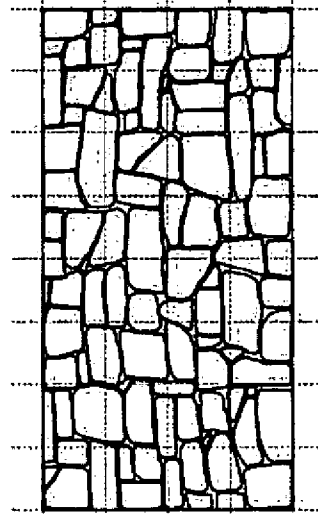


**GENERAL NOTES**  
**RETAINING WALL No. 2**

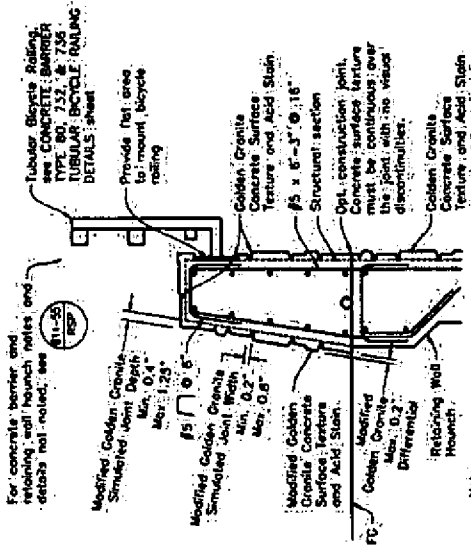
- DESIGN: AASHTO LRFD Bridge Design Specifications, 8th Edition with California Amendments.
- DC: Stem Architectural Treatment up to 3" thick of concrete considered (38 per)
- REINFORCED CONCRETE: Stem Architectural Treatment up to 3" thick of concrete considered (38 per)
- LOAD COMBINATIONS AND LIMIT STATES: Service I:  $Q = 1.00DC + 1.00(EV + EX)$   
Strength II:  $Q = 0.90C + 0.90(EV + EX)$   
Extreme I:  $Q = 1.00DC + 1.00(EV + EX) + 1.00(EOO + EOC)$
- where:  
Q: Force Effects  
C: 1.25 or 0.90; whichever controls design  
E: 1.50 or 0.90; whichever controls design  
DC: Dead Load of Structure Components  
EV: Horizontal Earth Pressure  
EX: Vertical Earth Pressure from Earth Fill Weight  
EOE: Seismic Earth Pressure  
EOO: Soil and Structural and Non-Structural Components Inertia



**GOLDEN GRANITE CONCRETE SURFACE TEXTURE**  
1" = 1'-0"



Formwork must be Fitzgerald Formline #17815 Patiform Fieldstone or approved equal



**CONCRETE BARRIER TYPE 732 MOD**  
NTS

PROJECT: No. 0500000542  
PROJECT NAME: HOLMAN HIGHWAY 68/ HIGHWAY 1 ROUNDABOUT  
RETAINING WALL DETAILS  
PROJECT NO. 0500000542  
DATE: 11/11/11  
DRAWN BY: [Signature]  
CHECKED BY: [Signature]

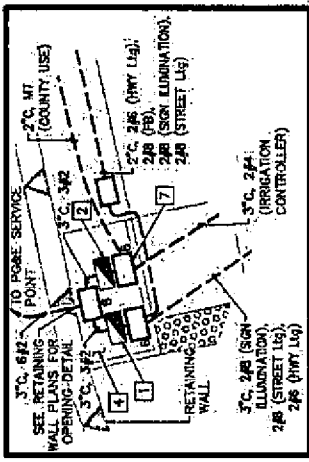




SHEET NO.	06	COUNTY	Mon	ROUTE	70.1, L4.2	SHEET TOTAL	113
DATE	1/88	PROJECT	70.1, L4.2	DATE	1/13/90		

DESIGNED BY: *B. B. BOYLE*  
 REGISTERED CIVIL ENGINEER  
 PLANS APPROVAL DATE: \_\_\_\_\_  
 BY STATE OF CALIFORNIA AS AUTHORIZED BY THE BOARD OF EXAMINERS OF PROFESSIONAL ENGINEERS  
 CIVIL ENGINEER

CITY OF MONTEREY  
 500 PACIFIC STREET  
 MONTEREY, CA 93940



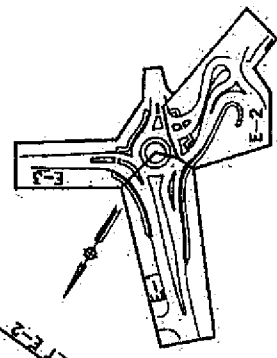
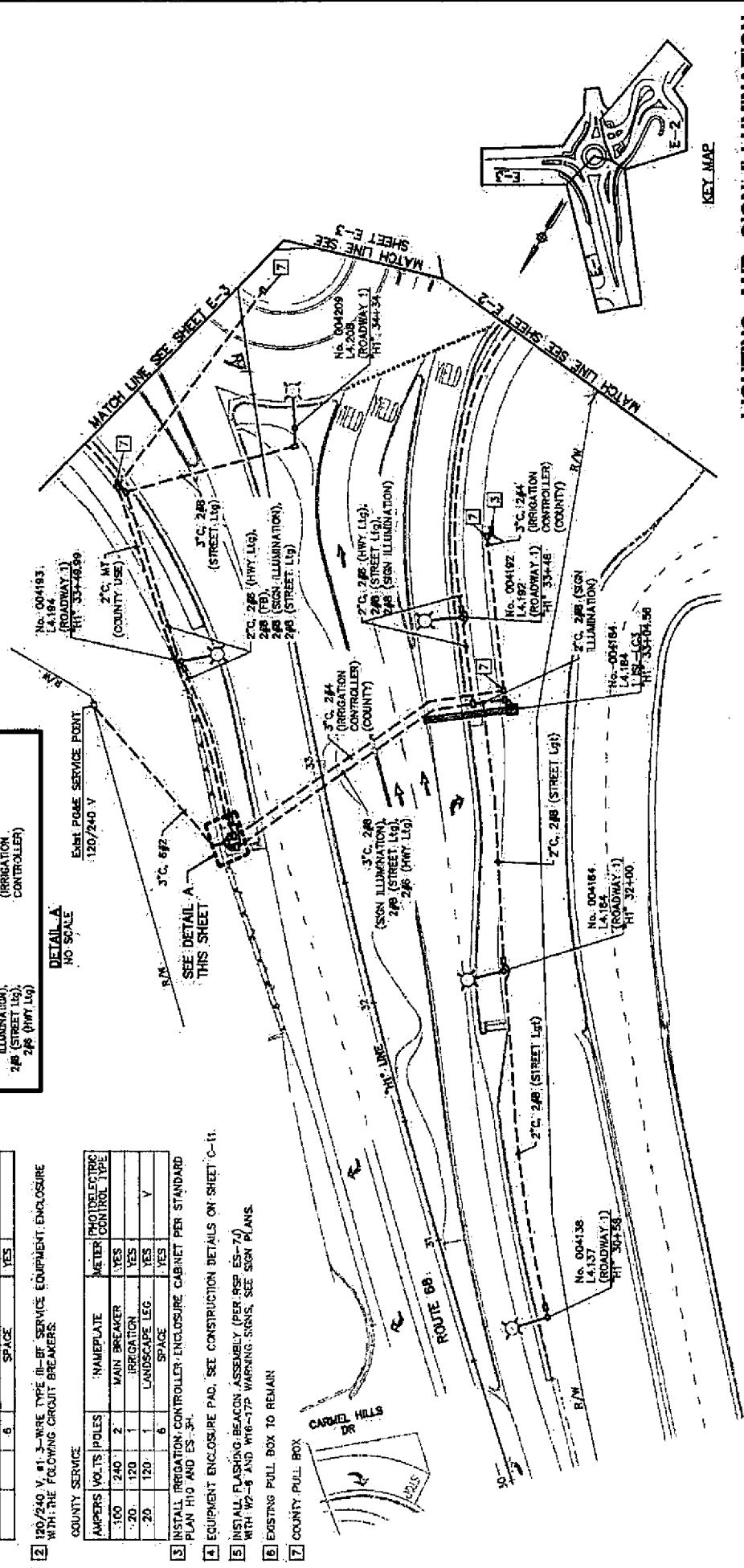
- PROJECT NOTES: (SHEETS E-1 - E-4)**
- ALL SUSPENDED STREET LIGHTS ARE TO BE TYPE 15 POLE (H-30) WITH 15 FOOT WAST ARM PER RSP ES-6A AND 165W LED LAMP.
  - ALL PROPOSED PULL BOXES ON THIS PLAN SHALL BE NO. 5 PER RSP ES-6A WITH THE FOLLOWING CIRCUIT BREAKERS:

AMPS	VOLTS	POLES	NAMEPLATE	METER	PHOTOELECTRIC CONTROL TYPE
100	240	2	MAIN DISCONNECT	YES	
30	240	2	HIGHWAY LG.	YES	V
30	240	2	SIGN ILLUMINATION	YES	LC3
30	240	2	STREET LG.	YES	V
15	120	1	FLASHING BEACON	YES	
		6	SPACE	YES	

- 120/240 V. #1 3-WIRE TYPE II-BF SERVICE EQUIPMENT ENCLOSURE WITH THE FOLLOWING CIRCUIT BREAKERS:
- | AMPS | VOLTS | POLES | NAMEPLATE      | METER | PHOTOELECTRIC CONTROL TYPE |
|------|-------|-------|----------------|-------|----------------------------|
| 100  | 240   | 2     | MAIN BREAKER   | YES   |                            |
| 20   | 120   | 1     | IRRIGATION     | YES   | V                          |
| 20   | 120   | 1     | LANDSCAPE LEC. | YES   | V                          |
|      |       | 6     | SPACE          | YES   |                            |
- INSTALL IRRIGATION CONTROLLER ENCLOSURE CABINET PER STANDARD PLAN H10 AND ES-3A.
  - EQUIPMENT ENCLOSURE PAD, SEE CONSTRUCTION DETAILS ON SHEET C-11.
  - INSTALL FLASHING BEACON ASSEMBLY (PER RSP ES-7J) WITH W2-8 AND W16-17P WARNING SIGNS, SEE SIGN PLANS.
  - EXISTING PULL BOX TO REMAIN
  - COUNTY PULL BOX

DESIGNED BY	REGISTERED BY	DATE REVISED
CHECKED BY	REVISIONS	
DESIGNED BY	REGISTERED BY	DATE REVISED
CHECKED BY	REVISIONS	

DESIGNED BY: *RONALD G. BOYLE*  
 REGISTERED CIVIL ENGINEER



KEY MAP

**LIGHTING AND SIGN ILLUMINATION**  
 SCALE: 1"=20'

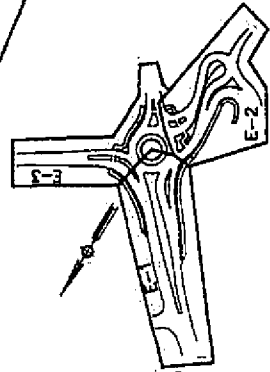
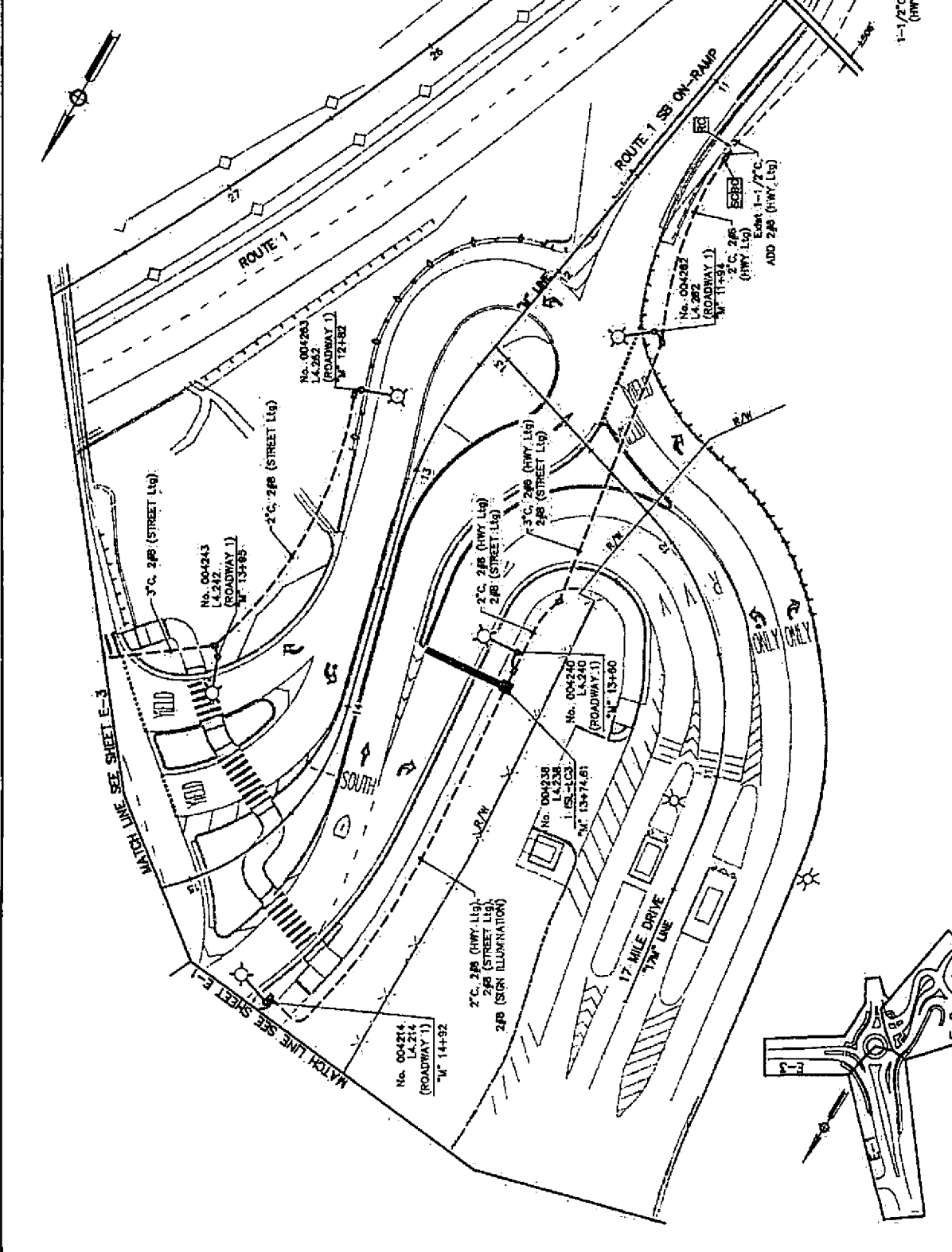
E-1

NO.	COUNTY	ROUTE	TOTAL SHEETS	SHEET NO.
08	Merced	1, 88	78, 1, L4, 2	114, 190

REGISTERED CIVIL ENGINEER  
 DATE: 8/20/87  
 NO. 82047

PLANS APPROVAL DATE: \_\_\_\_\_  
 BY STATE OF CALIFORNIA: \_\_\_\_\_  
 COUNTY OF MERCEDES: \_\_\_\_\_  
 CITY OF MONTEREY: \_\_\_\_\_  
 843 RESERVE DR. #100  
 ROSELVILLE, CA 95878

CITY OF MONTEREY  
 843 RESERVE DR. #100  
 ROSELVILLE, CA 95878



KEY MAP

**LIGHTING AND SIGN ILLUMINATION**  
 SCALE 1"=20'

E-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G. BOYLE
CHECKED BY	DATE REVISOR	
DESIGNED BY	DATE REVISOR	

APPROVED FOR ELECTRICAL WORK ONLY

INT

PROJECT NUMBER & PHASE

ETS 0600006542

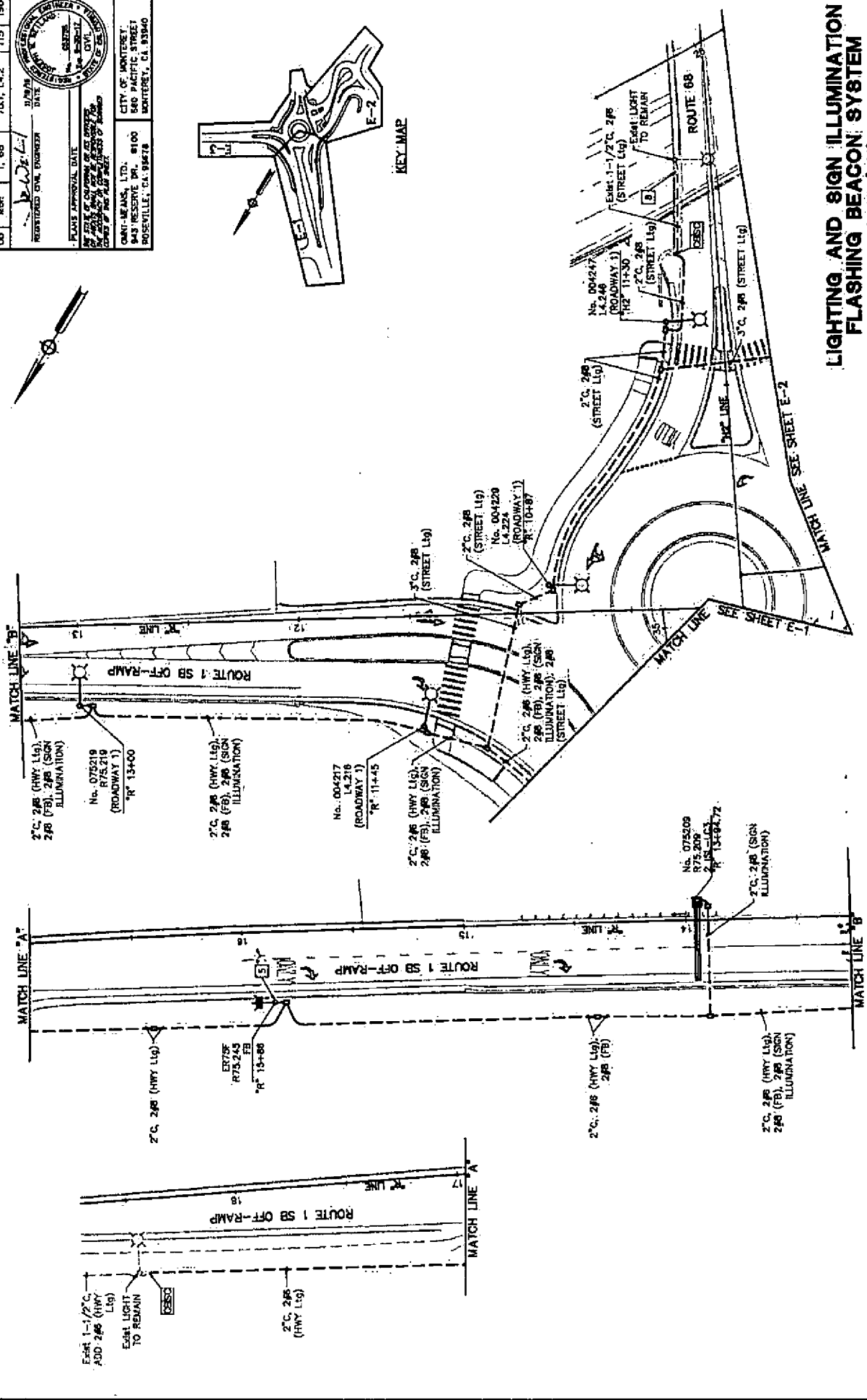
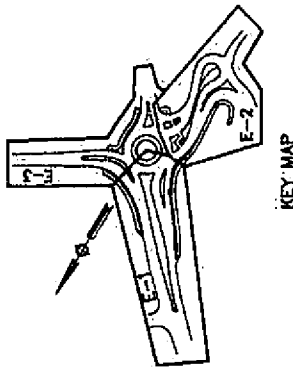
CAO RISK

REVISIONS: BY 177/690  
 DATE FILE: 177/692

Agreement #: Ag-5377 - Page 607 of 791

SHEET NO.	06	COUNTY	Mon	ROUTE	7A.1: L.A.2	SHEET TOTAL	115
DATE	1. 68	TOTAL PROJECT	7A.1: L.A.2	115	190.		

REGISTERED CIVIL ENGINEER  
 DATE: 1/15/68  
 CIVIL ENGINEER: [Signature]  
 CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA. 93940



**LIGHTING AND SIGN ILLUMINATION  
 FLASHING BEACON SYSTEM**  
 SCALE: 1"=20'

E-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G. BOYLE
CHECKED BY	DATE REVISION	
DESIGNED BY		

APPROVED FOR ELECTRICAL WORK ONLY.

RELATIVE DIMENSION SCALE  
 1" = 10' DIMENSIONS

PROJECT NUMBER & PHASE: EFIS 0500000542

UNIT: INT

CAO RISK

Agreement #: Ag-5377 - Page 608 of 791

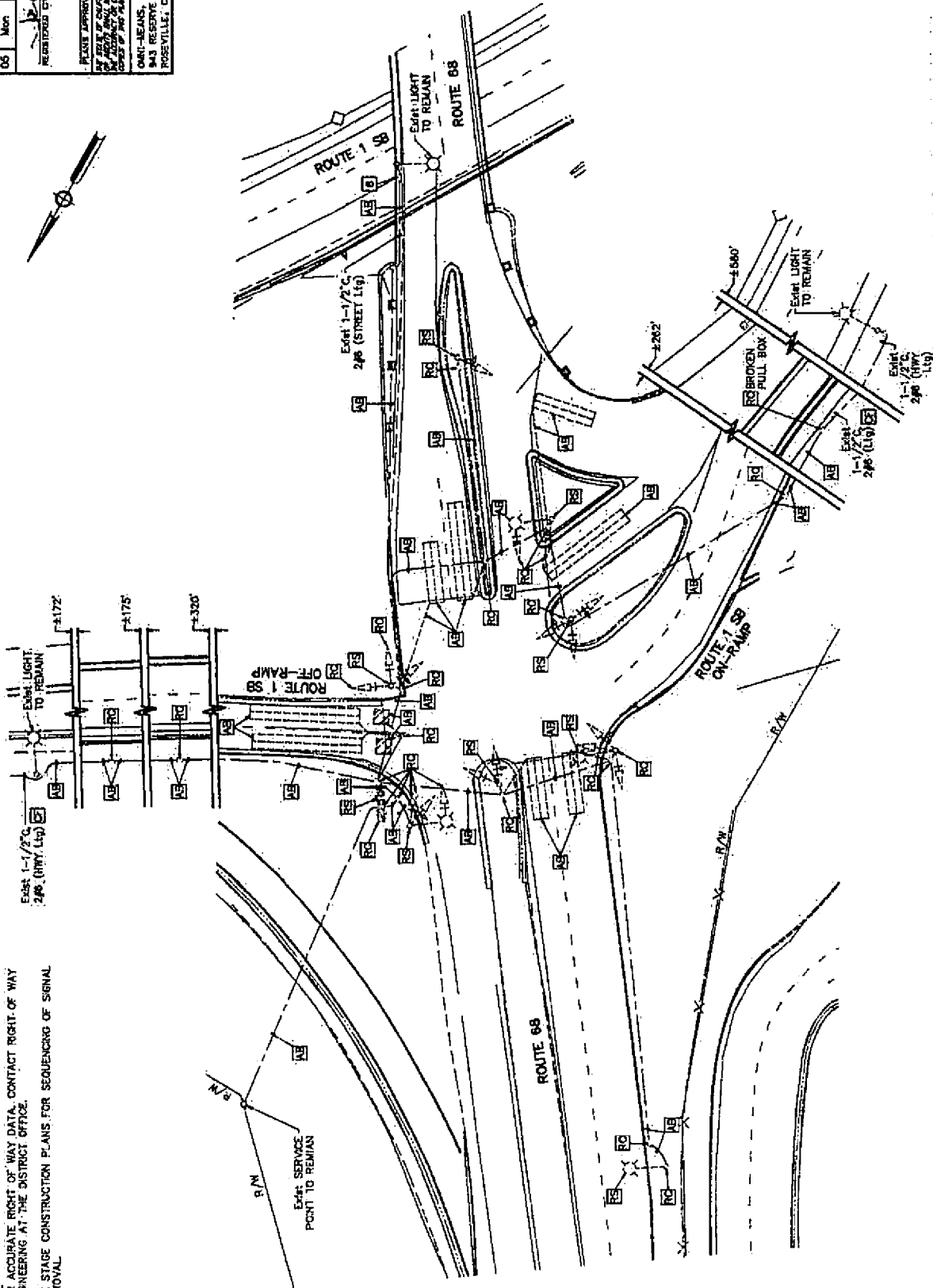


DATE	COUNTY	ROUTE	POST MILE	SHEET NO.	TOTAL SHEETS
05	Mon	1, 68	75.1, L.A.2.	116	190



REGISTERED CIVIL ENGINEER  
 DATE: 1/1/81  
 PROJECT APPROVAL DATE: 1/1/81  
 CITY OF MONTEREY  
 580 PACIFIC STREET  
 MONTEREY, CA 93940

- NOTE:**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - SEE STAGE CONSTRUCTION PLANS FOR SEQUENCING OF SIGNAL REMOVAL.



**SIGNAL AND LIGHTING REMOVAL PLAN**  
 SCALE 1"=20'

E-4

APPROVED FOR ELECTRICAL WORK ONLY  
 PROJECT NUMBER & PHASE: EFS 0800000542  
 N/T  
 CAO RISK

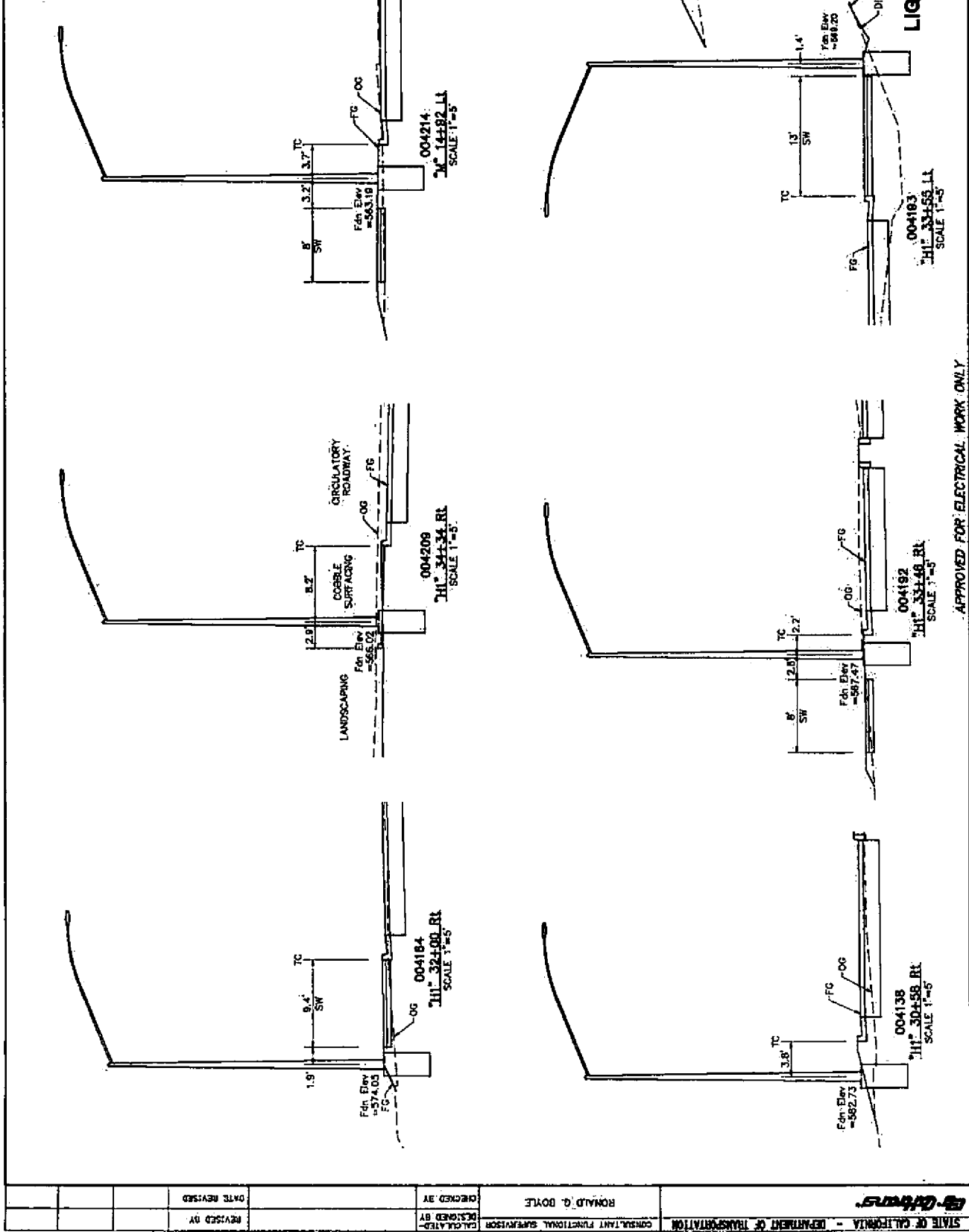
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
 CONSULTANT FUNCTIONAL SUPERVISOR: RONALD G. BOYLE  
 CHECKED BY: [ ]  
 DESIGNED BY: [ ]  
 REVISIONS: [ ]  
 DATE REVISION: [ ]  
 BORDEN LAST REVISED 7/2/2010  
 URBANITE CO. DA  
 DRAW FILE NO. 1772001  
 Agreement #: Ag-5377 - Page 609 of 791

DATE	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
03	Mon	1, 65	75.1, L.A.2	117	190



URBAN & ASSOCIATES, INC.  
REGISTERED CIVIL ENGINEER  
DATE: 1/2/2010  
SCALE: 1"=5'

PLANS APPROVAL DATE: 1/2/2010  
BY: [Signature]  
CITY OF MONTEREY  
943 RESERVE DR., #100  
MONTEREY, CA 95078



**LIGHTING DETAILS**  
SCALE AS SHOWN

E-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
CONSULTANT FUNCTIONAL SUPERVISOR: ROMAN Q. BOYLE  
CHECKED BY: [Signature]  
DESIGNED BY: [Signature]

REVISIONS:

NO.	DATE	REVISION

DATE REVISION: [Signature]

APPROVED FOR ELECTRICAL WORK ONLY: [Signature]

RELATIVE BRIDGE SCALE: 1" = 16' INCHES

PROJECT NUMBER & PHASE: EFTS 0500000342

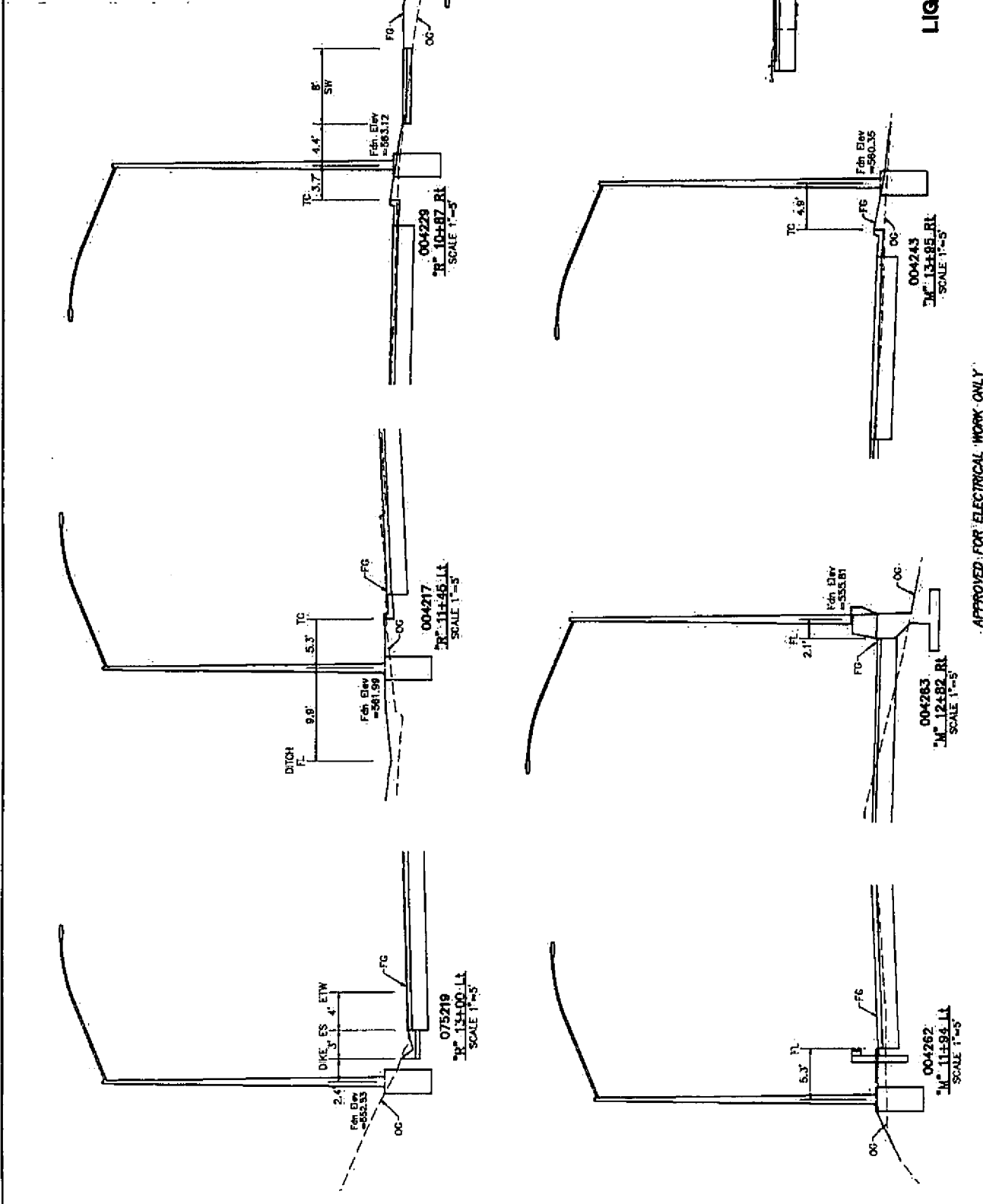
CAO RISK

DATE	COUNTY	ROUTE	POST MILEAGE	POST MILEAGE
03	Mon	1. 85	75.1 L4.2	118 190

REGISTERED CIVIL ENGINEER  
 NAME: *Boyle*  
 DATE: \_\_\_\_\_  
 PLACE APPROVAL DATE: \_\_\_\_\_

STATE OF CALIFORNIA  
 DIVISION OF HIGHWAYS  
 OFFICE OF THE CHIEF ENGINEER  
 1500 MARKET STREET, SUITE 100  
 SAN FRANCISCO, CALIFORNIA 94102

CITY OF MONTEREY  
 540 PACIFIC STREET  
 ROSEVILLE, CA 95678  
 MONTEREY, CA 93940



**LIGHTING DETAILS**  
 SCALE AS SHOWN

E-6

APPROVED FOR ELECTRICAL WORK ONLY

RELATIVE NUMBER SCALE  
 1" = 10' HORIZONTAL  
 1" = 4' VERTICAL

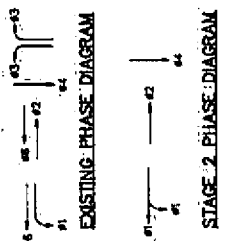
PROJECT NUMBER & PHASE: ETS 0500000542

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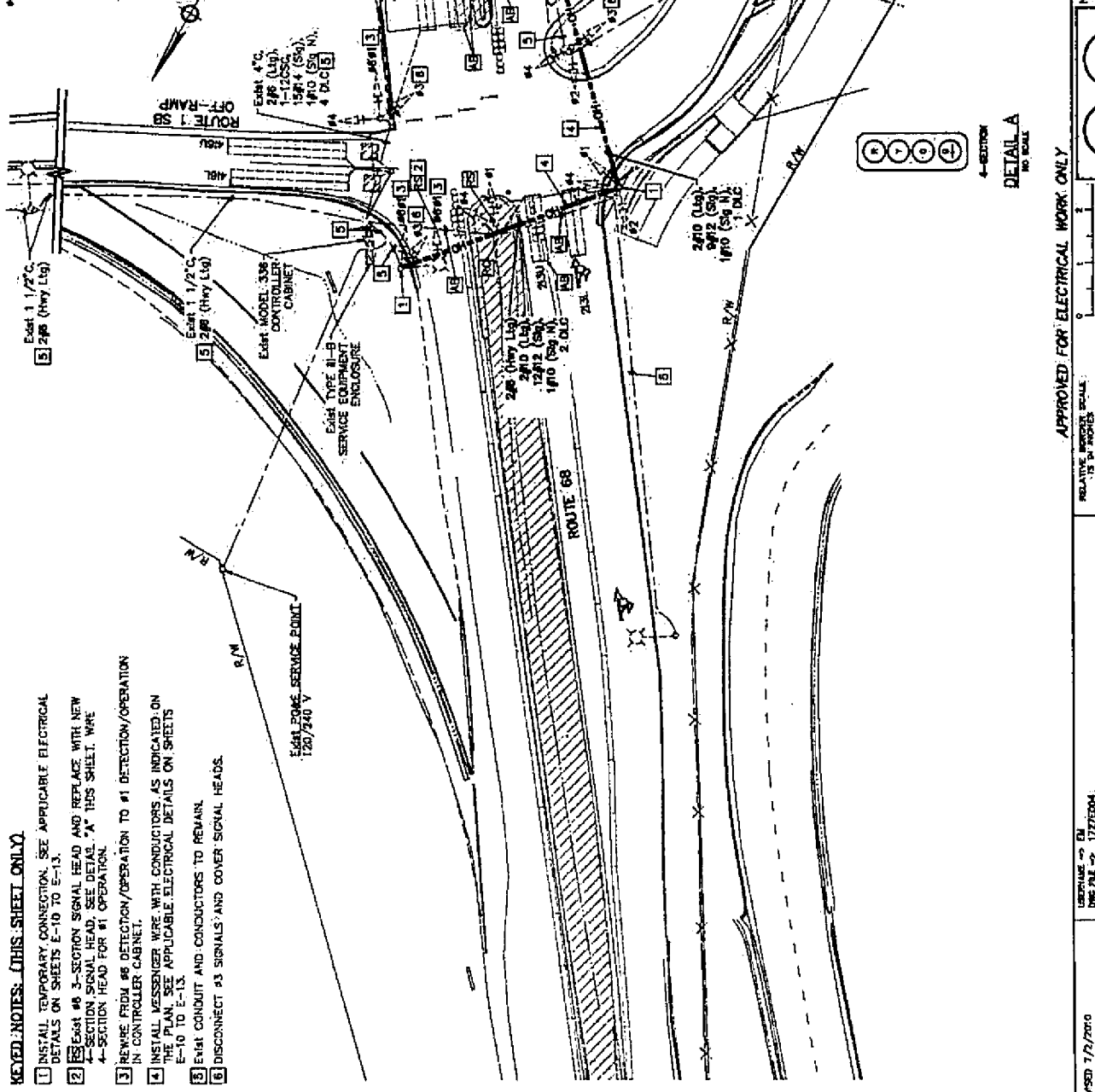
CAO RISK

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G. BOYLE	CHECKED BY	DATE REVISION
<i>Boyle</i>				

DATE	COUNTY	ROUTE	POST MILE	SHEET	TOTAL SHEETS
05	Mon	1, 65	75.1, L4.2	119	190
REGISTERED CIVIL ENGINEER DATE: 12-21-11 CITY OF MONTEREY 340 PACIFIC STREET ROSELVILLE, CA 95068					



- KEYED NOTES: (THIS SHEET ONLY)**
- 1 INSTALL TEMPORARY CONNECTION. SEE APPLICABLE ELECTRICAL DETAILS ON SHEETS E-10 TO E-13.
  - 2 EXIST #3 3-SECTION SIGNAL HEAD AND REPLACE WITH NEW 4-SECTION SIGNAL HEAD. SEE DETAIL "A" THIS SHEET. WIRE 4-SECTION HEAD FOR #1 OPERATION.
  - 3 REMOVE FROM #6 DETECTION/OPERATION TO #1 DETECTION/OPERATION IN CONTROLLER CABINET.
  - 4 INSTALL MESSENGER WIRE WITH CONDUCTORS AS INDICATED ON THE PLAN. SEE APPLICABLE ELECTRICAL DETAILS ON SHEETS E-10 TO E-13.
  - 5 ENRIT CONDUIT AND CONDUCTORS TO REMAIN.
  - 6 DISCONNECT #3 SIGNALS AND COVER SIGNAL HEADS.



**TEMPORARY SIGNAL SYSTEM  
STAGE 2  
SCALE 1"=20'**

E-7

APPROVED FOR ELECTRICAL WORK ONLY

DATE: 7/7/2010

DESIGNED BY: RONALD A. DOYLE

CHECKED BY: [Signature]

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONTRACT FUNCTIONAL SUPERVISOR

PROJECT NUMBER & PHASE: ETS 050000542

RELATIVE PROJECT SCALE: 1/8" = 10' PROJECT

LIBRARY FILE: 1727504

AGREEMENT #: Ag-5377 - Page 612 of 791

DETAIL A  
NO SCALE

4-SECTION

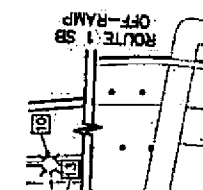
CAO RISK



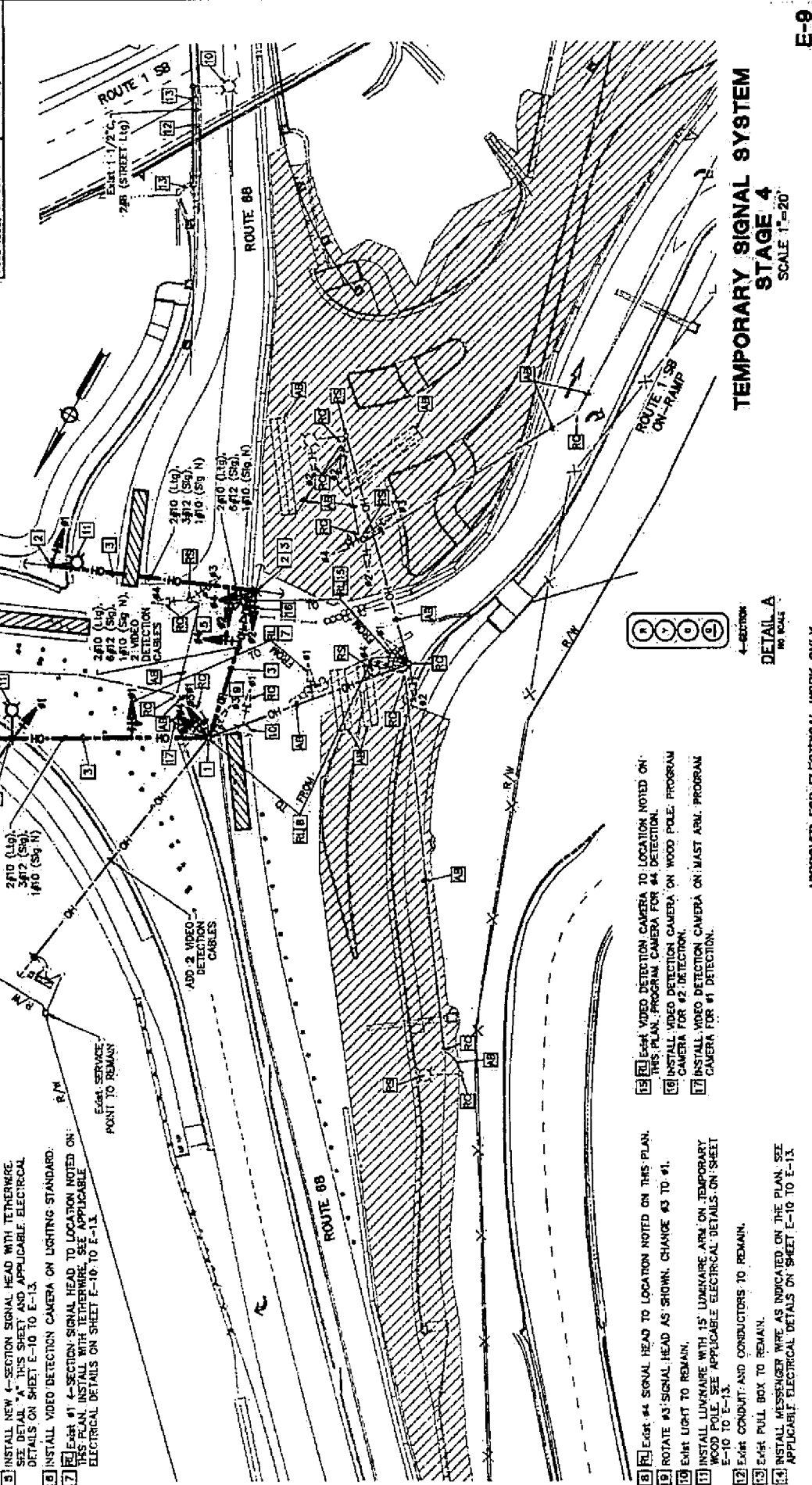
NO.	COUNTY	ROUTE	POST MILE TOTAL PROJECT	SHEET TOTAL SHEETS
05	Mon	1, 65	70.1, 1.4, 2	121
				121
				190

REGISTERED CIVIL ENGINEER  
 DATE: 1/1/2010  
 LICENSE: 10000  
 CIVIL ENGINEER  
 CITY OF MONTEREY  
 943 RESERVE DR. #100  
 MONTEREY, CA 93940

STAGE 4 PHASE DIAGRAM  
 LEGEND: (THIS SHEET ONLY)  
 VIDEO DETECTION ZONE



KEYED NOTES: (THIS SHEET ONLY)  
 1 SIGNAL STANDARD AND EQUIPMENT TO REMAIN IN PLACE EXCEPT AS NOTED ON THIS PLAN.  
 2 INSTALL TEMPORARY 50' WOOD POLE WITH GUY WIRE, CONDUCTORS OR CABLES, CONDUIT RISER AND OTHER EQUIPMENT AS REQUIRED. SEE APPLICABLE ELECTRICAL DETAILS ON SHEETS E-10 TO E-13.  
 3 INSTALL MESSENGER WIRE WITH CONDUCTORS AS INDICATED ON THE PLAN. SEE APPLICABLE ELECTRICAL DETAILS ON SHEET E-10 TO E-13.  
 4 INSTALL TEMPORARY CONNECTION. SEE APPLICABLE ELECTRICAL DETAILS ON SHEET E-10 TO E-13.  
 5 INSTALL NEW 4-SECTION SIGNAL HEAD WITH TETHERWIRE. SEE DETAIL 'A' THIS SHEET AND APPLICABLE ELECTRICAL DETAILS ON SHEET E-10 TO E-13.  
 6 INSTALL VIDEO DETECTION CAMERA ON LIGHTING STANDARD.  
 7 EACH #1 4-SECTION SIGNAL HEAD TO LOCATION NOTED ON THIS PLAN. INSTALL WITH TETHERWIRE. SEE APPLICABLE ELECTRICAL DETAILS ON SHEET E-10 TO E-13.  
 8 EACH #4 SIGNAL HEAD TO LOCATION NOTED ON THIS PLAN. EXCEPT AS SHOWN, CHANGE #3 TO #1.  
 9 ROTATE #3 SIGNAL HEAD AS SHOWN. CHANGE #3 TO #1.  
 10 EXIST LIGHT TO REMAIN.  
 11 INSTALL LUMINAIRE WITH 15' LUMINAIRE ARM ON TEMPORARY WOOD POLE. SEE APPLICABLE ELECTRICAL DETAILS ON SHEET E-10 TO E-13.  
 12 EXIST CONDUIT AND CONDUCTORS TO REMAIN.  
 13 EXIST PULL BOX TO REMAIN.  
 14 INSTALL MESSENGER WIRE AS INDICATED ON THE PLAN. SEE APPLICABLE ELECTRICAL DETAILS ON SHEET E-10 TO E-13.



APPROVED FOR ELECTRICAL WORK ONLY  
 DETAIL A  
 BY ROUTE

TEMPORARY SIGNAL SYSTEM  
 STAGE 4  
 SCALE 1"=20'

DATE	7/2/2010	PROJECT	705.1, L4.2	SHEET	122
REVISED BY		COUNTY	Mon	TOTAL SHEETS	190
CHECKED BY	RONALD C. BOWLE	ROUTE	1, 88		
DESIGNED BY		PROJECT	705.1, L4.2		

REGISTERED CIVIL ENGINEER  
 DATE: 1/17/05  
 NO. 62-30-17  
 CIVIL  
 STATE OF CALIFORNIA  
 PROFESSIONAL ENGINEER & ARCHITECT

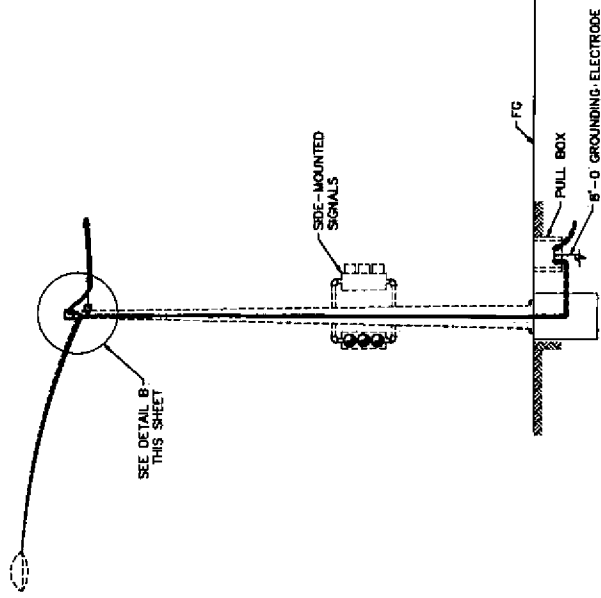
CITY OF MONTEREY  
 540 PACIFIC STREET  
 MONTEREY, CA 93940

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

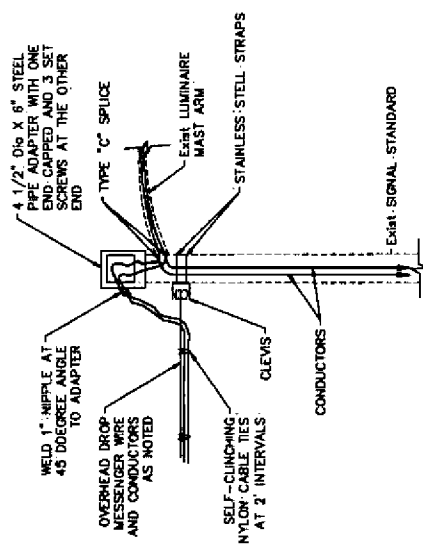
**GENERAL NOTES:**

1. AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, SIXTH EDITION (2013).
  2. GENERAL ORDER No. 95 OF PUBLIC UTILITIES COMMISSION.
  3. NATIONAL ELECTRICAL SAFETY CODE.
  4. CALTRANS STANDARD SPECIFICATIONS 2010.
- LOADING**  
 WIND LOADINGS: 85 MPH.  
 UNIT STRESSES  
 TOWER POLES:  $F_y = 1850$  psi, TAPERED TREATED ROUND POLE  
 $F_y = 110$  psi, ASTM D2899 STANDARD  
 $E = 1500 \times 10^6$  psi
- TREATMENT**  
 TO CONFORM WITH SECTION 86 STANDARD SPECIFICATIONS.

5. ALL OVERHEAD CABLES SHALL BE INSTALLED WITH 20'-0" MINIMUM OVERHEAD CLEARANCE.
6. CONDUCTORS SHALL BE SUSPENDED FROM SPAN-WIRE AS FOLLOWS: A) MAIN RUN 5/16" SPAN-WIRE WITH A MAXIMUM OF 4.5 PERCENT SAG. NO SPARE CONDUCTORS ALLOWED EXCEPT AS NOTED.
7. OVERHEAD LINE CONSTRUCTION NOT SPECIFICALLY COVERED HERE SHALL CONFORM WITH THE PROVISIONS OF GENERAL ORDER No. 95 OF PUBLIC UTILITIES COMMISSION.
8. WOOD POLES SHALL BE STABILIZED USING GUY WIRES, BREAST BLOCKS OR RAKES AT EACH DEAD END, CORNER, OR DROP OR LINE DEVIATION MORE THAN 15 DEGREES FROM STRAIGHT LINE. THE DIRECTION OF THE GUY SHALL COUNTERACT THE RESULTANT OF UNBALANCED FORCES APPLIED TO POLE. WHERE SPACE OR CONFLICT PREVENT GUY INSTALLATION, A DIAGONAL BRACE SHALL BE USED. THE BRACE SHALL BE WOOD AND SHALL BE CONNECTED TO THE POLE BY MEANS TO SATISFY STRUCTURAL AND ELECTRICAL REQUIREMENTS. THE DIRECTION OF THE BRACE SHALL COUNTERACT THE RESULTANT OF UNBALANCED HORIZONTAL FORCE OF 2000 POUNDS (MIN) APPLIED TO THE POLE.
9. GUY WIRE SHALL BE ATTACHED TO POLE AS NEARLY AS PRACTICAL TO THE CENTER OF CONDUCTORS LOAD, OR 3'-0" MAX FROM THE TOP OF WOOD POLE OTHERWISE, SEE NOTE 6.
10. ALL ATTACHMENTS SHALL BE MOUNTED WITH STAINLESS STEEL STRAPS OR OTHER MANUFACTURERS METHODS WITHOUT DRILLING HOLES IN POLE, EXCEPT AS SHOWN. DRILLING THROUGH POLE WILL REQUIRE THE ENGINEER'S APPROVAL.
11. FOUNDATION DESIGN IS BASED ON AASHTO 2001 ARTICLE 13.6 BROWS' APPROXIMATE PROCEDURE ASSUMING A COHESIONLESS MATERIAL. THE ANGLE OF INTERNAL FRICTION USED IS 30 AND UNIT WEIGHT OF SOIL USED IS 120 LB/FT<sup>3</sup>. THE CONTRACTOR TO VERIFY ACTUAL SOIL CONDITION.
12. IF POLE IS LOCATED ON A 2:1 OR STEEPER SLOPE, ADD 2' EXTRA FOR EMBEDMENT.
13. SEE SHEETS E-11 TO E-13 FOR ADDITIONAL DETAILS.
14. FOR DETAILS NOT SHOWN, SEE "2010 STANDARD PLANS"
15. ALL TEMPORARY POLES SUPPORT ON CONDUCTORS. ATTACH LUMINAIRE ARM AND/OR COMBINATION OF ATTACHMENTS AS SPECIFIED AT LOCATIONS WHERE INDICATED ON ELECTRICAL SHEETS.
16. ATTACHMENTS SHOWN ON POLE APPLY AS NOTED ON PLANS.
17. WOOD POLES AND UTILITY GRADE WIRES SHALL CONFORM TO CALTRANS STANDARD SPECIFICATIONS 2010.

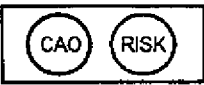


**DETAIL A**  
 TYPICAL EXISTING POLE INSTALLATION DETAIL



**DETAIL D**  
 TYPICAL OVERHEAD DROP INSTALLATION DETAIL

**ELECTRICAL DETAILS**  
 NOT TO SCALE



DATE	COUNTY	ROUTE	POST MILES	SHEET NO.	TOTAL SHEETS
05	MDT	1, 68	75.1, 4.2	123	190

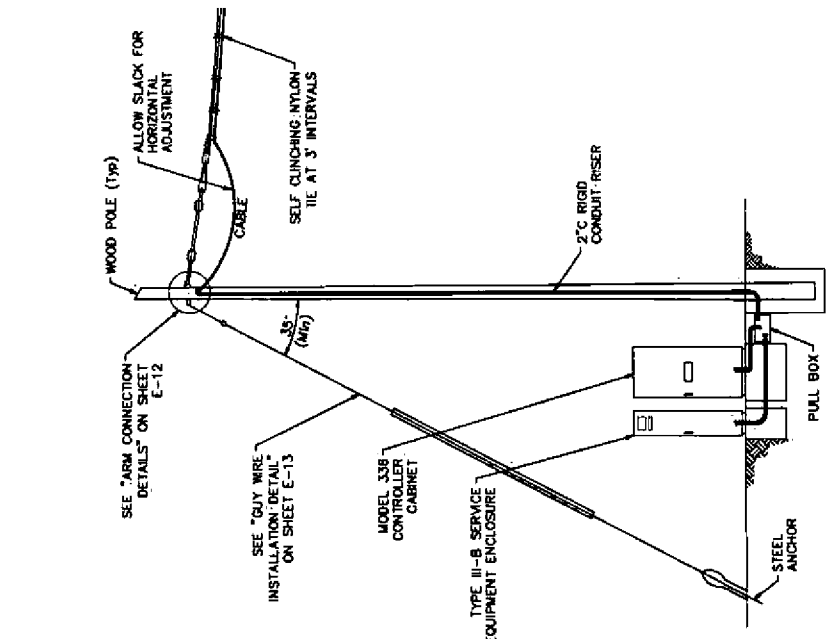
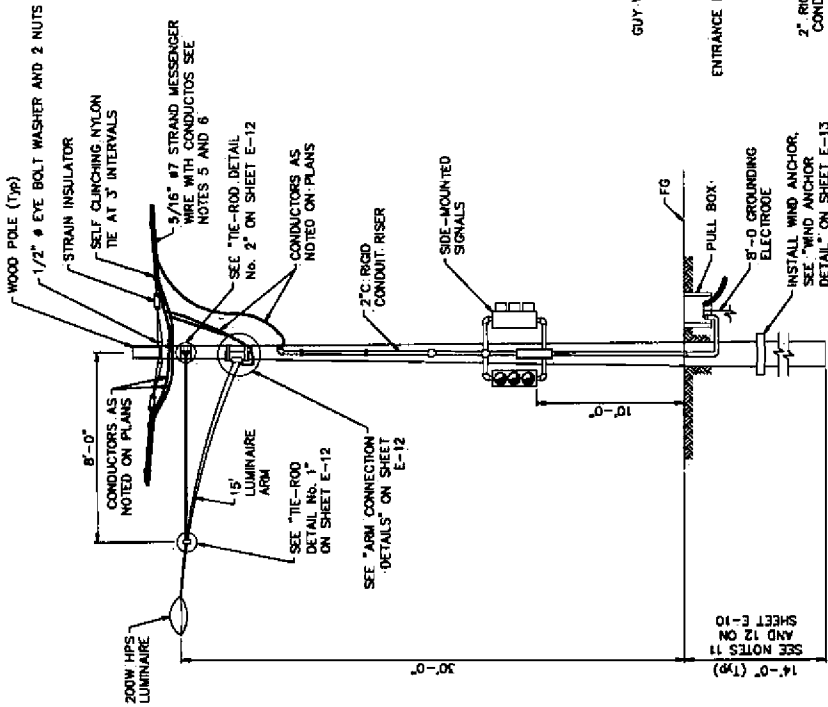
  

PLANS APPROVAL DATE	REGISTERED CIVIL ENGINEER	DATE

CITY OF MONTEREY	590 PACIFIC STREET	MONTEREY, CA 93940
------------------	--------------------	--------------------

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



**DETAIL C**  
RELOCATED CONTROLLER CABINET AND SERVICE EQUIPMENT ENCLOSURE

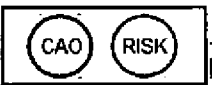
**DETAIL D**  
TYPICAL WOOD POLE SUPPORT WITH OPTIONAL ATTACHMENTS

**DETAIL E**  
WIRE ATTACHMENT FOR WOOD POLE DETAIL

**ELECTRICAL DETAILS**  
NOT TO SCALE

E-11

DESIGNED BY: RONALD G. BOYLE  
CHECKED BY:



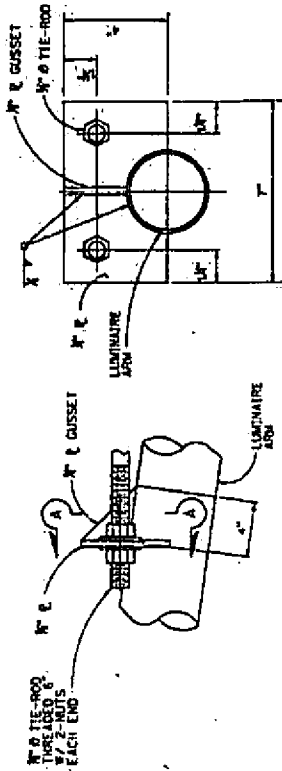


STATE	COUNTY	ROUTE	POST MILE NUMBER	SHEET NUMBER
06	Mon	1, 68	75.1; 14.2	124
REGISTERED CIVIL ENGINEER		DATE: 11/21/00		
PLANS APPROVAL DATE:		CITY OF MONTEREY		
PROJECT NO.:		SHEET NO.:		
PROJECT NAME:		PROJECT LOCATION:		
DRAWN BY:		CHECKED BY:		
DATE:		DATE:		

**NOTES: THIS SHEET ONLY.**

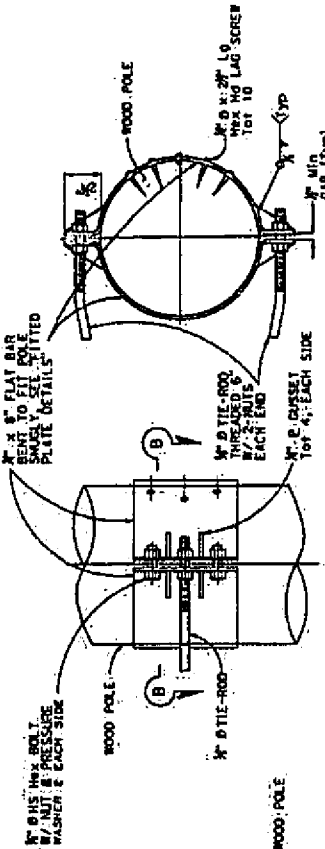
1. ALL HARDWARE AND STEEL SHALL BE GALVANIZED AFTER FABRICATION.
2. ARM BASE CONNECTION DETAILS SHALL BE IN COMPLIANCE WITH STANDARD PLANS DETAIL SHEET ES-60 WITH NOTED MODIFICATIONS.
3. 2000 LB Min. CAPACITY STRAP SYSTEM SHALL BE USED FOR TOP AND BOTTOM OF POLE.
4. THE CONTRACTOR TO VERIFY POLE DIMENSIONS AT TIE-ROD ATTACHMENT HEIGHT. FABRICATE 6" FLAT BAR WITH "L" DIMENSION TO MAINTAIN AN OPEN GAP BETWEEN ENCASUREMENT IN FINISHED INSTALLATION.

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



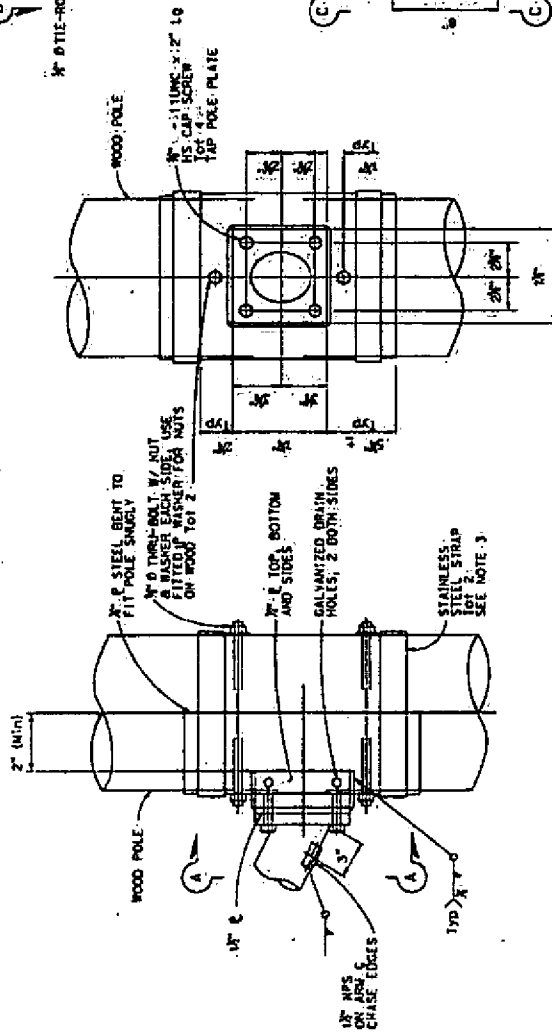
**TI E-ROD DETAIL No. 1**

**SECTION A-A**



**TI E-ROD DETAIL No. 2**

**SECTION B-B**



**VIEW A-A**

**ELEVATION**

**SECTION C-C**

**ARM CONNECTION DETAILS**

**FITTED PLATE DETAILS**

NOTE: 2 REQUIRED (1 W/ SCREW HOLES, 1 WITHOUT)

**ELECTRICAL DETAILS**  
NOT TO SCALE

APPROVED FOR ELECTRICAL WORK ONLY

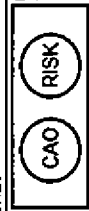
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
CONSULTANT FUNCTIONAL SUPERVISOR  
CALCULATED BY:  
DESIGNED BY:  
CHECKED BY: RONALD G. BOYLE  
DATE REVISED:  
REVISOR BY:

RELATIVE TO SCALE  
0 1 2 3 4 5  
IN FEET

NT

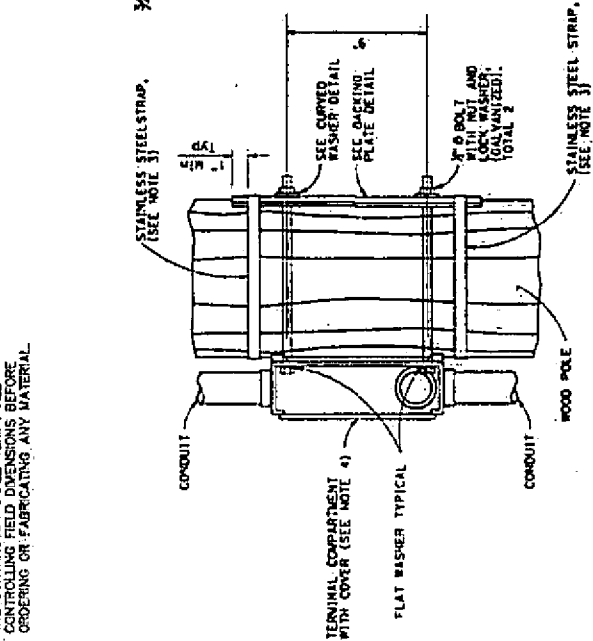
PROJECT NUMBER & PHASE

EFS 0500006542

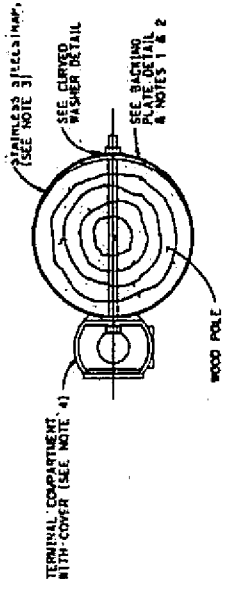


SHEET NO.	125
TOTAL SHEETS	190
DATE	7/21/2000
PROJECT	Ag-5377
COUNTY	Monterey
ROUTE	1, 68
POST MILE	75.1, L.A. 2
DATE	7/21/2000
DESIGNED BY	R. G. BOYLE
CHECKED BY	R. G. BOYLE
DATE	7/21/2000
APPROVED BY	[Signature]
TITLE	TERMINAL COMPARTMENT FABRICATION

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

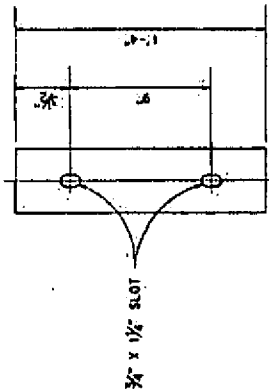


ELEVATION

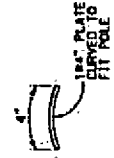


SECTION A-A

SIDE MOUNTING  
TERMINAL COMPARTMENT  
FOR DETAILS NOT SHOWN SEE RSP ES-40 SHEET

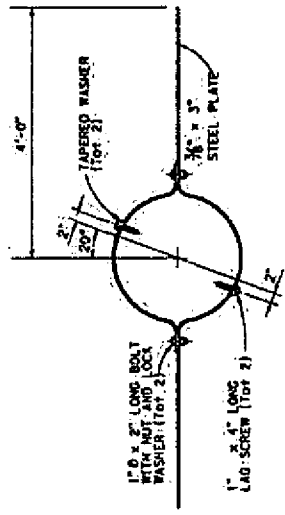


ELEVATION

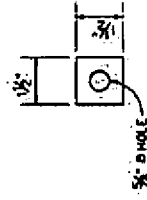


PLAN

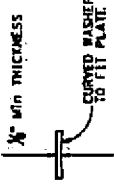
CURVED WASHER DETAIL



WIND ANCHOR DETAIL  
TO BE INSTALLED PERPENDICULAR TO MAST ARM AND 3'-0\"/>

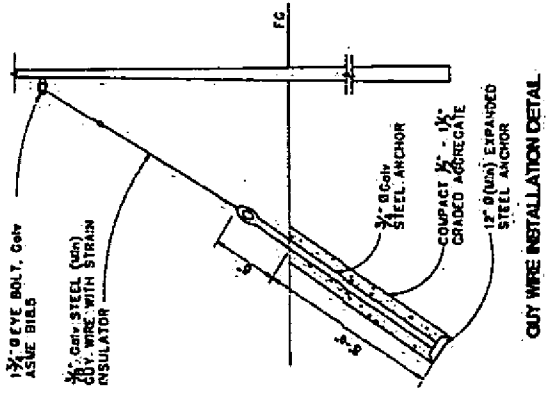


ELEVATION



PLAN

CURVED WASHER DETAIL



GUY WIRE INSTALLATION DETAIL

**NOTES: (THIS SHEET ONLY)**

- THE CONTRACTOR TO VERIFY POLE DIMENSIONS AT TERMINAL COMPARTMENT FOR FABRICATION OF BACKING PLATE AND CURVED WASHER.
- BACKING PLATE TO BE GALVANIZED AFTER FABRICATION.
- 3/4" X 0.044" MIN. ROUNDED EDGE STAINLESS STEEL STRAPS DOUBLE-WRAPPED WITH 2" LONG BEND UNDER STAINLESS STEEL STRAP BUOCLE.
- FOR DETAILS NOT SHOWN SEE STANDARD PLAN ES-40.



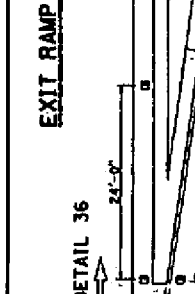
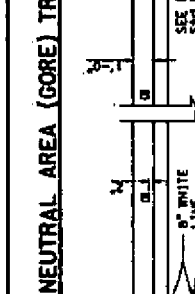
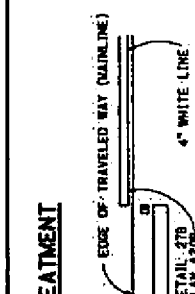
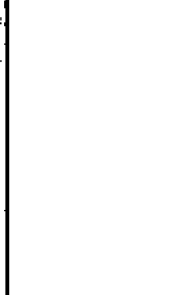
DIST.	COUNTY	ROUTE	POST MILE	PLAN NO.	DATE
05	Mon	1, 68	75.1, L4.2	127	190

REGISTERED ENGINEER

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 1201 N STREET, SACRAMENTO, CALIF. 95833  
 DATE: JULY 19, 2013  
 PLAN APPROVAL DATE: 8-23-13

TO ACCOMPANY PLANS DATED \_\_\_\_\_

**LANE DROP AT EXIT RAMP**



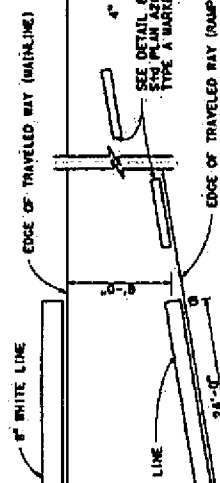
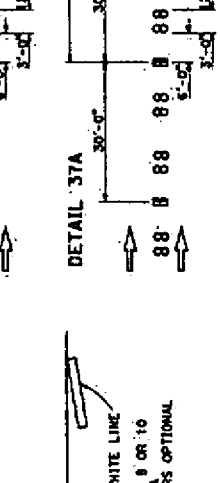
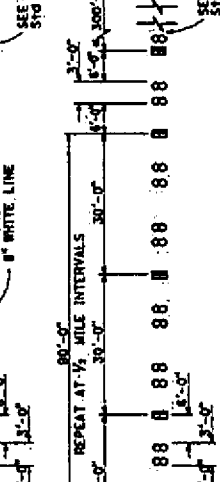
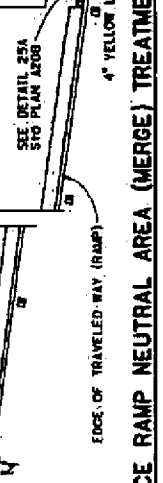
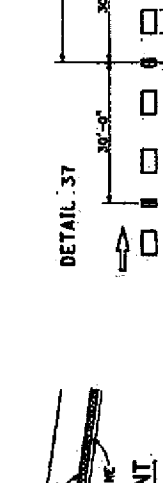
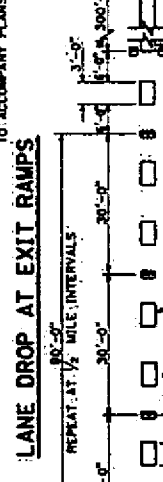
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

**PAVEMENT MARKERS AND TRAFFIC LINE TYPICAL DETAILS**

NO. SCALE

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

**REVISED STANDARD PLAN RSP A20C**



**LEGEND:**

MARKERS

○ TYPE A WHITE NON-REFLECTIVE

□ TYPE B RED-CLEAR RETROREFLECTIVE

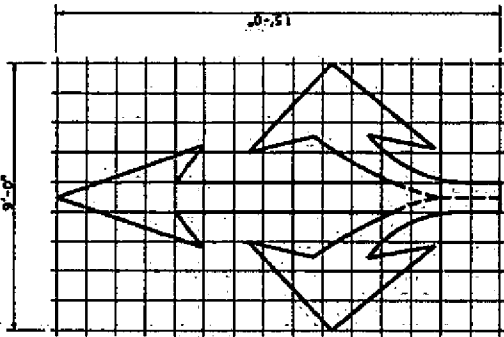
□ TYPE C ONE-WAY CLEAR RETROREFLECTIVE

□ TYPE G RETROREFLECTIVE FACE

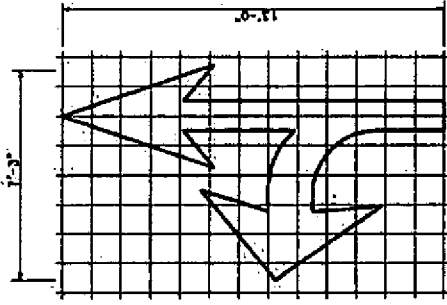
CAO RISK

FILE#	COUNTY	ROUTE	TOTAL SHEETS	SHEET NO.
05	Mon	1, 68	75, 1, L4, 2	128
REGISTERED CIVIL ENGINEER APR 11 20, 2012 STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS 1201 N STREET, SACRAMENTO, CA 95833 NO. 323131				

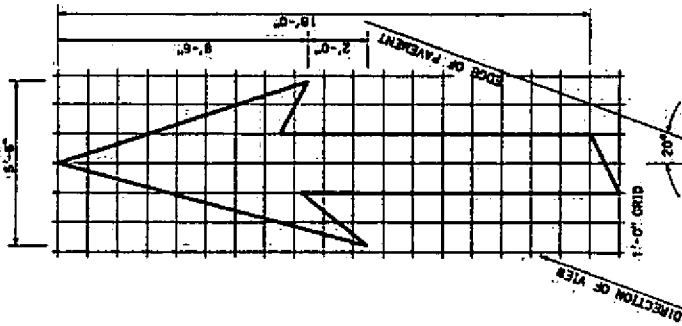
TO ACCOMPANY PLANS DATED \_\_\_\_\_



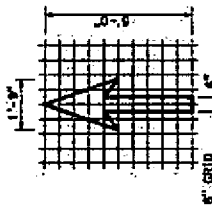
**TYPE VIII ARROW**  
A=33 f12



**TYPE VII (L) ARROW**  
A=27 f12  
(For Type III (R) arrow, use mirror image)

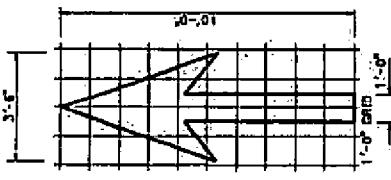


**TYPE VI ARROW**  
A=22 f12  
right lane drop arrow  
(For left lane, use mirror image)

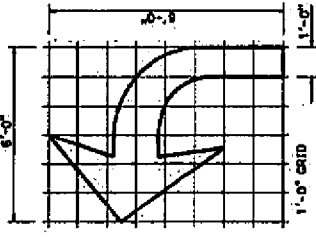


A=3.5 f12

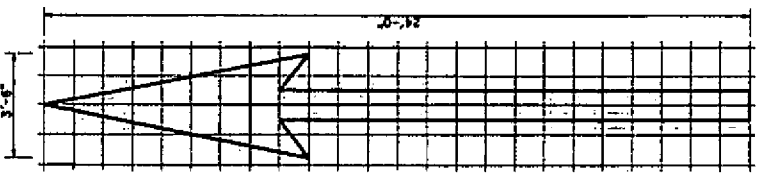
**BIKE LANE ARROW**



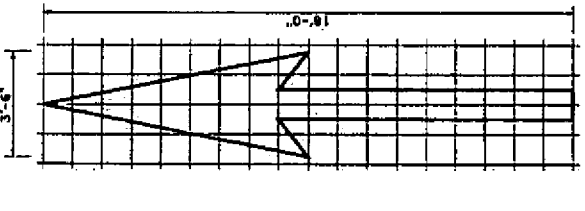
**TYPE I 10'-0" ARROW**  
A=14 f12



**TYPE IX (L) ARROW**  
A=15 f12  
(For Type II (R) arrow, use mirror image)



**TYPE I 24'-0" ARROW**  
A=31 f12



**TYPE I 18'-0" ARROW**  
A=25 f12

NOTE:  
Minor variations in dimensions may be accepted by the Engineer.

**TYPE X ARROW**  
A=33 f12  
**PAVEMENT MARKINGS ARROWS**  
NO. SCALE  
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

RSP A24A DATED APRIL 20, 2012 SUPERSEDES STANDARD PLAN A24A DATED MAY 20, 2011 - PAGE 13 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A24A**



Exhibit A.2

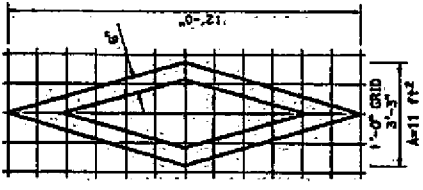
DATE	COUNTY	SHEET NO.	TOTAL SHEETS
05	Mon	1, 68	75, 1, 14, 2, 129, 190

REGISTERED CIVIL ENGINEER

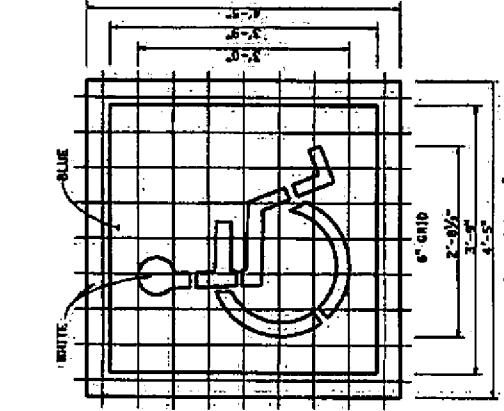
October 19, 2012  
PLANS APPROVAL DATE

BY STATE OF CALIFORNIA REGISTERED CIVIL ENGINEER  
FOR THE STATE OF CALIFORNIA REGISTERED CIVIL ENGINEER  
IN THE COUNTY OF CALIFORNIA

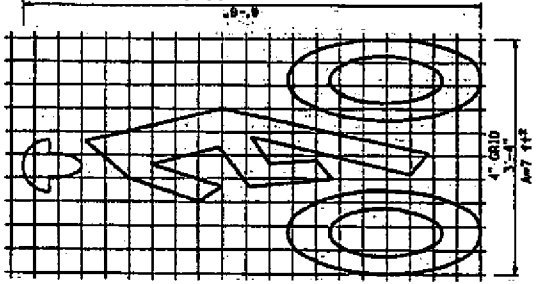
TO ACCOMPANY PLANS DATED  
Minor variations in dimensions may be accepted by the Engineer.



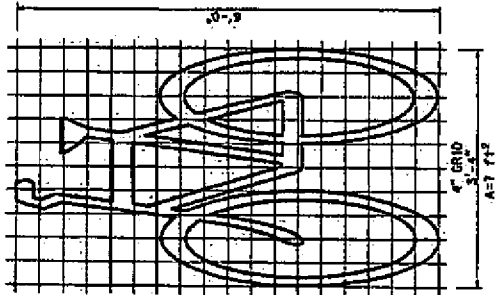
**DIAMOND SYMBOL**



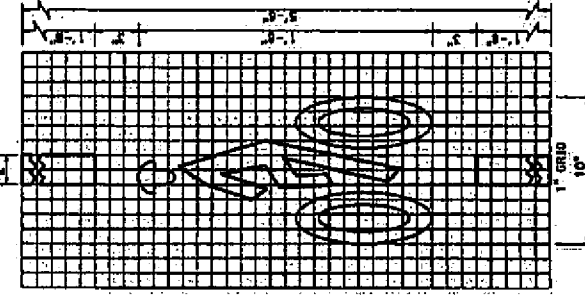
**INTERNATIONAL SYMBOL OF ACCESSIBILITY (ISAL) MARKING**



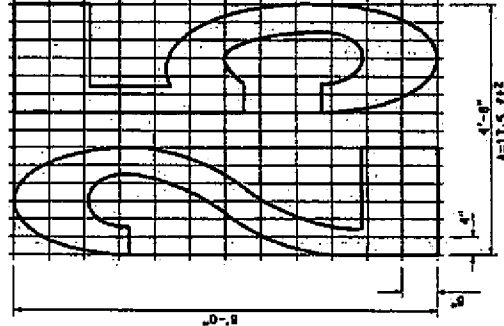
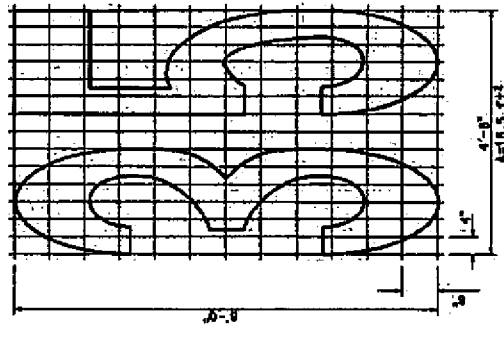
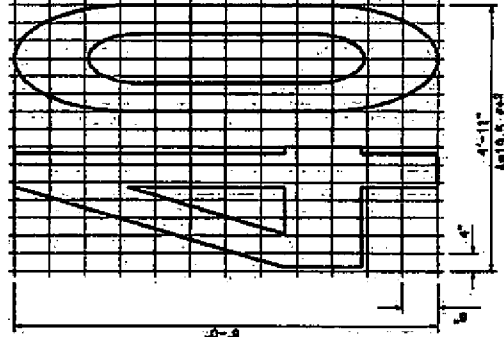
**BIKE LANE SYMBOL WITH PERSON**



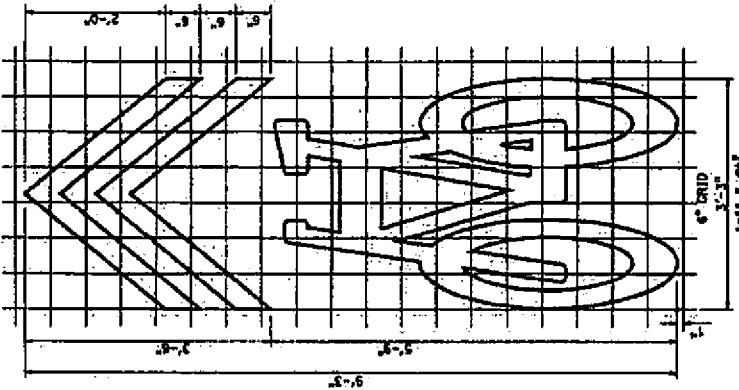
**BIKE LANE SYMBOL WITHOUT PERSON**



**BICYCLE LOOP DETECTOR SYMBOL**



**NUMERALS**



**SHARED ROADWAY BICYCLE MARKING**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**PAVEMENT MARKINGS SYMBOLS AND NUMERALS**

NO SCALE

RSP A24C DATED OCTOBER 19, 2012, SUPERSEDES STANDARD PLAN RSP A24C DATED MAY 20, 2011 - PAGE 15 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A24C**



DATE	COUNT	AMOUNT	TOTAL AMOUNT	NO. OF SHEETS
05	MON	1.68	751.14	130

REVISED SERVICE ORDER

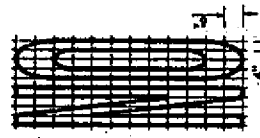
JULY 20, 2012

PLANS APPROVAL DATE

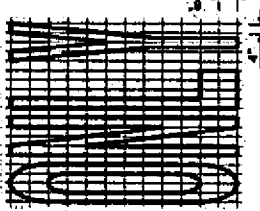
THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

NO. 100

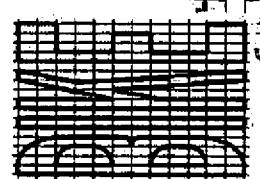
TO ACCOMPANY PLANS DATED



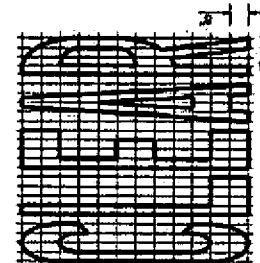
A=14 ft x 2



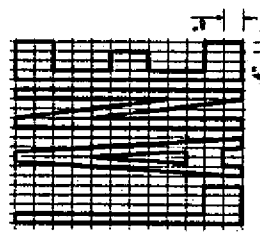
A=22 ft x 2



A=21 ft x 2



A=27 ft x 2



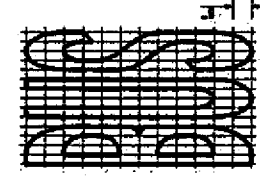
A=24 ft x 2



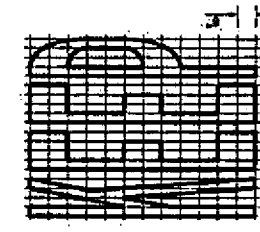
A=17 ft x 2



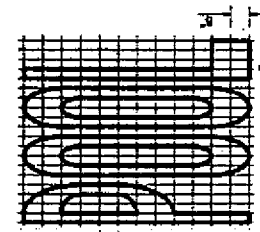
A=16 ft x 2



A=20 ft x 2



A=24 ft x 2



A=23 ft x 2

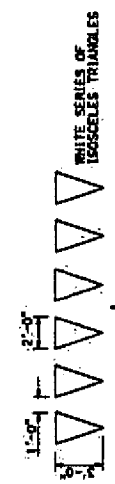
WORD MARKINGS			
ITEM	FT	ITEM	FT
LANE	24	NO.	14
POOL	23	BIKE	21
CAR	17	BUS	20
CLEAR	21	ONLY	22
KEEP	24	FEET	16

NOTES:

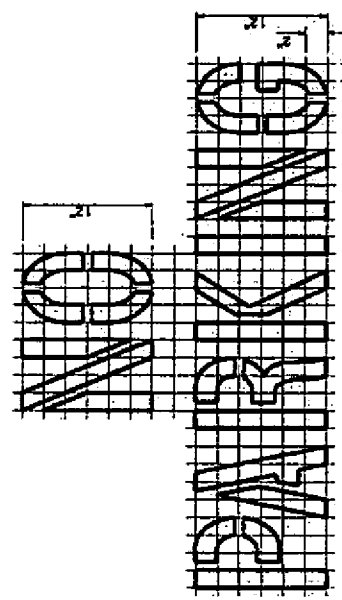
- If a message consists of more than one word, it should read "up", i.e., the first word should be nearest the driver.
- The space between words should be at least four times the height of the characters for low speed roads, but not more than ten times the height of the characters. The space may be reduced appropriately where there is limited space because of local conditions.
- Minor variations in dimensions may be accepted by the Engineer.
- Portions of a letter, number or symbol may be separated by connecting segments not to exceed 2" in width.
- The words "NO PARKING" pavement marking is to be used for parking facilities. For typical locations or markings, see Standard Plan A304 and A306.
- The words "NO PARKING" shall be painted in white letters no less than 1/2" high on a contrasting background and located so that it is visible to traffic enforcement officials.



LIMIT LINE (STOP LINE)



YIELD LINE



A=2 ft x 2  
See Notes 6 and 7

CAO RISK

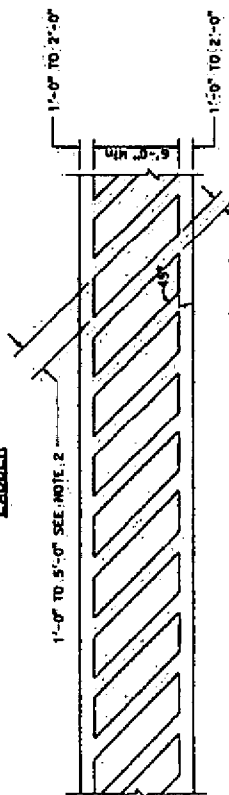
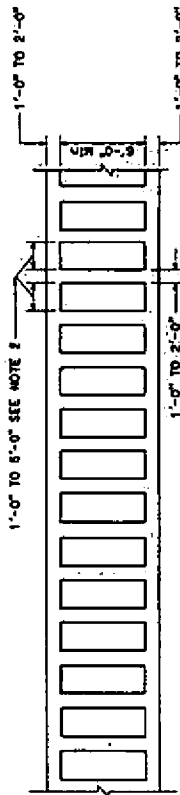
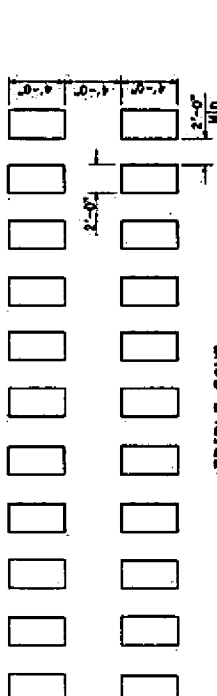
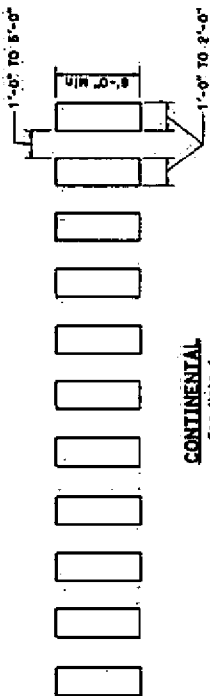
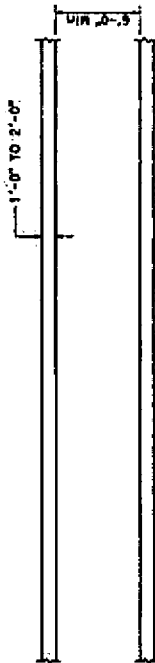
PLAN NO.	DATE	BY	CHKD.	REVISED	DATE
05	Mon 1. 68	75.1. L.4.2	131	180	

**REGISTERED CIVIL ENGINEER**  
 JULY 20, 2012  
 STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 1515 MARKET STREET, SUITE 100  
 SACRAMENTO, CALIFORNIA 95833

TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

1. Spaces between markings should be placed in wheel tracks of each lane.
2. Spacings not to exceed 2.5 times width of longitudinal line.
3. All crosswalk markings must be white except for those near schools must be yellow.



**HIGHER VISIBILITY CROSSWALKS**

CAO RISK

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**PAVEMENT MARKINGS  
CROSSWALKS**  
NO. SCALE  
RSP A24F DATED JULY 20, 2012 SUPPLEMENTS THE  
STANDARD PLANS BOOK DATED 2010.

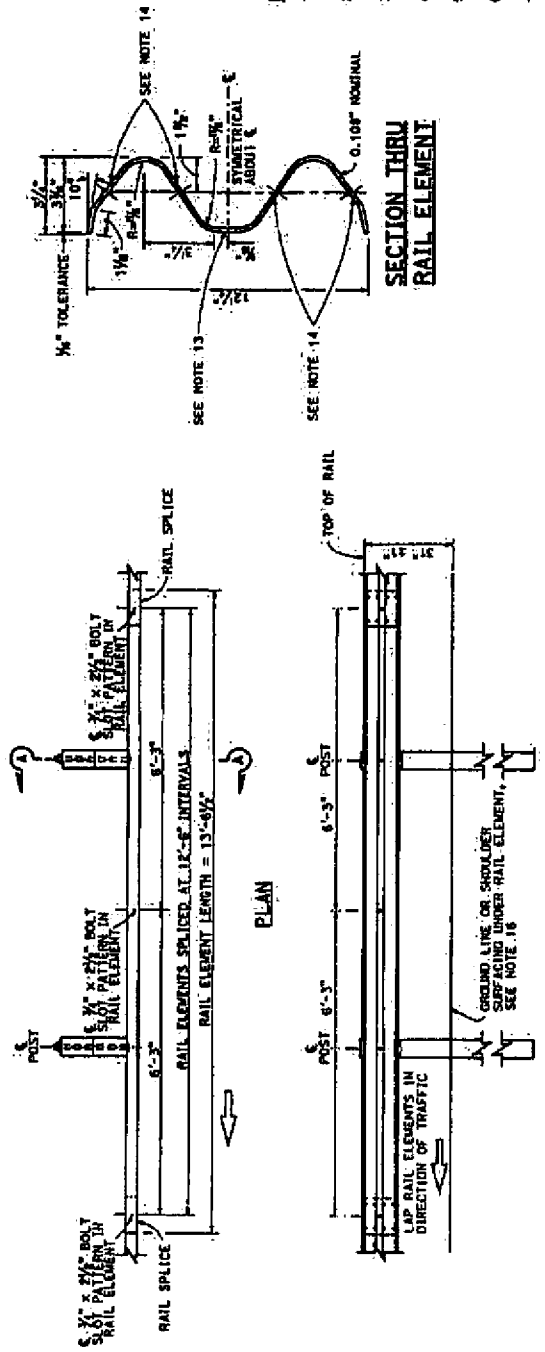
**REVISED STANDARD PLAN RSP A24F**



COUNTY	DATE	PROJECT NO.	SCALE
05	Mon 1. 88	75.1, L.A.2	1/32" = 1'-00"

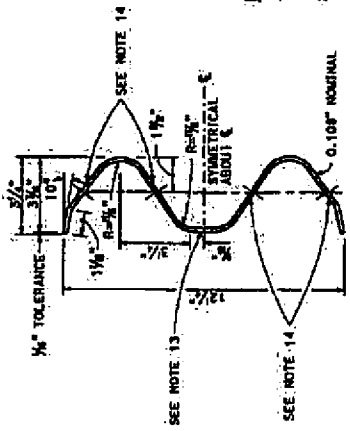
**Robert D. Hoot**  
 REGISTERED CIVIL ENGINEER  
 No. 128315  
 State of California  
 July 15, 2013  
 PLANS APPROVAL DATE  
 FOR THIS PROJECT ONLY  
 THIS APPROVAL IS NOT VALID FOR ANY OTHER PROJECT OR FOR ANY OTHER DATE.

TO ACCOMPANY PLANS DATED \_\_\_\_\_

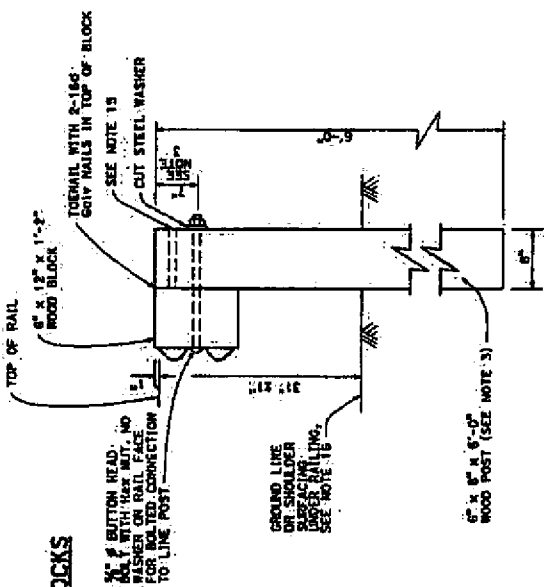


ELEVATION

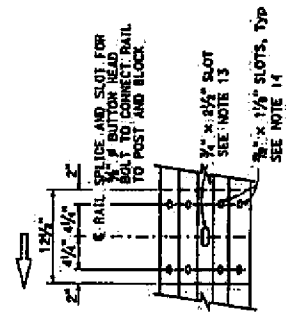
MIDWEST GUARDRAIL SYSTEM WITH WOOD POST AND BLOCKS



SECTION THRU RAIL ELEMENT



SECTION A-A  
TYPICAL WOOD LINE POST INSTALLATION  
See Note 4



ELEVATION

RAIL ELEMENT SPLICE DETAIL

- Connect the ends of the rail elements with 1/2" x 3/4" x 1/2" bolt heads and shoulder bolts inserted into the 3/8" x 1/2" slots and bolted together with 3/8" x 3" recessed hex nuts. Recess of hex nut points toward rail element. A total of 3 bolts and nuts are to be used at each rail splice connection.
- The ends of the rail elements are to be overlapped in the direction of traffic (see details).
- Where end cap is to be attached to the end of a rail element, the cap, 4 of the above described splices bolts and nuts are to be used.

NOTES

- For details of steel post installations, see Revised Standard Plan RSP AT1.2.
- For details of standard hardware used to construct MCS, see Revised Standard Plan RSP AT7M.
- For details of wood posts and wood blocks used to construct MCS, see Revised Standard Plan RSP AT7M.
- For additional installation details, see Revised Standard Plan RSP AT7M.
- MCS post spacing to be 6'-3" center to center, except as otherwise noted.
- For MCS typical layouts, see the AT7P, AT7O and AT7M series of Standard Plans.
- If railing is connected to terminal system and treatment, use 3" height terminal system and treatment.
- For MCS and anchor details, see Revised Standard Plans RSP AT7S and RSP AT7E.
- For details of MCS transition to bridge railing, see Revised Standard Plan RSP AT7U.
- For additional details of MCS connection to bridge railing see Revised Standard Plans RSP AT7U, RSP AT7O and RSP AT7V.
- For MCS connection details to abutments and walls, see Revised Standard Plan RSP AT7U.
- For typical MCS delineation and delineation details, see Revised Standard Plan RSP AT7M.
- Started hole for bolted connection of rail element to block and post. See "Section Thru Rail Element".
- Started holes for splice bolts to overlap ends of rail element. See "Section Thru Rail Element".
- Additional hole in uppermost portion of line post is for potential future adjustments of railing height. See Revised Standard Plan RSP AT7M.
- metal posts in wall.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

MIDWEST GUARDRAIL SYSTEM  
STANDARD RAILING SECTION  
(WOOD POST WITH WOOD BLOCK)

NO. SCALE

RSP A77L1 DATED JULY 15, 2013 SUPPLEMENTS STANDARD PLANS BOOK DATED 2010.

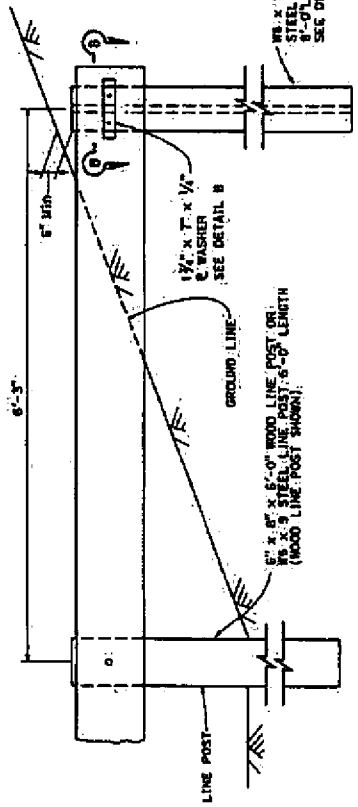
REVISED STANDARD PLAN RSP A77L1



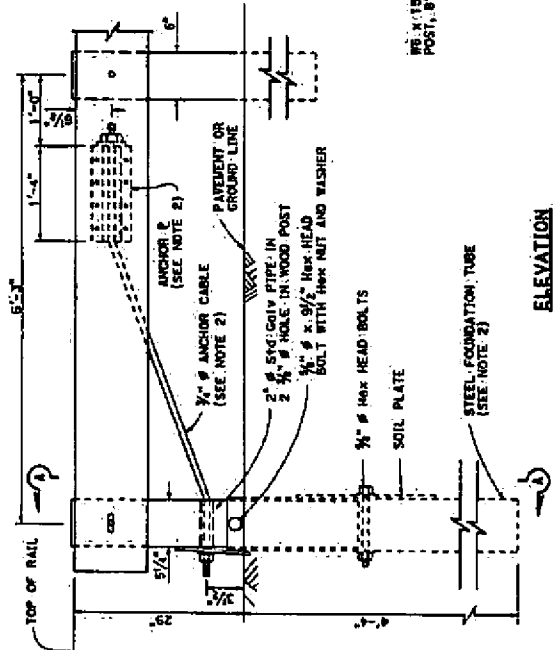
DATE	NO.	DESCRIPTION	BY
05	1	1. 68	75.1, L.A.2
130	190		

JULY 19, 2013  
 REGISTERED CIVIL ENGINEER  
 RICHARD D. HAYES  
 10000 WILSON AVENUE, SUITE 100  
 BOSTON, MA 02116  
 (617) 552-1234  
 www.rdh-engineering.com

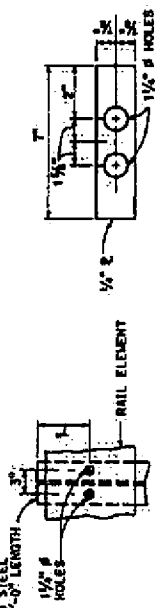
TO ACCOMPANY PLANS DATED \_\_\_\_\_



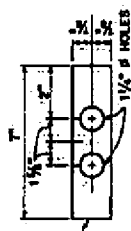
**BURIED POST END ANCHOR**



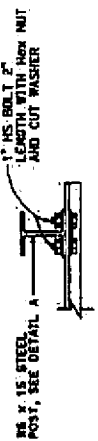
**ELEVATION END ANCHOR ASSEMBLY (TYPE SE1)**



**DETAIL A**

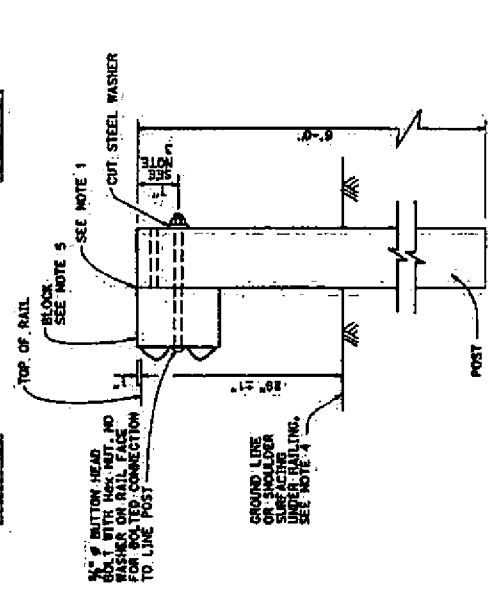


**DETAIL B**

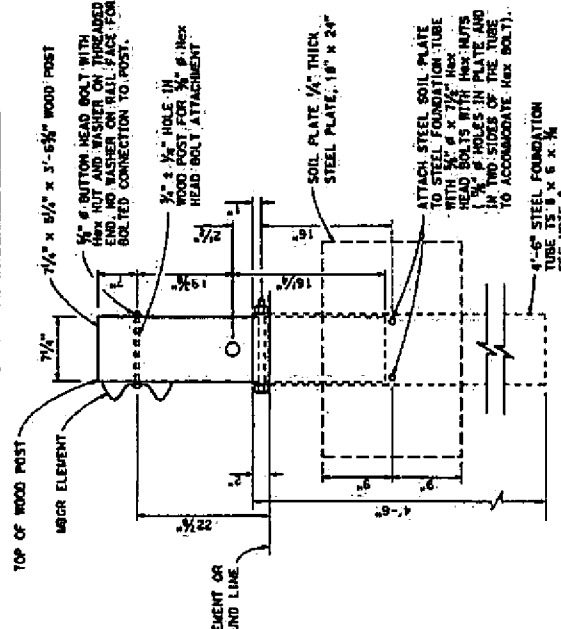


**SECTION B-B**

- NOTES:**
1. For wood post and wood block, treat with 2-16d galv nails for top surface and 2-16d galv nails for bottom surface. Use treated wood or plastic block, finished face of block faces steel post.
  2. A 4'-6" length steel foundation tube, 15.9 x 6 x 3/8, without a soil plate, may be furnished and installed in place of the 4'-6" length steel foundation tube and soil plate shown. All dimensions and the soil plate shall be maintained. The 4'-6" length tube shall be installed with the 1/2" x 6" x 6" wood line post to keep the wood post from dropping into the tube.
  3. To connect railing to 2nd terminal system end treatment, transition the top of railing height at a ratio of 1:20:1 to terminal system end treatment height plus one 12'-6" standard railing section of the transitioned height for a horizontal connection to the end treatment.
  4. Install posts in soil.
  5. See Revised Standard Plans RSP A77H1 and RSP A77H2 for details.
  6. Hole excavation in the slope to construct the buried post and anchor shall be backfilled with compacted earth. Placed in layers approximately 15'-0" thick. Each layer shall be moistened and thoroughly compacted.



**TYPICAL LINE POST INSTALLATION**



**SECTION A-A**

CAO RISK

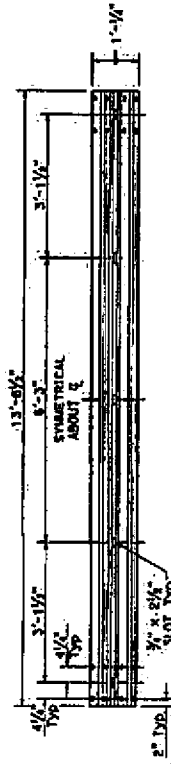
DATE	COUNTY	ROUTE	POST MILES	POST MILES	POST MILES
05	Mon	1. 68	75.1	L4.2	134 190

**Richard D. Hest**  
 REGISTERED CIVIL ENGINEER  
 JULY 19, 2013  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 COUNTY OF SAN DIEGO  
 PROJECT NO. 05-0000-0000-0000-0000  
 SHEET NO. 134 OF 190

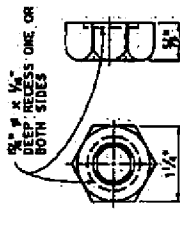
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES**

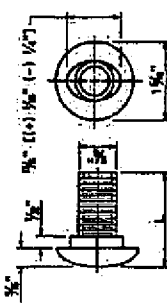
1. Slotted holes for splice bolts to overlap ends of rail element.



**TYPICAL RAIL ELEMENT**



3/8"  $\times$  1/2" DEEP RECESS ONE OR BOTH SIDES



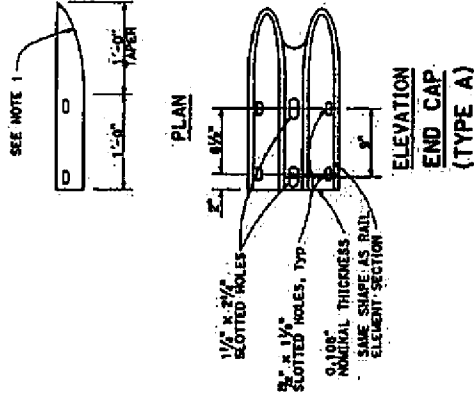
**5/8"  $\phi$  RECESS NUT**

**5/8"  $\phi$  BUTTON HEAD BOLT**

**BUTTON HEAD BOLT**

L	THREAD LENGTH
1 1/2"	FULL THREAD LENGTH
2"	FULL THREAD LENGTH
10"	4" MIN. THREAD LENGTH
18"	4" MIN. THREAD LENGTH
20"	4" MIN. THREAD LENGTH
22"	4" MIN. THREAD LENGTH
25"	4" MIN. THREAD LENGTH
31"	4" MIN. THREAD LENGTH
36"	4" MIN. THREAD LENGTH
42"	4" MIN. THREAD LENGTH

See For nested rail applications.



STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
 STANDARD HARDWARE**  
 NO. SCALE  
 RSP A77M1 DATED JULY 19, 2013. SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP A77M1**

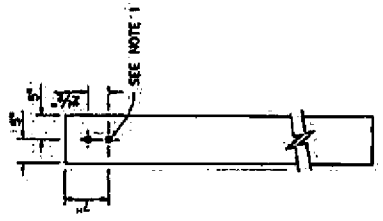


DATE	COUNTY	ROUTE	POST MILES	SECTION	NOTES
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JULY 19, 2013 CIVIL ENGINEER STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS 1515 MARKET STREET, SUITE 100 SAN FRANCISCO, CA 94102 PHONE: (415) 744-3333 FAX: (415) 744-3334 E-MAIL: <a href="mailto:caohighways@dot.ca.gov">caohighways@dot.ca.gov</a>					

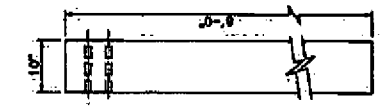
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

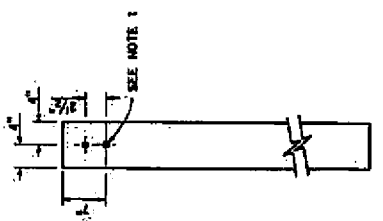
- All holes in wood posts and blocks shall be  $\frac{3}{8}$ " Dia  $\pm \frac{1}{8}$ ".
- Dimensions shown for wood post are nominal.
- This post and block combination used for standard line post sections of M3.
- This post and  $6" \times 12"$  block combination used for line post sections of M3 on narrow footings.
- This post and  $8" \times 12"$  block combination is typically used where strengthened line post sections of M3 are warranted to shield filed objects.
- See Revised Standard Plan RSP A77N3 for use of  $6" \times 8"$  and  $8" \times 8"$  wood blocks.



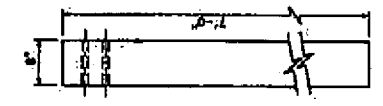
**6" x 8" WOOD POST**  
 SIDE FRONT  
 See Note 3



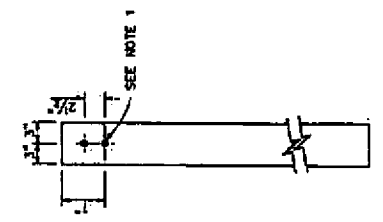
**6" x 12" WOOD BLOCK**  
 SIDE FRONT  
 See Note 3



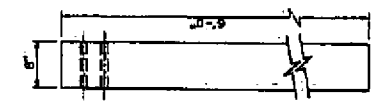
**8" x 8" WOOD POST**  
 SIDE FRONT  
 See Note 4



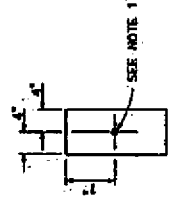
**8" x 12" WOOD BLOCK**  
 SIDE FRONT  
 See Note 4



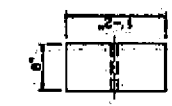
**10" x 10" WOOD POST**  
 SIDE FRONT  
 See Note 5



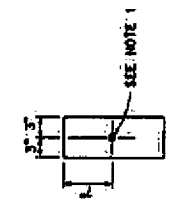
**10" x 10" WOOD BLOCK**  
 SIDE FRONT  
 See Note 5



**8" x 8" WOOD BLOCK**  
 SIDE FRONT  
 Only for use with standard line post sections of M3.



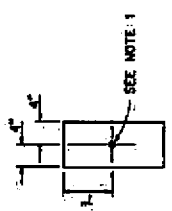
**8" x 8" WOOD BLOCK**  
 SIDE FRONT  
 Only for use with standard line post sections of M3.



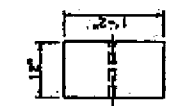
**6" x 8" WOOD BLOCK**  
 SIDE FRONT  
 Only for use with standard line post sections of M3.



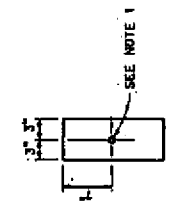
**6" x 8" WOOD BLOCK**  
 SIDE FRONT  
 Only for use with standard line post sections of M3.



**8" x 12" WOOD BLOCK**  
 SIDE FRONT  
 See Note 4



**8" x 12" WOOD BLOCK**  
 SIDE FRONT  
 See Note 4



**6" x 12" WOOD BLOCK**  
 SIDE FRONT  
 See Note 3

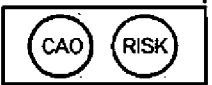


**6" x 12" WOOD BLOCK**  
 SIDE FRONT  
 See Note 3

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
 WOOD POST AND  
 WOOD BLOCK DETAILS**

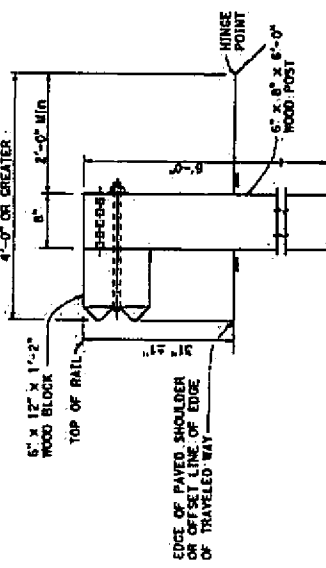
NO SCALE

RSP A77N1 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP A77N1**

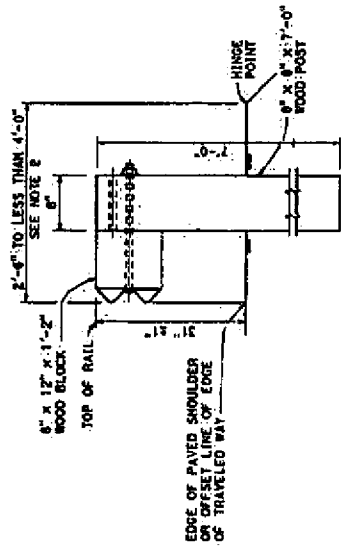


Dist	County	Route	Stationing	Sheet	Total
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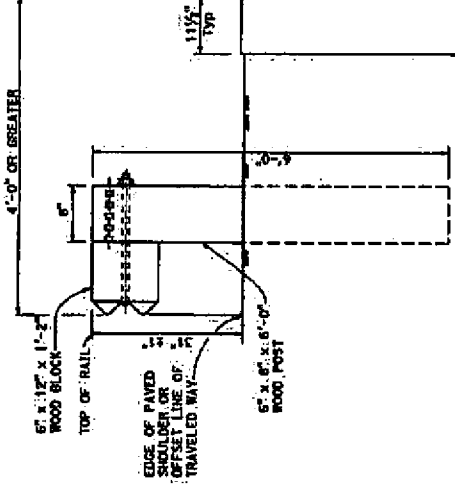
**November 15, 2013**  
 LAST APPROVAL DATE  
 FOR THIS PLAN AND ALL REVISIONS FOR  
 PROJECT OF THE STATE OF CALIFORNIA  
 REGISTERED CIVIL ENGINEER



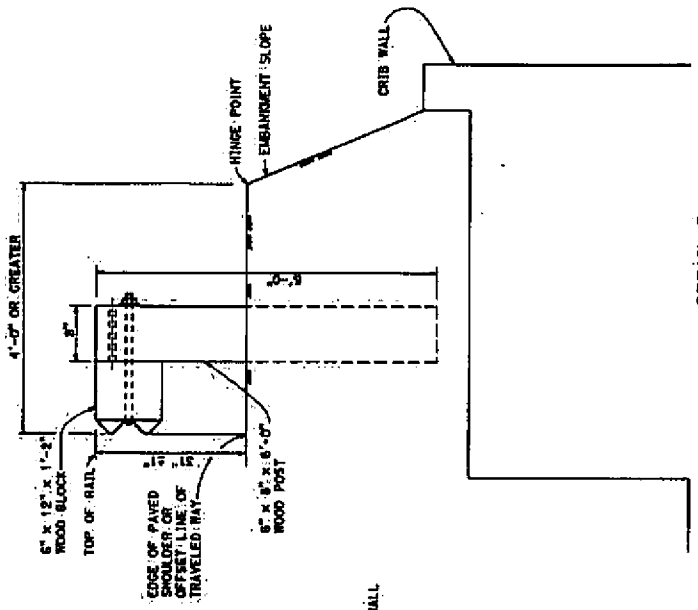
**DETAIL A**  
**TYPICAL ROADWAY**  
**INSTALLATION**  
 See Note 1



**DETAIL B**  
**NARROW ROADWAY**  
**INSTALLATION**  
 See Note 1



**DETAIL C**



**DETAIL D**

**POST EMBEDMENT**

**NOTES:**

- These installation details are applicable to steel line post installations. For Detail A, the wood post shall be 6'-0" in length, with 6" x 12" x 1'-2" notched wood blocks or notched recycled plastic blocks to be used in place of the size of wood post and wood block shown. For Detail B, where steel line post installations are constructed, 16" x 16" steel post, 8'-0" in length, may be used in place of the size of wood post and wood block shown. For additional installation details, see Revised Standard Plan RSP AT7L1 and RSP AT7L2.
- Where the distance between the face of the rail and the hinge point is less than 2'-6", see the Project Plans for special details.
- For all installations with MDS installations, see Revised Standard Plan RSP AT7M4.

**INSTALLATION AT EARTH RETAINING WALLS**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM**  
**TYPICAL LINE POST**  
**EMBEDMENT AND**  
**HINGE POINT OFFSET DETAILS**  
 NO SCALE  
 RSP A77N3 DATED NOVEMBER 15, 2013 SUPERSEDES RSP A77N3  
 DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP A77N3**



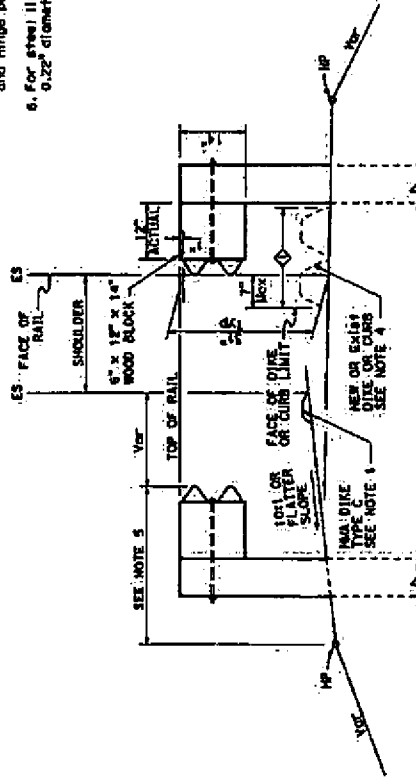
DATE	COUNTY	ROUTE	POST MILEAGE	PLAN SHEET
05	Mon.	1, 68	75.1, L4.2	137, 190

**Paul D. Holt**  
 REGISTERED CIVIL ENGINEER  
 JULY 19, 2013  
 LICENSE NO. 44843  
 STATE OF CALIFORNIA  
 CIVIL ENGINEERING  
 OFFICE OF THE REGISTERED PROFESSIONAL ENGINEERS AND ARCHITECTS OF CALIFORNIA  
 1001 K STREET, N.W.  
 WASHINGTON, D.C. 20004-4242

TO ACCOMPANY PLANS DATED \_\_\_\_\_

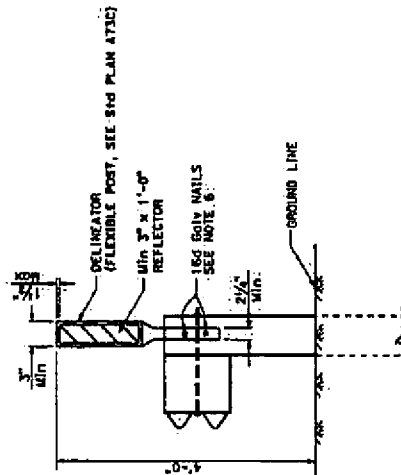
**NOTES:**

1. When necessary to place dike more than 7' in front of face of MGS, only Type C dike may be used. For dike details, see Revised Standard Plan RSP A87B.
2. For standard rolling post embedment, see Revised Standard Plan RSP A77N2.
3. MGS delineation to be used where shown on the Project Plans.
4. When dike or curb is placed under MGS, the maximum height of the dike or curb shall be 6". Mountable dike should not be used. For dike and curb details, see Revised Standard Plans RSP A87A and RSP A87B.
5. For details of typical distances between the face of rail and hinge point, see Revised Standard Plan RSP A77N3.
6. For steel line posts, use  $\frac{1}{2}$ " - 20 self-tapping screws in 0.22" diameter holes or  $\frac{1}{4}$ " bolts in  $\frac{1}{2}$ " diameter holes.



**DIKE POSITIONING**  
See Note 1

◇ PERMISSIBLE DIKE OR CURB PLACEMENT AREA



**MGS DELINEATION**  
See Note 3

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TYPICAL RAILING DELINEATION  
AND DIKE POSITIONING DETAILS**

NO SCALE

REP A77N4 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77N4**

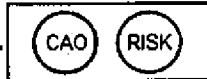


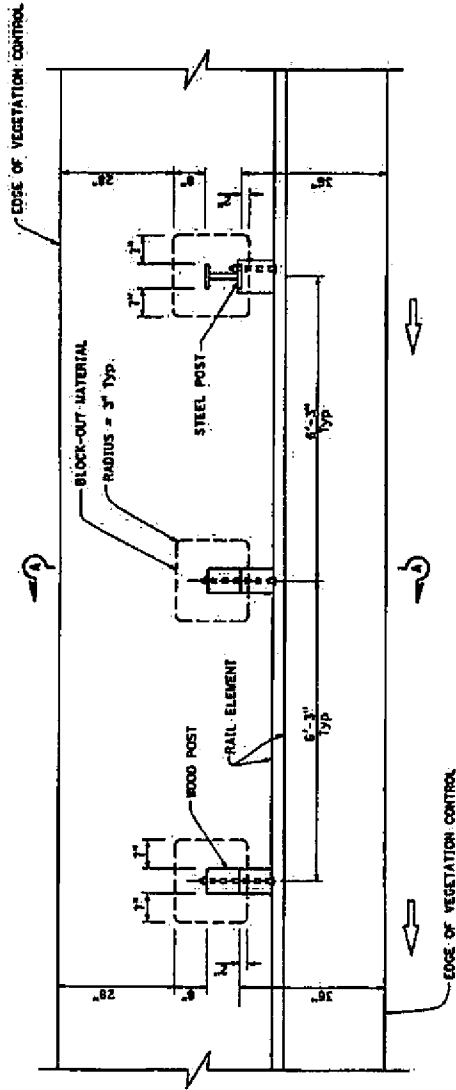
Exhibit A.2

DATE	COUNTY	ROUTE	TOTAL LENGTH	POST SPACING
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REGISTERED CIVIL ENGINEER July 19, 2013 License No. 44115 State of California Seal of the Board of Professional Engineers, Architects, and Surveyors				

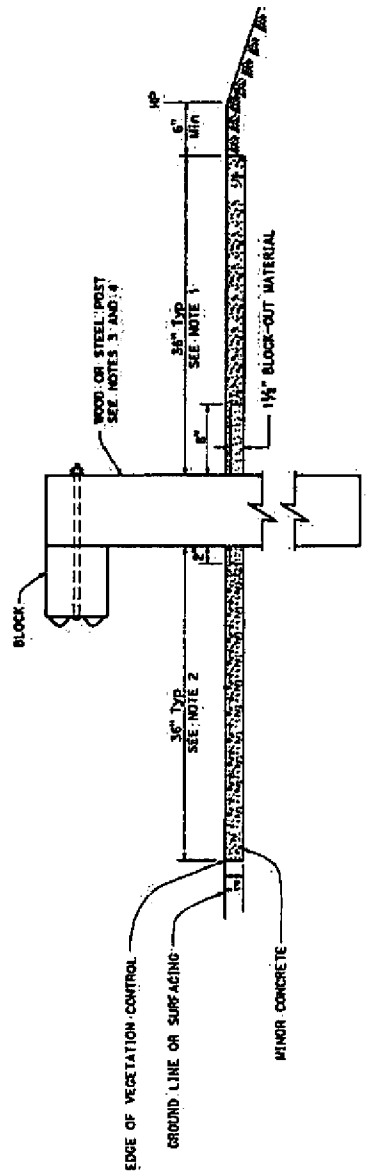
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

1. Where the distance between back of post and hinge point is less than 42", construct vegetation control to 6" from hinge point while maintaining the 3" block-out at back of post. If the 3" block-out is not maintained, construct vegetation control flush with the back edge of post.
2. Where ditch is constructed under railing, construct vegetation control at back edge of ditch. Where paved shoulder is constructed adjacent to the post, construct vegetation control to the edge of paved shoulder.
3. For wood post sizes, see Revised Standard Plan RSP A77M1.
4. For steel post sizes, see Revised Standard Plan RSP A77M2.
5. For details not shown, see Revised Standard Plans RSP A77L1 and RSP A77L2.



**PLAN**



**SECTION A-A**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
 TYPICAL VEGETATION CONTROL  
 STANDARD RAILING SECTION**  
 NO. SCALE

RSP A77N5 DATED JULY 19, 2013. SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

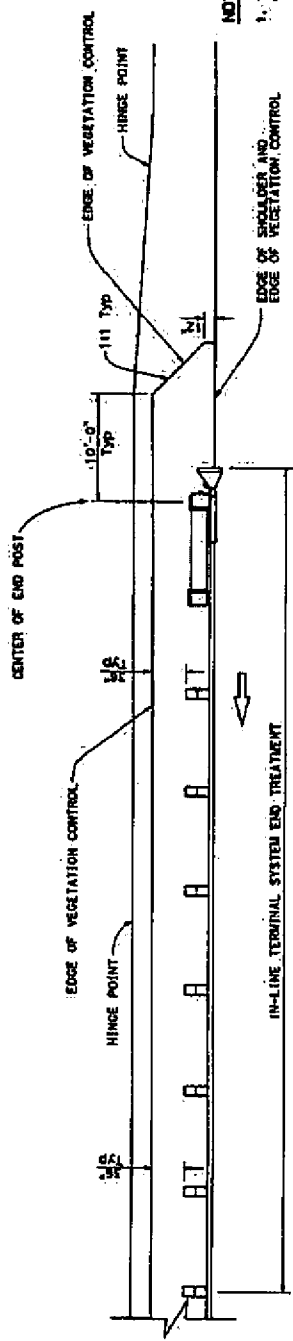
**REVISED STANDARD PLAN RSP A77N5**



DATE	10/15/13	PROJECT NO.	139 190
DATE	10/15/13	PROJECT NO.	139 190
DATE	10/15/13	PROJECT NO.	139 190
DATE	10/15/13	PROJECT NO.	139 190

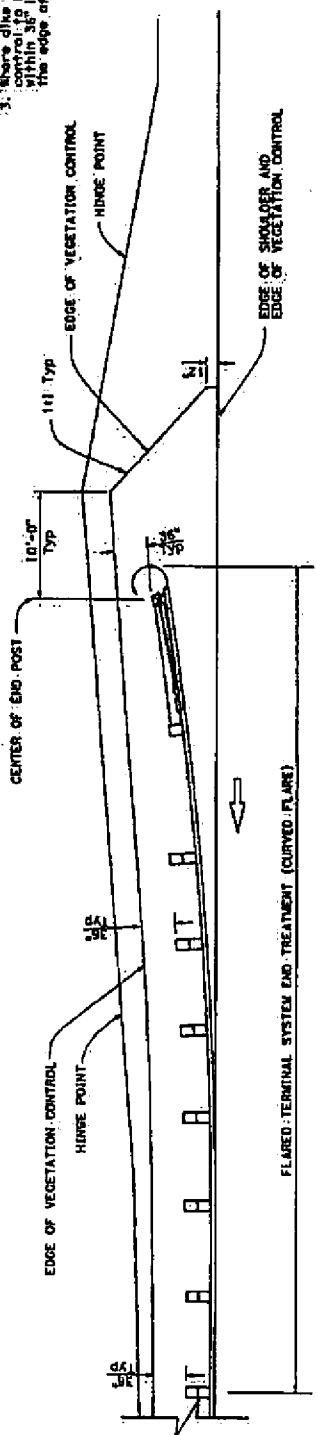


TO ACCOMPANY PLANS DATED \_\_\_\_\_

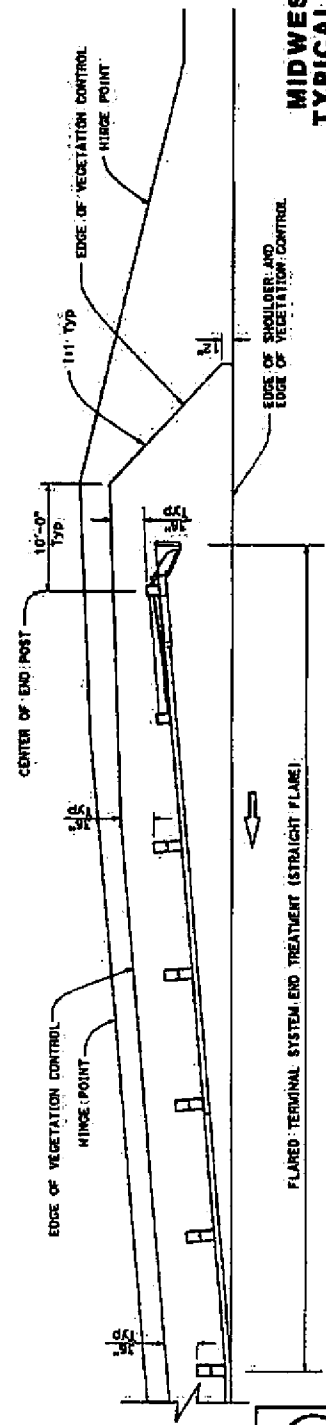


**NOTES:**

1. See revised Standard Plan RSP A77N5 for additional vegetation control details.
2. Where the distance between back of post and hinge point is less than 45', construct vegetation control to 5' from hinge point while maintaining the 1' block-out of back of post. If the 5' block-out is not possible, construct vegetation control to 45' from hinge point and flush with the back edge of post.
3. Where dike is constructed under rolling, construct vegetation control to back edge of dike. Where paved shoulder is constructed within 36' in front of the post, construct vegetation control to the edge of paved shoulder.



**PLAN**



**PLAN**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
TYPICAL VEGETATION CONTROL  
FOR TERMINAL SYSTEM END TREATMENTS**  
NO SCALE

RSP A77N6 DATED JULY 15, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77N6**





Exhibit A.2

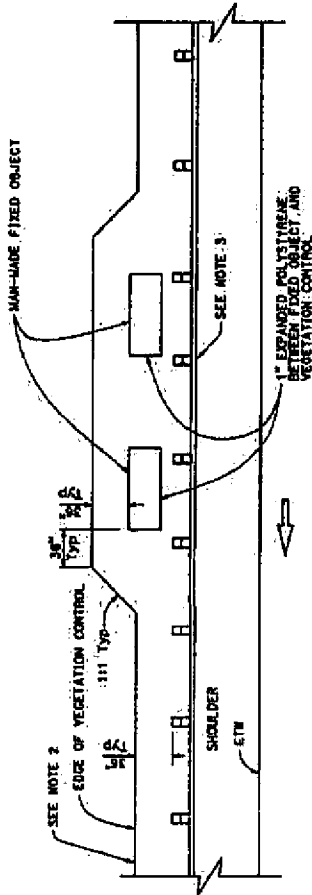
DATE	COUNTY	ROUTE	POST MILE	POST MILE	SHEET NO.	TOTAL SHEETS
05	Mon.	1. 88	75.1	L4.2	140	180

Revised Civil Engineer  
 July 19, 2013  
 PLANS APPROVAL DATE  
 FOR THE STATE OF CALIFORNIA  
 REGISTERED CIVIL ENGINEER  
 NO. 52800  
 DATE 07-19-2013

TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

1. See Revised Standard Plan RSP A77N8 for additional vegetation control details.
2. Where the distance between back of post and wing point is less than 40', construct vegetation control to wing point while maintaining the 3' block-out at back of post. If the block-out at back of post can not be maintained, construct vegetation control flush with the back edge of post.
3. Where dikes are constructed under railing, construct vegetation control to back edge of dike. Where paved shoulder is constructed within 36" in front of the post, construct vegetation control to the edge of paved shoulder.



**PLAN**

Fixed object(s) on shoulder

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
 TYPICAL VEGETATION CONTROL  
 AT FIXED OBJECT**

NO. SCALE

RSP A77N8 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77N8**



Exhibit A.2

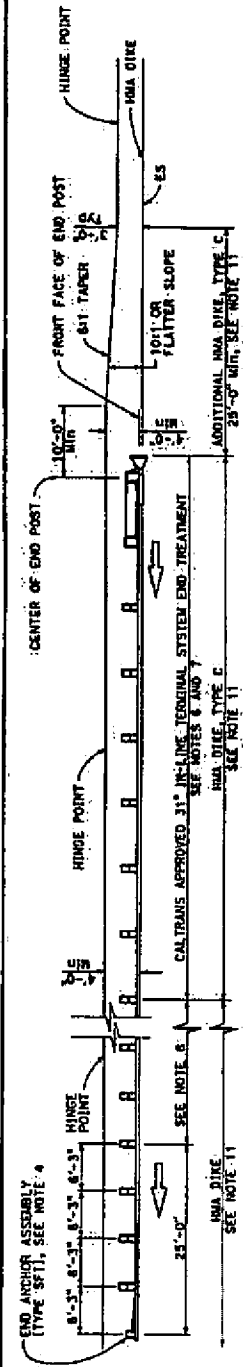
SHEET NO.	COUNT		DATE
	THIS SHEET	OF SHEETS	
05	1	68	7.5.1, L4.2   141   190

**Revell D. Kost**  
REGISTERED CIVIL ENGINEER

NOVEMBER 15, 2013  
PLANS APPROVAL DATE

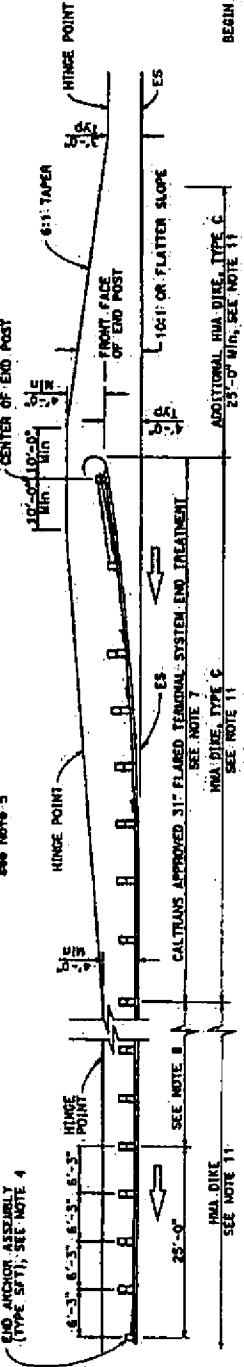
FOR USE OF THE STATE OF CALIFORNIA  
IN CONNECTION WITH THE PROJECT  
OF THE MIDWEST GUARDRAIL SYSTEM  
FOR THE STATE OF CALIFORNIA  
PROJECT NO. 13-00000000

TO ACCOMPANY PLANS, DATED \_\_\_\_\_



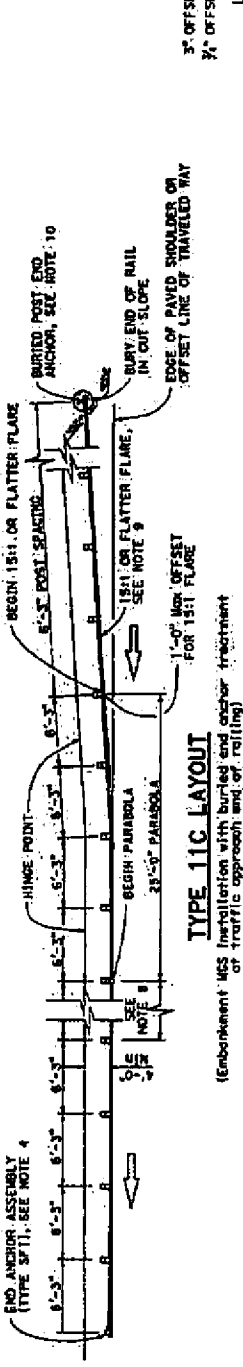
**TYPE 11A LAYOUT**

(Embankment MCS installation with 31" in-line end treatment at traffic approach end of railing) see Note 5



**TYPE 11B LAYOUT**

(Embankment MCS installation with 31" flared end treatment at traffic approach end of railing) see Note 5

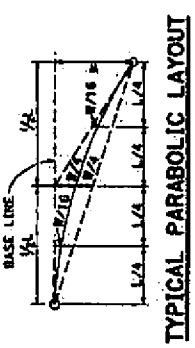


**TYPE 11C LAYOUT**

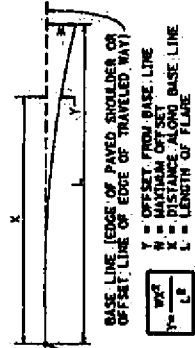
(Embankment MCS installation with buried end anchor treatment at traffic approach end of railing) see Notes 5 and 11

**NOTES:**

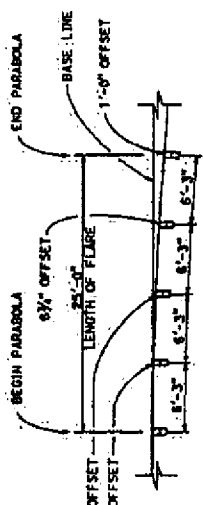
- Line posts, blocks and hardware to be used are shown on Revised Standard Plan RSP A77L1, RSP A77M1, RSP A77N1 and RSP A77Z1.
- MCS post spacing to be 8'-3" center to center, except as otherwise noted.
- Except as noted, line posts are 4" x 4" x 8'-0" wood with 1/2" x 1/2" x 12" x 12" notched wood blocks or recycled plastic blocks may be used for 4" x 4" x 8'-0" wood post with 6" x 12" x 1'-2" wood blocks where applicable and when specified.
- For End Anchor Assembly (Type SFT) details, see Revised Standard Plan RSP A77S1.
- Layout Types 11A, 11B or 11C details, see Revised Standard Plan RSP A77P1. Embankment MCS installation with 31" in-line end treatment is recommended to shield embankment slopes and a crashworthy end treatment is required for only one direction of traffic.
- 31" in-line terminal system and treatments are used where site conditions will not accommodate a flared end treatment.
- The type of 31" terminal system and treatment to be used will be shown on the Project Plans.
- Dependent on site conditions (embankment height and slope), construction of additional MCS (length equal to multiples of 12'-6" with 6'-3" post spacing) may be advisable.
- The 151" or flatter flares used with buried end anchors is based on the edge of the paved shoulder or offset line of embankment. The length of MCS within the 151" or flatter flare is based on site conditions and should be a length equal to multiples of 12'-6".
- For details of the buried post and anchor used with Type 11C Layout, see Revised Standard Plan RSP A77Z1.
- Where placement of dikes is required with MCS installations, see Revised Standard Plan RSP A77M for dike positioning details.



**TYPICAL PARABOLIC LAYOUT**



**PARABOLIC FLARE OFFSETS**



**TYPICAL FLARE OFFSETS FOR 1 FOOT MAX END OFFSET**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION


**MIDWEST GUARDRAIL SYSTEM  
TYPICAL LAYOUTS FOR  
EMBANKMENTS**

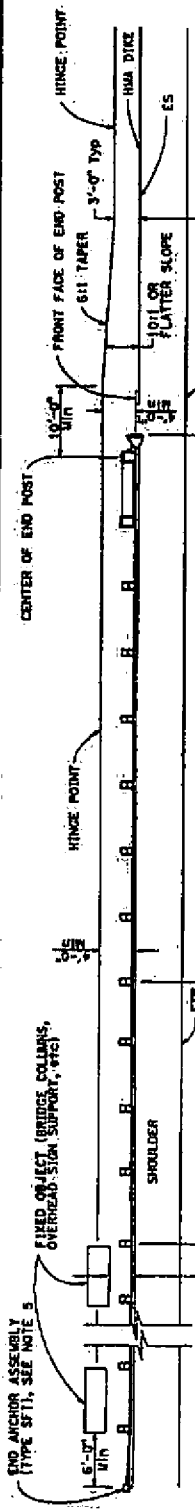
NO SCALE

RSP A77P1 DATED NOVEMBER 15, 2013. SUPERSEDES RSP A77P1 DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

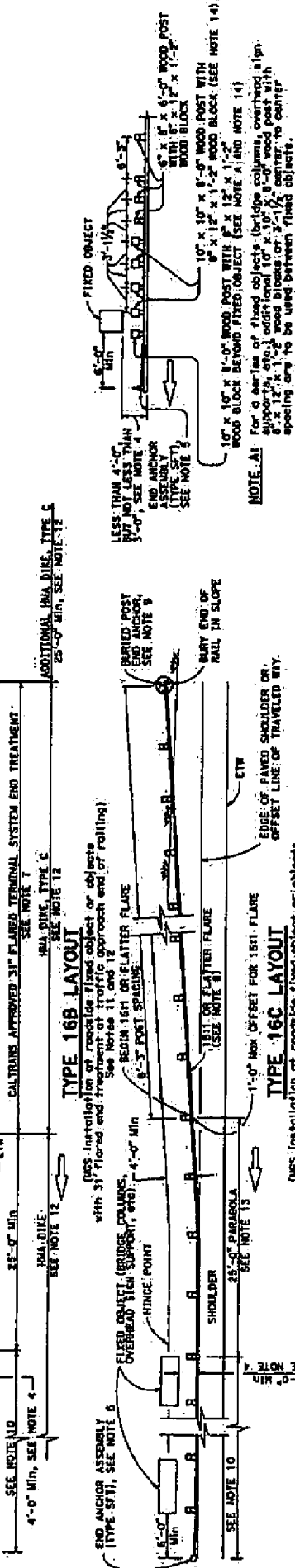
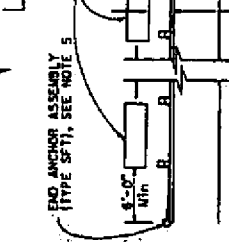
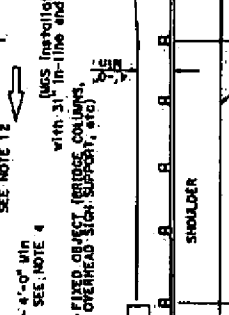
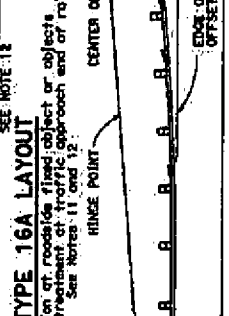
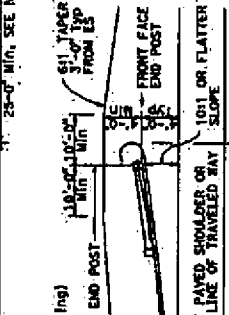
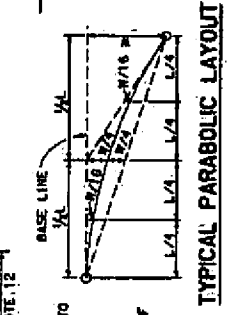
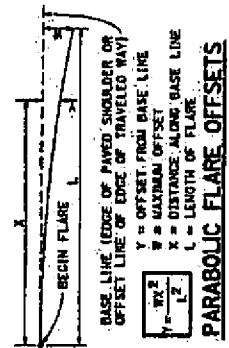
**REVISED STANDARD PLAN RSP A77P1**

CAO RISK

DATE	QUANTITY	NO. OF POSTS	NO. OF RAILS	NO. OF END POSTS	NO. OF END ANCHORS
05	MON	1.68	75.1	14.2	14.2
 JULY 19, 2013 CALIFORNIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS 1500 MARKET STREET, SACRAMENTO, CA 95834 CONTRACT NO. 751-14.2-14.2					



TO ACCOMPANY PLANS DATED \_\_\_\_\_



**PARABOLIC FLARE OFFSETS**

**TYPICAL PARABOLIC LAYOUT**

**TYPICAL PARABOLIC LAYOUT**

**TYPICAL PARABOLIC LAYOUT**

**TYPICAL PARABOLIC LAYOUT**

**TYPICAL PARABOLIC LAYOUT**

**TYPICAL PARABOLIC LAYOUT**

**TYPICAL PARABOLIC LAYOUT**

**TYPICAL PARABOLIC LAYOUT**

**STRENGTHENED MIDWEST GUARDRAIL SYSTEM SECTIONS**

**FOR FIXED OBJECT**

See strengthened MS sections with Types 16A, 16B or 16C layouts where minimum clearance between the face of the rolling end (fixed object) is less than 4'-0\", but not less than 3'-0\".

**STATE OF CALIFORNIA**  
**DEPARTMENT OF TRANSPORTATION**

**MIDWEST GUARDRAIL SYSTEM**  
**TYPICAL LAYOUTS FOR**  
**ROADSIDE FIXED OBJECTS**

NO SCALE

SEP A77R3 DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77R3**

**NOTES:**

- Line post, blocks and hardware to be used are shown on Revised Standard Plans RSP A77R1, RSP A77R2, RSP A77R3, RSP A77R4 and RSP A77R5.
- MS post spacing to be 6'-3\" center to center, except as otherwise noted.
- Except as noted, line posts are 6\" x 6\" x 8'-0\" wood with 1/2\" x 1/2\" x 12\" wood blocks, 1/2\" x 1/2\" or 1/2\" x 1/2\" steel posts, 6'-0\" in length. 1/2\" x 1/2\" x 12\" steel posts are used on the fixed object side where applicable and when specified.
- 4'-0\" minimum clearance is required between the face of the rolling end and face of a fixed object located directly behind MS sections with post spacing of 6'-3\". Contact MS as shown in the detail, strengthened layout, where the clearance between the face of the rolling end and face of a fixed object is less than 4'-0\" but not less than 3'-0\". Where the clearance is less than 3'-0\", a concrete wall or barrier should be constructed to shield the fixed object(s).
- End Anchor Assembly (Type SFT) details, see Revised Standard Plan RSP A77R1.
- In-line terminal system end treatments are used where: a) the conditions do not accommodate a 31\" flared end treatment; b) a type of 31\" terminal system to be used will be shown on the Project Plans.

**TYPE 16A LAYOUT**  
 (MS installation of roadside fixed object or objects with 31\" in-line and treatment at traffic approach end of rolling). See Notes 11 and 12.

**TYPE 16B LAYOUT**  
 (MS installation of roadside fixed object or objects with 31\" flared end treatment at traffic approach end of rolling). See Notes 11 and 12.

**TYPE 16C LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16D LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16E LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16F LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16G LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16H LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16I LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16J LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16K LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16L LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16M LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16N LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16O LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16P LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16Q LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16R LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16S LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16T LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16U LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16V LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16W LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16X LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

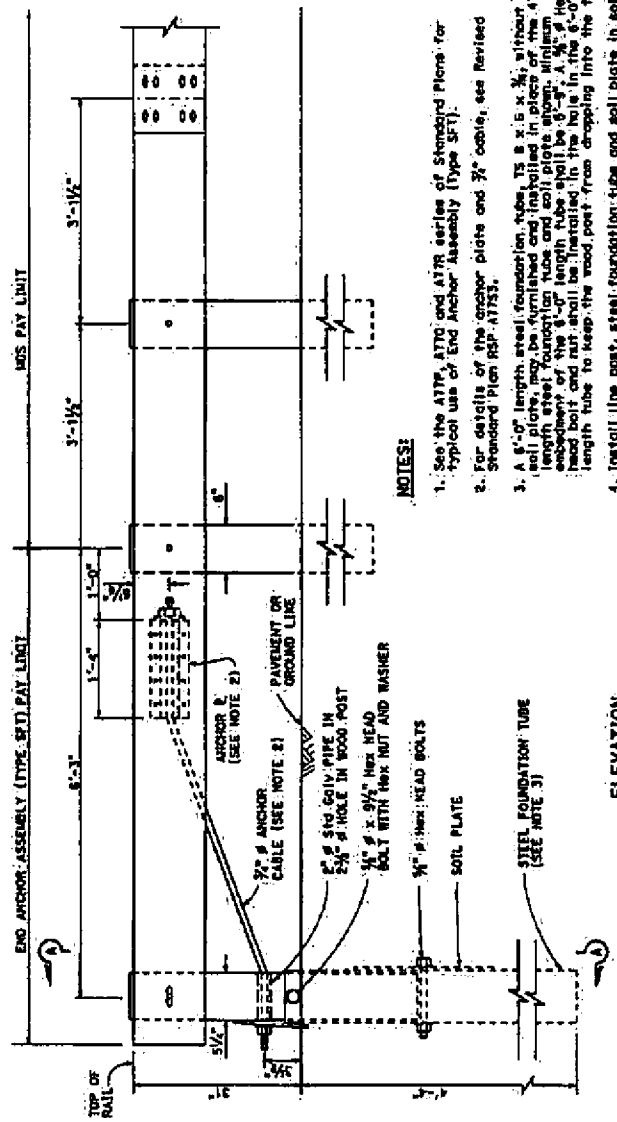
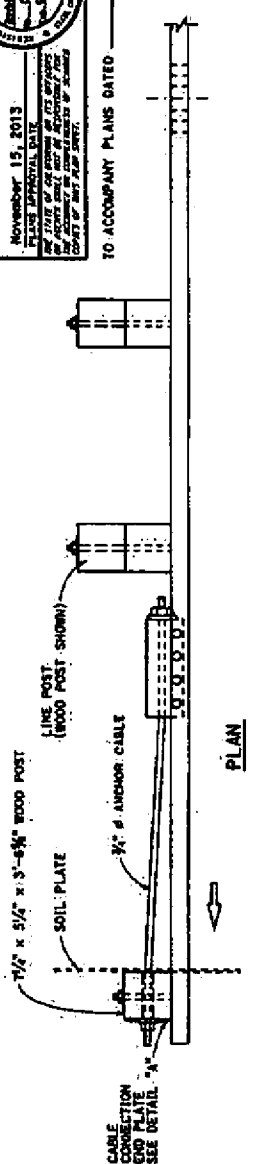
**TYPE 16Y LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**TYPE 16Z LAYOUT**  
 (MS installation of roadside fixed object or objects with a buried end anchor). See Notes 11 and 12.

**CAO** **RISK**

DATE	NO.	REVISION	BY	DATE
05	Mon	1. 68	75.1, L4.2	143
November 15, 2013 REGISTERED CIVIL ENGINEER R. D. H. H. H. REGISTERED CIVIL ENGINEER STATE OF CALIFORNIA PROFESSIONAL ENGINEERING BOARD LICENSE NO. 60111				

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**NOTES:**

1. See the AT77, AT70 and AT7R series of Standard Plans for typical use of End Anchor Assembly (Type SFT).
2. For details of the anchor plate and 3/8" cable, see Revised Standard Plan RSP-A7753.
3. A 5'-0" length steel foundation tube, TS 8 x 1/2 x 3/8, without a soil plate, may be furnished and installed in place of the 4'-6" length steel foundation tube and soil plate shown. Minimum length of the 5'-0" length tube shall be 5'-0". A 3/4" dia hex head bolt and nut shall be installed in the hole in the 5'-0" length tube to keep the wood post from dropping into the tube.
4. Install line post, steel foundation tube and soil plate in soil.

**END ANCHOR ASSEMBLY (TYPE SFT)**  
See Note 1

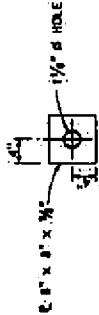
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
END ANCHOR ASSEMBLY  
(TYPE SFT)**

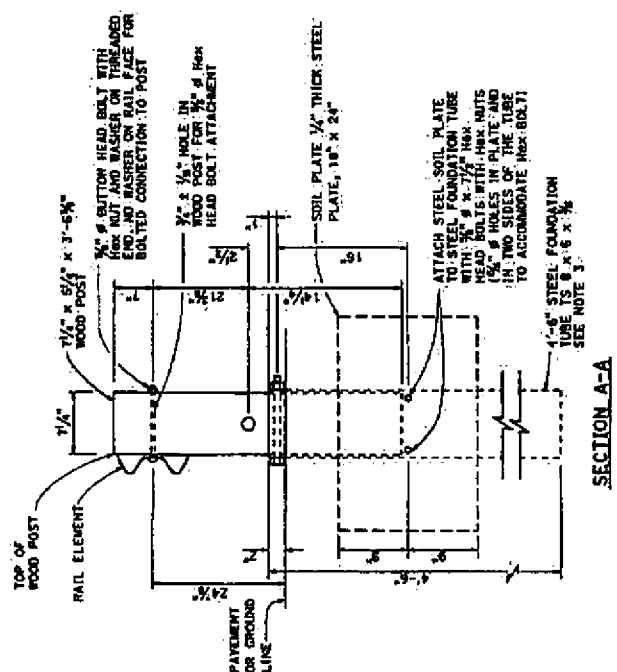
NO SCALE

RSP A7791 DATED NOVEMBER 15, 2013 SUPERSEDES RSP-A7791 DATED JULY 19, 2013 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 8010.

**REVISED STANDARD PLAN RSP A7791**



**DETAIL "A-A"**  
**CABLE CONNECTION TO END PLATE**



CAO RISK

DATE	COUNTY	ROUTE	POST MILE	POST MILE	POST MILE
05	Mon.	1. 68	75.1, L4.2	144	190

*Richard D. Hill*  
 REGISTERED CIVIL ENGINEER  
 July 19, 2013  
 PLANS APPROVAL DATE  
 FOR THE STATE OF CALIFORNIA  
 PROFESSIONAL SEAL AND EXPIRES 7/19/16  
 REGISTERED PROFESSIONAL ENGINEER  
 NO. 45215  
 CIVIL  
 STATE OF CALIFORNIA

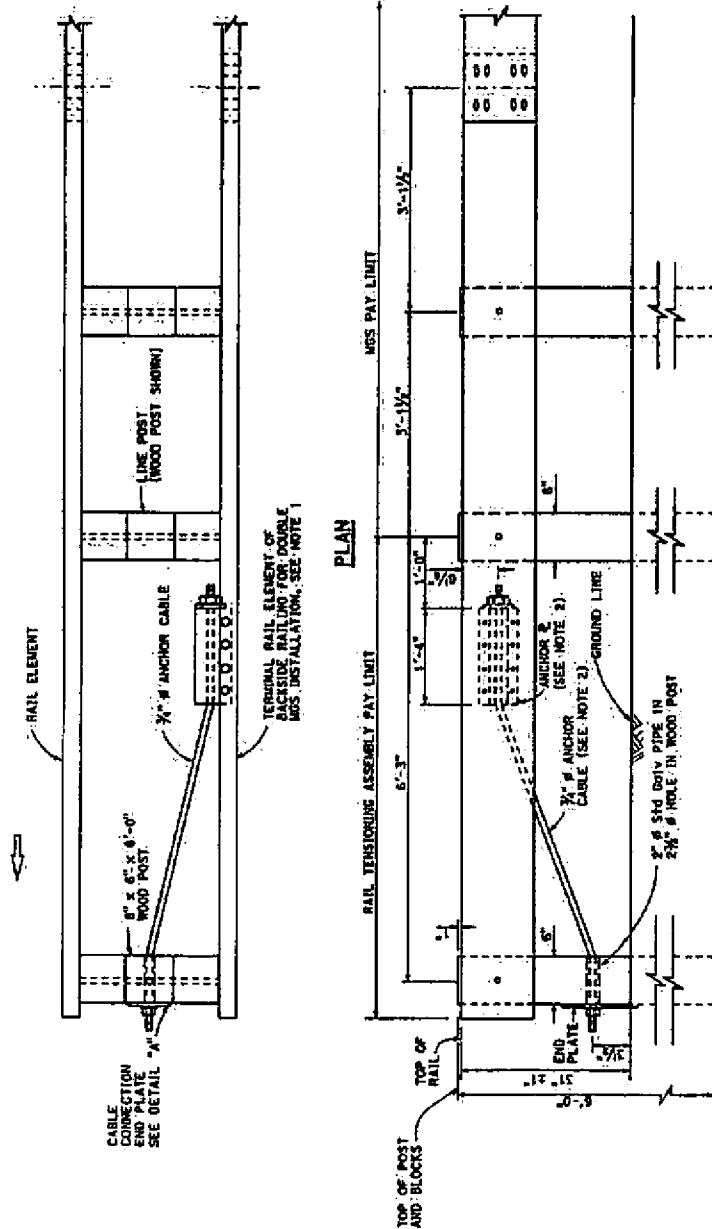
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

1. See Revised Standard Plans RSP A7703 and RSP A7701 for typical use of rail-tensioning assembly.
2. For details of the anchor plate and 3/4" cable, see Revised Standard Plan RSP A7751.



**DETAIL "A"  
CABLE CONNECTION  
END PLATE**



**ELEVATION  
RAIL TENSIONING  
ASSEMBLY**  
See Note 1

NO. SCALE

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
RAIL TENSIONING ASSEMBLY**

RSP A7752 DATED JULY 19, 2013, SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A7752**

CAO

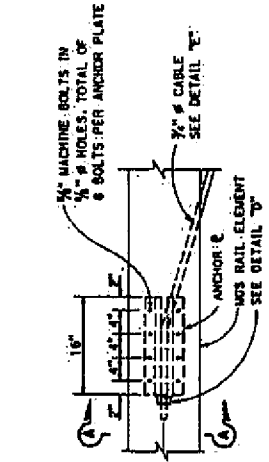
RISK

Exhibit A.2

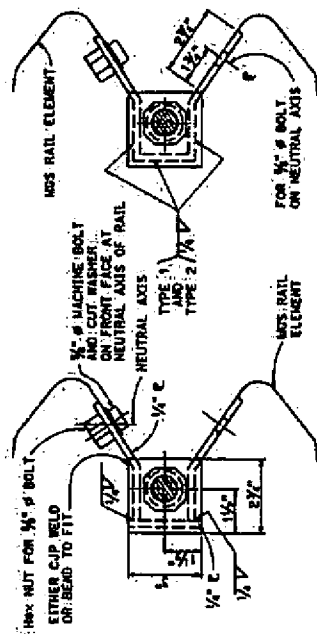
DATE	COUNTY	ROUTE	POST MILE	SECTION
06	MON	1. 68	75.1, L4.2	145
November 15, 2013 REGISTERED CIVIL ENGINEER RANDALL D. HUBB 1500 S. GARDEN AVENUE ANAHEIM, CA 92805 (714) 771-1111 FAX (714) 771-1112 www.rdh-engineers.com				

TO ACCOMPANY PLANS, DATED \_\_\_\_\_

**NOTE:**  
See Revised Standard Plans RSP A7791, RSP A7792 and RSP A7771 for typical use of anchor cable and anchor plate.



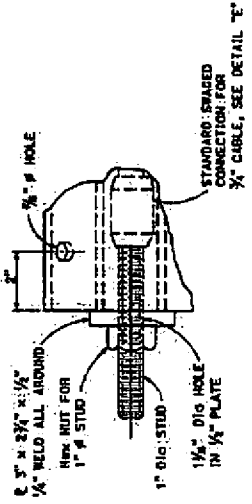
**ANCHOR PLATE DETAIL**  
(See above, T&E similar)



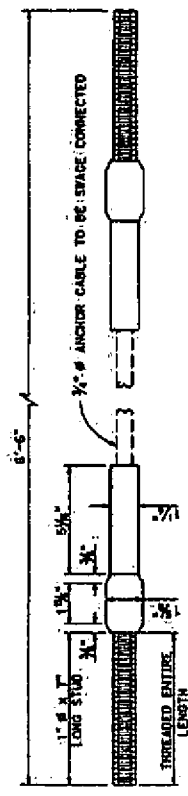
**SECTION A-A**  
(ALTERNATIVE TYPE 1)

**NOTES**  
Dimensioning applies to both types.

**SECTION A-A**  
(ALTERNATIVE TYPE 2)



**DETAIL "D"**



**ANCHOR CABLE WITH SWAGED FITTING AND STUD**  
**DETAIL "E"**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**METAL RAILING AND ANCHOR CABLE DETAILS**

NO. SCALE

RSP A7793, DATED NOVEMBER 15, 2013, SUPERSEDES RSP A7793 DATED JULY 18, 2013. THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

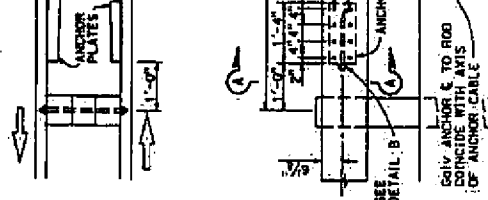
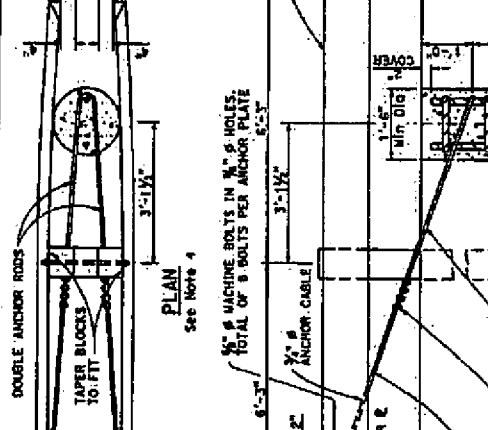
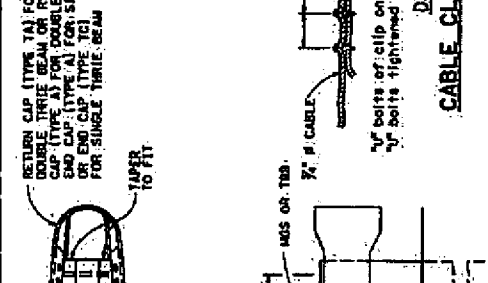
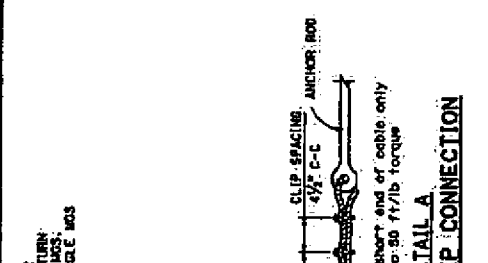
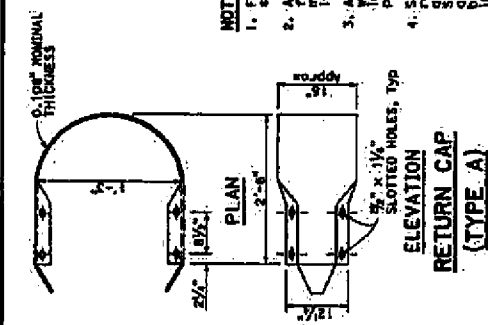
**REVISED STANDARD PLAN RSP A7793**

CAO

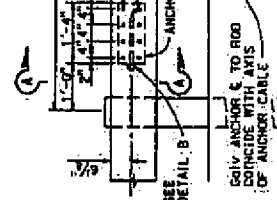
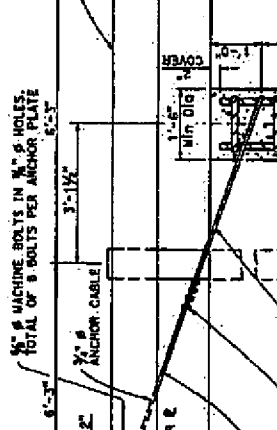
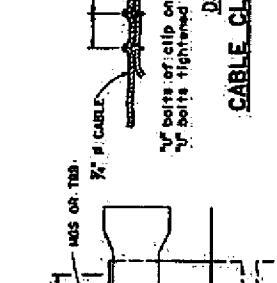
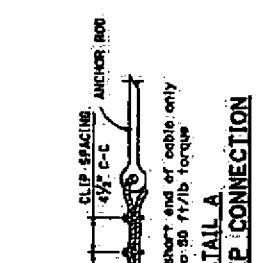
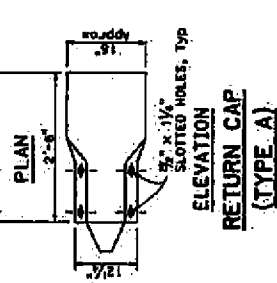
RISK

DIST	COUNT	ROUTE	TOTAL LENGTH		TOTAL
			FEET	INCHES	
05	MON	1. 68	75.1	LA. 2	146
					190

November 18, 2013  
 REGISTERED CIVIL ENGINEER  
 PROJECT NO. 13-0000  
 SHEET NO. 1-0013  
 DATE OF PREPARATION OF THIS PLAN: 11/18/13  
 DATE OF LAST REVISION: 11/18/13  
 BY: [Signature]



- TO ACCOMPANY PLANS DATED \_\_\_\_\_
- NOTES:**
- For typical use of this type of end anchor, see Revised Standard Plan RSP A78E2.
  - Anchor cable to be parallel to railing for straight runs of rail. Anchor cable may have angle point or anchor plate if railing is curved.
  - Anchor rod hooks to be in contact with anchor reinforcement when concrete is placed. Wire ties may be used to position anchor rods.
  - Single sided railing installations require only one anchor plate. Single sided railing with double cable or rail element or blockouts on backside of line posts as shown in the plan view.



STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**METAL RAILING END ANCHOR ASSEMBLY (TYPE CA)**  
 NO SCALE  
 REV. A77T1 DATED NOVEMBER 15, 2011 SUPERSEDES RSP A77T1  
 DATED JULY 19, 2013 THIS SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**ANCHOR PLATE DETAILS**

SECTION A-A  
 (Alternative Type 1)

SECTION A-A  
 (Alternative Type 2)

**RETURN CAP (TYPE A)**

PLAN

ELEVATION

3'-0" MINIMUM  
 2 1/2"  
 1/2" x 1/4" SLOTTED HOLES, TOP

**CABLE CLIP CONNECTION**

DETAIL A

1/4" BOLT OF CLIP ON SHORT END OF CABLE ONLY  
 1/2" BOLTS TIGHTENED TO 80 FT/LB TORQUE

**ELEVATION END ANCHOR ASSEMBLY (TYPE CA)**

(Wood Post, MSS shown, details similar for Tumble Beam Barrier.)

1 1/2" x 3/4" x 4'-6" GALV ROD WITH CAP WELD ON END - SEE NOTE 4

1 1/2" x 3/4" x 4'-6" GALV ROD WITH CAP WELD ON END - SEE NOTE 4

1 1/2" x 3/4" x 4'-6" GALV ROD WITH CAP WELD ON END - SEE NOTE 4

1 1/2" x 3/4" x 4'-6" GALV ROD WITH CAP WELD ON END - SEE NOTE 4

**ANCHOR RODS**

DOUBLE ANCHOR RODS

ANCHOR ROD

ANCHOR ROD

ANCHOR ROD

ANCHOR ASSEMBLY (TYPE CA)

NO SCALE

REV. A77T1 DATED NOVEMBER 15, 2011 SUPERSEDES RSP A77T1  
 DATED JULY 19, 2013 THIS SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**OPTIONAL ENDS ON SINGLE ANCHOR ROD**

(Not to be used for double anchors)

1 1/2" x 3/4" x 4'-6" GALV ROD

1 1/2" x 3/4" x 4'-6" GALV ROD

1 1/2" x 3/4" x 4'-6" GALV ROD

**ANCHOR CABLE WITH SWAGED FITTING AND STUD**

DETAIL C

1 1/2" x 3/4" x 4'-6" GALV ROD WITH CAP WELD ON END - SEE NOTE 4

1 1/2" x 3/4" x 4'-6" GALV ROD WITH CAP WELD ON END - SEE NOTE 4

**ANCHOR PLATE DETAILS**

SECTION A-A  
 (Alternative Type 1)

SECTION A-A  
 (Alternative Type 2)

**ELEVATION END ANCHOR ASSEMBLY (TYPE CA)**

(Wood Post, MSS shown, details similar for Tumble Beam Barrier.)

1 1/2" x 3/4" x 4'-6" GALV ROD WITH CAP WELD ON END - SEE NOTE 4

1 1/2" x 3/4" x 4'-6" GALV ROD WITH CAP WELD ON END - SEE NOTE 4

1 1/2" x 3/4" x 4'-6" GALV ROD WITH CAP WELD ON END - SEE NOTE 4

1 1/2" x 3/4" x 4'-6" GALV ROD WITH CAP WELD ON END - SEE NOTE 4

**ANCHOR RODS**

DOUBLE ANCHOR RODS

ANCHOR ROD

ANCHOR ROD

ANCHOR ROD

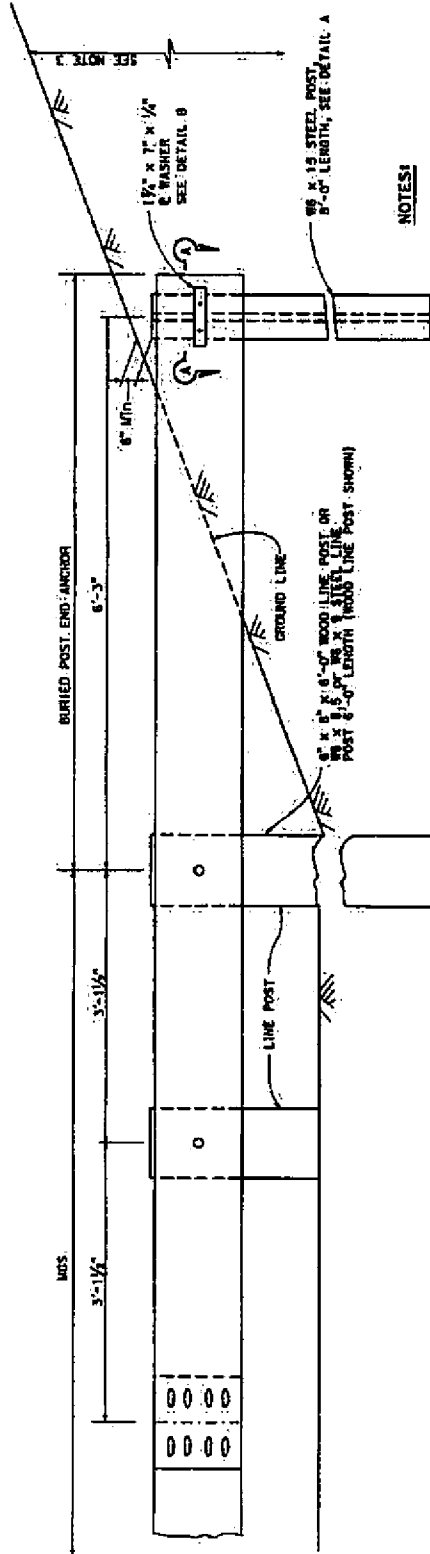


Exhibit A.2

STATE	COUNTY	SHEET	TOTAL SHEETS	DATE	BY	CHKD
05	Mon	1. 68	75.1, L4.2	147	190	

**Richard D. Smith**  
 REGISTERED CIVIL ENGINEER  
 November 18, 2013  
 PLANS APPROVAL DATE  
 REGISTERED PROFESSIONAL ENGINEER  
 NO. 41816  
 STATE OF CALIFORNIA  
 REGISTERED CIVIL ENGINEER  
 EXPIRES 11/18/15  
 REGISTERED CIVIL ENGINEER  
 NO. 41816  
 STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED \_\_\_\_\_

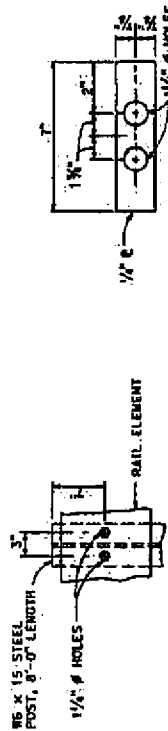


**NOTES**

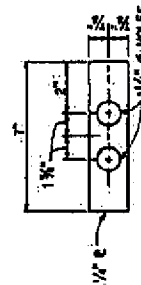
1. For typical use of this type of end anchor with MCS see the ATP, ATR and ATR Series of the Standard Plans.
2. Note elevation in the slope to construct the buried post end anchor. The anchor shall be constructed in place in layers compacted to 100% thickness. Each layer shall be moistened and thoroughly compacted.
3. The buried post end anchor shall only be constructed at those locations where the slope perpendicular to the roadway is non-traversable.

**BURIED POST END ANCHOR**

See Note 3



**DETAIL A**



**DETAIL B**



**SECTION A-A**

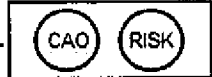
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
BURIED POST END ANCHOR**

NO. SCALE

RSP A77T2, DATED NOVEMBER 15, 2013, SUPERSEDES RSP A77T2  
DATED JULY 15, 2013, THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77T2**





DATE	DESIGN	NO.	POST	BEAM	SPACER	RAILING	PLATE	BOX	SPACER
05	Mon	1	68	75.1	1.4.2	148	190		

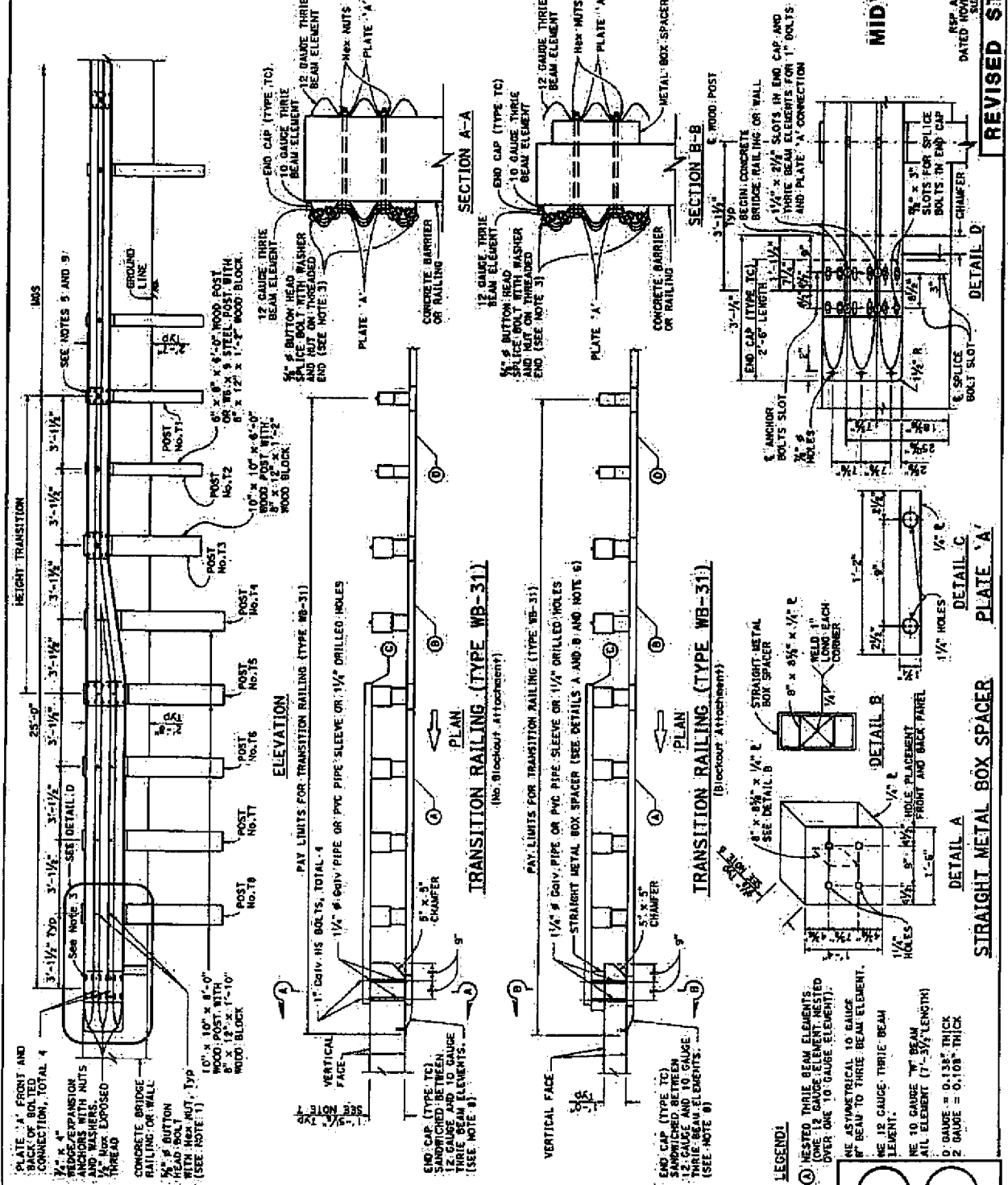
APPROVED FOR THE PROJECT BY  
 REGISTERED CIVIL ENGINEER  
 JOURNAL NO. 10000  
 EXPIRES 12/31/15  
 STATE OF CALIFORNIA  
 DIVISION OF PROFESSIONAL ENGINEERING

TO ACCOMPANY PLANS DATED  
 JANUARY 23, 2015

- NOTES:**
- Use 3/4" #4 bottom head bolts and 1/2" nuts for connections to concrete. No washers on rail face for bolted connections to post.
  - The nested rail elements, end cap, and 10 gauge thrie beam element may be bolted to the wood post and concrete barrier or railing.
  - Exterior splice bolt holes for rail element splices at Post No. 15 and the connection between the 12 gauge thrie beam element and the 10 gauge thrie beam element shall be increased up to 1/4" #4. Only the top 4 end splice bolts with washers and nuts are required for rail splices at post and end connection to the concrete barrier or railing.
  - The top elevation of Posts No. 15 through No. 17 shall not project more than 1" above the top elevation of the rail element.
  - Typically, the railing connected to transition railing (Type WB-31) will be either standard rolling ratio of 100:1 or 200:1 or 300:1 and treatment attached to Post No. 11.
  - The depth of the metal box spacer varies from 5/8" to 1 1/4" 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 2 1/4". There are splices between the metal box spacers. The metal plates similar to plate 'A' are to be used as spacers.
  - Where the width of the concrete railing or wall is less than 1 1/4", wood blocks are to be used to fill the space between the backside of Posts No. 15 through No. 18 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 gauge and 10 gauge thrie beam elements where transition railing is installed on the departure end of bridge railing.
  - Conform standard rolling section height to 31" or Post No. 11 using height transition ratio of 150:1.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**MIDWEST GUARDRAIL SYSTEM  
 TRANSITION RAILING  
 (TYPE WB-31)**  
 NO. SCALE  
 REV A77U4 DATED JANUARY 23, 2015. SUPERSEDES RSP A77U4 DATED NOVEMBER 11, 2013 AND RSP A77U4 DATED JULY 20, 2011. SUPPLEMENTS THE STANDARD PLANS RSP A67U4 DATED 2010.

REVISED STANDARD PLAN RSP A77U4



CAO RISK

Exhibit A.2

MARK	COUNTY	ROUTE	POST MILES	FILE NO.	DATE
05	Mon.	1, 68	75.1, L&2	149	190

**Paul D. Niess**  
REGISTERED CIVIL ENGINEER

JULY 19, 2013  
PLANS APPROVAL DATE

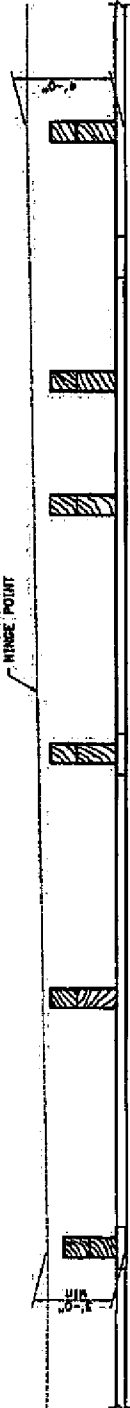
EXPIRES ON JULY 19, 2016  
EXPIRES ON JULY 19, 2016  
EXPIRES ON JULY 19, 2016

STATE OF CALIFORNIA  
DIVISION OF HIGHWAYS  
REGISTERED CIVIL ENGINEER

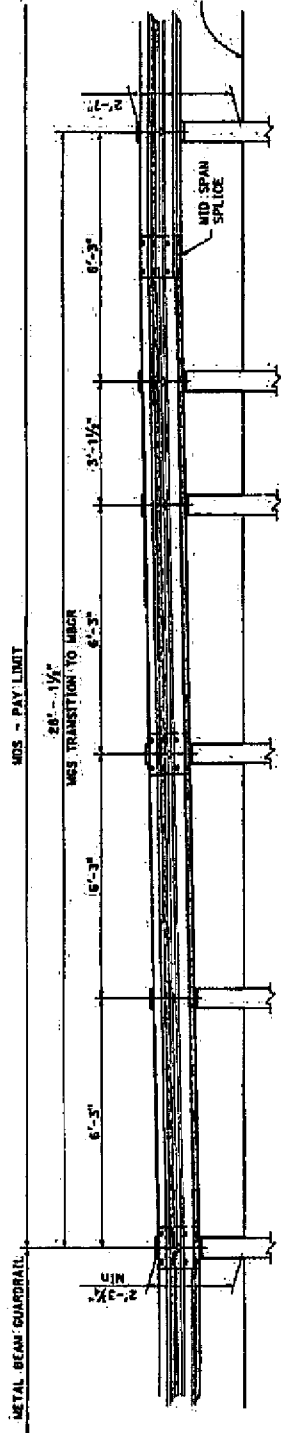
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

1. Refer to Revised Standard Plans RSP A77L1 and RSP A77L2 for component details for MCS not shown on this plan.
2. All posts for any standard barrier run shall be of the same type: wood or steel.
3. Install posts in soil.



PLAN



ELEVATION

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**MIDWEST GUARDRAIL SYSTEM  
TRANSITION TO METAL BEAM GUARDRAIL**

NO. SCALE

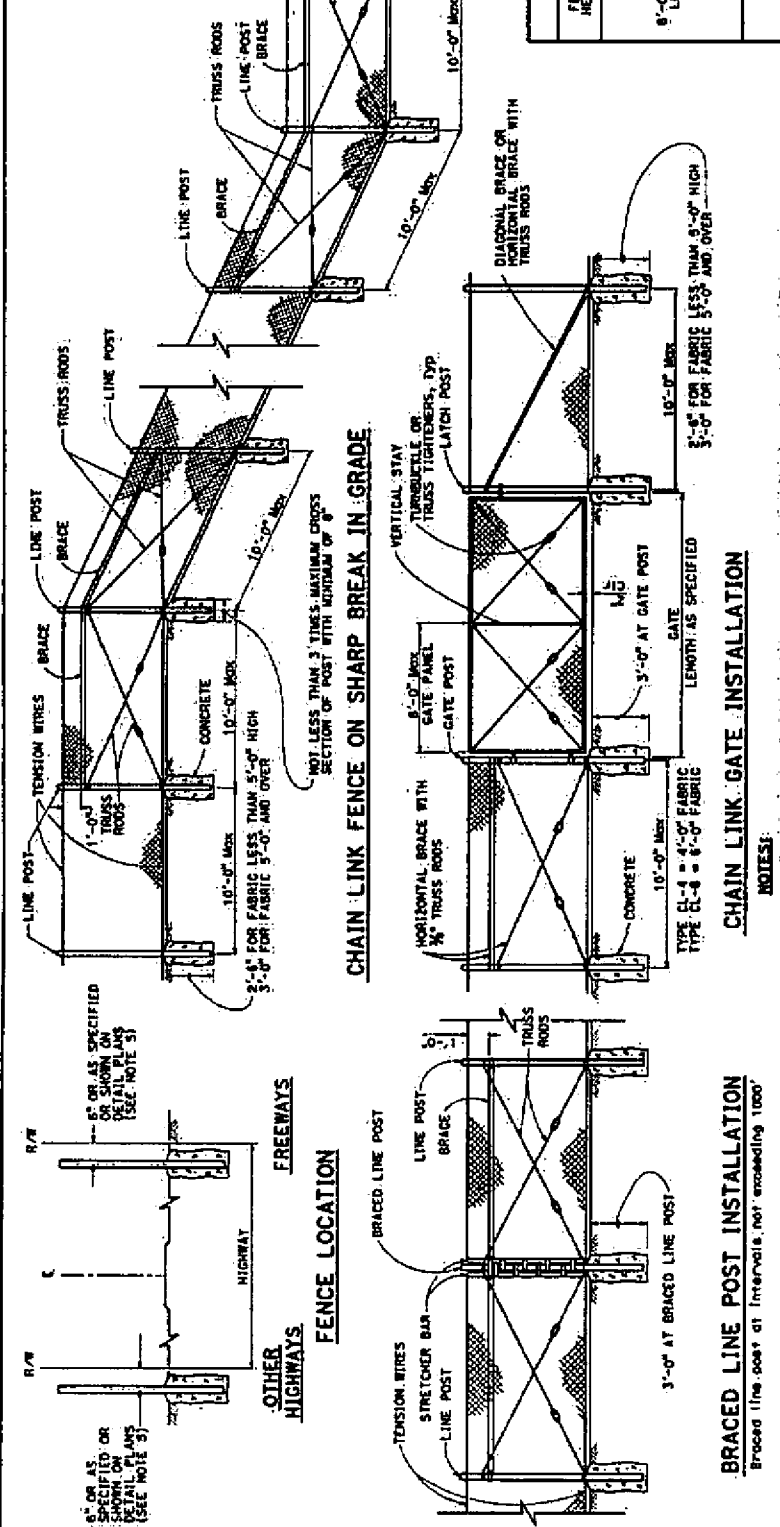
RSP A77U5 DATED JULY 19, 2013; SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A77U5**

CAO	RISK
-----	------

DIST. COUNTY: MOBILE  
 DATE: 1.68  
 SCALE: 75.1, L4.2, 150, 190  
 SHEET NO.: 150/190

REGISTERED CIVIL ENGINEER  
 JULY 18, 2014  
 EXPIRES: 7/18/15  
 STATE OF CALIFORNIA  
 LICENSE NO.: 48283  
 REGISTERED PROFESSIONAL ENGINEER  
 CIVIL ENGINEER



**GATE POST**

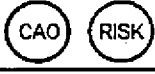
FENCE HEIGHT	GATE WIDTHS	ROUND OD PIPE (lb/ft)	WEIGHT (lb/ft)
8'-0" AND LESS	UP THRU 6'-0"	2.875"	5.80
	OVER 6'-0" TO THRU 12'-0"	4.500"	10.80
	OVER 12'-0" TO THRU 18'-0"	5.963"	14.63
	OVER 18'-0" TO 24'-0" Max.	8.625"	18.99
OVER 6'-0" TO 9'-0" Max.	UP THRU 6'-0"	3.500"	7.58
	OVER 6'-0" TO THRU 12'-0"	5.563"	14.63
	OVER 12'-0" TO THRU 18'-0"	8.625"	18.99
	OVER 18'-0" TO 24'-0" Max.	8.625"	28.58

Above post dimensions and weights are minimums. Larger sizes may be used upon approval.

**TYPICAL MEMBER DIMENSIONS (see notes)**

FENCE HEIGHT	LINE POSTS		END LATCH AND CORNER POSTS		BRACES	
	ROUND OD PIPE (lb/ft)	WEIGHT (lb/ft)	ROUND OD PIPE (lb/ft)	WEIGHT (lb/ft)	ROUND OD PIPE (lb/ft)	WEIGHT (lb/ft)
6'-0" AND LESS	1.900"	2.72	1.875" x 1.825"	1.85	1.66" x 1.25"	1.33
OVER 6'-0" TO 9'-0" Max.	2.375"	3.65	2.375"	3.65	1.625" x 1.25"	1.33
	2.375"	3.65	2.875" x 1.70"	2.78	1.66" x 1.25"	1.33
	2.375"	3.65	2.875" x 1.70"	2.78	1.66" x 1.25"	1.33

- NOTES:**
- The table below shows minimum sized posts and braces complying with the specifications. Larger or heavier post and brace sizes may be used upon approval.
  - Splicing when in the tables must also comply with the strength requirements and other provisions of the Specifications.
  - Other sections which comply with the strength requirements and other provisions of the Specifications may be used upon approval.
  - Options indicated shall be uniform on any one project.
  - Offset to be 2'-0" at adjacent locations, measured at right angles to R/W lines. Taper to achieve offset to be 8" (day 20'-0" long).
  - See Revised Standard Plan RSP A85 for Braces, Stretcher Bar, and Truss Tightener Details.



STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**CHAIN LINK FENCE**  
 NO SCALE

RSP A85 DATED JULY 18, 2014 SUPERSEDES STANDARD PLAN A85  
 DATED MAY 20, 2011 - PAGE 112 OF THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP A85**

Exhibit A.2

PLAN SHEET	DATE	BY	CHKD	DATE
05	Mon 1. 68	75.1, L4.2	151	190

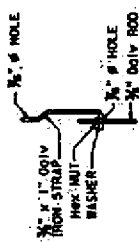
REGISTERED CIVIL ENGINEER

October 19, 2012  
 PLANS APPROVAL DATE  
 SIGNATURE  
 CHIEF ENGINEER  
 STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 1515 K STREET, SACRAMENTO, CA 95833

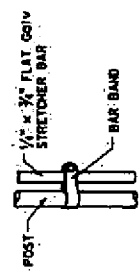
**NOTES:**

1. All material for abutment connection to be galvanized.
2. The chain link fabric shall be replaced by barbed wire strands of 1/2 inch diameter between the abutment posts.
3. When the width of the culvert makes it necessary to anchor a post to the top of the culvert, a cast iron shoe or other device approved by the Engineer shall be used.
4. Fencing over stream and around headwall may also use barbed wire or wire mesh fencing with either wood post or steel post installation.
5. See Standard Plan A85 for chain link fence dimensions. See Standard Plan A86 for Barbed Wire and Wire Mesh Fence dimensions and for wood post and steel post installation.

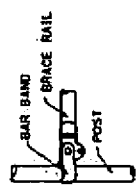
TO ACCOMPANY PLANS DATED \_\_\_\_\_



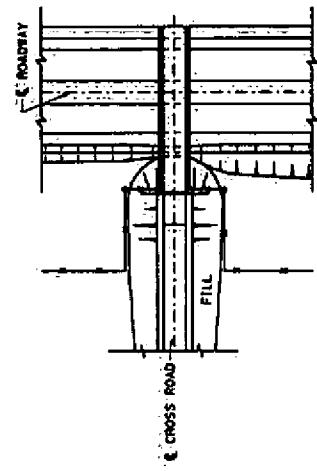
**TRUSS TIGHTENER**



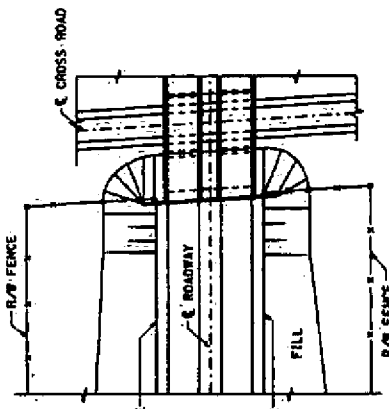
**STRETCHER BAR**



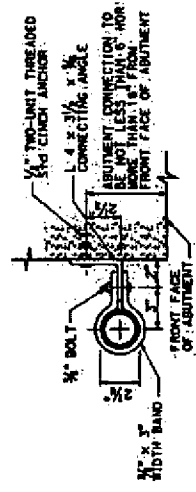
**BRACE RAIL**



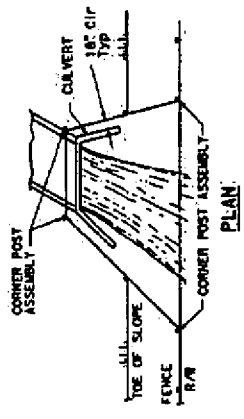
**PLAN OF ROADWAY - OVERCROSSING**



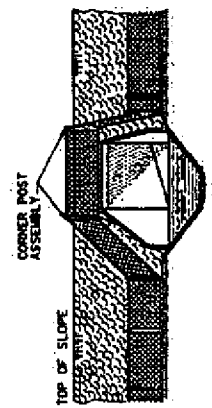
**PLAN OF ROADWAY - UNDERCROSSING**



**ABUTMENT CONNECTION**



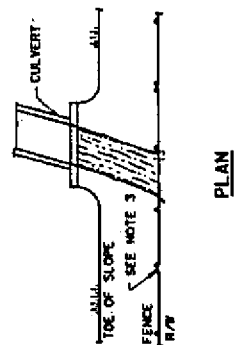
**PLAN**



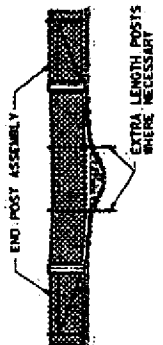
**ELEVATION**

**INSTALLATION AROUND HEADWALL**

See Note 4



**PLAN**



**ELEVATION**

**INSTALLATION OVER STREAM**

**TYPICAL INSTALLATION AT BRIDGES**

**CHAIN LINK FENCE DETAILS**

NO. SCALE

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
 RSP A85B DATED OCTOBER 19, 2012 SUPERSEDES STANDARD PLAN A85B DATED MAY 20, 2011 - PAGE 114 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A85B**



STATE COUNTY ROUTE DIST. DATE SHEET NO. CHECKED

05 Mon 1. 68 75.1, L.4.2 152 190

REGISTERED CIVIL ENGINEER

JULY 19, 2013

PLANS APPROVAL STAMP

FOR STATE OF CALIFORNIA OR ITS OFFICER

FOR THE PROJECT OF CALIFORNIA HIGHWAYS

FOR THE PROJECT OF CALIFORNIA HIGHWAYS

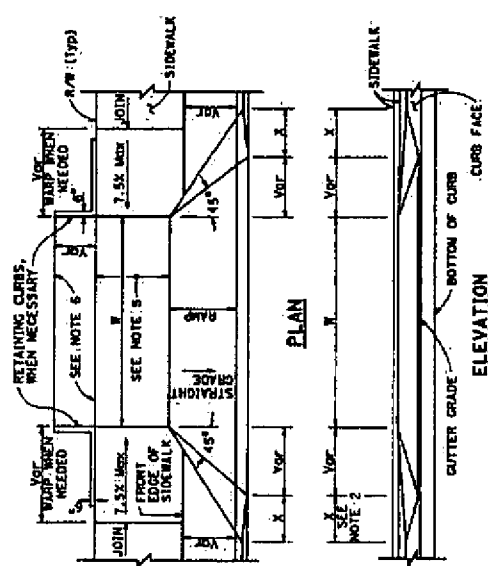
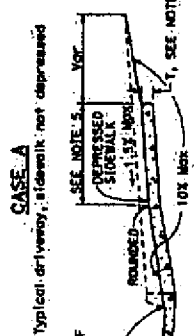
TO ACCOMPANY PLANS DATED \_\_\_\_\_

TABLE A

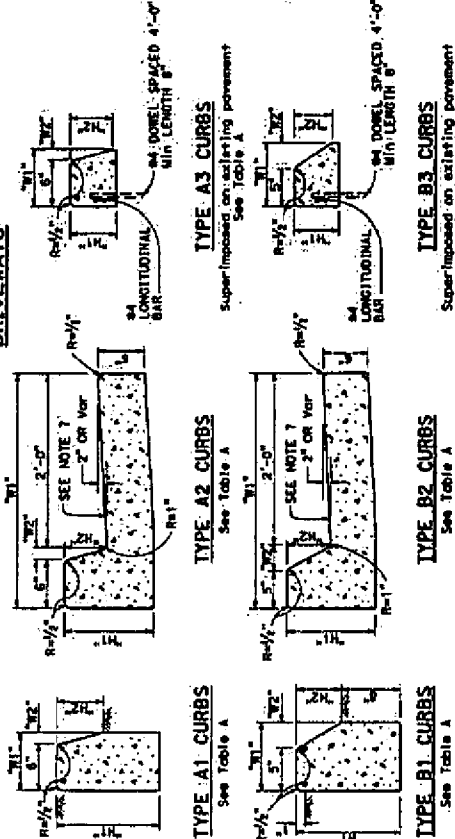
CURB TYPE	DIMENSIONS			
	"H"	"RIP"	"W1"	"W2"
A1-B	1'-2"	6"	7 1/2"	1 1/2"
A1-C	1'-4"	6"	7 1/2"	1 1/2"
A2-B	1'-0"	6"	2'-7 1/2"	1 1/2"
A2-C	1'-2"	6"	2'-8"	2"
A3-B	6"	5"	7 1/4"	1 1/2"
A3-C	6"	1"	7 1/4"	1 1/2"
B1-A	1'-0"	4"	7 1/4"	2 1/4"
B1-B	1'-2"	6"	7 1/4"	2 1/4"
B1-C	1'-0"	4"	2'-7 1/2"	2 1/4"
B2-B	1'-0"	6"	2'-9"	4"
B3-B	6"	4"	8 1/4"	3 1/4"
D-4	1'-0"	4"	1'-6"	1'-1"
D-6	1'-0"	6"	2'-2"	1'-9"

CURB QUANTITIES

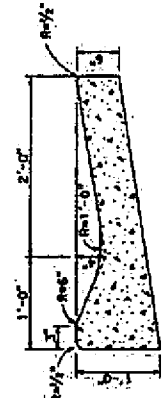
TYPE	CUBIC YARDS PER LINEAR FOOT
A1-B	0.02385
A1-C	0.03084
A2-B	0.05903
A2-C	0.06379
A3-B	0.01036
A3-C	0.01435
B1-A	0.02183
B1-B	0.02930
B2-B	0.05515
B3-B	0.00841
B3-C	0.01074
B4	0.05709
D-4	0.04683
D-6	0.04804
E	0.06681



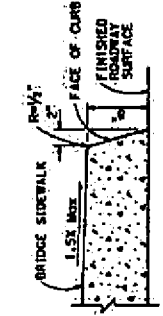
DRIVEWAYS



TYPE E CURB



TYPE H CURB



NOTES

- Case A driveway section typically applies.
- 3'-0" except for curb heights over 10" where 4 1/2" slopes shall be used on curb slope.
- Sidewalk and ramp thickness "T" at driveway shall be 4" for residential and 6" for commercial.
- Difference in slope of the driveway ramp and the slope of a line between the gutter and 6" point on the roadway 5'-0" from gutter line shall not exceed 1%. Reduce driveway ramp slope, not gutter slope, where required.
- Minimum width of clear passageway for sidewalks shall be 4'-2".
- Retaining curbs and acquisition of construction easement may be necessary for narrow sidewalks or curb heights in excess of 6".
- Across the pedestrian route of curb ramp locations, an additional curb shall not exceed 1" of depth for each 2'-0" of width.

CAO RISK

CURBS AND DRIVEWAYS

NO SCALE

RSP A87A DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN A87A, DATED MAY 20, 2011 - PAGE 119 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP A87A

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

DATE	COUNTY	ROUTE	POST MILE	SECTION	POST MILE
05	Mon	1	68	75.1, L4.2	153 190

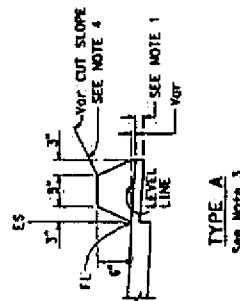
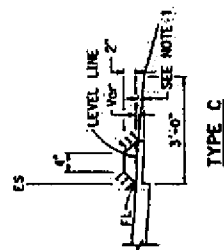
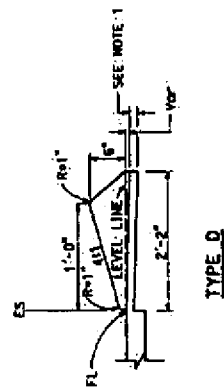
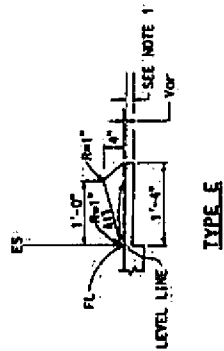
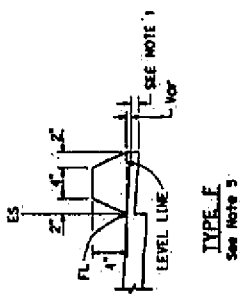
REGISTERED CIVIL ENGINEER

July 19, 2013

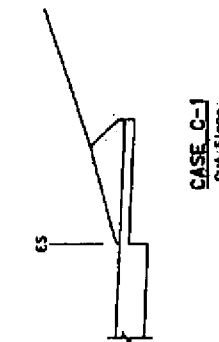
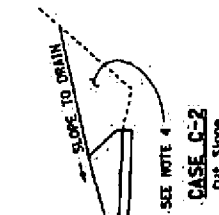
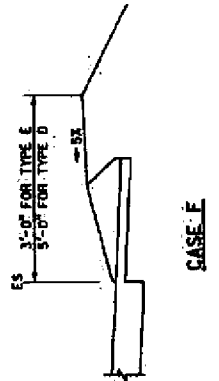
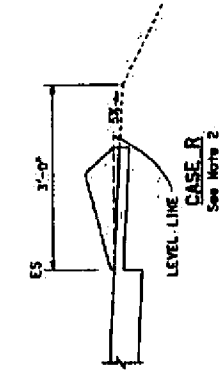
PLANS APPROVAL DATE

THIS PLAN IS APPROVED ON THE BASIS OF THE INFORMATION PROVIDED AND THE ASSUMPTIONS MADE BY THE ENGINEER. THE ENGINEER'S LIABILITY IS LIMITED TO THE SCOPE OF THIS PLAN ONLY.

TO ACCOMPANY PLANS DATED \_\_\_\_\_



**DIKES**



**TYPE D AND E BACKFILL DETAILS**

**DIKE QUANTITIES**

DIKE TYPE	CUBIC YARDS PER LINEAR FOOT
A	0.0135
C	0.0038
D	0.0293
E	0.0130
F	0.0088

Quantities based on 5% cross-slope.

**NOTES:**

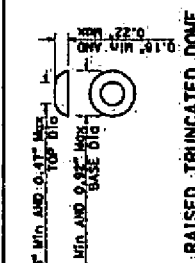
- For HMA shoulders only, existing top layer of HMA placed on the shoulder under the dike with no bituminous or aggregate projects (inlets, drains, etc.) extending out under dike, see project plans for modified dike details.
- Case R applies to retrofits only projects where restrictive conditions do not provide enough width for Case F backfill.
- Type A dike only to be used where restrictive slope conditions do not provide enough width to use Type D or Type E dike.
- Fill and compact with excavated material to top of dike.
- Use Type F dike where dike is required with guard railing installations. See Revised Standard Plan RSP A774A for dike positioning details.



CITY	COUNTY	ROUTE	POST MILE	POST MILES
OS	Mon	1	68	75.1, L.4.2, 154, 180

REGISTERED CIVIL ENGINEER March 21, 2014 March 21, 2014 2-20-13 2-20-13 2-20-13	
--	--



RAISED TRUNCATED DOME

NOTES:

1. As site conditions dictate, Case A through Case 6 curb ramps may be used for corner installations similar to those shown in Detail A and Detail B. In Case A, the curb ramp shall be constructed in a position to be the same. Case 6 curb ramps may be used in situations where a mild slope (topography) or site conditions dictate.
2. If distance from curb to back of sidewalk is too short to accommodate a 9.0% slope, the curb ramp shall be installed in Case A. The sidewalk may be depressed longitudinally as in Case 8, or Case 9, or may be widened as in Case 5.
3. When ramps are located in center of curb return, crosswalk configuration must be similar to that shown for Detail B.
4. As site conditions dictate, the remaining curb slope and the flared side of the Case 6 ramp shall be constructed in reversed position, but the minimum width of the ramp shall be 4'-2".
5. Side slope of ramp flares vary uniformly from a maximum of 9.0% at curb to conform with longitudinal sidewalk slope adjacent to top of the ramp, except in Case 7 and Case 8.
6. The curb ramp shall be surfaced as shown with a 1'-0" side border with 1/2" grades approximately 1/2" on center. See preceding detail.
7. Conditions of adjoining gutters and road surfaces immediately adjacent to and within 2' distance of the curb ramp shall not be steeper than 1:20 (5%). Inlet curb shall not exceed 1" or depth for each 2'-0" of width.
8. Curb ramps shall have a detectable warning surface that extends the full width and 3'-0" depth of the ramp. A 4'-0" wide detectable warning surface may be used on a 1'-2" wide curb ramp. Detectable warning shall conform to the requirements in the Standard Specifications.
9. The edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter profile.
10. Sidewalk and ramp thickness, "t", shall be 3 3/4" minimum.
11. Utility pull boxes, manholes, vaults and all other utility facilities adjacent to ramps shall be adjusted to provide for 12" clearance in conjunction with curb ramp construction.
12. Detectable warning surfaces may have to be cut to allow removal of utility covers while maintaining full detectable warning width and depth.

TO ACCOMPANY PLANS, DATED:



RAISED TRUNCATED DOME PATTERN (IN-LINE)  
DETECTABLE WARNING SURFACE

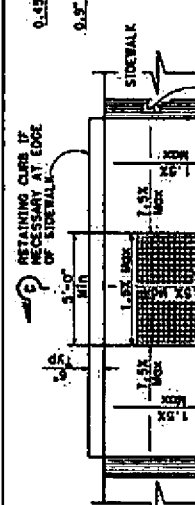
See Note 10

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

CURB RAMP DETAILS

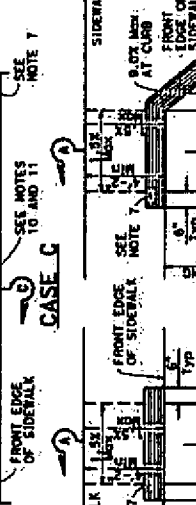
NO SCALE

RSP A88A, DATED MARCH 21, 2014. SUPERSEDES RSP A88A, DATED JULY 20, 2009. SEE STANDARD PLANS, BOOK DATED 2010. PAGE 121 OF THE STANDARD PLANS, BOOK DATED 2010.



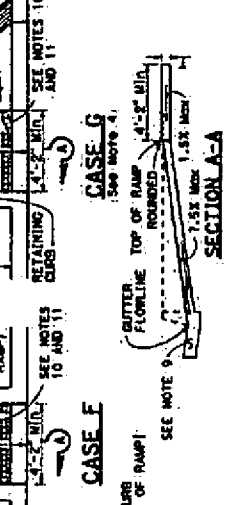
CASE A

CASE B



CASE C

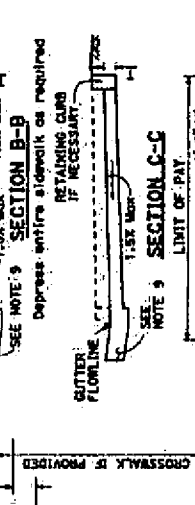
CASE D



CASE E

CASE F

CASE G



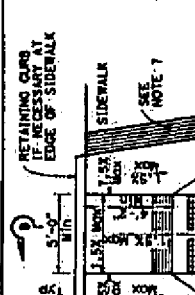
SECTION A-A

SECTION B-B

SECTION C-C

RETROFIT PAY LIMITS

GROOVING-DETAIL

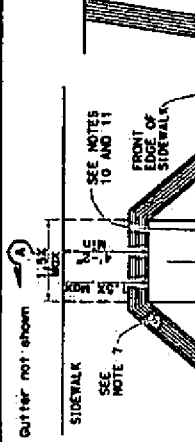


DETAIL A  
TYPICAL TWO-RAMP CORNER INSTALLATION

DETAIL B  
TYPICAL ONE-RAMP CORNER INSTALLATION

SEE NOTE 1

SEE NOTES 1 AND 3



DETAIL A  
TYPICAL TWO-RAMP CORNER INSTALLATION

DETAIL B  
TYPICAL ONE-RAMP CORNER INSTALLATION

SEE NOTE 1

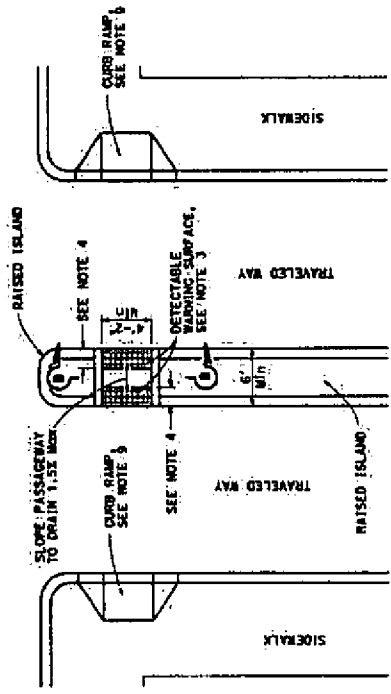
SEE NOTES 1 AND 3

Exhibit A.2

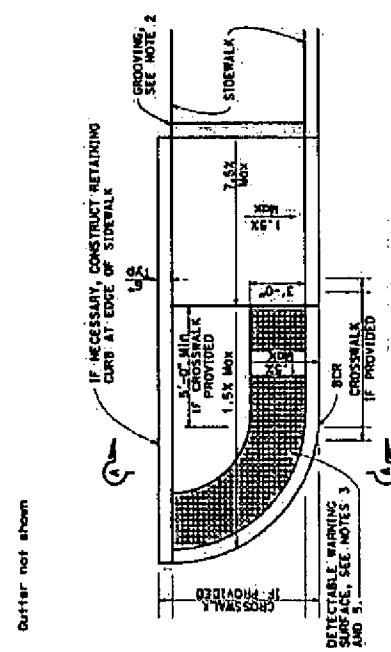
Sheet	05	of 10	Project No.	1551190
Contract	Mon	1.68	75.1. L.A.2	1551190

**March 21, 2014**  
 REGISTERED CIVIL ENGINEER  
 State of California  
 License No. 44197  
 1500 S. Bascom Avenue, Suite 200  
 San Jose, CA 95128  
 (408) 298-1111  
 www.danielcohen.com

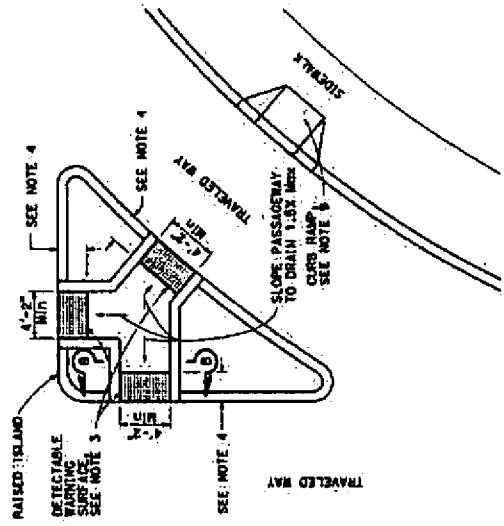
- TO ACCOMPANY PLANS DATED \_\_\_\_\_
1. Sidewalk, ramp and passageway thickness, "T", shall be 3 1/2" minimum.
  2. For details of grooving used with base DI curb ramp, see Revised Standard Plan RSP A88A.
  3. For details of detectable warning surfaces, see Revised Standard Plan RSP A88A.
  4. Where an island passageway length is greater than or equal to 8'-0" shall see note 4 with detectable warning. The passageway length where on island passageway length is greater than or equal to 8'-0", each detectable warning surface shall extend the full width and 3'-0" depth of the passageway length. A 4'-2" wide detectable warning surface may be used on a 4'-2" wide island passageway.
  5. For Case CM curb ramp, the edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flintline.
  6. Transitions from ramps to walks, gutters or streets shall be flush (no lip) and free of abrupt changes.
  7. Utility curbs, manholes, vaults and all other utility structures shall be indicated to grade by the same color, or in conjunction with, curb ramp construction.
  8. Detectable warning surface may have to be cut to allow removal of utility covers while maintaining full detectable warning width and depth.
  9. For additional curb ramp details, see Revised Standard Plan RSP A88A.



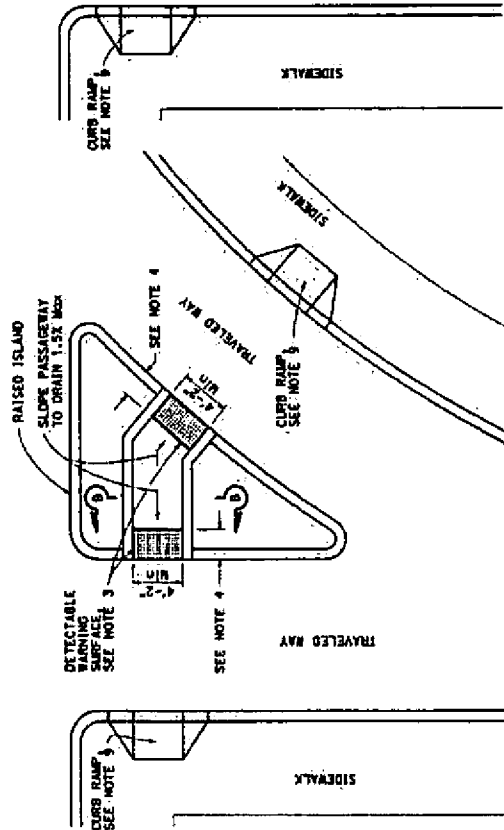
**TYPE A PASSAGEWAY**



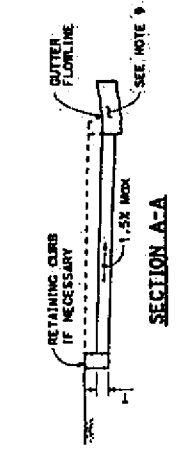
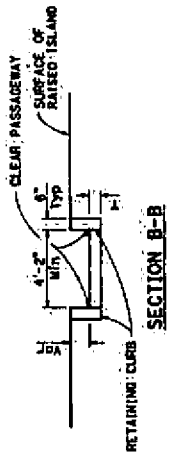
**CASE CM CURB RAMP**



**TYPE B PASSAGEWAY**



**TYPE C PASSAGEWAY**



STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**CURB RAMP AND ISLAND PASSAGEWAY DETAILS**  
 NO SCALE

RSP A88B DATED MARCH 21, 2014 SUPERSEDES RSP A88B DATED JULY 19, 2013 AND STANDARD PLAN A88B DATED MAY 20, 2011. PAGE 122 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP A88B**



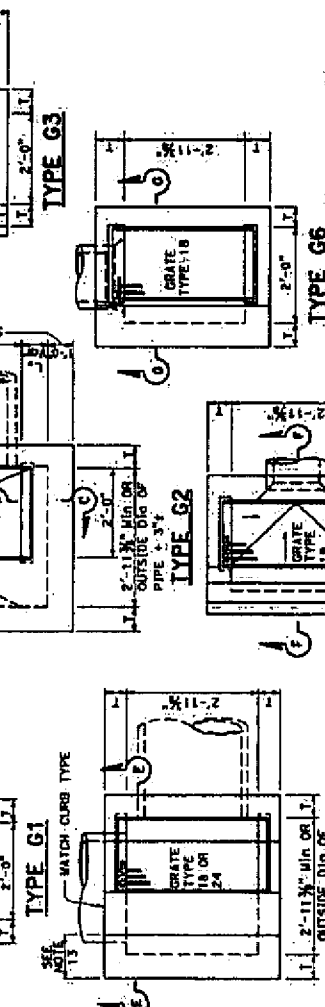
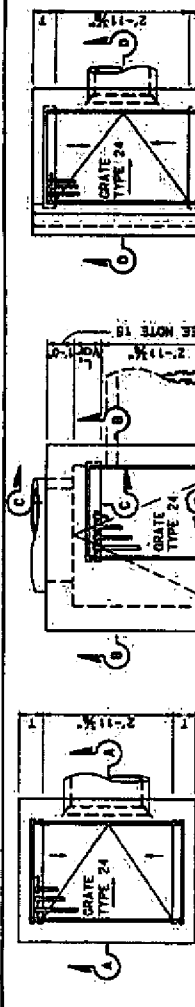
Exhibit A.2

TO ACCOMPANY PLANS DATED \_\_\_\_\_

DATE	QUANTITY	ROUTE	TOTAL LENGTH	SCALE
05 Mon	1	68	751. L4.2	1/8" = 1'-0"

REGISTERED CIVIL ENGINEER  
 OCTOBER 19, 2012  
 PLANS EXPIRATION DATE  
 THE STATE OF CALIFORNIA  
 DIVISION OF PROFESSIONAL ENGINEERS AND ARCHITECTS  
 CIVIL ENGINEERING

- NOTES:**
- "H" is the difference in elevation between the gutter pipe flow line and the normal gutter grade. The unobstructed, for "T" wall thicknesses, see Table A below.
  - Wall reinforcing not required when "H" is 9'-0" or less and the unsupported width or length is 7'-0" or less. Walls exceeding these limits shall be reinforced with at least 2 #4 bars @ 1'-6" c/c.
  - Inter bottom reinforcing not required. See Standard Plan D74C for alternative reinforced bottom and alternative half round bottom.
  - Steps (where required) shall be less than 2'-6". Where "H" is 2'-6" or more, install steps with lowest rung 1'-0" above the floor and highest rung not more than 6" below top of inlet. The distance between steps shall not exceed 1'-0" and shall be uniform throughout the length of the wall. Place steps in the wall without an opening. Steps inserts may be substituted for the bar steps. Step inserts shall comply with State (Industrial Safety) requirements. See Standard Plan D74C for step details.
  - Bar(s) shall apply to both metal and concrete pipe.
  - Bar(s) can be placed in any wall.
  - Curb section shall match adjacent curbs.
  - Basin floors shall have wood travel finish and a minimum slope of .12% from all directions toward outlet pipe.
  - Set inlets so that grate bars are parallel to direction of principal surface flow.
  - Use Revised Standard Plan D77A and D77B for grates and frame details and weights of miscellaneous iron and steel.
  - See Standard Plan D77A for gutter depression details.
  - This dimension will vary with different grates, curb types, box width and wall thickness.
  - Bar may be rotated as necessary to clear opening. Where "L" is 6" or less, bar may be omitted.
  - Where "L" is 6" or less, wall thickness shall be as shown in Table A.
  - Cast-in-place inlets to be formed around all pipes/stubs intersecting the inlet, and concrete poured in one continuous operation. Precast inlets shall have mentioned connections conforming to details for Type COP Inlet shown on Standard Plan D75B. See Standard Specifications for Mortar composition.



**TABLE A**

CONCRETE QUANTITIES

TYPE	H=3'-0" TO 9'-0" (H=3')	H=3'-1" TO 20'-0" (H=3'1")	ADDITIONAL PCC PER FOOT (CY)	ADDITIONAL PCC PER FOOT (CY)
G-1	0.85	0.220	See Note A	SEE NOTE A
G-2	1.31	0.235	3.50	0.337
G-3	1.03	0.220	See Note A	SEE NOTE A
G-4 (TYPE 24)	1.27	0.255	3.48	0.337
G-5 (TYPE 18)	1.30	0.255	3.50	0.337
G-6	1.02	0.220	SEE NOTE A	SEE NOTE A
G-7	1.04	0.220	SEE NOTE A	SEE NOTE A

NOTE: A) Maximum allowable height 9'-0".

NOTE: A) Maximum allowable height 9'-0".

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

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

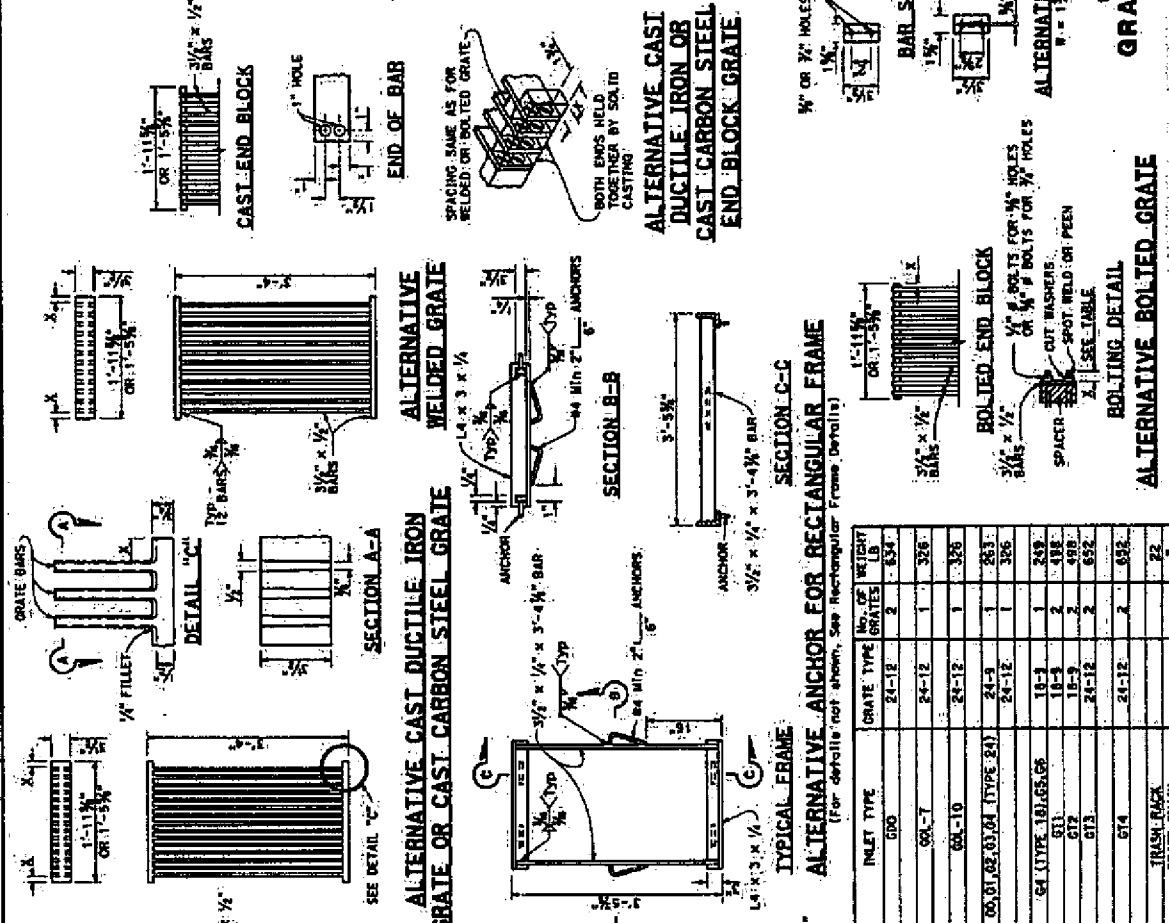
**REVISED STANDARD PLAN RSP D73**



Exhibit A.2

DATE	COMMITTEE	NO.	DATE	NO.	SECTION
05	Mon	1	68	75.1	L4.2 157
<b>APPROVED FOR THE PROJECT</b> 					
TO ACCOMPANY PLANS DATED: _____					

- NOTES:**
- Grate type, number, refer to appropriate plate of grate in inches and number of bars, respectively.
  - Quantity for bars has the option of using cast bolts, or cast and block grate.
  - Roundtop top of bars optional on all grates.
  - Pipe inlets: when a grate shall be placed so that bars parallel direction of principle surface flow.
  - Complete joint penetration butt 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.
  - Grate and frame weights are based on welded grates. Weights of face angles, steps, protection bars, etc. are not included.
  - Connect chain to grate and frame only at location shown on the plans. When chain is required, do not use cast ductile iron grates.



INLET TYPE	GRATE TYPE	NO. OF GRATES	WEIGHT LB
000	24-12	2	834
001-7	24-12	1	326
001-10	24-12	1	326
001-02, 03, 04 (TYPE 24)	24-9	1	253
	24-12	1	326
04 (TYPE 18), 05, 06	18-9	1	249
05	18-9	2	498
06-10	18-9	2	498
07	24-12	2	652
08	24-12	2	652
09	24-12	2	652
10	24-12	2	652
11	24-12	2	652
12	24-12	2	652
13	24-12	2	652
14	24-12	2	652
15	24-12	2	652
16	24-12	2	652
17	24-12	2	652
18	24-12	2	652
19	24-12	2	652
20	24-12	2	652
21	24-12	2	652
22	24-12	2	652
23	24-12	2	652

INLET TYPE	COVER TYPE	WEIGHT LB
05	PLATE	174
06-7	PLATE	170
08-10	PLATE	170
06-14	PLATE	170
06-21	PLATE	170
06-21	PLATE	112
06-21	PLATE	112
06-21	REINWOOD	42
06-21	GRP	177
06-21	GRP	177
06-21	GRP	177

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

**BASIS FOR M&G IRON & STEEL FINAL PAY WEIGHTS FOR DRAINAGE INLETS**

(See Note 1)

CAO RISK

Exhibit A.2

DIST	COUNTY	ROUTE	LINE	POST MILES	PLAN SHEETS
05	Mon	1. 68	75.1, L4.2	158	190

APPROVED FOR THE PROJECT BY THE CHIEF ENGINEER OF THE STATE DEPARTMENT OF TRANSPORTATION

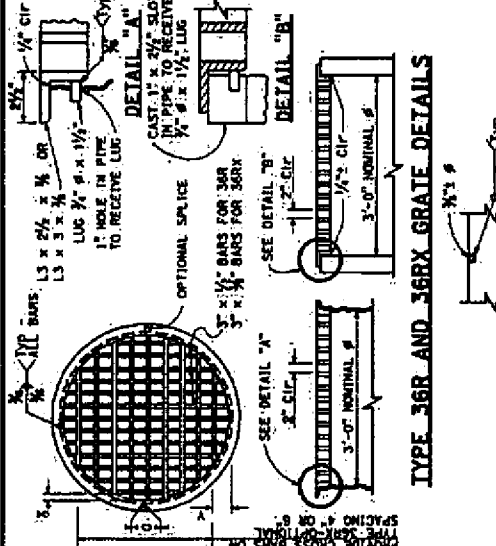
APRIL 19, 2013

PROJECT PERSONNEL DATE

FOR THE PROJECT OF THE STATE DEPARTMENT OF TRANSPORTATION

FOR THE PROJECT OF THE STATE DEPARTMENT OF TRANSPORTATION

FOR THE PROJECT OF THE STATE DEPARTMENT OF TRANSPORTATION

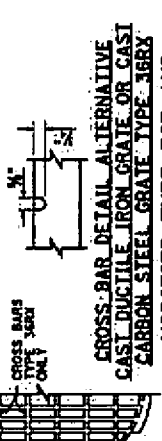


**TYPE 36R AND 36RX GRATE DETAILS**

3/8" # Cross bars may be fillet welded, but shall be fillet welded or electrobraced to bearing bars.

**CROSS BAR DETAIL TYPE 36RX GRATE (WELDED STEEL)**

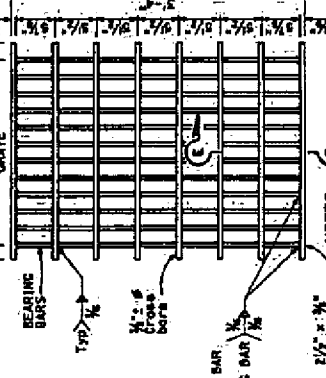
3/8" # CROSS BARS TYPE 36RX ONLY



**TYPE 18-10 AND 24-10C GRATE**

1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE

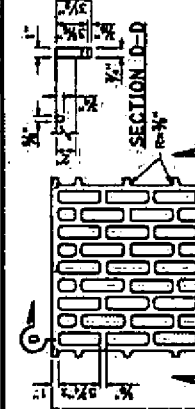
1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE



**TYPE 18-9X AND 24-12X GRATE**

1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE

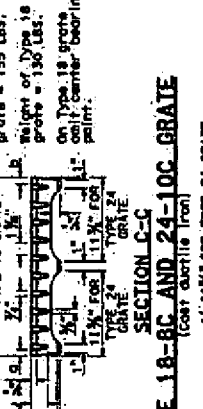
1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE



**TYPE 18-8C AND 24-10C GRATE**

1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE

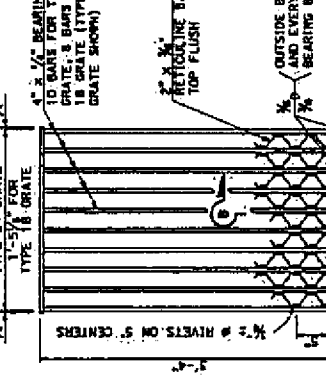
1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE



**TYPE 18-10 AND 24-13 GRATE**

1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE

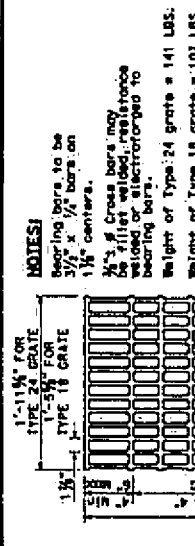
1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE



**TYPE 18-8S AND 24-10S GRATE**

1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE

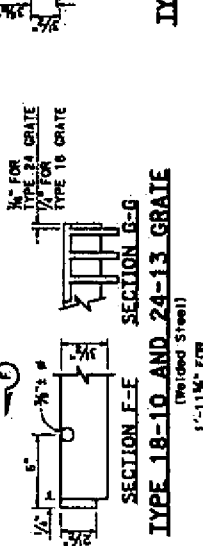
1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE



**TYPE 18-10 AND 24-10C GRATE**

1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE

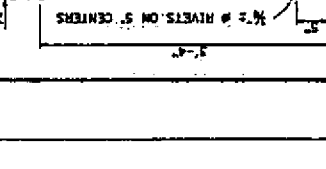
1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE



**TYPE 18-10 AND 24-10C GRATE**

1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE

1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE



**TYPE 18-10 AND 24-10C GRATE**

1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE

1/2" # BEARING BARS TO GRATE TYPE 24 GRATE 1/2" # BEARING BARS TO GRATE TYPE 18 GRATE

**ALTERNATIVE CAST DUCTILE IRON GRATE OR CAST CARBON STEEL GRATE TYPE 36R AND 36RX**

BASES FOR MILD IRON AND STEEL FINAL PAY WEIGHTS FOR DRAINAGE INLETS

INLET TYPE	GRATE TYPE	NO. OF GRATES	LB
C80 (SEE NOTE 4)	24-10C	2	331
	24-10S	2	456
	24-12X	2	473
90,00L,01,02,03,04 (TYPE 24)	24-10C	2	374
	24-10S	2	229
	24-13	2	187
G4 (TYPE 18)	18-10	1	149
	18-10S	1	159
	18-13	1	174
G11,072	18-10	2	374
	24-10C	2	404
	24-10S	2	458
G13,074	24-12X	2	418
	24-13	2	319
	36RX (cast)	1	176
GMP, GCP, GEP1	36RX (cast)	1	219
	36R (mod)	1	250
	36R (mod)	1	236
TRASH RACK	36R	1	22
	36R	1	22

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**GRATE DETAILS No. 2**

NO SCALE


RSP D77B DATED APRIL 19, 2013 SUPERSEDES RSP D77B DATED JULY 29, 2012 AND STANDARD PLAN D77B DATED MAY 20, 2011 - PAGE 155 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP D77B**





STATE	COUNTY	ROUTE	SECTION	DATE
05	Mon.	1. 68	75.1, L4.2	180 190


  
 November 15, 2013  
 Plans Approval Date  
 For Approval, See Title 19, Part 91000  
 of the California Code of Regulations  
 for Approval of Plans and Specifications  
 for Public Works Projects.  
 TO ACCOMPANY PLANS DATED \_\_\_\_\_

**ITEM DESCRIPTION**

**NEW**

**EXISTING**

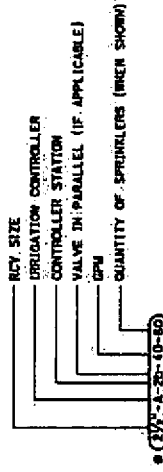
ITEM DESCRIPTION	NEW	EXISTING
WATER METER (WM)		
BACKFLOW PREVENTER ASSEMBLY (BPA)		
BACKFLOW PREVENTER ENCLOSURE (BPE)		
BOOSTER PUMP (BP)		
TRUCK LOADING STANDPIPE (TLS)		
FLOW SENSOR (FS)		
MASTER IRRIGATION CONTROLLER (MIC)		
AUXILIARY IRRIGATION CONTROLLER (AIC)		
IRRIGATION CONTROLLER (IC)		
IRRIGATION CONTROLLER (IC) (BATTERY)		
IRRIGATION CONTROLLER (IC) (SOLAR)		
IRRIGATION CONTROLLER (IC) (TWO WIRE)		
IRRIGATION CONTROLLER (IC) IN CONTROLLER ENCLOSURE CABINET (ICC)		
ARMOR-CLAD CONDUCTORS (ACC)		
CONTROL AND NEUTRAL CONDUCTORS (CNC)		
IRRIGATION CONDUIT		
EXTEND IRRIGATION CONDUIT		
DUCTILE IRON PIPE (SUPPLY LINE) (MAIN) (DIP)		
GALVANIZED STEEL PIPE (SUPPLY LINE) (MAIN) (GSP)		
GALVANIZED STEEL PIPE (SUPPLY LINE) (LATERAL) (GSLP)		
PLASTIC PIPE (SUPPLY LINE) (MAIN)		
PLASTIC PIPE (SUPPLY LINE) (LATERAL)		
COPPER PIPE (SUPPLY LINE)		
DRIP IRRIGATION TUBING		
REMOTE CONTROL VALVE (RCV)		
REMOTE CONTROL VALVE (MASTER) (RCVM)		
REMOTE CONTROL VALVE (MASTER) W/FLOW METER (RCVMF)		
REMOTE CONTROL VALVE W/PRESSURE REGULATOR (RCVP)		
EXISTING MANUAL CONTROL VALVE (MCV)		
DRIP VALVE ASSEMBLY (DVA)		
WPE STRAINER ASSEMBLY (WPSA)		

**ITEM DESCRIPTION**

**NEW**

**EXISTING**

ITEM DESCRIPTION	NEW	EXISTING
GATE VALVE (GV)		
BALL VALVE (BV)		
QUICK COUPLING VALVE (QCV)		
CAM COUPLER ASSEMBLY (CCA)		
GARDEN VALVE ASSEMBLY (GARVA)		
PRESSURE REGULATING VALVE (PRV)		
PRESSURE RELIEF VALVE (PRV)		
FLOW CONTROL VALVE (FCV)		
COMBINATION AIR RELEASE VALVE (CARV)		
CHECK VALVE (CV)		
FLUSH VALVE (FV)		
EXISTING NOZZLE LINE W/TURNING UNION		
EXISTING IRRIGATION SYSTEM		
EXISTING IRRIGATION SYSTEM TO BE REMOVED		
CHAIN LINK GATE		
QUICK COUPLING VALVE W/SPRINKLER PROTECTOR		
SPRINKLER W/SPRINKLER PROTECTOR		
CONNECT TO EXISTING SYSTEM		
CAP		
CAP EXISTING		
FIBER ROLL		
COMPOST SOCK		



**VALVE CODE**

\* VALVE CODES FOR EXISTING VALVES ARE SHOWN IN A DASHED ENCLOSURE.


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

RSP H2 DATED NOVEMBER 15, 2013. SUPERSEDES RSP H2 DATED JULY 13, 2011 AND STANDARD PLAN H2 DATED MAY 20, 2011. - PAGE 219 OF THE STANDARD PLANS BOOK, DATED 2010.

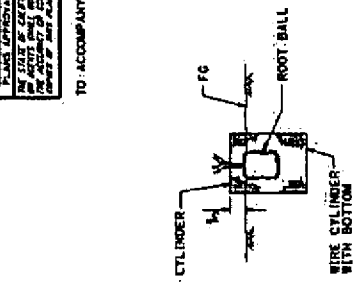
**REVISED STANDARD PLAN RSP H2**



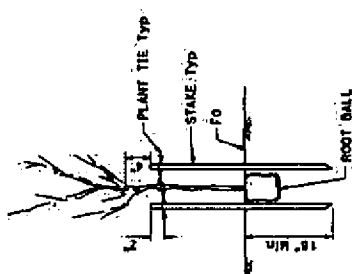
DATE	COUNTY	ROUTE	POST MILE	SHEET TOTAL
05	Mon	1	75.1, L4.2	181

  
 JULY 19, 2013  
 PLANS APPROVAL DATE  
 IN STATE OF CALIFORNIA ON ITS BEHALF  
 BY *[Signature]* STATE ENGINEER  
 COUNTY OF *[Signature]* COUNTY ENGINEER

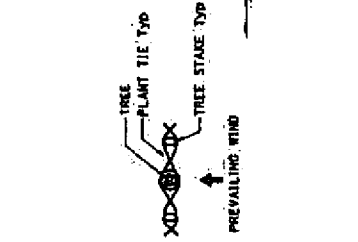
TO: ACCOMPANY PLANS DATED \_\_\_\_\_



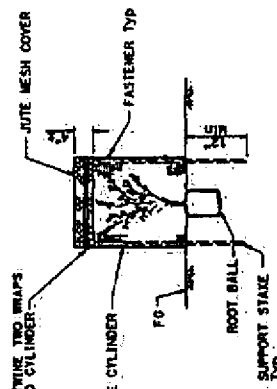
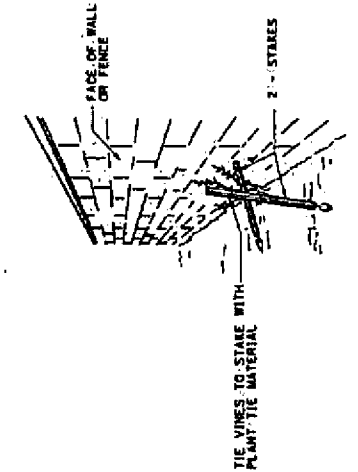
SECTION  
ROOT PROTECTOR



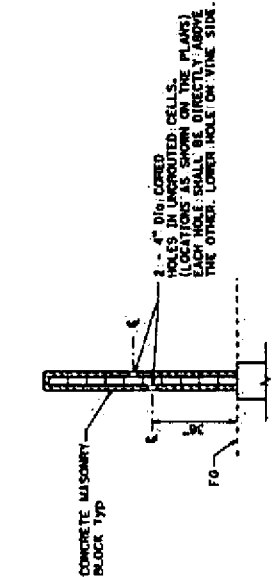
SECTION  
TREE STAKING



SECTION  
PERSPECTIVE VINE STAKING



SECTION  
FOLIAGE PROTECTOR



SECTION  
CORE HOLE (VINE)

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE DETAILS**  
 NO SCALE  
 RSP H4 DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN H4  
 DATED MAY 20, 2011 - PAGE 221 OF THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP H4**

CAO
RISK

CITY	COUNTY	ROUTE	POST MILE	SECTION
05	MON	1. 68	76.1, L4.2	162 190

DATE: July 19, 2013

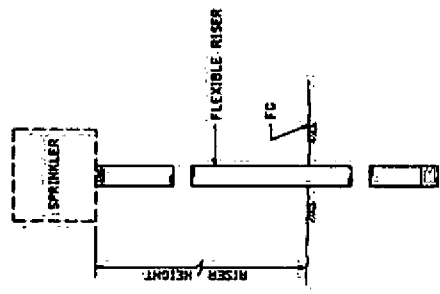
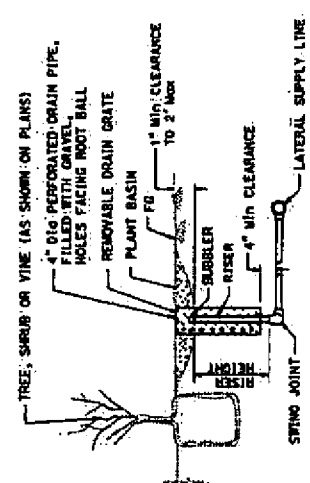
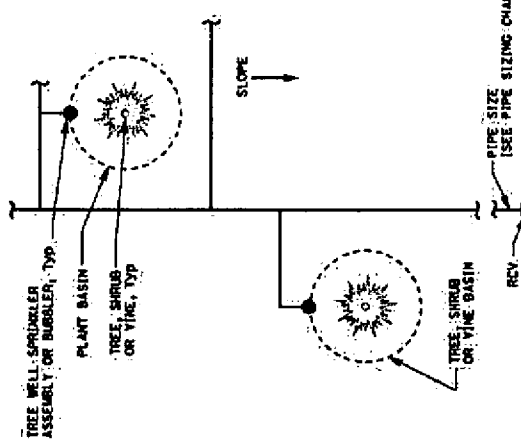
PLANS APPROVAL DATE:

THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

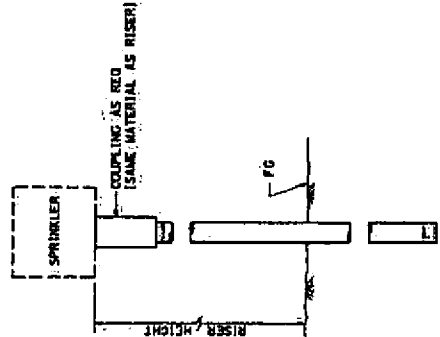
DESIGNED BY: [Signature]

CHECKED BY: [Signature]

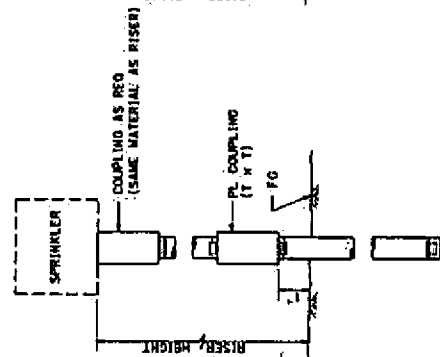
TO: ACCOMPANY PLANS DATED: \_\_\_\_\_



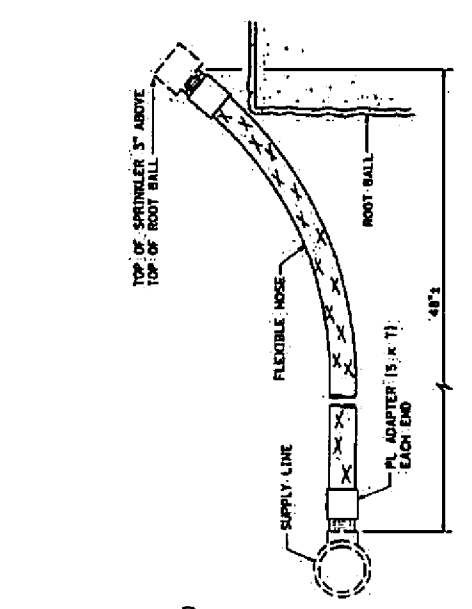
**RISER SPRINKLER ASSEMBLY TYPE III**



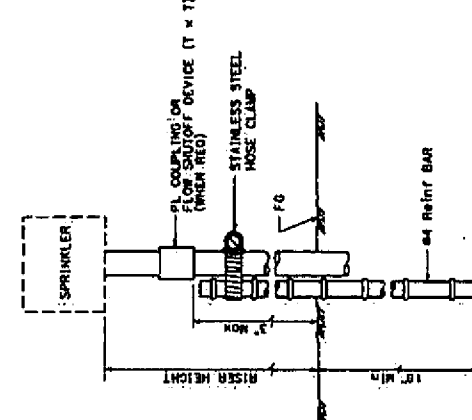
**RISER SPRINKLER ASSEMBLY TYPE II**



**RISER SPRINKLER ASSEMBLY TYPE I**



**RISER SPRINKLER ASSEMBLY TYPE V**



**RISER SPRINKLER ASSEMBLY TYPE IV**

CAO RISK

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**LANDSCAPE DETAILS**

NO SCALE

RSP H5 DATED: JULY 19, 2013 SUPERSEDES STANDARD PLAN H5 DATED: MAY 20, 2011 - PAGE 222 OF THE STANDARD PLANS BOOK DATED 2010.

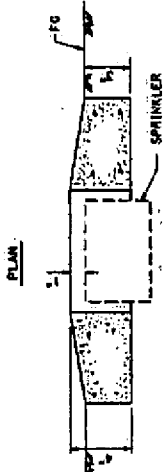
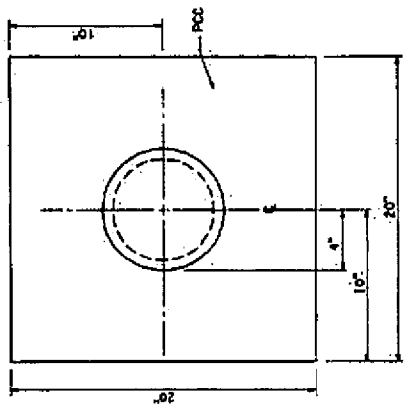
**REVISED STANDARD PLAN RSP H5**

Exhibit A.2

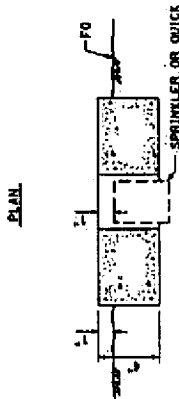
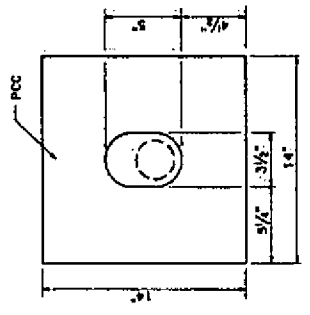
DATE	COUNTY	ROUTE	SECTION	PLAN	SHEETS
05	Mon	1, 68	75.1, L4.2	163	180

JULY 19, 2013  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
 COUNTY OF SAN DIEGO  
 PROJECT: [Illegible]

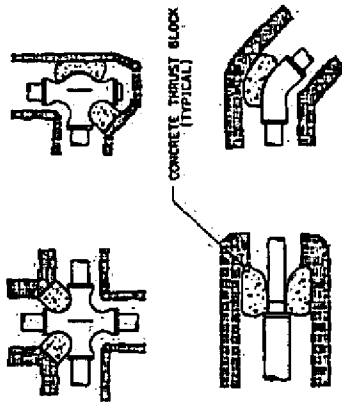
TO ACCOMPANY PLANS DATED \_\_\_\_\_



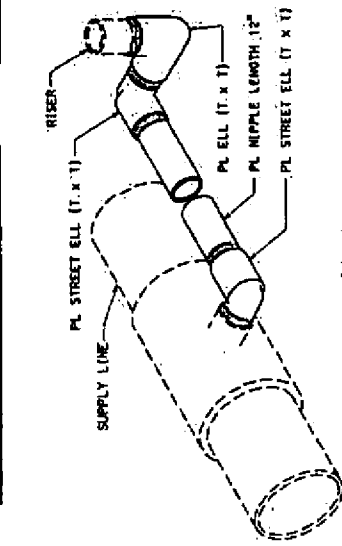
SPRINKLER PROJECTOR TYPE II



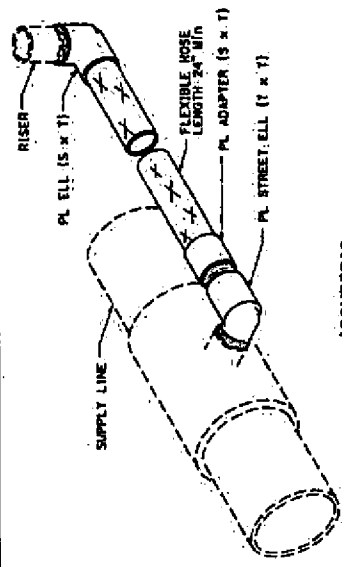
SPRINKLER PROJECTOR TYPE I



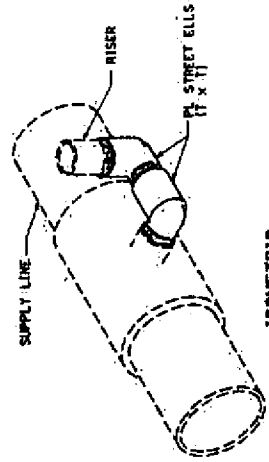
TYPICAL THRUST BLOCKS



POP-UP SPRINKLER ASSEMBLY TYPE I



POP-UP SPRINKLER ASSEMBLY TYPE II



POP-UP SPRINKLER ASSEMBLY TYPE III

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

LANDSCAPE DETAILS

NO. SCALE

RSP H6 DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN H6 DATED MAY 20, 2011 - PAGE 223 OF THE STANDARD PLANS BOOK DATED 2010.

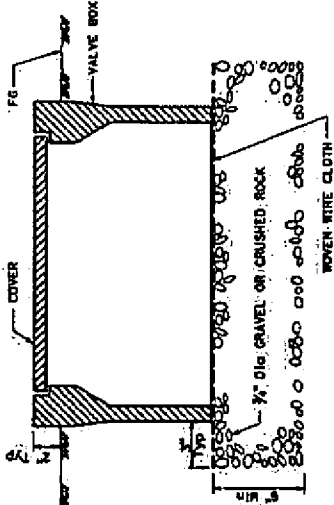
REVISED STANDARD PLAN RSP H6

CAO RISK

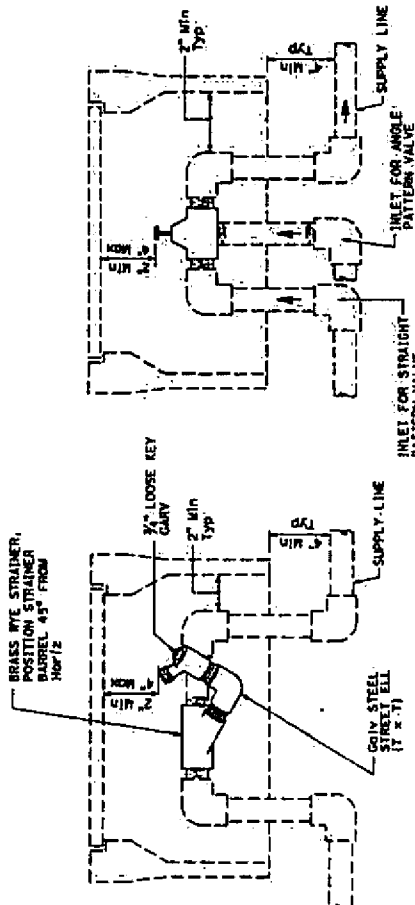


DIST.	COUNTY	ROUTE	POST MILE	POST MILE	POST MILE	POST MILE
06	Mon	1. 68	75.1	L4.2	164	190

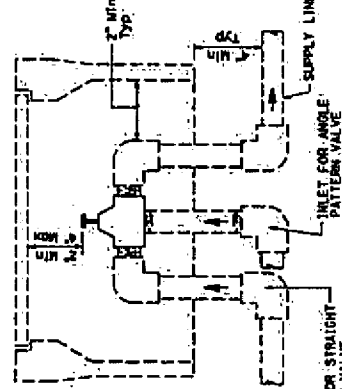
July 19, 2013.  
 THIS PLAN APPROVAL DATE  
 IS VALID FOR THE PROJECT ONLY.  
 IT IS NOT VALID FOR ANY OTHER PROJECT.  
 THE STATE OF CALIFORNIA DOES NOT GUARANTEE THE ACCURACY OF THIS PLAN.  
 THE USER SHALL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF THIS PLAN.  
 (PROJECT OF THE STATE OF CALIFORNIA)



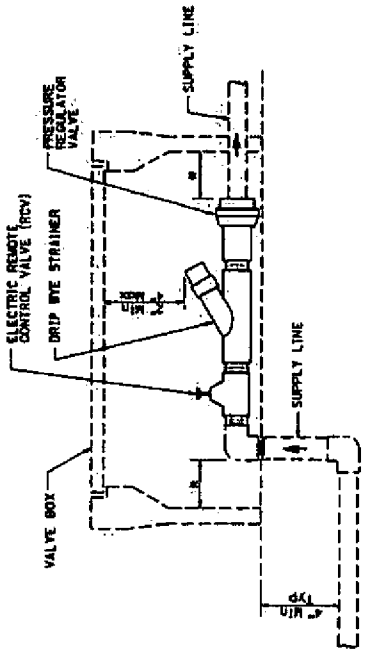
SECTION  
VALVE BOX



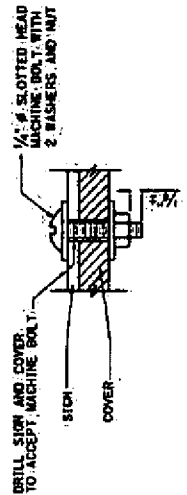
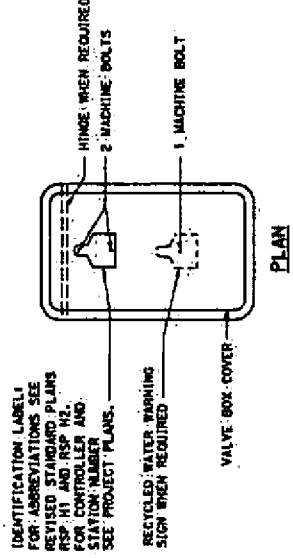
ELEVATION  
WYE STRAINER ASSEMBLY



ELEVATION  
VALVE



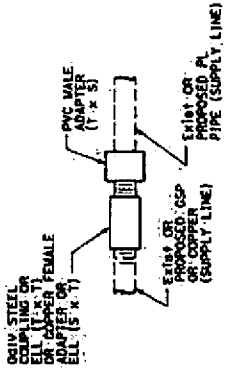
ELEVATION  
DRIP VALVE ASSEMBLY



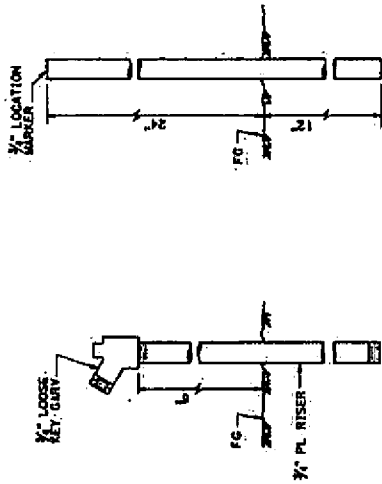
SECTION  
VALVE BOX IDENTIFICATION

IDENTIFICATION LABELS FOR ABBREVIATIONS SEE REVISED STANDARD PLANS RSP H1 AND RSP H2. FOR CONTROLLER AND STATION NUMBER SEE PROJECT PLANS.  
RECYCLED WATER WARNING SIGN WHEN REQUIRED

**GALVANIZED OR COPPER PIPE CONNECTION TO PLASTIC PIPE**



**GARDEN VALVE ASSEMBLY**



**LANDSCAPE DETAILS**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

NO. SCALE

RSP H7 DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN H7 DATED MAY 20, 2011 - PAGE 224 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP H7**

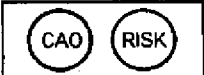


Exhibit A.2

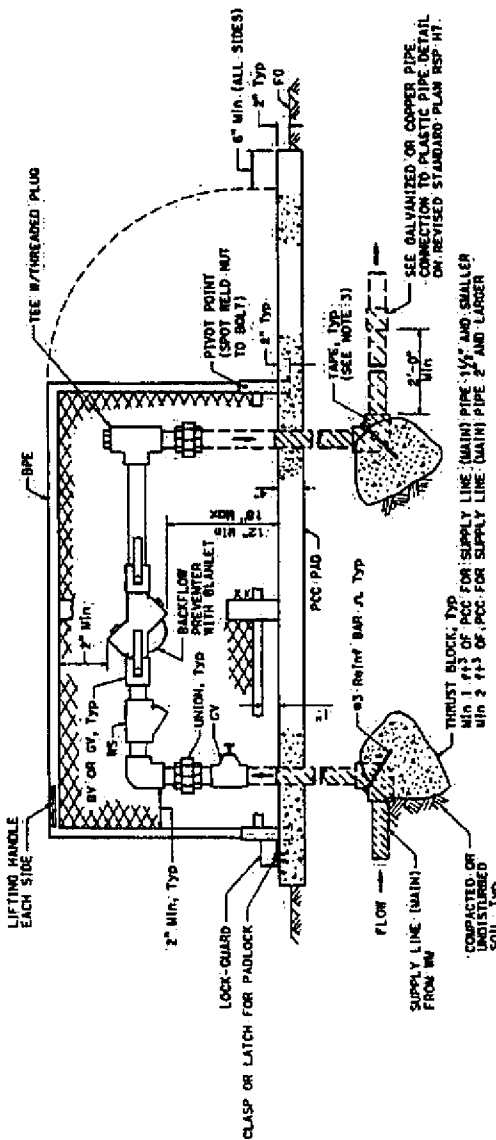
Sheet	Quantity	Route	City	Scale	Project	Notes
05	Mon	1, 68	75.1, L4.2	165	190	

**TO ACCOMPANY PLANS DATED \_\_\_\_\_**

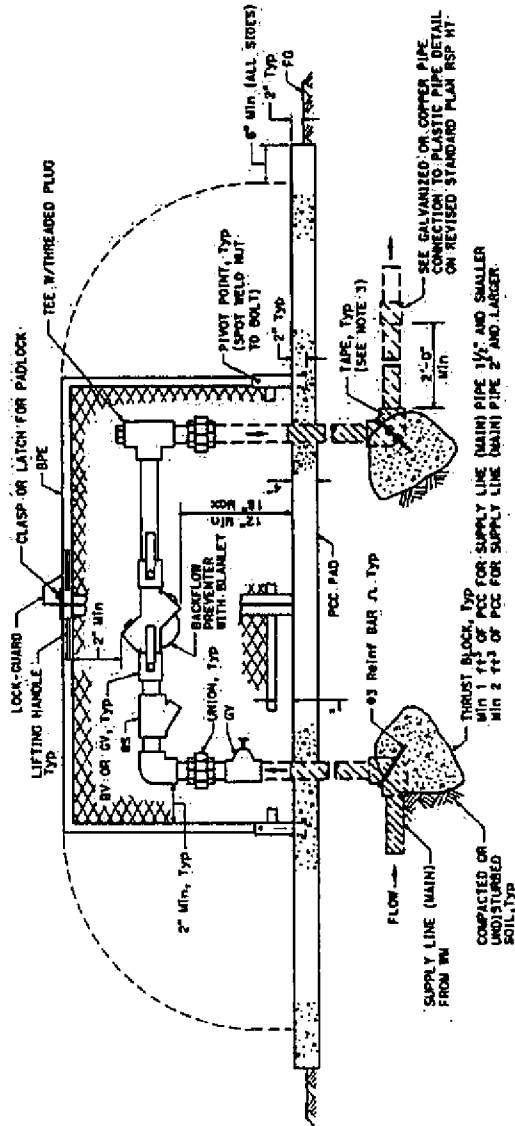
**July 19, 2013**  
 JULY 19, 2013  
 STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
 STANDARD PLAN BOOK DATED 2010

**NOTES**

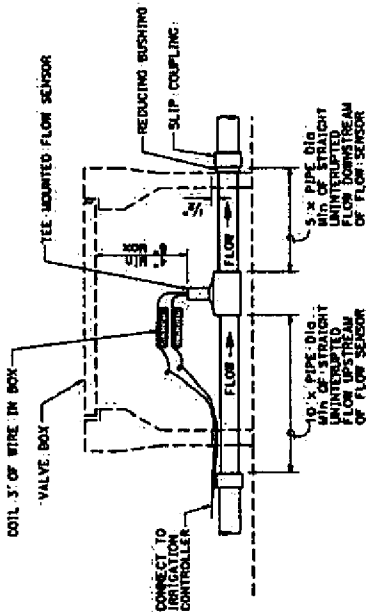
1. Eye strainer and fittings must be the same size as the backflow preventer shown on the plans.
2. Backflow preventer assembly nonrigid pipe must be the same pipe as the supply line (main) pipe to be installed from the water meter to the backflow preventer assembly.
3. All contact with wall and Portland Cement Concrete must be wrapped with 2" wide plastic-backed adhesive polyethylene tape 20 mil thick with 1/4" overlap.



**ELEVATION**  
**BACKFLOW PREVENTER ASSEMBLY**  
 IN ONE PIECE ENCLOSURE



**ELEVATION**  
**BACKFLOW PREVENTER ASSEMBLY**  
 IN TWO PIECE ENCLOSURE



**SECTION**  
**FLOW SENSOR**

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

**LANDSCAPE DETAILS**

NO. SCALE

RSP H8 DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN H8 DATED MAY 20, 2011 - PAGE 225 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP H8**

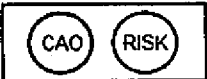

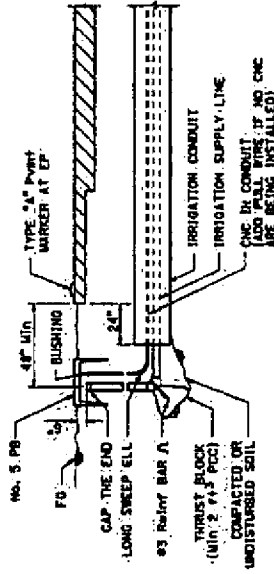


Exhibit A.2

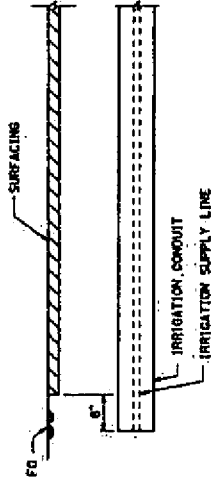
DATE	COUNTY	ROUTE	TOTAL LENGTH	POST MILES	POST MILES	POST MILES
05	Mon	1, 68	75.1	L4.2	186	190

  
 JULY 19, 2013  
 PLEASE APPROVAL DATE  
 OF THIS PLAN AND ALL OF ITS ATTACHED SHEETS AND SPECIFICATIONS IN ACCORDANCE WITH THE STANDARD PLAN BOOK DATED 2010.

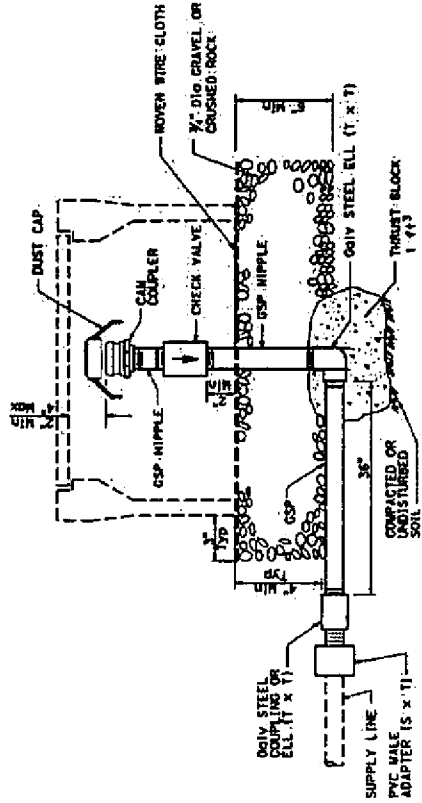
TO ACCOMPANY PLANS DATED \_\_\_\_\_



**SECTION**  
**IRRIGATION CONDUIT**  
UNDER TRAVELED WAY.



**SECTION**  
**IRRIGATION CONDUIT**  
UNDER SIDEWALKS, DRIVEWAYS, AND PATHS.



**ELEVATION**  
**CAM COUPLER ASSEMBLY**

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE DETAILS**  
NO. SCALE


RSP H9 DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN H9  
DATED MAY 20, 2011 - PAGE 226 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP H9**

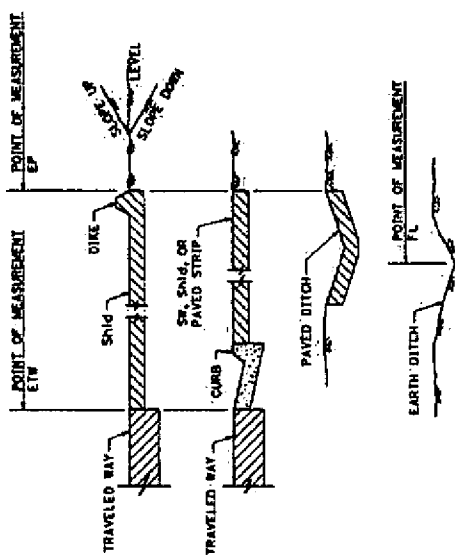
CAO RISK

Exhibit A.2

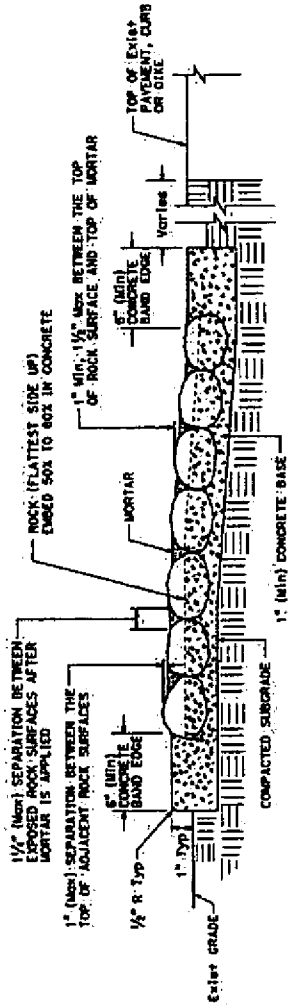
DIST.	COUNTY	ROUTE	POST MILE	POST MILES	POST MILES
05	Mon	1, 68	75.1, L4.2	167	190

  
 JULY 19, 2013  
 PLAN APPROVAL DATE  
 THE USE OF THIS PLAN OR ANY PART THEREOF IS LIMITED TO THE PROJECT AND SITE SPECIFIC FOR WHICH IT WAS DESIGNED AND SHALL NOT BE USED FOR ANY OTHER PROJECT OR SITE.

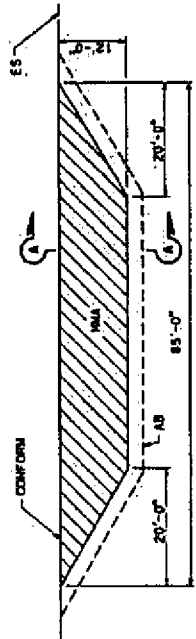
TO ACCOMPANY PLANS DATED \_\_\_\_\_



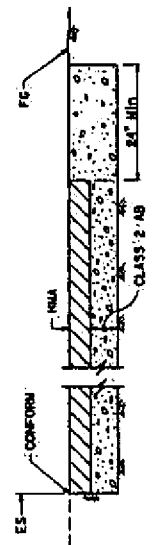
SECTION  
POINTS OF MEASUREMENT



SECTION  
ROCK BLANKET



PLAN




SECTION A-A  
MAINTENANCE VEHICLE PULLOUT

CAO RISK

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**LANDSCAPE DETAILS**  
NO. SCALE  
RSP H9A DATED JULY 19, 2013 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP H9A**

DATE	COUNTY	ROUTE	TOTAL MILEAGE	NO. OF SHEETS
05	Mon	1, 68	75.1, L4.2	168, 190


  
 JULY 19, 2013  
 PLEASE APPROVAL DATE  
 BY STATE ENGINEER, 1015 N. STANFORD BLVD., SACRAMENTO, CA 95833  
 I HEREBY CERTIFY THAT THE ABOVE IS A TRUE AND CORRECT COPY OF THE ORIGINAL AS SUBMITTED TO THE STATE ENGINEER.

TO ACCOMPANY PLANS DATED

TABLE 3

ROAD TYPE	DISTANCE BETWEEN SIGNS #		
	A	B	C
	ft	ft	ft
URBAN - 25 mph OR LESS	100	100	100
URBAN - MORE THAN 25 mph TO 40 mph	250	250	250
URBAN - MORE THAN 40 mph	350	350	350
RURAL	500	500	500
EXPRESSWAY / FREEWAY	1000	1500	2540

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

TABLE 2

SPEED #	MIN. D.M.	DOWNGRADE MIN. D. MM		
		-3%	-4%	-5%
20	115	116	120	124
25	135	138	143	148
30	200	205	211	217
35	250	257	271	281
40	305	315	333	354
45	350	378	400	427
50	423	448	474	507
55	485	520	553	583
60	570	598	638	688
65	645	682	728	785
70	730	771	825	881

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

TABLE 1

SPEED (SI)	TAPER LENGTH CRITERIA AND CHANNELIZING DEVICE SPACING									
	MINIMUM TAPER LENGTH, #					MAXIMUM CHANNELIZING DEVICE SPACING				
	TANGENT	SHIFTING	SHOULDER	L	L/2	X	Y	Z	Z	Z
20	71	71	71	71	71	71	71	71	71	71
25	180	80	40	27	42	25	40	10	10	12
30	360	160	80	42	60	30	60	15	15	15
35	490	245	123	62	82	35	70	17	17	17
40	640	320	160	107	107	40	80	20	20	20
45	1080	540	270	180	180	45	90	22	22	22
50	1200	600	300	200	200	50	100	25	25	25
55	1320	660	330	220	220	55	110	27	27	27
60	1440	720	360	240	240	60	120	30	30	30
65	1560	780	390	260	260	65	130	32	32	32
70	1680	840	420	280	280	70	140	35	35	35

\* - For other offsets, use the following average taper length formula for L:  
 For speed of 40 mph or less, L = 85.7S  
 For speed of 45 mph or more, L = 85  
 where: L = taper length in feet  
 S = posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

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

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM TABLES  
 FOR LANE AND RAMP CLOSURES**  
 NO. SCALE

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

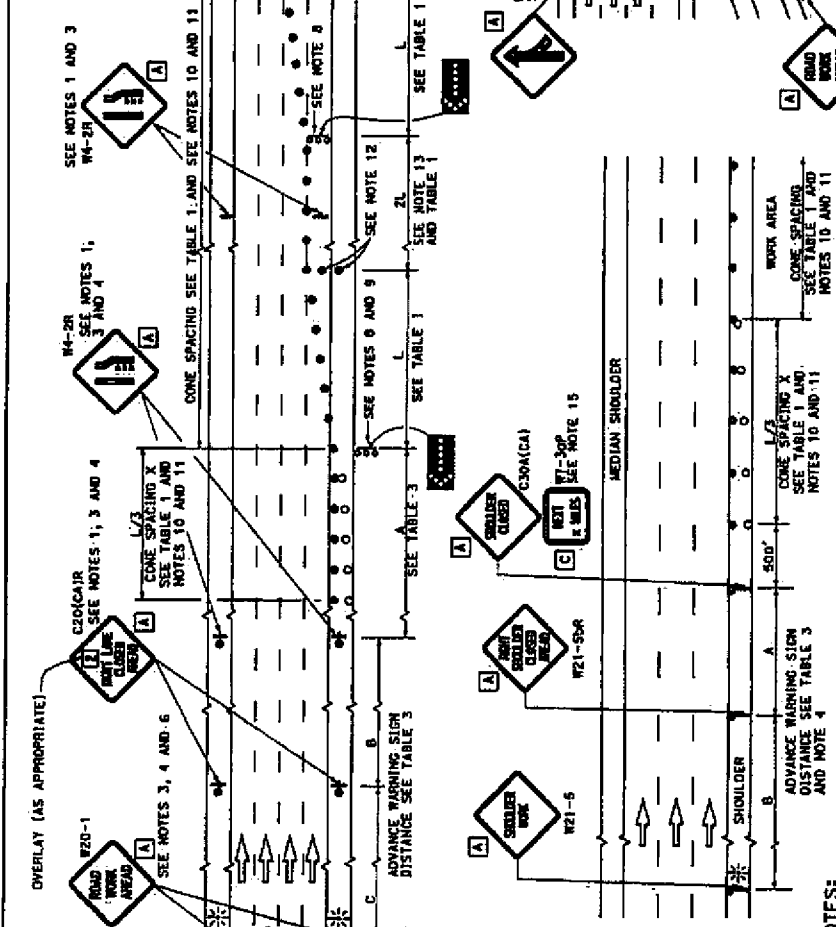
**REVISED STANDARD PLAN RSP T9**



DATE	QUANTITY	ROUTE	TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
05	Mon	1, 68	75.1, L4.2	169	190

APPROVED FOR THE PROJECT  
 APRIL 19, 2013  
 REGISTERED CIVIL ENGINEER  
 PLAN NO. 2013-0013  
 THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION  
 COUNTY OF SAN DIEGO PROJECT NO. 2010-0003-03

**NOTES:**  
 TO ACCOMPANY PLANS DATED \_\_\_\_\_  
 See Revised Standard Plan RSP T9 for tables.  
 Use cone spacing X for taper segment, Y for tangent segment, or Z for cone spacing. Cone spacing, or cone length, per Table 1, unless A, Y, or Z cone spacing is shown on this sheet.  
 Unless otherwise specified in the special provisions, all temporary warning signs shall have black legend on fluorescent orange background.  
 California codes are designated by (CA). Otherwise, Federal (MUTCD) codes are shown.  
 SEE NOTE 5



- LEGEND:**
- TRAFFIC CONE
  - TRAFFIC CONE (OPTIONAL TAPER)
  - TEMPORARY TRAFFIC CONTROL SIGN
  - FLASHING ARROW SIGN (FAS)
  - FAS SUPPORT OR TRAILER
  - PORTABLE FLASHING BEACON
- LANE CLOSURE**
12. Unless otherwise specified in the special provisions, the 2L tapered stream along the lane lines shall be used between the taper required for each closed traffic lane.
13. Unless otherwise specified in the special provisions, the 2L tapered stream along the lane lines shall be used between the taper required for each closed traffic lane.
14. Unless otherwise specified in the special provisions, the ES-1 or SC1(CA) and W1-1 signs shall be used as shown.
15. A W1-300 NEXT sign must be used on a freeway that can be perceived by road users.
- SHOULDER CLOSURE**
6. If the W20-1 sign would follow within 2000' of a stationary W20-11 or C20-1 ROAD WORK NEXT sign, use a C20(CA) sign for the first advance warning sign.
7. Place a C20(CA) sign every 2000' throughout length of lane closure.
8. A minimum 1000' of sight distance shall be provided when posting signs.
9. One flashing arrow sign for each lane closed. The flashing arrow sign shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
10. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
11. Portable delineators, placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.

- LANE CLOSURE AT ENTRANCE RAMP**
- ES-1 SEE NOTE 14 SC1(CA)
- LANE CLOSURE AT EXIT RAMP**
- ES-1 SEE NOTE 14 SC1(CA)
- NOTES:**
- Median lane closures shall conform to the details as shown except that C20(CA) and W4-2L signs shall be used.
  - At least one person shall be assigned to provide full time intervention of traffic control devices for lane closures.
  - Duplicate sign installations are not required:
    - On opposite shoulder if at least one-half of the available lanes remain open to traffic.
    - In the median if the width of the median shoulder is less than 2' and the outside lanes are to be closed.
  - Advance warning sign on each side of roadway shall be equipped with at least two flashing arrow sign. Each sign shall be orange or fluorescent orange in color. Flashing beacons shall be placed at the locations indicated lane closure during hours of darkness.
  - W1-300 ROAD WORK sign with minimum of 48" x 24" as appropriate shall be placed at the end of the lane closure unless the end of work area is obvious or ends within project limits.

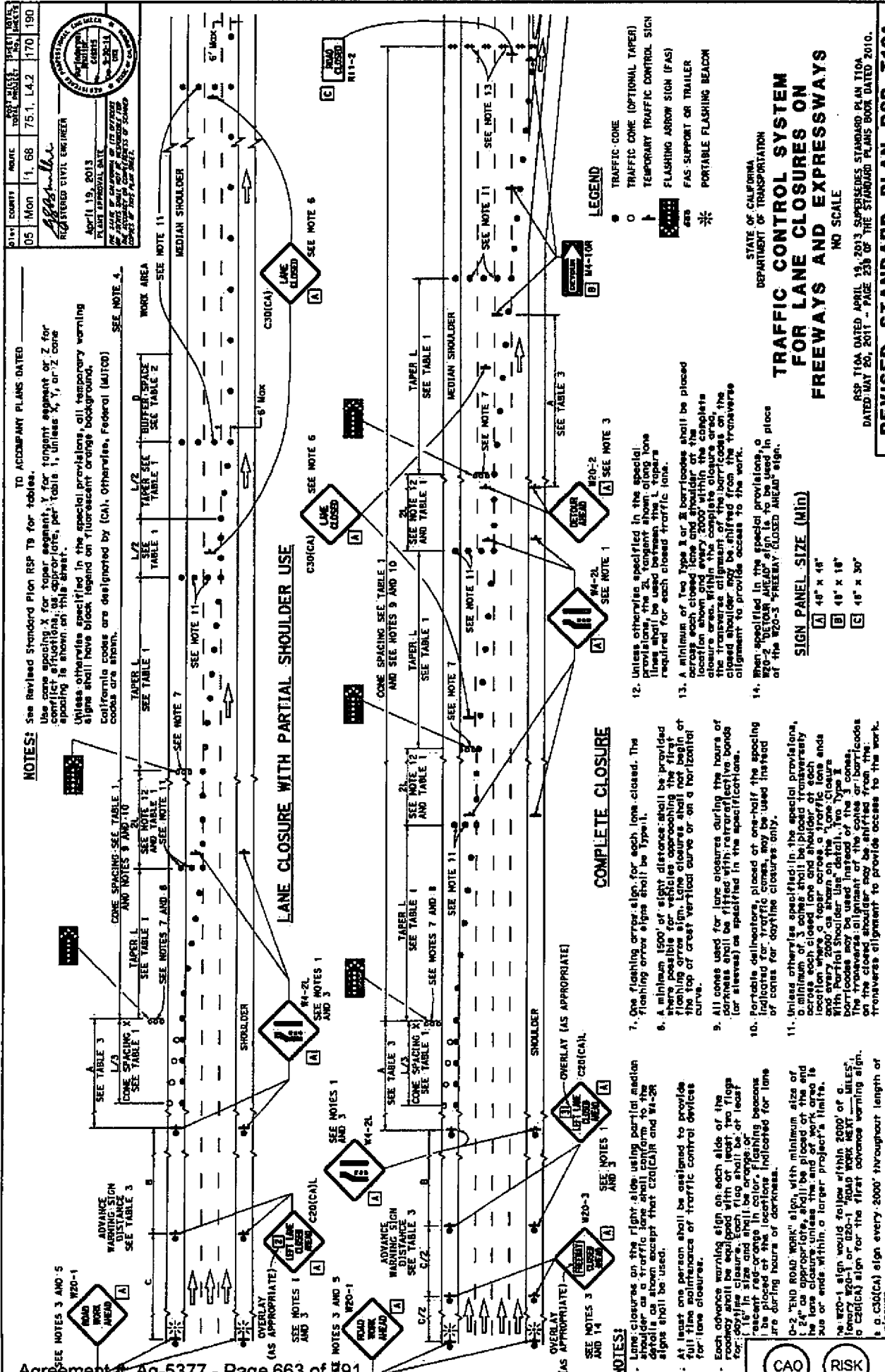
CAO      RISK

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
 FOR LANE CLOSURE ON  
 FREEWAYS AND EXPRESSWAYS**  
 NO SCALE  
 RSP T10 DATED APRIL 19, 2010 SUPERSEDES STANDARD PLAN T10  
 DATED MAY 20, 2011 - PAGE 237 OF THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP T10**

DATE	COUNTY	ROUTE	TOTAL MILES	POST MILES	POST MILES
05	Mon	1, 68	75.1	L.4.2	170 190

REGISTERED CIVIL ENGINEER  
 APR 11 19 2013  
 EXPIRES 04 11 2016  
 STATE OF CALIFORNIA  
 PROFESSIONAL SEAL  
 NO. 45852  
 REGISTERED CIVIL ENGINEER  
 APR 11 19 2013  
 EXPIRES 04 11 2016  
 STATE OF CALIFORNIA  
 PROFESSIONAL SEAL  
 NO. 45852

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

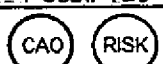


**TRAFFIC CONTROL SYSTEM FOR LANE CLOSURES ON FREEWAYS AND EXPRESSWAYS**  
 NO SCALE

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

RSP T10A DATED APRIL 19, 2013, SUPERSEDES STANDARD PLAN T10A, DATED MAY 20, 2011 - PAGE 239 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP T10A**



**COMPLETE CLOSURE**

- One flashing arrow sign for each lane closed. The flashing arrow signs shall be Type 1.
- A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of a vertical curve or on a horizontal curve.
- All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
- Portable delineators, placed at one-half the spacing of cones for daytime closures only.
- Unless otherwise specified in the special provisions, a minimum of 3 cones shall be placed transversely across each closed lane and shoulder at each end and every 2000' as shown on the Lane Closure and Partial Shoulder Use detail. Two Type III barricades may be used instead of the 3 cones. The transverse alignment of the cones or barricades on the closed shoulder may be shifted from the transverse alignment to provide access to the work.

- Unless otherwise specified in the special provisions, the 2L taper shown along lane lines shall be used between the L tapers required for each closed traffic lane.
- A minimum of Two Type III or II barricades shall be placed across each closed lane and shoulder at the location shown and every 2000' within the complete closure area. Within the complete closure area, the transverse alignment of the barricades on the closed shoulder shall be shifted from the transverse alignment to provide access to the work.
- When specified in the special provisions, a W20-2 'VELOCITY AHEAD' sign is to be used in place of the W20-3 'PREEVENT CLOSED AHEAD' sign.

**SIGN PANEL SIZE (Min)**

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

**NOTES:**

- Each advance warning sign on each side of the roadway shall be equidistant with the end of the work area. Signs shall be placed at least 24' from the end of the work area. Signs shall be placed at least 24' from the end of the work area. Signs shall be placed at least 24' from the end of the work area.
- At least one person shall be assigned to provide full time maintenance of traffic control devices for lane closures.
- Each advance warning sign on each side of the roadway shall be equidistant with the end of the work area. Signs shall be placed at least 24' from the end of the work area. Signs shall be placed at least 24' from the end of the work area.

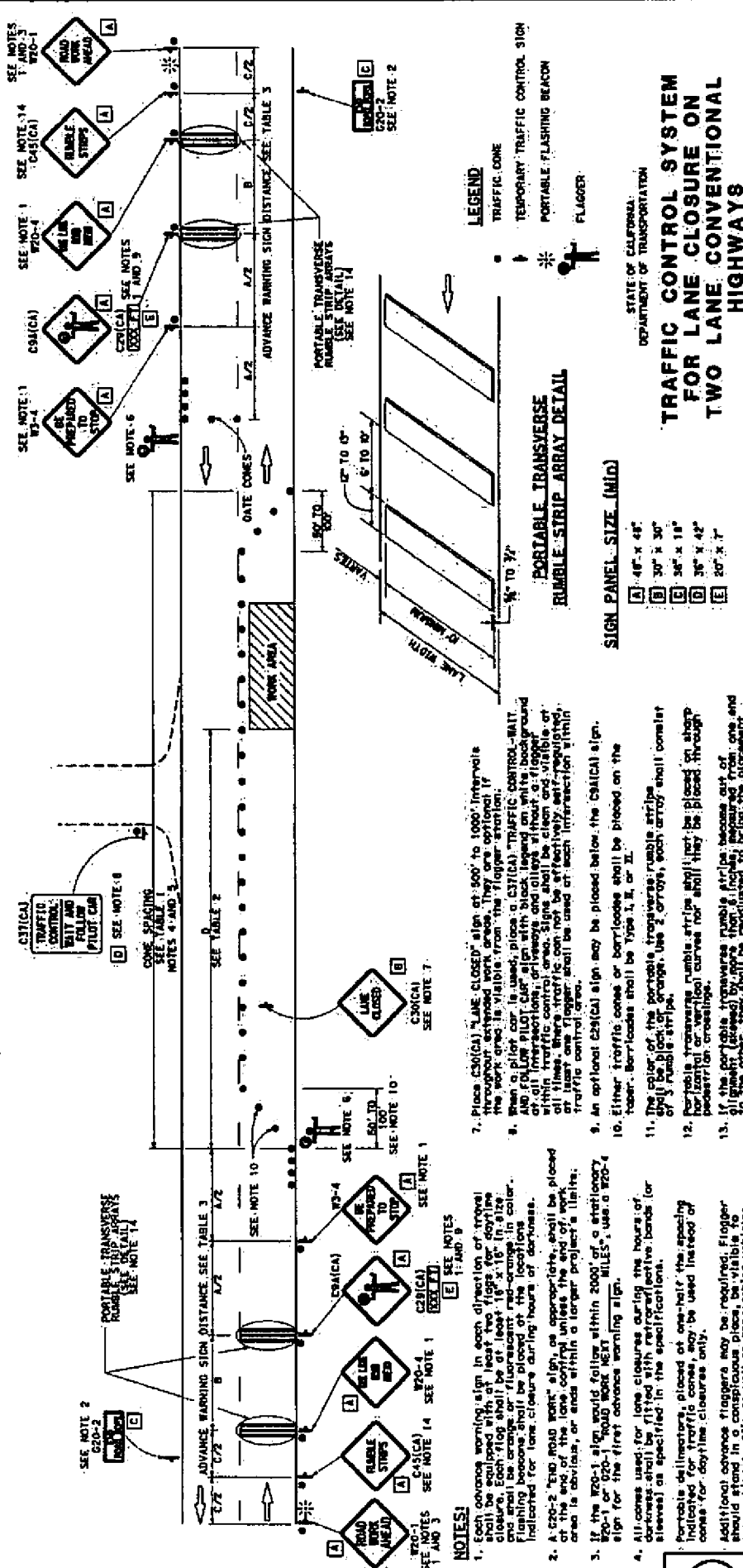
Exhibit A.2

DATE	COUNTY	ROUTE	POST MILE	SHEET NO.	TOTAL SHEETS
05/18/11	Mon	1	68	75.1, L4.2	171

October 17, 2014  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAY SAFETY AND DESIGN  
 DIVISION OF TRANSPORTATION PLANNING AND DESIGN  
 DIVISION OF TRAFFIC CONTROL AND SIGNALS  
 DIVISION OF HIGHWAY DESIGN  
 DIVISION OF HIGHWAY MAINTENANCE

TYPICAL LANE CLOSURE WITH REVERSIBLE CONTROL



TO ACCOMPANY PLANS DATED \_\_\_\_\_

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

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

NO SCALE

RP T13 DATED OCTOBER 17, 2014 SUPERSEDES RP T13 DATED JULY 19, 2014 AND RP T13 DATED APRIL 19, 2013 AND STANDARD PLAN T13 DATED MAY 29, 2011 - PAGE 241 OF THE STANDARD PLANS BOOK DATED 2010.

#### REVISED STANDARD PLAN RSP T13

**NOTES:**

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

**NOTES:**

- Each advance warning sign in each direction of travel shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
- A "END ROAD WORK" sign, as appropriate, shall be placed at the end of the lane control unless the end of work area is obvious, or ends within a larger project's limits.
- If the W20-1 sign would follow within 2000' of a stationery sign for the first advance warning sign, W1E5-1, use a W20-4 sign.
- All cones used for lane closures during the hours of darkness shall be equipped with reflective bands (or sleeves) as specified in the specifications.  
 Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.  
 Additional advance flaggers may be required. Flaggers should stand in a conspicuous place, be visible to approaching traffic as well as approaching vehicles after the first vehicle has stopped. During the hours of darkness, flaggers shall wear reflective vests, be illuminated and clearly visible to approaching traffic. The illumination requirement of the flagging on the ground shall be at least 20" in diameter. Place a minimum of four cones at 50' intervals in advance of flagger station as shown.

CAO
RISK



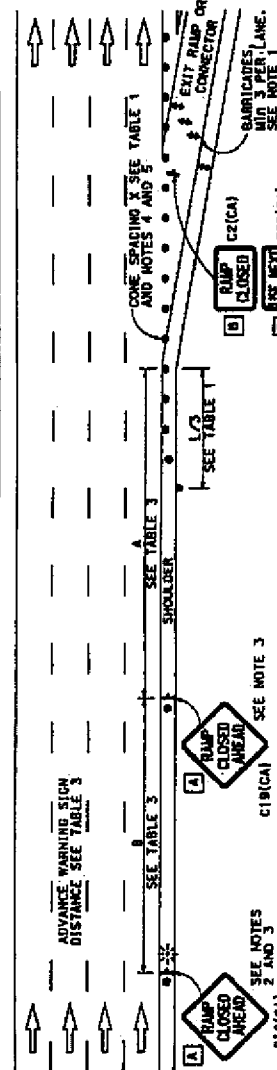
STATE	COUNTY	ROUTE	POST MILEAGE	SHEET NO.	TOTAL SHEETS
09	Mon	1, 68	75.1, L4.2	172	180

APPROVED: *[Signature]*  
 REGISTERED CIVIL ENGINEER  
 APR 19, 2013  
 EXPIRES: APR 19, 2015  
 THE STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 1200 N. STREETS  
 SACRAMENTO, CALIFORNIA 95833

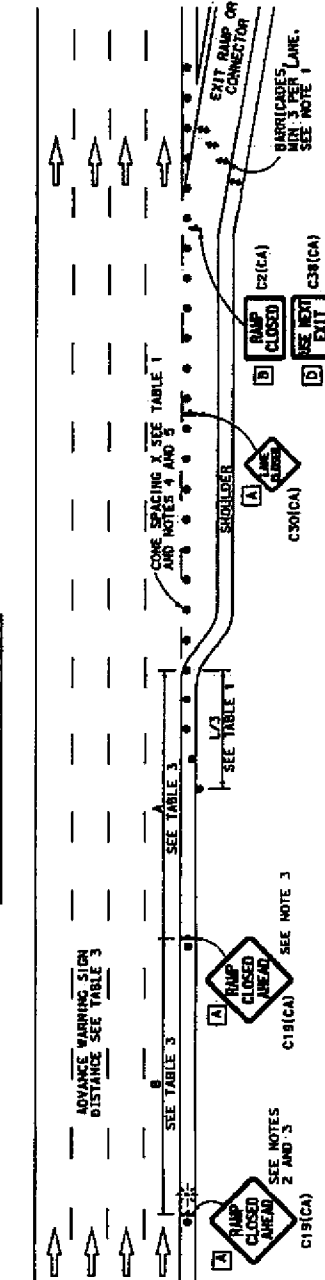
**TYPICAL RAMP CLOSURES**

- SIGN PANEL SIZE (MIN)**
- A 48" x 48"
  - B 48" x 30"
  - C 36" x 36"
  - D 48" x 36"
- LEGEND**
- TRAFFIC CONE
  - ↑ TEMPORARY TRAFFIC CONTROL SIGN
  - ⬇ BARRICADES
  - ⚡ PORTABLE FLASHING BEACON

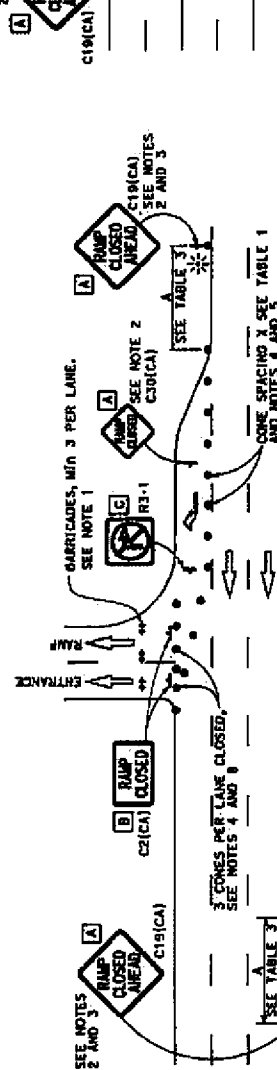
**EXIT RAMP OR CONNECTOR**



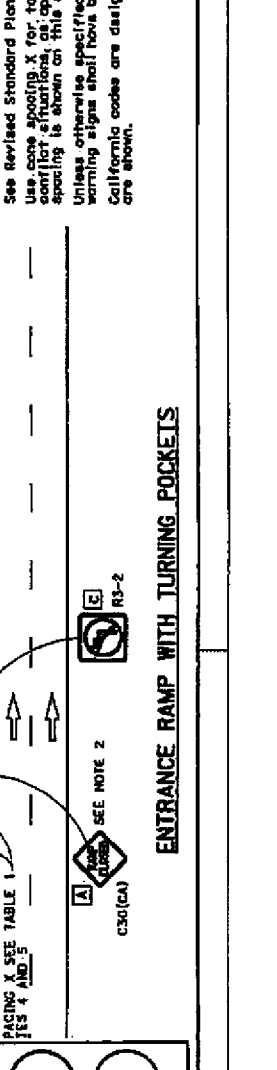
**EXIT RAMP OR CONNECTOR**



**EXIT RAMP OR CONNECTOR WITH ADDITIONAL LANE**



**ENTRANCE RAMP WITH TURNING POCKETS**



**NOTES:**

1. Barricades shall be Type I, II, or III for closures lasting 15 minutes or less and Type IV for closures lasting longer than one week.
2. In addition to placing the C19(CA) "RAMP CLOSED AHEAD" and C30(CA) "RAMP CLOSED" signs, black on orange overlay plaques with the word "CLOSED" may be mounted, as directed by the Engineer, on all guide signs along the approach to the closure. The overlay size on the overlay shall be the same as the guide sign.
3. Each advance C19(CA) "RAMP CLOSED AHEAD" sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16 x 24 in size and shall be orange or fluorescent orange-red. The flags shall be placed on top of the sign. The C19(CA) sign during hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
4. All cones used for ramp closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.
5. Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime ramp closures only.
6. At least one person shall be assigned to provide full time control devices, unless otherwise directed by the Engineer.
7. The existing "EXIT" signs shall be covered during ramp closures.
8. A minimum of 3 cones shall be placed transversely across each closure lane and shoulder.

**NOTES:**

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

CAO RISK

**ENTRANCE RAMP WITH TURNING POCKETS**

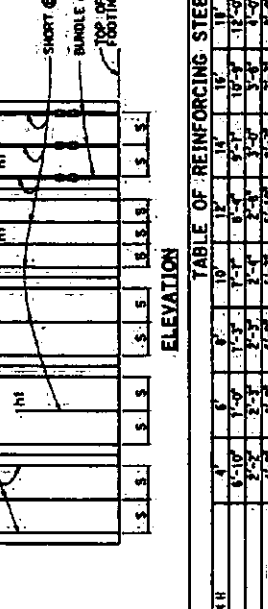
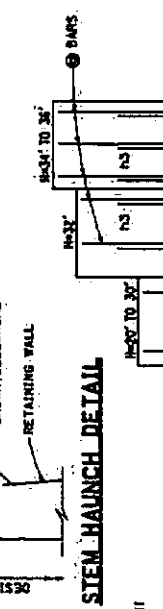
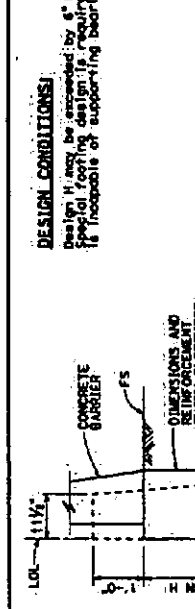
Sheet	05	Mon	1.68	75.1	14.2	173	190
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APR 26, 2012  
 PLANS APPROVAL DATE  
 FOR STATE OF CALIFORNIA  
 CIVIL ENGINEER  
 REGISTERED PROFESSIONAL ENGINEER  
 STATE OF CALIFORNIA  
 CIVIL ENGINEER  
 NO. 50787  
 JOHN J. BAKER

**DESIGN NOTES:**  
 TO ACCOMPANY PLANS DATED: \_\_\_\_\_  
 AASHTO LRFD Bridge Design Specifications, 4th Edition with California Amendments.  
 Varied surcharge on level ground; surface  
 stem architectural treatment of thickness up to 54" of concrete (75 psf) considered  
 54 kip transverse force applied at  $h_e = 35'$  distributed over 10 feet of the top of wall and 1:1 distribution down and outward.  
 Distribution below footing taken no less than 40".  
 $h_e = 0.2 \cdot h_v = 0.0$   
 $\beta = 34'$ ,  $\gamma = 120$  pcf  
 $f'_c = 3,600$  psi  
 $f_y = 60,000$  psi  
**LOAD COMBINATIONS AND LIMIT STATES**  
 Service I  
 Strength I  
 Extreme I  
 Extreme II

**DESIGN CONDITIONS:**  
 Design will be provided by 4" before going to the next step. Special footing design is required where foundation material is incapable of supporting bearing stresses listed in the table.

**DESIGN NOTES:**  
 FORCE EFFECTS  
 1.55 or 1.20 whichever controls Design  
 1.55 or 1.20 whichever controls Design  
 Dead Load of Structure Components  
 Horizontal Earth Pressure  
 Live Load Surcharge (from Earth Fill Height)  
 Soil and Structural and Nonstructural Components Inertia  
 Ventilation and Corrosion Forces



**NOTES:**  
 1. For details not shown and drainage notes, see (A) and (B).  
 2. For wall stem joint details see (C) and (D).  
 3. At @ bars:  
 H ≤ 6', no splices are allowed within 1'-8" above the top of footing.  
 H > 6', no splices are allowed within H/4 above the top of footing.  
 4. Bundles @ bars for H = 34' & 35'.  
 5. Provide @ 10" x 15" of @ bars over a distance of 9'-0" measured from all expansion joints, both wall and end wall locations. For H ≤ 34', back @ bar into footing and reduce bar length as needed to maintain min. C/C cover.

**OPTIONAL KEY DIMENSION**  
 8" FOR H10'  
 1'-0" FOR H12'  
 1'-0" FOR H14'  
 1'-0" FOR H16'  
 1'-0" FOR H18'  
 1'-0" FOR H20'  
 1'-0" FOR H22'  
 1'-0" FOR H24'  
 1'-0" FOR H26'  
 1'-0" FOR H28'  
 1'-0" FOR H30'  
 1'-0" FOR H32'  
 1'-0" FOR H34'  
 1'-0" FOR H36'

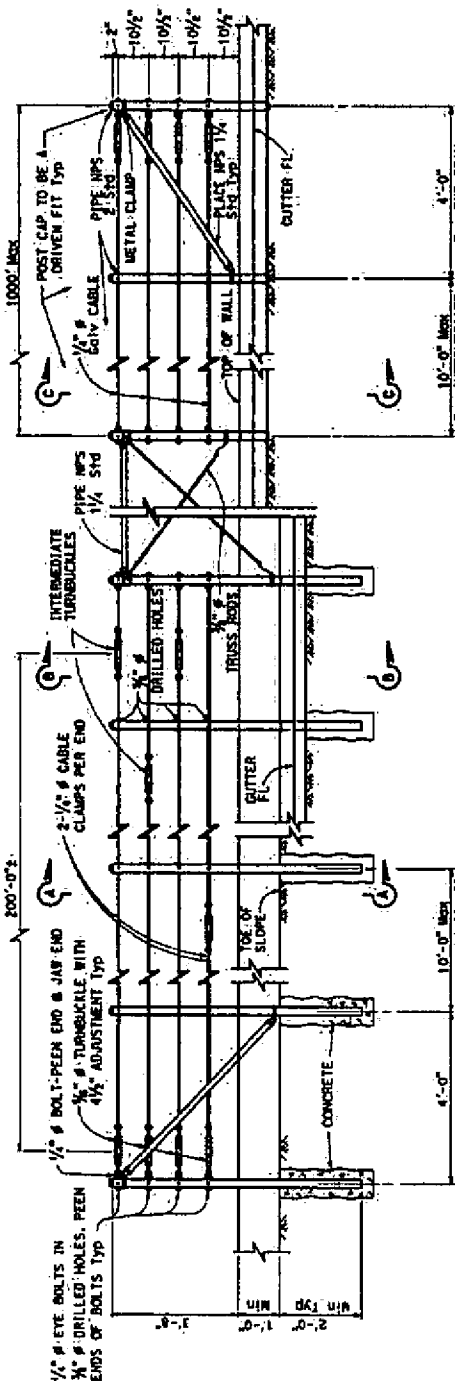
**STATE OF CALIFORNIA**  
 DEPARTMENT OF TRANSPORTATION  
**RETAINING WALL TYPE 1 (CASE 1)**  
 NO SCALE  
 RSP B3-1A DATED APRIL 20, 2012 SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

**REVISIONS**  
 1. 11/12/10  
 2. 11/12/10  
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 100. 11/12/10





DATE	QUANTITY	NO.	DATE	NO.	DATE	NO.
05	Mon	1	68	75.1	14.2	175
REVISIONS: SEE PLAN DRAWING OCTOBER 21, 2011 PLANS APPROVED DATE THE CITY OF LOS ANGELES PUBLIC WORKS DEPARTMENT THE CITY OF LOS ANGELES PUBLIC WORKS DEPARTMENT THE CITY OF LOS ANGELES PUBLIC WORKS DEPARTMENT						

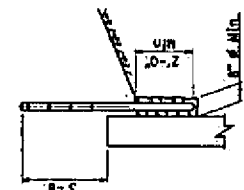
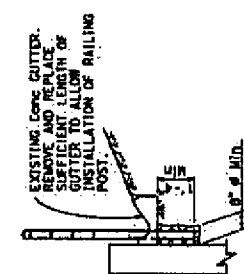
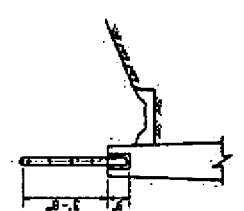


EXISTING WALL (WITHOUT GUTTER)  
Existing

RETAINING WALL (WITH GUTTER)  
Existing

RETAINING WALL (WITH GUTTER)  
New construction

**ELEVATION**



SECTION A-A  
Existing

SECTION B-B  
Existing

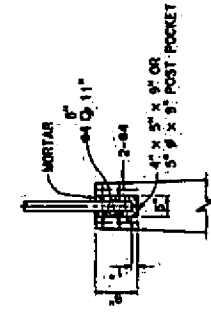
SECTION C-C  
New construction

**NOTES**

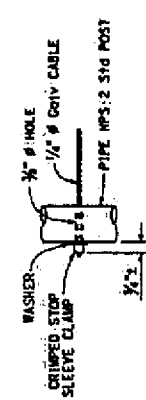
1. Maximum distance between turnbuckles shall be 200'-0".
2. Intermediate turnbuckles to be placed in adjacent spans.
3. Cable shall not be spliced between intermediate turnbuckles and end posts.
4. Posts to be vertical.
5. Alignment of holes in posts may vary to conform to slope of top of retaining wall.
6. The Contractor shall verify all dependent dimensions in the field before ordering or fabricating any material.
7. Line posts shall be braced horizontally and trussed diagonally in both directions at intervals not to exceed 1000'.
8. Post pockets to be centered in top of wall.
9. Typical end spans, braced in both directions, shall be constructed at changes in line where the angle of deflection is 15° or more.
10. Provide thimbles of all cable loops.

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**CABLE RAILING**  
NO SCALE  
RSP B11-47, DATED OCTOBER 21, 2011, SUPERSEDES STANDARD PLAN B11-47  
DATED MAY 20, 2011 - PAGE 253 OF THE STANDARD PLANS BOOK DATED 2010.

POST POCKET



ALTERNATIVE DEAD END ANCHORAGE







FILE NO.	COUNTY	ROUTE	POST MILE	POST MILE	POST MILE	POST MILE	POST MILE
05	Mon	1	68	75.1	14.2	178	190

REGISTERED ELECTRICAL ENGINEER

JULY 19, 2013

PLANS APPROVAL DATE

ON FILE AT THE OFFICE OF THE REGISTERED ELECTRICAL ENGINEER

FOR THE STATE OF CALIFORNIA

REGISTERED ELECTRICAL ENGINEER

CONDUIT		SIGNAL EQUIPMENT	
NEW	EXISTING	NEW	EXISTING
---	---	PEDESTRIAN SIGNAL HEAD INDICATES COUNTDOWN PEDESTRIAN HEAD	
---	---	PUSH BUTTON ASSEMBLY POST	
---	---	PEDESTRIAN BARRICADE	
---	---	VEHICLE SIGNAL HEAD WITH BACKPLATE AND 3 SECTIONS (RED, YELLOW AND GREEN)	
---	---	VEHICLE SIGNAL HEAD WITH SINGLE VISOR	
---	---	MODIFICATIONS OF BASIC STANDARD INDICATES ALL NON-ARROW SECTIONS LOWERED	
---	---	INDICATES LOWERED GREEN SECTION ONLY	
---	---	INDICATES ALL 3 SECTIONS LOWERED (RED, YELLOW AND GREEN)	
---	---	VEHICLE SIGNAL HEAD CONSISTING OF RED, YELLOW AND GREEN LEFT ARROW SECTIONS	
---	---	VEHICLE SIGNAL HEAD CONSISTING OF RED AND YELLOW SECTIONS WITH AN UP GREEN ARROW SECTION	
---	---	VEHICLE SIGNAL HEAD (IS SECTION) CONSISTING OF RED, YELLOW AND GREEN SECTIONS WITH YELLOW AND GREEN RIGHT ARROW SECTIONS	
---	---	TYPE 115 STANDARD WITH VEHICLE SIGNAL HEAD AND LUMINAIRE	
---	---	TYPE 115 STANDARD WITH VEHICLE SIGNAL HEAD AND LUMINAIRE	
---	---	STANDARD WITH LUMINAIRE AND SIGNAL MAST ARMS AND ATTACHED VEHICLE SIGNAL HEADS	
---	---	TYPE 1 STANDARD WITH ATTACHED VEHICLE SIGNAL HEADS	
---	---	STANDARD WITH A SIGNAL MAST ARM, ATTACHED VEHICLE SIGNAL HEADS AND INTERNALLY ILLUMINATED STREET LIGHT SIGN	
---	---	CONTROLLER ASSEMBLY, DOOR INDICATES FRONT OF CABINET	

SERVICE EQUIPMENT		SIGNAL EQUIPMENT CONT	
NEW	EXISTING	NEW	EXISTING
---	---	GUARD POST	
---	---	TYPE 1 STANDARD WITH RAMP	
---	---	VEHICLE DETECTION FOR THE EMERGENCY	
---	---	VEHICLE DETECTION SYSTEM	

TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

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

POLE-MOUNTED SERVICE DESIGNATION		ILLUMINATED OVERHEAD SIGN	
NEW	EXISTING	NEW	EXISTING
---	---	SINGLE POST, SINGLE ILLUMINATED SIGN, BACKLASH BUTTERFLY	
---	---	SINGLE POST, DOUBLE ILLUMINATED SIGN, BACKLASH BUTTERFLY	
---	---	SINGLE POST, SINGLE ILLUMINATED SIGN, FULL BUTTERFLY	
---	---	DOUBLE POST, SINGLE ILLUMINATED SIGN	
---	---	SINGLE ILLUMINATED SIGN MOUNTED ON STRUCTURE	
---	---	DOUBLE POST, SINGLE ILLUMINATED SIGN WITH ELECTRAFLYER	

FLASHING BEACON	
NEW	EXISTING
---	---
---	---
---	---

FLASHING BEACON	
NEW	EXISTING
---	---
---	---
---	---

FLASHING BEACON	
NEW	EXISTING
---	---
---	---
---	---

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION

**ELECTRICAL SYSTEMS  
(LEGEND AND ABBREVIATIONS)**

NO SCALE

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

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

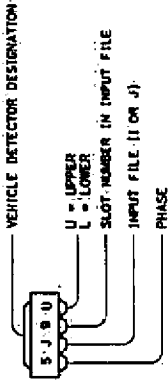


DATE	PROJECT	DATE	SCALE
05	Mon	1, 68	75.1, L4.2
REGISTERED ELECTRICAL ENGINEER [Signature] JULY 19, 2013 FLEETS APPROVAL DATE BY STATE OF CALIFORNIA [Signature] FOR PROJECT NO. 100 07003 FOR APPROVAL OF THE PUBLIC WORKS DIVISION OF THE STATE OF CALIFORNIA		179 190 179 190	

**WIRING DIAGRAM LEGEND**

- EXTERNAL CONDUCTOR
- CONDUCTOR OR BUS
- TIE POINT
- CONTACTOR, NO. CONTACT
- TERMINAL BLOCKS
- CONTACTOR, NC CONTACT
- ENCLOSURE BOND
- GROUNDING ELECTRODE
- CIRCUIT BREAKER
- RECEPTACLE

**VEHICLE DETECTORS**



**EQUIPMENT IDENTIFICATION**

- ILLUMINATED SIGN IDENTIFICATION NUMBER:**  
 SIGN NO. 12345  
 TO 151, 251, 1.0  
 TRANSFORMER RATING (VA)  
 LIGHTING CONTROL TYPE  
 MOUNTING AND TYPE OF FIXTURES  
 DO NOT PLACE ON STANDARD OR STRUCTURE
- ELECTROLUMINESCENT IDENTIFICATION NUMBER:**  
 12345 - 15'-0"  
 MOUNTING LENGTH, IF SHOWN  
 DO NOT PLACE ON STANDARD OR STRUCTURE  
 EQUIPMENT NUMBER - PLACE ON STANDARD OR STRUCTURE, EXISTING EQUIPMENT NUMBERS ARE SHOWN IN PARENTHESES
- CONDUIT AND CONDUCTOR IDENTIFICATION:**  
 1/2" E, 2" D, 1.5" B, 2 D.C., 12" B, 18"  
 NUMBER AND SIZE OF CONDUCTORS AND CABLES  
 SIZE OF CONDUIT IN INCHES  
 #11, #2, #22, #10  
 TRAFFIC PHASE IDENTIFICATION FOR SIGNAL, FACES, DETECTORS AND PHASE DIAGRAMS

**PULL BOXES**

- NEW**
- No. 3 1/2 PULL BOX
  - No. 5 PULL BOX
  - No. 6 PULL BOX
  - No. 7 (CELLING PULL BOX)
  - No. 8 (PENDANT SOFFIT PULL BOX)
  - No. 9 PULL BOX
  - No. 9A PULL BOX
- EXISTING**
- PULL BOX, NO. 5 UNLESS OTHERWISE INDICATED OR NOTED
  - PULL BOX, ADDITIONAL DESIGNATIONS OR DESCRIPTIONS:
    - (C) COMMUNICATIONS PULL BOX
    - (E) PULL BOX WITH EXTENSION
    - (S) SPRINKLER CONTROL PULL BOX
    - (21) ANCHOR BOLTS AND CONDUIT FOR FUTURE INSTALLATION OF TYPE 21 STANDARD
    - (T) TRAFFIC PULL BOX

**SIGNAL AND LIGHTING STANDARD TYPICAL DESIGNATIONS**

- WIND VELOCITY = 100 mph  
 CASE 3 ARM LOADING  
 STANDARD TYPE  
 DETAIL, NUMBER, SECTION, TYPE OR ELEVATION

**MISCELLANEOUS EQUIPMENT**

- NEW**
- CHANGABLE MESSAGE SIGN
  - CLOSED CIRCUIT TELEVISION CAMERA
  - HIGHWAY ADVISORY RADIO POLE AND ANTENNA
  - EXTINGUISHABLE MESSAGE SIGN
  - DETECTION DEVICE
    - M = MICROWAVE SENSOR
    - V = VIDEO IMAGE SENSOR
- EXISTING**

**EXISTING**

- TYPE A DETECTOR LOOP OUTLINE OF SAWCUT SHOWN
- TYPE B DETECTOR LOOP OUTLINE OF SAWCUT SHOWN
- TYPE C DETECTOR LOOP OUTLINE OF SAWCUT SHOWN
- TYPE D DETECTOR LOOP OUTLINE OF SAWCUT SHOWN
- TYPE E DETECTOR LOOP OUTLINE OF SAWCUT SHOWN
- TYPE O DETECTOR LOOP OUTLINE OF SAWCUT SHOWN
- MAGNETIC DETECTOR
- DETECTOR HANDHOLE
- MICROWAVE OR VIDEO DETECTION ZONE

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS  
 (LEGEND AND ABBREVIATIONS)**  
 NO SCALE

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

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





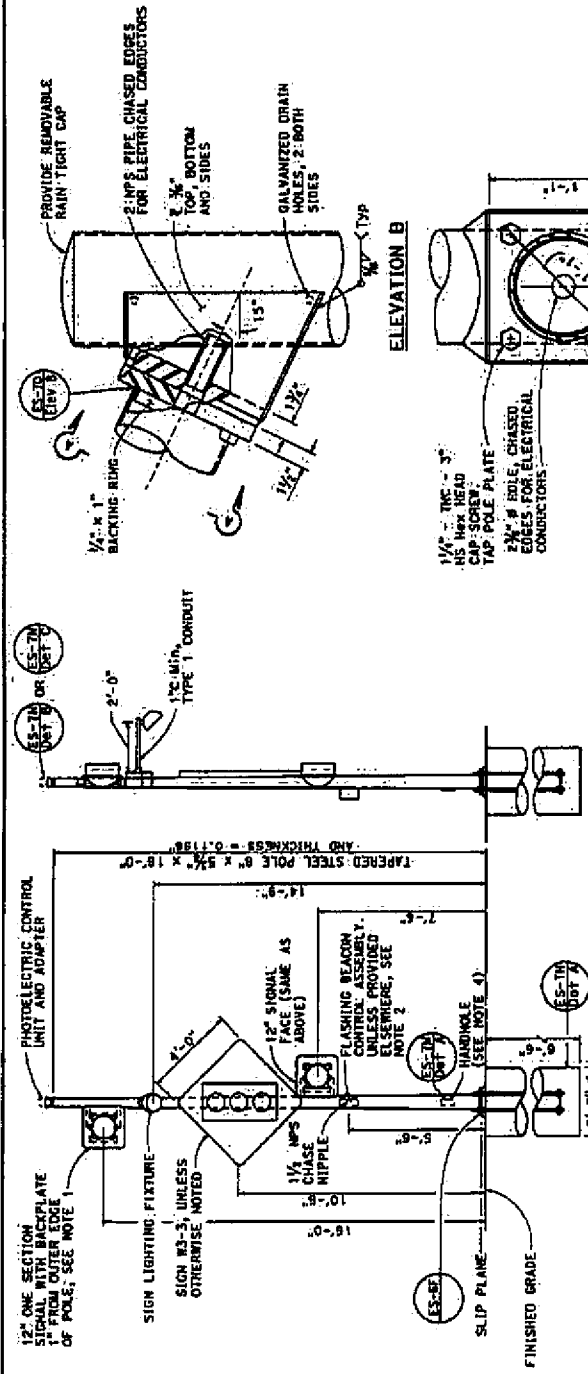
DATE	COUNTY	ROUTE	TOTAL PROJECT	POST MILE	PROJECT NO.	SECTION
05	Mon	1, 88	75.1	L4.2	180	190



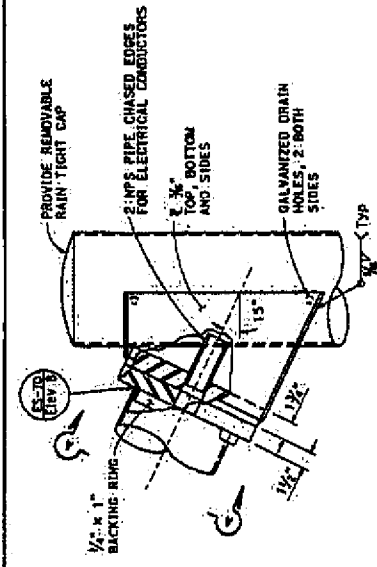
TO ACCOMPANY PLANS DATED \_\_\_\_\_  
 JULY 19, 2013  
 PLEASE DISREGARD DATE  
 ON ANY OF THE SHEETS  
 IN THIS SET OF PLANS  
 WHICH MAY BE DATED  
 PRIOR TO THE DATE OF THIS SET OF PLANS.

**NOTES:**

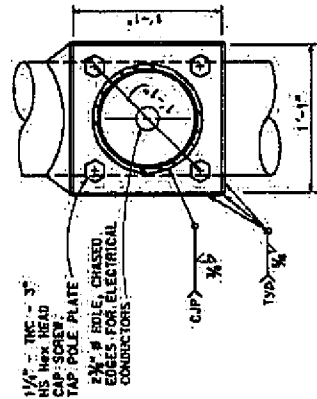
1. See Revised Standard Plan RSP ES-4A and Standard Plan ES-4B for attachment fitting details.
2. For wiring diagram, see Standard Plan ES-149.
3. For additional notes and details, see Standard Plans ES-7M and ES-7N.
4. Handholes shall be located on the downstream side of traffic.
5. See project plans for type of standard to be installed.



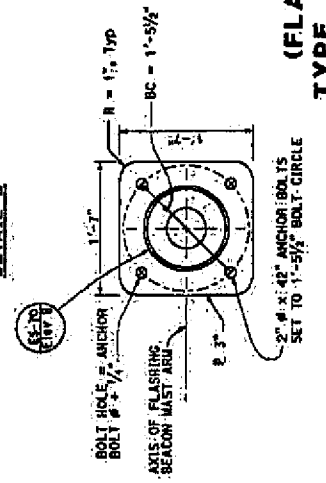
**FRONT VIEW**  
**TYPE 15-FBS**  
**ADVANCE FLASHING BEACON WITH SLIP BASE INSTALLATION**  
**DETAIL A**



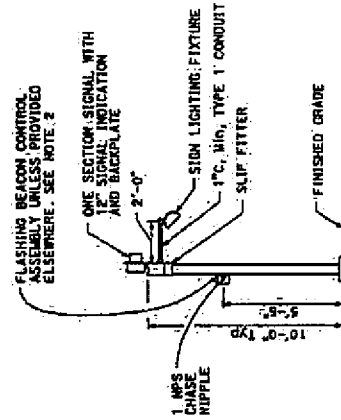
**ELEVATION B**



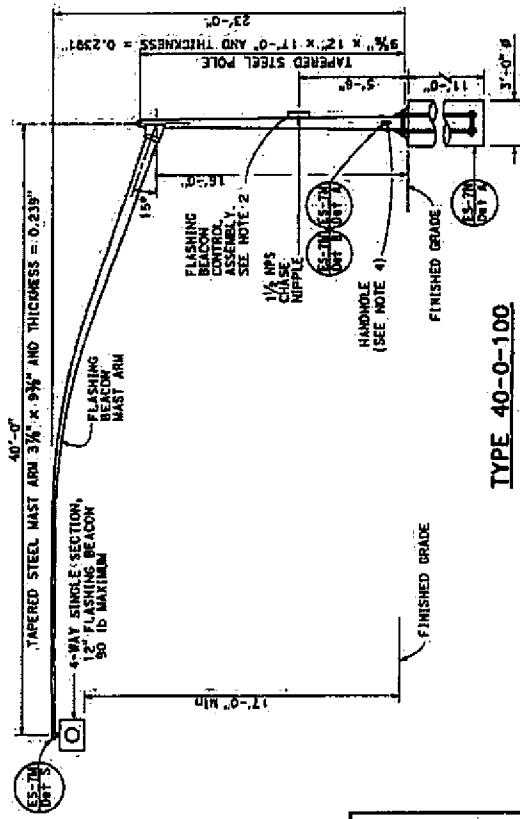
**VIEW A-A**  
**FLASHING BEACON MAST ARM CONNECTION DETAIL**  
**DETAIL B**



**BASE PLATE**  
**DETAIL C**



**TYPE 1-A, 1-B, 1-C AND 1-D**  
**ADVANCE FLASHING BEACON INSTALLATION**  
**DETAIL D**  
 See Note 5



**TYPE 40-0-100**  
**ELEVATION A**



**ELECTRICAL SYSTEMS**  
**(FLASHING BEACON ON A TYPE 1, TYPE 15-FBS AND TYPE 40 STANDARD)**  
 NO SCALE  
 STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
 RSP ES-7J DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-7J, DATED MAY 26, 2011, PAGE 411 OF THE STANDARD PLANS BOOK DATED 2010.

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

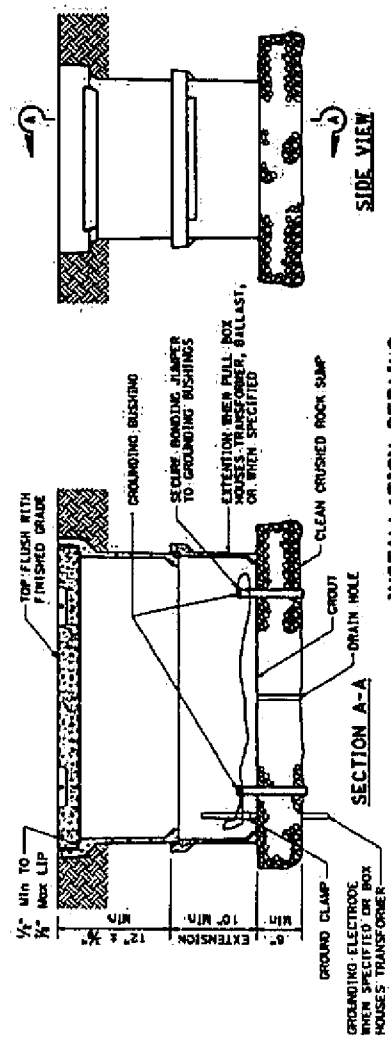
DIST	COUNTY	ROUTE	POST MILES	POST MILE	POST MILE
05	Mon	1 68	75.1, LA.2	181	190

REGISTERED ELECTRICAL ENGINEER  
 July 19, 2013  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA  
 DIVISION OF INDUSTRIAL SAFETY  
 400 R STREET, SACRAMENTO, CA 95833  
 (916) 227-2300  
 www.dir.ca.gov

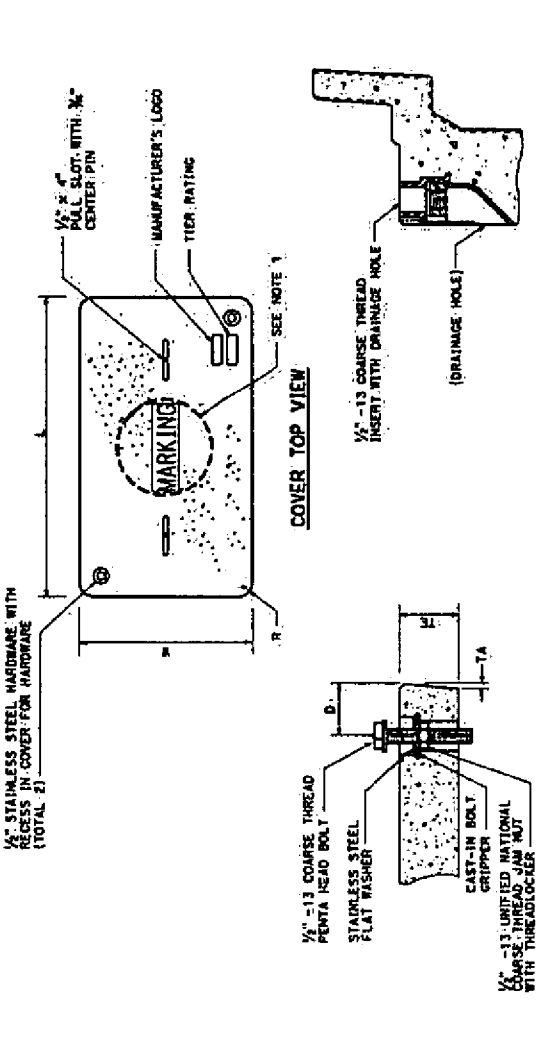
TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

- Pull box covers shall be worked as follows: "SERVICE" service circuits between service point and service disconnect; "SUBALTER-CONTROL" service circuits; control circuits for lighting, signaling, and other circuits; except pull boxes termed "SPRINKLER-CONTROL" and "TELEPHONE" Telephone services)
  - No. 3/4 pull box.
    - "SIGNAL" - Traffic signal circuits with or without lighting or sign lighting circuits.
    - "LIGHTING" - Lighting or sign lighting circuits where voltage is under 600 V.
    - No. 5, 6, 9 or 3/4 pull box.
      - "TRAFFIC SIGNAL" - Traffic signal circuits with or without lighting or sign lighting circuits.
      - "LIGHTING" - Lighting or sign lighting circuits where voltage is under 600 V.
      - "LIGHTING-HIGH VOLTAGE" - Lighting or sign lighting circuits where voltage is above 600 V.
      - "INDICATION" - Circuits to irrigation controller-120 V
      - "PUMP MOTOR" - Pump motor circuits.
      - "COUNT STATION" - Count or speed monitor circuits.
      - "COMMUNICATIONS" - Communication circuits.
      - "TOS COMMUNICATIONS" - TOS communication line.
      - "TOS POWER" - TOS power.
      - "TDC POWER" - Telephone demarcation cabinet power.
      - "TCTV" - Closed circuit television circuits.
      - "TMS" - Traffic monitoring station circuits.
      - "TOS" - Changeable message sign circuits.
      - "MOTOR" - Highway advisory radio circuits.
      - "BOOSTER PUMP" - Booster pump circuit.
- The nominal dimensions of the opening in which the cover sets shall be the same as the cover dimensions except the length and width dimensions shall be 1/8" greater.
- Covers and boxes shall be interchangeable with California standard male and female gages, when interchanged with a standard male or female gage, the top surface shall be flush within 1/8"; top circular radius of covers and pull boxes shall have a 3/8" radius.
- Pull box extension may be another pull box as long as the bottom edge of the pull box can fit into the cover opening.
- All dimensions for the cover for non-traffic pull box are nominal values.



**INSTALLATION DETAILS**



TYPICAL THREADED INSERT OR SIMILAR

PULL BOX	COVER			
	MINIMUM DEPTH BOX	MINIMUM DEPTH EXTENSION	MAXIMUM WEIGHT	MAXIMUM WEIGHT
No. 3/4	12"	N/A	40 LB	30 LB
No. 5	12"	10"	55 LB	60 LB
No. 6	12"	10"	70 LB	85 LB

CAO RISK

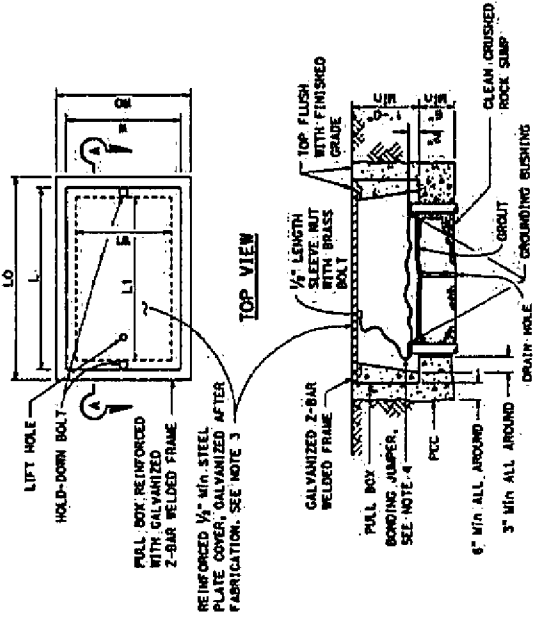
DIST	COUNTY	ROUTE	POST MILE	PLAN SHEET
05	MON	1, 68	75.1, L4.2	182, 180

REGISTERED ELECTRICAL ENGINEER  
 July 19, 2013  
 PLANS APPROVAL DATE  
 OF STATE OF CALIFORNIA  
 REGISTERED ELECTRICAL ENGINEER  
 LICENSE NO. 15119

TO ACCOMPANY PLANS DATED \_\_\_\_\_

**NOTES:**

- Traffic pull box shall be provided with steel cover and special concrete footing. Steel reinforcing shall be as regularly used in the standard products of the respective manufacturer.
- Steel reinforcing shall be as regularly used in the standard products of the respective manufacturer.
- Pull box covers shall be marked as follows: "SUBJECT" service circuits shall be marked "SUBJECT" and "TRAFFIC SIGNALS" shall be marked "TRAFFIC SIGNALS". Signal control circuits 50 V or less shall be marked "TRAFFIC SIGNALS". Telephone service shall be marked "TELEPHONE SERVICE".
- No. 3/4(T) pull box:
  - "Signal" - Traffic signal circuits with or without lighting or sign lighting circuits.
  - "Lighting" - Lighting or sign lighting circuits where voltage is 50V or less.
  - "Traffic Signal" - Traffic signal circuits with or without lighting or sign lighting circuits.
  - "Lighting" - Lighting or sign lighting circuits where voltage is 50V or less.
  - "Lighting or Sign" - Lighting or sign lighting circuits where voltage is 50V or less.
  - "Irrigation" - Circuits to irrigation controller 120 V or more.
  - "Jump Meter" - Ramp meter circuits.
  - "Count Station" - Count or speed monitor circuits.
  - "Communications" - Communication circuits.
  - "TOS Communications" - TOS communications line.
  - "TOS Power" - TOS power.
  - "TDC Power" - Telephone deactivation cabinet power.
  - "CCV" - Closed circuit television circuits.
  - "TMS" - Traffic monitoring station circuits.
  - "CMS" - Changeable message sign circuits.
  - "HAR" - Highway advisory radio circuits.
  - "Booster Pump" - Booster pump circuit.
- Bonding jumper for metal covers shall be 3' long, minimum. The metal dimensions of the opening in which the cover sits shall be the same as the cover dimensions except the length and width dimensions shall be 1/8" greater.
- Covers and boxes shall be interchangeable with California standard scale and frame gages, then interchange with standard scale or female gage, the top surfaces shall be flush within 1/8".



**SECTION A-A**  
**No. 3/4(T), No. 5(T) AND**  
**No. 6(T) TRAFFIC PULL BOX**

**DIMENSION TABLE**

PULL BOX	MINIMUM DEPTH BOX AND EXTENSION		COVER									
	MINIMUM THICKNESS	EXTENSION	NO.	L0	L1	W1	L#	W#	R	EDGE THICKNESS	EDGE TAPER	
No. 3/4(T)	1 1/2"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
No. 5(T)	1 1/2"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
No. 6(T)	2"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"

\* EXCLUDING CONSULT: #B #W TOP DIMENSION

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(TRAFFIC PULL BOX)**  
 NO. SCALE  
 RSP ES-8B DATED JULY 19, 2013, SUPPLEMENTS RSP ES-8B DATED JANUARY 20, 2012  
 PLAN SUPPLEMENTS: THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP ES-8B**

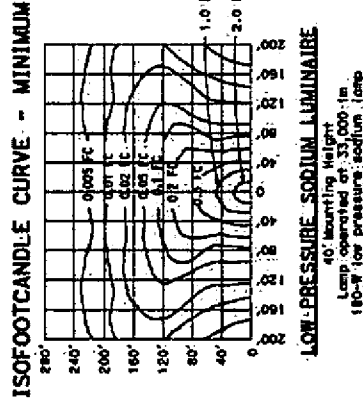
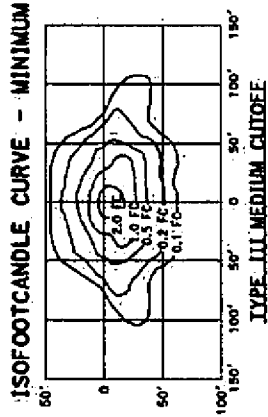
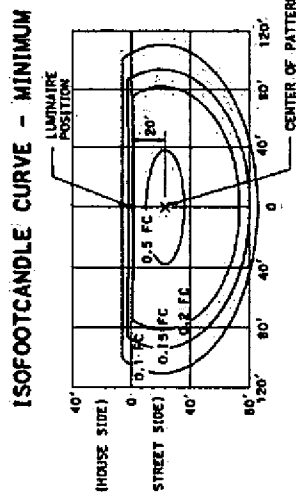
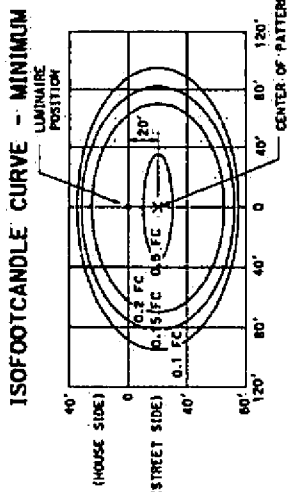
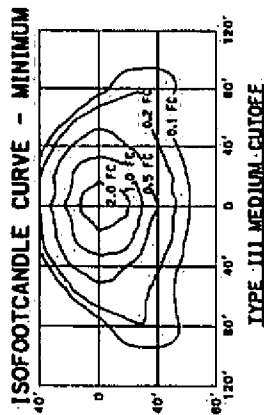
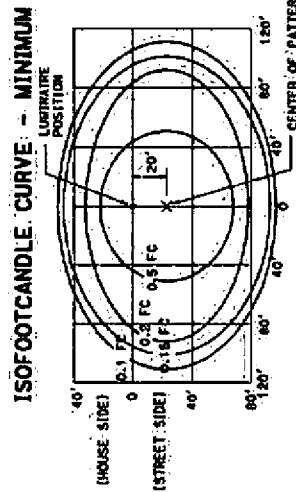
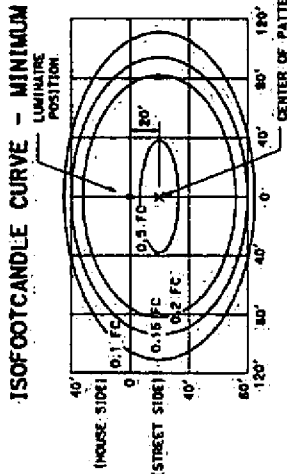
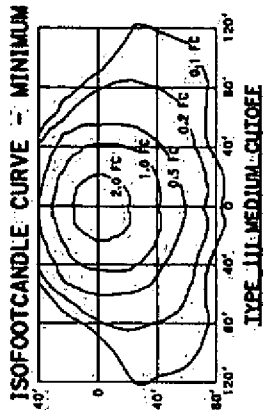


Exhibit A.2

STATE	COUNTY	CITY	PROJECT	DATE	SCALE
05	Mon	1	75.1 L4.2	183	190

DESIGNED BY: [Signature]  
 CHECKED BY: [Signature]  
 DATE: July 19, 2013  
 PROJECT: [Project Name]  
 SHEET NO.: [Sheet Number]

TO ACCOMPANY PLANS DATED \_\_\_\_\_



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

NO. SCALE

RSP ES-10A DATED JULY 19, 2013 SUPERSEDES RSP ES-10A DATED JULY 20, 2012 THAT SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP ES-10A

CAO

RISK

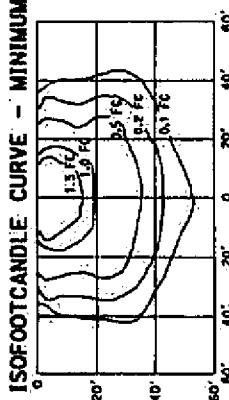
DATE	COUNTY	PROJECT	DATE	SCALE	DATE
05	MON	1.68	75.1, L4.2	1/84	180

**Professional Engineer**  
**California State Board of Electrical Engineering**  
 License No. 10722  
 State of California  
 License No. 10722  
 State of California  
 License No. 10722  
 State of California

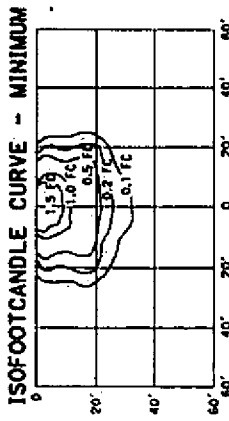
**Professional Engineer**  
**California State Board of Electrical Engineering**  
 License No. 10722  
 State of California  
 License No. 10722  
 State of California  
 License No. 10722  
 State of California

JULY 20, 2012  
 PLANS APPROVAL DATE  
 BY: [Signature]  
 FOR: [Signature]  
 PROJECT: [Signature]

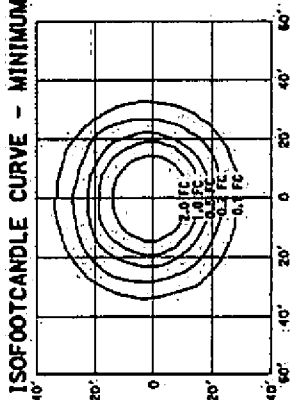
TO ACCOMPANY PLANS DATED \_\_\_\_\_



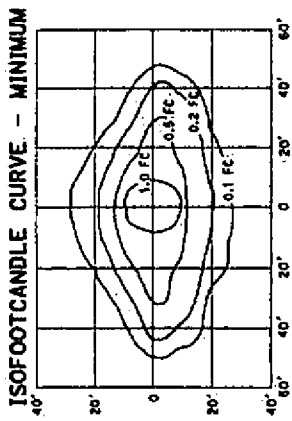
**WALL LUMINAIRE**  
 15' mounting height  
 Lamp operated at 5,500 lm  
 100-W high pressure sodium lamp  
 ANSI Designation S54



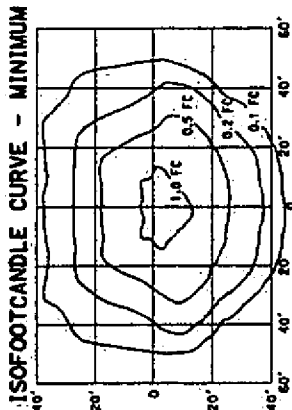
**WALL LUMINAIRE**  
 15' mounting height  
 Lamp operated at 5,800 lm  
 70-W high pressure sodium lamp  
 ANSI Designation S52



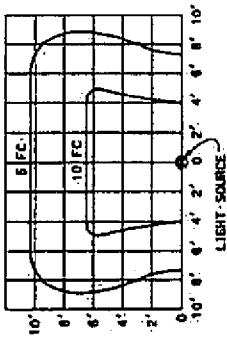
**PENDANT SOFFIT LUMINAIRE**  
 17' mounting height  
 Lamp operated at 5,500 lm  
 70-W high pressure sodium lamp  
 ANSI Designation S52



**PENDANT SOFFIT LUMINAIRE TYPE III SHORT**  
 17' mounting height  
 Lamp operated at 5,500 lm  
 70-W high pressure sodium lamp  
 ANSI Designation S52



**FLUSH SOFFIT LUMINAIRE**  
 17' mounting height  
 Lamp operated at 5,500 lm  
 70-W high pressure sodium lamp  
 ANSI Designation S52



**SIGN LIGHTING FIXTURE ISOFOOTCANDLE DIAGRAM**

- NOTES:**
1. (FC) of initial illumination on a 10'-0" x 20'-0" panel;
  2. The FC shown are with the fixture attached to the light fixture mounting channel which places the center of the source 4 ft in front of panel and 1'-0" below the bottom edge;
  3. Applicable lamps: 85-W fluorescent phosphor coated (operation lamp).

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**ELECTRICAL SYSTEMS**  
**(ISOFOOTCANDLE DIAGRAMS)**  
 NO SCALE  
 RSP ES-10B DATED JULY 20, 2010. SUPPLEMENTS THE STANDARD PLANS BOOK DATED 2010.  
**REVISED STANDARD PLAN RSP ES-10B**

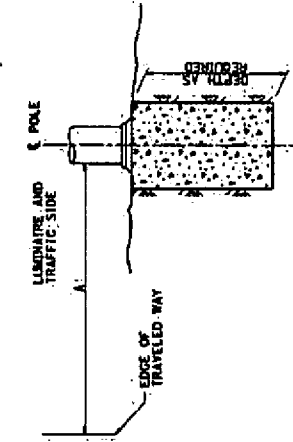


CITY	COUNTY	ROUTE	POST MILE	PROJECT NO.	SHEET NO.
05	Mon	1. 88	75.1, L4.2	185	190

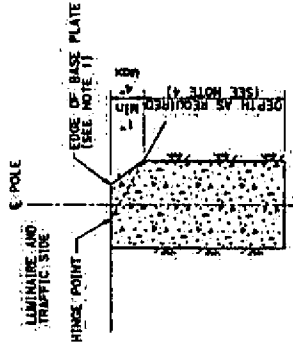
JULY 19, 2013  
 PLANS APPROVAL DATA  
 THE STATE OF CALIFORNIA  
 REGISTERED CIVIL ENGINEER  
 [Signature]  
 REGISTERED CIVIL ENGINEER

TO ACCOMPANY PLANS DATED \_\_\_\_\_

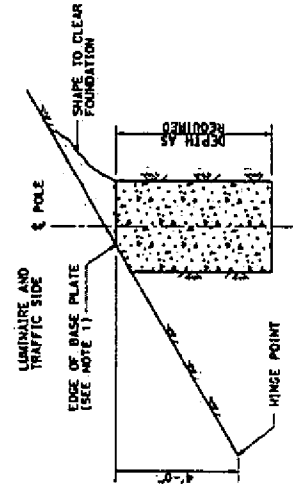
STANDARD TYPE	SETBACK (DIMENSION A)
32'	30'-0" (Min)
31'	20'-0" (Min)
15', 15'-15", 20', 21', 30'	ARM LENGTH (ft/in)



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



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

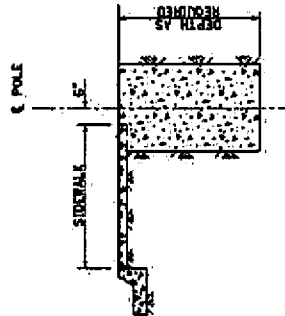


**CUT SLOPES  
STEEPER THAN 4:1,  
LESS THAN 2:1  
DETAIL A-1**  
See Note 2 and 3

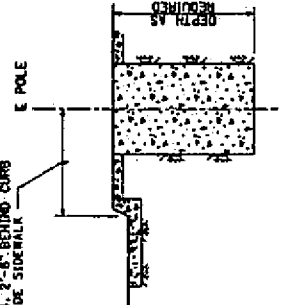
**FOUNDATIONS ADJACENT TO ALL ROADWAYS EXCEPT  
IN SIDEWALK, MEDIAN AND ISLAND AREAS  
DETAIL A**

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

3'-4" BEHIND MEDIAN OR ISLAND CURB  
MEDIAN OR ISLAND CURB  
WITH WIDE SIDEWALK



**NARROW SIDEWALK  
DETAIL B-2**  
Less than 7' wide



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

**FOUNDATIONS IN SIDEWALK, MEDIAN AND ISLAND AREAS  
DETAIL B**

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

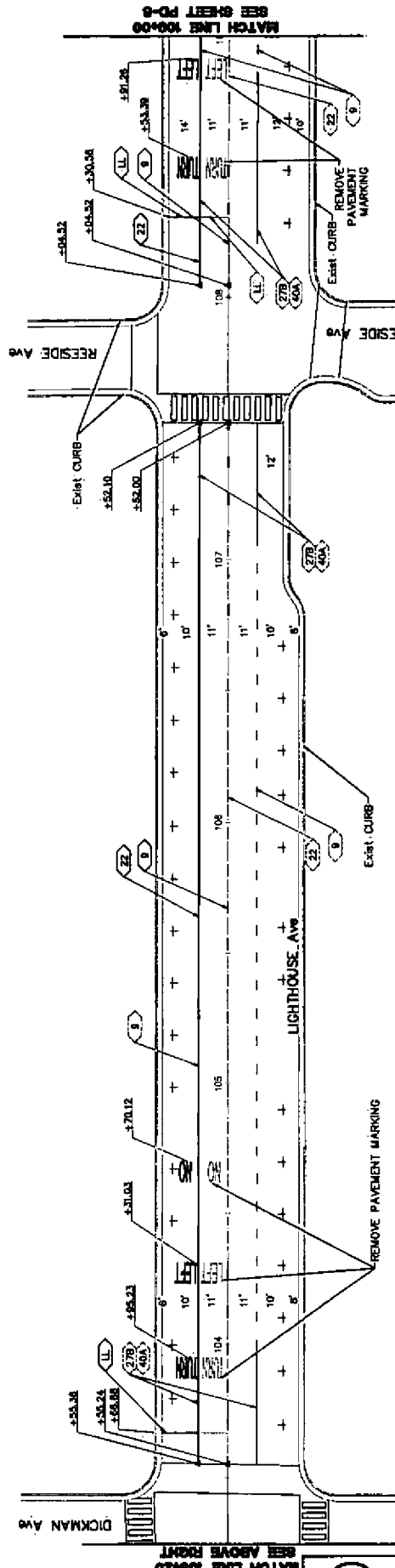
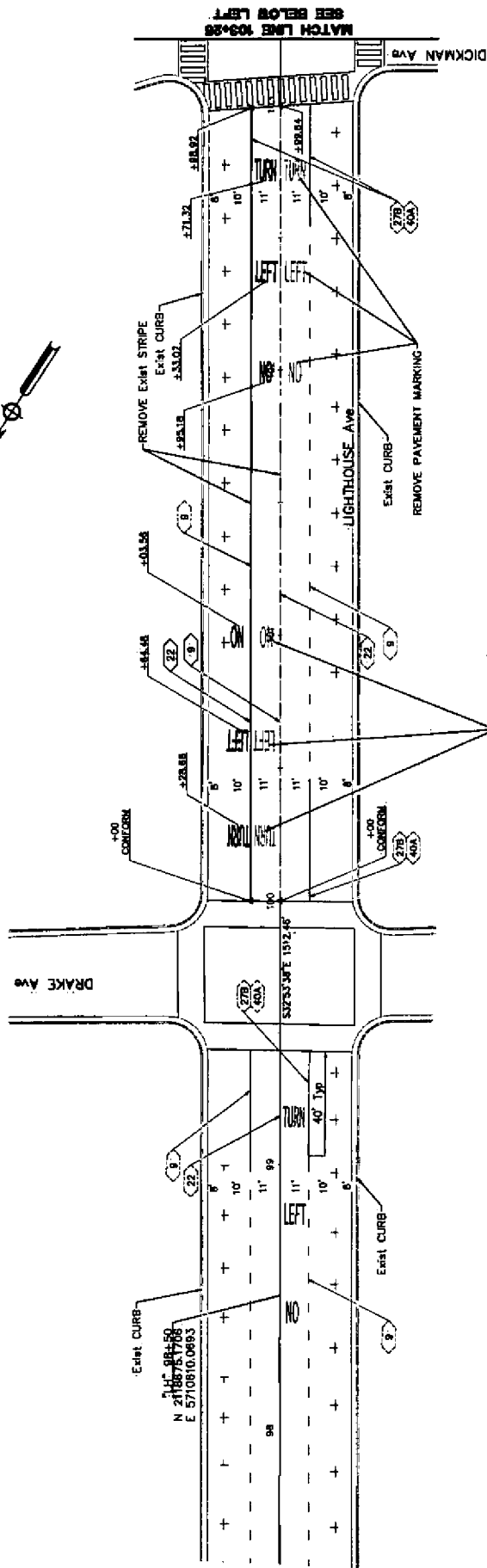
RSP ES-11 DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-11  
DATED MAY 20, 2011 - PAGE 488 OF THE STANDARD PLANS BOOK DATED 2010.

**REVISED STANDARD PLAN RSP ES-11**

CAO RISK

- NOTES:**
1. FOR PAVEMENT DELINEATION NOTES AND LEGEND SEE SHEET PD-1.
  2. REMOVE ALL CONFLICTING STRIPING PRIOR TO PLACING PROPOSED.

Agreement #: Ag-5377 - Page 679 of 791



THIS PLAN ACCURATE FOR PAVEMENT DELINEATION ONLY



**CITY OF MONTEREY  
DEPARTMENT OF PLANS AND PUBLIC WORKS**  
580 PACIFIC STREET, MONTEREY, CA 93940  
TEL: 831.846.3921 WEBSITE: WWW.MONTEREY.ORG

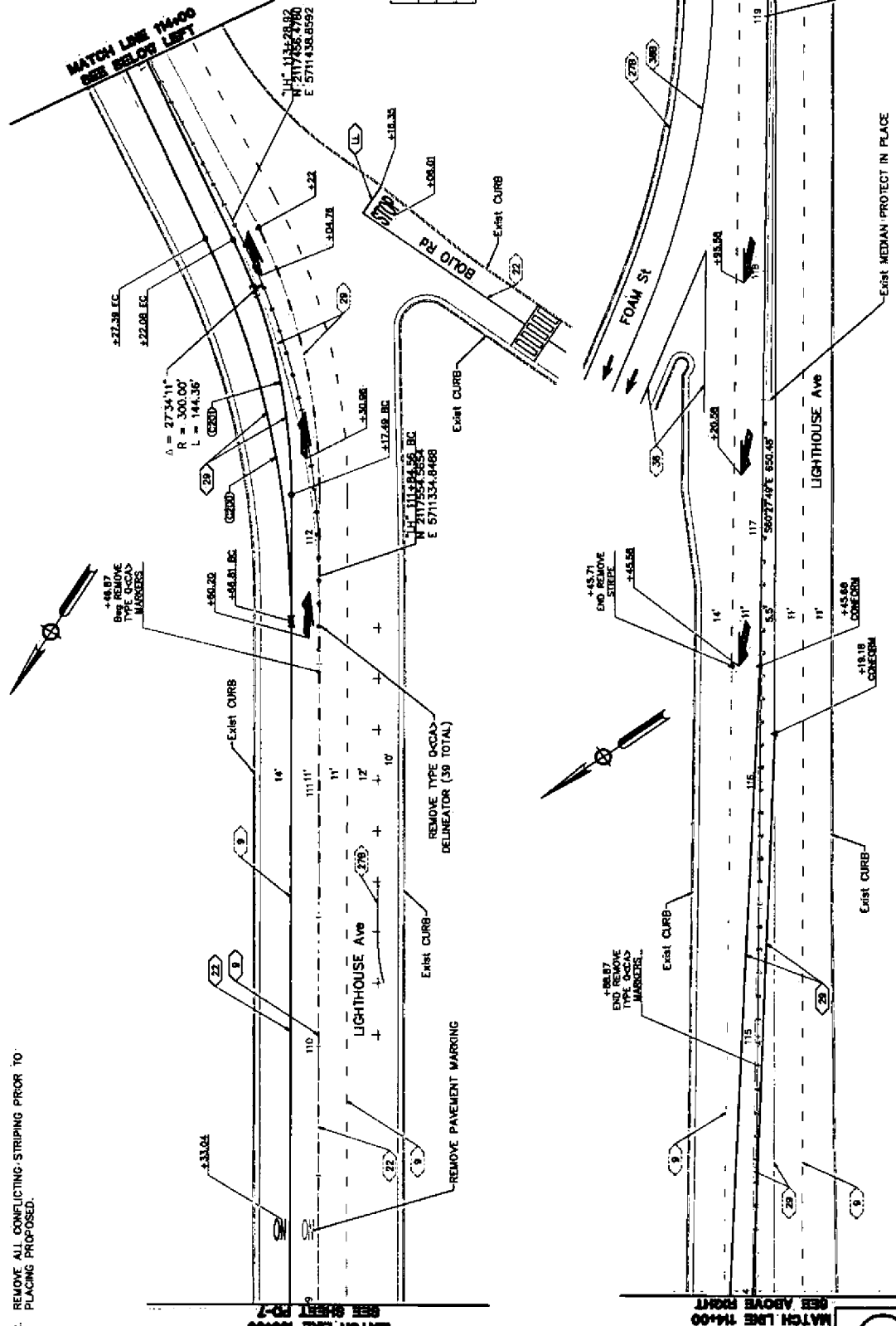
**HOLMAN HIGHWAY 68 / ROUTE 1 ROUNDABOUT**  
LIGHTHOUSE AVENUE PAVEMENT DELINEATION (PRIOR TO CONSTRUCTION)

DATE: 11/19/2015  
DRAWN BY: J. B. BENTLEY  
CHECKED BY: J. B. BENTLEY  
SCALE: AS SHOWN

CAO RISK

- NOTES:**
1. FOR PAVEMENT DELINEATION NOTES AND LEGEND SEE SHEET PD-1.
  2. REMOVE ALL CONFLICTING STRIPING PRIOR TO PLACING PROPOSED.

Agreement #: Ag-5377 - Page 680 of 791



**CURVE TABLE**

No.	R	DELTA	T	L
C500	348.00'	25°21'28"	78.32'	154.45'
C201	228.00'	25°51'43"	82.35'	102.91'

THIS PLAN ACCURATE FOR PAVEMENT DELINEATION ONLY

<p><b>CITY OF MONTEREY</b> DEPARTMENT OF PLANS AND PUBLIC WORKS 580 PACIFIC STREET, MONTEREY, CA 93940 TEL: 831.646.3921 WEBSITE: WWW.MONTEREY.ORG</p>	<p><b>omni-means</b> ENGINEERING SOLUTIONS 172 PPOWEE DR MONTEREY, CA 93940 TEL: 831.646.3921</p>	DRAWN BY: D. GARDNER CHECKED BY: D. GARDNER IN CHARGE: R. BOTTLE DATE: 11/27/2015	SCALE: 1"=20' DATE: 11/27/2015 SHEET NO. OF 90
		PROJECT: HOLMAN HIGHWAY 68 / ROUTE 1 ROUNDABOUT ID: 0500000542 DATE: 05-14-2005	SHEET: PD-8 PROJECT: Lighthouse Avenue Pavement Delineation (Prior to Construction)

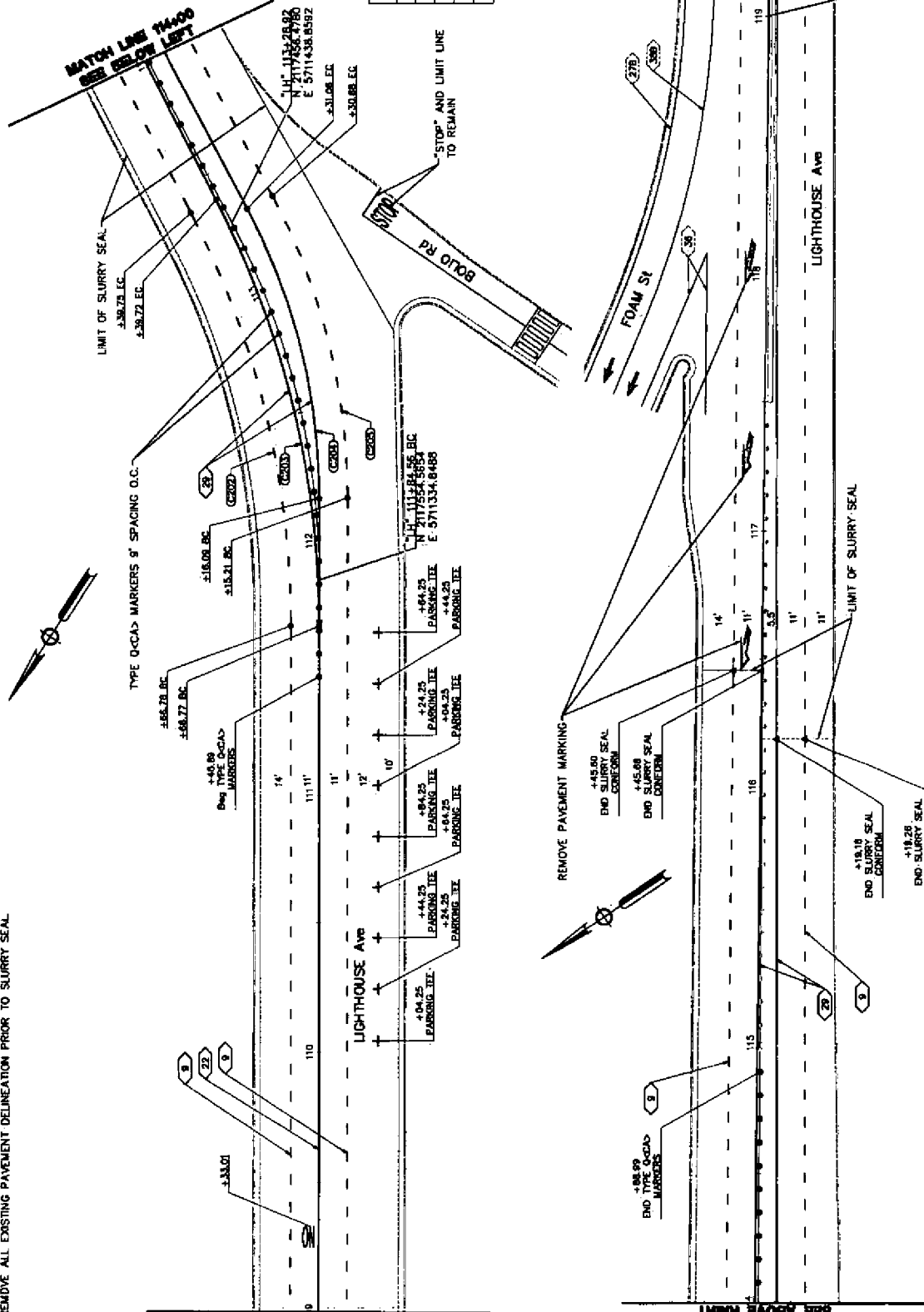
CAO RISK





- NOTE:**
1. FOR PAVEMENT DELINEATION NOTES AND LEGEND SEE SHEET PD-1.
  2. REMOVE ALL EXISTING PAVEMENT DELINEATION PRIOR TO SLURRY SEAL.

Agreement #: Ag-5377 - Page 682 of 791



**CURVE TABLE**

No.	R	DELTA	T	L
C202	348.00'	27°22'38"	85.00'	188.79'
C203	380.00'	27°22'36"	87.86'	173.02'
C204	240.00'	28°00'52"	88.87'	117.35'
C205	250.00'	28°00'52"	82.37'	122.24'

THIS PLAN ACCURATE FOR PAVEMENT DELINEATION ONLY.

	DESIGNED BY: [Redacted] DRAWN BY: [Redacted] CHECKED BY: [Redacted] DATE: 06-14-2004	DATE: 06-14-2004 PROJECT NO: 05-050000542
	PROJECT: HOLMAN HIGHWAY 68 / ROUTE 1 ROUNDABOUT CONTRACT NO: 05-050000542 SHEET NO: PD-10 TOTAL SHEETS: 10	CONTRACTOR: LIGHTHOUSE AVENUE PAVEMENT DELINEATION (POST CONSTRUCTION)

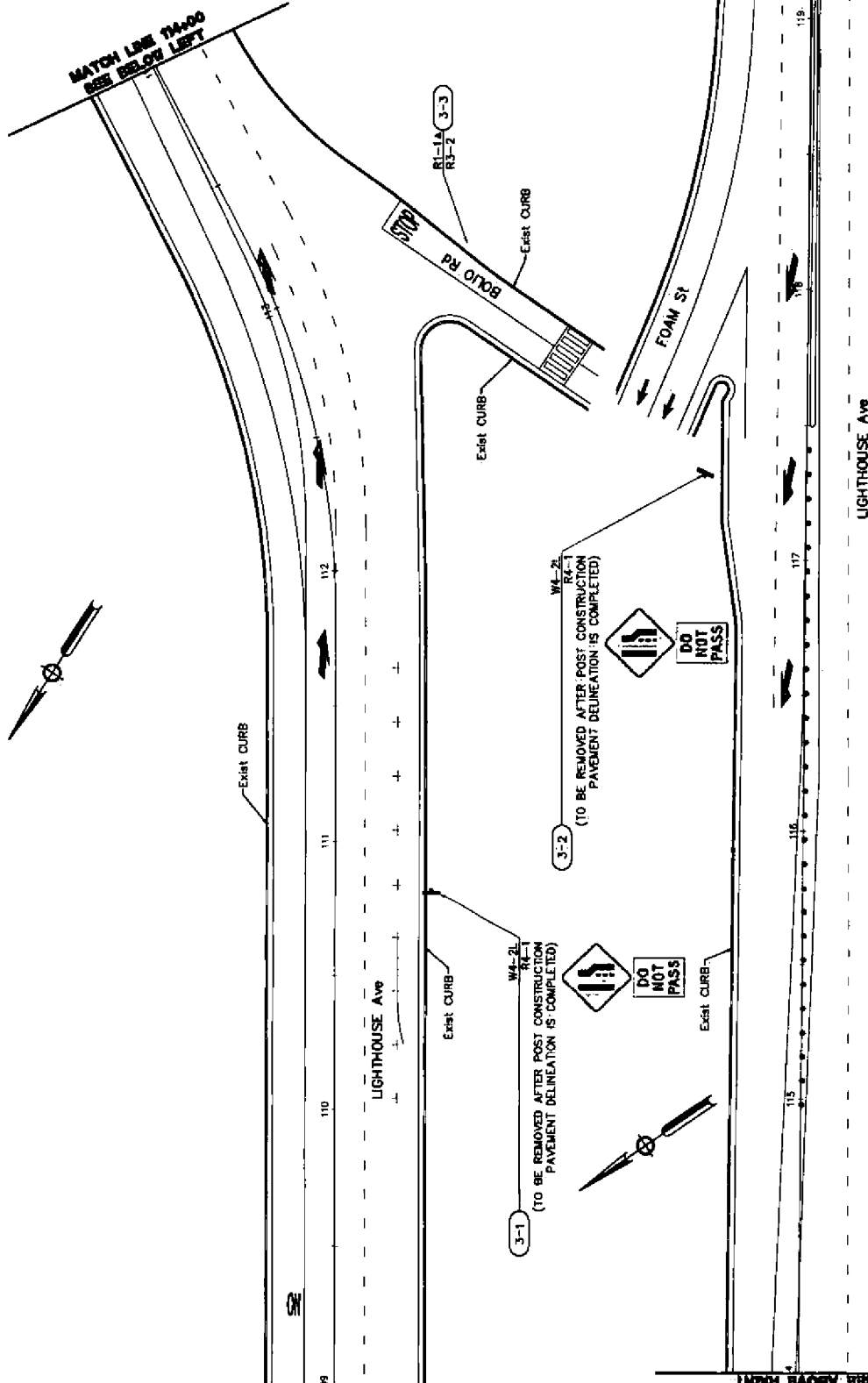
CAO RISK

**omni-means**  
 ENGINEERING SOLUTIONS  
 172 POND LANE  
 MONTEREY, CA 93940  
 TEL: 831.648.9921

**CITY OF MONTEREY**  
 DEPARTMENT OF PLANS AND PUBLIC WORKS  
 580 PACIFIC STREET, MONTEREY, CA 93940  
 TEL: 831.648.9921 WEBSITE: WWW.MONTEREY.ORG

**NOTES:**

1. FOR SIGNING NOTES AND LEGEND SEE S-1.



CAO RISK

THIS PLAN ACCURATE FOR SIGNING WORK ONLY.

**CITY OF MONTEREY**  
**DEPARTMENT OF PLANS AND PUBLIC WORKS**  
 580 PACIFIC STREET, MONTEREY, CA 93940  
 TEL 831 646 3921 WEBSITE WWW.MONTEREY.ORG



DESIGNED BY: D. DECKER  
 CHECKED BY: [Signature]  
 DATE: 11/19/2015

NO.	DATE	REVISION

**HOLMAN HIGHWAY 68 / ROUTE 1 ROUNDABOUT**  
 PROJECT: Lighthouse Avenue Sign Plan (Prior to Construction)  
 DATE: 11/19/2015  
 SHEET NO. OF 100



December 8, 2015

To: All Plan Holders  
 Project: SR1/SR68 Separation - SR 68 Holman Hwy Roundabout Project  
 Subject: Addendum #1  
 Sent Via: Web Posting on City of Monterey EBidBoard

**Bidder must acknowledge this Addendum #1, and any subsequent addenda, in your Bid Proposal, in the Bid Book (Book 1 of 2), Appendix B, Page 15, "Declaration of Bidder."**

**Bid Book (Book 1 of 2) is revised as follows:**

- Appendix B, Page 1, add the following text as the second paragraph under "Notice to Bidders":

"A pre-bid meeting will be held on Wednesday, December 16, 2015, at 9:00 AM at the City of Monterey Council Chambers, 580 Pacific Street, in Monterey, CA 93940. All potential bidders, subcontractors, and vendors are encouraged to attend the pre-bid meeting; however, attendance is optional. Any questions asked and answered, as well as the attendance roster, will be posted in an addendum."

**Special Provisions (Book 2 of 2) is revised as follows:**

- Page 3, Section 2-1.06B: Delete the Supplemental Project Information table in its entirety, and replace with:

Description	Means
Cross Sections	Ebidboard: <a href="http://goo.gl/OlwNvP">http://goo.gl/OlwNvP</a>
Geotechnical Design & Materials Report	
Hazardous Materials Report	
NEPA/CEQA Form	
Storm Water Data Report	
Final EIR	
Construction Staging Area Exhibit	
Environmental Certification	
Right of Way Certification	

- Page 3, Section 2-1.06B, Supplemental Project Information: An Exhibit showing the location of the Construction Staging Area has been provided as supplemental project information and is attached to this Addendum #1.



4. Page 12, Section 5-1.20D, Agency Relations: Add Section 5-1.20D(2):

***"5-1.20D(2) Relations with the City of Monterey:***

*The work to be performed along Lighthouse Avenue is within the jurisdiction of the City of Monterey. Contractor shall apply for a public works encroachment permit before beginning any work in the City right of way. This permit will be issued at no cost to the Contractor."*

5. Page 55, Add to Section 20, Landscape, as the first paragraph:

*"Add to section 20-1.01C of the RSS for section 20: Before project close out, submit to the City of Monterey, all operators manuals for all irrigation controllers installed."*

**Sealed bid proposals will be received in the Office of the City Clerk, 580 Pacific St., Room 6, Monterey, CA 93940 until 2:00 pm on Tuesday, January 19, 2016.**

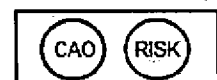
If you have any questions, please email [harary@monterey.org](mailto:harary@monterey.org).

Sincerely,



Robert M. Harary, P.E.  
Principal Engineer/Capital Programs Manager  
City of Monterey

Attachment: Construction Staging Area Exhibit





December 22, 2015

To: All Plan Holders  
 Project: SR1/SR68 Separation - SR 68 Holman Hwy Roundabout Project  
 Subject: Addendum #2  
 Sent Via: Web Posting on City of Monterey EBidBoard

***Bidder must acknowledge this Addendum #2, and any subsequent addenda, in your Bid Proposal, in the Revised Bid Book (Book 1 of 2), Appendix B, Page 15, "Declaration of Bidder."***

**I. Pre-Bid Meeting**

A non-mandatory Pre-Bid Meeting was held on December 16, 2015.

- A. Attached is the Sign In Sheet.
- B. Attached are the Powerpoint Presentation slides.
- C. The following questions were asked and answered.
  1. What are the square foot requirements for the 3 overhead signs?  
**Answer: See plan S-1, sheet 88, and plan SQ-5, sheet 97.**
  2. How will the anticipated Deductive Alternate, combining Stages 4 and 6 work?  
**Answer: The City intends to issue this Deductive Alternate in a subsequent Addendum.**
  3. Will the Deductive Alternate be included in the Basis of Award?  
**Answer: No. The Basis of Award will remain the Total Base Bid of Items 1 through 173.**
  4. Is the \$6 million cost estimate for the Total Base Bid?  
**Answer: Yes.**
  5. Is there a DBE goal for this Project?  
**Answer: No.**
  6. Will there be a cost share on flagging?  
**Answer: No, per section 12-1.03 of the specifications.**
  7. Who will perform the post-construction survey on the ADA ramps?  
**Answer: Post-construction survey will be performed by the design firm.**



8. What are the cost estimates for the City encroachment permit, the Caltrans permit, and the Air Quality District permit?  
**Answer: There is no cost for the City's encroachment permit. The Monterey Bay Unified Air Pollution Control District permit and fees are dependent on the Contractor's means and methods. Refer to mbuapcd.org. The cost for the Caltrans permit is unknown at this time. This information will be provided as a subsequent addendum.**
9. What is happening to the two existing AT&T vaults?  
**Answer: AT&T will be installing new vaults prior to construction of this project. The two existing AT&T vaults will be abandoned in place.**
10. Is there a City of State policy on construction water? Does the contractor have to use potable water?  
**Answer: There is no City or State policy on construction water applicable to this project. The Contractor may obtain potable water from a nearby fire hydrant through a permit by California American Water (CalAm), or the Contractor may provide an alternate source of non-potable water. The water meter to be installed from Pebble Beach is only for irrigation purposes.**
11. Can we use the traffic closure charts/staging for stages not mentioned?  
**Answer: No.**
12. Does the Skyline Bridge need to be widened?  
**Answer: No. The Skyline Bridge is not part of the project.**
13. Does the City have a need for excess dirt?  
**Answer: No.**

## II. City-Initiated Changes:

D. Book 1 of 2 is hereby reissued. Revisions are:

1. Appendix B, page 3, "Interpretation of Specifications." Add the following text:  
 "Written questions must be submitted to Robert Harary at [harary@monterey.org](mailto:harary@monterey.org) by Tuesday, January 12, 2016 at 5:00 p.m., unless this date and the date of the bid opening are extended by a future addendum."
2. Original Bid Book 1 of 2, Subcontractors List on Appendix B, page 16 was deleted. Please use Subcontractors List shown in Revised Bid Book 1 of 2, page 21.
3. On page 17, the "Noncollusion Affidavit" form title was changed to "Noncollusion Declaration," page 16, Revised Bid Book 1 of 2.

E. Specifications (Book 2 of 2) will be revised as follows:

4. Page 5, Section 2-1.33D(3)(c), "Bid Form Submittal Schedule for a Non-Federal Aid Contract without a DBE goal" table, delete the last four rows and footnote "b." The revised table is as follows:



Bid Form Submittal Schedule for a Federal-Aid Contract with a DBE Goal	
Form	Submittal deadline
Bid to the City of Monterey	Time of bid except for the public works contractor registration number for a joint-venture contract
For a joint-venture contract, a copy of the Bid to the City of Monterey as submitted at the time of the bid with the public works contractor registration number.	10 days after bid opening
Subcontractor List	Time of bid
Opt Out of Payment Adjustments for Price Index Fluctuations <sup>a</sup>	Time of bid

<sup>a</sup>Submit only if you choose the option or preference

5. Page 36, Section 12-4.05G, Lane Closure Chart No. 6 is revised as follows:

Chart no. 6 Partial City Street Closure Hours/City Street Requirements and Hours of Work																									
County: MON							Route/Direction: Route 68/ Eastbound and Westbound							PM: L4.1 - L4.3											
Closure limits: SR-68/SR-1 Overcrossing to Carmel Hills Driveway																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	R	R	R	R	R	R															R	R	R	R	R
Fri	R	R	R	R	R	R															R	R	R	R	R
Sat	R	R	R	R	R	R															R	R	R	R	R
Sun	R	R	R	R	R	R															R	R	R	R	R

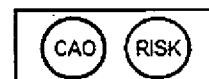
Legend:

Work allowed within the highway where shoulder or lane closure is not required

R Provide at least 1 through traffic lane, not less than 14 feet in width, for use by entering and exiting directions of travel only as specified in Remarks below. (Flagger Required).

REMARKS:

1. See Lane Closure Restriction for Designated Legal Holidays and Special Days table
2. Maintain Traffic of these special provisions for additional closure restrictions.
3. Placement and removal of temporary traffic control devices for Stages 2 through 6.
4. Stage 3 (night) movement restriction at Carmel Hills Driveway.





6. Page 36, Section 12-4.05G, Lane Closure Chart No. 12 was added:

Chart no. 12 Full Conventional Highway Closure Hours																									
County: MON						Route/Direction: SR-1 Southbound						PM: 75.1 - 75.3													
Closure limits: SR-1 from SR-68 Off-Ramp to SR-68 On-Ramp to Southbound SR-1																									
Hour	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon-Thu	1	1	1	1	1	1														1	1	1	1	1	
Fri	1	1	1	1	1	1														1	1	1	1	1	
Sat	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sun	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>Legend:</b>																									
1	Provide at least 1 through traffic lane open in direction of travel only as specified in Remarks below																								
<b>REMARKS:</b>																									
<ol style="list-style-type: none"> <li>See Lane Closure Restriction for Designated Legal Holidays and Special Days table in Maintain Traffic of these special provisions for additional closure restrictions.</li> <li>Stage 1 closure for placement and removal of temporary traffic control devices on southbound SR-1 shoulder.</li> </ol>																									

III. Bidder-Initiated Questions

- Alternate Item 3, clean and paint structural steel. Is this to paint an existing sign structure or is it for the new sign structure? If existing can you let me know where it is on the plans?  
**Answer: Additive Alternate No. 3 is to paint the new overhead signs.**
- I am working on some takeoff for the estimator on this bid. Can I get a pdf/cad file with clear distinction to existing contours/spot evaluations within the grading limits?  
**Answer: Attached is Exhibit EX-108, a pdf of the existing contours and grading limits. A stationing line is also shown for scale reference. Proposed contours are included in the plan set on the Contour Grading Plan, sheet 30.**
- Stage 1 has K rail down on Highway 1, what are the lane closure requirements for that work?  
**Answer: The new Lane Closure Chart No. 12 for SB Route 1 lane closure is included in this addendum. This chart is intended only for work regarding placement and removal of K rail along the shoulder.**
- Stage 2 requires K rail to be set/removed in both directions on Highway 68, there is no specific chart. Lane closure chart 3 only allows WB/EB 68 to be closed on night for SC-5. Chart 2 says 68 can only be closed Westbound. Chart 6 allows reverse control on 68 for stage 3 only. (This is probably the

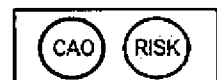


chart you need to use for other stages on Highway 68). Chart 8 allows reverse control on 68 only for Stage 5 B, and C.

**Answer: The revised Lane Closure Chart No. 6 is included in this addendum.**

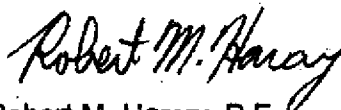
18. Stage 3 requires K rail, Chart 6 covers this work. Stage 4 has K rail with no Chart for setting/removing K rail on 68. Stage 5, same, Stage 6. Basically, come down to charts 6 & 8 allow reverse control, but due to remarks we can only use those for specific stage's. Please advise?

**Answer: The revised Lane Closure Chart No. 6 is included in this addendum.**

**Sealed bid proposals will be received in the Office of the City Clerk, 580 Pacific St., Room 6, Monterey, CA 93940 until 2:00 pm on Tuesday, January 19, 2016.**

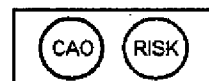
If you have any questions, please email [harary@monterey.org](mailto:harary@monterey.org) .

Sincerely,



Robert M. Harary, P.E.  
Principal Engineer/Capital Programs Manager  
City of Monterey

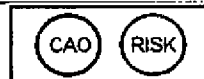
- Attachments:
1. Pre-Bid Meeting Sign In Sheet
  2. Pre-Bid Meeting Powerpoint Presentation slides
  3. Revised Bid Book 1 of 2
  4. Existing Contours Exhibit Ex-108 (From Question 15)



## SR 68 (HOLMAN HIGHWAY) ROUNDABOUT PROJECT AT ROUTE 1/68 SEPARATION

Pre-Bid Meeting – December 16, 2015

Name	Company	Phone	E-Mail
Randy Bonino	Granite rock	831-768-2100	Estimating@graniterock.com
Nayeli Orozco	Marina Landscaping	(714) 934-1100	estimator@marinaco.com
Clarence Sakoda	Granite Construction	831-763-6100	Clarence.Sakoda@gcinc.com
SAM DUKWORTH	ANDRESON PAPER	408 388-1671	SCOTT@ANDPAPER.COM
Ariana Green	TAMC	831-775-4403	ariana@tamcmonterey.org
JEFF SMITH	DOW CHAPIN CO.	831/444-4121	jsmith@dorchapin.com
Frank Lopez	Harris & Assoc.	831/253-4242	Frank.Lopez@we.sra.harris.com
Pena Shortles	GRANITE CONST	831/763-5055	Pena.Shortles@gcinc.com
PETER ADRIANA	MPE	831 384 4081	PETER@MPE2000.COM



## **PRE-BID CONFERENCE**

### **HOLMAN HIGHWAY 68 ROUNABOUT PROJECT**

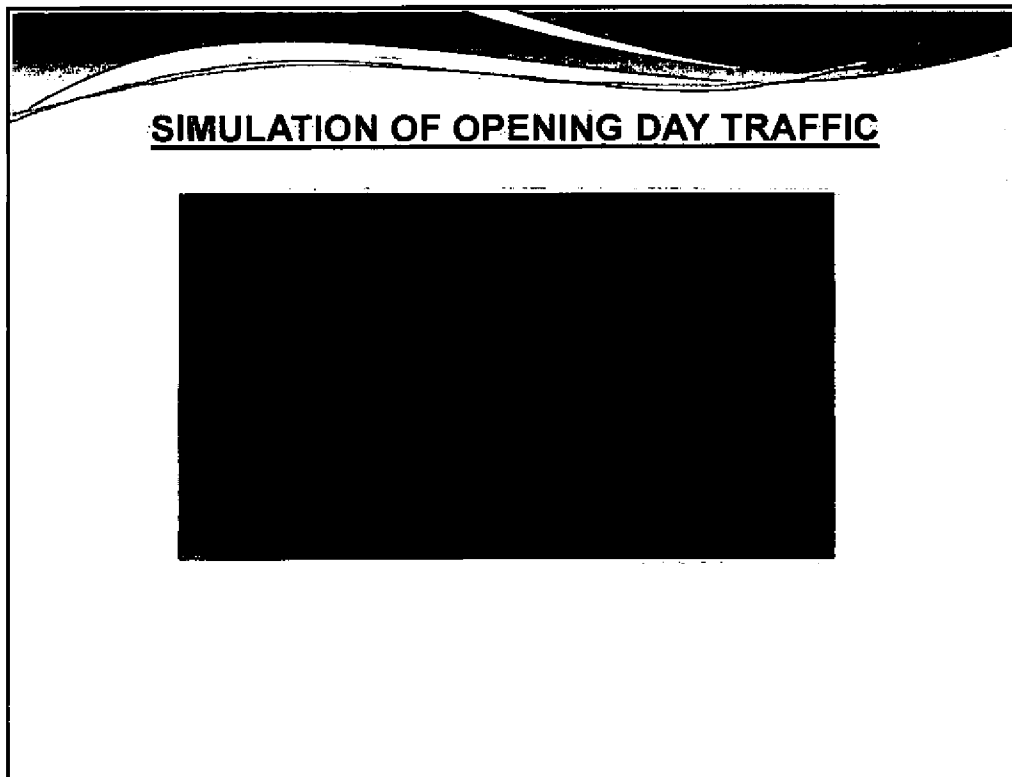
**DECEMBER 16, 2015**



### **PRE-BID CONFERENCE OUTLINE**

- Rich Deal – Project Overview, Stakeholders, Design Objectives and Constraints
- Ron Boyle – Construction Objectives, Scope of Work and Traffic Phasing
- Bob Harary – Bid Information, Addenda, Award and Schedule Information
- Questions





## PROJECT STAKEHOLDERS/ROLES

- City of Monterey – Implementing Agency
- Caltrans – Lead Agency - Will Own Improvements
- Pebble Beach Company – Funding Partner
- TAMC – Funding Partner & Outreach
- Monterey County – Within Jurisdictional Boundary
- CHOMP - Dependant on Access
- City of Pacific Grove

## DESIGN OBJECTIVES

- Relieve Existing and Future Traffic Congestion
- Improve Traffic Safety
- Improve Traffic Operations
- Minimize Delay of Emergency Vehicle Access to CHOMP
- Reduce Incentive for Bypass Traffic through Skyline Forest Neighborhood
- Improve Access to Pebble Beach, CHOMP and Carmel Hills Professional Center



## WORK CONSTRAINTS

### **Special Events – No Work**

- Concours d'Elegance August 13 - 21, 2016
- AT&T ProAm February 4 – 12, 2017

### **Permits**

- Caltrans Encroachment
- City of Monterey Encroachment Permit
- Air District Permit

### **Coordinate with other City Projects**

- Sewer Rehabilitation Program
- Measure P Paving Projects




## CONSTRUCTION PHASE OBJECTIVES

- Maintain access to CHOMP at all times
- Minimize disruption to traffic
- Non-work periods for major events to have no lane closures or detours
- All lane dimensions, curb radii, curb locations as shown on the plans are critical to proper roundabout operations
- All sidewalk, ramp and crosswalk grades and slopes must meet ADA requirements



## SCOPE OF WORK




- Demolition
- 10,066 CY Excavation, incl. Aerially Deposited Lead
- 799 LF Storm Drain + 13 Inlets
- 2 Retaining Walls 3157 SF with Concrete Texture
- 5,148 Tons HMA
- 51 Roadside Signs + 3 Overhead Signs
- 623 CY Curb, Gutter, Sidewalks, Ramps, Aprons
- Guardrail
- Landscaping, Irrigation, 5 Year Plant Establishment
- Street Lighting
- Other Work shown in Plans/Bid Schedule



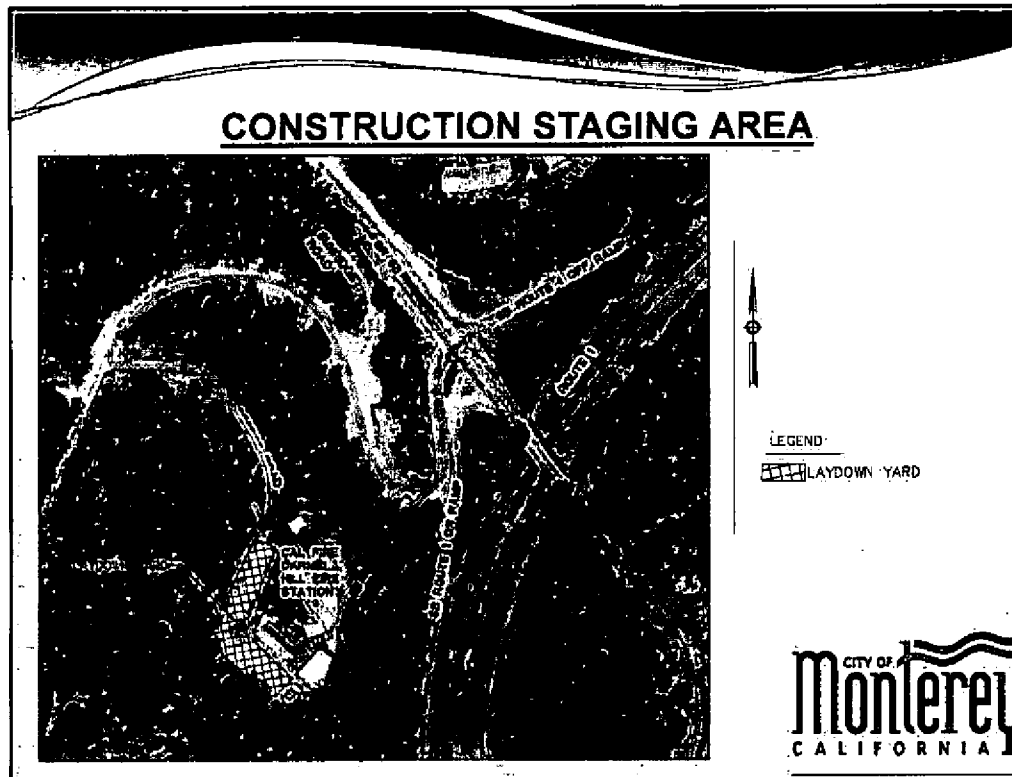
## CONSTRUCTION STAGING

	Mobilization Phase (No Field Work)	85 days
	Stage 1	37 days
	Stage 2	10 days
	Stage 3	64 days
	Stage 4	26 days
	Stage 5	19 days
	Stage 6	24 days
	Stage 7	5 days
	Stage 8	30 days

	Night Work		No Work
	Day Work		Not counted as working day
	COZEEP at Ramp Closure		Detours





**BID INFORMATION**

- Bid Opening: 2:00 pm, Tuesday, January 19, 2016  
 Attn: Finance Director  
 580 Pacific Street, Room 6 (City Clerk Office)  
 Monterey, California 93940
- Bid Questions: ALL questions must be received in writing by 5:00 pm, Tuesday, January 12, 2016. Submit to Robert Harary via email at [harary@monterey.org](mailto:harary@monterey.org)
- Basis of Award: Total Base Bid (Items 1 through 173)
- 3 Additive Alternate Bid Items

CITY OF  
**Monterey**  
CALIFORNIA

## **BID PROPOSAL FORMS**

Bid Book 1 of 2, Appendix B

### **Required Forms:**

- Bid Schedule (Do's and Don'ts)
- Declaration of Bidder:
  - Acknowledgement of Addenda
  - Similar Projects
- Noncollusion Declaration
- Debarment and Suspension Certification
- Certification of Good-Faith Effort for Local Hire (Prime)
- Subcontractor's List (use page 22, Addendum 2)
- Bid Bond, 10%
- Book 2, Page 5—Addendum 2: Deleting DBE, Small Business, CA Co. Preference Forms



## **ADDENDA**

### **ISSUED**

1. Tues, 12/8/15: Pre-Bid Meeting, Supplemental Information

### **ANTICIPATED**

2. Mon. 12/21/15: Pre-Bid Conference Q&A, Attendance, Revised Book 1
3. Early January: Bidder-Initiated Q&A

***All written questions must be received by  
5:00 pm, Tuesday, 1/12/16***

4. Thurs. 1/14/16: Final Addendum

*There may be additional addenda*



### **CONTRACT AWARD**

- Contract Award: Estimated February 16, 2016
- Notice of Award: February 17, 2016
- 15 Days: Bonds, Insurance, Business License
- Notice to Proceed: March 7, 2016



### **SCHEDULE ISSUES**

- Project Duration –215 Working Days (Feb. 2017)
- Liquidated Damages - \$5,400/Working Day
- Work Hours/Nights/Weekends: Section 12, pg 27-39 and Stage Construction Plans SC-1 – SC-18
- AT&T, PG&E Utility Relocations Status: Jan – March 2017
- NTP March 7, Submittals, Long Lead Items, Mobilize



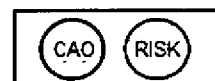
### CONSULTANT SERVICES

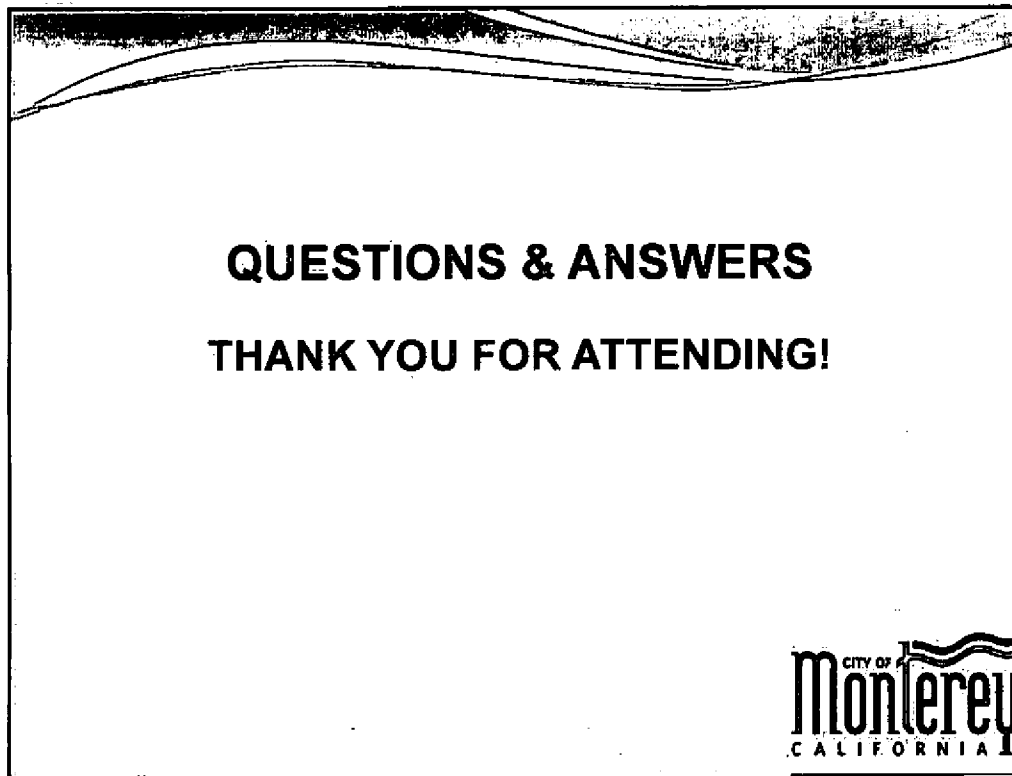
<u>Service</u>	<u>Firm</u>	<u>Hired By</u>
Design Support	Omni Means	City
Survey/Staking	Omni Means/ Whitson Engineering	City
CM/RE	TBD	City
QA Materials & Source Inspections	CM/Sub	City
Environmental Monitoring	CM/Sub	City
QC Testing/ Special Inspections	TBD	Contractor
Laboratory	TBD	Contractor

### ADDITIONAL INFORMATION

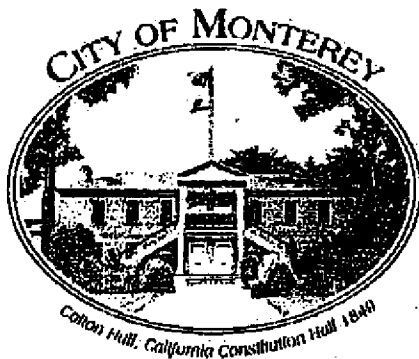
- Engineer's Estimate: \$6,077,080
- Prevailing Wage Project (No Federal Funds)
- ebidboard link: <http://goo.gl/OlwNyP>
- Supplemental Project Information:

Cross Sections	Storm Water Data Report
Geotechnical Design & Materials Report	Final EIR
Hazardous Materials Report	Construction Staging Area Exhibit
NEPA/CEQA Form	Environmental Certification
	Right of Way Certification





**Book 1 of 2**



CITY OF MONTEREY  
DEPARTMENT OF PLANS AND PUBLIC WORKS

# REVISED BID BOOK

FOR

FOR CONSTRUCTION ON STATE HIGHWAY  
IN MONTEREY COUNTY IN AND NEAR THE CITY OF MONTEREY

AT ROUTE 1/68 SEPARATION  
(SR 68 (HOLMAN HIGHWAY) ROUNDABOUT PROJECT)

In District 05 on Route 68 and Route 1

This is a Capital Improvement Project

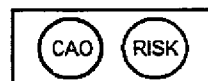
APPROVED:

*Robert M. Harney*  
\_\_\_\_\_  
FOR CITY TRAFFIC ENGINEER

DATE: 12/21/2015

Master Revision: 01/02/15

Project Revision: December 2015



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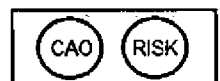
## SR-68/HIGHWAY 1 ROUNDABOUT PROJECT

## TABLE OF CONTENTS

<b>NOTICE TO BIDDERS</b> .....	<b>1</b>
<b>PREVAILING WAGES</b> .....	<b>1</b>
<b>SPECIFICATIONS AND BID FORMS</b> .....	<b>2</b>
<b>BID BOND</b> .....	<b>2</b>
<b>BID VALIDITY</b> .....	<b>2</b>
<b>RESPONSIBLE BIDDER</b> .....	<b>2</b>
<b>BID REJECTION</b> .....	<b>3</b>
<b>UNBALANCED BID</b> .....	<b>3</b>
<b>INTERPRETATION OF SPECIFICATIONS</b> .....	<b>3</b>
<b>INTERPRETATION/BIDDER QUESTIONS</b> .....	<b>4</b>
<b>DEFINITIONS</b> .....	<b>4</b>
<b>GENERAL INFORMATION</b> .....	<b>4</b>
<b>PROPOSAL SCHEDULE OF QUANTITIES AND PRICES</b> .....	<b>6</b>
<b>BID SCHEDULE (BID ITEM LIST)</b> .....	<b>6</b>
<b>BID ITEM DESCRIPTIONS</b> .....	<b>12</b>
<b>ANCILLARY ITEMS</b> .....	<b>12</b>
<b>LUMP SUM PRICE BREAKDOWN</b> .....	<b>12</b>
<b>BID CLARIFICATION</b> .....	<b>13</b>
<b>BONDS</b> .....	<b>13</b>
<b>DECLARATION OF BIDDER RE: LICENSE QUALIFICATIONS</b> .....	<b>15</b>
<b>NONCOLLUSION DECLARATION</b> .....	<b>16</b>
<b>DEBARMENT AND SUSPENSION CERTIFICATION</b> .....	<b>17</b>
<b>LOCAL HIRING REQUIREMENT</b> .....	<b>18</b>
<b>CERTIFICATION OF GOOD-FAITH EFFORT (PRIME CONTRACTOR)</b> .....	<b>19</b>
<b>CERTIFICATION OF GOOD-FAITH EFFORT (SUBCONTRACTOR)</b> .....	<b>20</b>
<b>BIDDER'S LIST OF SUBCONTRACTORS</b> .....	<b>21</b>



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**CITY OF MONTEREY  
DEPARTMENT OF PUBLIC WORKS  
MONTEREY, CALIFORNIA**

**NOTICE TO BIDDERS**

Sealed proposals will be received in the office of the City Clerk, attention Finance Director, 580 Pacific Street, Room 6, City of Monterey, California, until 2:00 p.m., **January 19**, at which time they will be publicly opened and read in the City Council Chambers, for **constructing the State Route 68 (SR-68) (Holman Highway) Roundabout Project** in Monterey County, California, in accordance with these plans and specifications.

An pre-bid meeting will be held on Wednesday, December 16, 2015, at 9:00 AM at the City of Monterey Council Chambers, 580 Pacific Street, in Monterey, CA 93940. All potential bidders, subcontractors, and vendors are encouraged to attend the pre-bid meeting; however, attendance is optional. Any questions asked and answered, as well as the attendance roster, will be posted in an addendum.

This work shall be diligently prosecuted to completion before the expiration of **215 WORKING DAYS** beginning on the date stated in the Notice to Proceed.

Plant Establishment (Type1) shall continue for 5 years (Calendar days) after completion of construction.

In general, the work consists of constructing a modern roundabout at the intersection of SR-68 and the southbound Highway 1 on/off ramps and a yield controlled intersection at 17 Mile Drive and the Highway 1 on Ramp.

At the time of the bid opening, the successful Bidder must be legally entitled to perform contracts requiring a Class A Contractor's license or a combination of Class C licenses that make up a majority of the work. Any Bidder or contractor not so licensed shall be subject to all penalties imposed by law including, but not limited to, any appropriate disciplinary action by the Contractors' State License Board.

All electricians performing work under this contract, as defined as making electrical connections at or above 100 volt-amperes, shall be certified pursuant to Section 3099 et seq. of the California Labor Code. Contractor shall submit proof of certification, or proof that the requirements of Section 3099.4 (a) of the California Labor Code have been met, prior to electricians commencing work under this contract.

**PREVAILING WAGES**

Local prevailing wage rates shall be paid in accordance with Sections 1770, 1773, and 1782, as amended, of the California Labor Code, and Section 28-20(e) of the Monterey City Code, on all public works construction contracts exceeding twenty-five thousand dollars (\$25,000) and all public works contracts for alteration, demolition, repair or maintenance work exceeding fifteen thousand dollars (\$15,000). Local wage rates may be obtained from City of Monterey, Capital Projects Office, 353 Camino El Estero, Monterey, CA, (831-646-3997) or the Director, Department of Industrial Relations, State of California, 455 Golden Gate Avenue, San Francisco, California (415-703-4774). Any Bidder contractor awarded a public works contract that uses a craft or classification not in the general prevailing wage determinations may be required to pay the wage rate most closely related in the general determinations, effective at the time of the call for bids.

In accordance with the provisions of Sections 1725.5, 1771.1, 1771.3, and 1771.4 of the Labor Code, this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal (subject to the requirements of Section 4104 of the Public Contract Code), or engage in the performance of any contract for public work, as defined by that chapter of the Labor Code, unless currently registered and qualified to perform public work pursuant to Section 1725.5 of the Labor Code. **See Part IV of these Specifications**



**for additional requirements.**

In accordance with the provisions of Section 1773.3 of the Labor Code, the City of Monterey shall provide notice to the Department of Industrial Relations (DIR) of the award of any public works contract subject to the requirements of Chapter 1 of the Labor Code, within five days of the award. The notice shall be transmitted electronically in a format specified by the DIR (see <https://www.dir.ca.gov/pwc100ext/>) and shall include the name of the contractor, any subcontractor listed on the successful bid, the bid and contract award dates, the contract amount, the estimated start and completion dates, job site location, and any additional information the DIR specifies that aids in the administration and enforcement of this chapter.

**SPECIFICATIONS AND BID FORMS**

Specifications, including instructions to Bidders and all necessary contract documents and forms, may be obtained at the office of the Administrative Services Center, Revenue Desk, 735 Pacific Street, City of Monterey, California for a fee of fifty dollars (\$50). Submit bid forms in sealed envelopes marked on the outside with time and date of bid opening and the work for which the bid is submitted.

**BID BOND**

Cash, a certified check or cashier's check, payable to the order of the City of Monterey, or a satisfactory bid bond, in original form (no fax or photocopy shall be accepted), executed by the Bidder and an acceptable surety in an amount equal to ten percent (10%) of the bid amount shall be submitted with each bid.

**BID VALIDITY**

No Bidder may withdraw their bid for a period of **ninety (90) days** from the date of opening of the bids for the purpose of reviewing the bids and investigating the qualifications of Bidders, prior to awarding of the contract.

**RESPONSIBLE BIDDER**

Responsible bidder as it pertains to this contract shall be as follows:

1. **Standards of Responsibility:** The City may reject bids on the basis of non-responsibility. A responsible bidder is one that has the capacity in all respects to perform fully the contract requirements, and the integrity and reliability which will assure good faith performance of the contract. Factors to be considered in determining whether the standard of responsibility has been met include whether a bidder has:
  - a. The appropriate financial, material, equipment, facility, capacity (adequate workforce to complete the job in a timely fashion) and personnel resources, including all required certifications, licenses, and expertise necessary to indicate its capacity to meet all contractual requirements, including the following specific requirements:
    - i. Adequate workforce to meet multiple critical work schedules at once;
    - ii. Ability to start projects on the commencement dates set forth by the City and satisfactorily complete them within the City's stated time limits;
  - b. A satisfactory record of performance, including but not limited to any prior work performed by bidder for the City or other agency;
  - c. Adequate bonding and insurance capacity;
  - d. A satisfactory record of integrity, diligence, and professionalism in the specific contract work;

- e. The legal qualifications to contract with the City; and
  - f. Supplied all information requested by the City in connection with the inquiry concerning responsibility.
2. Information Pertaining to Responsibility. The prospective contractor shall supply any information requested by the City concerning the responsibility of such contractor, including the qualifications and performance records of contractor's employees and proposed subcontractors. If the prospective contractor fails to supply the requested information, the City shall base the determination of responsibility in award of the Contract upon any available information, or may find the prospective contractor non-responsible on the basis of its failure to provide the requested information to the City.
  3. The City's Duty Concerning Responsibility. Before awarding a contract, the City must be satisfied that the prospective contractor is responsible. The City may use the information provided by prospective contractor as well as information obtained from other legitimate sources, including City staff's own experience with the prospective contractor and prospective contractor's employees.
  4. Written Determination of Non-responsibility Requirements. If a bidder or offeror who otherwise would have been awarded the Contract is found non-responsible, a written determination of non-responsibility setting forth the basis determination shall be prepared by the City and sent to the non-responsible bidder or offeror. The bidder or offeror shall have an opportunity to appeal the City's determination on non-responsibility.

### **BID REJECTION**

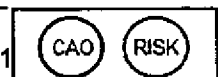
The City reserves the right to reject any or all bids as the best interests of the City may dictate and, to the extent permitted by law, waive any irregularity in any bid. If there is any reason for believing that collusion exists among the bidders, the City may reject any or all bids.

### **UNBALANCED BID**

Bids which are obviously unbalanced may be rejected. For the purposes of this section, an unbalanced bid is one that (a) has unit prices based on nominal prices for some items of work and enhanced unit prices for other items of work, and (b) the amount and manner in which the unit prices are distributed is not reflective of the true cost to perform the work. Any unbalanced bid may be rejected by the Public Works Director whether or not the result of the unbalanced bid increases the cost of the project to the City.

### **INTERPRETATION OF SPECIFICATIONS**

Should a Bidder be in doubt as to the true meaning of any item in the Plans or Specifications or should Bidder discover items containing discrepancies or omissions, the Engineer shall be immediately notified. All requests for interpretations must be submitted ninety-six (96) hours before bid opening. If found necessary, interpretation or correction will be made by written addendum, a copy of which will be sent to each plan holder. Such addenda are to be considered as part of the contract documents, and the Bidder shall acknowledge this condition by listing each addendum by number in his proposal. The Engineer shall not be held responsible for any oral interpretations or instructions. No addenda can be issued less than seventy-two (72) hours before bid opening without an accompanying bid time extension. The Engineer reserves the right to make decisions on extending the bid period.



## INTERPRETATION/BIDDER QUESTIONS

Written questions must be submitted to Robert Harary at harary@monterey.org by Tuesday, January 12, 2016 at 5:00 pm, unless this date and the date of bid opening are extended by a future addendum.

## DEFINITIONS

For the purposes of this document, the following definitions shall apply:

<u>CITY:</u>	The term <u>City</u> refers to and indicates the City of Monterey, Monterey County, State of California.
<u>ENGINEER OR CITY ENGINEER:</u>	The term <u>Engineer</u> or <u>City Engineer</u> refers to and indicates the Public Works Director of the City of Monterey or his duly authorized representative.
<u>BIDDER:</u>	Party submitting a bid for consideration by the City of Monterey.
<u>CONTRACTOR:</u>	The term <u>Contractor</u> refers to and indicates the party or parties contracting to perform the work to be done in pursuance of this contract and specifications. The City Council of the City of Monterey.
<u>COUNCIL OR CITY COUNCIL:</u>	
<u>PLANS:</u>	The project plans referred to herein.
<u>SPECIAL PROVISIONS:</u>	Part IV of these Specifications.
<u>SPECIFICATIONS:</u>	This document, in its entirety.
<u>STANDARD SPECIFICATIONS:</u>	Specifications entitled "State of California, Department of Transportation, Standard Specifications" of latest publication on file in the office of the City Clerk of the City of Monterey.
<u>STANDARD PLANS:</u>	Plans entitled "State of California, Department of Transportation, Standard Plans" of latest publication.

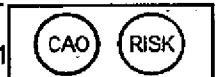
## GENERAL INFORMATION

Bids must be on a unit price basis. ***The amount of the bid for comparison purposes will be the total of all the base bid items and alternative bid items.*** The City retains the right to remove any and/or all Additive Alternatives to from the plans as they see fit.

The contract work shall begin on the date as stated in the Notice to Proceed issued by the City of Monterey.



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**SR-68 (Holman Highway) Roundabout Project**

**CITY OF MONTEREY**

**PROPOSAL SCHEDULE OF QUANTITIES AND PRICES**

To the Honorable City Council  
City of Monterey  
City Hall  
Monterey, California

The undersigned declares to have carefully examined the location of the proposed work, that the Plans and Specifications as set forth herein have been examined, and hereby proposes to furnish all materials and equipment and do all the work required to complete the said work in accordance with said Plans and Specifications for the lump sums and unit prices set forth in the following schedule:

**BID SCHEDULE (BID ITEM LIST)**

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
1	027545	Remove Survey Monument	1	EA		
2	066105	Resident Engineer's Office	1	LS		
3	080050	Progress Schedule (Critical Path Method)	1	LS		
4	090105	Time Related Overhead (5%)	215	WDays		
5	120090	Construction Area Signs	1	LS		
6	120100	Traffic Control System	1	LS		
7	120120	Type III Barricade	74	EA		
8	120149	Temporary Pavement Marking (Paint)	3695	SF		
9	120159	Temporary Traffic Stripe (Paint)	21156	LF		
10	120165	Temporary Channelizer (Surface Mounted)	168	EA		
11	128601	Temporary Signal System	1	LS		
12	128650	Portable Changeable Message Sign	1	LS		
13	129000	Temporary Railing (Type K)	4120	LF		
14	129100	Temporary Crash Cushion Module	168	EA		
15	129110a	Temporary Alternative Crash Cushion System	5	EA		
16	130100	Job Site Management	1	LS		
17	130300	Prepare Storm Water Pollution Prevention Plan	1	LS		
18	130310	Rain Event Action Plan	45	EA		
19	130320	Storm Water Sampling and Analysis Day	45	EA		
20	130330	Storm Water Annual Report	2	EA		
21	130505	Move-In/Move-Out (Temporary Erosion Control)	2	EA		
22	130530	Temporary Hydraulic Mulch (Bonded Fiber Matrix)	2600	SQYD		

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
23	130610	Temporary Check Dam	450	LF		
24	130620	Temporary Drainage Inlet Protection	12	EA		
25	130710	Temporary Construction Entrance	2	EA		
26	130640	Temporary Fiber Rolls	1800	LF		
27	130660	Temporary Large Sediment Barrier	1900	LF		
28	130730	Street Sweeping	1	LS		
29	130900	Temporary Concrete Washout	1	LS		
30	141000	Temporary Fence (Type ESA)	3350	LF		
31	141103	Remove Yellow Thermoplastic Traffic Stripe (Hazardous Waste)	8105	LF		
32	141120	Treated Wood Waste	2178	LB		
33	150204	Abandon Culvert	172	LF		
34	150608	Remove Chain Link Fence	222	LF		
35	150668	Remove Flared End Section	6	EA		
36	150711	Remove Painted Traffic Stripe	11497	LF		
37	150712	Remove Painted Pavement Marking	1762	SQFT		
38	150714	Remove Thermoplastic Traffic Stripe	10675	LF		
39	150715	Remove Thermoplastic Pavement Marking	3071	SF		
40	150722	Remove Pavement Marker	1066	EA		
41	150742	Remove Roadside Sign	53	EA		
42	150768	Remove Asphalt Concrete Pavement (AC Ditch)	5	CY		
43	150771	Remove Asphalt Concrete Dike	1917	LF		
44	150772	Remove Curb	278	LF		
45	150801	Remove AC Overside Drain	11	LF		
46	150812	Remove Pipe	242	LF		
47	150820	Remove Inlet	9	EA		
48	150821	Remove Headwall	2	EA		
49	150826	Remove Manhole	1	EA		
50	150860	Remove Base and Surfacing	24	CY		
51	150630	Remove Marker (Type Q<CA>)	39	EA		
52	151296	Salvage Guardrail	393	LF		
53	152390	Relocate Roadside Sign	1	EA		
54	152438	Adjust Frame and Cover Grade	1	EA		
55	153215	Remove Concrete Curb and Gutter	1729	LF		
56	153103	Cold Plane Asphalt Concrete Pavement	1562	SQYD		
57	153121	Remove Concrete (Ditch)	26	CY		
58	160101	Clearing and Grubbing	1	LS		
59	160120	Remove Tree	10	EA		



Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
60	160120a	Remove Tree Stump	70	EA		
61(F)	190101	Roadway Excavation	7895	CY		
62	190107	Roadway Excavation ( Type Z-2) (Aerially Deposited Lead)	2171	CY		
63	190110	Lead Compliance Plan	1	LS		
64(F)	192037	Structure Excavation (Retaining Wall)	835	CY		
65(F)	193013	Structure Backfill (Retaining Wall)	465	CY		
66	200114	Rock Blanket (Cobble Median Treatment)	6301	SQFT		
67	200116	Gravel Mulch - Beach Pebbles	20	SQYD		
68	201023	Plant (Group K) (24" Box)	17	EA		
69	201024	Plant (Group K) (48" Box)	1	EA		
70	202006	Soil Amendment	18	CY		
71	202011	Wood Bark Mulch	115	CY		
72	202035	Fertilizer (Packet)	2434	EA		
73	204013	Plant (Group M) (LINER)	90	EA		
74	204035	Plant (Group A) (NO. 1)	1984	EA		
75	204036	Plant (Group B) (NO. 5)	143	EA		
76	204099	Plant Establishemnt (5 Years)	1	LS		
77	205062	Root Barrier	611	LF		
78	206005	Edging (Metal)	282	LF		
79	206562	1" Remote Control Valve	2	EA		
80	206570	Remote Control Valve (Master Valve with Flow Sensor)	1	EA		
81	206851	Master Irrigation Tubing	1	EA		
82	208222	1/2" Drip In-Line Tubing	4863	LF		
83	208301	Irrigation Controller Enclosure Cabinet	1	EA		
84	208310	Irrigation Sleeve	798	LF		
85	208421	Backflow Preventer Assembly Enclosure	1	EA		
86	208423	1" Backflow Preventer Assembly	1	EA		
87	208445	Tree Well Sprinkler Assembly	18	EA		
88	208450	1" Drip Valve Assembly	7	EA		
89	208598	1" Plastic Pipe (Shcedule 40) (Main Line)	689	LF		
90	208598A	3/4" Plastic Pipe (Schedule 40) (Supply Line)	1807	LF		
91	208601	4" Schedule 40 HDPE Pipe Conduit	115	LF		
92	208738A	6" Corrugated High Density Polyethelene Conduit	814	LF		
93	209999A	1-GPH Drip Emitter	541	EA		
94	209999B	Imported Biofiltration Soil	66	CY		
95	209999C	1/2" Drip Irrigation Tubing	2845	LF		

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
96	209999D	Dripline Flush Valves	15	EA		
97	209999E	Control & Neutral Conductors	1	LS		
98	210010	Move-In/Move-Out (Erosion Control)	2	EA		
99	210600	Compost	26233	SQFT		
100	210110	Imported Topsoil	1093	CY		
101	210270	RECEP (Netting)	26233	SQFT		
102	210430	Hydroseed	26233	SQFT		
103	260201	Aggregate Base (Class 2)	7794	CY		
104	377501	Slurry Seal	78	TON		
105	390132	Hot Mix Asphalt (Type A)	5148	TON		
106	394073	Place HMA Dike (Type A)	123	LF		
107	394075	Place HMA Dike (Type D)	89	LF		
108	394077	Place HMA Dike (Type F)	224	LF		
109	394077A	Place HMA Dike (Special)	301	LF		
110	394090	Place HMA (Miscellaneous Area)	52	SQYD		
111	397005	Tack Coat	5	TON		
112(F)	510060	Structural Concrete, Retaining Wall	234	CY		
113(F)	510502	Minor Concrete (Minor Structure) (Drainage)	33	CY		
114(F)	511035	Golden Granite Concrete Texture	3157	SQFT		
115(F)	511036	Modified Golden Granite Concrete Texture	356	SQFT		
116(F)	520103	Bar Reinforcing Steel (Retaining Wall)	36740	LB		
117(F)	560218	Furnish Sign Structure (Truss)	41220	LB		
118(F)	560219	Install Sign Structure (Truss)	41220	LB		
119	560248	Furnish Single Sheet Aluminum Sign (0.063" Unframed)	377	SF		
120	560249	Furnish Single Sheet Aluminum Sign (0.080" Unframed)	116	SF		
121	560251	Furnish Single Sheet Aluminum Sign (0.063" Framed)	204	SF		
122	560252	Furnish Single Sheet Aluminum Sign (0.080" Framed)	144	SF		
123	561005	60" Cast In Drilled Hole Concrete Pile (Sign Foundation)	45	LF		
124	566011	Roadside Sign - One Post	42	EA		
125	566012	Roadside Sign - Two Post	9	EA		
126	568001	Install Sign (Strap and Saddle Bracket Method)	8	EA		
127	568001A	Post Sleeve (Roadside Sign)	27	EA		
128	568016	Install Sign Panel on Existing Frame	18	EA		
129	650014	18" Reinforced Concrete Pipe	390	LF		

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
130	650018	24" Reinforced Concrete Pipe	342	LF		
131	665017	18" Corrugated Steel Pipe (0.079" Thick)	67	LF		
132(F)	682042	Class 2 Permeable Material	33	CY		
133	700617	Drainage Inlet Marker	14	EA		
134	705204	18" Concrete Flared End Section	1	EA		
135	705206	24" Concrete Flared End Section	1	EA		
136	707225	48" Precast Concrete Pipe Manhole	1	EA		
137	721015	Rock Slope Protection (Light, Method B)	5	CY		
138	721015A	Small Rock Slope Protection (3"-6" size cobble)	37	SQYD		
139	721015B	Small Rock Slope Protection- (6"-8" size cobble Check Dam)	4	SQYD		
140	729010	Rock Slope Protection Fabric (Class 8)	14	SY		
141	730070	Detectable Warning Surface	442	SF		
142	731504	Minor Concrete (Curb & Gutter)	133	CY		
143	731501	Minor Concrete (Curb)	55	CY		
144	731502	Minor Concrete (Misc. Construction)	4	CY		
145	731508	Minor Concrete (Exposed Aggregate Concrete)	25	CY		
146	731517	Minor Concrete (Gutter)	145	LF		
147	731519B	Minor Concrete (Truck Apron)	100	CY		
148	731519C	Minor Concrete (Central Island Curb)	28	CY		
149	731521	Minor Concrete (Sidewalk)	107	CY		
150	731623	Minor Concrete (Curb Ramp)	26	CY		
151	750001	Misc. Iron and Steel (Drainage)	3780	LB		
152	800360	Chain Link Fence (Type CL-6)	225	LF		
153	810111	Survey Monument (Type A)	3	EA		
154	820107	Delineator (Class 1)	22	EA		
155	820130	Object Marker	42	EA		
156	832007	Midwest Guard Rail System (Wood Post)	326	LF		
157	832007A	Stain Midwest Guard Railing and Alternative Terminals	67	LF		
158	832070	Vegetation Control (Minor Concrete)	213	SY		
159	833999A	Tubular Bicycle Railing	134	LF		
160(F)	839521	Cable Railing	145	LF		
161	839543	Transition Railing (Type WB-31)	3	EA		
162	839581	End Anchor Assembly (Type SFT)	4	EA		
163	839584	Alternative In-Line Terminal System	3	EA		

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
164(F)	839721	Concrete Barrier (Type 732A MOD)	134	LF		
165	840515	Thermoplastic Pavement Marking	3623	SF		
166	840504	4" Thermoplastic Traffic Stripe	23422	LF		
167	840505	6" Thermoplastic Traffic Stripe	863	LF		
168	840506	8" Thermoplastic Traffic Stripe	1847	LF		
169	850111	Pavement Marker (Retroreflective)	1062	EA		
170	860460	Lighting & Sign Illumination	1	LS		
171	860604	Flashing Beacon System	1	LS		
172	869999	Maintain Electrical System	1	LS		
173	999990	Mobilization (5%)	1	LS		

<b>TOTAL BASE BID</b>	\$
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<b>Additive Alternatives</b>						
Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
1	869999a	Central Island Lighting	1	LS		
2	731519a	Minor Concrete (Colored Concrete)(Misc. Areas)	19295	SQFT		
3	590115A	Clean and Paint Structural Steel (Overhead Signs)	1	LS		
<b>TOTAL ADDITIVE ALTERNATIVES</b>						

<b>TOTAL BASE BID PLUS ALTERNATIVES</b>	\$
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(F) Denotes Final Pay

## BID ITEM DESCRIPTIONS

This section covers details of individual items of the Bid Schedule to insure that it is clear as to what is to be included in each item. The costs submitted with each item are to reflect the work to be completed under that bid item only. Payment of all the following items shall be for actual materials installed on the job and for actual work accomplished.

### **Mobilization**

Measurement and payment for this item shall be on a lump sum (LS) basis. The lump sum cost shall pay for all the costs of mobilization and demobilization for items awarded. The work shall include, but not be limited to, preparatory and cleanup work necessary for performance of the work in accordance with the Standard Specifications, Plans and Specifications, and as directed by the Engineer. This item also includes the movement of construction personnel, equipment, supplies and incidentals to and from the project site, and all other work and operations, which must be incurred prior to the beginning of and after the end of construction work. This item shall also include obtaining bonds, insurance policies, licenses, and permits required by the contract documents, project meetings, coordination and all related administrative costs for this Project. Partial payment of this bid item shall be based on percent of this item completed and shall be contingent upon the Contractor's furnishing and the City's acceptance of: 1) the schedule of values, 2) the construction schedule, 3) Traffic Control Plans, 4) Quality Control Plan, 5) all submittals and shop drawings, 6) electrician certifications, 7) subcontractor's Certificate of Good Faith Effort to hire local, and 8) fringe benefit summary statement. Also included in this bid item is maintaining the project site, regular cleanup and final cleanup, temporary fencing and staging area, if any.

### **Traffic Control System**

Measurement and payment for this item shall be on a lump sum (LS) basis. The work shall include, but not be limited to, the furnishing of all labor, materials, tools, equipment, and incidentals necessary to maintain vehicular traffic for public use during performance of the work, including all related construction area sign placement and maintenance not separately measured and paid for. This work also includes the preparation, submittal and implementation of the traffic control plan(s), establishing traffic detour(s), traffic control device placement and maintenance, flagging, barriers, temporary drainage facilities, temporary access, temporary asphalt tapers, protection of adjacent existing improvements from damage or staining, removal of the detour(s) upon direction of the Engineer, and restoration of all areas affected by construction, maintenance, use, and removal of the detour in accordance with the Standard Specifications, Plans and Specifications, and as directed by the Engineer.

### **Record Drawings**

No separate measurement and payment shall be made for this item. Furnishing to the City a complete set of Record (As-Built) Drawings upon project completion shall be considered as an ancillary item.

### **FINAL PAY ITEMS**

Items designated with (F) are Final Pay items in accordance with Section 9, "Payment", of the Standard Specifications

### **ANCILLARY ITEMS**

Payment for any items that do not have instruction indicating where expenses for said items are to be accounted for are to be considered ancillary to the work and accounted for in every one of the lump sum or unit price items and no additional compensation will be allowed therefor.

### **LUMP SUM PRICE BREAKDOWN**

Immediately after award of the contract, the contractor shall submit a cost breakdown list to the Engineer for all Lump Sum Bid items. The list shall consist of major elements of work that make up the item and shall be used for determining progress pay estimates.

## **BID CLARIFICATION**

Award of contract, if any be made, shall be made to the Contractor with the lowest responsive responsible bid based on the Total Base Bid plus Additive Items taken in order up to the funding amount disclosed by City before the bid opening.

Pursuant to the provisions of the California Public Contract Code Section 20103.8, City reserves the option to award any or all the additive bid items in addition to the original contract after the lowest responsive responsible Bidder has been determined, should the City later obtain additional funding for additive alternatives not awarded with the original contract.

Unit and lump sum prices shall be for items in place, as shown on the Plans, including all labor, materials, equipment, taxes, and incidentals necessary for a complete job.

Whenever unit prices are required and there is an incorrect extension thereof, the unit price correctly extended shall prevail and the total bid shall be corrected to reflect the correct extension.

The foregoing quantities are approximate only, being given as a basis for comparison of bids, and the City of Monterey does not, expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of work by twenty-five percent (25%) or to omit portions of the work as may be deemed necessary by the Engineer.

Bidders may withdraw or revise their bid personally, or upon a written or telegraphic request, or by FAX (the City's FAX number is 646-3702), at any time prior to the hour set for the opening of bids, but not thereafter; however, the City shall not accept faxed copies of bid bonds, affidavits or any other documents where an original document or signature is required by these Specifications. Bids may not be withdrawn for the time period specified in **BID VALIDITY** of Part I.

## **BONDS**

The Contractor, at the time of signing and executing the contract, shall execute and file with the City a performance bond to the satisfaction and approval of said City, in a sum of not less than one hundred percent (100%) of the amount of the contract conditional upon the faithful performance of the contract.

The Contractor, at the time of signing and executing any contract in excess of twenty-five thousand dollars (\$25,000), shall execute and file with the City a public works labor and materials bond to the satisfaction and approval of said City, in a sum of one hundred percent (100%) of the amount of the contract.

The Contractor, shall execute a separate Material and Labor Payment Bond and Performance Bond for plant establishment, issued by a corporate surety, in conformance with the requirements set forth in the contract documents, for the duration of the plant establishment period, a period of 5-calendar years (1,825 days), each for not less than one hundred percent (100%) of the contract price for landscape items. These bonds will be released upon completion of plant establishment.

The surety shall be an admitted carrier in California with a valid surety license and possess a minimum rating from A. M. Best Company of A-VII. The Surety and /or co-sureties must be listed as an acceptable surety on federal bonds by the United States Department of the Treasury, subject to the maximum amount shown in the listing. If co-sureties are used, their bonds shall be on a joint and several basis.

Notwithstanding the above, the Contractor may substitute adequate securities for any bond called for under the provisions of these Specifications as set forth in Public Contracts Code Section 22300. Alternate security substitutions shall be submitted to the City no later than ten (10) days after written notice that a contract has been awarded to the contractor to allow processing and escrow agreement for in lieu security.



The Contractor shall submit the contract with his signature affixed thereto, required bonds or alternate security and evidence of insurance that conforms to the contract within fifteen (15) calendar days after written notice that a contract has been awarded to him.

The Contractor shall be required to submit additional performance and payment bond for project work orders more than one-hundred thousand dollars (\$100,000). Additional bonds shall be submitted within fourteen (14) calendar days after the execution of such work orders. Additional bonds shall be paid as percent of cost as described in Part II of these Specifications.

The Contractor shall maintain the faithful performance bond in full force and effect during the guarantee period for the purpose of insuring that said repairs or replacements will be made, or may, at the Contractor's option, replace said faithful performance bond for a similar bond in the amount of fifty percent (50%) of the total actual contract amount.

The Noncollusion Affidavit included in this document shall be executed and submitted with each bid. The Local Hire Certification included in this document shall be executed and submitted with each bid, except in the following cases: 1) informal bids (i.e., under \$60,000); 2) when a state or federal law or regulation applicable to a particular contract prohibits the provision of a local hire requirement; or 3) whenever the City, in accordance with the requirements of the City Code or state law, determines that the contract is necessary to respond to an emergency which endangers the public health, safety, or welfare; or 4) whenever the City determines that a suitable pool of persons providing specialized skills does not exist locally for a specific public works project.

**DECLARATION OF BIDDER  
RE: LICENSE QUALIFICATIONS**

Bidder certifies he/she posses a license in accordance with a State Act providing for the registration of Contractors. License No. \_\_\_\_\_, Class: \_\_\_\_\_, Expiration date: \_\_\_\_\_.

Department of Industrial Relations Registration No. \_\_\_\_\_

**FAILURE TO PROVIDE THIS INFORMATION AND SIGNATURE MAY RESULT IN YOUR BID BEING DEEMED NON-RESPONSIVE OR WILL RESULT IN REJECTION OF BID.**

The foregoing information is true and correct and is executed under penalty of perjury in \_\_\_\_\_ County, California, ON \_\_\_\_\_, 201\_\_.

Name of Firm:

Address:

Telephone:

Email:

(If an individual, so state. If a firm or co-partnership, state the firm name and give the names of person authorized to execute the declaration on its behalf.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name and Title

The Bidder shall list below any and all addenda issued for this project. Failure to list issued addenda will result in a non-responsive bid:

<b>ADDENDA</b>	<b>DATE RECEIVED</b>
1. _____	_____
2. _____	_____
3. _____	_____

The Bidder shall list below jobs of a similar nature completed by Bidder's organization within the past three (3) years:

<b>Date Completed</b>	<b>Dollar Amount</b>	<b>Agency</b>	<b>Type Of Job</b>	<b>Contracting Location</b>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____



**NONCOLLUSION DECLARATION**

**TO BE EXECUTED BY BIDDER, LEGALLY NOTARIZED AND SUBMITTED WITH BID**

State of California )  
 ) ss.  
County of \_\_\_\_\_ )

\_\_\_\_\_, being first duly sworn, deposes and says that he or she is \_\_\_\_\_ of \_\_\_\_\_, the party making the foregoing bid; that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived or agreed with any Bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the Bidder or any other Bidder, or to fix any overhead, profit, or cost element of the price bid, or of that of any other Bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the Bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid; and that the bid is not made in the interest of, or on behalf of, any member of the Monterey City Council or any City officer or employee.

Signed: \_\_\_\_\_

State of \_\_\_\_\_ )  
 ) ss.  
County of \_\_\_\_\_ )

On \_\_\_\_\_ before me, \_\_\_\_\_  
Date Name and Title of the Officer

personally appeared \_\_\_\_\_  
Name(s) of Signer(s)

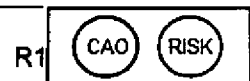
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity (ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the persons(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

(seal)

\_\_\_\_\_  
Notary's Signature



### DEBARMENT AND SUSPENSION CERTIFICATION

The Bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any state, federal, or local agency;
- Has not been suspended, debarred, voluntarily excluded or determined ineligible by any state, federal, or local agency within the past 3 years;
- Does not have a proposed debarment pending; and
- Has not be indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessarily result in denial of award, but will be considered in determining Bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions.

I declare under penalty of perjury that the foregoing is true and correct and that this certification is signed this \_\_\_\_\_ day of \_\_\_\_\_, 201\_\_ in \_\_\_\_\_ County, California.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name and Title



## LOCAL HIRING REQUIREMENT

All Contractors who submit bids, or proposals, to construct or provide work on any City of Monterey Public Works project, or for any other Public Works construction, or improvement, on City property must comply with Monterey City Code Article 2 of Chapter 28, which sets forth the requirements regarding the Local Hiring Requirement for Public Works Projects. A copy of Monterey's Local Hiring Requirement Ordinance is available at the City Clerk's Office; Bidders are responsible for familiarizing themselves with the contents thereof before signing the certifications required below.

Among other requirements, this ordinance requires the Contractor to promise to make a good-faith effort to hire qualified individuals who are residents of the Monterey Bay Area (Monterey, Santa Cruz and San Benito Counties), in sufficient numbers so that no less than fifty percent (50%) of the Contractor's total construction work force, including subcontractor work force, measured in labor work hours, is comprised of Monterey Bay area residents. This same requirement applies to all subcontractors.

Every Bidder must complete and sign under penalty of perjury a Certification of Good-Faith effort to Hire Monterey Bay Area Residents, on the form provided, and submit said Certification with the sealed bid no later than the date and time of the bid opening. Bidder shall attach to the Certification documentary evidence supporting Bidder's promise to meet, or to make a good-faith effort to meet, the local hiring goal.

Contractor shall include in each and every subcontract relating to the project the requirement that the subcontractor promises to make a good faith effort to hire qualified individuals who are residents of the Monterey Bay Area. Contractor shall be responsible for subcontractor's compliance.

Prior to submitting bids, Bidders shall ensure that any and all subcontractors listed in their bids are not disqualified at that time pursuant to Section 28-78 of the City ordinance referenced above. Prospective contractors may consult the list, available from the City Clerk, of contractors and subcontractors, if any, who are currently disqualified.

The local hiring requirement shall not apply under the following circumstances:

- (a) Whenever a state or federal law or regulation applicable to a particular contract prohibits the provisions of a local hire requirement; or
- (b) Whenever the City, in accordance with the requirements of the Code or state law, determines that the contract is necessary to respond to an emergency which endangers the public health, safety, or welfare; or
- (c) Whenever the City determines that a suitable pool of person providing specialized skills (an example would be marine-related pile drivers) does not exist locally for a specific public works project.



**CERTIFICATION OF GOOD-FAITH EFFORT (PRIME CONTRACTOR)**

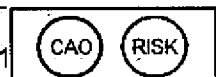
**To Hire Monterey Bay Area Residents  
(Prime Contractor – To be Submitted with Bid)**

I, \_\_\_\_\_, a licensed contractor, or responsible managing officer, of the company known as \_\_\_\_\_, do hereby certify, under penalty of perjury, that I have met, or made a good-faith effort to meet, the requirements set forth in Monterey City Code Article 2 of Chapter 28. Further, I certify that during the performance of the contract, I shall keep an accurate record on a standardized form showing the name, place or residence, trade classification, hours employed, proof of qualified individual status, per diem wages and benefits of each person employed by the company on the specific public works project, including full-time, part-time, permanent, and temporary employees, and provide such records to the City upon request, within five working days. I understand that I am responsible for insuring that any subcontractor working under my direction, complies with this ordinance, including submitting a Certification of Good Faith Effort to Hire Monterey Bay Residents, and to keeping accurate records as described above.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name and Title

\_\_\_\_\_  
Date



**CERTIFICATION OF GOOD-FAITH EFFORT (SUBCONTRACTOR)**

**To Hire Monterey Bay Area Residents  
(Subcontractor – To be Completed by Subcontractor After Bid is Awarded)**

I, \_\_\_\_\_, a licensed contractor, or responsible managing officer, of the company known as \_\_\_\_\_, do hereby certify, under penalty of perjury, that I have met, or made a good-faith effort to meet, the requirements set forth in Monterey City Code Article 2 of Chapter 28. Further, I certify that during the performance of the contract, I shall keep an accurate record on a standardized form showing the name, place or residence, trade classification, hours employed, proof of qualified individual status, per diem wages and benefits of each person employed by the contractor on the specific public works project, including full-time, part-time, permanent, and temporary employees, and provide such records to the City upon request, within five working days. I understand that I am responsible for insuring that any subcontractor working under my direction, complies with this ordinance, including submitting a Certification of Good Faith Effort to Hire Monterey Bay Residents, and to keeping accurate records as described above.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name and Title

\_\_\_\_\_  
Date

### BIDDER'S LIST OF SUBCONTRACTORS

The Bidder must identify each subcontractor performing work in an amount in excess of ½ of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.). Complete columns 1 through 6 and submit with the bid. Failure to provide complete information in columns 1 through 6 will result in a nonresponsive bid.

Column 1: Business Name and Location	Column 2: Ca Contractor License No.	Column 3: DIR No. *	Column 4: Bid Item Nos.	Column 5: % of Bid Item Subcontracted	Column 6: Description of Subcontracted Work

\* Department of Industrial Relations registration number

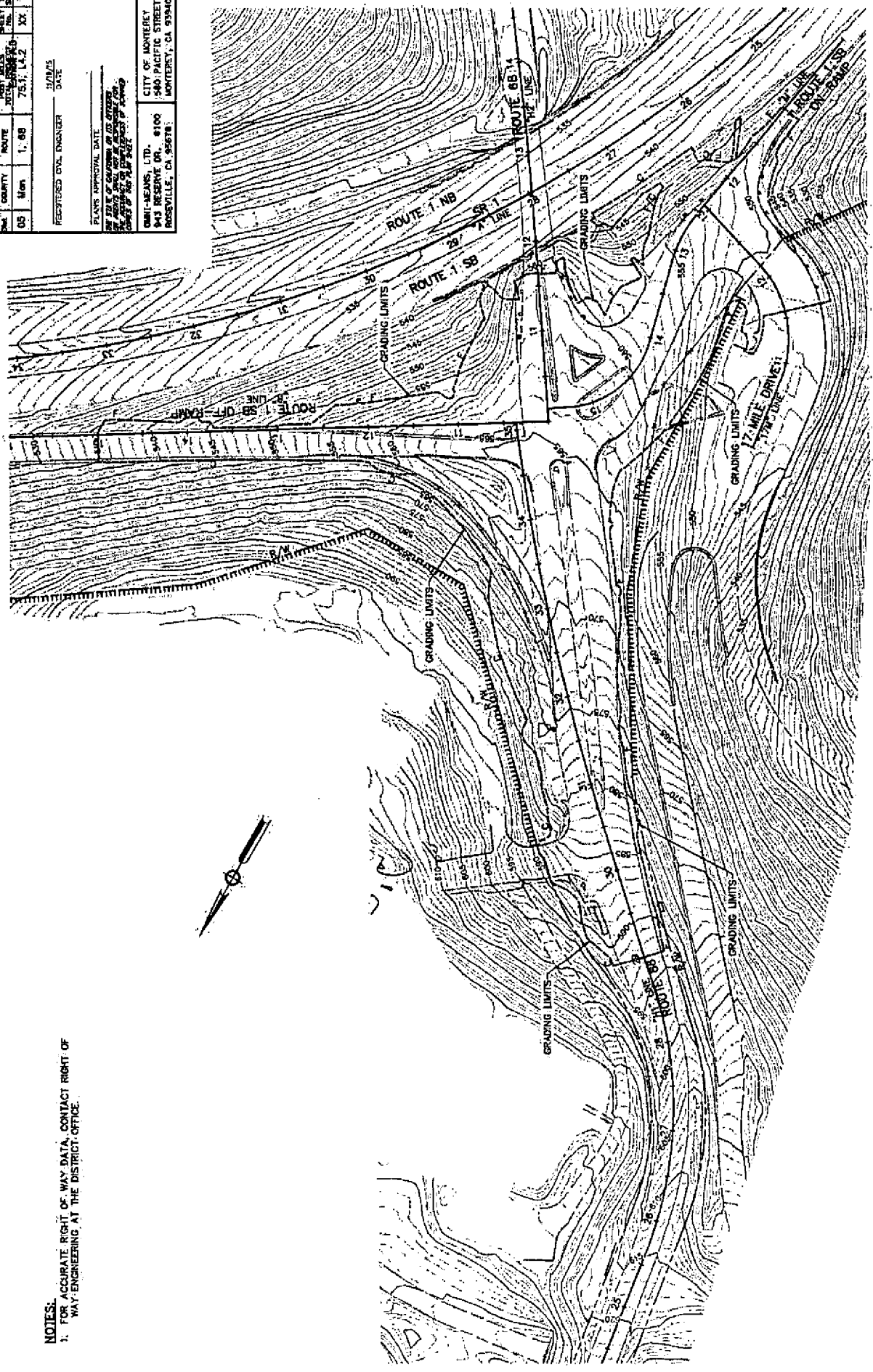
DATE	QUANTITY	ROUTE	POST MILE	STATION	SHEET	TOTAL SHEETS
05	Mar	1: 68	75.1	L+Z	XX	180

REGISTERED CIVIL ENGINEER: \_\_\_\_\_ DATE: \_\_\_\_\_

PLANS APPROVAL DATE: \_\_\_\_\_  
 BY: \_\_\_\_\_  
 FOR THE CITY OF MONTEREY, CALIFORNIA  
 COUNTY OF SAN BENITO

CITY OF MONTEREY  
 540 PACIFIC STREET  
 MONTEREY, CA 93940

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



**EXISTING CONTOURS**  
 SCALE 1"=50'

CAO PRSK

Agreement # Ag-5377 - Page 727 of 791  
 THIS PLAN ACCURATE FOR CONTOUR GRADING WORK ONLY.



January 12, 2016

To: All Plan Holders  
 Project: SR1/SR68 Separation - SR 68 Holman Hwy Roundabout Project  
 Subject: Addendum #3  
 Sent Via: Web Posting on City of Monterey EBidBoard

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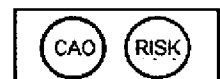
***Bidder must acknowledge this Addendum #2, and any subsequent addenda, in your Bid Proposal, in the Revised Bid Book (Book 1 of 2), Appendix B, Page 15, "Declaration of Bidder."***

**1. City-Initiated Changes:**

1. At the Pre-Bid Meeting held on December 16, 2015, a potential Deductive Alternate Stage Construction Plan merging stage 4 and stage 6 was mentioned. This alternative plan is still in ongoing evaluations and will not be included in any addendum. If Caltrans approves, this alternate staging concept will be reviewed together with the selected Contractor to determine if this approach would save time, costs, and/or increase public safety. Regardless of the outcome of this alternative, the selected Contractor is encouraged to submit other alternate staging strategies as well.

**Revised Bid Book (Book 1 of 2) Appendix B is revised as follows:**

2. Page 2, Bid Validity is changed from 90 to 120 days.
3. Pages 6-11, Bid Schedule (Bid Item List) is deleted in its entirety and replaced with Revised Bid Schedule (Bid Item List) attached to this Addendum #3.
4. Page 8, Bid Schedule, Item 81 description is revised to read "Irrigation Controller" on the attached, Revised Bid Schedule.
5. Bid Item 84, "Irrigation Sleeve" is deleted on the attached, Revised Bid Schedule.
6. Page 10, Bid Schedule, Item 157: The quantity for "Stain Midwest Guard Railing, Cable Railing, and Alternative Terminals" is revised from 67 linear feet to 850 linear feet on the attached, Revised Bid Schedule.





**Special Provisions (Book 2 of 2) is revised as follows:**

5. Page 12, Section 5-1.20D(1) Relations with Caltrans. Add the follow sentence: "The Double Permit will be issued at no cost to the Contractor." Also reference Addendum #2, Part I, Pre-Bid Meeting, Question 8.
6. Page 17, Section 7-1.02K(6)(j)(iii), Earth Material Containing Lead: Delete the following:
  - a. The last sentence of the 3rd paragraph and items 1 and 2.
  - b. The 2nd to last paragraphs and items 1-3.
  - c. The last paragraph and items 1 and 2.

**Project Plans will be revised as follows:**

7. Plan sheets SC-7 (Sheet 56), SC-8 (Sheet 57), SC-13 (Sheet 62) and Q-2 (Sheet 99) were revised and are attached. These Plans were revised in response to Bidder-Initiated Questions #6, #7, and #12.

**ii. Bidder-Initiated Questions**

1. What are the Insurance Qualifications?  
**Answer: Insurance requirements are shown in the Caltrans Standard Specifications, Section 7-1.06, starting on page 75.**
2. Appendix B, Page 14, Paragraph 3: How many years is the bond for if additional bonds are required? Bonding Company needs to know since the project is \$6M.  
**Answer: In the Revised Bid Book (Book 1 of 2), Page 14, delete the second paragraph, regarding additional bonds, in its entirety.**
3. Bid item 77 calls for root barriers but is not shown on the plans. The specifications ask that we provide root barriers as shown on the plans. Please clarify requirements of root barriers.  
**Answer: Root barrier limits and location are shown on C-2 (sheet 14 of 190 in the plans).**
4. Bid item 81 calls for Master irrigation tubing. This is not shown on the plans. Please define what is the master irrigation tubing.  
**Answer: Bid Item 81 description is changed to "Irrigation Controller" on the attached, Revised Bid Schedule.**
5. Bid item 84 calls for irrigation sleeve. This appears to be shown as item 91 and 92. Please clarify if this is a duplicate item.  
**Answer: Bid Item 84, "Irrigation Sleeve" is deleted on the attached, Revised Bid Schedule. Bid Item 91, for 4" HDPE conduit, and Bid Item 92, for 6" HDPE conduit, and their quantities, cover the irrigation sleeves.**
6. Summary of quantities page Q-2 shows irrigation crossovers and mainline pipe sizes but does not show conduit size. Please provide.  
**Answer: On Revised Plan Q-2, Sheet 99, irrigation crossovers are 6" diameter as shown on the top of the table. The waterline crossover sizes**



are listed on the right of the same table. The irrigation sleeves are 4" diameter as shown on the adjacent table.

7. Irrigation crossover at station 33+15 shows one 1" mainline, three 1" lateral lines, and one 3/4" lateral line going through two 6" crossovers. The Summary of quantities sheet shows only four 1" water lines installed in the two 6" crossovers. Please advise.

**Answer: Summary of Quantities plan Q-2, Sheet 99 is replaced with the Revised Q-2 attached to this Addendum. There is (1) 1" main line, (2) 1" lateral lines, and (2) 3/4" lateral lines crossing Highway 68 at this location.**

8. Bid item 100 calls for import topsoil. Please advise if there is a specific type of topsoil required.

**Answer: Refer to Section 21-2.02D in the Special Provisions (Page 60).**

9. Bid item 71 calls for wood bark mulch. Please advise if there is a specific type required.

**Answer: Refer to Section 20-5.30E in the Special Provisions (Pages 207-208).**

10. Project funding signs, page 22 of the specials calls out Type 1 PFS, Sheet 49 (CS-1) of the plans, shows 2 each Bond Funding Signs are required. There is considerable difference between the 2, can you please clarify?

**Answer: Two (2) identical Project Funding Signs are required as shown on Plan CS-1, Sheet 49. In the Special Provisions, Page 22, Section 12-2.02, Materials, third paragraph, replace "Type II" with "Type I."**

11. Our product was spec'd for staining the guardrails and end terminals, cable barrier, and bike rail. The quantities for these items are below. What doesn't make sense is that item 157 says to stain 67 LF of MGS and Alternative Terminals but then the quantities for these items add up to quite a bit more than 67 LF. Please clarify what you want stained or tell me how/where to submit this question.

**Answer: The quantity for Bid Item 157, Stain Midwest Guard Railing, Cable Railing, and Alternative Terminals, is revised from 67 linear to 850 linear feet on the attached, Revised Bid Schedule.**

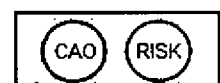
12. There appears to be work shown that does not have a stage:  
H1 from station 29+00 to approx. 30+50, and approx. 20 ft. left and 10 ft. right of center line.

H1 Rt from 29+50-31+00, there is a road section left out between stage 4 (day) and 5 day.

H1 at center line 34+50 to approx. 34+62 there is a piece of road section not shown in any stages.

It appears that work shown on Staging plans does not show all of the pieces that need to get built, thus requiring additional shifts of night time traffic control and work crews to build the areas not shown on staging plans or maybe the section does not need to be built there? Please advise?

**Answer: Along H1, from Sta 29+00 to 31+00: The area north of the centerline is included in Stage 3 Phase B (Night Work). The area south of the centerline is added to Stage 5 Phase C (Night Work). Both are**




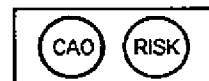
performed using temporary closures (cones) and do not impact quantities for traffic control. Along H1, from 34+50 to 34+62 is constructed during Stage 3 Night Work Off-ramp closure. See attached Revised Plan sheets SC-7, SC-8, and SC-13.

13. Page 17 of the specials says the lead onsite is non-hazardous. The page 42 of the specials defines Z-2 as California hazardous, please clarify?  
**Answer: Soils contaminated (with non-hazardous levels of lead) need to be removed off site per the Z-2 Classification as specified on Page 45. The specifications have been modified under City-Initiated Changes, #6.**
14. Where do we submit questions for this bid?  
**Answer: "Written questions must be submitted to Robert Harary at harary@monterey.org by Tuesday, January 12, 2016 at 5:00 p.m., unless this date and the date of the bid opening are extended by a future addendum."**
15. Stage 2 shows filling in the median on H1 with pavement section, and stage 5 and some other stages show digging out the new road section there and other stages on the ramps and building the islands. Is that the plan to build the road sections use them for staging/shifting the traffic and then digging out to construct the new islands after everything is widened?  
**Answer: Yes, this is the plan to utilize these areas to shift traffic for various stages. The quantities for temporary pavement and over-excavation are included in the bid quantities.**
16. Sheet L-1, note 10, there does not appear to be a section for the maintenance pull out, please clarify?  
**Answer: The note on sheet L-1 refers to sheets X-3 and C-5. On Sheet X-3, the Section for "M" Line, Route 1 SB On-Ramp (Sta 13+66.95 to Sta 14+95.10)" shows the location of the Maintenance Vehicle Pullout (MVP) and structural section. Sheet C-5 provides additional information, such as flow lines, in that area.**
17. R line, station 13+00 calls out a special dike, can you provide a detail?  
**Answer: Plan sheet C-6 provides the Special HMA Dike detail and a Curb-Dike Transition Detail between the dike, earthen ditch, and standard curb.**

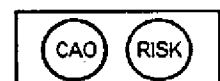
Sealed bid proposals will be received in the Office of the City Clerk, 580 Pacific St., Room 6, Monterey, CA 93940 until 2:00 pm on Tuesday, January 19, 2016.

Sincerely,

  
 Robert M. Harary, P.E.  
 Principal Engineer/Capital Programs Manager  
 City of Monterey



**Attachments:**    Revised Bid Schedule (Bid Item List)  
                         Revised Plan Sheet SC-7 (Sheet 56)  
                         Revised Plan Sheet SC-8 (Sheet 57)  
                         Revised Plan Sheet SC-13 (Sheet 62)  
                         Revised Plan Sheet Q-2 (Sheet 99)



**SR-68 (Holman Highway) Roundabout Project**

**CITY OF MONTEREY**

**PROPOSAL SCHEDULE OF QUANTITIES AND PRICES  
(As Modified by Addendum No. 3 - Issued January 13, 2016)**

To the Honorable City Council  
City of Monterey  
City Hall  
Monterey, California

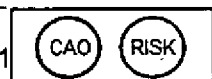
The undersigned declares to have carefully examined the location of the proposed work, that the Plans and Specifications as set forth herein have been examined, and hereby proposes to furnish all materials and equipment and do all the work required to complete the said work in accordance with said Plans and Specifications for the lump sums and unit prices set forth in the following schedule:

**BID SCHEDULE (BID ITEM LIST)**

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
1	027545	Remove Survey Monument	1	EA		
2	066105	Resident Engineer's Office	1	LS		
3	080050	Progress Schedule (Critical Path Method)	1	LS		
4	090105	Time Related Overhead (5%)	215	WDays		
5	120090	Construction Area Signs	1	LS		
6	120100	Traffic Control System	1	LS		
7	120120	Type III Barricade	74	EA		
8	120149	Temporary Pavement Marking (Paint)	3695	SF		
9	120159	Temporary Traffic Stripe (Paint)	21156	LF		
10	120165	Temporary Channelizer (Surface Mounted)	168	EA		
11	128601	Temporary Signal System	1	LS		
12	128650	Portable Changeable Message Sign	1	LS		
13	129000	Temporary Railing (Type.K)	4120	LF		
14	129100	Temporary Crash Cushion Module	168	EA		
15	129110a	Temporary Alternative Crash Cushion System	5	EA		
16	130100	Job Site Management	1	LS		
17	130300	Prepare Storm Water Pollution Prevention Plan	1	LS		
18	130310	Rain Event Action Plan	45	EA		
19	130320	Storm Water Sampling and Analysis Day	45	EA		
20	130330	Storm Water Annual Report	2	EA		
21	130505	Move-In/Move-Out (Temporary Erosion Control)	2	EA		
22	130530	Temporary Hydraulic Mulch	2600	SQYD		

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
		(Bonded Fiber Matrix)				
23	130610	Temporary Check Dam	450	LF		
24	130620	Temporary Drainage Inlet Protection	12	EA		
25	130710	Temporary Construction Entrance	2	EA		
26	130640	Temporary Fiber Rolls	1800	LF		
27	130660	Temporary Large Sediment Barrier	1900	LF		
28	130730	Street Sweeping	1	LS		
29	130900	Temporary Concrete Washout	1	LS		
30	141000	Temporary Fence (Type ESA)	3350	LF		
31	141103	Remove Yellow Thermoplastic Traffic Stripe (Hazardous Waste)	8105	LF		
32	141120	Treated Wood Waste	2178	LB		
33	150204	Abandon Culvert	172	LF		
34	150608	Remove Chain Link Fence	222	LF		
35	150668	Remove Flared End Section	6	EA		
36	150711	Remove Painted Traffic Stripe	11497	LF		
37	150712	Remove Painted Pavement Marking	1762	SQFT		
38	150714	Remove Thermoplastic Traffic Stripe	10675	LF		
39	150715	Remove Thermoplastic Pavement Marking	3071	SF		
40	150722	Remove Pavement Marker	1066	EA		
41	150742	Remove Roadside Sign	53	EA		
42	150768	Remove Asphalt Concrete Pavement (AC Ditch)	5	CY		
43	150771	Remove Asphalt Concrete Dike	1917	LF		
44	150772	Remove Curb	278	LF		
45	150801	Remove AC Overside Drain	11	LF		
46	150812	Remove Pipe	242	LF		
47	150820	Remove Inlet	9	EA		
48	150821	Remove Headwall	2	EA		
49	150826	Remove Manhole	1	EA		
50	150860	Remove Base and Surfacing	24	CY		
51	150630	Remove Marker (Type Q<CA>)	39	EA		
52	151296	Salvage Guardrail	393	LF		
53	152390	Relocate Roadside Sign	1	EA		
54	152438	Adjust Frame and Cover Grade	1	EA		
55	153215	Remove Concrete Curb and Gutter	1729	LF		
56	153103	Cold Plane Asphalt Concrete Pavement	1562	SQYD		
57	153121	Remove Concrete (Ditch)	26	CY		
58	160101	Clearing and Grubbing	1	LS		

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
59	160120	Remove Tree	10	EA		
60	160120a	Remove Tree Stump	70	EA		
61(F)	190101	Roadway Excavation	7895	CY		
62	190107	Roadway Excavation ( Type Z-2) (Aerially Deposited Lead)	2171	CY		
63	190110	Lead Compliance Plan	1	LS		
64(F)	192037	Structure Excavation (Retaining Wall)	835	CY		
65(F)	193013	Structure Backfill (Retaining Wall)	465	CY		
66	200114	Rock Blanket (Cobble Median Treatment)	6301	SQFT		
67	200116	Gravel Mulch - Beach Pebbles	20	SQYD		
68	201023	Plant (Group K) (24" Box)	17	EA		
69	201024	Plant (Group K) (48" Box)	1	EA		
70	202006	Soil Amendment	18	CY		
71	202011	Wood Bark Mulch	115	CY		
72	202035	Fertilizer (Packet)	2434	EA		
73	204013	Plant (Group M) (LINER)	90	EA		
74	204035	Plant (Group A) (NO. 1)	1984	EA		
75	204036	Plant (Group B) (NO. 5)	143	EA		
76	204099	Plant Establishemnt. (5 Years)	1	LS		
77	205062	Root Barrier	611	LF		
78	206005	Edging (Metal)	282	LF		
79	206562	1" Remote Control Valve	2	EA		
80	206570	Remote Control Valve (Master Valve with Flow Sensor)	1	EA		
81	206851	Irrigation Controller	1	EA		
82	208222	1/2" Drip In-Line Tubing	4863	LF		
83	208301	Irrigation Controller Enclosure Cabinet	1	EA		
84					<u>Bid Item Removed</u>	
85	208421	Backflow Preventer Assembly Enclosure	1	EA		
86	208423	1" Backflow Preventer Assembly	1	EA		
87	208445	Tree Well Sprinkler Assembly	18	EA		
88	208450	1" Drip Valve Assembly	7	EA		
89	208598	1" Plastic Pipe (Shcedule 40) (Main Line)	689	LF		
90	208598A	3/4" Plastic Pipe (Schedule 40) (Supply Line)	1807	LF		
91	208601	4" Schedule 40 HDPE Pipe Conduit	115	LF		
92	208738A	6" Corrugated High Density Polyethelene Conduit	814	LF		
93	209999A	1-GPH Drip Emitter	541	EA		
94	209999B	Imported Biofiltration Soil	66	CY		



Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
95	209999C	1/2" Drip Irrigation Tubing	2845	LF		
96	209999D	Dripline Flush Valves	15	EA		
97	209999E	Control & Neutral Conductors	1	LS		
98	210010	Move-In/Move-Out (Erosion Control)	2	EA		
99	210600	Compost	26233	SQFT		
100	210110	Imported Topsoil	1093	CY		
101	210270	RECEP (Netting)	26233	SQFT		
102	210430	Hydroseed	26233	SQFT		
103	260201	Aggregate Base (Class 2)	7794	CY		
104	377501	Slurry Seal	78	TON		
105	390132	Hot Mix Asphalt (Type A)	5148	TON		
106	394073	Place HMA Dike (Type A)	123	LF		
107	394075	Place HMA Dike (Type D)	89	LF		
108	394077	Place HMA Dike (Type F)	224	LF		
109	394077A	Place HMA Dike (Special)	301	LF		
110	394090	Place HMA (Miscellaneous Area)	52	SQYD		
111	397005	Tack Coat	5	TON		
112(F)	510060	Structural Concrete, Retaining Wall	234	CY		
113(F)	510502	Minor Concrete (Minor Structure) (Drainage)	33	CY		
114(F)	511035	Golden Granite Concrete Texture	3157	SQFT		
115(F)	511036	Modified Golden Granite Concrete Texture	356	SQFT		
116(F)	520103	Bar Reinforcing Steel (Retaining Wall)	36740	LB		
117(F)	560218	Furnish Sign Structure (Truss)	41220	LB		
118(F)	560219	Install Sign Structure (Truss)	41220	LB		
119	560248	Furnish Single Sheet Aluminum Sign (0.063" Unframed)	377	SF		
120	560249	Furnish Single Sheet Aluminum Sign (0.080" Unframed)	116	SF		
121	560251	Furnish Single Sheet Aluminum Sign (0.063" Framed)	204	SF		
122	560252	Furnish Single Sheet Aluminum Sign (0.080" Framed)	144	SF		
123	561005	60" Cast In Drilled Hole Concrete Pile (Sign Foundation)	45	LF		
124	566011	Roadside Sign - One Post	42	EA		
125	566012	Roadside Sign - Two Post	9	EA		
126	568001	Install Sign (Strap and Saddle Bracket Method)	8	EA		
127	568001A	Post Sleeve (Roadside Sign)	27	EA		
128	568016	Install Sign Panel on Existing Frame	18	EA		



Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
129	650014	18" Reinforced Concrete Pipe	390	LF		
130	650018	24" Reinforced Concrete Pipe	342	LF		
131	665017	18" Corrugated Steel Pipe (0.079" Thick)	67	LF		
132(F)	682042	Class 2 Permeable Material	33	CY		
133	700617	Drainage Inlet Marker	14	EA		
134	705204	18" Concrete Flared End Section	1	EA		
135	705206	24" Concrete Flared End Section	1	EA		
136	707225	48" Precast Concrete Pipe Manhole	1	EA		
137	721015	Rock Slope Protection (Light, Method B)	5	CY		
138	721015A	Small Rock Slope Protection (3"-6" size cobble)	37	SQYD		
139	721015B	Small Rock Slope Protection- (6"-8" size cobble Check Dam)	4	SQYD		
140	729010	Rock Slope Protection Fabric (Class B)	14	SY		
141	730070	Detectable Warning Surface	442	SF		
142	731504	Minor Concrete (Curb & Gutter)	133	CY		
143	731501	Minor Concrete (Curb)	55	CY		
144	731502	Minor Concrete (Misc. Construction)	4	CY		
145	731508	Minor Concrete (Exposed Aggregate Concrete)	25	CY		
146	731517	Minor Concrete (Gutter)	145	LF		
147	731519B	Minor Concrete (Truck Apron)	100	CY		
148	731519C	Minor Concrete (Central Island Curb)	28	CY		
149	731521	Minor Concrete (Sidewalk)	107	CY		
150	731623	Minor Concrete (Curb Ramp)	26	CY		
151	750001	Misc. Iron and Steel (Drainage)	3780	LB		
152	800360	Chain Link Fence (Type CL-6)	225	LF		
153	810111	Survey Monument (Type A)	3	EA		
154	820107	Delineator (Class 1)	22	EA		
155	820130	Object Marker	42	EA		
156	832007	Midwest Guard Rail System (Wood Post)	326	LF		
157	832007A	Stain Midwest Guard Railing, Cable Railing and Alternative Terminals	825	LF		
158	832070	Vegetation Control (Minor Concrete)	213	SY		
159	833999A	Tubular Bicycle Railing	134	LF		
160(F)	839521	Cable Railing	145	LF		
161	839543	Transition Railing (Type WB-31)	3	EA		
162	839581	End Anchor Assembly (Type SFT)	4	EA		

Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
163	839584	Alternative In-Line Terminal System	3	EA		
164(F)	839721	Concrete Barrier (Type 732A MOD)	134	LF		
165	840515	Thermoplastic Pavement Marking	3623	SF		
166	840504	4" Thermoplastic Traffic Stripe	23422	LF		
167	840505	6" Thermoplastic Traffic Stripe	863	LF		
168	840506	8" Thermoplastic Traffic Stripe	1847	LF		
169	850111	Pavement Marker (Retroreflective)	1062	EA		
170	860460	Lighting & Sign Illumination	1	LS		
171	860604	Flashing Beacon System	1	LS		
172	869999	Maintain Electrical System	1	LS		
173	999990	Mobilization (5%)	1	LS		

<b>TOTAL BASE BID</b>	\$
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<b>Additive Alternatives</b>						
Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
1	869999a	Central Island Lighting	1	LS		
2	731519a	Minor Concrete (Colored Concrete)(Misc. Areas)	19295	SQFT		
3	590115A	Clean and Paint Structural Steel (Overhead Signs)	1	LS		
<b>TOTAL ADDITIVE ALTERNATIVES</b>						

<b>TOTAL BASE BID PLUS ALTERNATIVES</b>	\$
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(F) Denotes Final Pay

- NOTES:**
- FOR ACCURATE RIGHT OF WAY DATA, CONTACT OFFICE OF WAY ENGINEERING AT THE DISTRICT OFFICE.
  - FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET SC-1.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITIONS AT LAKE SHIFTS BY GRADING OR CONFORM PAVING. MAXIMUM GRADE DIFFERENTIAL BETWEEN LAKE SHIFTS IS 0.15.
  - CONTACT CALTRANS TRAFFIC ELECTRICAL OPERATIONS (800-540-3040) TO CLOSE WEEK PRIOR TO ANY PUMP MODIFICATION WORK.

**LEGEND:**

- CONSTRUCT THIS STAGE:**
- DIRECTION OF TRAFFIC
  - TEMPORARY TRAFFIC STRIPE (PAINT)
  - CHANGE IN TEMPORARY STRIPE DETAIL
  - TEMPORARY 12" LIMIT LINE (PAINT)
  - TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)
  - TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)
  - CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.
  - TEMPORARY RAILING (TYPE K)
  - TEMPORARY CRASH CUSHION (ARRAY: TB1)
  - TYPE III BARRICADE
  - TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION
  - TRAFFIC CONE PLACED 10' O.C.
  - FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS, SEE DETOUR PLAN: DE-4

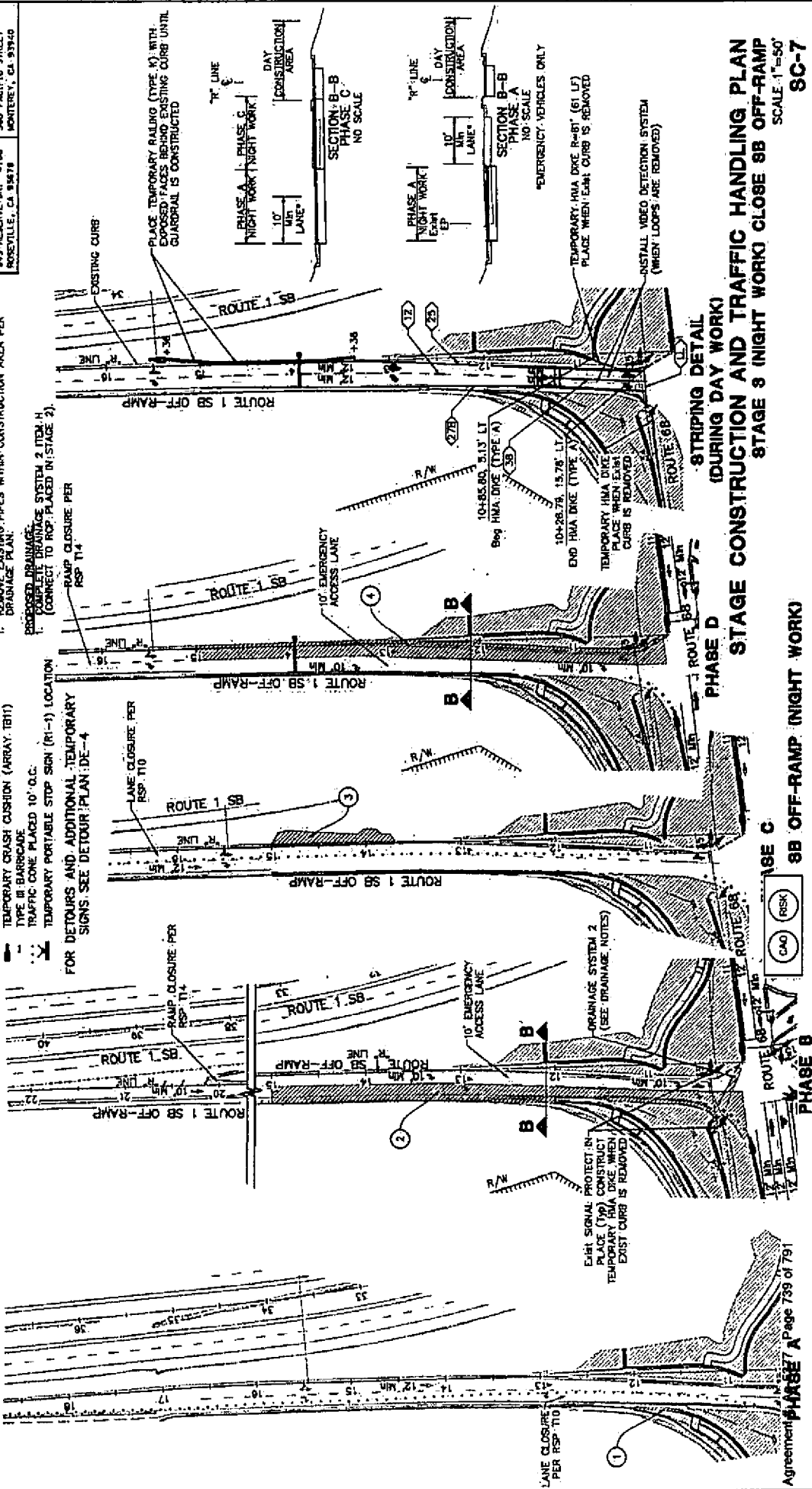
**REVIEW NOTES (THIS SHEET ONLY):**

- LANE CLOSURE PER RSP T10 CUTTER
- SB OFF-RAMP CLOSED (EXCEPT FOR EMERGENCY ACCESS). ROADWAY BASE MATERIAL, TEMPORARY DRAINAGE CONNECTION, ROADWAY BASE MATERIAL, PAVING EXCLUDING FINAL LIFT, HMA DIKE
- LANE CLOSURE PER RSP T10
- CONSTRUCTION: OVERHEAD SIGN AND GUARDRAIL
- SB OFF-RAMP CLOSED (EXCEPT FOR EMERGENCY ACCESS). GUARDRAIL, PAVING EXCLUDING FINAL LIFT
- DRAINAGE NOTES (THIS SHEET ONLY):
- TEMPORARY PAVING: PIPES WITHIN CONSTRUCTION AREA PER DRAINAGE PLAN
- EMERGENCY ACCESS SYSTEM 2, ITEM N (COMPLETE TO RSP; PLACED IN STAGE 2)
- RAMP CLOSURE PER RSP T14

DATE: 08  
COUNTY: Mer  
ROUTE: 1, 68  
MILEPOSTS: 75.1, L4.2, 56, 190

REGISTERED CIVIL ENGINEER  
LIVELY STATE  
NO. 41887  
EXPIRES 03/01/17  
OVAL

CITY OF MONTEREY  
843 RESERVE DR. #100  
ROSEVILLE, CA 95678  
MONTEREY, CA 93940



**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 8 (NIGHT WORK) CLOSE SB OFF-RAMP**  
**SC-7**

SCALE: 1"=50'

PROJECT NUMBER & PHASE: ERS 0600000542

UNIT: 1"=50'

RELATIVE WORKER SCALE: 15' N, W, E, S

SECTION NO: DWG TLE-2

DATE: 7/7/2010

DESIGNED BY: D.K.

CHECKED BY: RONALD C. BOWE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
CONSULTANT FUNCTIONAL SUPERVISOR  
DESIGNED BY: D.K.  
CHECKED BY: RONALD C. BOWE

Agreement PHASE A Page 733 of 791

DATE REVISION:	1/11/16	DESIGNED BY:	DKK
DATE REVISION:		CHECKED BY:	RONALD G. BOYLE
CALCULATED BY:			
CONSULTANT: FUNCTIONAL SURVEILLANCE			
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION			
NO.	COUNTY	ROUTE	POST MILEAGE
09	Mon	1, 88	75.1, LA.2
			57 190
REGISTERED CIVIL ENGINEER DATE: 10/27/12 NO. 4824 PROJECT: STATE ST. & SUNNYSIDE BLVD.			
CIVIL CITY OF MONTEREY, 340 PACIFIC STREET MONTEREY, CA 95040			

**KEYED NOTES (THIS SHEET ONLY):**

1. CARMEL HILLS DRIVE REDUCED TO ONE LANE CONSTRUCTION. EXCAVATION, ROADWAY BASE MATERIAL, DRAINAGE, PAVING, EXCLUDING FINAL LIFT.

**DRAINAGE NOTES (THIS SHEET ONLY):**

EXISTING DRAINAGE: (SEE EXISTING PIPES WITHIN CONSTRUCTION AREA PER DRAINAGE PLAN.)

PROPOSED DRAINAGE: (SEE PROPOSED DRAINAGE SYSTEM 1 ITEMS THROUGH 'A')

**LEGEND:**

CONSTRUCT THIS STAGE

DIRECTION OF TRAFFIC

TEMPORARY TRAFFIC STRIPE (PAINT)

CHANGE IN TEMPORARY STRIPE DETAIL

TEMPORARY 12" LIMIT LINE (PAINT)

TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)

TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)

TEMPORARY "STOP" PAVEMENT MARKING (PAINT)

CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.

TEMPORARY RAILING (TYPE X)

TEMPORARY CRASH CUSHION (ARRAY TB11)

TYPE III BARRICADE

TRAFFIC CONE PLACED 10' O.C.

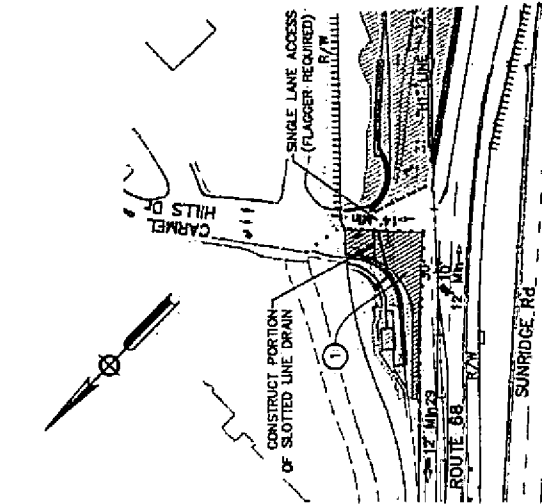
TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION

**NOTES:**

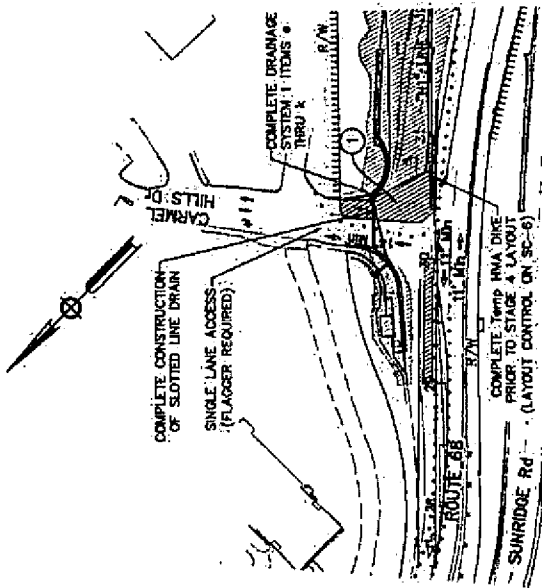
1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

2. FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET SC-1.

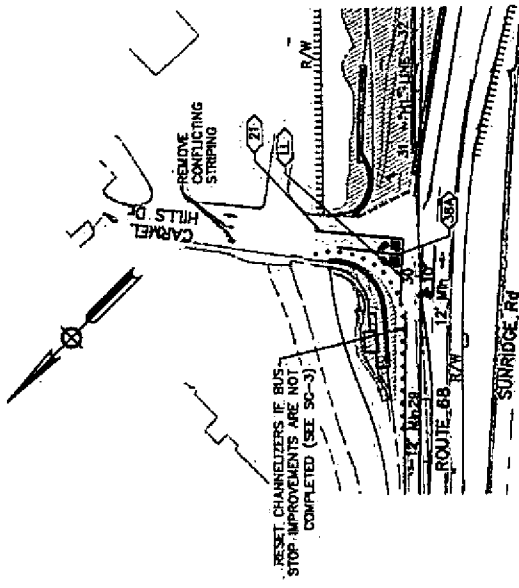
3. CONTRACTOR TO PROVIDE SMOOTH TRANSITIONS AT LAINE SHEETS BY GRINDING OR CONFORM PAVING. MAXIMUM GRADE DIFFERENTIAL BETWEEN LAINE SHIFTS IS 0.15'.



PHASE A



PHASE B



STRIPING DETAIL (DURING DAY WORK)

CARMEL HILLS DRIVE (NIGHT WORK)

STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN  
STAGE 3 (NIGHT WORK)  
SCALE: 1"=50'

Agreement #: Ag-5377 - Page 740 of 791



NO.	DATE	BY	REVISION
03	Mon 1-88		

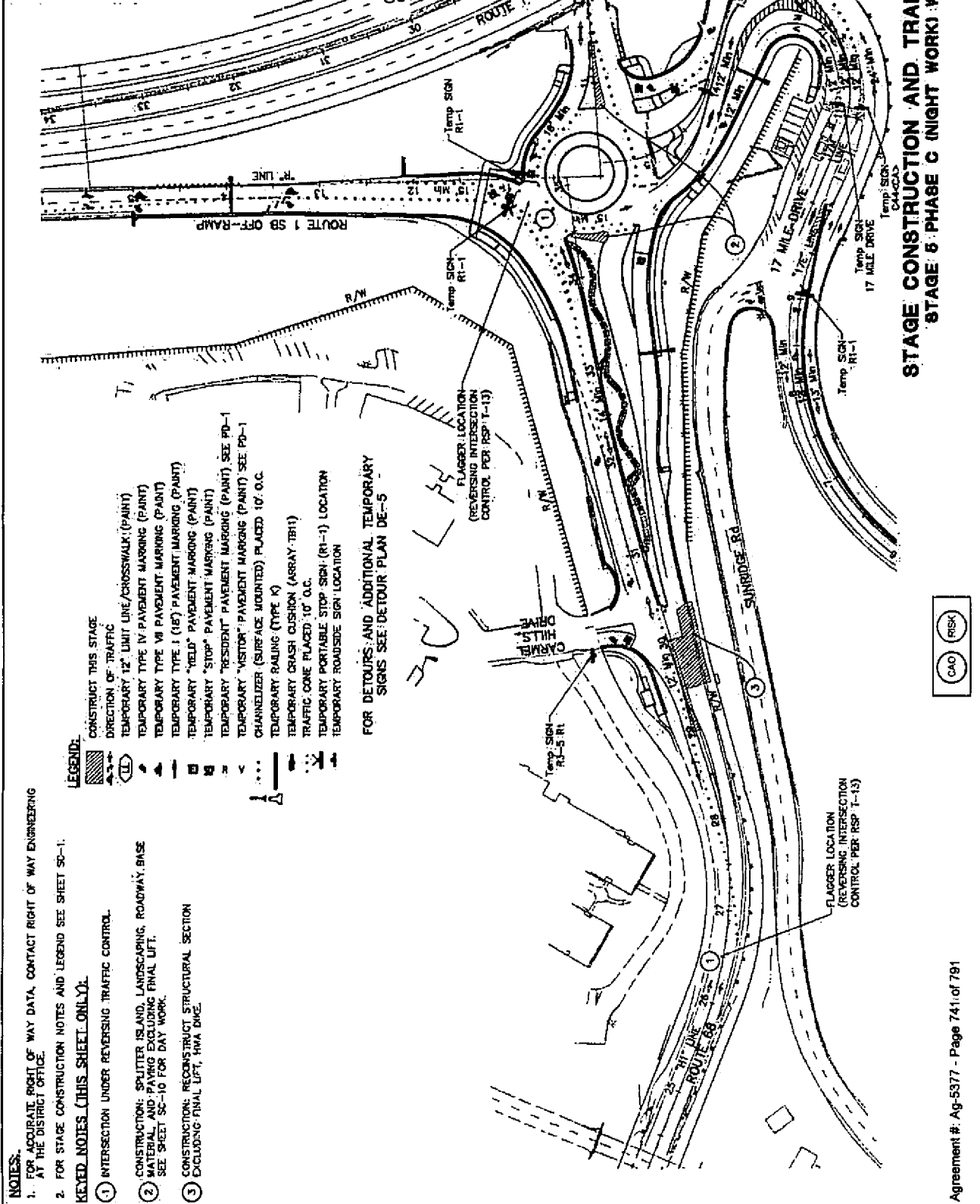
PROJECT NO.	75.1.14.2	DATE	1-82
PROJECT NAME	MOUNTAIN VIEW HIGHWAY		
PROJECT LOCATION	MOUNTAIN VIEW HIGHWAY		
PROJECT SCALE	1"=50'		

REGISTERED CIVIL ENGINEER	DATE	APPROVAL DATE

CITY OF MONTEREY	443 RESERVE ST.	MONTEREY, CA 93940
ENGINEER	443 RESERVE ST.	MONTEREY, CA 93940



**NOTES:**

- FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
- FOR STAGE CONSTRUCTION NOTES AND LEGEND SEE SHEET SC-1.

**KEYED NOTES (THIS SHEET ONLY):**

- INTERSECTION UNDER REVERSING TRAFFIC CONTROL.
- CONSTRUCTION: SPALTER ISLAND, LANDSCAPING, ROADWAY BASE MATERIAL, AND PAVING EXCLUDING FINAL UFT. SEE SHEET SC-10 FOR DAY WORK.
- CONSTRUCTION: RECONSTRUCT STRUCTURAL SECTION EXCLUDING FINAL UFT, HMA BASE.

**LEGEND:**

- CONSTRUCT THIS STAGE
- DIRECTION OF TRAFFIC
- TEMPORARY 12" LIMIT LINE/CROSSWALK (PAINT)
- TEMPORARY TYPE IV PAVEMENT MARKING (PAINT)
- TEMPORARY TYPE VI PAVEMENT MARKING (PAINT)
- TEMPORARY TYPE J (H) PAVEMENT MARKING (PAINT)
- TEMPORARY "YIELD" PAVEMENT MARKING (PAINT)
- TEMPORARY "STOP" PAVEMENT MARKING (PAINT)
- TEMPORARY "PRESIDENT" PAVEMENT MARKING (PAINT) SEE PD-1
- TEMPORARY "VISITOR" PAVEMENT MARKING (PAINT) SEE PD-1
- CHANNELIZER (SURFACE MOUNTED) PLACED 10' O.C.
- TEMPORARY RAILING (TYPE K)
- TEMPORARY CRASH CUSHION (ARRAY-TBH1)
- TRAFFIC CONE PLACED 10' O.C.
- TEMPORARY PORTABLE STOP SIGN (R1-1) LOCATION
- TEMPORARY ROADSIDE SIGN LOCATION

**FOR DETOURS AND ADDITIONAL TEMPORARY SIGNS SEE: DETOUR PLAN DE-5**

**STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN**  
**STAGE 6 - PHASE C (NIGHT WORK) WITH REVERSING CONTROL**  
 SCALE 1"=50'

SC-13



Agreement # Ag-5377 - Page 741 of 791



# ***Bid Proposal***

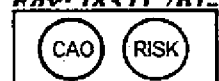
**Route 1/68 Separation  
SR 68 Holman Highway Roundabout  
Monterey, California  
Contract No. 37C1450C4**

*Submitted By:*

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**GRANITE™**

***Monterey Bay Office  
580 West Beach Street  
Watsonville, California 95076  
Phone: (831) 763-6100  
Fax: (831) 761-1042***





# CHUBB GROUP OF INSURANCE COMPANIES

Surety Department, 15 Mountain View Road, P.O. Box 1615, Warren, NJ 07061-1615  
Phone: (908) 903-3485 • Facsimile: (908) 903-3656

## FEDERAL INSURANCE COMPANY

### BID BOND

Bond No. N/A

Amount \$ Ten Percent (10%)  
of Bid Amount

## Know All Men By These Presents,

That we, Granite Construction Company

(hereinafter called the Principal),  
as Principal, and the FEDERAL INSURANCE COMPANY, Warren, New Jersey, a corporation duly organized under  
the laws of the State of Indiana, (hereinafter called the Surety), as Surety, are held and firmly bound unto

City of Monterey

(hereinafter called the Obligee),

In the sum of Ten Percent (10%) of Bid Amount \_\_\_\_\_ Dollars  
(\$ 10% of Bid Amount \_\_\_\_\_), for the payment of which we, the said Principal and the said Surety, bind ourselves,  
our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Sealed with our seals and dated this January 4, 2016

WHEREAS, the Principal has submitted a bid, dated January 19, 2016  
for SR 68 (Holman Highway) Roundabout Project

Contract No. 37C1450C4

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Obligee shall accept the bid of  
the Principal and the Principal shall enter into a contract with the Obligee in accordance with such bid and give bond  
with good and sufficient surety for the faithful performance of such contract, or in the event of the failure of the  
Principal to enter into such contract and give such bond, if the Principal shall pay to the Obligee the difference, not  
to exceed the penalty hereof, between the amount specified in said bid and the amount for which the Obligee may  
legally contract with another party to perform the work covered by said bid, if the latter amount be in excess of the  
former, then this obligation shall be null and void, otherwise to remain in full force and effect.

Granite Construction Company

Principal

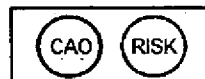
By: \_\_\_\_\_

Karim Massoud, Chief Estimator

FEDERAL INSURANCE COMPANY

By: \_\_\_\_\_

Ashley Stinson, Attorney-in-Fact





A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

# ACKNOWLEDGMENT

State of California  
County of Santa Cruz )

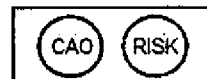
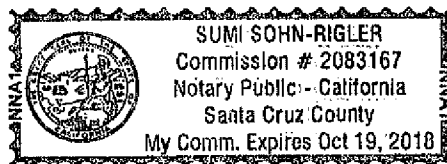
On January 4, 2016 before me, Sumi Sohn-Rigler, Notary Public  
(insert name and title of the officer)

personally appeared Ashley Stinson, Attorney-in-Fact  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature *Sumi SR* (Seal)  
Sumi Sohn-Rigler, Notary Public





Chubb  
Surety

POWER  
OF  
ATTORNEY

Federal Insurance Company  
Vigilant Insurance Company  
Pacific Indemnity Company

Attn: Surety Department  
15 Mountain View Road  
Warren, NJ 07059

Know All by These Presents, That FEDERAL INSURANCE COMPANY, an Indiana corporation, VIGILANT INSURANCE COMPANY, a New York corporation, and PACIFIC INDEMNITY COMPANY, a Wisconsin corporation, do each hereby constitute and appoint Jigisha Desai, John D. Gilliland, Catherine Gustavson, Kathleen Schreckengost, Ashley Stinson and Lillian Tse of Watsonville, California

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business on behalf GRANITE CONSTRUCTION INCORPORATED and all Subsidiaries alone or in joint venture as principal, in connection with bids, proposals or contracts to or with the United States of America, any State or political subdivision thereof or any person, firm or corporation. And the execution of such bond or obligation by such Attorney-in-Fact in the Company's name and on its behalf as surety thereon or otherwise, under its corporate seal, in pursuance of the authority hereby conferred shall, upon delivery thereof, be valid and binding upon the Company.

In Witness Whereof, said FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY have each executed and attested these presents and affixed their corporate seals on this 18<sup>th</sup> day of July, 2014.

*Dawn M. Chloros*  
Dawn M. Chloros, Assistant Secretary

*David B. Norris, Jr.*  
David B. Norris, Jr., Vice President



STATE OF NEW JERSEY

58.

County of Somerset

On this 18<sup>th</sup> day of July, 2014 before me, a Notary Public of New Jersey, personally came Dawn M. Chloros, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Dawn M. Chloros, being by me duly sworn, did depose and say that she is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By-Laws of said Companies; and that she signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that she is acquainted with David B. Norris, Jr., and knows him to be Vice President of said Companies; and that the signature of David B. Norris, Jr., subscribed to said Power of Attorney is in the genuine handwriting of David B. Norris, Jr., and was thereto subscribed by authority of said By-Laws and in deponent's presence.

Notarial Seal



KATHERINE J. ADELAAR  
NOTARY PUBLIC OF NEW JERSEY  
No. 2316638  
Commission Expires July 16, 2019

*Katherine J. Adelaar*  
Notary Public

CERTIFICATION

Extract from the By-Laws of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Dawn M. Chloros, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

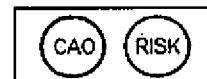
- (i) the foregoing extract of the By-Laws of the Companies is true and correct,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U.S. Treasury Department; further, Federal and Vigilant are licensed in the U.S. Virgin Islands, and Federal is licensed in American Samoa, Guam, Puerto Rico, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this January 4, 2016

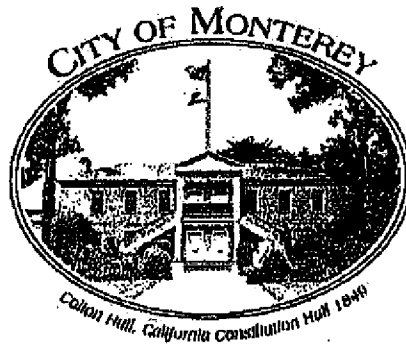


*Dawn M. Chloros*  
Dawn M. Chloros, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY Telephone (908) 903-3493 Fax (908) 903-3656 e-mail: surety@chubb.com



Book 1 of 2



CITY OF MONTEREY  
DEPARTMENT OF PLANS AND PUBLIC WORKS

# REVISED BID BOOK

FOR

FOR CONSTRUCTION ON STATE HIGHWAY  
IN MONTEREY COUNTY IN AND NEAR THE CITY OF MONTEREY

AT ROUTE 1/68 SEPARATION  
(SR 68 (HOLMAN HIGHWAY) ROUNDABOUT PROJECT)

In District 05 on Route 68 and Route 1

This is a Capital Improvement Project

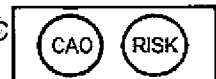
APPROVED:

*Robert M. Harvey*  
FOR CITY TRAFFIC ENGINEER

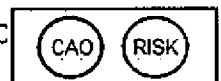
DATE: 12/21/2015

Master Revision: 01/02/15

Project Revision: December 2015



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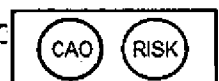


**SR-68/HIGHWAY 1 ROUNDABOUT PROJECT**

**TABLE OF CONTENTS**

<b>NOTICE TO BIDDERS</b> .....	<b>1</b>
<b>PREVAILING WAGES</b> .....	<b>1</b>
<b>SPECIFICATIONS AND BID FORMS</b> .....	<b>2</b>
<b>BID BOND</b> .....	<b>2</b>
<b>BID VALIDITY</b> .....	<b>2</b>
<b>RESPONSIBLE BIDDER</b> .....	<b>2</b>
<b>BID REJECTION</b> .....	<b>3</b>
<b>UNBALANCED BID</b> .....	<b>3</b>
<b>INTERPRETATION OF SPECIFICATIONS</b> .....	<b>3</b>
<b>INTERPRETATION/BIDDER QUESTIONS</b> .....	<b>4</b>
<b>DEFINITIONS</b> .....	<b>4</b>
<b>GENERAL INFORMATION</b> .....	<b>4</b>
<b>PROPOSAL SCHEDULE OF QUANTITIES AND PRICES</b> .....	<b>6</b>
<b>BID SCHEDULE (BID ITEM LIST)</b> .....	<b>6</b>
<b>BID ITEM DESCRIPTIONS</b> .....	<b>12</b>
<b>ANCILLARY ITEMS</b> .....	<b>12</b>
<b>LUMP SUM PRICE BREAKDOWN</b> .....	<b>12</b>
<b>BID CLARIFICATION</b> .....	<b>13</b>
<b>BONDS</b> .....	<b>13</b>
<b>DECLARATION OF BIDDER RE: LICENSE QUALIFICATIONS</b> .....	<b>15</b>
<b>NONCOLLUSION DECLARATION</b> .....	<b>16</b>
<b>DEBARMENT AND SUSPENSION CERTIFICATION</b> .....	<b>17</b>
<b>LOCAL HIRING REQUIREMENT</b> .....	<b>18</b>
<b>CERTIFICATION OF GOOD-FAITH EFFORT (PRIME CONTRACTOR)</b> .....	<b>19</b>
<b>CERTIFICATION OF GOOD-FAITH EFFORT (SUBCONTRACTOR)</b> .....	<b>20</b>
<b>BIDDER'S LIST OF SUBCONTRACTORS</b> .....	<b>21</b>

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**CITY OF MONTEREY  
DEPARTMENT OF PUBLIC WORKS  
MONTEREY, CALIFORNIA**

**NOTICE TO BIDDERS**

Sealed proposals will be received in the office of the City Clerk, attention Finance Director, 580 Pacific Street, Room 6, City of Monterey, California, until 2:00 p.m., **January 19**, at which time they will be publicly opened and read in the City Council Chambers, for **constructing the State Route 68 (SR-68) (Holman Highway) Roundabout Project** in Monterey County, California, in accordance with these plans and specifications.

An pre-bid meeting will be held on Wednesday, December 16, 2015, at 9:00 AM at the City of Monterey Council Chambers, 580 Pacific Street, in Monterey, CA 93940. All potential bidders, subcontractors, and vendors are encouraged to attend the pre-bid meeting; however, attendance is optional. Any questions asked and answered, as well as the attendance roster, will be posted in an addendum.

This work shall be diligently prosecuted to completion before the expiration of **215 WORKING DAYS** beginning on the date stated in the Notice to Proceed.

Plant Establishment (Type1) shall continue for 5 years (Calendar days) after completion of construction.

In general, the work consists of constructing a modern roundabout at the intersection of SR-68 and the southbound Highway 1 on/off ramps and a yield controlled intersection at 17 Mile Drive and the Highway 1 on Ramp.

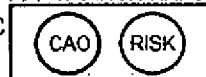
At the time of the bid opening, the successful Bidder must be legally entitled to perform contracts requiring a Class A Contractor's license or a combination of Class C licenses that make up a majority of the work. Any Bidder or contractor not so licensed shall be subject to all penalties imposed by law including, but not limited to, any appropriate disciplinary action by the Contractors' State License Board.

All electricians performing work under this contract, as defined as making electrical connections at or above 100 volt-amperes, shall be certified pursuant to Section 3099 et seq. of the California Labor Code. Contractor shall submit proof of certification, or proof that the requirements of Section 3099.4 (a) of the California Labor Code have been met, prior to electricians commencing work under this contract.

**PREVAILING WAGES**

Local prevailing wage rates shall be paid in accordance with Sections 1770, 1773, and 1782, as amended, of the California Labor Code, and Section 28-20(e) of the Monterey City Code, on all public works construction contracts exceeding twenty-five thousand dollars (\$25,000) and all public works contracts for alteration, demolition, repair or maintenance work exceeding fifteen thousand dollars (\$15,000). Local wage rates may be obtained from City of Monterey, Capital Projects Office, 353 Camino El Estero, Monterey, CA, (831-646-3997) or the Director, Department of Industrial Relations, State of California, 455 Golden Gate Avenue, San Francisco, California (415-703-4774). Any Bidder contractor awarded a public works contract that uses a craft or classification not in the general prevailing wage determinations may be required to pay the wage rate most closely related in the general determinations, effective at the time of the call for bids.

In accordance with the provisions of Sections 1725.5, 1771.1, 1771.3, and 1771.4 of the Labor Code, this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal (subject to the requirements of Section 4104 of the Public Contract Code), or engage in the performance of any contract for public work, as defined by that chapter of the Labor Code, unless currently registered and qualified to perform public work pursuant to Section 1725.5 of the Labor Code. **See Part IV of these Specifications**



**for additional requirements.**

In accordance with the provisions of Section 1773.3 of the Labor Code, the City of Monterey shall provide notice to the Department of Industrial Relations (DIR) of the award of any public works contract subject to the requirements of Chapter 1 of the Labor Code, within five days of the award. The notice shall be transmitted electronically in a format specified by the DIR (see <https://www.dir.ca.gov/pwc100ext/>) and shall include the name of the contractor, any subcontractor listed on the successful bid, the bid and contract award dates, the contract amount, the estimated start and completion dates, job site location, and any additional information the DIR specifies that aids in the administration and enforcement of this chapter.

**SPECIFICATIONS AND BID FORMS**

Specifications, including instructions to Bidders and all necessary contract documents and forms, may be obtained at the office of the Administrative Services Center, Revenue Desk, 735 Pacific Street, City of Monterey, California for a fee of fifty dollars (\$50). Submit bid forms in sealed envelopes marked on the outside with time and date of bid opening and the work for which the bid is submitted.

**BID BOND**

Cash, a certified check or cashier's check, payable to the order of the City of Monterey, or a satisfactory bid bond, in original form (no fax or photocopy shall be accepted), executed by the Bidder and an acceptable surety in an amount equal to ten percent (10%) of the bid amount shall be submitted with each bid.

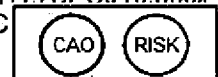
**BID VALIDITY**

No Bidder may withdraw their bid for a period of **ninety (90) days** from the date of opening of the bids for the purpose of reviewing the bids and investigating the qualifications of Bidders, prior to awarding of the contract.

**RESPONSIBLE BIDDER**

Responsible bidder as it pertains to this contract shall be as follows:

1. **Standards of Responsibility:** The City may reject bids on the basis of non-responsibility. A responsible bidder is one that has the capacity in all respects to perform fully the contract requirements, and the integrity and reliability which will assure good faith performance of the contract. Factors to be considered in determining whether the standard of responsibility has been met include whether a bidder has:
  - a. The appropriate financial, material, equipment, facility, capacity (adequate workforce to complete the job in a timely fashion) and personnel resources, including all required certifications, licenses, and expertise necessary to indicate its capacity to meet all contractual requirements, including the following specific requirements:
    - i. Adequate workforce to meet multiple critical work schedules at once;
    - ii. Ability to start projects on the commencement dates set forth by the City and satisfactorily complete them within the City's stated time limits;
  - b. A satisfactory record of performance, including but not limited to any prior work performed by bidder for the City or other agency;
  - c. Adequate bonding and insurance capacity;
  - d. A satisfactory record of integrity, diligence, and professionalism in the specific contract work;





- e. The legal qualifications to contract with the City; and
  - f. Supplied all information requested by the City in connection with the inquiry concerning responsibility.
2. Information Pertaining to Responsibility. The prospective contractor shall supply any information requested by the City concerning the responsibility of such contractor, including the qualifications and performance records of contractor's employees and proposed subcontractors. If the prospective contractor fails to supply the requested information, the City shall base the determination of responsibility in award of the Contract upon any available information, or may find the prospective contractor non-responsible on the basis of its failure to provide the requested information to the City.
  3. The City's Duty Concerning Responsibility. Before awarding a contract, the City must be satisfied that the prospective contractor is responsible. The City may use the information provided by prospective contractor as well as information obtained from other legitimate sources, including City staff's own experience with the prospective contractor and prospective contractor's employees.
  4. Written Determination of Non-responsibility Requirements. If a bidder or offeror who otherwise would have been awarded the Contract is found non-responsible, a written determination of non-responsibility setting forth the basis determination shall be prepared by the City and sent to the non-responsible bidder or offeror. The bidder or offeror shall have an opportunity to appeal the City's determination on non-responsibility.

### **BID REJECTION**

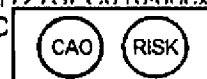
The City reserves the right to reject any or all bids as the best interests of the City may dictate and, to the extent permitted by law, waive any irregularity in any bid. If there is any reason for believing that collusion exists among the bidders, the City may reject any or all bids.

### **UNBALANCED BID**

Bids which are obviously unbalanced may be rejected. For the purposes of this section, an unbalanced bid is one that (a) has unit prices based on nominal prices for some items of work and enhanced unit prices for other items of work, and (b) the amount and manner in which the unit prices are distributed is not reflective of the true cost to perform the work. Any unbalanced bid may be rejected by the Public Works Director whether or not the result of the unbalanced bid increases the cost of the project to the City.

### **INTERPRETATION OF SPECIFICATIONS**

Should a Bidder be in doubt as to the true meaning of any item in the Plans or Specifications or should Bidder discover items containing discrepancies or omissions, the Engineer shall be immediately notified. All requests for interpretations must be submitted ninety-six (96) hours before bid opening. If found necessary, interpretation or correction will be made by written addendum, a copy of which will be sent to each plan holder. Such addenda are to be considered as part of the contract documents, and the Bidder shall acknowledge this condition by listing each addendum by number in his proposal. The Engineer shall not be held responsible for any oral interpretations or instructions. No addenda can be issued less than seventy-two (72) hours before bid opening without an accompanying bid time extension. The Engineer reserves the right to make decisions on extending the bid period.



**INTERPRETATION/BIDDER QUESTIONS**

Written questions must be submitted to Robert Harary at harary@monterey.org by Tuesday, January 12, 2016 at 5:00 pm, unless this date and the date of bid opening are extended by a future addendum.

**DEFINITIONS**

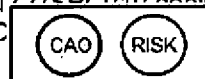
For the purposes of this document, the following definitions shall apply:

- CITY:** The term City refers to and indicates the City of Monterey, Monterey County, State of California.
- ENGINEER OR CITY ENGINEER** The term Engineer or City Engineer refers to and indicates the Public Works Director of the City of Monterey or his duly authorized representative.
- BIDDER:** Party submitting a bid for consideration by the City of Monterey.
- CONTRACTOR:** The term Contractor refers to and indicates the party or parties contracting to perform the work to be done in pursuance of this contract and specifications. The City Council of the City of Monterey.
- COUNCIL OR CITY COUNCIL:** The City Council of the City of Monterey.
- PLANS:** The project plans referred to herein.
- SPECIAL PROVISIONS:** Part IV of these Specifications.
- SPECIFICATIONS:** This document, in its entirety.
- STANDARD SPECIFICATIONS:** Specifications entitled "State of California, Department of Transportation, Standard Specifications" of latest publication on file in the office of the City Clerk of the City of Monterey.
- STANDARD PLANS:** Plans entitled "State of California, Department of Transportation, Standard Plans" of latest publication.

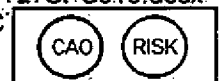
**GENERAL INFORMATION**

Bids must be on a unit price basis. ***The amount of the bid for comparison purposes will be the total of all the base bid items and alternative bid items.*** The City retains the right to remove any and/or all Additive Alternatives to from the plans as they see fit.

The contract work shall begin on the date as stated in the Notice to Proceed issued by the City of Monterey.



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SR-68 (Holman Highway) Roundabout Project

CITY OF MONTEREY

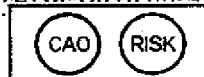
**PROPOSAL SCHEDULE OF QUANTITIES AND PRICES  
(As Modified by Addendum No. 3 - Issued January 13, 2016)**

To the Honorable City Council  
City of Monterey  
City Hall  
Monterey, California

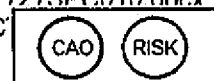
The undersigned declares to have carefully examined the location of the proposed work, that the Plans and Specifications as set forth herein have been examined, and hereby proposes to furnish all materials and equipment and do all the work required to complete the said work in accordance with said Plans and Specifications for the lump sums and unit prices set forth in the following schedule:

**BID SCHEDULE (BID ITEM LIST)**

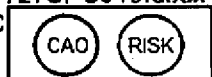
Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
1	027545	Remove Survey Monument	1	EA	1,000.-	1,000.-
2	066105	Resident Engineer's Office	1	LS	60,000.-	60,000.-
3	080050	Progress Schedule (Critical Path Method)	1	LS	4,300.-	4,300.-
4	090105	Time Related Overhead (5%)	215	WDays	<del>1,300.-</del> 1,500.-	322,500.-
5	120090	Construction Area Signs	1	LS	41,000.-	41,000.-
6	120100	Traffic Control System	1	LS	300,000.-	300,000.-
7	120120	Type III Barricade	74	EA	80.-	5,920.-
8	120149	Temporary Pavement Marking (Paint)	3695	SF	4.-	14,780.-
9	120159	Temporary Traffic Stripe (Paint)	21156	LF	1.-	21,156.-
10	120165	Temporary Channelizer (Surface Mounted)	168	EA	40.-	6,720.-
11	128601	Temporary Signal System	1	LS	195,000.-	195,000.-
12	128650	Portable Changeable Message Sign	1	LS	35,000.-	35,000.-
13	129000	Temporary Railing (Type K)	4120	LF	15.-	61,800.-
14	129100	Temporary Crash Cushion Module	168	EA	200.-	33,600.-
15	129110a	Temporary Alternative Crash Cushion System	5	EA	5,000.-	25,000.-
16	130100	Job Site Management	1	LS	30,000.-	30,000.-
17	130300	Prepare Storm Water Pollution Prevention Plan	1	LS	5,000.-	5,000.-
18	130310	Rain Event Action Plan	45	EA	125.-	5,625.-
19	130320	Storm Water Sampling and Analysis Day	45	EA	175.-	7,875.-
20	130330	Storm Water Annual Report	2	EA	975.-	1,950.-
21	130505	Move-In/Move-Out (Temporary Erosion Control)	2	EA	300.-	600.-
22	130530	Temporary Hydraulic Mulch	2600	SQYD	1.-	2,600.-



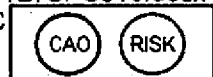
Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
		(Bonded Fiber Matrix)				
23	130610	Temporary Check Dam	450	LF	4.00	1,800.00
24	130620	Temporary Drainage Inlet Protection	12	EA	150.00	1,800.00
25	130710	Temporary Construction Entrance	2	EA	10,000.00	20,000.00
26	130640	Temporary Fiber Rolls	1800	LF	2.00	3,600.00
27	130660	Temporary Large Sediment Barrier	1900	LF	10.00	19,000.00
28	130730	Street Sweeping	1	LS	60,000.00	60,000.00
29	130900	Temporary Concrete Washout	1	LS	3,000.00	3,000.00
30	141000	Temporary Fence (Type ESA)	3350	LF	2.00	6,700.00
31	141103	Remove Yellow Thermoplastic Traffic Stripe (Hazardous Waste)	8105	LF	1.82 2.65 CY	14,589.00 21,478.25 CY
32	141120	Treated Wood Waste	2178	LB	5.00	10,890.00
33	150204	Abandon Culvert	172	LF	25.00	4,300.00
34	150608	Remove Chain Link Fence	222	LF	12.50	2,775.00
35	150668	Remove Flared End Section	6	EA	110.00	660.00
36	150711	Remove Painted Traffic Stripe	11497	LF	1.15	13,221.55
37	150712	Remove Painted Pavement Marking	1762	SQFT	2.25	3,964.50
38	150714	Remove Thermoplastic Traffic Stripe	10675	LF	1.25	13,343.75
39	150715	Remove Thermoplastic Pavement Marking	3071	SF	2.35	6,909.75
40	150722	Remove Pavement Marker	1066	EA	2.25	2,398.50
41	150742	Remove Roadside Sign	53	EA	100.00	5,300.00
42	150768	Remove Asphalt Concrete Pavement (AC Ditch)	5	CY	300.00	1,500.00
43	150771	Remove Asphalt Concrete Dike	1917	LF	2.00	3,834.00
44	150772	Remove Curb	278	LF	7.00	1,946.00
45	150801	Remove AC Overside Drain	11	LF	60.00	660.00
46	150812	Remove Pipe	242	LF	72.00	17,424.00
47	150820	Remove Inlet	9	EA	375.00	3,375.00
48	150821	Remove Headwall	2	EA	300.00	600.00
49	150826	Remove Manhole	1	EA	350.00	350.00
50	150860	Remove Base and Surfacing	24	CY	125.00	3,000.00
51	150630	Remove Marker (Type Q<CA>)	39	EA	10.00	390.00
52	151296	Salvage Guardrail	393	LF	14.00	5,502.00
53	152390	Relocate Roadside Sign	1	EA	205.00	205.00
54	152438	Adjust Frame and Cover Grade	1	EA	850.00	850.00
55	153215	Remove Concrete Curb and Gutter	1729	LF	8.50	14,696.50
56	153103	Cold Plane Asphalt Concrete Pavement	1562	SQYD	8.50	13,277.00
57	153121	Remove Concrete (Ditch)	26	CY	150.00	3,900.00
58	160101	Clearing and Grubbing	1	LS	14,584.45 CY 125,000.00	14,584.45 CY 125,000.00



Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
59	160120	Remove Tree	10	EA	650.-	6,500.-
60	160120a	Remove Tree Stump	70	EA	110.-	7,700.-
61(F)	190101	Roadway Excavation	7895	CY	70.-	552,650.-
62	190107	Roadway Excavation ( Type Z-2) (Aerially Deposited Lead)	2171	CY	100.- 150.- CY	217,100.- 325,650.- CY
63	190110	Lead Compliance Plan	1	LS	4,600.-	4,600.-
64(F)	192037	Structure Excavation (Retaining Wall)	835	CY	32.-	26,720.-
65(F)	193013	Structure Backfill (Retaining Wall)	465	CY	65.-	30,225.-
66	200114	Rock Blanket (Cobble Median Treatment)	6301	SQFT	11.-	69,311.- 311.- CY
67	200116	Gravel Mulch - Beach Pebbles	20	SQYD	31.25	625.-
68	201023	Plant (Group K) (24" Box)	17	EA	500.-	8,500.-
69	201024	Plant (Group K) (48" Box)	1	EA	2,000.-	2,000.-
70	202006	Soil Amendment	18	CY	80.-	1,440.-
71	202011	Wood Bark Mulch	115	CY	40.-	4,600.-
72	202035	Fertilizer (Packet)	2434	EA	0.15	365.10
73	204013	Plant (Group M) (LINER)	90	EA	26.-	2,340.-
74	204035	Plant (Group A) (NO. 1)	1984	EA	18.50	36,684.-
75	204036	Plant (Group B) (NO. 5)	143	EA	62.-	8,866.-
76	204099	Plant Establishemnt (5 Years)	1	LS	62,000.-	62,000.-
77	205062	Root Barrier	611	LF	8.40	5,126.40
78	206005	Edging (Metal)	282	LF	15.-	4,230.-
79	206562	1" Remote Control Valve	2	EA	445.-	890.-
80	206570	Remote Control Valve (Master Valve with Flow Sensor)	1	EA	1,250.-	1,250.-
81	206851	Irrigation Controller	1	EA	1,200.-	1,200.-
82	208222	1/2" Drip In-Line Tubing	4863	LF	1.15	5,592.45
83	208301	Irrigation Controller Enclosure Cabinet	1	EA	880.-	880.-
84					Bid Item Removed	
85	208421	Backflow Preventer Assembly Enclosure	1	EA	900.-	900.-
86	208423	1" Backflow Preventer Assembly	1	EA	1,000.-	1,000.-
87	208445	Tree Well Sprinkler Assembly	18	EA	100.-	1,800.-
88	208450	1" Drip Valve Assembly	7	EA	500.-	3,500.-
89	208598	1" Plastic Pipe (Schedule 40) (Main Line)	689	LF	9.-	6,201.-
90	208598A	3/4" Plastic Pipe (Schedule 40) (Supply Line)	1807	LF	3.10	5,601.70
91	208601	4" Schedule 40 HDPE Pipe Conduit	115	LF	52.-	5,980.-
92	208738A	6" Corrugated High Density Polyethelene Conduit	814	LF	31.-	25,234.-
93	209999A	1-GPH Drip Emitter	541	EA	5.25	2,840.25
94	209999B	Imported Biofiltration Soil	66	CY	205.-	13,530.-



Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
95	209999C	1/2" Drip Irrigation Tubing	2845	LF	0.80	2,276.00
96	209999D	Dripline Flush Valves	15	EA	70.00	1,050.00
97	209999E	Control & Neutral Conductors	1	LS	5,000.00	5,000.00
98	210010	Move-In/Move-Out (Erosion Control)	2	EA	800.00	1,600.00
99	210600	Compost	26233	SQFT	0.55	14,428.15
100	210110	Imported Topsoil	1093	CY	88.00	96,184.00
101	210270	RECEP (Netting)	26233	SQFT	1.18	31,056.30
102	210430	Hydroseed	26233	SQFT	0.10	2,623.30
103	260201	Aggregate Base (Class 2)	7794	CY	75.00	584,550.00
104	377501	Slurry Seal	78	TON	760.00	59,280.00
105	390132	Hot Mix Asphalt (Type A)	5148	TON	125.00	643,500.00
106	394073	Place HMA Dike (Type A)	123	LF	6.15	756.45
107	394075	Place HMA Dike (Type D)	89	LF	6.15	547.35
108	394077	Place HMA Dike (Type F)	224	LF	6.15	1,377.60
109	394077A	Place HMA Dike (Special)	301	LF	6.15	1,851.15
110	394090	Place HMA (Miscellaneous Area)	52	SQYD	58.00	3,016.00
111	397005	Tack Coat	5	TON	1,100.00	5,500.00
112(F)	510060	Structural Concrete, Retaining Wall	234	CY	1,200	280,800.00
113(F)	510502	Minor Concrete (Minor Structure) (Drainage)	33	CY	2,000	66,000.00
114(F)	511035	Golden Granite Concrete Texture	3157	SQFT	35.00	110,495.00
115(F)	511036	Modified Golden Granite Concrete Texture	356	SQFT	40.00	14,240.00
116(F)	520103	Bar Reinforcing Steel (Retaining Wall)	36740	LB	1.75	64,295.00
117(F)	560218	Furnish Sign Structure (Truss)	41220	LB	3.27	134,789.40
118(F)	560219	Install Sign Structure (Truss)	41220	LB	0.27	11,129.40
119	560248	Furnish Single Sheet Aluminum Sign (0.063" Unframed)	377	SF	13.45	5,070.65
120	560249	Furnish Single Sheet Aluminum Sign (0.080" Unframed)	116	SF	16.25	1,885.00
121	560251	Furnish Single Sheet Aluminum Sign (0.063" Framed)	204	SF	24.55	5,008.20
122	560252	Furnish Single Sheet Aluminum Sign (0.080" Framed)	144	SF	24.22	3,592.80
123	561005	60" Cast In Drilled Hole Concrete Pile (Sign Foundation)	45	LF	1300.00	58,500.00
124	566011	Roadside Sign - One Post	42	EA	305	12,810.00
125	566012	Roadside Sign - Two Post	9	EA	405	3,645.00
126	568001	Install Sign (Strap and Saddle Bracket Method)	8	EA	150	1,200.00
127	568001A	Post Sleeve (Roadside Sign)	27	EA	200	5,400.00
128	568016	Install Sign Panel on Existing Frame	18	EA	150	2,700.00



Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
129	650014	18" Reinforced Concrete Pipe	390	LF	135	52,650
130	650018	24" Reinforced Concrete Pipe	342	LF	209	99,180
131	665017	18" Corrugated Steel Pipe (0.079" Thick)	67	LF	160	10,720
132(F)	682042	Class 2 Permeable Material	33	CY	290	9,570
133	700617	Drainage Inlet Marker	14	EA	50.21	707.14
134	705204	18" Concrete Flared End Section	1	EA	2,800	2,800
135	705206	24" Concrete Flared End Section	1	EA	3,000	3,000
136	707225	48" Precast Concrete Pipe Manhole	1	EA	5,800	5,800
137	721015	Rock Slope Protection (Light, Method B)	5	CY	300	1,500
138	721015A	Small Rock Slope Protection (3"-6" size cobble)	37	SQYD	100	3,700
139	721015B	Small Rock Slope Protection- (6"-8" size cobble Check Dam)	4	SQYD	75	300
140	729010	Rock Slope Protection Fabric (Class 8)	14	SY	90	1,260
141	730070	Detectable Warning Surface	442	SF	50	22,100
142	731504	Minor Concrete (Curb & Gutter)	133	CY	62.5	8,312.5
143	731501	Minor Concrete (Curb)	55	CY	1,300	71,500
144	731502	Minor Concrete (Misc. Construction)	4	CY	200	800
145	731508	Minor Concrete (Exposed Aggregate Concrete)	25	CY	1,300	32,500
146	731517	Minor Concrete (Gutter)	145	LF	75	10,875
147	731519B	Minor Concrete (Truck Apron)	100	CY	550	55,000
148	731519C	Minor Concrete (Central Island Curb)	28	CY	1,500	42,000
149	731521	Minor Concrete (Sidewalk)	107	CY	400	42,800
150	731623	Minor Concrete (Curb Ramp)	26	CY	1,800	36,800
151	750001	Misc. Iron and Steel (Drainage)	3780	LB	4.0	15,120
152	800360	Chain Link Fence (Type CL-6)	225	LF	32.0	7,200.0
153	810111	Survey Monument (Type A)	3	EA	1,500.0	4,500.0
154	820107	Delineator (Class 1)	22	EA	46.0	1,012.0
155	820130	Object Marker	42	EA	52.0	2,184.0
156	832007	Midwest Guard Rail System (Wood Post)	326	LF	92.0	29,992.0
157	832007A	Stain Midwest Guard Railing, Cable Railing and Alternative Terminals	825	LF	23.0	18,975.0
158	832070	Vegetation Control (Minor Concrete)	213	SY	230.0	48,990.0
159	833999A	Tubular Bicycle Railing	134	LF	165.0	22,110.0
160(F)	839521	Cable Railing	145	LF	30.0	4,350.0
161	839543	Transition Railing (Type WB-31)	3	EA	5,200	15,600
162	839581	End Anchor Assembly (Type SFT)	4	EA	915	3,660



Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
163	839584	Alternative In-Line Terminal System	3	EA	3,800	11,400
164(F)	839721	Concrete Barrier (Type 732A MOD)	134	LF	350.-	46,900
165	840515	Thermoplastic Pavement Marking	3623	SF	4.45	16,122. <sup>35</sup>
166	840504	4" Thermoplastic Traffic Stripe	23422	LF	0.80	18,737. <sup>60</sup>
167	840505	6" Thermoplastic Traffic Stripe	863	LF	1.45	1,251. <sup>35</sup>
168	840506	8" Thermoplastic Traffic Stripe	1847	LF	1.65	3,047. <sup>55</sup>
169	850111	Pavement Marker (Retroreflective)	1062	EA	4.-	4,248.-
170	860460	Lighting & Sign Illumination	1	LS	<del>250</del> 235,000.	235,000.-
171	860604	Flashing Beacon System	1	LS	13,300.-	13,300.-
172	869999	Maintain Electrical System	1	LS	46,000.-	46,000.-
173	999990	Mobilization (5%)	1	LS	150,000.-	150,000.-

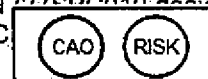
<b>TOTAL BASE BID</b>	<b>\$6,235,283.<sup>43</sup></b>
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Additive Alternatives						
Item No.	Item Code	Description	Approx. Quantity	Unit	Unit Price	Amount
1	869999a	Central Island Lighting	1	LS	100,000.-	100,000.-
2	731519a	Minor Concrete (Colored Concrete)(Misc. Areas)	19295	SQFT	2.-	38,590.-
3	590115A	Clean and Paint Structural Steel (Overhead Signs)	1	LS	7,500.-	7,500.-
<b>TOTAL ADDITIVE ALTERNATIVES</b>						<b>146,090.-</b>

<b>TOTAL BASE BID PLUS ALTERNATIVES</b>	<b>EX \$146</b>
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(F) Denotes Final Pay

**6,381,373.<sup>43</sup>**



## BID ITEM DESCRIPTIONS

This section covers details of individual items of the Bid Schedule to insure that it is clear as to what is to be included in each item. The costs submitted with each item are to reflect the work to be completed under that bid item only. Payment of all the following items shall be for actual materials installed on the job and for actual work accomplished.

### **Mobilization**

Measurement and payment for this item shall be on a lump sum (LS) basis. The lump sum cost shall pay for all the costs of mobilization and demobilization for items awarded. The work shall include, but not be limited to, preparatory and cleanup work necessary for performance of the work in accordance with the Standard Specifications, Plans and Specifications, and as directed by the Engineer. This item also includes the movement of construction personnel, equipment, supplies and incidentals to and from the project site, and all other work and operations, which must be incurred prior to the beginning of and after the end of construction work. This item shall also include obtaining bonds, insurance policies, licenses, and permits required by the contract documents, project meetings, coordination and all related administrative costs for this Project. Partial payment of this bid item shall be based on percent of this item completed and shall be contingent upon the Contractor's furnishing and the City's acceptance of: 1) the schedule of values, 2) the construction schedule, 3) Traffic Control Plans, 4) Quality Control Plan, 5) all submittals and shop drawings, 6) electrician certifications, 7) subcontractor's Certificate of Good Faith Effort to hire local, and 8) fringe benefit summary statement. Also included in this bid item is maintaining the project site, regular cleanup and final cleanup, temporary fencing and staging area, if any.

### **Traffic Control System**

Measurement and payment for this item shall be on a lump sum (LS) basis. The work shall include, but not be limited to, the furnishing of all labor, materials, tools, equipment, and incidentals necessary to maintain vehicular traffic for public use during performance of the work, including all related construction area sign placement and maintenance not separately measured and paid for. This work also includes the preparation, submittal and implementation of the traffic control plan(s), establishing traffic detour(s), traffic control device placement and maintenance, flagging, barriers, temporary drainage facilities, temporary access, temporary asphalt tapers, protection of adjacent existing improvements from damage or staining, removal of the detour(s) upon direction of the Engineer, and restoration of all areas affected by construction, maintenance, use, and removal of the detour in accordance with the Standard Specifications, Plans and Specifications, and as directed by the Engineer.

### **Record Drawings**

No separate measurement and payment shall be made for this item. Furnishing to the City a complete set of Record (As-Built) Drawings upon project completion shall be considered as an ancillary item.

### **FINAL PAY ITEMS**

Items designated with (F) are Final Pay items in accordance with Section 9, "Payment", of the Standard Specifications

### **ANCILLARY ITEMS**

Payment for any items that do not have instruction indicating where expenses for said items are to be accounted for are to be considered ancillary to the work and accounted for in every one of the lump sum or unit price items and no additional compensation will be allowed therefor.

### **LUMP SUM PRICE BREAKDOWN**

Immediately after award of the contract, the contractor shall submit a cost breakdown list to the Engineer for all Lump Sum Bid items. The list shall consist of major elements of work that make up the item and shall be used for determining progress pay estimates.

**BID CLARIFICATION**

Award of contract, if any be made, shall be made to the Contractor with the lowest responsive responsible bid based on the Total Base Bid plus Additive Items taken in order up to the funding amount disclosed by City before the bid opening.

Pursuant to the provisions of the California Public Contract Code Section 20103.8, City reserves the option to award any or all the additive bid items in addition to the original contract after the lowest responsive responsible Bidder has been determined, should the City later obtain additional funding for additive alternatives not awarded with the original contract.

Unit and lump sum prices shall be for items in place, as shown on the Plans, including all labor, materials, equipment, taxes, and incidentals necessary for a complete job.

Whenever unit prices are required and there is an incorrect extension thereof, the unit price correctly extended shall prevail and the total bid shall be corrected to reflect the correct extension.

The foregoing quantities are approximate only, being given as a basis for comparison of bids, and the City of Monterey does not, expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of work by twenty-five percent (25%) or to omit portions of the work as may be deemed necessary by the Engineer.

Bidders may withdraw or revise their bid personally, or upon a written or telegraphic request, or by FAX (the City's FAX number is 646-3702), at any time prior to the hour set for the opening of bids, but not thereafter; however, the City shall not accept faxed copies of bid bonds, affidavits or any other documents where an original document or signature is required by these Specifications. Bids may not be withdrawn for the time period specified in **BID VALIDITY** of Part I.

**BONDS**

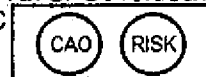
The Contractor, at the time of signing and executing the contract, shall execute and file with the City a performance bond to the satisfaction and approval of said City, in a sum of not less than one hundred percent (100%) of the amount of the contract conditional upon the faithful performance of the contract.

The Contractor, at the time of signing and executing any contract in excess of twenty-five thousand dollars (\$25,000), shall execute and file with the City a public works labor and materials bond to the satisfaction and approval of said City, in a sum of one hundred percent (100%) of the amount of the contract.

The Contractor, shall execute a separate Material and Labor Payment Bond and Performance Bond for plant establishment, issued by a corporate surety, in conformance with the requirements set forth in the contract documents, for the duration of the plant establishment period, a period of 5-calendar years (1,825 days), each for not less than one hundred percent (100%) of the contract price for landscape items. These bonds will be released upon completion of plant establishment.

The surety shall be an admitted carrier in California with a valid surety license and possess a minimum rating from A. M. Best Company of A-VII. The Surety and /or co-sureties must be listed as an acceptable surety on federal bonds by the United States Department of the Treasury, subject to the maximum amount shown in the listing. If co-sureties are used, their bonds shall be on a joint and several basis.

Notwithstanding the above, the Contractor may substitute adequate securities for any bond called for under the provisions of these Specifications as set forth in Public Contracts Code Section 22300. Alternate security substitutions shall be submitted to the City no later than ten (10) days after written notice that a contract has been awarded to the contractor to allow processing and escrow agreement for in lieu security.



**DECLARATION OF BIDDER  
RE: LICENSE QUALIFICATIONS**

Bidder certifies he/she possesses a license in accordance with a State Act providing for the registration of Contractors. License No. 89, Class: A, B\*, Expiration date: 5/31/2017

**See Attached Copy of License**

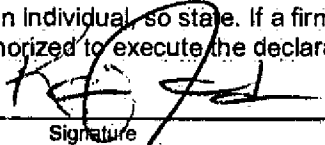
Department of Industrial Relations Registration No. 1000000085

**FAILURE TO PROVIDE THIS INFORMATION AND SIGNATURE MAY RESULT IN YOUR BID BEING DEEMED NON-RESPONSIVE OR WILL RESULT IN REJECTION OF BID.**

The foregoing information is true and correct and is executed under penalty of perjury in Santa Clara County, California, ON January 19, 2016.

Name of Firm: GRANITE CONSTRUCTION COMPANY  
Address: 580 West Beach Street, Watsonville CA 95076  
Telephone: (831) 763-6100  
Email: patricia.arnett@gcinc.com

(If an individual, so state. If a firm or co-partnership, state the firm name and give the names of person authorized to execute the declaration on its behalf.)

  
\_\_\_\_\_  
Signature  
Karim Massoud, Chief Estimator  
Printed Name and Title

The Bidder shall list below any and all addenda issued for this project. Failure to list issued addenda will result in a non-responsive bid:

<b>ADDENDA</b>	<b>DATE RECEIVED</b>
1. <u>1 (one)</u>	<u>December 8, 2015</u>
2. <u>2 (two)</u>	<u>December 22, 2015</u>
3. <u>3 (three)</u>	<u>January 12, 2016</u>

The Bidder shall list below jobs of a similar nature completed by Bidder's organization within the past three (3) years:

Date Completed	Dollar Amount	Agency	Type Of Job	Contracting Location
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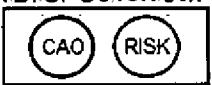
See Appendix A1 for List of Local Job References

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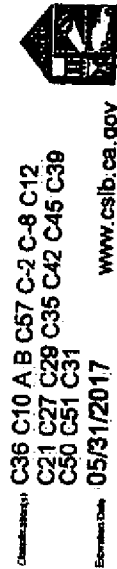




License Number: **89**

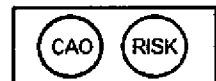
State: **CA** **CORP**

Business Name: **GRANITE CONSTRUCTION COMPANY**



Classification: **C36 C10 A B C57 C-2 C-8 C12  
C21 C27 C29 C35 C42 C45 C39  
C50 C51 C31**

Expiration Date: **05/31/2017** [www.cslb.ca.gov](http://www.cslb.ca.gov)



**NONCOLLUSION DECLARATION**

**TO BE EXECUTED BY BIDDER, LEGALLY NOTARIZED AND SUBMITTED WITH BID**

State of California )  
 ) ss.  
County of Santa Clara )

Karim Massoud, being first duly sworn, deposes and says that he or she is Chief Estimator of GRANITE CONSTRUCTION COMPANY, the party making the foregoing bid; that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived or agreed with any Bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the Bidder or any other Bidder, or to fix any overhead, profit, or cost element of the price bid, or of that of any other Bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the Bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid; and that the bid is not made in the interest of, or on behalf of, any member of the Monterey City Council or any City officer or employee.

Signed: [Signature]

State of California )  
 ) ss.  
County of Santa Clara )

**\*\* See Attached Notary Acknowledgement**

On \*\* before me, \*\*  
Date Name and Title of the Officer  
personally appeared \*\*  
Name(s) of Signer(s)

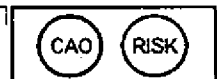
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity (ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the persons(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

(seal)

Notary's Signature



A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

### ACKNOWLEDGMENT

State of California  
County of  Santa Clara  )

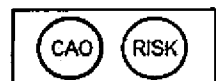
On  January 19, 2016  before me,  Patricia A. Arnett, Notary Public   
(insert name and title of the officer)

personally appeared  Karim Massoud   
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature    (Seal)  
Patricia A. Arnett, Notary Public



### DEBARMENT AND SUSPENSION CERTIFICATION

The Bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any state, federal, or local agency;
- Has not been suspended, debarred, voluntarily excluded or determined ineligible by any state, federal, or local agency within the past 3 years;
- Does not have a proposed debarment pending; and
- Has not be indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

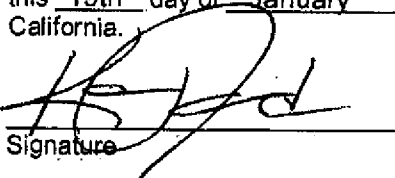
If there are any exceptions to this certification, insert the exceptions in the following space.

No exceptions

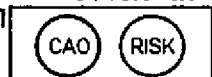
Exceptions will not necessarily result in denial of award, but will be considered in determining Bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions.

I declare under penalty of perjury that the foregoing is true and correct and that this certification is signed this 19th day of January, 2016 in Santa Clara, Santa Clara County, California.

  
Signature

Karim Massoud, Chief Estimator  
Printed Name and Title





## LOCAL HIRING REQUIREMENT

All Contractors who submit bids, or proposals, to construct or provide work on any City of Monterey Public Works project, or for any other Public Works construction, or improvement, on City property must comply with Monterey City Code Article 2 of Chapter 28, which sets forth the requirements regarding the Local Hiring Requirement for Public Works Projects. A copy of Monterey's Local Hiring Requirement Ordinance is available at the City Clerk's Office; Bidders are responsible for familiarizing themselves with the contents thereof before signing the certifications required below.

Among other requirements, this ordinance requires the Contractor to promise to make a good-faith effort to hire qualified individuals who are residents of the Monterey Bay Area (Monterey, Santa Cruz and San Benito Counties), in sufficient numbers so that no less than fifty percent (50%) of the Contractor's total construction work force, including subcontractor work force, measured in labor work hours, is comprised of Monterey Bay area residents. This same requirement applies to all subcontractors.

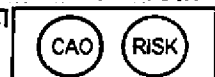
Every Bidder must complete and sign under penalty of perjury a Certification of Good-Faith effort to Hire Monterey Bay Area Residents, on the form provided, and submit said Certification with the sealed bid no later than the date and time of the bid opening. Bidder shall attach to the Certification documentary evidence supporting Bidder's promise to meet, or to make a good-faith effort to meet, the local hiring goal.

Contractor shall include in each and every subcontract relating to the project the requirement that the subcontractor promises to make a good faith effort to hire qualified individuals who are residents of the Monterey Bay Area. Contractor shall be responsible for subcontractor's compliance.

Prior to submitting bids, Bidders shall ensure that any and all subcontractors listed in their bids are not disqualified at that time pursuant to Section 28-78 of the City ordinance referenced above. Prospective contractors may consult the list, available from the City Clerk, of contractors and subcontractors, if any, who are currently disqualified.

The local hiring requirement shall not apply under the following circumstances:

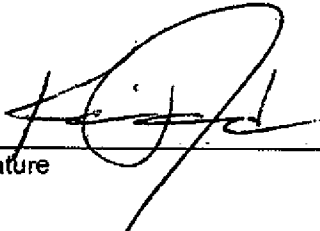
- (a) Whenever a state or federal law or regulation applicable to a particular contract prohibits the provisions of a local hire requirement; or
- (b) Whenever the City, in accordance with the requirements of the Code or state law, determines that the contract is necessary to respond to an emergency which endangers the public health, safety, or welfare; or
- (c) Whenever the City determines that a suitable pool of person providing specialized skills (an example would be marine-related pile drivers) does not exist locally for a specific public works project.



**CERTIFICATION OF GOOD-FAITH EFFORT (PRIME CONTRACTOR)**

**To Hire Monterey Bay Area Residents  
(Prime Contractor – To be Submitted with Bid)**

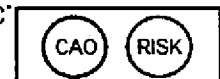
I, Karim Massoud, a licensed contractor, or responsible managing officer, of the company known as GRANITE CONSTRUCTION COMPANY, do hereby certify, under penalty of perjury, that I have met, or made a good-faith effort to meet, the requirements set forth in Monterey City Code Article 2 of Chapter 28. Further, I certify that during the performance of the contract, I shall keep an accurate record on a standardized form showing the name, place or residence, trade classification, hours employed, proof of qualified individual status, per diem wages and benefits of each person employed by the company on the specific public works project, including full-time, part-time, permanent, and temporary employees, and provide such records to the City upon request, within five working days. I understand that I am responsible for insuring that any subcontractor working under my direction, complies with this ordinance, including submitting a Certification of Good Faith Effort to Hire Monterey Bay Residents, and to keeping accurate records as described above.



Signature

Karim Massoud, Chief Estimator  
Printed Name and Title

January 19, 2016  
Date



**CERTIFICATION OF GOOD-FAITH EFFORT (SUBCONTRACTOR)**

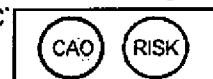
**To Hire Monterey Bay Area Residents  
(Subcontractor – To be Completed by Subcontractor After Bid is Awarded)**

I, \_\_\_\_\_, a licensed contractor, or responsible managing officer, of the company known as \_\_\_\_\_ do hereby certify, under penalty of perjury, that I have met, or made a good-faith effort to meet, the requirements set forth in Monterey City Code Article 2 of Chapter 28. Further, I certify that during the performance of the contract, I shall keep an accurate record on a standardized form showing the name, place or residence, trade classification, hours employed, proof of qualified individual status, per diem wages and benefits of each person employed by the contractor on the specific public works project, including full-time, part-time, permanent, and temporary employees, and provide such records to the City upon request, within five working days. I understand that I am responsible for insuring that any subcontractor working under my direction, complies with this ordinance, including submitting a Certification of Good Faith Effort to Hire Monterey Bay Residents, and to keeping accurate records as described above.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name and Title

\_\_\_\_\_  
Date

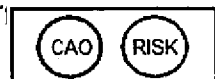


**BIDDER'S LIST OF SUBCONTRACTORS**

The Bidder must identify each subcontractor performing work in an amount in excess of 1/2 of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.). Complete columns 1 through 6 and submit with the bid. Failure to provide complete information in columns 1 through 6 will result in a nonresponsive bid.

Column 1: Business Name and Location	Column 2: Ca Contractor License No.	Column 3: DIR No.*	Column 4: Bid Item Nos.	Column 5: % of Bid Item Subcontracted	Column 6: Description of Subcontracted Work
No list			106-109, 110	100	AC DIKE
No list			164		Concrete Barrier
Barrel <del>Drill</del> verni Electric Watsonville, CA	735622	<del>1000001220</del> SAS 1000001220	11, 170-172, 174	100	Electrical
No list			34, 152,	100	Fence
Greenvista landscape, Rocklin, CA	878017	1000007433	21-24, 26, 27, 30, 48, SAS, SAS, SAS, SAS, 99, 101, 102	100	Hydroseed
Lone star landscape, San Martin, CA	463280	1000062345	SAS 99 67-83, 85-87, 101 100	100 67	landscape
Coral Construction, Wilsonville, Oregon	332441	1000005868	117, 118, 123, 176	100	Hwy sign
Midstate Barrier, Stockton, CA	529261	1000000538	32, 52, 156, 157, 158, 161, 162, 163	100	Guard rail

\* Department of Industrial Relations registration number

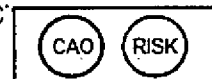


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Column 1: Business Name and Location	Column 2: Ca Contractor License No.	Column 3: Column 3: DIR No.*	Column 4: Bid Item Nos.	Column 5: % of Bid Item Subcontracted	Column 6: Description of Subcontracted Work
No list			17-20, 63	100	Environmental plan
Harris Rebar, Livermore, CA	695035	1000002339	116 147 158 184	76 10 7 7	wall Rebar
No list			59, 60	100	remove trees
Farwest safety, Lodi, CA	523187	100000137	5, 7, 10, 14, 15, 41, 51, 53, 119-122, 124-128, 133, 154, 155  32	100     90	Signs
Sterndahl, Sunvalley, CA	421823	1000006711	8, 9, 31, 32-40 63, 153, 166 167, 168, 169	100	striping
Entermountain slurry seal SAS Sacramento, CA Elk Grove	462443	100000238	104	100	<del>slurry</del> SAS Seal slurry
No list					Flat work

\* Department of Industrial Relations registration number

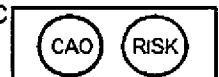


**BIDDER'S LIST OF SUBCONTRACTORS**

The Bidder must identify each subcontractor performing work in an amount in excess of 1/2 of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.). Complete columns 1 through 6 and submit with the bid. Failure to provide complete information in columns 1 through 6 will result in a nonresponsive bid.

Column 1: Business Name and Location	Column 2: Ca Contractor License No.	Column 3: DIR No.*	Column 4: Bid Item Nos.	Column 5: % of Bid Item Subcontracted	Column 6: Description of Subcontracted Work
No list					Tack
No list			56	34	Milling
No list					Tub rail

\* Department of Industrial Relations registration number



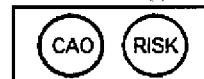


## GRANITE CONSTRUCTION COMPANY

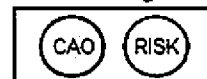
*Monterey Bay Area Office*

### Roadwork References 2012-2015

Year Complete	Contract Value	Agency & Contact Person	Name of Job, Type of Work and Location
2015	\$9,976,229	Caltrans Pat Dussell, RE (831) 246-1166	<b>Hwy 1 RHMA-G Overlay</b> Contract No. 05-1C8604 Santa Cruz, CA <i>Overlay of highway from Santa Cruz north to San Mateo County line, including: asphalt &amp; concrete roadway removals; 61,000 sy of cold planing; prepaving inertial profiler &amp; grinding; overlay of 7,200 tn HMA; overlay of 57,200 tn rubberized HMA (gap graded); centerline &amp; edgeline rumble strips; 48,290 lf HMA dike; minor concrete structures; guard railing upgrades; and striping &amp; marking.</i>
2014	\$448,803	City of Carmel Sherman Low (831) 624-2110	<b>Carmel 2014 Street Projects, Phase 1</b> Carmel-by-the-Sea, CA <i>Pavement rehabilitation on various City streets, including: roadway excavation, pavement grinding, patching, reconstruction, paving, leveling courses, overlays, asphalt concrete berms, walkway resurfacing, reconstruction of drainage facilities, raising of manholes, cleanouts, and valve boxes to new finished grade.</i>
2014	\$1,628,628	City of Morgan Hill Scott Creer (408) 778-6480	<b>Morgan Hill 2014 Street Resurfacing</b> Morgan Hill, CA <i>AC overlay, full depth AC pavement repair, paving mat, slurry seal, crack seal and replacement of all existing traffic delineation.</i>
2014	\$486,605	City of Scotts Valley Majid Yamin, PE (831) 438-5854	<b>Vine Hill School Road/Tabor Drive Sidewalk &amp; Bike Lanes</b> Scotts Valley, CA <i>Roadway repairs &amp; additions, including demolition; clearing &amp; grubbing; retaining walls; storm drainage improvements; asphalt concrete pavement; Portland Cement concrete sidewalks; erosion control; and finishing roadway.</i>
2014	\$4,105,105	County of Santa Cruz Laurie Goessel, CM (831) 454-2160	<b>2014 Pavement Management Project</b> Contract No. CW33801 Santa Cruz County, CA <i>Improvements on various streets, including: asphalt digouts; pavement grinding; fiberized slurry seal; utility adjustments; engineered paving mat; and striping &amp; marking.</i>
2013	\$1,905,217	County of Monterey Jonathan Pascua, PE (831) 755-8963	<b>Harris Road Overlay Project</b> Contract No. 13-142365 Salinas, CA <i>Road improvement, including: hot mix asphalt concrete overlay; clearing &amp; grubbing; reconstruction of failed pavement areas and striping &amp; marking.</i>



Year Complete	Contract Value	Agency & Contact Person	Name of Job, Type of Work and Location
2013	\$6,362,515	Caltrans Farshad Keshavarzi (831) 235-3120	<b>Hwy 101 Widening &amp; Concrete Barrier</b> Contract No. 05-0Q5704 Soledad, CA <i>Construction of shoulder widening &amp; concrete barrier, including: roadway excavation; erosion control; HMA Superpave; rumble strip; concrete structures; drainage; guard railing &amp; barriers; and striping &amp; marking.</i>
2013	\$849,912	Pebble Beach Company Shawn Casey (831) 625-8435	<b>Pebble Beach 2012 Road Improvements</b> Pebble Beach, CA <i>Private road paving &amp; improvements at 9 separate locations for the Pebble Beach Company. Work included grinding &amp; milling of existing asphalt pavement, fine grading, rolling of sub grade, placement of hot mix asphalt overlay, tack coat, minor pavement patching, new and/or reconstructed speed bumps, miscellaneous concrete work, and adjustment of utilities.</i>
2013	\$2,008,667	County of Santa Cruz Laurie Goessel (831) 454-2160	<b>2012 Cape/Chip Seal &amp; Overlay</b> Contract No. CW23720 Santa Cruz County, CA <i>Resurfacing of sections of various County-maintained roads, including approx. 106,705 SF of grinding &amp; replacing asphalt concrete, 40,000 SF AC overlay, 51,178 SY chip seal, 32,292 SY cape seal, asphalt berm, fog seal, striping &amp; marking, and misc. concrete flatwork, street monuments &amp; drainage.</i>
2013	\$1,745,596	County of Monterey Bilal Issa, RE (831) 755-1343	<b>Blackie Road Safety Improvements</b> Contract No. 13-140665 & 13-142265 Near Prunedale in Monterey County, CA <i>Roadway widening including; pavement reconstruction with hot mix asphalt, shoulder construction, pavement delineation, clearing and grubbing, ditch and storm drain construction, and traffic control.</i>
2012	\$1,888,043	County of Santa Cruz Laurie Goessel (831) 454-2160	<b>2012 Pavement Management Project</b> Contract No. CW13709 Santa Cruz County, CA <i>Resurfacing of sections of various County-maintained roads, including approx. 88,970 SF asphalt grinding, 66,691 SF AC digouts, tack coat, placement of 12,215 TN asphalt concrete overlay, striping &amp; marking, and utility adjustments.</i>





Performance Bond

82396697 Federal  
106304449 Travelers  
929607192 CNA

BOND NO. 09171232 F&D  
PREMIUM: \$29,238.00

WHEREAS, The City of Monterey, (hereinafter designated as "Obligee") and Granite Construction Company (hereinafter designated as "Principal") have entered into an agreement whereby principal agrees to install and complete certain designated public improvements, which said agreement, dated \_\_\_\_\_, and identified as project Holman Highway 68/Highway 1 Roundabout Project is hereby referred to and made a part hereof; and

WHEREAS, Said principal is required under the terms of said agreement to furnish a bond for the faithful performance of said agreement;

NOW, THEREFORE, We, the principal and Federal Insurance Company as surety, are held and firmly bound unto the hereinafter called "The Obligee," in the penal sum of Six Million Two Hundred Seven Thousand Five Hundred Seventy-Four Dollars and Twenty-Three Cents (\$6,207,574.23) lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors, executors and administrators, jointly and severally firmly by these presents.

As part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by county in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the agreement or to the work to be performed thereunder or the specification accompanying the same shall in any wise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by the principal and surety above named, on

Granite Construction Company  
By: [Signature]  
PRINCIPAL Bradley G. Graham, Vice President  
By: N/A - SEE ATTACHED CERTIFICATE OF SECRETARY  
PRINCIPAL  
By: [Signature]  
ATTORNEY-IN-FACT Ashley Stinson



A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

# ACKNOWLEDGMENT

State of California  
County of Santa Cruz

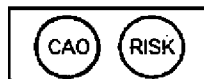
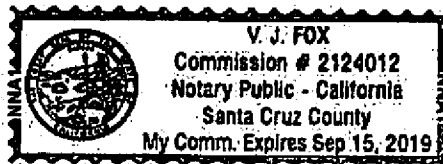
On April 27, 2016 before me, V.J. Fox, Notary Public  
(insert name and title of the officer)

personally appeared Ashley Stinson  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature [Handwritten Signature] (Seal)  
V.J. Fox, Notary Public



**Payment Bond Public Works**

82396697 Federal  
106304449 Travelers  
929607192 CNA

BOND NO.: 09171232 F&D

KNOW ALL MEN BY THESE PRESENTS, That we, Granite Construction Company Principal, and Federal Insurance Company\* incorporated under the laws of the State of Indiana and authorized to execute bonds and undertakings as ~~SOLE SURETY~~ Surety, are held and firmly bound unto any and all persons named in California Civil Code Section 1181 whose claim has not been paid by the contractor, company or corporation, in the aggregate total of Six Million Two Hundred Seven Thousand Five Hundred Seventy-Four Dollars and Twenty-Three Cents (\$6,207,574.23), for the payment whereof, well and truly to be made, said Principal and Surety bind themselves, their heirs, administrators, successors and assigns, jointly and severally, firmly by these present.

The Condition of the foregoing obligation is such that; whereas the above bounden Principal has entered into a contract, dated \_\_\_\_\_, with the City of Monterey to do the following work, to-wit:

Holman Highway 68/Highway 1 Roundabout Project

This bond shall inure to the benefit of any person named in Section 3181 of the Civil Code of the State of California so as to vie a right of action to them or their assignees in any suit brought upon this bond.

This bond is executed and filed to comply with the provisions of the act of Legislature of the State of California as designated in Civil Code Sections 3247-3252 inclusive, and all amendments thereto.

Signed and sealed this 27th day of April, 2016

Granite Construction Company

BY: [Signature]  
Bradley G. Graham, Vice President

Federal Insurance Company\*

BY: [Signature]  
ATTORNEY-IN-FACT Ashley Stinson



A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

### ACKNOWLEDGMENT

State of California  
County of Santa Cruz )

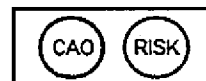
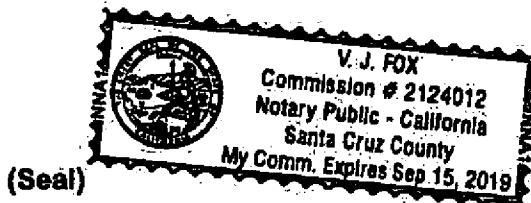
On April 27, 2016 before me, V.J. Fox, Notary Public  
(insert name and title of the officer)

personally appeared Ashley Stinson  
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature   
V.J. Fox, Notary Public





**Chubb  
Surety**

**POWER  
OF  
ATTORNEY**

**Federal Insurance Company  
Vigilant Insurance Company  
Pacific Indemnity Company**

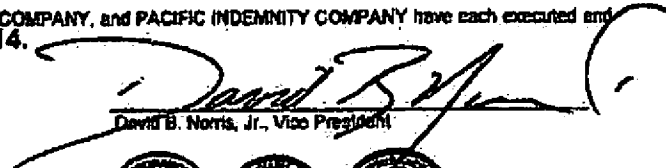
**Attn: Surety Department  
15 Mountain View Road  
Warren, NJ 07059**

Know All by These Presents, That **FEDERAL INSURANCE COMPANY**, an Indiana corporation, **VIGILANT INSURANCE COMPANY**, a New York corporation, and **PACIFIC INDEMNITY COMPANY**, a Wisconsin corporation, do each hereby constitute and appoint Igisha Desai, John D. Gilliland, Catherine Gustavson, Kathleen Schreckengost, Ashley Stinson and Lillian Tse of Watsonville, California

each as their true and lawful Attorney- In- Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than ball bonds) given or executed in the course of business on behalf **GRANITE CONSTRUCTION INCORPORATED** and all Subsidiaries alone or in joint venture as principal, in connection with bids, proposals or contracts to or with the United States of America, any State or political subdivision thereof or any person, firm or corporation. And the execution of such bond or obligation by such Attorney- In- Fact in the Company's name and on its behalf as surety thereon or otherwise, under its corporate seal, in pursuance of the authority hereby conferred shall, upon delivery thereof, be valid and binding upon the Company.

In Witness Whereof, said **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY** have each executed and attested these presents and affixed their corporate seals on this **18<sup>th</sup>** day of **July, 2014**.

  
Dawn M. Chloros, Assistant Secretary

  
David B. Norris, Jr., Vice President



STATE OF NEW JERSEY

ss.

County of Somerset

On this **18<sup>th</sup>** day of **July, 2014** before me, a Notary Public of New Jersey, personally came Dawn M. Chloros, to me known to be Assistant Secretary of **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY**, the companies which executed the foregoing Power of Attorney, and the said Dawn M. Chloros, being by me duly sworn, did depose and say that she is Assistant Secretary of **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY**, and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By- Laws of said Companies; and that she signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that she is acquainted with **David B. Norris, Jr.**, and knows him to be Vice President of said Companies; and that the signature of **David B. Norris, Jr.** subscribed to said Power of Attorney is in the genuine handwriting of **David B. Norris, Jr.**, and was thereto subscribed by authority of said By- Laws and in deponent's presence.

Notarial Seal



**KATHERINE J. ADELAAR**  
NOTARY PUBLIC OF NEW JERSEY  
No. 2318695  
Commission Expires July 18, 2019

  
Notary Public

**CERTIFICATION**

Extract from the By- Laws of **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY**:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice-President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice-President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys- In- Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Dawn M. Chloros, Assistant Secretary of **FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY** (the "Companies") do hereby certify that:

- (i) the foregoing extract of the By- Laws of the Companies is true and correct,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U.S. Treasury Department; further, Federal and Vigilant are licensed in the U.S. Virgin Islands, and Federal is licensed in American Samoa, Guam, Puerto Rico, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this **April 27, 2016**



  
Dawn M. Chloros, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY Telephone (908) 903- 3493 Fax (908) 903- 3656 e-mail: surety@chubb.com





POWER OF ATTORNEY

Farmington Casualty Company
Fidelity and Guaranty Insurance Company
Fidelity and Guaranty Insurance Underwriters, Inc.
St. Paul Fire and Marine Insurance Company
St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company
Travelers Casualty and Surety Company
Travelers Casualty and Surety Company of America
United States Fidelity and Guaranty Company

Attorney-In-Fact No. 228138

KNOW ALL MEN BY THESE PRESENTS: That St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company and St. Paul Mercury Insurance Company are corporations duly organized under the laws of the State of Minnesota, that Farmington Casualty Company, Travelers Casualty and Surety Company, and Travelers Casualty and Surety Company of America are corporations duly organized under the laws of the State of Connecticut, that United States Fidelity and Guaranty Company is a corporation duly organized under the laws of the State of Maryland, that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of Iowa, and that Fidelity and Guaranty Insurance Underwriters, Inc. is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint John D. Gilliland, Jigisha Desai, Kathleen Schreckengost, Catherine Gustavson, Ashley Stinson, and Lillian Tse of the City of Watsonville, State of California, their true and lawful Attorney(s)-In-Fact, each in their separate capacity if more than one is named above, to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

This Power of Attorney is limited to bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof for Granite Construction Incorporated and all subsidiaries and affiliates, alone or in joint venture.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 26th day of June, 2014.

Farmington Casualty Company
Fidelity and Guaranty Insurance Company
Fidelity and Guaranty Insurance Underwriters, Inc.
St. Paul Fire and Marine Insurance Company
St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company
Travelers Casualty and Surety Company
Travelers Casualty and Surety Company of America
United States Fidelity and Guaranty Company



State of Connecticut

City of Hartford ss.

By:

Robert L. Raney, Senior Vice President

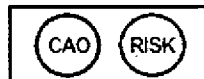
On this the 26th day of June, 2014, before me personally appeared Robert L. Raney, who acknowledged himself to be the Senior Vice President of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.

My Commission expires the 30th day of June, 2016.



Marie C Tetreault
Marie C. Tetreault, Notary Public



This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, which resolutions are now in full force and effect, reading as follows:

**RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

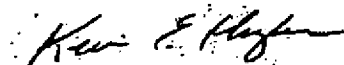
**FURTHER RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

**FURTHER RESOLVED**, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

**FURTHER RESOLVED**, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, Kevin E. Hughes, the undersigned, Assistant Secretary, of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is in full force and effect and has not been revoked.

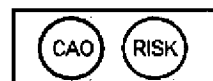
**IN TESTIMONY WHEREOF**, I have hereunto set my hand and affixed the seals of said Companies this **April 27, 2016**



Kevin E. Hughes, Assistant Secretary



To verify the authenticity of this Power of Attorney, call 1-800-421-3880 or contact us at [www.travelersbond.com](http://www.travelersbond.com). Please refer to the Attorney-In-Fact number, the above-named individuals and the details of the bond to which the power is attached.



Know All Men By These Presents, That The Continental Insurance Company, a Pennsylvania insurance company, is a duly organized and existing insurance company having its principal office in the City of Chicago, and State of Illinois, and that it does by virtue of the signature and seal herein affixed hereby make, constitute and appoint

John D Gilliland, Jigisha Desai, Kathleen Schreckengost, Catherine Gustavson, Ashley Stinson, Lillian Tse, Individually

of San Francisco, CA, its true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on its behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind them thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of the insurance company and all the acts of said Attorney, pursuant to the authority hereby given is hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law and Resolutions, printed on the reverse hereof, duly adopted, as indicated, by the Board of Directors of the insurance company.

In Witness Whereof, The Continental Insurance Company has caused these presents to be signed by its Vice President and its corporate seal to be hereto affixed on this 24th day of June, 2015.



The Continental Insurance Company

Paul T. Bruflat Vice President

State of South Dakota, County of Minnehaha, ss:

On this 24th day of June, 2015, before me personally came Paul T. Bruflat to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is a Vice President of The Continental Insurance Company, a Pennsylvania insurance company, described in and which executed the above instrument; that he knows the seal of said insurance company; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said insurance company and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said insurance company.



My Commission Expires February 12, 2021

S. Eich Notary Public

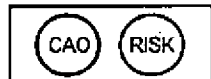
CERTIFICATE

I, D. Bult, Assistant Secretary of The Continental Insurance Company, a Pennsylvania insurance company, do hereby certify that the Power of Attorney herein above set forth is still in force, and further certify that the By-Law and Resolution of the Board of Directors of the insurance company printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said insurance company this April 27, 2016



The Continental Insurance Company

D. Bult Assistant Secretary





## Authorizing By-Laws and Resolutions

ADOPTED BY THE BOARD OF DIRECTORS OF THE CONTINENTAL INSURANCE COMPANY:

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the Board of Directors of the Company at a meeting held on May 10, 1995.

**"RESOLVED:** That any Group Vice President may authorize an officer to sign specific documents, agreements and instruments on behalf of the Company provided that the name of such authorized officer and a description of the documents, agreements or instruments that such officer may sign will be provided in writing by the Group Vice President to the Secretary of the Company prior to such execution becoming effective.

This Power of Attorney is signed by Paul T. Bruflat, Vice President, who has been authorized pursuant to the above resolution to execution power of attorneys on behalf of The Continental Insurance Company.

This Power of Attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of the Company by unanimous written consent dated the 25<sup>th</sup> day of April, 2012.

**"Whereas,** the bylaws of the Company or specific resolution of the Board of Directors has authorized various officers (the "Authorized Officers") to execute various policies, bonds, undertakings and other obligatory instruments of like nature; and

Whereas, from time to time, the signature of the Authorized Officers, in addition to being provided in original, hard copy format, may be provided via facsimile or otherwise in an electronic format (collectively, "Electronic Signatures"), Now therefore be it resolved: that the Electronic Signature of any Authorized Officer shall be valid and binding on the Company."



ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND  
POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by Geoffrey Delisio, Vice President, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint Jigisha DESAI, Catherine GUSTAVSON, Cynthia P. JOHNSON, Kathleen SCHRECKENGOST, John D. GILLILAND, Ashley STINSON and Lillian TSE, each its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: any and all bonds and undertakings, issued on behalf of Granite Construction Incorporated, Watsonville, California and all subsidiaries alone or in a joint venture and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York, the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland, and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland, in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND, this 1st day of March, A.D. 2013.



*Geoffrey Delisio*

By: \_\_\_\_\_  
Vice President - Geoffrey Delisio

*Gerald F. Haley*

By: \_\_\_\_\_  
Assistant Secretary - Gerald F. Haley

State of Maryland  
County of Baltimore

On this 1st day of March, A.D. 2013, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, Geoffrey Delisio, Vice President and Gerald F. Haley, Assistant Secretary of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.



*Constance A. Dunn*

By: \_\_\_\_\_  
Constance A. Dunn - Notary Public  
My Commission Expires: July 14, 2015



**EXTRACT FROM BY-LAWS OF THE COMPANIES**

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify or revoke any such appointment or authority at any time."

**CERTIFICATE**

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

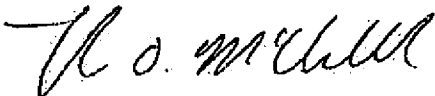
RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

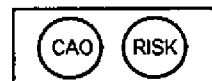
RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereto subscribed my name and affixed the corporate seals of the said Companies,

This April 27, 2016



Thomas O. McClellan, Vice President



**NONCOLLUSION DECLARATION**

**TO BE EXECUTED BY BIDDER, LEGALLY NOTARIZED AND SUBMITTED WITH BID**

State of California )  
County of Santa Clara ) ss.

Karim Massoud, being first duly sworn, deposes and says that he or she is Chief Estimator of GRANITE CONSTRUCTION COMPANY, the party making the foregoing bid; that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived or agreed with any Bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the Bidder or any other Bidder, or to fix any overhead, profit, or cost element of the price bid, or of that of any other Bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the Bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid; and that the bid is not made in the interest of, or on behalf of, any member of the Monterey City Council or any City officer or employee.

Signed: 

State of California )  
County of Santa Clara ) ss.

**\*\* See Attached Notary Acknowledgement \*\***

On \*\* before me, \*\*  
Date Name and Title of the Officer  
personally appeared \*\*  
Name(s) of Signer(s)

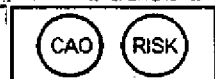
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity (ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the persons(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

(seal)

Notary's Signature



A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

### ACKNOWLEDGMENT

State of California  
County of  Santa Clara  )

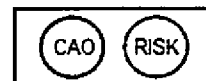
On  January 19, 2016  before me,  Patricia A. Arnett, Notary Public   
(insert name and title of the officer)

personally appeared  Karim Massoud   
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature   (Seal)   
Patricia A. Arnett, Notary Public



### DEBARMENT AND SUSPENSION CERTIFICATION

The Bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any state, federal, or local agency;
- Has not been suspended, debarred, voluntarily excluded or determined ineligible by any state, federal, or local agency within the past 3 years;
- Does not have a proposed debarment pending; and
- Has not be indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

No exceptions

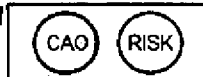
Exceptions will not necessarily result in denial of award, but will be considered in determining Bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions.

I declare under penalty of perjury that the foregoing is true and correct and that this certification is signed this 19th day of January, 2016 in Santa Clara, Santa Clara County, California.

  
Signature

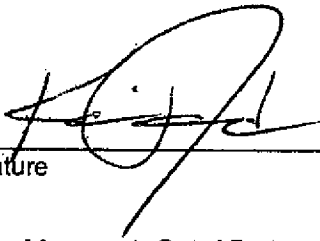
Karim Massoud, Chief Estimator  
Printed Name and Title



**CERTIFICATION OF GOOD-FAITH EFFORT (PRIME CONTRACTOR)**

**To Hire Monterey Bay Area Residents  
(Prime Contractor – To be Submitted with Bid)**

I, Karim Massoud, a licensed contractor, or responsible managing officer, of the company known as GRANITE CONSTRUCTION COMPANY, do hereby certify, under penalty of perjury, that I have met, or made a good-faith effort to meet, the requirements set forth in Monterey City Code Article 2 of Chapter 28. Further, I certify that during the performance of the contract, I shall keep an accurate record on a standardized form showing the name, place or residence, trade classification, hours employed, proof of qualified individual status, per diem wages and benefits of each person employed by the company on the specific public works project, including full-time, part-time, permanent, and temporary employees, and provide such records to the City upon request, within five working days. I understand that I am responsible for insuring that any subcontractor working under my direction, complies with this ordinance, including submitting a Certification of Good Faith Effort to Hire Monterey Bay Residents, and to keeping accurate records as described above.

  
\_\_\_\_\_  
Signature

Karim Massoud, Chief Estimator  
\_\_\_\_\_  
Printed Name and Title

January 19, 2016  
\_\_\_\_\_  
Date

