

The Contractor must secure a general license and private crossing permit with BNSF. Instructions and application for the BNSF right of entry and private crossing permits are included in Appendix G.

For additional permit requirements, please contact Greg Rousseau, with BNSF, at (909) 386-4079 or visit <http://www.bnsf.com/communities/faqs/permits-real-estate/>

**Replace section 5-1.20D with:**

**5-1.20D Riverside County Flood Control and Water Conservation District Relations**

Work must comply with the Riverside County Flood Control and Water Conservation District requirements. Encroachment permit application is provided as supplemental project information in these special provisions.

**Replace section 5-1.20E with:**

**5-1.20E Riverside Transit Agency Relations**

During the progress of the work under this Contract, the Riverside Transit Agency will relocate or install bus stop facilities within the project limits. Prior to the reduction of traffic lanes within the project limits, the Riverside Transit Agency will relocate bus stop facilities outside of the construction limits. Upon completion of road widening and adjacent sidewalk, the Riverside Transit Agency will install final bus stop facilities. Make the necessary arrangements with the Riverside Transit Agency through the Engineer and submit a schedule per the following:

1. Agreed to by a representative of the Riverside Transit Agency - Contact: Sam Wattanachinda, (951) 565-5122.
2. Allowing at least fifteen days for the Riverside Transit Agency to complete its work for each stage. The days start on the notification date.

**Replace Section 5-1.21 with:**

**5-1.21 COORDINATION WITH PRIVATE PROPERTY OWNERS**

Work within the property at 12321 Magnolia Avenue must be staged in a manner that allows for a minimum of twenty parking spaces to remain available at all times.

If the light poles being stored on the property at 12689 Magnolia Avenue are needed to be moved, the work must be performed by you at no additional cost. Work must be coordinated with the property owner and arrangements made for temporary storage location.

Within private properties, all work must be limited to the boundaries defined in the Temporary Construction Easements.

If work requires removal of a fence separating public from private properties, temporary fencing must be incorporated to ensure security is maintained at all times.

Notify the Engineer not less than 15 days and not more than 60 days before the anticipated start of an activity that will take place within private property or change the access to private properties within the project limits.

**Replace the 1<sup>st</sup> paragraph of section 5-1.23B(1) with:**

Action submittals include:

1. Shop drawings
2. Product data
3. Samples and mockups
4. Test samples
5. Quality Control Plans
6. Work plans
7. Material sources

8. Test data, test results, and evaluation reports

**Replace the 2<sup>nd</sup> paragraph of section 5-1.23B(2) with:**

Each drawing and calculation sheet must be in black ink (unless noted otherwise) and sequentially numbered. Shop drawings related to citrus label tile, decorative steel disc and interpretive panel tiles must show final layout, text, images, color (where occurs), dimensions, and font type and size. Architect to select and furnish citrus labels for citrus label tiles. Architect to furnish concept images shown on interpretive tile panels.

**Add to section 5-1.23B(3):**

Submit product data for the following:

1. Terra-cotta tile
2. Ceramic glazed tiles with silk-screened images and text
3. Grout and grout sealer
4. Tile caulking
5. Thinset installation materials
6. Decorative steel disc with custom imagery

**Add to section 5-1.23B(4):**

Submit samples for verification:

1. One full-size sample of terra-cotta tile.
2. One full-size sample of ceramic glazed tile with citrus label as selected by Architect.
3. Full-size samples of all ceramic glazed tiles inclusive of all text and images that make up Interpretive Panel #3.
4. Grout sample.
5. Tubular steel railing color sample; minimum HSS 2x3 by 12 inches long.
6. Laser cut lemon tree color steel sample; ¼ inch thick and minimum 2 feet square. Include trunk, branches, leaves, and lemons.
7. Concrete barrier with recesses as shown on Plans; minimum full height by 4 feet long.
8. Cast-in-place concrete wall with texture to match MSE panels; minimum 5 feet by 5 feet square.
9. One full size sample of decorative steel disc with custom imagery

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

The utility owner will relocate a utility shown in the following table before the corresponding date shown:

**Utility Relocation and Date of the Relocation**

Utility	Location	Date
<u>Southern California Gas Company</u> <u>6" MPG (abandoned)</u>	<u>Approx. Sta 10+00 to 40+00 (LT of</u> <u>"C" line)</u>	<u>Prior to Construction</u>
<u>Southern California Gas Company</u> <u>8" HPG</u>	<u>Approx. Sta 10+00 to 40+00 (RT of</u> <u>"C" line)</u>	<u>Prior to Construction</u>
<u>ATT California-South UG Fiber</u> <u>Optic duct bank (abandoned)</u>	<u>Approx. Sta 11+00 to 38+00 (RT of</u> <u>"C" line)</u>	<u>Prior to Construction</u>
<u>ATT California-North UG Fiber</u> <u>Optic duct bank</u>	<u>Approx. Sta 26+80, Bent 6 (LT of</u> <u>"C" line)</u>	<u>Prior to Construction</u>
<u>Riverside Public Utilities-Water</u> <u>12" waterline appurtenances (FH,</u> <u>WM, AV, BO &amp; FS)-Temporary</u>	<u>Approx. Sta 10+00 to 26+00 (RT of</u> <u>"C" line)</u>	<u>Prior to Construction</u>
<u>Sunesys-OH Fiber Optic (on RPU-</u> <u>Power poles)</u>	<u>Sta 38+75 to 41+00 (LT of "BS" line)</u>	<u>Prior to Construction</u> <u>Completed 131502</u>
<u>Riverside Public Utilities-Water 20"</u> <u>WL</u>	<u>Approx. Sta 10+00 to 31+00 ("C"</u> <u>line)</u>	<u>Prior to Construction</u>

Installation of the utilities shown in the following table requires coordination with your activities. Make the necessary arrangements with the utility company through the Engineer and submit a schedule:

1. Verified by a representative of the utility company
2. Allowing at least the time shown for the utility owner to complete its work

**Utility Relocation and Contractor-Arranged Time for the Relocation**

Utility	Utility address	Location	Days
Riverside Public Utilities- Water 20" waterline- connections to main	3750 University Ave 4 <sup>th</sup> Floor, Riverside, CA 92501 POC: Matthew Bates 951-826-5116	Approx. Sta 33+00 to 40+00, (LT of "C" line)	60 Working Days
Riverside Public Utilities- Water 12" waterline- connections to main	3750 University Ave 4 <sup>th</sup> Floor, Riverside, CA 92501 POC: Matthew Bates 951-826-5116	Sta 26+45, Bent 6 (RT of "C" line) Sta 27+65, Bent 7 (RT of "C" line)	60 Working Days
Riverside Public Utilities- Water 12" waterline appurtenances (FH, WM, AV, BO & FS)- Temporary	3750 University Ave 4 <sup>th</sup> Floor, Riverside, CA 92501 POC: Matthew Bates 951-826-5116	Sta 17+00 to 25+00 (RT of "C" line)	60 Working Days
Riverside Public Utilities- Water 12" waterline appurtenances (FH, WM, AV, BO & FS)- Permanent	3750 University Ave 4 <sup>th</sup> Floor, Riverside, CA 92501 POC: Matthew Bates 951-826-5116	Sta 17+00 to 25+00 (RT of "C" line)	60 Working Days
Riverside Public Utilities- Water 12" WL & appurtenances (Permanent)	3750 University Ave 4 <sup>th</sup> Floor, Riverside, CA 92501 POC: Matthew Bates 951-826-5116	Approx. Sta 10+00 to 26+00 ("C" line)	120 Working Days
Riverside Public Utilities- Power OH	3750 University Ave 3 <sup>rd</sup> Floor, Riverside, CA 92501 POC: Summer Delgado 951-826-2129	Approx. Sta 29+00 to 41+00 ("C" line) Approx. Sta 38+00 to 42+00 ("BS" line)	90 Working Days
Riverside Public Utilities- Power Remove SL poles & OH	3750 University Ave 3 <sup>rd</sup> Floor, Riverside, CA 92501 POC: Summer Delgado 951-826-2129	Sta 31+85 to 41+85 (on "C" line)	60 Working Days
Riverside Public Utilities- Power TS & bridge SL Feed point	3750 University Ave 3 <sup>rd</sup> Floor, Riverside, CA 92501 POC: Summer Delgado 951-826-2129	Sta 41+00 (LT of "BS" line)	60 Working Days
Riverside Public Utilities- Power SL Feed point	3750 University Ave 3 <sup>rd</sup> Floor, Riverside, CA 92501 POC: Summer Delgado 951-826-2129	Sta 38+75 (LT of "BS" line)	60 Working Days

ATT California Manholes-adjust to FG	3939 E Coronado St Anaheim, CA 92807 POC: David Bell 714-666-5423	Sta 07+10 Sta 11+40 Sta 37+10 Sta 39+15 (RT of "C" line) Sta 12+00 Sta 12+35 Sta 12+45 Sta 19+60 (2 UMH) Sta 33+95 Sta 37+00 (LT of "C" line) Sta 40+90 (RT of "BS" line)	60 Working Days
ATT California Pedestals-adjust to FG	3939 E Coronado St Anaheim, CA 92807 POC: David Bell 714-666-5423	Sta 13+60 (RT of "C" line) Sta 10+50 Sta 10+95 Sta 11+30 Sta 12+25 Sta 38+90 (LT of "C" line)	60 Working Days
ATT California UG FO duct & adjust manholes to FG	3939 E Coronado St Anaheim, CA 92807 POC: David Bell 714-666-5423	Approx. Sta 11+40 to 38+60 ("C" line)	120 Working Days
Southern California Edison Facilities-adjust to FG	1351 East Francis St Ontario, CA 91761 POC: Theresa Taylor 909-930-8406	Sta 07+35 (VP) Sta 07+40 (UMH) Sta 07+45 (VP) Sta 10+45 (UP) (LT of "C" line) Sta 13+40 (SL) Sta 13+45 (UP) (RT of "C" line)	120 Working Days

Make the necessary arrangements with the utility company through the Engineer; submit a schedule and list of Approved Materials:

1. At least 30 days prior to commencement of work
2. Verified by a representative of the utility company
3. Complete the relocation work under the supervision of the utility owner's qualified inspector

Make the necessary arrangements with the utility company through the Engineer; submit a schedule and list of Approved Materials:

1. At least 30 days prior to commencement of work
2. Verified by a representative of the utility company
3. Complete the relocation work under the supervision of the utility owner's qualified inspector

### **Utility Relocation and Contractor-Arranged Time for the Relocation**

Utility	Utility address	Location	Days
Home Gardens Sewer District 8" sewer & manholes	13538 Magnolia Ave Corona, CA 92879-2032 POC: Charlie McKinley 949-474-1401 ext 272	Sta 26+00 to 26+80, Bent 6 (RT of "C" line)	60 Working Days
Home Gardens Sewer District Manholes-adjust to FG	13538 Magnolia Ave Corona, CA 92879-2032 POC: Charlie McKinley 949-474-1401 ext 272	Sta 06+90 Sta 08+10 Sta 11+00 Sta 13+45 Sta 17+10 Sta 20+45 Sta 23+90 (RT of "C" line)	30 Working Days

Adjustments of the utilities shown in the following table requires coordination with the utility owner. Make the necessary arrangements with the utility company through the Engineer; submit a schedule and list of Approved Materials:

1. At least 30 days prior to commencement of work
2. Verified by a representative of the utility company
3. Complete the relocation work under the supervision of the utility owner's qualified inspector

Utility	Utility address	Location
City of Riverside Sewer Manholes	3750 University Ave 2 <sup>nd</sup> Floor, Riverside, CA 92501 POC: Thuy Nguyen 951-826-5706	Sta 38+25 Sta 41+85 Sta 42+90 (LT of "C" line) Sta 38+45 (RT of "BS" line)

Installation of the utilities shown in the following table requires coordination with your activities and represent a betterment of facilities. The installation is for new facilities; there are currently no existing facilities within the project limits. Make the necessary arrangements with the utility company through the Engineer and submit a schedule:

1. Verified by a representative of the utility company
2. Allowing at least the time shown for the utility owner to complete its work

### **Utility Betterment and Contractor-Arranged Time for the Betterment**

Utility	Utility address	Location	Days
Time Warner Cable 2-4" FO ducts in bridge and approaches-Utility vaults in sidewalk at begin & end station	560 S Promenade Ave Suite 102 Corona, CA 92880 POC: Steve Waters 951-547-3830	Approx. Sta 12+00 to 36+50 (RT of "C" line) Approx. Sta 37+00 (LT of "C" line)	90 Working Days-3 Move-ins-Const Stages 3B to 6

To allow pile driving, drilling activities, or substructure construction, the utility owner will rearrange the utilities shown in the following table during construction activities. No other utility will be rearranged or temporarily deactivated before or during construction activities for this purpose unless you make arrangements with the utility owner. Notify the Engineer at least 30 days before the interfering utilities are to be rearranged. The Engineer notifies the utility owners.

### Utility Rearrangement for Pile Driving, Drilling Activities, or Substructure Construction

Utility	Location
Riverside Public Utilities-Water 12" waterline appurtenances (FH, WM, AV, BO & FS)-Temporary	Sta 17+00 to 25+00 (RT of "C" line)

The utilities shown in the following table will not be rearranged. The utilities may interfere with pile driving, drilling activities, or substructure construction. If you want any of them rearranged or temporarily deactivated, make arrangements with the utility owner.

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

Utility	Location
ATT California (South fiber optic duct bank- abandoned)	Approx. Sta 19+00 to 35+00 (RT of "C" line)
Southern California Gas Company 6" MPG (abandoned)	Approx. Sta 19+00 to 35+00 (LT of "C" line)

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## 7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

### Add to section 7-1.03:

Notify the Engineer not less than 20 days and not more than 90 days before the anticipated start of an activity that will change the handling of traffic within the project limits.

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## 9 PAYMENT

### Add to section 9-1.16C:

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

1. Mechanically Stabilized Embankment
2. Steel Piling
3. Post-Grouting CIDH Pile
4. Prestressing steel for cast-in-place members, sealed packages only
5. Prestressing ducts and anchorages.
6. PTFE/Elastomeric Bearings
7. Joint Seal Assemblies
8. Bar Reinforcing Steel
9. Structural Steel
10. Welded Steel Pipe Casing
11. Isolation Casing
12. Miscellaneous Metal
13. Bridge Deck Drainage System
14. Metal Railing
15. Chain Link Railing
16. Tubular Hand Railing

- 17. Culvert Pipe
- 18. Fences and Gates
- 19. Irrigation Controller Enclosure Cabinets
- 20. Irrigation Controllers
- 21. Irrigation Pump and Equipment
- 22. Lighting Fixtures
- 23. Luminaires
- 24. Miscellaneous Drainage Facilities
- 25. Miscellaneous Iron and Steel
- 26. Pipe (Irrigation Systems)
- 27. Signal and Lighting Standards
- 28. Signal Cabinets
- 29. Signal Heads and Mounting Brackets
- 30. Masonry Block
- 31. Sprinklers
- 32. Valves

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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 and loop detectors 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.

Perform post-tensioning sequence as shown.

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## 11 QUALITY CONTROL AND ASSURANCE

#### Add to section 11-2.01:

The following must comply with the specifications for PC concrete QC:

1. Mechanically Stabilized Earth Concrete Panels

#### Add to section 11-3.02A:

The following must comply with the specifications for welding QC:

1. Joint Seal Assemblies

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## 12 TEMPORARY TRAFFIC CONTROL

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.

A reference exhibit displaying the text and colors of the sign will be provided to the Contractor prior to construction.

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 8' x 4' in dimension, 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 must comply as specified in the Federal Highway Administration's *Color Tolerance Chart*.

The Engineer will provide the year of completion for the legend on construction project funding signs. Furnish and install a sign overlay for the year of completion within 10 working days of notification.

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

Submit a copy of the sign design for approval by the Engineer prior to fabrication. After approval, provide Engineer the final sign design in the form of an editable picture file in .eps format – Encapsulated PostScript file.

#### 12-2.03 CONSTRUCTION

Install two construction project funding signs at the locations designated by the Engineer before starting major work activities visible to roadway users.

At the completion of the project, the signs will become property of the County. When directed by the Engineer, remove all hardware from the signs. Posts and hardware will become property of the Contractor. Deliver and off-load the signs to the address listed below or as directed by the Engineer:

Riverside County of Transportation Department  
McKenzie Highway Operations Center  
2950 Washington Street  
Riverside, CA 92504  
Telephone: (951-955-6894

#### 12-2.04 PAYMENT

The contract bid unit price paid for Construction project funding signs will be under bid item "Funding Awareness Sign".

Replace section 12-3.14 with:

### 12-3.14 TEMPORARY TRAFFIC SCREEN

#### 12-3.14A General

Section 12-3.14 includes specifications for constructing temporary traffic screen at the locations shown.

#### **12-3.14B Materials**

Temporary traffic screen panels must be new or used, CDX grade or better, plywood or weather-resistant strandboard mounted and anchored on Type K temporary railing.

Wale boards must be new or used Douglas fir, rough sawn, construction grade or better.

Pipe screen supports must be new or used schedule 40, galvanized steel pipe.

Nuts, bolts, and washers must be cadmium plated.

Screws must be black or cadmium-plated flat head, cross-slotted screws with full thread length.

#### **12-3.14C Construction**

Mount and anchor temporary traffic screen on top of Type K temporary railing.

Remove the traffic screen from the highway when the Engineer determines it is no longer required. The traffic screen that is removed becomes your property.

A lateral move of Type K temporary railing with attached temporary traffic screen is change order work if ordered and the repositioning is not shown.

#### **12-3.14D Payment**

Temporary traffic screen is measured along the line of the completed screen.

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

#### **12-3.18 INLINE TEMPORARY CRASH CUSHION**

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

Section 12-3.18 includes specifications for installing and maintaining inline temporary crash cushion modules.

Whenever work activity exposes traffic to a fixed obstacle where the use of a standard sand-filled temporary crash cushion array or grouping do not provide a minimum lateral clearance of one foot to the edge of traveled way, protect the traffic from the obstacle with an inline temporary crash cushion module. The temporary inline crash cushion module must be in place before opening traffic lanes adjacent to the obstacle.

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

An inline temporary crash cushion module must be an ABSORB-350, 9-element system, as manufactured by Barrier Systems, Inc or an approved equal manufactured after March 31, 1997 and on the Authorized Material List for highway safety features.

The Contractor must furnish the Engineer one copy of the manufacturer's plan and parts list.

The Contractor must provide the Engineer with a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-3.05E, "Certificates of Compliance," of the Standard Specifications. The Certificate of Compliance shall certify that the crash cushion conforms to the contract plans and specifications, conforms to the prequalified design and material requirements, and was manufactured in conformance with the approved quality control program.

##### **12-3.18C Construction**

Secure the inline temporary crash cushion modules in place before commencing any work activity requiring a temporary crash cushion.

Inline temporary crash cushion modules must be installed in conformance with the manufacturer's installation instructions.

Maintain inline temporary crash cushion modules in place at each location, including times when work is not actively in progress. You may remove inline temporary crash cushion modules during the work period for access to the work if the exposed fixed obstacle is 15 feet or more from the nearest lane carrying

traffic. Reset the inline temporary crash cushion modules before the end of the work period. Remove inline temporary crash cushion modules when no longer required.

Immediately repair inline temporary crash cushion modules damaged due to your activities. Remove and replace any module damaged beyond repair. Repair of inline temporary crash cushion modules damaged by traffic is change order work.

You may place inline temporary crash cushion modules on movable pallets or frames complying with the dimensions shown. The pallets or frames must provide a full-bearing base beneath the modules. Do not move the modules and supporting pallets or frames by sliding or skidding along the pavement or bridge deck.

Attach a Type R or Type P marker panel to the front of the inline temporary crash cushion module if the closest point of the crash cushion array is within 12 feet of the traveled way. Firmly fasten the marker panel to the crash cushion with commercial quality hardware or by other authorized methods.

Remove inline temporary crash cushion modules, including sand, pallets or frames, and marker panels, at the time of Contract acceptance. Do not install inline temporary crash cushion modules in the permanent work.

#### **12-3.18D Payment**

Payment for inline temporary crash cushion modules includes full compensation for furnishing all labor, materials (including marker panels), tools, equipment, and incidentals, and for doing all the work involved in furnishing, installing, maintaining, moving, and removing from the site of the work when no longer required (including those damaged by public traffic) temporary crash cushion systems, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The Department does not pay for inline temporary crash cushion modules placed under section 7-1.04 or placed in excess of the number described.

A lateral move of temporary crash cushion module is change order work if ordered and the repositioning is not shown. The Department does not count repositioned modules in the count of inline temporary crash cushion modules.

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

Designated holidays are as shown in the following table:

#### **Designated Holidays**

Holiday
January 1st
January 2nd when it falls on a Friday
3rd Monday in January
February 12th
3rd Monday in February
Last Monday in May
July 4th
1st Monday in September
2nd Monday in October
November 11th
Thanksgiving Day
Friday following Thanksgiving Day
December 24th when it falls on a Monday
December 25th
December 26th when it falls on a Friday
December 31st when it falls on a Monday

If a designated holiday falls on a Sunday, the following Monday is a designated holiday. If January 1st, February 12th, July 4th, November 11th, or December 25th fall on a Saturday, the preceding Friday is a designated holiday.

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 with fluorescent orange traffic cones or portable delineators. Place the cones or delineators on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25-foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment. Use at least 9 cones or delineators for the taper. Use a W20-1, "Road Work Ahead," W21-5b, "Right/Left Shoulder Closed Ahead," or C24(CA), "Shoulder Work Ahead," sign mounted on a crashworthy, portable sign support with flags. The sign must be placed as ordered by the Engineer and at least 48 by 48 inches in size. If a cone or delineator is displaced or overturned, immediately restore the device to its original position or location.

A minimum of 1 paved traffic lane not less than 12 feet wide must be open for use by traffic.

If a connector closure is required within the limits of a freeway lane closure, complete the work on the connector first. Then, complete the work on the freeway traveled way necessary to ensure safe passage of traffic between the connector and open freeway lanes. Complete the remaining work only after reopening the connector.

At each location where falsework is constructed over a street or route listed, provide openings through the bridge falsework. The type, minimum width, height, and number of openings at each location, and the location and maximum spacing of the falsework lighting, if required for each opening, must comply with the requirements shown in the table. The width of vehicular openings is the clear width between temporary railings or other protective work. The spacing shown in the table for falsework pavement lighting is the maximum distance from center to center, in feet, between fixtures.

#### Magnolia Avenue Grade Separation

	Number	Width (feet)	Height (feet)
Vehicle openings Combined EB&WB	<u>1</u>	<u>32'</u>	<u>15'</u>
Vehicle openings: Divided EB or WB	<u>2</u>	<u>20'</u>	<u>15'</u>
BNSF Railroad	<u>1</u>	<u>44'±</u>	<u>21'-6"</u>
Pedestrian openings	<u>1</u>	<u>8'</u>	<u>10'</u>
	Location	Spacing	
Falsework pavement lighting	<u>R and L</u>	<u>22.5</u>	

**NOTE:**

R = Right side of traffic

L = Left side of traffic

C = Centered overhead

The exact location of openings will be determined by the Engineer.

Erect falsework girders over Magnolia Avenue and/or BNSF Railway 1 span at a time. During girder erection, traffic in the lanes over which girders are being placed must be detoured or stopped as specified in section 12-4.02A and BNSF Overpass Agreement.

Have the necessary materials and equipment on site to erect or remove the girders in any 1 span or over any 1 opening before detouring or stopping traffic.

Replace "Reserved" in section 12-4.04 with:

Lane Closure Restriction for Designated Holidays and Special Days										
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun
x	H xx	xx	xx							
	SD xx									
x	xx	H xx	xx							
		SD xx								
	x	xx	H xx	xx						
			SD xx							
	x	xx	xx	H xx	xxx					
	x	xx	xx	SD xx	xxx					
				x	H xx					
				x	SD xx					
					x	H xx				
						SD xx				
						x	H xx	xx	xx	xx
							SD xx			
Legend:										
	Refer to lane requirement charts									
x	The full width of the traveled way must be open for use by traffic after 7am.									
xx	The full width of the traveled way must be open for use by traffic.									
xxx	The full width of the traveled way must be open for use by traffic until 7pm.									
H	Designated holiday									
SD	Special day									

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.

Temporary pavement delineation must be reapplied after 180 days.

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, 30 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**

Temporary pavement markers are paid per each.

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### **13 WATER POLLUTION CONTROL**

Add following to section 13-1.01 General:

#### **WATER POLLUTION CONTROL (SANTA ANA RIVER BASIN- RISK LEVEL 1):**

Throughout the term of this contract, the total land disturbance area of the project site is more than 1 acre. County will submit a Notice of Intent (NOI) to the California Regional Water Quality Board – Santa Ana Region for compliance with the General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (hereafter referred to as the Construction General Permit), which is available at:

[http://www.waterboards.ca.gov/water\\_issues/programs/stormwater/construction.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml)).

The Area-Wide Municipal Stormwater Permit (R8-2010-033, NPDES No. CAS618033), hereafter referred to in this section as the "Municipal Permit", issued by the California Regional Water Quality Control Board (CRWQCB) – Santa Ana Region. This permit regulates both stormwater and non-stormwater discharges associated with Contractor's construction activities. A copy of the Permit may be obtained at the office of the County of Riverside Transportation Department, 14<sup>th</sup> Street Transportation Annex, 3525 14<sup>th</sup> Street, Riverside, California, (951) 955-6780, or may be obtained on the internet at: <http://www.waterboards.ca.gov/santaana/>.

The Contractor shall comply with the requirements of the Construction General Permit (NPDES No. CAS000002), the Municipal Permit, and the De Minimis Permit (NPDES No. CAG998001).

Contractor's Stormwater Pollution Prevention Plan and Monitoring Program (SWPPP/MP) shall be prepared by a Qualified SWPPP Developer in accordance with the Construction General Permit Section I.M.77.

This project is a Risk Level 1 project under the Construction General Permit. Therefore, Contractor's SWPPP/MP shall also conform to Attachment C, Risk Level 1 Requirements of the Construction General Permit.

#### **WATER POLLUTION CONTROL MEASURES**

A. Work having the potential to cause water pollution shall not commence until the Contractor's SWPPP/MP has been reviewed and approved by the Engineer. The Engineer's review and approval of the Contractor's SWPPP/MP shall not waive any contractual requirements and shall not relieve the Contractor from achieving and maintaining compliance with all federal, state, and local laws,



ordinances, statutes, rules, and regulations. A copy of Contractor's SWPPP/MP shall be maintained onsite. When the SWPPP/MP or access to the construction site is requested by a representative of a federal, state, or local regulatory agency, Contractor shall make the SWPPP/MP available and Contractor shall immediately contact the Engineer. Requests from the public for the Contractor's SWPPP/MP shall be directed to the Engineer.

- B. Contractor's SWPPP/MP shall describe the Contractor's plan for managing runoff and runoff during each construction phase. Contractor's SWPPP/MP shall describe the Best Management Practices (BMPs) that will be implemented to control erosion, sediment, tracking, construction materials, construction wastes, and non-stormwater flows. BMP details shall be based upon California Stormwater Quality Association's (CASQA) 2009 California Stormwater Quality BMP Handbook Subscription Portal (<http://www.cabmphandbooks.com>) or the Caltrans Construction Site BMP Manual (<http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm>). Contractor's SWPPP/MP shall describe installation, operation, inspection, maintenance, and monitoring activities that will be implemented for compliance with the Construction General Permit and all applicable federal, state, and local laws, ordinances, statutes, rules, and regulations related to the protection of water quality.

- C. Preparer of Contractor's SWPPP/MP shall have one of the following credentials:

1. A California registered professional civil engineer;
2. A California registered professional geologist or engineering geologist;
3. A California registered landscape architect;
4. A professional hydrologist registered through the American Institute of Hydrology;
5. A Certified Professional in Erosion and Sediment Control™ (CPESC®) registered through EnviroCert International, Inc.; or
6. A Certified Professional in Storm Water Quality™ (CPSWQ®) registered through EnviroCert International, Inc.

Additionally, the preparer of the Contractor's SWPPP/MP shall have a Qualified SWPPP Developer (QSD) certificate in conformance with the Construction General Permit.

- D. Contractor shall designate a Water Pollution Control Manager that shall have one of the certifications in the immediately preceding subsection D or one of the following certifications:

1. A certified erosion, sediment and storm water inspector registered through EnviroCert International, Inc.; or
2. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

Additionally, the Contractor's Water Pollution Control Manager shall have a QSD certificate or a Qualified SWPPP Practitioner (QSP) certificate in conformance with the Construction General Permit.

- E. Contractor's Water Pollution Control Manager shall:

1. Be responsible for all water pollution control work.
2. Be the Engineer's primary contact for all water pollution control work.
3. Have the authority to mobilize resources (crews, supplies, equipment, etc.) to make immediate repairs of water pollution control measures or to supplement water pollution control measures to maintain compliance with all federal, state, and local laws, ordinances, and regulations related to the protection of water quality, including the General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities.

F. Water Pollution Control Training: Contractor shall provide water pollution control training to Contractor's employees and subcontractors prior to their performing work on the work site. The water pollution control training shall be appropriate to the employee or subcontractor function and area of responsibility and shall address (as applicable):

1. Erosion Control (water and wind)
2. Sediment Control
3. Tracking Control
4. Materials & Waste Management
5. Non-Stormwater Discharge Management
6. Run-on and Run-off Control

G. Monitoring and Reporting: Observations and inspections conducted by the Contractor's Water Pollution Control Manager shall be documented on the Construction Site Inspection Checklist included in Contractor's SWPPP/MP. A copy of each completed Construction Site Inspection Checklist shall be submitted to the Engineer within 24 hours of conducting the inspection.

**General Requirements:**

In the event the County incurs any Administrative Civil Liability (fine) imposed by the California Regional Water Quality Control Board – Santa Ana River Basin Region, the State Water Resources Control Board, or EPA, as a result of Contractor's failure to fully implement the provisions of "Stormwater and Non-Stormwater Pollution Control", the Engineer, may, in the exercise of his sole judgment and discretion, withhold from payments otherwise due Contractor a sufficient amount to cover the Administrative Civil Liability including County staff time, legal counsel, consultant support costs and all other associated cost.

The Contractor shall be responsible for all costs and for any liability imposed by law as a result of the Contractor's failure to comply with the requirements set forth in "Water Pollution Control", including but not limited to, compliance with the applicable provisions of the Caltrans Handbooks, Construction General Permit, Federal, State, and local regulations. For the purpose of this paragraph, costs and liabilities include, but not limited to, fines, penalties, damages, and costs associated with defending against enforcement actions whether taken against the County or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Quality Act.

Within ten (15) working days after the award of the contract, the Contractor shall submit two (2) copies and one (1) pdf. file of the SWPPP/CSMP to the Engineer for review and approval. The Contractor shall allow five (5) working days for the Engineer to review the SWPPP/CSMP. If revisions are required as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP/CSMP within three (3) working days of receipt of the Engineer's comments and shall allow five (5) working days for the Engineer to review the revisions. The Contractor shall submit four (4) copies and one (1) pdf. file of the approved SWPPP/CSMP to the Engineer prior to notice to proceed. The Contractor must have an approved SWPPP/CSMP and a Waste Discharge Identification Number (WDID) prior to the notice to proceed. The contractor cannot start work, including equipment and material mobilization, stockpiling, clearing and grubbing or any other ground disturbance, without an approved SWPPP and the issuance of the WDID by the State Water Resources Control Board.

The Contractor's SWPPP/MP shall contain all required and applicable certifications and evidence of training for the Water Pollution Control Manager, SWPPP Developer, and all other employees working on the project receiving formal training or certification.

Unless otherwise directed by the Engineer or specified in these Special Provisions, the Contractor's responsibility for SWPPP/MP implementation shall continue throughout any temporary suspension of work ordered in accordance with Section 8-1.05, "Temporary Suspension of the Work", of the Standard Specifications.

The Engineer may withhold progress payments or order the suspension of construction operations without an extension of the contract time, if the Contractor fails to comply with the requirements of "Water Pollution Control" as determined by the Engineer.

All BMP repairs shall be implemented by the Contractor within 72 hrs. All BMP repairs shall also be implemented by the Contractor prior to a qualifying storm event, as defined in the Construction General Permit.

The Contractor shall be responsible for all the "Risk Level 1 Monitoring and Reporting Requirements" described in the General Construction Permit, which includes (but not limited to):

- a. Risk Level 1 - Visual Monitoring (Inspection) Requirements for Qualifying Rain Events
- b. Risk Level 1 – Monitoring Methods
- c. Risk Level 1 – Non-Storm Water Discharge Monitoring Requirements
- d. Risk Level 1 – Non-Visible Pollutant Monitoring Requirements
- e. Risk Level 1 – Records

The Contractor shall be responsible for all of the inspection required by the General Construction Permit (weekly, pre and post storm, quarterly non-stormwater, etc). The Contractor shall be responsible for providing any information for annual reporting purposes in electronic format, including inspection reports, photos, NOI, sampling and analysis reports, etc.

The Contractor shall be responsible for obtaining coverage under latest adopted version of the De Minimus Permit for non-stormwater discharges that do not qualify for the Regional Board's Condition Waiver No. 2, and provide notification prior to a regulated discharge. Compliance with the De Minimus Permit is required by the Municipal Permit. This permit regulates non-stormwater discharges to surface waters of various types of wastes that pose an insignificant threat to water quality and includes monitoring and reporting requirements. At least 45 days before the start of a new (De Minimus Permit) discharge, the contractor shall submit an application and obtain the authorization letter from the (the Regional Board's) Executive Officer to discharge wastewater to surface waters. The types of wastewater discharges regulated under this Permit include the following discharges:

- a. Construction dewatering wastes;
- b. Wastes associated with well installation, development, test pumping and purging;
- c. Aquifer testing wastes;
- d. Dewatering wastes from subterranean seepage, except for discharges from utility vaults;
- e. Discharges resulting from hydrostatic testing of vessels, pipelines, tanks, etc.;
- f. Discharges resulting from the maintenance of potable water supply pipelines, tanks, reservoirs, etc.;
- g. Discharges resulting from the disinfection of potable water supply pipelines, tanks, reservoirs, etc.;
- h. Discharges from potable water supply systems resulting from initial system startup, routine startup, sampling of influent flow, system failures, pressure releases, etc.;
- i. Discharges from fire hydrant testing or flushing;
- j. Air conditioning condensate;
- k. Swimming pool discharge;
- l. Discharges resulting from diverted stream flows;
- m. Decanted filter backwash wastewater and/or sludge dewatering filtrate water from water treatment facilities; and
- n. Other similar types of wastes as determined by the Regional Water Board Executive Officer, which pose a de minimus threat to water quality yet must be regulated under waste discharge requirements.

At the direction of the Engineer, the Contractor shall conduct monitoring, sampling and analysis, and report preparation for conformance with the Construction Permit, Municipal Permit, and De Minimus Permit. The Contractor will not be compensated for sampling and analysis work due to the Contractor's failure to properly implement, inspect, maintain, and repair BMPs in conformance with the approved SWPPP/MP and any amendments thereto, or for failing to store construction materials or wastes in watertight conditions.

Each proposal shall have listed therein the name and address of a local certified laboratory within 50 miles of the project site to whom the Contractor proposes to subcontract all laboratory sampling and analysis, monitoring and report preparation necessary to comply with the Construction General Permit, De Minimus and the Municipal Permit, in accordance with the Subletting and Subcontracting Fair Practices Act, commencing with Section 4100 of the Public Contract Code. The Contractor's attention is invited to other provisions of the Act related to the imposition of penalties for a failure to observe its provisions by using unauthorized subcontractors or by making unauthorized substitutions. The certified laboratory shall have experience with monitoring, sampling and analysis, and report preparation for the Construction General Permit and/or the De Minimus Permit and shall be certified by the State. A list of certified laboratories by the State can be found at:

<http://www.cdph.ca.gov/certlic/labs/Documents/ELAPLablist.xls>

#### **Notice of Termination**

Contractor shall perform all work specified within this specification and within the project SWPPP and shall remain responsible for Construction General Permit Compliance until such time the Notice of Termination (NOT) is filed and approved by the California Regional Water Quality Control Board. Within 30 days of completion of construction, the Contractor shall be responsible to collect, compile, and furnish to the County Engineer all necessary backup documentation required to submit for NOT. This documentation shall include at a minimum:

- a. Final Site Map
- b. Final Site Photos
- c. Documents demonstrating achievement of "final stabilization".(computational).
- d. Certification that all construction materials and wastes have been properly disposed.
- e. Certification that all construction equipment and temporary BMPs have been removed from the site.
- f. Documents indicating that all permanent BMPs (required by the MS4 Permit) have been constructed and are properly functioning. Documentation shall also indicate that a mechanism for long term maintenance of these BMPs is in place.
- g. Other documentation as necessary to demonstrate that no potential exists for discharge of construction related pollutants within stormwater.

County Engineer or NPDES Coordinator will upload documentation and file the NOT in SMARTS.

#### **Method of Payment:**

Payment for Water Pollution Control shall be on a lump sum basis and shall include full compensation for the work performed, including obtaining Permit coverage, developing, preparing, revising, obtaining approval of, and amending the SWPPP/MP, implementing, installing, constructing, operating, maintaining, and removing and disposing of temporary BMPs, performing the observations, inspections, sampling, analysis, reporting, and street sweeping, achieving NOT approval and as specified in the Caltrans Handbooks, Construction General Permit, De Minimus Permit, Municipal Permit and these Special Provisions, and as directed by the Engineer.

#### **Street Sweeping.**

The following special provision regarding "Street Sweeping" is being added to the contract document.

#### **GENERAL**

##### **Summary**

This work includes street sweeping.

The Contractor's SWPPP/MP shall describe and include the use of street sweeping as a Water Pollution Control practice for sediment control and tracking control. Street sweeping shall also conform to all applicable AQMD requirements.

#### **Submittals**

At least 5 working days before starting clearing and grubbing, earthwork, or other activities with the potential for tracking sediment or debris, submit:

- A. The number of street sweepers that will be used as described in the SWPPP/MP.
- B. Type of sweeper technology (or technologies).

#### **Quality Control and Assurance**

Retain the following records related to street sweeping and submit weekly to Engineer:

- A. Tracking Inspection Log
- B. Sweeping times and locations.
- C. Quantity of sweeping waste disposal.

### **CONSTRUCTION**

#### **Street Sweepers**

Sweepers must use one of these technologies:

- A. Mechanical sweeper followed by a vacuum-assisted sweeper.
- B. Vacuum-assisted dry (waterless) sweeper.
- C. Regenerative-air sweeper.

#### **Operation**

Street sweeping shall be conducted at:

- A. Paved roads at job site entrance and exit locations.
- B. Paved areas within the job site that flow to storm drains or water bodies.

Street sweeping shall be conducted, and sweeper(s) shall be available on site or within four hours at any given time, for the following:

- A. During clearing and grubbing activities.
- B. During earthwork activities.
- C. During trenching activities.
- D. During roadway structural section activities.
- E. When vehicles are entering and leaving the job site.
- F. After soil disturbing activities.
- G. After observing offsite tracking of material.

Contractor's Water Pollution Control Manager shall inspect adjacent paved areas at job site entrances and exits and paved roadways within the job site on a minimum daily basis, and more frequently when activities that require street sweeping are being performed. Contractor's Water Pollution Control Manager shall maintain a "Tracking Inspection Log." Street sweeping shall be conducted:

- A. Within 4 hours, if sediment or debris is observed on paved areas or paved roadways.

At least one sweeper, in good working order, must be available for the job at all times when sweeping work may be required.

Perform street sweeping to minimize dust. If dust generation is excessive or sediment pickup is ineffective, water may be used but shall be contained, collected (e.g. vacuum), and properly disposed.

Material collected during street sweeping must be removed and disposed of under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way" of the Standard Specifications.

**Method of Payment:**

Full compensation to conform with the requirements of this section shall be considered as included the contract lump sum price paid for Water Pollution Control including furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in street sweeping, including disposal of collected material, as shown on the plans, as specified in the Standard Specifications, these Special Provisions, and as directed by the Engineer. Therefore, no additional compensation will be allowed for street sweeping

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

**Replace section 13-3.04 with:**

For projects with 60 working days or less, the Department pays you for prepare stormwater pollution prevention plan as follows:

1. A total of 75 percent of the item total upon authorization of the SWPPP
2. A total of 100 percent of the item total upon Contract acceptance

For projects with more than 60 working days, the Department pays you for prepare stormwater pollution prevention plan as follows:

1. A total of 50 percent of the item total upon authorization of the SWPPP
2. A total of 90 percent of the item total over the life of the Contract
3. A total of 100 percent of the item total upon Contract acceptance

Payment for each rain event action plan is included in the payment for prepare storm water pollution prevention plan.

The County does not adjust the unit price for an increase or decrease in the rain event action plan quantity.

Payment for each storm water sampling and analysis day is included in the payment for prepare storm water pollution prevention plan.

The County does not adjust the unit price for an increase or decrease in the storm water sampling and analysis day quantity.

Payment for each storm water annual report is included in the payment for prepare storm water pollution prevention plan.

The County does not adjust the unit price for an increase or decrease in the storm water annual report quantity.

For each failure to submit a completed storm water annual report, the County withholds \$10,000. This withhold is in addition to other performance failure withholds.

**Replace section 13-5.04 with:**

Payment for conforming to the requirements of this section is included in the payment for water pollution control.

**Replace 1st paragraph of section 13-6.03C with:**

Provide temporary drainage inlet protection around drainage inlets as changing conditions require. Drainage inlet protection must be Type 3A or Type 3B as appropriate for conditions around the drainage inlet.

**Replace section 13-6.04 with:**

Payment for conforming to the requirements of this section is included in the payment for water pollution control.

**Replace section 13-7.04 with:**

Payment for conforming to the requirements of this section is included in the payment for water pollution control.

**Replace section 13-9.04 with:**

Payment for conforming to the requirements of this section is included in the payment for water pollution control.

**Replace section 13-10.04 with:**

Payment for conforming to the requirements of this section is included in the payment for water pollution control.

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## **14 ENVIRONMENTAL STEWARDSHIP**

**Replace the 7th paragraph of section 14-6.03A with:**

If migratory or nongame bird nests are discovered that may be adversely affected by construction activities or an injured or killed bird is found, immediately:

1. Stop all work within a 200-foot radius of the discovery
2. Notify the Engineer

**Replace the 1st paragraph of section 14-8.02 with:**

Do not operate construction equipment or run the equipment engines from 7:00 p.m. to 7:00 a.m. or on Sundays except you may operate equipment within the project limits during these hours to:

1. Service traffic control facilities
2. Service construction equipment

**Add to section 14-8.02:**

Provide one Type 1 sound level meter and 1 acoustic calibrator to be used by the Department until Contract acceptance. Provide training by a person trained in noise monitoring to 1 Department employee designated by the Engineer. The sound level meter must be calibrated and certified by the manufacturer or other independent acoustical laboratory before delivery to the Department. Provide annual recalibration by the manufacturer or other independent acoustical laboratory. The sound level meter must be capable of taking measurements using the A-weighting network and the slow response settings. The measurement microphone must be fitted with a windscreen. The Department returns the equipment to you at Contract acceptance. Work specified in this paragraph is paid for as noise monitoring.

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## 15 EXISTING FACILITIES

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 7 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 15-2.03A(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 Recycle coordinator at telephone number (951) 737-2310

For roadside signs and irrigation components, the Department salvage storage location is:

Riverside County Transportation Department  
Rudy Martinez Yard  
19355 Ontario Ave.  
Corona, CA 92881

**Add to section 15-2.04B:**

Automatic Gate Openers to be reused must be installed on reconstructed gate locations as designated by the Engineer. Reconstructed automatic gate openers must be in good working condition and comply with all current safety regulations at completion of project.

**Replace section 15-2.04F with:**

**15-2.04F Reconstruct Drainage Facility****15-2.04F(1) General**

This section includes specifications for reconstruction of drainage facilities with diversion of channel flow, removal of concrete, replacing concrete and reinforcement and restoring channel flow to preconstruction condition due to installation of large diameter cast-in-drilled hole concrete piling and temporary bridge behind the Arlington channel drainage facility.

Diversion of flow must comply with Riverside County Flood and Water Control District requirements.

Concrete removal must comply with section 15-3 Concrete Removal.

Earthwork must comply with section 19-3 Structure Excavation and Backfill. Temporary shoring must comply with section 48-3.

Concrete and concrete construction must comply with section 51 Concrete Structures.

Drill and bond dowels must comply with 51-1.03E(3) Drill and Bond Dowels.

Reinforcement and couplers must comply with section 52 Reinforcement.

#### **15-2.04F(2) Submittals**

##### **15-2.04F(2)(a) General**

For drainage facility reconstruction at installation of large diameter cast-in-drilled hole concrete piling, submit a work plan in a 3-ring binder that has labeled dividers for each type of plan. The work plan must include:

1. Flow diversion plan
2. Inspection plan
3. Cleaning plan
4. Inspection and evaluation report
5. Post reconstruction inspection report

For each portion of the work plan, obtain the Department's authorization before you perform work based on that portion.

At the pre-rehabilitation meeting, submit the work plan. Allow 7 days for the Department's review. If multiple binders are submitted simultaneously or a binder is submitted before the review of a previously submitted binder is complete, designate the sequence that the binders are to be reviewed. Allow review time specified plus 3 days for each additional binder.

Within 7 days of the inspection of the drainage facility at the CIDH pile location, submit an inspection and evaluation report. Allow 7 days for the Department's review. If multiple reports are submitted simultaneously or a report is submitted before the review of a previously submitted report is complete, designate the sequence that the reports are to be reviewed. Allow the review time specified plus 3 days for each additional report.

Within 7 days of the completion of all reconstruction work, submit a post-reconstruction inspection report as an action submittal. Allow 5 days for the Department's review. If multiple reports are submitted simultaneously or an additional report is submitted before the review of a previously submitted report is complete, designate the sequence that the reports are to be reviewed. Allow the specified review time plus 3 days for each additional re-inspection report. Obtain written approval of the re-inspection report.

To make a change to an authorized plan or report, submit it as specified for a new submittal. Note the changes.

Retain a copy of the drainage facility inspection photos and records until the post-reconstruction inspection report is authorized.

##### **15-2.04F(2)(b) Flow Diversion Plan**

1. Controlling and diverting the existing stream or groundwater flow. The bypass system must have adequate capacity and size. Include:
  - 1.1. Your calculations for the existing flows and the capacity of the bypass system
  - 1.2. Your schedule for the required use of the bypass system

##### **15-2.04F(2)(c) Inspection Plan**

The inspection plan must include:

1. Sample of the printed photo log. The printed log must include digital photographs of facility as is prior to any construction activities including, construction and expansion joints, existing concrete condition of channel walls and invert.

##### **15-2.04F(2)(d) Cleaning Plan**

1. Cleaning
2. Controlling sediments dislodged during the cleaning

#### **15-2.04F(2)(e) Inspection and evaluation report**

Report inspection findings. Photography must comply with section 15-2.04F(2)(c).

The inspection and evaluation report must include:

1. 1 set of the digital photographs.
2. Documentation of the condition of the drainage facility, including:
  - 2.1. Concrete cracking.
  - 2.2. Condition of construction and expansion joints.
  - 2.3. Spalled or reduced cross-sectional areas.
  - 2.4. Each lateral pipe opening, including:
    - 2.4.1. Drainage system identification.
    - 2.4.3. Exact position and orientation within facility wall.
    - 2.4.4. Size or dimensions of opening.
    - 2.4.5. Connecting joint.
    - 2.4.6. Flow direction.

If the Engineer determines that the inspection documentation is not adequate, your inspection and evaluation report will be rejected and you must re-inspect and resubmit your report. Inadequate documentation may include poor camera head position, poor camera focus, poor illumination, and incomplete records and logs.

#### **15-2.04F(2)(f) Post-reconstruction inspection report**

After the completion of the post-reconstruction inspection, submit a post-reconstruction inspection report. The written logs, and photographs must comply with section 15-2.04F(2)(e).

The report must document the reconstruction and any subsequent deficiencies, including:

1. Defects
2. Discoloration
3. Irregularities
4. Surface discontinuities
5. Anomalies
6. Constrictions
7. Deformities

If there are deficiencies and human entry is possible, the report must include more detailed documentation of human-entry inspection, concentrating on the areas with deficiencies.

If there are deficiencies, the inspection report must include recommendations to correct the deficiencies.

If the Engineer determines that the inspection report is not adequate, your report will be rejected and you must re-inspect and resubmit your report. Inadequate documentation may include poor camera head position, lack of focus, poor illumination, rapid rate of progression, and incomplete records and logs. No payment is made for re-cleaning and re-inspecting.

If there are deficiencies, do not start corrections until you have obtained authorization of the report.

#### **15-2.04F(3) Materials**

Not used.

#### **15-2.04F(4) Construction**

Comply with the following work sequence and notify the Engineer before you start each of the following steps:

1. Clean and prepare
2. Inspect and evaluate
3. Install temporary shoring and divert flow
4. Remove concrete
5. Construct CIDH Piling
6. Reconstruct drainage facility, complete.

7. Perform post-reconstruction inspection

**15-2.04F(4) Payment**

Temporary shoring and CIDH Piling are paid elsewhere.

**Replace section 15-2.05C with:**

**15-2.05C Abandon Culverts and Pipelines**

**15-2.05C(1) General**

Abandon culverts or pipelines by removing portions of the culverts or pipelines, filling the inside, and backfilling the depressions and trenches to grade. As an alternative to abandoning a culvert or pipeline, you may remove the culvert or pipeline, dispose of it, and backfill.

Notify the Engineer before abandoning a culvert or pipeline.

**15-2.05C(2) Materials**

Openings into existing structures that are to remain in place must be plugged with minor concrete under section 90.

**15-2.05C(3) Construction**

Wherever culverts or pipelines intersect side slopes, remove them to a depth of at least 3 feet. Measure the depth normal to the plane of the finished side slope. Abandon the remaining portion of the culvert or pipeline.

Culverts or pipelines that are 12 inches or more in diameter must be completely filled by authorized methods. Backfill with sand that is clean, free draining, and free from roots and other deleterious substances. As an alternative to sand, you may backfill with one of the following:

1. Controlled low-strength material under section 19-3.02F
2. Slurry cement backfill under section 19-3.02D

Ends of culverts and pipelines must be securely closed by a 6-inch-thick, tight-fitting plug or wall of commercial-quality concrete.

**15-2.05C(4) Payment**

Payment for backfilling inside and outside the culvert or pipeline is included in the payment for abandon culvert or abandon pipeline.

**Replace section 15-2.05D with:**

**15-2.05D Abandon Inlets**

Abandon pipe inlets and concrete drainage inlets as shown.

The top portion of the inlets must be removed to a depth of 2 feet below finished grade.

Inlet caps must comply with section 51.

**Add to section 15-2.09C:**

Relocated sign structures must be installed at new locations as designated by the Engineer. Protect stored signs from damage until installation at new location can occur.

**Delete the 6th paragraph of section 15-3.01.**

**Replace the 1st and 2nd paragraphs in section 15-6.01C(1) with:**

Comply with the following work sequence for CIDH Pile construction at Bents 5 & 6 next to Arlington Channel and notify the Engineer before you start each of the following steps:

1. Control and divert Arlington Channel storm water flow
2. Install Temporary Shoring behind channel wall.
3. Remove portions of channel wall
4. Construct CIDH Piles

5. Reconstruct channel wall
6. Remove temporary shoring
7. Repair culvert as needed
8. Restore flow
9. Perform construction inspection

Before starting culvert work, control and divert Arlington Channel storm water flow. Maintain control and diversion until the post construction inspection report is authorized.

Keep the culvert clean and free of debris until the construction report is authorized.

AA

## DIVISION III GRADING

### 19 EARTHWORK

#### Add to section 19-3.01A(1):

Structure backfill includes constructing the geocomposite drain. Geocomposite drain must comply with section 68-7.

#### Replace "Reserved" in section 19-3.03A with:

Where shown, remove material below the bottom of MSE and cast-in-place concrete retaining wall footings. Replace with Class 2 aggregate base and place and compact as specified for structure backfill in section 19-3.03E. Relative compaction must be at least 95 percent.

#### Add to section 19-3.04:

Class 2 aggregate base placed below footings is paid for as structure backfill for cast-in-place retaining walls.

Class 2 aggregate base placed below footings for MSE walls is included in the cost per square foot of MSE wall.

Pervious backfill material placed within the limits of payment for bridges is paid for as structure backfill (bridge). Pervious backfill material placed within the limits of payment for retaining walls is paid for as structure backfill (retaining wall).

Earthwork (structural excavation and structure backfill) performed in conjunction of removing concrete and reconstruction of the Arlington Channel and removal of the temporary bridge at that location is included in the various items of work involved and no separate payment will be made.

Only the earthwork involved in the construction of the temporary bridge will be paid separately as structural excavation and structure backfill.

#### Replace section 19-6.03B with:

##### 19-6.03B Subsidence

You may compact the ground surface on which an embankment is to be constructed before placing embankment material.

If the compaction results in an average subsidence exceeding 0.25 foot, the Engineer measures the ground surface after compaction. Allow time for the Engineer to measure the area before placing embankment material.

A quantity of 410 cubic yards of embankment will be added to the computed imported borrow quantity for the anticipated effect of subsidence.

If you do not agree with this specified quantity, you may submit a plan for measuring subsidence. The plan must include complete details of the measuring devices and their installation.

If the your plan for measuring subsidence is authorized, install and maintain the subsidence-measuring devices.

The Engineer takes readings as needed to determine the progress of subsidence. Provide assistance as needed.

If the Engineer finds that a device has been damaged, that device will not be used for determining subsidence in the area the device represents. The subsidence for that area is considered as zero regardless of the subsidence measured at other areas.

Subsidence is considered as zero at:

1. Intersection of the side slope and end slope at structures with the ground line as established by the original cross-sections
2. Points on the cross-sections 50 feet beyond the start and end of the area with subsidence-measuring devices, unless the Engineer agrees otherwise

The additional quantity of material for embankment work due to subsidence is determined by the average-end-area method from the original measurements and the final measurements, including zero subsidence at specified areas.

After final measurements are made, remove detachable elements of the subsidence-measuring devices.

**Add to section 19-6.03D:**

Settlement periods are required for bridge approach embankments as shown in the following table:

Bridge name or number	Abutment number	Bent number	Anticipated Settlement (inch)	Settlement period (days)
<u>Magnolia Ave</u> <u>GS</u>	<u>11. Left</u>		<u>± 2"</u>	<u>60</u>

Settlement periods are required for roadway embankments at the earth retaining structures as shown in the following table:

Earth retaining structure number	Anticipated Settlement (inch) *	Settlement period (days)
<u>Retaining Wall</u> <u>No's 1 &amp; 2</u>	<u>± 3" at maximum</u> <u>height</u>	<u>60</u>
<u>Retaining Wall No.</u> <u>3</u>	<u>± 3" at maximum</u> <u>height</u>	<u>60</u>
<u>Retaining Wall No.</u> <u>4</u>	<u>± 2" at maximum</u> <u>height</u>	<u>60</u>
<u>Temporary</u> <u>Retaining Wall</u>	<u>± 3" at maximum</u> <u>height</u>	<u>60</u>

\* settlement will vary from value at maximum height of embankment to zero at end of embankment or retaining structures.

**Replace the 2nd and 3rd paragraph with:**

Imported borrow is measured based on planned or authorized cross section for embankments as shown and the measured ground surface.

Quantities of roadway excavation, structure excavation, and ditch excavation used in constructing the embankment will be adjusted by multiplying by a grading factor. This grading factor is determined by the

The quantity of imported borrow is the quantity remaining after deducting the adjusted quantities from excavations from the total embankment quantity and adding the quantity for subsidence as specified in section 19-6.03B.

## 39 HOT MIX ASPHALT

Add to section 39-1.01:

Produce and place HMA Type A as specified below:

### HOT MIX ASPHALT:

This work includes producing and placing hot mix asphalt (HMA) **Type A**. Comply with the specifications for HMA under Section 39, "Hot Mix Asphalt" of the Standard Specifications and these Special Provisions.

The type of hot mix asphalt will be shown on the plans or specified in the Special Provisions.

### **Asphalts**

Asphalt shall conform to the provisions in this Section, "Asphalts." Section 92, "Asphalts" of the Standard Specifications shall not apply.

Asphalt shall consist of refined petroleum or a mixture of refined liquid asphalt and refined solid asphalt, prepared from crude petroleum. Asphalt shall be:

1. Free from residues caused by the artificial distillation of coal, coal tar, or paraffin;
2. Free from water;
3. Homogeneous.

The Contractor shall furnish asphalt in conformance with the State of California Department of Transportation's "Certification Program for Suppliers of Asphalt". The Department maintains the program requirements, procedures, and a list of approved suppliers at <http://www.dot.ca.gov/hq/esc/Translab/ofpm/fpmcoc.htm> or the State of California Department of Transportation's METS web site.

The Contractor shall ensure the safe transportation, storage, use, and disposal of asphalt.

The Contractor shall prevent the formation of carbonized particles caused by overheating asphalt during manufacturing or construction.

The grade for asphalt binder shall be **PG 64-10**.



## Grades

Performance graded (PG) asphalt binder [and PG polymer modified asphalt binder] shall conform to the following table[s]:

Performance Graded Asphalt Binder				
Property	AASHTO Test Method	Specification Grade		
		PG 64-10	PG 64-16	PG 70-10
Original Binder				
Flash Point, Minimum °C	T48	230	230	230
Solubility, Minimum % <sup>b</sup>	T44	99	99	99
Viscosity at 135 °C, Maximum, Pa·s	T316	3.0	3.0	3.0
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G'/sin(delta), kPa	T315	64 1.00	64 1.00	70 1.00
RTFO Test <sup>e</sup> , Mass Loss, Maximum, %	T240	1.00	1.00	1.00
RTFO Test Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G'/sin(delta), kPa	T315	64 2.20	64 2.20	70 2.20
Ductility at 25 °C Minimum, cm	T51	75	75	75
PAV <sup>f</sup> Aging, Test Temperature, °C	R28	100	100	110
RTFO Test and PAV Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum G'/sin(delta), kPa	T315	31 <sup>d</sup> 5000	28 <sup>d</sup> 5000	34 <sup>d</sup> 5000
Creep Stiffness, Test Temperature, °C Maximum S-value, Mpa Minimum M-value	T313	0 300 0.300	-6 300 0.300	0 300 0.300

### Notes:

- Not used.
- The Engineer will waive this specification if the supplier is a Quality Supplier as defined by Department's "Certification Program for Suppliers of Asphalt".
- The Engineer will waive this specification if the supplier certifies the asphalt binder can be adequately pumped and mixed at temperatures meeting applicable safety standards.
- Test the sample at 3 °C higher if it fails at the specified test temperature. G' sin(delta) shall remain 5000 kPa maximum.
- "RTFO Test" means the asphaltic residue obtained using the Rolling Thin Film Oven Test, AASHTO Test Method T240 or ASTM Designation: D2827.
- "PAV" means Pressurized Aging Vessel.

**[Performance Graded Polymer Modified Asphalt Binder<sup>a</sup>**

Property	AASHTO Test Method	Specification Grade		
		PG 58-34 PM	PG 64-28 PM	PG 76-22 PM
Original Binder				
Flash Point, Minimum °C	T 48	230	230	230
Solubility, Minimum % <sup>b</sup>	T 44 <sup>c</sup>	98.5	98.5	98.5
Viscosity at 135°C, <sup>d</sup> Maximum, Pa·s	T 316	3.0	3.0	3.0
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 1.00	64 1.00	76 1.00
RTFO Test , Mass Loss, Maximum, %	T 240	1.00	1.00	1.00
RTFO Test Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 2.20	64 2.20	76 2.20
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum (delta), %	T 315	Note e 80	Note e 80	Note e 80
Elastic Recovery, Test Temp., °C Minimum recovery, %	T 301	25 75	25 75	25 65
PAV <sup>g</sup> Aging, Temperature, °C	R 28	100	100	110
RTFO Test and PAV Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum G*/sin(delta), kPa	T 315	16 5000	22 5000	31 5000
Creep Stiffness, Test Temperature, °C Maximum S-value, MPa Minimum M-value	T 313	-24 300 0.300	-18 300 0.300	-12 300 0.300

**Notes:**

- Do not modify PG Polymer Modifier using acid modification.
- The Engineer waives this specification if the supplier is a Quality Supplier as defined by the Department's "Certification Program for Suppliers of Asphalt".
- The Department allows ASTM D5546 instead of AASHTO T44.
- The Engineer waives this specification if the supplier certifies the asphalt binder can be adequately pumped and mixed at temperatures meeting applicable safety standards.
- 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 Engineer also accepts direct measurement of (delta) at the temperature when G\*/sin(delta) is 2.2 kPa.
- Test without a force ductility clamp may be performed.
- "PAV" means Pressurized Aging Vessel.]

## Aggregate

Aggregates shall be clean and free from decomposed materials, organic material, and other deleterious substances. Coarse aggregate is material retained on the No. 4 sieve and fine aggregate is material passing the No. 4 sieve. Supplemental fine aggregate is added fine material passing the No. 30 sieve including, but not limited to, cement and stored fines from dust collectors.

The aggregate grading of the different types of hot mix asphalt shall conform to the following, unless otherwise specified on the plans:

HMA Type	Grading
A	[3/4-inch and/or 1/2-inch]

The combined aggregate and quality characteristics for the [¾-inch and ½-inch] aggregate[s] for use in HMA Type A, prior to addition of asphalt binder, shall conform to the requirements of Section 39-1.02E, "Aggregate" of the Standard Specifications.

The aggregate shall conform to the following quality requirements prior to the addition of asphalt binder.

Aggregate Quality		
Quality Characteristic	Test Method	Requirement
Percent of crushed particles <sup>a</sup>	CT 205	
Coarse aggregate (% min.)		95
Two fractured faces		
Fine aggregate (Passing No. 4 sieve and retained on No. 8 sieve.) (% min.)		90
One fractured face		
Los Angeles Rattler (% Max.) <sup>a</sup>	CT 211	
Loss at 100 rev.		12
Loss at 500 rev.		40
Sand equivalent <sup>a, b</sup> (min.)	CT 217	47
Fine aggregate angularity (% min.) <sup>a</sup>	CT 234	45
Flat and elongated particles (% max. by weight @ 5:1.) <sup>a</sup>	CT 235	10

Note:

<sup>a</sup> Combine aggregate in the JMF proportions.

<sup>b</sup> Reported value must be the average of 3 tests from a single sample.]

## Lift Thickness

Hot mix asphalt shall be spread and compacted in the number of layers of the thicknesses indicated in the following table:

Total Thickness Shown on Plans <sup>a</sup>	Minimum No. of Layers	Top Layer Thickness (ft)		Next Lower Layer Thickness (ft)		All Other Lower Layer Thickness (ft)	
		Min.	Max.	Min.	Max.	Min.	Max.
0.24-foot or less	1	-	-	-	-	-	-
0.25-foot	2 <sup>b</sup>	0.12	0.13	0.12	0.13	-	-
0.26 - 0.46 foot	2	0.12	0.21	0.14	0.25	-	-
0.47-foot or more	3 or more	0.15	0.21	0.15	0.25	0.17	0.25

<sup>a</sup> When pavement reinforcing mat is shown to be placed between layers of asphalt concrete, the thickness of asphalt concrete above the pavement reinforcing mat shall be considered to be the "Total Thickness Shown on Plans."

<sup>b</sup> One layer of 0.25 foot thick may be placed as approved by the Engineer. When the Traffic Index specified is 5.5 or below, two layers shall be placed.

### Reclaimed Asphalt Pavement

The use of reclaimed asphalt pavement (RAP) in HMA production shall comply to Section 39-1.02F, "Reclaimed Asphalt Pavement" of the Standard Specifications, and this Section. Use of RAP in HMA Type C will not be allowed unless otherwise approved by the Engineer.

### HMA Mix Design

The HMA mix design shall conform to Section 39-1.03B, "Hot Mix Asphalt Mix Design" of the Standard Specifications and the provisions of this Section, "HMA Mix Design." The mix design process consists of performing California Test 367 and laboratory procedures in combinations of aggregate gradations and asphalt binder contents to determine the optimum binder content (OBC) and HMA mixture qualities. The results become the proposed job mix formula (JMF).

The Contractor shall submit records of aggregate quality and mix design data. Test data shall be within one year from the last test performed.

The Contractor shall submit the HMA mix design using the "COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT, CONTRACTOR JOB MIX FORMULA PROPOSAL" form to present the JMF. Formats other than the referenced form will not be accepted.

The final HMA mix design shall be signed and stamped by a Civil Engineer registered in the State of California.

The HMA mix design for Type A shall comply with the following requirements:

### HMA Type A Mix Design Requirements

Quality characteristic	Test method	HMA type
		A
Air void content (%)	California Test 367	4.0
Voids in mineral aggregate (% min.) 1/2" grading 3/4" grading	California Test 367	14.0 13.0
Voids filled with asphalt (%) 1/2" grading 3/4" grading	California Test 367	65.0–75.0 65.0–75.0
Dust proportion 1/2" and 3/4" gradings	California Test 367	0.6–1.3
Stabilometer value (min.) <sup>b</sup> 1/2" and 3/4" gradings	California Test 366	37

<sup>a</sup> Not used.

<sup>b</sup> California Test 304, Part 2.13.

<sup>c</sup> Not used.

### Sampling

The Contractor or the Contractor's representative shall provide a sampling device in the asphalt feed line connecting the plant storage tanks to the asphalt weighing system or spray bar. The sampling device shall be accessible between 24 and 30 inches above the platform. The Contractor shall provide a receptacle for flushing the sampling device.

The sampling device shall include a valve:

1. With a diameter between 1/2 and 3/4 inches;
2. Manufactured in a manner that a one-quart sample may be taken slowly at any time during plant operations;
3. Maintained in good condition.

The Contractor shall replace failed valves.

In the presence of the Engineer, the Contractor shall take 2 one-quart samples per operating day. The Contractor shall provide round friction top containers with one-quart capacity for storing samples.

### Prime Coat

Liquid asphalt for prime coat shall conform to the provisions in Section 93, "Liquid Asphalts" of the Standard Specifications and shall be **Grade SC-70**. Prime coat shall be applied only to those areas designated by the Engineer. The application rate shall be 0.20 gallon per square yard of surface covered. The exact rate and number of applications will be determined by the Engineer.

### Tack Coat

Asphaltic emulsion for paint binder (tack coat) shall conform to the provisions in Section 94, "Asphaltic Emulsion" of the Standard Specifications for the rapid-setting or slow-setting type and grade approved by the Engineer. **Grade SS1h** shall be used if not otherwise specified. Tack coat shall be applied to all vertical surfaces of existing pavement, curbs, gutters, and construction joints in the surfacing against which additional material is to be placed, to a pavement to be surfaced, and to other surfaces designated in the Special Provisions. The application rate shall

be from 0.02 to 0.10 gallon per square yard of surface covered. The exact rate and number of applications will be determined by the Engineer.

#### **Control of Materials**

All proposed materials for use in HMA shall be furnished in conformance with the provisions of Section 6, "Control of Materials" of the Standard Specifications and this Section. All materials to be used in producing the hot mix asphalt shall be supplied from a single source for each material unless approved by the Engineer. Materials to be used in HMA will be subject to inspection and tests by the Engineer. The Contractor shall furnish without charge sample of materials as may be required.

The Contractor shall furnish the Engineer a list of the Contractor's sources of materials and the locations at which those materials will be available for inspection. The Contractor shall assure that the Engineer has free access or entry at all times to the material or production of the material to be inspected, sampled, and tested. It is understood that the inspections and tests made at any point shall, in no way, be considered as a guaranty of acceptance of the material nor continued acceptance of the material presumed to be similar to that upon which inspections and tests have been made, and that inspection and testing performed by the Engineer shall not relieve the Contractor of responsibility for quality control.

All materials which the Engineer has determined defective or do not conform to the requirements of the plans and specifications will be rejected whether in place or not. Under the provisions of this Section, the Engineer will have authority to cause the removal and replacement of rejected material and to deduct the cost thereof from any moneys due or to become due the Contractor.

#### **Utility Covers**

Except as otherwise provided herein, the Contractor shall adjust to finish grade any valve covers encountered within the project limits, as required, for those utility valves that are provided with slip cans and are adjustable without the replacement of part or the removal of concrete collars. In cases where the owning utility company insists upon upgrades in the standards, or when additional parts or the removal of concrete collars are required for the adjustment, said adjustment will be the responsibility of the owning utility company.

The Contractor shall lower manholes and valves when and as necessary for the protection of the traveling public during construction, and shall coordinate all work on said facilities with the owning utility companies. Final adjustment to grade will be the responsibility of the owning utility company, except as provided herein.

#### **Placing HMA**

Asphalt paving equipment shall be in conformance with the provisions of Section 39-1.10, "Spreading and Compacting Equipment" of the Standard Specifications. Spreading and Compacting shall be in accordance with this Section and the provisions in Section 39-1.11, "Transporting, Spreading, and Compacting" of the Standard Specifications, except QC/QA construction process and rubberized HMA do not apply.

When placing asphalt concrete to the lines and grades established by the Engineer, the automatic controls shall control the longitudinal grade and transverse slope of the screed. Grade and slope references shall be furnished, installed, and maintained by the Contractor. Should the Contractor elect to use a ski device, the minimum length of the ski device shall be 30 feet. The ski device shall be a rigid one piece unit and the entire length shall be utilized in activating the sensor.

When placing the initial mat of asphalt concrete on existing pavement, the end of the screed nearest the centerline shall be controlled by a sensor activated by a ski device not less than 30 feet. The end of the screed farthest from centerline shall be controlled by an automatic transverse slope device set to reproduce the cross slope designated by the Engineer, by a sensor activated by a similar ski device or as directed by the Engineer.

When paving contiguously with previously placed mats, the end of the screed adjacent to the previously placed mat shall be controlled by a sensor that responds to the grade of the previously

placed mat and will reproduce the grade in the new mat within a 0.12 inch tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same way it was controlled when placing the initial mat.

Should the methods and equipment furnished by the Contractor fail to produce a layer of asphalt concrete conforming to the provisions, including straightedge tolerance, of Section 39-1.11, "Transporting, Spreading, and Compacting" of the Standard Specifications or elsewhere in these Special Provisions, the paving operations shall be discontinued and the Contractor shall modify the equipment or methods, or furnish substitute equipment.

Should the automatic screed controls fail to operate properly during a day's work, the Contractor may manually control the spreading equipment for the remainder of that day. However, the equipment shall be corrected or replaced with alternative automatically controlled equipment conforming to the provisions in this section before starting another day's work.

### **Construction Process of HMA**

The HMA construction process shall comply with the provisions of Section 39 of the Standard Specification, the provisions of these Special Provisions, and shall include one or more of the following:

1. Standard
2. Method

#### **Standard**

When the total HMA is more than 3,000 tons, the Standard construction process shall be followed as specified in Section 39-2, "Standard Construction Process" of the Standard Specification.

When the total paved HMA thickness is at least 0.15 foot and the individual layer is more than 0.15 foot, the Contractor shall determine the in-place density and relative compaction of HMA pavement in accordance with the procedures of California Test 375. The Contractor shall use California Test 308, Method A, in determining in-place density of each density core instead of using the nuclear gauge in Part 4, "Determining In-Place Density by the Nuclear Density Device." The Contractor shall use California Test 309 to determine the maximum theoretical density instead of calculating test maximum density in Part 5, "Determining Test Maximum Density" and shall be at the frequency specified for Test Maximum Density under California Test 375, Part 5D. Relative compaction is required for HMA Type A [and Type C] and shall be reported at various pave thicknesses as listed in the following table:

**HMA Relative Compaction Requirements**

HMA Type	Minimum Pave Thickness (ft)	Relative Compaction (%)
A (1/2-inch)	0.15	91-97
A (3/4-inch)	0.15	91-97
C (3/4-inch)	0.15	91-97
C (1-inch)	0.25	91-97

The Contractor shall perform sampling and testing at the specified frequency for the quality characteristics shown in the following table:

Quality characteristic	Test method	Minimum sampling and testing frequency	HMA type	
			A	C
Aggregate gradation <sup>a</sup>	California Test 202	1 per 750 tons and any remaining part	JMF $\pm$ Tolerance <sup>b</sup>	JMF $\pm$ Tolerance <sup>b</sup>
Sand equivalent (min) <sup>c</sup>	California Test 217		47	47
Asphalt binder content (%)	California Test 379 or 382		JMF $\pm$ 0.45	JMF $\pm$ 0.45
HMA moisture content (% max)	California Test 226 or 370	1 per 1,500 tons but not less than 1 per paving day	1.0	1.0
Percent of maximum theoretical density (%) <sup>d,e</sup>	QC plan	1 per day's production (min.)	91–97	91–97
Stabilometer value (min) <sup>e,f</sup> No. 4 and 3/8" gradings 1/2" 3/4" 1" gradings	California Test 366	One per 1,500 tons or 2 per 5 business days, whichever is greater	30 37	30 37
Air void content (%) <sup>g</sup>	California Test 367		4 $\pm$ 2	5 $\pm$ 2
Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants <sup>h</sup>	California Test 226 or 370	2 per day during production	--	--
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	California Test 205	As designated in the QC plan. At least once per project.	90 75 70	90 95 90
Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev.	California Test 211		12 45	12 40
Flat and elongated particles (% max by weight @ 5:1)	California Test 235		Report only	10
Fine aggregate angularity (% min)	California Test 234	As designated in the QC plan. At least once per project.	45	45
Voids filled with asphalt (%) <sup>i</sup> 1/2" grading 3/4" grading 1" grading	California Test 367		65.0–75.0 65.0–75.0	60.0–70.0



Voids in mineral aggregate (% min) <sup>i</sup> 1/2" grading 3/4" grading 1" grading	California Test 367		14.0 13.0	13.0
Dust proportion <sup>l</sup> 1/2" and 3/4" gradings 1" grading	California Test 367		0.6–1.3	0.6–1.3
Smoothness	Section 39-1.12	--	12-foot straight-edge, must grind, and P <sub>10</sub>	12-foot straight-edge, must grind, and P <sub>10</sub>

<sup>a</sup> Determine combined aggregate gradation containing RAP under California Test 367.

<sup>b</sup> The tolerances must comply with the allowable tolerances in section 39-1.02E.

<sup>c</sup> Report the average of 3 tests from a single split sample.

<sup>d</sup> Required for HMA Type A and Type C if the specified paved thickness is at least 0.15 foot.

<sup>e</sup> Determine maximum theoretical density (California Test 309) at the frequency specified for Test Maximum Density under California Test 375, Part 5.D.

<sup>f</sup> California Test 304, Part 2.13.

<sup>g</sup> Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

<sup>h</sup> For adjusting the plant controller at the HMA plant.

<sup>i</sup> Report only if the adjustment for the asphalt binder content TV is less than or equal to  $\pm 0.3$  percent from OBC value.

<sup>j</sup> Not Used.

When the total paved HMA thickness is at least 0.15 foot and the individual layer is less than or equal to 0.15 foot, the Contractor shall determine the percent of maximum theoretical density from density cores taken from the final layer measured at the full depth of the total paved HMA thickness.

#### Method

When the total HMA is less than 3,000 tons and the total paved HMA thickness is less than 0.15 foot, the Method construction process shall be followed as specified in Section 39-3, "Method Construction Process" of the Standard Specification.

#### **HMA Acceptance and Payment Factor**

Acceptance of placed HMA shall be based on a single defined lot of HMA. A lot is defined as having 1,000 tons of paved HMA, except if a quantity of HMA paved at day's end is greater than 500 tons, this quantity of paved HMA shall be considered a lot. If a quantity of HMA paved at day's end is less than 500 tons, this quantity of HMA shall be included in the previous lot's test result for payment evaluation.

For percent of maximum theoretical density, the Engineer shall determine a deduction for each lot's test result outside the specifications using the following reduced payment factors:

**Reduced Payment Factors for Percent of Maximum Theoretical Density**

HMA Type A percent of maximum theoretical density	Reduced payment factor	HMA Type A 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

### Density Cores

The Contractor shall take and test density cores to determine the percent of maximum theoretical density of the paved HMA. For Standard construction process projects, 4- or 6-inch diameter density cores shall be taken from each 500 tons of HMA production.

The Contractor shall determine the percent of maximum theoretical density from the average density of 3 density cores taken from every 500 tons of production or part thereof divided by the maximum theoretical density. The location of the density cores shall be randomly selected by the Engineer and shall be performed in the Engineer's presence. Density holes shall be backfilled and compacted with material approved by the Engineer. Density cores shall be marked with the density core's location and layer number and shall be placed in a protective container. If a density core is damaged, it shall be replaced and re-cored within 1 foot longitudinally from the original density core.

### Straightedge

The straightedge for smoothness determination on the top layer of HMA pavement shall conform to the tolerance specified in Section 39-1.12B, "Straightedge" of the Standard Specifications.

### Profilograph

In addition to the straightedge provisions in Section 39-1.12B, "Straightedge" of the Standard Specifications, HMA concrete pavement shall conform to the surface tolerances specified in this Section, "Profilograph."

When directed by the Engineer, the uppermost layer of asphalt concrete surfacing shall be profiled in the presence of the Engineer using a California Profilograph or equivalent in conformance with California Test 526, Section 39-1.12C, "Profilograph" of the Standard Specifications, and as specified in these Special Provisions.

The California Profilograph or equivalent will not be required for the following areas of the pavement surface but shall conform to the straightedge requirements in Section 39-1.12B, "Straightedge" of the Standard Specifications:

1. Pavement with a total thickness less than 0.24 foot;
2. Pavement on horizontal curves with a centerline curve radius of less than 1,000 feet and the pavement within the superelevation transition on those curves;
3. Pavement placed in a single lift when required by the Special Provisions;
4. Pavement with extensive grade or cross slope correction which does not receive advance leveling operations in conformance with the provisions in Section 39-6.02, "Spreading" of the Standard Specifications;
5. Pavement for ramps and connectors with steep grades and high rates of superelevation, as determined by the Engineer;
6. Shoulders and miscellaneous areas.

The Contractor shall conform to California Test 526, except a zero (null) blanking band shall be used for determining the Profile Index. Prior to beginning profiles, the profilograph shall be calibrated in the presence of the Engineer. Two profiles shall be obtained within each traffic lane, 3 feet from and parallel with the edges of the lane.

Pavements profiled shall conform to the following Profile Index requirements:

1. Pavement on tangent alignment and pavement on horizontal curves having a centerline curve radius of 2,000 feet or more shall have a Profile Index of 0.16 foot or less for each 330 feet section profiled;
2. Pavement on horizontal curves having a centerline curve radius of 1,000 feet or more but less than 2,000 feet, including the pavement within the superelevation transition of these curves, shall have a Profile Index of 0.32 foot or less for each 330 feet section profile;
3. Pavement within any 330 feet section, containing high point areas with deviations in excess of 0.025 foot in a length of 25 feet or less, when tested in conformance with the requirements in California Test 526, shall be corrected by the Contractor regardless of the Profile Index.

The Contractor shall complete initial runs of the profilograph prior to opening the pavement to public traffic. If initial profiles cannot be made prior to opening the pavement to public traffic, the initial runs of the profilograph shall be made the next day that traffic control is permitted for the area to be profiled.

Areas of the top surface of the uppermost layer of asphalt concrete pavement that do not meet the specified surface tolerances shall be brought within tolerance by abrasive grinding.

Abrasive grinding shall be performed to reduce individual deviations in excess of 0.025 foot, and to reduce the Profile Index of the pavement to be within the specified tolerance. Areas which have been subjected to abrasive grinding shall receive a seal coat. Deviations in excess of 0.025 foot which cannot be brought into specified tolerance by abrasive grinding shall be corrected by either (1) removal and replacement or (2) placing an overlay of asphalt concrete. The corrective method

for each area shall be selected by the Contractor and shall be approved by the Engineer prior to beginning the corrective work. Replacement or overlay pavement not meeting the specified tolerances shall be corrected by the methods specified above. Corrective work shall be at the Contractor's expense. The Contractor shall run profilograms on the areas that have received abrasive grinding or corrective work until the final profilograms indicate the Profile Index of the area is within the specified tolerance.

When abrasive grinding is used to bring the top surface of the uppermost layer of asphalt concrete surfacing within the specified surface tolerances, additional abrasive grinding shall be performed as necessary to extend the area ground in each lateral direction so that the lateral limits of grinding are at a constant offset from, and parallel with, the nearest lane line or pavement edge, and in each longitudinal direction so that the grinding begins and ends at lines normal to the pavement centerline, within a ground area. Ground areas shall be neat rectangular areas of uniform surface appearance.

The original of the final profilograms that indicate the pavement surface is within the Profile Index specified shall become the property of the County and shall be delivered to the Engineer prior to acceptance of the contract.

#### **Method of Payment**

The contract bid price paid per ton for Hot Mix Asphalt (HMA) for the type shown in bid proposal shall include full compensation for furnishing all labor, tools, materials, equipment, and incidentals, and for doing all the work involved including the sampling and testing of HMA quality characteristics, sampling and testing of density cores, and furnishing and applying asphaltic emulsion (paint binder/tack coat).

At road connections and at limits of asphalt paving, existing pavement shall be header cut as shown on the plans or as directed by the Engineer. Full compensation for furnishing all labor, tools and doing all the work necessary including grinding, and sawcutting shall be considered as included in the contract prices paid per ton for the various asphalt concrete items and no additional compensation will be allowed therefor.

Full compensation for furnishing and applying asphaltic emulsion (paint binder/tack coat) shall be considered as included in the contract price paid for Asphalt Concrete.]

The quantity of Hot Mix Asphalt for driveway, driveway tie-ins, asphalt concrete (miscellaneous area), AC Dike and Overside Drain will be paid for at a unit price per ton as a combined item, including mineral aggregate and asphalt binder in place on the roadbed.

[The placing of Hot Mix Asphalt (miscellaneous area), AC Dike and overside Drain shall be paid for at the separate contract unit shown in the bid proposal in addition to the price paid for the materials other than Hot Mix Asphalt involved.

The adjustment of frames, valve covers, grates, manholes, including initial lowering of valves and manholes when required, shall be considered as included in the contract price paid for hot mix asphalt.

#### **Add to section 39-1.02C:**

Asphalt binder used in HMA Type A must be PG 64-10.

#### **Add to section 39-1.02E:**

Aggregate used in HMA Type A must comply with the 3/4-inch HMA Types A and B gradation.

#### **Add to section 39-6:**

Asphalt concrete overside drain is paid for complete in place and no additional compensation will be allowed for the weight of hot mix asphalt.

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## **DIVISION VI STRUCTURES**

### **47 EARTH RETAINING SYSTEMS**

#### **Add to section 47-2.01A:**

Section 47-2 includes specification for construction of Mechanically Stabilized Earth Temporary Retaining Wall.

You may use an alternative earth retaining system for the mechanically stabilized embankment at Retaining Wall No's 1 & 2, 3 and 4. The alternative system must comply with section 47-6.

Retaining wall locations are designated as follows:

Structure	Location Designation
Retaining Wall No. 1 & 2	Location A
Retaining Wall No. 3	Location B
Retaining Wall No. 4	Location C

#### **Add to section 47-2.02B:**

Architectural treatment must comply with section 51-1.03G.

#### **Replace Section 47-5 with:**

### **47-5 MASONRY RETAINING WALLS**

#### **47-5.01 General**

Section 47-5 includes specifications for constructing masonry retaining walls.

Masonry retaining walls consist of concrete footings with either reinforced concrete stems or reinforced concrete masonry unit stems.

Reinforced concrete footings and stems must comply with section 51.

CMU stems must comply with section 58-2.

#### **47-5.02 Materials**

Hollow CMUs must comply with ASTM C 90, normal weight, and must be of uniform color and size.

Caulking for sealing expansion joints must be a nonsag polysulfide or polyurethane type complying with ASTM C 920.

Grout must comply with section 58-2.02D and contain at least 590 lb/cu yd of cementitious material.

#### **47-5.03 Construction**

You may construct wall stems of reinforced concrete or reinforced CMUs. Use only 1 stem type for each wall.

Mix mortar fresh as necessary.

CMU construction must be true and plumb.

Provide recesses in the units for horizontal reinforcement.

Provide cleanout openings at the bottoms of cells where the wall height is over 4 feet. Seal cleanouts after inspection and before filling cells with grout.

Lay units with full mortar coverage of the face in both vertical and horizontal joints except at weep holes. Shove vertical joints tight. Exposed joints must be concave and tooled smooth.

Fill cells in hollow unit masonry with grout. Consolidate grout while pouring by puddling or vibrating. Place the top lift of grout approximately 1 inch below the top of units. Place a mortar cap above the top lift.

Do not place backfill against the back of masonry retaining walls until grout strength is 1,500 psi or the grout has been in place for 28 days.

#### **47-5.04 Payment**

Masonry retaining walls are measured by the square foot of completed wall stem including cap, measured along the horizontal length and the vertical height from top of footing to top of wall.

Payment for reinforced concrete footing, bar reinforcing steel, structure excavation, and structure backfill used in constructing masonry retaining walls is included in the payment for masonry retaining walls.

#### **Add to section 47-6.01A:**

The alternative earth retaining system for permanent walls must be one of the systems shown in the following table:

Proprietary earth retaining system	Web site/e-mail	Address	Telephone no.
Reinforced Earth – 5 ft cruciform	<a href="http://www.reinforcedearth.com">http://www.reinforcedearth.com</a>	THE REINFORCED EARTH COMPANY 1660 HOTEL CIR N STE 304 SAN DIEGO CA 92108-2803	(619) 688-2400
Reinforced Earth – 5 ft square	<a href="http://www.reinforcedearth.com">http://www.reinforcedearth.com</a>	THE REINFORCED EARTH COMPANY 1660 HOTEL CIR N STE 304 SAN DIEGO CA 92108-2803	(619) 688-2400
Retained Earth	<a href="http://www.reinforcedearth.com">http://www.reinforcedearth.com</a>	THE REINFORCED EARTH COMPANY 1660 HOTEL CIR N STE 304 SAN DIEGO CA 92108-2803	(619) 688-2400
MSE Plus – 5 ft square	<a href="http://www.mseplus.com">http://www.mseplus.com</a>	SSL 4740 SCOTTS VALLEY DR STE E 209 SCOTTS VALLEY CA 95066-4240	(831) 430-9300
MSE Plus – 5 by 6 ft	<a href="http://www.mseplus.com">http://www.mseplus.com</a>	SSL 4740 SCOTTS VALLEY DR STE E 209 SCOTTS VALLEY CA 95066-4240	(831) 430-9300
ARES – 9 by 5 ft	<a href="http://www.tensarcorp.com">http://www.tensarcorp.com</a>	TENSAR INTERNATIONAL CORPORATION 2500 NORTHWIND PKWY STE 500 ALPHARETTA GA 30009-2247	(770) 344-2000

Alternative state designed system	Contact information
5' x 5' Panel	State of California

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## 48 TEMPORARY STRUCTURES

### Add to section 48-2.01C(2):

The review time for shop drawings for specific structures or portions of structures is shown in the following table:

Structure or portion of structure	Total review time
<u>Magnolia Avenue / BNSF Grade Separation</u>	<u>65 days, first review; 30 days for subsequent reviews.</u>

### Replace section 48-3 with:

#### 48-3 TEMPORARY SHORING

##### 48-3.01 GENERAL

##### 48-3.01A Summary

Section 48-3 includes specifications for providing temporary support shoring for existing structures during CIDH pile construction, reconstruction, and removal activities.

##### 48-3.01B Definitions

**frame:** the portion of a bridge between expansion joints.

##### 48-3.01C Submittals

##### 48-3.01C(1) General

Submit 2 copies of the initial location survey signed by an engineer who is registered as a civil engineer in the State.

Submit a copy of the monitoring record after completing CIDH piles at bent 5 and 6 next to the Arlington Channel wall.

##### 48-3.01C(2) Shop Drawings

Submit shop drawings with design calculations for the temporary shoring support system. Submit 6 copies of shop drawings and 2 copies of design calculations. Include the following:

1. Descriptions and values of all loads, including construction equipment loads.
2. Descriptions of equipment to be used.
3. Details and calculations for supporting the existing structure.
4. Stress sheets, pile and lagging layouts, shop details, and installation and removal plans for the temporary shoring.
5. Assumed soil bearing values and design stresses for temporary shoring.
6. Maximum distance temporary shoring piles may be pulled for placement existing footing.
7. Maximum deviation of temporary shoring piles from a vertical line through the point of fixity.
8. Details for use of permanent piles. Include any additional loads imposed on the piles.
9. Details for additional bracing required during erection and removal of temporary supports.
10. Details of the displacement monitoring system, including equipment, location of control points, and methods and schedule of taking measurements.

Calculations must show a summary of computed stresses in (1) temporary shoring members, and (2) existing channel wall load-supporting members. The computed stresses must include the effect of the pile installation sequence. Calculations must include a lateral stiffness assessment of the temporary shoring system.

Shop drawings and calculations must be signed by an engineer who is registered as a civil engineer in the State.

Review time for temporary shoring shop drawings is shown in the following table:

Structure or portion of structure	Review time, days
Temporary Shoring for Arlington Channel Wall	35

For temporary shoring adjacent to railways, authorization of shop drawings is contingent upon the drawings being satisfactory to the railway company involved.

#### **48-3.01D Quality Control and Assurance**

##### **48-3.01D(1) General**

Welding, welder qualification, and welding inspection for temporary shoring must comply with AWS D1.1.

Before starting wall removal activities, an engineer who is registered as a civil engineer in the State must inspect and certify that (1) the temporary shoring, and displacement monitoring system comply with the authorized shop drawings and (2) the materials and workmanship are satisfactory for the work. A copy of this certification must be available at the job site at all times.

An engineer who is registered as a civil engineer in the State must:

1. Be present during pile placement activities and during wall removal activities.
2. Inspect removal activities and report daily on the progress of the operation and the status of the remaining structure during CIDH pile construction activities. The daily report must be available at the job site at all times.
3. Immediately submit proposed procedures to correct or remedy unplanned occurrences.

##### **48-3.01D(2) Displacement Monitoring**

Monitor and record vertical and horizontal displacements of the temporary shoring and the existing wall structure. Use vandal-resistant displacement monitoring equipment. Perform monitoring continuously during construction activities and at least weekly during wall removal, CIDH pile construction, wall reconstruction activities, and shoring removal. Make monitoring records available at the job site during normal work hours. Monitoring records must be signed by an engineer who is registered as a civil engineer in the State.

As a minimum, monitor the existing structure at the CIDH pile location and where the construction equipment are within 40 feet of the wall. Locate control points at each location near the top of wall. As a minimum, take control dimensions and elevations at the following times:

1. Before starting temporary shoring construction activities
2. Immediately after completing temporary shoring construction
3. After completing portion of wall removal
4. Before the reconstruction of the channel wall
5. After removing temporary shoring

Perform an initial survey to record the location of the existing structure before starting work.

##### **48-3.01D(3) Design Criteria**

The Engineer does not authorize temporary shoring designs based on allowable stresses greater than those specified in section 48-2.01D(3)(c).

Temporary shoring must resist the specified lateral earth and surcharge design forces applied to the existing structure during construction activities.

Place temporary shoring resisting transverse lateral loads within the limit where construction equipment is placed closer than 40 feet to the Arlington Channel Walls and exceeds the loading shown on the plans.

Shoring piles placed in drilled holes and backfilled will remain in place. Only the portion of the pile not encased may be cut off and removed.

Design temporary shoring piles to carry the loads imposed without exceeding the estimated soil bearing values or anticipated settlements. You must determine soil bearing values.



Provide additional bracing as required to withstand all imposed loads during each phase of temporary shoring construction and removal. Removal of portions of the shoring must not exceed design loading or damage to the existing channel structure.

Temporary shoring must comply with sections 19-3, 49-4 and 57-2.02.

#### **48-3.02 MATERIALS**

Not used. **48-3.03 CONSTRUCTION**

The construction sequence and application of temporary shoring loads is described. You may submit proposed changes to the Engineer for authorization.

Construct temporary shoring under sections 19-3.03, 49-4.03, and 57-2.02C.

After reconstruction activities, the monitored control points must not deviate by more than 1/4 inch from the initial vertical surveyed positions.

Remove temporary shoring under section 48-2.03D.

Remove attachments from the existing structure. Restore concrete surfaces to original conditions except where permanent alterations are shown.

#### **48-3.04 PAYMENT**

Temporary Shoring (Arlington Channel Wall) is paid for separately.

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## **49 PILING**

**Add to section 49-1.01D(4):**

The Department performs dynamic monitoring of driven piling at the corresponding support locations or control zones shown in the following table:

<u>Bridge Name</u>	<u>Support location or control zone</u>
<u>Magnolia Avenue Grade Separation</u>	<u>Abutment 1 and 11, back row only</u>

A minimum of two driven load test piles at each support location will be monitored for dynamic response to the driving equipment during the final 25 feet of driving.

**Add to section 49-1.03:**

Expect difficult pile installation due to the conditions shown in the following table:

Pile location		Conditions
Bridge no.	Support location	
<u>Grade Separation</u>	<u>Abutments 1 and 11 including wing walls.</u>	<u>very dense sands, cobbles and boulders, underground utilities, vibration monitoring, and traffic control</u>
<u>Grade Separation</u>	<u>Bents 5, 6 and 10</u>	<u>caving soils, high ground water, cobbles and boulders, underground utilities, adjacent structures, temporary shoring, vibration monitoring, and traffic control</u>
<u>Grade Separation</u>	<u>Bents 2 to 4, 7 to 9</u>	<u>caving soils, high ground water, cobbles and boulders, underground utilities, and traffic control</u>
<u>Temporary Bridge</u>	<u>Both abutments</u>	<u>very dense sands, cobbles and boulders, underground utilities, adjacent structures, vibration monitoring, and traffic control</u>

**Add to section 49-2.01A(3)(b):**

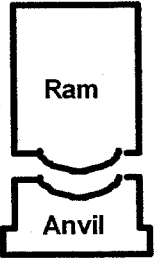

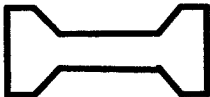


Before installing driven piles, submit a driving system submittal for each pile type for each of the support locations or control zones shown in the following table:

Bridge no.	Pile type	Support location or control zone
<u>Grade Separation</u>	<u>HP Steel Pile</u>	<u>Abutments 1 and 11</u>

CALIFORNIA DEPARTMENT OF TRANSPORTATION  
TRANSPORTATION LABORATORY

# PILE AND DRIVING DATA FORM

Structure Name : \_\_\_\_\_ Contract No.: \_\_\_\_\_  
 \_\_\_\_\_ Project: \_\_\_\_\_  
 Structure No.: \_\_\_\_\_ Pile Driving Contractor or  
 Dist./Co./Rte./Post Mi: \_\_\_\_\_ Subcontractor \_\_\_\_\_ (Pile Driven By)

 <p>Ram Anvil</p>	<b>Hammer</b>	Manufacturer: _____ Model: _____ Type: _____ Serial No.: _____ Rated Energy: _____ at _____ Length of Stroke _____ Modifications: _____ _____ _____
	<b>Capblock (Hammer Cushion)</b>	Material: _____ Thickness: _____ in Area: _____ in <sup>2</sup> Modulus of Elasticity - E: _____ ksi Coefficient of Restitution - e: _____
	<b>Pile Cap</b>	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">           Helmet Bonnet Anvil Block Drivehead         </div> <div>           Weight: _____ kips         </div> </div>
	<b>Pile Cushion</b>	Material: _____ Thickness: _____ in Area: _____ in <sup>2</sup> Modulus of Elasticity - E: _____ ksi Coefficient of Restitution - e: _____
	<b>Pile</b>	Pile Type: _____ Length (In Leads): _____ ft Lb/ft.: _____ Taper: _____ Wall Thickness: _____ in Cross Sectional Area: _____ in <sup>2</sup> Design Pile Capacity: _____ kips Description of Splice: _____ _____ Tip Treatment Description: _____ _____

**DISTRIBUTE:**

- ☐ Translab,  
Foundation Testing
- ☐ Translab,  
Geotechnical Design
- ☐ Resident Engineer

Note: If mandrel is used to drive the pile, attach separate manufacturer's detail sheet(s) including weight and dimensions.

Submitted By: \_\_\_\_\_  
 Date: \_\_\_\_\_ Phone No.: \_\_\_\_\_

**Add to section 49-2.01C(2):**

If you encounter obstructions to driving, provide special driving tips or heavier pile sections, or subexcavate below the bottom of footing, or take other measures to prevent damage to the pile during driving.

**Add to section 49-2.01C(4):**

Drive piles in predrilled holes at the locations and to the bottom of hole elevations shown in the following table:

Bridge name or number	Abutment no.	Bent no.	Bottom of hole elevation
<u>Temporary Bridge at Arlington Channel</u>	<u>1 and 2</u>		<u>679.00</u>

Drive piles listed in the above table in holes with diameters no larger than 12 inches.

**Add to section 49-3.02A(1) :**

The CIDH concrete piles shown in the following table are specified as end bearing and will be post grouted per section 49-3.02E:

Bridge name or no.	Abutment no.	Bent no.
<u>Magnolia Avenue Grade Separation</u>	<u>N/A</u>	<u>Bent 4, left pile</u> <u>Bent 10, all piles</u>

**Add item 8. to list of 1<sup>st</sup> paragraph of section 49-3.02A(3)(b) :**

8. Schedule for drilling activities for each CIDH pile.

**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
9. Post-grouting plan, methods, equipment and testing

**Add to section 49-3.02B(6)(c):**

The synthetic slurry must be one of the materials shown in the following table (or approved equal):

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:

**SLURRYPRO CDP**

Property	Test	Value
Density During drilling	Mud Weight (density), API 13B-1, section 1	$\leq 67.0 \text{ pcf}^a$
Before final cleaning and immediately before placing concrete		$\leq 64.0 \text{ pcf}^a$
Viscosity During drilling	Marsh Funnel and Cup. API 13B-1, section 2.2	50–120 sec/qt
Before final cleaning and immediately before placing concrete		$\leq 70 \text{ sec/qt}$
pH	Glass electrode pH meter or pH paper	6.0–11.5
Sand content, percent by volume Before final cleaning and immediately before placing concrete	Sand, API 13B-1, section 5	$\leq 0.5 \text{ percent}$

<sup>a</sup>If authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.

Slurry temperature must be at least 40 degrees F when tested.

Super Mud synthetic slurry must comply with the requirements shown in the following table:

SUPER MUD		
Property	Test	Value
Density During drilling	Mud Weight (Density), API 13B-1, section 1	$\leq 64.0 \text{ pcf}^a$
Before final cleaning and immediately before placing concrete		$\leq 64.0 \text{ pcf}^a$
Viscosity During drilling	Marsh Funnel and Cup. API 13B-1, section 2.2	32–60 sec/qt
Before final cleaning and immediately before placing concrete		$\leq 60 \text{ sec/qt}$
pH	Glass electrode pH meter or pH paper	8.0–10.0
Sand content, percent by volume Before final cleaning and immediately before placing concrete	Sand, API 13B-1, section 5	$\leq 0.5 \text{ percent}$

<sup>a</sup>If authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.

Slurry temperature must be at least 40 degrees F when tested.

Shore Pac GCV synthetic slurry must comply with the requirements shown in the following table:

SHORE PAC GCV		
Property	Test	Value
Density During drilling	Mud Weight (Density), API 13B-1, section 1	$\leq 64.0 \text{ pcf}^a$
Before final cleaning and immediately before placing concrete		$\leq 64.0 \text{ pcf}^a$
Viscosity During drilling	Marsh Funnel and Cup. API 13B-1, section 2.2	33–74 sec/qt
Before final cleaning and immediately before placing concrete		$\leq 57 \text{ sec/qt}$
pH	Glass electrode pH meter or pH paper	8.0–11.0
Sand content, percent by volume Before final cleaning and immediately before placing concrete	Sand, API 13B-1, section 5	$\leq 0.5 \text{ percent}$

<sup>a</sup>If authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.

Slurry temperature must be at least 40 degrees F when tested.

Terragel or Novagel Polymer synthetic slurry must comply with the requirements shown in the following table:

TERRAGEL OR NOVAGEL POLYMER		
Property	Test	Value
Density	Mud Weight (Density), API 13B-1, section 1	
During drilling		$\leq 67.0 \text{ pcf}^a$
Before final cleaning and immediately before placing concrete		$\leq 64.0 \text{ pcf}^a$
Viscosity	Marsh Funnel and Cup. API 13B-1, section 2.2	
During drilling		45–104 sec/qt
Before final cleaning and immediately before placing concrete		$\leq 104 \text{ sec/qt}$
pH	Glass electrode pH meter or pH paper	6.0–11.5
Sand content, percent by volume	Sand, API 13B-1, section 5	
Before final cleaning and immediately before placing concrete		$\leq 0.5 \text{ percent}$

<sup>a</sup>If authorized, you may use slurry in salt water. The allowable density of slurry in salt water may be increased by 2 pcf.

Slurry temperature must be at least 40 degrees F when tested.

**Replace section 49-3.02B(7) with:**

**49-3.02B(7) Slurry Cement Backfill**

Slurry cement backfill must comply with section 19-3.02D.

**Add to section 49-3.02C(2):**

Drilled holes within the influence of track surcharge (Bents 4 through 8) shall be constructed with a casing to protect the track against cave-in, subsidence and or displacement of the surrounding ground. The casing shall be designed for live loads due to the Railroad surcharged in addition to all other applicable loads.

Section 49-3.02C(3) shall apply to temporary casings.

**Add to section 49-3.02C(4):**

If the hole is drilled below the specified tip elevation shown, the reinforcement must extend to within 3 inches of the bottom of the drilled hole only for CIDH piles specified as end bearing in section 49-3.02A(1).

**Replace “Not Used” in section 49-3.02D with:**

Post-grouting of CIDH concrete piles constructed under slurry for end bearing is not included in payment for CIDH concrete piles.

**Add to end of section 49-3.02:**

**49-3.02E Post-Grouting CIDH Concrete Piling**

**49-3.02E(1) General**

This work consists of post-grouting the bases of cast-in-drilled-hole concrete piling as shown.

**49-3.02E(2) Submittals**

Submit 6 sets of shop drawings for post-grouting. Include the following:

- a. The proposed schedule and detailed construction sequence of the construction of post-grouting;
- b. Complete details and specifications for the grouting materials and equipment, including delivery piping (material, diameter and port spacing), packers, grout mixer and grout pump;
- c. Grout mix designs and testing procedures; and
- d. Grout placement procedures, including minimum required cure time.
- e. Conform to all permit requirements.

The shop drawings must be stamped and signed by an engineer who is registered as a Civil Engineer in the State of California.

Contractor must provide a minimum of 30 days' notice to the Engineer before beginning construction of the cast-in-drilled hole piles to be post-grouted.

#### **49-3.02E(3) Contractor Experience**

Post-grouting must be performed by a contractor with documented experience of successfully performing post-grouting (base and/or side grouting) of drilled shafts on at least 3 similar projects in the last 5 years.

#### **49-3.02E(4) Construction**

Post-grouting must begin no later than 30 hours, or less if accelerators are used in the drilled shaft concrete, after Contractor completes concreting of an individual drilled shaft (not including annulus grouting near surface casings), when the compressive strength of the shaft concrete is within the range of 1,000 to 2,500 psi.

Supply all required materials, equipment, and labor required to effectively post-grout the bottom of specified drilled shafts. This equipment includes, but is not limited to:

1. A single- or double-stage hydraulic piston-type grout pump, and a back-up grout pump, capable of supplying 1000 psi of grout pressure, with a capacity of 1 cubic foot per minute at 650 psi, and equipped with a colloidal mixer and an agitating holding tank;
2. Grout pump instrumentation, including a pressure gauge mounted at the grout delivery port, water meter, and volume measurement capability;
3. Potable water supply delivered to the grout pump;
4. Grout supply tubing and manifold to connect to the grout access tubes in the drilled shaft, of sufficient strength to resist the applied grout pressures;
5. Precise survey level to record upward movement of the shafts during grouting to within +/- 80 mils; and
6. Grout delivery piping, tube-a-manchette (TAM) type with rubber-sleeved ports, to attach to the reinforcing steel cage prior to concreting, supplied by a post-grouting specialty firm such as Strata Tech, Des Moines, IA, or equal, as approved by the Engineer.

Affix the grout delivery piping to the reinforcing cage using approved spacers, at the base of the pile. Take care during handling and placement of the cage so as not to damage the TAM grout delivery piping.

For large-diameter CIDH concrete piling, use four pairs of 2"-ID, Schedule 40 PVC grout pipes with smoothbore couplings and standard rubber-sleeved ports at 12 to 15"-on-center, placed in a U-tube arrangement across the base of the shaft as shown on the Plans. Where the dimensions of the pile reinforcement do not permit grout delivery piping to be placed per these requirements, shop drawings must include a plan for the grout delivery piping placement as part of the pile installation plan.

Perform the base grouting process in accordance with the grouting criteria approved by the Engineer, and the following typical procedure:

1. Survey and record the shaft top elevation referenced to a site benchmark.
2. Using the intended grout pump, fill the pump reservoir with clean water and flush the pump lines and shaft access tubes until residual drilling fluid is expelled and clear water is returned. Fit each access line with an in-line packer valve capable of sustaining the design grout pressure. Fracture the concrete cover at the bottom of the shaft by pressurizing the water-filled tubes (fracture pressure estimated at approximately 10 percent of the unconfined compressive strength of the concrete at the time of post-grouting).



3. Mix a sufficient amount of neat cement grout consisting of Type I-II Portland cement and water, beginning with a water to cement ratio of 0.60, or as directed in writing by the Engineer. Note: The practical range of water-to-cement ratio is expected to be 0.40 to 0.60; some grout take with higher water-to-cement ratio is encouraged over low or zero grout take with a low water-to-cement ratio. The Engineer, in consultation with the Grouting Contractor, reserves the right to adjust the actual maximum grouting pressure, grout water/cement ratio and volume (take) per stage), based on field conditions observed during the grouting process. Admixtures may be added as necessary to improve grout flow, workability, bleed and setting time. If admixtures are used, Contractor must submit the mix design to the Engineer for review. Sand mixes may not be used. Contractor must mix the grout thoroughly with the colloidal mixer until it is in a semi-colloidal suspension. The required grout cube strength prior to continuing superstructure work is 1,500 psi in accordance with ASTM C 1019-09, Standard Test Method for Compressive Strength of Hydraulic Cement Grout.
4. Depending on the anticipated grout pressures and manifold / packer capabilities, start with connection of one side each of one to four sets of the base grouting distribution tubes and pump grout with an open return side until competent grout is returned. Close the return line(s) and steadily pump grout below the base of the shaft until the specified grout pressure is sustained for 2 minutes. (significantly fluctuating peak pressures at the grout pump are not considered sufficient).  
The grouting process for a given U-tube circuit must be continuous from the time of commencement. Pump an initial minimum net volume of 5 cubic feet by the time the design pressure is achieved, to ensure that an artificial pressure is not being caused by a line blockage. It may be necessary to grout a second stage to meet the design pressure, as determined by the grouting contractor and approved in the field by the Engineer. Perform the second stage of base grouting (if needed) using all of the available tube sets.
5. Continuously monitor and record grout pressure, grout volume injected, upward displacement of the top-of-shaft and time of grouting.
6. Discontinue a given base grouting stage when one of the following criteria is met, or as directed in writing by the Engineer:
  - a. The design grouting pressure is achieved and held for 2 minutes while pumping a minimum net volume of 10 cubic feet to the toe of the shaft.
  - b. Surveyed upward displacement of the top of the shaft reaches 0.25". If the design grouting pressure has not been achieved prior to reaching the upward displacement limit, fully flush the base grouting tubes with clear water and contact the Engineer regarding a second stage of base grouting.
  - c. If the grout pressure is not achieved after pumping 50 cubic feet net volume of grout to the base and the shaft has not exceeded the upward displacement criteria, take one or more of the following steps:
    - c.1. If the pressure is still systematically increasing with additional grout volume injected, the grouting can be continued until the desired grout pressure is achieved.
    - c.2. Systematically reduce the water to cement ratio of the grout in increments of 0.05 and resume grouting until the design pressure can be achieved (the practical lower limit of water to cement ratio is 0.40).
    - c.3. Fully flush the grout lines with clear water after initial set of the grout from the first stage of grouting (estimated at 4 hours minimum after completion of stage 1 grouting). After flushing, perform a second stage of base grouting using all available base grouting tube pairs. Re-grout each tube pair in an attempt to achieve the design grout pressure in each of the grout circuits, or until an additional 50 cubic feet of grout has been injected.

Upon completion of all grouting activities at a given CIDH pile, Contractor must re-survey the elevation of the top of the shaft, record upward displacement, net grout volume, and maximum sustained grout pressure.

After completion of post-grouting and downhole integrity testing, Contractor must grout all access lines and/or downhole integrity tubes, whether used for the post-grouting operation or not.

#### 49-3.02E(5) Payment

The Department pays for post-grouting cast-in-drilled-hole concrete piles indicated including, shop drawings, all labor, materials, tools, equipment, and for doing all work involved in post-grouting, complete in place.

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## 50 PRESTRESSING CONCRETE

### Add to section 50-1.01A:

The details shown for CIP PS box girder bridges are based on a bonded full length draped tendon prestressing system. For these bridges, you may submit a VECP for an alternative prestressing system using bonded partial length tendons if the proposed system and associated details comply with the following requirements:

1. The proposed system and details must provide moment and shear resistances at least equal to those used for the design of the structure shown.
2. The concrete strength must be at least that shown.
3. Not less than 35 percent of the total prestressing force at any section must be provided by full length draped tendons.
4. Anchorage blocks for partial length tendons must be located such that the blocks will not interfere with the placement of the utility facilities shown or of any future utilities to be placed through openings shown.
5. Temporary prestressing tendons, if used, must be detensioned, and the temporary ducts must be filled with grout before completion of the work. Temporary tendons must be either removed or fully encased in grout before completion of the work.

Upon your request, the Department furnishes you with the demand moments and shears used in the design shown.

Submit shop drawings of the proposed system, including all details and supporting checked calculations.

Provide 18"x36" openings in the deck slab running parallel to the girder centerline and opening in the Post-Tension (PT) Ducts at Bents on top of at least two girders for monitoring and obtaining measurement of elongation of the prestressing strands. Provide elongation measurements to the Engineer for recalibration of prestressing force. The ducts shall have reserve strands (minimum 2) to accommodate additional prestressing force if required by recalibration. After receiving elongations measurements, the Engineer will provide the recalibrated prestressing force to the contractor within approximately 4 Hours.

You must take all necessary precautions not to damage the deck slab reinforcement and prestressing strands.

Fill the 18"x36" deck openings and post-tension ducts immediately following locking of the prestressing strands and prior to grouting of PT Ducts.

### Replace the 2nd paragraph of section 50-1.01C(3) with:

For initial review, submit:

1. 8 copies for railroad bridges
2. 10 copies for railroad bridges if the project includes a BNSF Railway underpass
3. 6 copies for other structures

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## 51 CONCRETE STRUCTURES

### Add to section 51-1.01C(1):

If the methacrylate crack treatment is performed within 100 feet of a residence, business, or public space, submit a public safety plan that includes the following:

1. Public notification letter with a list of delivery and posting addresses. The letter must describe the work to be performed and state the treatment work locations, dates, and times. Deliver the letter to residences and businesses within 100 feet of overlay work and to local fire and police officials not less than 7 days before starting overlay activities. Post the letter at the job site.
2. Airborne emissions monitoring plan. A CIH certified in comprehensive practice by the American Board of Industrial Hygiene must prepare and execute the plan. The plan must have at least 4 monitoring points including the mixing point, application point, and point of nearest public contact. Monitor airborne emissions during overlay activities.
3. Action plan for protecting the public if levels of airborne emissions exceed permissible levels.
4. Copy of the CIH's certification.

After completing methacrylate crack treatment activities, submit results from monitoring production airborne emissions as an informational submittal.

### Add to section 51-1.02B:

Aggregate for Magnolia Avenue Grade Separation superstructure must be the 1-inch combined aggregate grading complying with section 90-1.02C(4)(d).

### Replace the 1st paragraph in section 51-1.03F(5)(b)(i) with:

Except for bridge widenings, texture the bridge deck surfaces longitudinally by grinding and grooving. You may texture the deck surface at Magnolia Ave Temporary Bridge by longitudinal tining.

The portion of the deck surface on Magnolia Avenue Grade Separation to be used for pedestrian sidewalks shall be broom finished. The sidewalk surface shall be broomed transverse to the direction of traffic.

### Add to section 51-1.03G(1):

The precast MSE wall panel and cast-in-place concrete surface texture at MSE portions of the retaining walls and abutment face must match the "ashlar stone" texture, color, and pattern as shown.

### Add to section 51-1.04:

The payment quantity for architectural treatment does not include the area of architectural treatment on the concrete barrier, MSE wall concrete panel, and concrete parapet.

Payment for architectural treatment surface texture on cast-in-place concrete surfaces is not paid for as structure concrete, retaining wall or structure concrete, bridge.

Payment for structure excavation, structure backfill and bar reinforcement is included in the payment for structure concrete, barrier slab.

The payment of formed relief architectural treatment surface texture on concrete barrier and concrete parapet is included in the payment of the concrete barrier and concrete payment.

Payment for bar reinforcing steel, structure excavation, and structure backfill used in constructing box culverts is included in the payment for the type of box culvert involved.

**Add to section 51-2.02E(3):**

Size the recess such that the primary reinforcement for structural members is outside the recess. The maximum recess sizes are shown in the following table:

Location	Maximum Recess Depth	Maximum Recess Width
Hinge	16"	2'-6"
Abutment 11	14"	1'-6"

**Replace "Reserved" in section 51-3.03 with:**

**51-3.03A General**

**51-3.03A(1) Summary**

Section 51-3.03 includes specifications for fabricating and installing PTFE spherical bearings.

PTFE spherical bearings consist of PTFE and stainless steel bearing surfaces, stainless steel plates, and anchors. PTFE spherical bearings are either (1) fixed type with spherical bearing surfaces or (2) expansion type with spherical and sliding bearing surfaces.

**51-3.03A(2) Definitions**

**load category:** PTFE spherical bearings of differing vertical load capacity within a range defined as follows:

1. Bearings of 500 kips capacity or less
2. Bearings over 500 kips up to and including 2,000 kips capacity
3. Bearings over 2,000 kips capacity

Bearings in 2 different load categories that have vertical load capacities within 180 kips of each other are considered to be in 1 load category for proof testing.

**51-3.03A(3) Submittals**

**51-3.03A(3)(a) General**

Submit proof that the bearing manufacturer has furnished PTFE spherical bearings that have had at least 3 years of satisfactory service for 2 projects with similar conditions to this project.

Submit certificates of compliance for the materials used in PTFE bearings.

Submit test reports for proof-tested bearings signed by the personnel conducting the testing. Include bearing numbers of the tested bearings and the names of the personnel interpreting the test results. If proof tests cannot be performed at the specified load, submit a testing plan listing additional physical tests to be performed.

**51-3.03A(3)(b) Shop Drawings**

Submit shop drawings to OSD, Documents Unit. Notify the Engineer of your submittal. Include in the notification the date and contents of the submittal.

For initial review, submit 6 copies for railroad bridges and 4 copies for other structures. After review, submit 6 to 12 copies, as requested, for authorization and use during construction. Allow 55 days for the Department's review for railway bridges and at least 45 days for all other structures.

Shop drawings must include a description of the method of mechanical interlocking of PTFE fabric to the metallic substrate.

At locations other than hinges, shop drawings must include temporary support details for the bearing sole plate during concrete placement.

**51-3.03A(4) Quality Control and Assurance**

**51-3.03A(4)(a) General**

A qualified representative of the bearing manufacturer must be present during installation of the 1st bearing and be available during remaining installations.

Templates for the spherical surfaces must be available for inspection.

#### **51-3.03A(4)(b) Proof Testing**

Proof test the PTFE spherical bearings in the Engineer's presence as follows:

1. Test fixed-type bearings for compression.
2. Test expansion-type bearings for compression and initial static coefficient of friction.

Proof test 1 bearing from each lot of production bearings. A lot of bearings is 25 bearings, or fraction thereof, of the same type within a load category.

The Engineer selects random test samples from each lot of production bearings. Notify the Engineer at least 7 days before starting proof testing.

If proof tests cannot be performed at the specified load, perform the additional physical tests listed in the testing plan in the presence of the Engineer. The tests must demonstrate that the requirements for proof testing at the specified load are satisfied.

Before proof testing, the test bearings must be conditioned for 12 hours at  $75 \pm 5$  degrees F. Clean the bearing surfaces before testing.

For compression testing of PTFE spherical bearings:

1. Rotate the bearings at the design rotation or 0.02 radians, whichever is greater, and hold for 1 hour at a load of 1.5 times the maximum vertical load capacity. You may rotate the bearing by inserting a beveled plate between the bearing and the restraining surface before loading.
2. Maintain the bearing in a rotated position during testing.

For coefficient of friction testing of PTFE spherical bearings:

1. Continuously load the bearing to the minimum dead load for 12 hours before testing. Maintain the dead load during testing.
2. Measure the initial static coefficient of friction on the 1st movement of the bearing.
3. Measure the initial static and dynamic coefficients of friction at a sliding speed of not more than 1 inch per minute. The initial static friction must not exceed that specified.
4. Cycle the test bearings for a minimum of 100 movements. Each movement must consist of at least 1 inch of relative movement at a sliding speed of not more than 12 inches per minute. After cycling, measure the initial static and dynamic coefficients of friction at a sliding speed of not more than 1 inch per minute. The initial static friction must not exceed that specified.

Proof-tested bearings must not show any signs of the following:

1. Bond failure of bearing surfaces
2. Separation or lift-off of plates from each other or from PTFE surfaces
3. Excessive transfer of PTFE to the stainless steel surface
4. Other defects

If a proof-tested bearing fails to comply with the above requirements, proof test all the remaining bearings in the lot.

#### **51-3.03B Materials**

##### **51-3.03B(1) General**

Welding must comply with AWS D1.1 except welding of stainless steel must comply with AWS D1.6.

PTFE spherical bearings must be self-lubricating.

PTFE surfaces must be unfilled fabric made from virgin PTFE oriented multifilament and other fibers. Filament resin must comply with ASTM D 4441.

At the highest point of substrate and after compression, the PTFE fabric must have a thickness from 1/16 to 1/8 inch.

Steel plates must comply with ASTM A 709/A 709M.

Stainless steel plates must comply with ASTM A 240, Type 304, and be at least 1/8 inch thick.

Surfaces of flat stainless steel that mate with PTFE surfacing must have a minimum no. 8 mirror finish. Surfaces of curved stainless steel that mate with PTFE surfacing must have a finish of less than 16 microinches root mean square. Determine the finish under ANSI B46.1.

PTFE spherical bearings must have an initial static coefficient of friction of at most 0.06.

Stud connectors must comply with section 55-1.02.

#### **51-3.03B(2) Fabrication**

Flat stainless steel surfaces must be a weld overlay on structural steel plate or a solid or sheet stainless steel.

Curved stainless steel surfaces must be solid stainless steel except curved stainless steel surfaces over 6 inches thick may be a weld overlay on structural steel plate.

When a weld overlay is used for stainless steel surfacing, attach the overlay by submerged arc welding using Type 309L electrodes. The completed overlay must have a 3/32-inch minimum thickness after fabrication.

When stainless steel sheets are used for stainless steel surfacing, attach the sheets by perimeter arc welding using Type 309L electrodes. After welding, the stainless steel surface must be smooth and without waves.

Plate radius dimensional tolerances are from 0.000 to -0.010 inch for convex plates and from +0.010 to 0.000 inch for concave plates.

Use a full-size convex and concave metal templates for the spherical surfaces of each bearing radius.

PTFE fabric backing material on bearing surfaces must be epoxy bonded and mechanically interlocked to the steel substrate. Bonding must be performed under controlled factory conditions. The mechanical interlock on the spherical concave surface must be integrally machined into the steel substrate. Welded retention grids are not allowed on the concave surface. Except for the selvage, oversaw or recess edges such that no cut fabric edges are exposed.

During fabrication, the maximum temperature of bonded PTFE surfaces must be 300 degrees F.

After bonding to the substrate, the PTFE surface must be smooth and free from bubbles.

Assemble PTFE spherical bearings at the fabrication site.

The PTFE and stainless steel interfaces must be in full bearing after completing assembly.

Use at least 4 steel straps bolted to threaded holes in the masonry and sole plates to secure each bearing assembly as a unit for shipment. Steel straps must (1) not be welded and (2) be adequate to use for lifting the bearing assembly. Bearings must be shipped as a unit and remain intact when uncrated and installed.

Except for stainless steel surfaces, clean and paint metal bearing surfaces after fabrication under the specifications for new structural steel in section 59-2. SSPC-QP 1, SSPC-QP 2, and AISC-420-10/SSPC-QP 3 certifications are not required.

#### **51-3.03C Construction**

Protect bearing surfaces from contamination and weather damage.

Prepare concrete surfaces to receive PTFE spherical bearings under section 55-1.03C(2).

The Engineer must be present during the dismantling of each bearing assembly at the job site.

Temporarily support PTFE bearing sole plates during concrete placement. Temporary supports must prevent rotation or displacement of the bearings. Temporary supports must not (1) inhibit the function of

the PTFE bearings after concrete is placed or (2) restrict movement at bridge joints due to temperature changes and prestress shortening. Materials for temporary supports must comply with the requirements for form fasteners in section 51-1.03C(2)(a).

Replace or resurface damaged bearings and bearings with scratched mating surfaces. Resurfacing must be performed at the bearing manufacturer's plant.

#### **51-3.03D Payment**

PTFE spherical bearing quantities are determined from actual counts in the completed work. PTFE spherical bearings with more than 1 PTFE surface are considered a single bearing.

#### **Replace section 51-7.01D with:**

The Department does not adjust the payment for minor structures designated as final pay on the Bid Item List when the constructed height of the minor structure is within 6 inches of the vertical dimensions shown.

Catch Basins are paid for complete in place and no additional compensation will be allowed for reinforcement, cast in place connections, miscellaneous metals, metal frames and covers or frames and grates.

Manholes are paid for complete in place and no additional compensation will be allowed for reinforcement, miscellaneous metals or metal frames and covers.

Junction Structures are paid for complete in place and no additional compensation will be allowed for reinforcement, miscellaneous metals or metal frames and covers.

Concrete Bulkheads are paid for complete in place and no additional compensation will be allowed for reinforcement, filter fabric or miscellaneous metals.

Concrete Headwalls are paid for complete in place and no additional compensation will be allowed for reinforcement.

Concrete Collars are paid for complete in place and no additional compensation will be allowed for reinforcement.

Cap Inlet is paid for complete in place and no additional compensation will be allowed for reinforcement.

Concrete Transition Structures are paid for complete in place and no additional compensation will be allowed for reinforcement.

Concrete Cleanout Boxes are paid for complete in place and no additional compensation will be allowed for reinforcement, miscellaneous metals or metal frames and covers.

#### **Replace "Reserved" in section 51-7.02 with:**

#### **51-7.02A General**

##### **51-7.02A(1) Summary**

Section 51-7.02 includes specifications for constructing PC drainage inlets.

Precast drainage inlets must be fabricated of PC concrete.

##### **51-7.02A(2) Definitions**

Reserved

##### **51-7.02A(3) Submittals**

For inlets with oval or circular cross sections, submit shop drawings with calculations. Shop drawings and calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State. Allow 15 days for the Engineer's review.

Submit field repair procedures and a patching material test sample before repairs are made. Allow 10 days for the Engineer's review.

#### **51-7.02A(4) Quality Control and Assurance**

The Engineer may reject PC drainage inlets exhibiting any of the following:

1. Cracks passing through walls more than 1/16 inch wide
2. Nonrepairable honeycombed or spalled areas of more than 6 square inches
3. Noncompliance with reinforcement tolerances or cross sectional area shown
4. Wall or lid less than minimum thickness
5. Internal dimensions less than plan dimensions by 1 percent or 1/2 inch, whichever is greater
6. Defects affecting performance or structural integrity

#### **51-7.02B Materials**

##### **51-7.02B(1) General**

Nonshrink grout must be a dry, packaged type complying with ASTM C 1107.

Concrete for basin or inlet floors placed in the field must comply with the specifications for minor concrete.

Joint sealant must be butyl-rubber complying with ASTM C 990. Joint primer must be recommended by the joint seal manufacturer.

Resilient connectors must comply with ASTM C 923.

Sand bedding must comply with section 19-3.02E.

Bonding agents must comply with ASTM C 1059, Type II.

##### **51-7.02B(1) Fabrication**

If oval or circular shape cross-sections are furnished, they must comply with *AASHTO LRFD Bridge Design Specifications, Fourth Edition with California Amendments*.

Wall and slab thicknesses may be less than the dimensions shown by at most 5 percent or 3/16 inch, whichever is greater.

Reinforcement placement must not vary more than 1/2 inch from the positions shown.

Cure PC drainage inlets under section 90-4.03.

##### **51-7.02C Construction**

Repair PC drainage inlet sections to correct damage from handling or manufacturing imperfections before installation.

Center pipes in openings to provide a uniform gap. Seal gaps between the pipe and the inlet opening with nonshrink grout under the grout manufacturer's instructions. For systems designated as watertight, seal these gaps with resilient connectors.

Match fit keyed joints to ensure uniform alignment of walls and lids. Keys are not required at the inlet floor level if the floor is precast integrally with the inlet wall. Seal keyed joint locations with preformed butyl rubber joint sealant. You may seal the upper lid and wall joint with grout.

Clean keyed joint surfaces before installing sealant. Joint surfaces must be free of imperfections that may affect the joint. Use a primer if surface moisture is present. Use a sealant size recommended by the sealant manufacturer. Set joints using sealant to create a uniform bearing surface.

Flat drainage inlet floors must have a field-cast topping layer at least 2 inches thick with a slope of 4:1 (horizontal:vertical) toward the outlet. Use a bonding agent when placing the topping layer. Apply the bonding agent under the manufacturer's instructions.

##### **51-7.02D Payment**

The Department does not adjust the payment for precast concrete catch basins designated as final pay on the Bid Item List when the constructed height of the catch basin is within 6 inches of the vertical dimensions shown.



Precast concrete catch basins are paid for complete in place and no additional compensation will be allowed for reinforcement, minor concrete, cast in place connections, miscellaneous metals, metal frames and covers or frames and grates.

AA

## 52 REINFORCEMENT

**Add to the list in the 2nd paragraph of section 52-2.02A(1):**

7. Anchor reinforcing bars for steel piles
8. Hooked reinforcement at hinge as shown.

**Replace "Not Used" in section 52-2.02D with:**

Epoxy coated reinforcement is not paid for separately.

AA

## 55 STEEL STRUCTURES

**Add to section 55-1.02B(6)(a):**

Zinc coat HS fastener assemblies and other fasteners attached to structural steel. If direct tension indicators are used, all components of these fastener assemblies must be zinc coated by mechanical deposition.

**Replace "Reserved" in section 55-1.02B(7)(b) with:**

For welds subject to computed stresses, backing for welds that is left in place in the completed structure must be (1) a single length and (2) the same material as the structural steel being welded.

Single length backing may be either a continuous strip or multiple lengths joined by complete joint penetration butt welds before being installed as backing.

Butt welds in backing material are subject to the same type and frequency of testing as specified for the type of joint in the material being joined. Grind butt welds in backing material flush as necessary to obtain proper inspection and fit-up in the welded joint where backing is used.

AA

## 56 SIGNS

### Replace section 56-4.04 with:

A roadside sign consisting of 1 post with attached sign panels is paid for as 1 roadside sign - one post. An installed roadside sign consisting of 2 posts with attached sign panels is paid for as 1 roadside sign - two post.

A roadside sign mounted on a barrier, light pole, wall surface, or railing is paid for complete in place and no additional compensation will be allowed for pipe posts, base plates, anchorage assemblies or other metal parts.

Type N (CA), Type P (CA), and Type R (CA) marker panels are paid for as roadside sign – one post.

Payment for furnishing sign panels is included in the payment for the type of roadside sign involved.

AA

## 58 SOUND WALLS

### Replace 1st paragraph of section 58-1.01A with:

Section 58-1 includes general specifications for constructing sound walls and concrete block walls.

### Add to section 58-1.01A:

Steel doors and frames must comply with section 99-08100

Door hardware must comply with section 99-08710

Fencing must comply with section 80

### Add to section 58-1.04:

Concrete block slough walls, concrete block security walls and concrete block enclosure walls are measured by the linear foot of completed wall stem, measured along the horizontal length.

Payment for concrete footing, structure excavation, structure backfill and fence post embedment is included in the payment for concrete block slough walls.

Payment for chain link fencing, razor wire, barbed wire, fencing hardware, bar reinforcing, concrete footing, structure excavation, structure backfill and fence post embedment is included in the payment for concrete block security walls.

Payment for steel doors, door frames, door hardware, door painting, bird spikes, bar reinforcing, concrete footing, structure excavation and structure backfill is included in the payment for concrete block security walls.

AA

## 59 PAINTING

### Add to section 59-2.01A:

Clean and paint the structures shown in the following table with the coating system specified:

Bridge name and number	Work description	Coating system
<u>Magnolia Avenue Temporary Bridge (at Arlington Channel)</u>	Clean, blast clean, and paint new steel bridge.	<u>Zinc Primer only, no finish coat</u>

**Replace "Reserved" in section 59-2.01C(2) with:**

Submit proof of each required SSPC-QP certification as specified in section 2-1.35. Required certifications are as follows:

1. AISC-420-10/SSPC-QP 3 (Enclosed Shop)

**Add to section 59-2.01D(1):**

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.

**Add to section 59-2.03C(2)(b)(iii):**

Finish coats are not required for the following structures:

1. Magnolia Avenue Temporary Bridge (at Arlington Channel)

**Add to section 59-3.03:**

For metal railings and tubular hand railing, the 2nd finish coat must match color no. 14031 (Dark Bronze) of FED-STD-595.

AA

## **DIVISION VII DRAINAGE**

### **65 CONCRETE PIPE**

**Add to section 65-2.04:**

Connections to existing facilities is included in the payment for the type of pipe involved

AA

## **70 MISCELLANEOUS DRAINAGE FACILITIES**

**Replace the 8th paragraph in section 70-1.04 with:**

Pipe risers are paid for complete in place and no additional compensation will be allowed for reinforcement, minor concrete, connections, miscellaneous metals or metal frames and covers.

**Replace "Reserved" in section 70-3.04 with:**

Welded steel pipe is measured along the centerline of the pipe and parallel with the slope line. The payment quantity includes the length of pipe reducers, bends, wyes, tees, and other branches to the point of intersection. The payment quantity is the length determined by the Engineer. If pipes are cut to fit a

structure or slope, the payment quantity is the length of pipe necessary to be placed before cutting, measured in 2-foot increments.

Pipe reducers are paid for as pipe of the larger diameter connected to the reducer.

**Replace "Reserved" in section 70-4.04 with:**

The Department does not adjust the payment for precast concrete pipe drainage facilities designated as final pay on the Bid Item List when the constructed height of the drainage facility is within 6 inches of the vertical dimensions shown.

Precast concrete pipe inlets are paid for complete in place and no additional compensation will be allowed for reinforcement, minor concrete, cast in place connections, miscellaneous metals, metal frames and covers or frames and grates.

AA

**DIVISION VIII MISCELLANEOUS CONSTRUCTION**  
**72 SLOPE PROTECTION**

**Add to section 72-2.04 with:**

Payment for rock slope protection fabric is included in the payment for the type of rock slope protection involved.

AA

**73 CONCRETE CURBS AND SIDEWALKS**

**Add to section 73-1.04 with:**

Detectable warning surface is included in the payment for the type of curb ramp involved.

Curb and curb and gutter transitions are paid for as the larger type of curb or curb and gutter involved.

No adjustment is made for the curb or curb and gutter through pedestrian ramps and drive approaches.

Curb ramps are measured from the back of curb to the outside limits of grooving pattern or back of retaining curb.

**Replace section 73-5 with:**

**73-5 PARKING BUMPERS**

**73-5.01 GENERAL**

Section 73-5 includes specifications for installing parking bumpers.

**73-5.02 MATERIALS**

Parking bumper must be precast with concrete and reinforcing steel. Concrete must be minor concrete. Concrete must contain not less than 472 pounds of cementitious material per cubic yard. Parking bumper may be commercially available precast concrete unit. Minor variations in cross sectional dimensions are acceptable in a commercially available unit.

Dowels must be commercial quality reinforcing steel or mild steel rods.

**73-5.03 CONSTRUCTION**

Parking bumper shall be constructed per standard specification and as directed by Engineer.

**73-5.04 PAYMENT**

Parking bumper will be paid per each.

AA

## 75 MISCELLANEOUS METAL

Add to section 75-1.03D(1):

Bridge deck drainage system consists of:

1. Drain pipes
2. Pipe hangers
3. Pipe straps
4. Inlet frames and grates
5. Sleeve connections and expansion couplings
6. Casing pipe at abutments
7. Connectors and anchorages

Replace section 75-1.03H with:

### 75-1.03H Isolation Casings

#### 75-1.03H(1) General

Isolation casing consists of installing isolation casings isolate a support from the surrounding soil.

#### 75-1.03H(2) Materials

Corrugated steel pipe must comply with section 66-1 and be made from zinc-coated steel sheet.

Steel cover plates, steel support angles and concrete anchorage devices must comply with section 75 and must be galvanized.

The concrete collar must be minor concrete.

Bar reinforcing steel must comply with section 52.

Pourable seal must comply with section 51-2.02B(2).

Structure backfill must comply with section 19-3.02B.

#### 75-1.03H(3) Construction

Slightly round corrugated steel pipe sharp edges and edges that are marred, cut, or roughened in handling or installation. Clean and paint the edges of the pipe as specified for repairing damaged galvanized surfaces in section 75-1.05.

Install the steel cover plates and concrete anchorage devices under section 75.

Place structure backfill under section 19-3.03E. Do not pond or jet the backfill. Compact structure backfill to a relative compaction of at least 90 percent.

#### 75-1.03H(4) Payment

Earthwork in not included in payment for isolation casing.

AA

## 80 FENCES

**Replace section 80-1.08 with:**

### **80-1.08 WROUGHT IRON FENCES**

Wrought iron fences must match existing wrought iron fences in material, type and color as directed by the Engineer.

**Add to section 80-10.02:**

Wrought iron gates must match existing wrought iron fences in material, type and color as directed by the Engineer.

Automated gate openers must be LiftMaster CSW24V, or approved equal, and must include a reflective photo beam, vehicle loop detectors, edge sensors and an emergency vehicle switch. Automatic gate openers and associated safety components must be for commercial use.

**Add to section 80-10.03:**

Automated gate openers and associated safety components must be installed per manufacturer's specifications.

Provide property owner with a minimum of two gate remotes at completion of the gate construction.

AA

## DIVISION IX TRAFFIC CONTROL FACILITIES

### 83 RAILINGS AND BARRIERS

**Replace section 83-1.02C(3) with:**

#### **83-1.02C(3) Alternative Flared Terminal System**

Alternative flared terminal system must be furnished and installed as shown on the plans and under these special provisions.

The allowable alternatives for a flared terminal system must consist of one of the following or a Department-authorized equal.

1. TYPE FLEAT TERMINAL SYSTEM - Type FLEAT terminal system must be a Flared Energy Absorbing Terminal 350 manufactured by Road Systems, Inc., located in Big Spring, Texas, and must include items detailed for Type FLEAT terminal system shown on the plans. The Flared Energy Absorbing Terminal 350 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 Industries, Inc., 4100 13<sup>th</sup> Street, S.W., Canton, OH 44708, telephone (330) 477-4800.
2. TYPE SRT TERMINAL SYSTEM - Type SRT terminal system must be an SRT-350 Slotted Rail Terminal (8-post system) as manufactured by Trinity Highway Products, LLC, and must include items detailed for Type SRT terminal system shown on the plans. The SRT-350 Slotted Rail Terminal (8-post system) can be obtained from the manufacturer, Trinity Highway Products, LLC, P.O. Box 99, Centerville, UT 84012, telephone (800) 772-7976.

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.

For Type SRT terminal system, the steel foundation tubes with soil plates attached must be, at the Contractor's option, either 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. The wood terminal posts must be inserted into the steel foundation tubes by hand and must not be driven. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts must be coated with a grease that will not melt or run at a temperature of 149 degrees F or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

For Type FLEAT terminal system, the soil tubes 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. Wood posts must be inserted into the steel foundation tubes by hand. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts must be coated with a grease that will not melt or run at a temperature of 149 degrees F or less. The edges of the wood posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

After installing the terminal system, dispose of surplus excavated material in a uniform manner along the adjacent roadway where designated by the Engineer.

**Replace section 83-1.02G(4) with:**

**83-1.02G(4) Ornamental Metal Railing**

**83-1.02G(4)(a) Summary**

Metal railing consists of tubular metal rails, welded wire mesh and frame, and "lemon tree" cuts supported by metal posts, pickets, base plates, anchor bolts, hardware, and fittings.

**83-1.02G(4)(b) Submittals**

Mockups: Build full size mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Metal railing with lemon tree cut-out and welded wire mesh and frame.

**83-1.02G(4)(c) Quality Control and Assurance**

Pre-installation Conference: Conduct conference at job site.

**83-1.02G(4)(d) Materials**

Materials for tubular rails, posts, pickets, base plates, welded wire mesh and frame, "lemon tree" cut-outs, rods, bolts, and nuts must comply with the requirements shown in the following table:

Material	ASTM
Tubular steel rails	A 500, Grade B
Steel posts, pickets, rolled bars, and plate washers	A 36/A 36M
Steel base plates for tubular posts	A 36/A 36M
Steel welded wire mesh and U-shaped frame	A 2453/A 2453M
Steel "Lemon Tree" cut-outs	A 653/A 653M
HS bolts	A 325, A 325M, or A 449
HS threaded rods	A 449
Nuts and washers for HS bolts and rods	A 325 or A 325M

**83-1.02G(4)(e) Construction**

Welded wire mesh (1 inch square with 0.063 inch diameter wire) set and welded in U-shaped frame. Frame welded to tubular steel rails and posts on outside face of fencing.

"Lemon tree" cut-outs laser cut as detailed on Plans with all edges ground smooth. "Lemon tree" cut-outs welded to pickets on inside face of fencing.

Stud bolts must comply with the specifications for stud connectors in section 55-1.02.

HS bolts or threaded rods furnished under ASTM A 449 must comply with the mechanical requirements specified in ASTM A 449 after galvanizing.

Install shims at posts and railings, where necessary, to provide uniform bearing and conformance with the horizontal lines and vertical grade lines. Shims at steel posts must be commercial quality, galvanized sheet steel.

Built up tubular railing must match the seamless tubing in appearance.

Submit 2 sets of anchor bolt layouts before placing parapet or other structural support reinforcement.

Carefully handle materials to avoid bending, braking, abrading, or otherwise damaging the parts. Do not use manufacturing, handling, or installation methods that damage or distort the members or damage the galvanizing.

Before the railing parts are assembled, clean bearing surfaces and surfaces to be in permanent contact. The bases of posts must be true and flat to provide uniform bearing on the concrete portions of the railing.

Adjust the vertical position of the metal railing to allow for camber and dead load deflection of the superstructure. The amount of adjustment will be ordered before the metal railing is installed.

Painting of the metal railing, pipe hand railing and lemon tree cutout must comply with specifications in section 59-3.

#### **Replace section 8.1-02H with:**

#### **83-1.02H Tiling**

##### **83-1.02H(1) General**

Tiling consists of custom fabricated tiles, grout, bond coat, waterproof membrane, and ancillary materials attached to concrete substrate.

Carefully handle tile to avoid braking, chipping, or otherwise damaging the pieces. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location. Store liquid materials in unopened containers and protect from freezing.

##### **83-1.02H(2) Submittals**

Mockups: Build full size mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockup of one citrus label tile installation with terra-cotta tile surround. Use same citrus label tile as approved during sample submittal process.
2. Build mockup of one interpretive tile panel installation with terra-cotta tile surround. Use same interpretive tile panel as approved during sample submittal process.

##### **83-1.02H(3) Quality Control and Assurance**

Pre-installation Conference: Conduct conference at job site.

1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades. Maximum allowable variation in tile substrate – for tiles with all edges shorter than 15 inches, maximum allowable variation is ¼ inch in 10 feet from the required plane with no more than 1/16 inch variation in 12 inches when measured from the high points in the surface. For tiles with at least one edge 15 inches in length, maximum allowable variation is 1/8 inch in 10 feet from the required plane with no more than 1/16 inch variation in 24 inches when measured from the high points in the surface.

##### **83-1.02H(4) Terra-Cotta Tiles**

##### **83-1.02H(4)(a) Summary**

Terra-cotta tile installation consists of custom fabricated terra-cotta tiles, cementitious grout, grout sealer, caulk, cementitious bond coat, and waterproof membrane.



### 83-1.02H(4)(b) Materials

Terra-cotta tile custom fabricated by an approved manufacturer located in Corona, CA. Terra-cotta tile must comply with ICC-ES Evaluation Report No. 2144. Tile thickness: ½ inch; tile dimensions as shown on Plans. Color: As selected by Architect from manufacturer's full range.

All other materials, unless noted otherwise, must comply with the requirements shown in the following table:

Material	ANSI
Cementitious grout (Sanded)	A118.6
Cementitious bond coat	A118.4
Waterproof membrane	A118.10

Grout Color: As selected by Architect from manufacturer's full range.

### 83-1.02h(4)(c) Construction

Concrete must be well-cured, dimensionally stable, and free of cracks, waxy or oily films, and curing compounds. As required, bush-hammer or sandblast concrete to facilitate bonding.

Grout joint width 1/8 inch maximum; nominal centerline of all joints must be straight and of even width. Grout joints must be sealed with penetrating sealer. Sealer must comply with all Federal EPA and SCAQMD standards for VOC.

All expansion, control, construction, cold, saw-cut, isolation, contraction, and seismic joints in concrete structure must continue through tilework. Expansion joint width must comply with Tile Council of North America (TCNA) installation method EJ171. Fill expansion joint with commercial 100% silicone caulk. Color: As selected by Architect from manufacturer's standard full range. Caulk must comply with ASTM C 920, Type S, Grade NW, Class 25, Use T, I, M, and G and ASTM C 794 properties.

Install terra-cotta tiles per Tile Council of North America (TCNA) installation method W201.

### 83-1.02H(5) Ceramic Glazed Tiles

#### 83-1.02H(5)(a) Summary

Ceramic glazed tile installation for citrus label and interpretive panel tiles consists of custom ceramic glazed tiles (with text and imagery silk-screened), cementitious grout, grout sealer, caulk, bond coat, and waterproof membrane.

#### 83-1.02H(5)(b) Materials

Custom colored and fabricated ceramic glazed tile composed of mixtures of predominantly clays and other naturally-occurring minerals that have been mixed with water and fired in a high temperature kiln. Ceramic tile must comply with ANSI A137.1. Tile thickness: 5/16 inch; tile dimensions as shown on Plans.

Citrus Label Tiles:

Architect to furnish 26 different full color citrus labels. "Orange Packing" labels from Riverside locate on east end of bridge and "Lemon Packing" labels from Corona locate on west end of bridge. Image silk-screened onto tile. Tile clear glazed with matte finish.

Architect to furnish 23 different full color images of citrus labels for each tile. Each image to be silk-screened onto a ceramic tile and glazed with a clear, matte finish by General Contractor. Each label will be installed on roadway side of a bridge light fixture concrete base. "Orange Packing" labels from Riverside to be located on east side of bridge. "Lemon Packing" labels from Corona to be located on west side of bridge.

Interpretive Panel Tiles:

Background ceramic tile field colors to match Pantone® Cool Gray 9 and PMS 4655; see Plans for color locations. Text and images shown on Plans to be silk-screened onto colored tiles and glazed with a clear, matte finish by General Contractor. Font style: Times; font size as shown on Plans. Font color: Black. All images sepia-toned, unless noted otherwise on Plans. All images hand drawn by a

sole artist. Reduced color copy of interpretive tile panel Plans is included in Appendix L. Full size color copy of interpretive tile panel Plans is available at the District office.

All other materials, unless noted otherwise, must comply with the requirements shown in the following table:

Material	ANSI
Cementitious grout (Sanded)	A118.6
Cementitious bond coat	A118.4
Waterproof membrane	A118.10

Grout Color: As selected by Architect from manufacturer's full range.

**83-1.02G(5)(c) Construction**

Concrete must be well-cured, dimensionally stable, and free of cracks, waxy or oily films, and curing compounds. As required, bush-hammer or sandblast concrete to facilitate bonding.

Grout joint width 1/8 inch maximum; nominal centerline of all joints must be straight and of even width. Grout joint sealed must be sealed with a penetrating sealer. Sealer must comply with all Federal EPA and SCAQMD standards for VOC.

All expansion, control, construction, cold, saw-cut, isolation, contraction, and seismic joints in concrete structure must continue through tilework. Expansion joint width must comply with Tile Council of North America (TCNA) installation method EJ171. Fill expansion joint with commercial 100% silicone caulk. Color: As selected by Architect from manufacturer's standard full range. Caulk must comply with ASTM C 920, Type S, Grade NW, Class 25, Use T, I, M, and G and ASTM C 794 properties.

Install tiles per Tile Council of North America (TCNA) installation method W201.

**Add to section 83-2.02D(1):**

Formed relief architectural treatment surface texture must comply with section 51-1.03G.

Payment for Ceramic Glazed tiles and Terra-Cotta tiles are not included in the payment for concrete barrier or concrete parapet and are paid separately.

**Replace section 83-2.02E(3) with:**

**83-2.02E(3) Type TRACC Crash Cushion**

Type TRACC crash cushion must be installed where shown.

Type TRACC crash cushion must be a TRACC as manufactured by Trinity Highway Products, LLC, or an approved equal manufactured after March 31, 1997 and on the Authorized Material List for highway safety features. Type TRACC crash cushion must include the items shown for the crash cushion.

The successful bidder can obtain the crash cushion from the manufacturer, Trinity Highway Products, LLC, P.O. Box 99, Centerville, UT 84012, telephone (800) 772-7976.

Submit a copy of the manufacturer's plan and parts list as an informational submittal.

Submit a certificate of compliance for Type TRACC crash cushion.

Install the crash cushion under the manufacturer's installation instructions.

After installing the Type TRACC crash cushion and backup, dispose of surplus excavated material in a uniform manner along the adjacent roadway where designated by the Engineer.

**Add to section 83-2.03:**

Payment for type TRACC crash cushion includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing type TRACC crash cushion system, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

AA

**84 TRAFFIC STRIPES AND PAVEMENT MARKINGS**

**Add to section 84-1.01:**

Pavement markers must comply with section 85

AA

**85 PAVEMENT MARKERS**

**Add to section 85-1.04:**

Pavement markers are included in the payment for striping

AA

**86 ELECTRICAL SYSTEMS**

Replace section 86 with Appendix J for portions of work within the County of Riverside limits.

Replace section 86 with Appendix K for portions of work within the City of Riverside limits.

AA

## **DIVISION X MATERIALS**

### **88 GEOSYNTHETICS**

**Add to section 88-1.02B:**

Filter fabric for mechanically stabilized embankment (temporary retaining wall) must be Class A.

AA

AA

## **DIVISION XI BUILDING CONSTRUCTION**

### **99 BUILDING CONSTRUCTION**

#### **99-08100 STEEL DOORS AND FRAMES**

##### **99-08100A General**

##### **99-08100A(1) Summary**

This work consists of installing steel doors and frames.

##### **99-08100A(2) Definitions**

**ANSI/SDI:** American National Standards Institute/Steel Door Institute.

**ANSI/NAAMM-HMMA:** American National Standards Institute/National Association of Architectural Metal Manufacturers-Hollow Metal Manufacturers Association.

##### **99-08100A(3) Submittals**

Product Data: Submit for all products. Include the following:

1. Material descriptions
2. Core descriptions
3. Fire-resistance rating
4. Installation instructions for fire rated assemblies
5. Finishes
6. Construction details

Shop Drawings: Include the following:

1. Elevations of each door design
2. Details of doors, including vertical and horizontal edge details and metal thicknesses
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses
4. Locations of reinforcement and preparations for hardware
5. Details of each different wall opening condition
6. Details of anchorages, joints, field splices, and connections
7. Details of accessories
8. Details of moldings, removable stops, and glazing
9. Where electrified door hardware is described, include details of conduit and preparations for power, signal, and control systems

Door Schedule: Submit a schedule of steel doors and frames using same reference numbers for details and openings shown. Include a description of the type, location and size of each door and frame. Coordinate with door hardware schedule.

Fire-Rated Door Assembly Product Test Reports: Submit comprehensive tests performed by a NRTL for each type of fire-rated door assembly.

Certificates of Compliance: Furnish a certificate of compliance for steel doors and frames.

**99-08100A(4) Quality Control and Assurance**

Single Source Responsibility: Obtain steel doors and frames from single manufacturer.

Steel Doors and Frames: Fabricate steel doors and frames under ANSI/SDI A250.8 or ANSI/NAAMM-HMMA 861.

Hardware Reinforcement: Fabricate hardware reinforcement under ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

Fire-Rated Door Assemblies: Furnish assemblies complying with NFPA 80, with all components listed and labeled by a NRTL, for fire-protection ratings shown. Assemblies must be listed by the California State Fire Marshal.

Smoke-Control Door Assemblies: Furnish assemblies complying with UL 1784, with all components listed and labeled by a NRTL. Assemblies must be listed by the California State Fire Marshall. Install assemblies under NFPA 105.

**99-08100A(5) Delivery, Storage, and Handling**

Deliver steel doors palletized, wrapped, or crated to provide protection during transit and job site storage. Do not use nonvented plastic. Furnish additional protection to prevent damage to finish.

Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

Store steel doors and frames under cover at the job site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on at least 4-inch high wood blocking. Do not store in a way that traps excess humidity.

Furnish at least 1/4-inch space between each stacked door to allow air circulation.

**99-08100A(5) Coordination**

Coordinate installation of anchorages for steel frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors.

**99-08100B Materials**

**99-08100B(1) General**

Thickness dimensions must be minimum thickness of base metal without coatings.

Steel sheet must comply with the following:

1. Cold rolled must be commercial steel, Type B, ASTM A 1008/A 1008M
2. Hot-rolled must be commercial steel, Type B, ASTM A 1011/A 1011M; free of scale, pitting, surface defects, and pickled and oiled
3. Metallic coated must be commercial steel, Type B, ASTM A 1008/A 1008M with at least A60 metallic coating complying with ASTM A 653/A 653M
4. Stainless steel must be Type 304, ASTM A 666

Frame anchors must be commercial steel, hot dip galvanized complying with ASTM A 153/A 153M.

Inserts and fasteners must be commercial steel, hot dip galvanized complying with ASTM A 153/A 153M.

Glazing must comply with section 99-08810. Glazing must be at least 3/16-inch thick.

**99-08100B(2) Steel Doors**

**99-08100B(2)(a) General**

Steel doors must be at least 1-3/4 inches thick, full flush, seamless hollow metal construction unless otherwise shown. Construct doors with smooth surfaces without visible joints or seams on exposed faces, and the following:

1. Concealed stiffeners and hardware reinforcement from steel sheet, except use stainless steel to match stainless steel face sheets.
2. Furnish beveled edge, 1/8-inch in 2 inches, for single doors. Furnish round vertical edge with 2 1/8-inch radius for double doors.
3. Astragals must be full height, 1/8-inch flat bar or folded sheet strip, at least 0.053 inches thick, and same material as face sheets. Weld on the outside of the active leaf of double doors.

#### **99-08100B(2)(b) Exterior Doors**

Exterior doors must comply with ANSI/SDI A250.4, physical endurance Level A, and the following:

1. Fabricate face sheets, vertical stiffeners, and top and bottom channels from at least 0.053-inch thick metallic-coated steel sheet.
2. Fabricate the steel-stiffened core using vertical stiffeners that extend full-door height. Install stiffeners not more than 6 inches apart and spot weld to both face sheets no more than 5 inches on center. Fill spaces between stiffeners with glass-fiber insulation or mineral-fiber insulation.
3. Top and bottom channels must be continuous and spot welded to both face sheets. The top channel must be flush and the bottom channel must be inverted.
4. Include moisture vents in the bottom channel.

#### **99-08100B(2)(c) Interior Doors**

Interior doors must comply with ANSI/SDI A250.4, physical endurance Level B, and the following:

1. Fabricate face sheets, vertical stiffeners, and top and bottom channels from at least 0.042-inch thick steel sheet unless metallic-coated sheet is described
2. Use the manufacturer's standard kraft-paper honeycomb core, polystyrene core, polyurethane core, or steel-stiffened core with glass-fiber or mineral-fiber insulation
3. Top and bottom channels must be at least 0.042 inch thick, same material as face sheets, and spot welded to both face sheets. The top channel must be flush and the bottom channel must be inverted.

#### **99-08100B(3) Steel Frames**

##### **99-08100B(3)(a) General**

Steel frames must comply with details shown for type and profile. Frames must be mitered corners, integral stop, and continuously welded unless otherwise shown.

Frames for fire rated doors must be listed and labeled for the same rating shown for the matching door.

Steel frames must be constructed as follows:

1. Interior frames from cold-rolled steel sheet unless metallic-coated sheet is described for door.
2. Exterior frames from metallic-coated steel sheet.
3. Borrowed-light frames from 0.053-inch-thick steel sheet.
4. Sidelight and transom frames from same thickness material as adjacent door frame.
5. Frames for openings 48 inches and less from 0.053-inch thick steel sheet.
6. Frames for openings wider than 48 inches from 0.067-inch thick steel sheet. Include at least 0.093-inch thick steel channel or angle stiffener head reinforcement.

##### **99-08100B(3)(b) Frame Anchors**

Jamb Anchors: Select one of the following methods to suit the wall type shown:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, at least 0.042 inch thick, with corrugated or perforated straps at least 2 inches wide by 10 inches long. For grouted frames or where shown use wire anchors at least 0.177 inch thick.
2. Stud Wall Type: Designed to engage stud, welded to back of frames; at least 0.042-inch thick.
3. Drywall Slip-on Type: Adjustable compression anchors.
4. Postinstalled Expansion Type for Tilt Up and In-Place Concrete: At least 3/8-inch diameter bolts with expansion shields or inserts. Furnish pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

Floor Anchors: Furnish the same material as frame and at least 0.042-inch thick. Select one of the following attachment methods for the floor shown:

1. Monolithic Concrete Slab: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slab: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

#### **99-08100B(3)(c) Stops And Moldings**

Moldings for Glazed Lites in Doors: At least 0.032-inch thick, fabricate from same material as door face sheet in which installed.

Fixed Frame Moldings: Form integral with steel frames, at least 5/8 inch high unless otherwise shown.

Loose Stops for Glazed Lites in Frames: At least 0.032-inch thick, fabricate from same material as door face sheet in which installed.

#### **99-08100B(4) Louvers**

Louvers for interior doors must be non-vision inverted Y type. Frame must be cold rolled steel sheet at least 0.042 inches thick, mitered corners, with hidden welds. Frame screws must be on the inside.

Louvers for exterior doors must be dual security grille type. Fabricate frame and blades from metallic coated steel sheet. Fabricate grates from metallic coated steel sheet at least 0.093 inches thick. Blades must be non-vision inverted Y type. Include removable bronze mesh insect screen mounted on the inside.

Louvers in fire-rated assemblies must be factory fabricated, multi-blade adjustable fire damper type. Frame must be cold rolled steel sheet at least 0.053 inches thick, mitered corners, with hidden welds. Include a 160°F fusible link and removable bronze mesh insect screen mounted on the inside of exterior doors. Frame screws must be on the inside.

#### **99-08100B(5) Accessories**

Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

Ceiling Struts: At least 1/4-inch thick by 1-inch wide steel.

Grout Guards: Form from same material as frames and at least 0.016-inch thick.

Sealants: Sealants must be ultraviolet and ozone resistant, gun grade polysulfide or polyurethane, multicomponent, complying with ASTM C 920.

Grout: Furnish grout complying with ASTM C 476, except with a maximum slump of 4 inches, as measured under ASTM C 143.

#### **99-08100B(6) Fabrication**

##### **99-08100B(6)(a) General**

Fabricate steel doors and frames to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at job site, clearly identify work that cannot be permanently factory assembled before shipment.

Fabricate steel doors and frames to tolerances under SDI 117 or ANSI/NAAMM-HMMA 861.

##### **99-08100B(6)(b) Steel Doors**

Furnish overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where shown. Extend at least 3/4 inch beyond edge of door on which astragal is mounted.

Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold or hot-rolled steel sheet.

Factory cut glazing and louver openings in doors.

### **99-08100B(6)(c) Steel Frames**

#### **99-08100B(6)(d) Frame Anchors**

Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.

Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

Jamb Anchors: Unless otherwise shown, furnish number and spacing of anchors as follows:

1. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
  - 1.1. Two anchors per jamb up to 60 inches high.
  - 1.2. Three anchors per jamb from 60 to 90 inches high.
  - 1.3. Four anchors per jamb from 90 to 120 inches high.
2. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
  - 2.1. Three anchors per jamb up to 60 inches high.
  - 2.2. Three anchors per jamb up to 60 inches high.
  - 2.3. Five anchors per jamb from 90 to 96 inches high.
  - 2.4. Two anchors per head for frames above 42 inches wide and mounted in metal-stud partitions.

Compression Type Anchor: Not less than two anchors in each jamb.

Postinstalled Expansion Type Anchor: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.

#### **99-08100B(6)(e) Stops and Moldings**

Furnish stops and moldings around glazed lites as follows:

1. Form corners of stops and moldings with butted or mitered hairline joints.
2. Furnish fixed stops and moldings welded on the secure side of steel doors and frames for single glazed lites.
3. Furnish fixed and removable stops and moldings for multiple glazed lites so that each glazed lite can be removed independently.
4. Furnish fixed frame moldings on the outside of exterior and on the secure side of interior doors and frames.
5. Furnish loose stops and moldings on the inside of steel doors and frames.
6. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation described.

### **99-08100B(7) Shop Finishes**

Apply shop primer to steel doors, frames, and louvers. Use manufacturer's standard, fast-curing, lead-free and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria. Primer must be recommended by manufacturer for substrate; and compatible with field-applied coating.

### **99-08100C Construction**

#### **99-08100C(1) General**

Examine rough-in for embedded and built-in anchors to verify actual locations before frame installation. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **99-08100C(2) Preparation**

Check door frames for square, alignment, twist, and plumb before installation and adjust if necessary. Tolerances are  $\pm 1/16$  inch.

Check the door frame as follows:

1. Squareness at door rabbet on a line 90 degrees from jamb perpendicular to frame head
2. Alignment at jambs on a horizontal line parallel to plane of wall
3. Twist at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall
4. Plumbness at jambs on a perpendicular line from head to floor



Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

Doors, frames, stops, molding, louvers, and accessories must be cleaned, prepared, and painted under section 99-09900 before installation.

If grout contains an antifreezing agent, field apply a bituminous coating to the backside of frames.

### **99-08100C(3) Installation**

#### **99-08100C(3)(a) General**

Install steel doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with manufacturer's written instructions. Install fire rated assemblies under NFPA 80, the SFM, and the manufacturer's written instructions.

After installation, measure frames for squareness, alignment, twist, and plumbness under section 99-08100C(2). Adjust to meet tolerances as required.

Remove grout and other bonding material from exposed surfaces of steel doors and frames immediately after installation.

Install and fit fire rated assemblies under NFPA 80.

Install and fit smoke-control door assemblies under NFPA 105.

#### **99-08100C(3)(b) Steel Frames**

Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove spreaders and braces. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

Where frames are fabricated in sections because of shipping or handling limitations, field splice at accepted locations by welding face joint continuously. Grind, fill, dress, and make splices smooth, flush, and invisible on exposed faces.

Install frames with removable glazing stops located on the secure side of opening.

Install floor anchors for each jamb and mullion that extends to the floor and secure with expansion anchors.

Coordinate installation of frames to allow for solidly filling space between frame and walls with grout or mineral-fiber insulation as shown.

Solidly pack mineral-fiber insulation behind frames set in metal-stud partitions. Fill frames in masonry or concrete walls with grout. Hand trowel grout; do not pump in. Do not allow frames to be deformed or damaged by grout forces.

#### **99-08100C(3)(c) Steel Doors**

Fit steel doors accurately in frames. Shim as necessary. Clearances must be as follows:

1. Jambs and Head: 1/8 inch  $\pm$  1/16 inch.
2. Between Edges of Pairs of Doors: 1/8 inch  $\pm$  1/16 inch.
3. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
4. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

#### **99-08100C(3)(d) Glazing**

Install glazing under section 99-08810 and the door manufacturer's written instructions. Secure stops with countersunk machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

#### **99-08100C(4) Adjustments**

Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Replace defective work, including steel doors and frames that are warped, bowed, or otherwise unacceptable.

**99-08100C(5) Field Finish Repairs**

After installation, clean field welds, bolted connections, and abraded areas of paint under SSPC-SP 2. Apply one coat of the same coating as applied for painting to the cleaned areas. Use galvanizing repair paint for metallic coated surfaces complying with manufacturer's written instructions.

**99-08100D Payment**

Not Used

**99-08710 DOOR HARDWARE****99-08710A General****99-08710A(1) Summary**

Scope: This work consists of installing mechanical door hardware and electrified door hardware for swinging doors.

**99-08710A(2) Design Requirements**

Hardware must be free of defects, blemishes, and excessive play. Obtain each kind of hardware from 1 manufacturer for (1) latch and locksets, (2) exit devices, or (3) hinges and closers.

Furnish hardware items required to complete the work complying with performance level and design intent. Comply with the manufacturers' instructions for installation.

Furnish the manufacturer's updated item where specified item is now obsolete.

Furnish hardware with suitable fasteners to complete work.

Furnish ANSI/BHMA A156 Operational Grade 1 and Security Grade 1 for door hardware unless otherwise specified.

Fire-Rated Door Assemblies: Furnish door hardware (1) rated for use, (2) listed by the SFM, and (3) complying with NFPA 80.

Smoke-Control Assemblies: Furnish door hardware (1) rated for use, (2) listed by the SFM, (3) complying with UL 1784, and (4) installed under NFPA 105.

Maintenance Tools: Furnish a complete set of specialized tools for continued adjustment, maintenance, removal, and replacement of door hardware.

**99-08710A(3) Definitions**

**BHMA:** Builders Hardware Manufacturers Association.

**NRP:** Non-removable pin.

**SFIC:** Small format interchangeable core.

**SFM:** CA State Fire Marshall.

**99-08710A(4) Submittals**

Product Data: Submit for all products. Include the following:

1. Manufacturer's technical information and catalog cuts for each door hardware item. Include style, function or type, grades, size, and finish.
2. Fasteners and other pertinent information.
3. Explanation of abbreviations, symbols, and codes contained in schedules.
4. ANSI/BHMA certification.
5. SFM listing and UL approval where specified.
6. Installation details for door hardware.

Shop Drawings:

Submit locations of door hardware sets, cross-referenced to drawings, both on floor plans and in door schedule. Include identification number, location, hand, fire rating, and material of each door and frame.

Submit details of electrified door hardware, including:

1. Power, signal, and control wiring diagrams. Include conductor numbers.
2. Schematic diagrams of interface of electrified door hardware and building intrusion and security systems.

**Door Hardware Schedule:** Submit door hardware sets with all items required for each door. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, style, thickness, hand, function, and finish of door hardware.

**Closeout Documents:**

Include closeout documents in the "Maintenance and Operations Manual" before completion of the work. Submit 1 copy of PDF files on CD or DVD.

Closeout documents must include the following:

1. Index.
2. Parts list.
3. Operating instructions.
4. Maintenance instructions.

Incomplete or inadequate documentation will be returned for correction and resubmittal.

#### **99-08710A(5) Quality Control and Assurance**

##### **99-08710A(5)(a) General**

Floor Stops must comply with California Access Compliance Reference Manual Policy No. 99-08, *Door Stops and Other Floor-Mounted Obstructions*.

##### **99-08710A(5)(b) Regulatory Requirements**

Door hardware and installation must comply with 24 CA Code of Regs Pt 2 and the following table:

Door hardware item	ANSI/BHMA Standard
Full mortise hinges	ANSI/BHMA A156.1
Cylindrical locksets	ANSI/BHMA A156.2
Automatic flush bolts, panic devices, exit only devices, and coordinators	ANSI/BHMA A156.3
Door closers	ANSI/BHMA A156.4
Lock cylinders, single cylinder deadbolts and electric strikes	ANSI/BHMA A156.5
Push plates, pull plates, kick plates, and mop plates	ANSI/BHMA A156.6
Mortise locksets	ANSI/BHMA A156.13
Manual flush bolts, floor stops, wall stops, door stops, and wall bumpers	ANSI/BHMA A156.16
Materials and finishes	ANSI/BHMA A156.18
Thresholds	ANSI/BHMA A156.21
Door gasketing, automatic door bottoms, door shoes with rain drip, door sweeps, door top weatherstrips, and overhead door drips	ANSI/BHMA A156.22
Electromechanical locks	ANSI/BHMA A156.23
Keying systems	ANSI/BHMA A156.28
Electric strikes and frame mounted actuators	ANSI/BHMA A156.31
Hardware preparation in steel doors and steel frames	ANSI/BHMA A156.115
Hardware preparation in wood doors with wood or steel frames	ANSI/BHMA A156.115W

#### **99-08710A(5)(c) Certificates**

Certificates of Compliance: Submit a Certificate of Compliance for door hardware sets.

#### **99-08710B Materials**

##### **99-08710B(1) General**

Furnish door hardware sets for each door as described.

Exit doors must be operable from the inside at all times with single motion and without the use of a key, special knowledge, or effort.

Plans show direction of swing or hand of each door leaf. Furnish each item of hardware for proper door movement.

##### **99-08710B(2) Hinges**

Hinges must be full mortise, five knuckle, ball bearing construction and comply with the following:

1. Heavy Weight Hinges:
  - 1.1. Interior: Type 8111
  - 1.2. Exterior: Type 5111, use NRP with set screw on out swinging exterior doors
2. Standard Weight Hinges: Type A8112

##### **99-08710B(3) Mechanical Locks and Latches**

##### **99-08710B(3)(a) General**

Lock Throw: Comply with length of bolts required for labeled fire-rated doors and the following:

1. Cylindrical Lockset: At least 1/2-inch latchbolt throw
2. Mortise Lockset: At least 3/4-inch latchbolt throw
3. Deadbolt: At least 1-inch bolt throw

Lock Backset: 2-3/4 inches, unless otherwise described.

Strike: Manufacturer's standard strike for each lock bolt or latchbolt, with strike box and curved lip extended to protect frame. Furnish (1) flat-lip strike for three-piece antifriction latchbolts where instructed

by the lock manufacturer, (2) extra-long-lip strike for frames with applied wood casing trim, or (3) manufacturer's specific aluminum strike box for aluminum frames.

#### **99-08710B(3)(b) Cylindrical Locksets**

Cylindrical locksets must be series 4000, non handed steel lock chassis, SFIC, self aligning trim with concealed through bolts. Include the following:

1. Lever: Curved with return. On exterior doors, free wheeling exterior lever when locked.
2. Rose: Chromium, flat with rounded edge.
3. Latchbolt: Chrome, square corner. Same manufacturer as lockset.
4. Screws: Supplied with lockset.

Entrance lockset must be Function F109 with dual levers and roses. Passage lockset must be Function F75 with dual levers and roses. Privacy lockset must be Function F76A, dual levers and roses, with coin turn outside and thumbscrew turn inside.

#### **99-08710B(3)(d) Auxiliary Locks**

Single cylinder deadbolt must be Function E2151, free spinning solid brass cylinder collar and security shield, non handed, steel alloy deadbolt with anti-saw center, SFIC, with concealed through bolts.

#### **99-08710B(3)(e) Lock Cylinders**

Lock cylinders must be a master key system.

Lock cylinders must be tumbler type, constructed from nickel silver, and same manufacturer as locking devices. Cylinders must be SFIC type, interchangeable cores with six pin barrels, and face finished to match lockset.

Temporary cores must be SFIC type with interchangeable cores with six pin barrels. Temporary cores must be a change key system. Temporary cores and keys must not be the Department's permanent keying system or furnished on the same keyway or key section as the Department's permanent keying system. Temporary cores will remain Department property.

Keys must be nickel silver and same manufacturer as locking devices. Furnish 2 change keys per temporary core. Furnish 2 blank keys per permanent core. Stamp change key bows and blank key bows "County of Riverside" and "Do Not Duplicate."

#### **99-08710B(6) Flush Bolts**

Manual Flush Bolts: Function L04251 set or Function L02461 set as required, non handed, 1/2-inch bolt head, 3/4-inch min bolt throw, and dust proof strikes.

#### **99-08710B(7) Accessories For Pairs Of Doors**

Coordinators: Type 21A, flush bolts, manufacturer's coordinated channel or filler, active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates. Include built-in, adjustable safety release.

#### **99-08710B(13) Door Gasketing**

Door Gasketing: Bumper-type resilient inserts with retainer strips and surface applied. Perimeter seals must meet performance tests for heat, cold, air leakage, and smoke. At astragals, furnish a compression bulb resilient pressure sensitive door gasketing. Materials must be NRTL listed where used with labeled assemblies.

#### **99-08710B(14) Thresholds**

Thresholds must be factory non-slip mill-finished aluminum, nominal 6 inches wide unless otherwise shown, and full width of opening described.

Threshold bedding sealant must be weatherproof silicone sealant and adhesive.

### **99-08710B(15) Shop Fabrication**

**Manufacturer's Nameplate:** Do not use products that have manufacturer's name or trade name displayed in a visible location except with required fire-rated labeling. Manufacturer's identification will be permitted on lock cylinder rims.

**Base Metals:** Furnish door hardware items of base metal specified, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware items. Do not use a manufacturer's standard materials or forming methods if different from the specified standard.

**Fasteners:** Screws must comply with commercially recognized industry standards for application intended. Furnish Phillips oval-head screws finished to match surface of door hardware. Furnish fire-rated fasteners for labeled assemblies for the following:

1. Hinges mortised to wood doors or frames.
2. Strike plates to wood frames.
3. Closers to wood doors and frames.
4. Surface hinges to steel doors.
5. Closers to steel doors and frames.
6. Surface-mounted exit devices to steel doors and frames.
7. Spacers or sex bolts for through bolting of hollow-metal doors.

Do not use aluminum fasteners. Furnish noncorrosive fasteners for exterior door gasketing applications.

### **99-08710B(16) Finishes**

**Interior Hardware:** Standard Finish 626 (US 26D), satin chromium.

**Exterior Hardware:** Standard Stainless Steel Finish 630 (US 32D), satin stainless steel. Where shown, use Standard Finish 626 (US 26D), satin chromium.

**Factory Covering:** Apply a strippable, temporary protective covering to exposed finishes before shipping.

### **99-08710C Construction**

#### **99-08710C(1) General**

**Doors and Frames:** Doors and frames must be set square, plumb, and properly prepared before hardware installation.

#### **99-08710C(2) Examination**

**Doors and Frames:** Examine doors and frames for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting door hardware installation.

#### **99-08710C(3) Installation**

Furnish heavy weight hinges for (1) interior doors with closers or panic devices, (2) interior doors wider than 3'-5", and (3) exterior doors. You must use 4 1/2-inch hinges unless otherwise described.

Furnish standard weight hinges for interior doors unless otherwise specified. For doors 2'-0" wide you must use 3-inch hinges. For doors wider than 2'-0" you must use 3 1/2-inch hinges.

Hardware items must be accurately fit, securely applied, adjusted, and lubricated to comply with the manufacturer's instructions. Hardware items must operate without binding or excessive play.

Hinges must be installed at equal spacing with the end hinges not more than 9 5/8 inches from the top and bottom of the door.

Thresholds must be set in a continuous bed of bedding sealant.

Mechanical stops on concrete surfaces must be attached with expansion anchoring devices. Mechanical stops mounted elsewhere must be attached with wood screws. Do not locate stops in the path of travel.

Hardware, except hinges, must be removed from surfaces to be painted before painting. Do not install surface-mounted items until finishes have been completed on substrates involved. Painting must comply with section 99-09900.

Furnish all dogging keys, closer valve keys, lock spanner wrenches, other factory furnished installation aids, instructions, and maintenance guides to the Engineer.

Install continuous weatherstripping at each edge of exterior door leaf. Seal finish must match adjacent frame color.

#### **99-08710C(4) Lock Cylinders**

Install temporary cores in all lockable doors during construction.

Furnish permanent cores and keys to the Engineer before Contract acceptance. The Department will install permanent cores.

#### **99-08710C(5) Cleaning and Protection**

Clean adjacent surfaces soiled by door hardware installation.

Clean hardware items as necessary to restore proper function and finish.

Furnish final protection and maintain conditions that ensure that door hardware is without damage or deterioration before Contract acceptance.

#### **99-08710C(6) Adjusting**

Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of HVAC equipment.

#### **99-08710C(7) Door Hardware Schedule**

Furnish hardware sets as specified in the following tables:

##### **DOOR HARDWARE SET 1**

No.	Item	Description	Quantity
1	Hinges	Type 5111	6
2	Cylindrical lockset and latch	Entrance	1
3	Cylindrical auxiliary deadbolt		1
4	Flush bolts		2
5	Lock cylinder	Top and Bottom	2
6	Gasketing	Perimeter bumper type	1
7	Threshold		1

#### **99-08710D Payment**

Not Used

#### **99-09900 PAINTING**

##### **99-09900A General**

##### **99-09900A(1) Summary**

Scope: This work consists of preparing surfaces to receive coatings and applying coatings.

The coatings specified in this section are in addition to any factory finishes, shop priming, or surface treatment described.

##### **99-09900A(2) Definitions**

**Detergent Wash:** Removal of dirt and water-soluble chemicals by scrubbing with a solution of detergent and water, and removal of all solution and residues with clean water.

**Hand Cleaning:** Removal of dirt, loose rust, mill scale, excess base material, filler, aluminum oxide, chalking paint, peeling paint, or paint that is not firmly bonded to the surfaces by using hand or powered wire brushes, hand scraping tools, power grinders, or sandpaper and removal of all loose particles and dust prior to coating.

**Mildew Wash:** Removal of mildew by scrubbing with a solution of detergent, hypochlorite-type household bleach, and warm water, and removal of all solution and residues with clean water.

**Abrasive Blasting:**

Removal of loosely adhering paint, dirt, rust, mill scale, efflorescence, weak concrete, or laitance, must be by the use of airborne abrasives. Loose particles, dust, and abrasives must be removed by blasting with clean, oil-free air.

Abrasives must be limited to mineral grit, steel grit, or steel shot, and must be graded to produce the surface profile recommended in the manufacturer's data sheet.

**Steam Cleaning:** Removal of oil, grease, dirt, or other foreign matter by using steam generated by commercial steam cleaning equipment, from a solution of water and steam cleaning compounds, and removal of all residues and cleaning compounds with clean water.

**TSP Wash:** Removal of oil, grease, dirt, paint gloss, and other foreign matter by scrubbing with a solution of trisodium phosphate and warm water, and removal of all solution and residues with clean water.

**Water Blasting:** Removal of dirt, loose scale, chalking, or peeling paint by low-pressure water cleaning. Water blasting must be performed under SSPC-SP12 and must produce a surface cleanliness meeting SSPC-SP12-WJ4. Equipment used must have a minimum flow rate of 1.5 gpm. If a detergent solution is used, it must be biodegradable and must be removed from all surfaces with clean water.

**99-09900A(3) Submittals**

**Product Data:**

Manufacturer's descriptive data, a materials list, and color samples must be submitted.

Product descriptive data must include product description, manufacturer's instructions for product mixing, thinning, tinting, handling, site environmental requirements, product application, and drying time.

Materials list must include manufacturer's name, trade name, and product numbers for each type coating to be applied.

**Samples:** Submit color samples. Samples must be manufacturer's color cards, nominally 2 by 3 inches for each color of coating shown. Color samples for stains must be submitted on wood of the same species, color, and texture as the wood to receive the stain.

**Certificates of Compliance:** Submit certificates of compliance for products required to comply with SSPC standards.

**99-09900A(4) Quality Control and Assurance**

**Regulatory Requirements:** Coatings and applications must comply with the rules for control of VOC emissions adopted by the AQMD in the air basin in which the coatings are applied.

**99-09900A(5) Site Environmental Requirements**

Coatings must be applied under the environmental constraints specified in the manufacturer's instructions. These conditions must be maintained until the coating has cured and is ready for recoat.

Continuous ventilation must be provided during application of the coatings.

Adequate lighting must be provided while surfaces are being prepared for coatings and during coating applications.



#### **99-09900A(6) Maintenance Stock**

Upon completion of coating work, deliver a full one-gallon container of each type and color of finish coat and stain used to the Engineer. Containers must be tightly sealed, have the manufacturer's standard product label, and be labeled with color, texture, and room locations where used.

#### **99-09900B Materials**

##### **99-09900B(1) General**

Products for each coating system must be from a single manufacturer and must comply with the Detailed Performance Standards of the Master Painters Institute (MPI). Each product must be shown on the MPI Approved Products List unless otherwise specified.

##### **99-09900B(2) Delivery, Storage, and Handling**

Products must be delivered to the site in sealed, labeled containers and stored in a well-ventilated area at an ambient air temperature of at least 45 degrees F. Container labeling must include manufacturer's name, type of coating, trade name, color designation, drying time, and instructions for tinting, mixing, and thinning.

#### **99-09900C Construction**

##### **99-09900C(1) Inspection**

Coatings must not be applied until surface preparation has been authorized by the Engineer. Notify the Engineer at least 3 business days before application of coatings.

##### **99-09900C(2) Surface Preparation**

Prepare surfaces for coating under the coating manufacturer's instructions unless otherwise specified.

Remove hardware, cover plates, light fixture trim, and similar items before preparing surfaces for coating. Following the application of the finish coating, the removed items must be reset in their original locations.

Steel and Other Ferrous Metals: Surface must be cleaned under SSPC-SP 1. Surface profile must be as required for the coating system specified.

##### **99-09900C(3) Application**

Coatings must be applied under the manufacturer's instructions and at the application rates recommended by the manufacturer to achieve the dry film thickness stated in the coating technical data sheet.

Mixing, thinning and tinting must comply with the manufacturer's instructions. After thinning, the coating must comply with the regulatory requirements.

Coatings must be applied only when surfaces are dry and properly prepared.

Cleaning and painting must be scheduled so that dust and other contaminants from the cleaning process do not fall on wet, newly coated surfaces.

Materials required to be coated must have coatings applied to all exposed surfaces, including the tops and bottoms of wood and metal doors, the insides of cabinets, and other surfaces not normally visible from eye level.

##### **Surface Finish Application:**

Each coat must be applied to a uniform finish. Finished surfaces must be free of surface deviations and imperfections such as skips, cloudiness, spotting, holidays, laps, brush marks, runs, sags, curtains, ropiness, improper cutting in, overspray, drips, ridges, waves, and variations in color and texture.

Each application of a multiple application finish system must closely resemble the final color coat, except each application must provide enough contrast in shade to distinguish the separate applications.

##### **Work Required Between Applications:**

Each application of material must be cured under the coating manufacturer's instructions before applying the next coating.

Stain blocking primer must be spot applied whenever bleeding substances are visible through the previous application of a coating.

**Timing of Applications:** The first application of the coating system must be during the same work shift that the final surface preparation was performed. Additional coats must be applied as soon as the required drying time of the preceding coat, specified in the coating manufacturer's instructions, has been met.

**Application Methods:**

Coatings must be applied by brush, roller or spray. Rollers must not leave a stippled texture in the paint film. Extension handles for rollers must not be greater than 6 feet in length.

If spray methods are used, surface deviations and imperfections such as overspray, thickness deviations, lap marks, and orange peel must be considered as evidence the work is unsatisfactory and the Contractor must apply the remainder of the coating by brush or roller, as authorized by the Engineer.

**Back Priming:** The first application of the coating system must be applied to all wood surfaces (face, back, edges, and ends) of wood materials that are not factory coated, immediately upon delivery to the job site. Surfaces of interior finish woodwork that adjoin concrete or masonry must be coated with one application of exterior wood primer before installation.

**Patches in Previously Coated Surfaces:** Where patches are made on surfaces of previously coated walls or ceilings, the entire surface to corners on every side of the patch must be coated with at least 1 application of the finish coat.

**Finishing Mechanical and Electrical Components:**

Shop primed mechanical and electrical components must be finish coated under the coating system specified for the substrate material. Louvers, grilles, covers, and access panels on mechanical and electrical components must be removed and coated separately.

Interior surfaces of air ducts which are visible through grilles or louvers must be coated with one application of flat black enamel, to the limit of the sight line.

Both sides and all surfaces, including edges and back of wood mounting panels for electrical and telephone equipment must be finish coated before installing equipment.

**99-09900C(4) Cleaning**

Upon completion of all operations, the coated surfaces must be thoroughly cleaned of dust, dirt, grease, or other unsightly materials or substances.

Surfaces marred or damaged as a result of your operations must be repaired, to match the condition of the surfaces before the beginning of your operations.

**99-09900C(4) Protection**

Provide protective devices, such as tarps, screens or covers, as necessary to prevent damage to the work and to other property or persons from all cleaning and painting operations.

Paint or paint stains on surfaces not designated to be painted must be removed at your expense and the original surface must be restored.

**99-09900C(5) Coating System**

The surfaces to be coated must be as described. When a coating system is not described for a surface to be finish coated, use the coating system as specified below for the substrate material. The number of applications specified for each coating system specified is a minimum. Additional coats must be applied if necessary to obtain a uniform color, texture, appearance, or required dry film thickness.

**SYSTEM 1 - STEEL AND OTHER FERROUS METALS, NON-CORROSIVE ENVIRONMENT**

**VISIBLE IN FINISHED WORK:**

**2 Prime Coats:**

Shop Primer: Coating meeting the requirements of SSPC-Paint 15

Field Primer: Rust Inhibitive, Water Based, MPI List Number 107

**2 Finish Coats:**

Eggshell-like: Light Industrial coating, Water Based, Exterior, MPI Gloss Level 3,  
MPI List Number 161

**NOT VISIBLE IN FINISHED WORK:**

**2 Prime Coats:**

Shop Primer: Coating meeting the requirements of SSPC-Paint 15

Field Primer: Rust Inhibitive, Water Based, MPI List Number 107

**99-09900C(6) Color Schedule**

Colors must be approved by Engineer.

**99-09900D Payment**

Payments will be made per Standard Specifications and these Special Provisions.

## **Appendix**

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\* Note: See the first page of this document description for a detailed Table of Contents.

# **Appendix A**

## **AQMD Recommendations**

## **Dust Abatement Attachments Table of Contents**

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**AQMD SIGNAGE RECOMMENDATIONS****November, 2001**

Plan holder shall post signage at specified locations on the subject property in accordance with the standards specified below. The exception to the standards is that all letters shall be 4 inches high, with the names and telephone numbers of appropriate contacts and services in bold print, as indicated in the standards. These signs shall also include the SCAQMD toll free complaint line 1-800-CUT-SMOG (1-800-288-7664) and the telephone number for the Environmental Observer. These signs shall be posted within 50 feet of the curb on all four (4) corners of the subject property.

For each Dust Control Plan aggregating less than, or equal to, ten (10) acres:

1. The applicant shall install a sign on such property which is visible to the public that meets the following requirements:
  - (a) Such sign shall measure at least four (4) feet wide by four (4) feet high and conform to the specifications in 1 (a) below.

For each Dust Control Plan aggregating over ten (10) acres:

2. The applicant shall install a sign on such property which is visible to the public that meets the following requirements:
  - (a) Such sign shall measure at least eight (8) feet wide by four (4) feet high and conform to the specifications in 1 (b) below.

**THE SIGN SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:**

1. **The sign boards shall be constructed with materials capable of withstanding the environment in which they are placed.**
  - (a) For 4' x 4' signs, the District recommends the following:
    - I. ¾" A/C laminated plywood board
    - II. Two 4" x 4" posts
    - III. The posts should be attached to the edges of the plywood board with at least 2 carriage bolts on each post.
    - IV. The front surface of the sign board should be painted in the contrasting color of a white background with black lettering.
  - (b) For 4' x 8' signs, the District recommends the following:
    - I. 1" A/C laminated plywood board
    - II. Two 5" x 6" posts
    - III. The posts should be attached to the 4' edges of the plywood board with at least 2 carriage bolts on each post.
    - IV. The front surface of the sign board should be painted in the contrasting color of a white background with black lettering.

**2. The sign board shall be installed and maintained in a condition such that members of the public can easily view, access, and read the sign at all times until the expiration date of the Dust Control plan.**

**(a) For 4' x 4' signs, the District recommends the following:**

- I. The lower edge of the sign board should be mounted at least 2' above the existing ground surface to facilitate ease of viewing.
- II. The posts should be set in a hole at least 3' deep with concrete footings to preclude downing by high winds.
- III. On the construction site, the sign should be positioned such that nothing obstructs the public's view from the primary street access point.
- IV. For construction projects that are developed in phases, the sign should be moved to the area that is under active construction.
- V. In situations where all phases of the construction project are completed on a property prior to expiration of the Dust Control Plan, a written request for cancellation of the Dust Control Plan must be submitted to the Engineer.

**(b) For 4' x 8' signs, the District recommends the following:**

- I. The lower edge of the sign board should be mounted at least 2' above the existing ground surface to facilitate ease of viewing.
- II. The posts should be set in a hole at least 4' deep with concrete footings to preclude downing by high winds.
- III. On the construction site, the sign should be positioned such that nothing obstructs the public's view from the primary street access point.
- IV. For construction projects that are developed in phases, the sign should be moved to the area that is under active construction.
- V. In situations where all phases of the construction project are completed on a property prior to expiration of the Dust Control Plan, a written request for cancellation of the Dust Control Plan must be submitted to the Engineer.

**3. The sign board shall contain the following information:**

- (a) Project Name
- (b) Name of Prime Contractor
- (c) Phone Number of Contractor's Employee Responsible for Dust Control Matters
- (d) County designated phone number (to be provided by the Engineer)
- (e) South Coast Air Quality Management District Phone Number



**4. The sign board shall be designed to the following alpha and numeric text dimensions (sign boards written in longhand are unacceptable).**

- (a) For a permittee subject to the 4' x 4' sign requirement, the District provides the following example: (as modified by the County of Riverside for use on County Public Works projects)

1" UPPERCASE Letters →	PROJECT NAME:		3 ½ " Title Case Bold Letters ←
1" UPPERCASE Letters →	CONTRACTOR		3 ½ " Title Case Bold Letters ←
1" Title Case Letters →	Contractor's Dust Control Phone #		3" Bold Numbers ←
1" Title Case Letters →	County of Riverside Phone #		3" Bold Numbers ←
1" Title Case Letters →	Phone Number:	<b>SCAQMD</b> <b>1-800-CUT-SMOG</b>	3 ½ " Bold Numbers ←

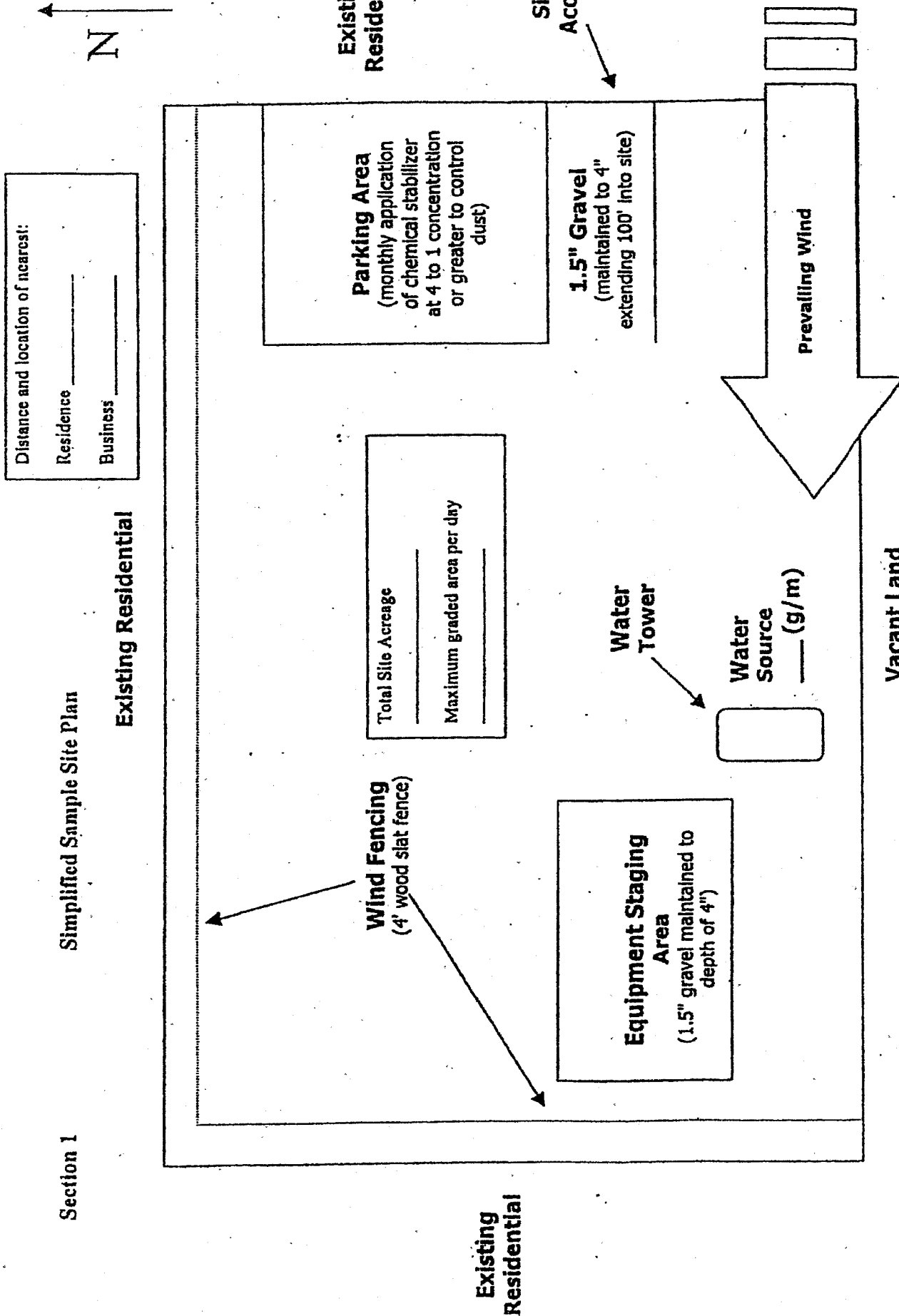
"Title Case" means the first letter of a word is capitalized and subsequent letters are lower case.

AQMD Recommendations

(b) For a permittee subject to the 4' x 8' sign requirement, the District provides the following example: (as modified by the County of Riverside)

2" UPPERCASE Letters	PROJECT NAME:	4" Title Case Bold Letters
2" UPPERCASE Letters	CONTRACTOR	4" Title Case Bold Letters
2" Title Case Letters	Contractor's Dust Control Phone #	4" Bold Numbers
2" Title Case Letters	County of Riverside Phone #	4" Bold Numbers
2" Title Case Letters	Phone Number:	4 1/2" Bold Numbers
2" Title Case Letters	SCAQMD 1-800-CUT-SMOG	
	COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT	

QMD Recommendations



Section 1

Simplified Sample Site Plan

Existing Residential

Remember...  
DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK,  
REGARDLESS OF CONSTRUCTION STATUS

### Plan Review Checklist Clearing/Grubbing/Mass Grading Phase

☐ If feasible, use grading permit conditions to break the project into phases so that only a portion of the site is disturbed at any given time to ensure control of fugitive dust. This technique is critical for project sites with greater than 100 acres.

☐ Prior to initiating activity, pre-water site through use of portable irrigation lines. At least 72 hours of pre-watering is recommended for each area prior to initiating earth-movement. Require the Applicant to specify water source and available flow rate (g/m).

☐ Water applied continuously to all disturbed portions of the site by means of water truck/water pull as necessary to maintain sufficient visible moisture on the soil surface. For reference, one 2,000 gallon water truck can treat approximately 4 acres of active construction per hour. Also, for cut and fill activities, one 10,000 gallon water pull is estimated to be necessary for each 7,000 cubic yards of daily earth-movement. Multiple 4,000-gallon water trucks may be used in place of one 10,000-gallon water pull. Touch and visual contrast are reasonably good indicators of soil moisture. Surface areas that are dry to the touch and appear lighter-colored require the application of additional water to prevent visible or fugitive dust. Require the Applicant to specify the number of watering vehicles available for dust control during mass grading and during off-hours as well as availability of back-up water trucks if the site experiences dust control problems.

☐ Water towers are necessary for projects with more than 10 acres of active construction. Without a water tower, it can take up to 30 minutes to fill a 2,000 gallon water truck. Also, multiple water towers are necessary for projects that use water pulls as filling one 10,000 gallon water pull can drain a water tower which takes up to 40 minutes to refill.

☐ Wind fencing is necessary between the site and nearby residences or businesses. Off-site upwind fencing and on-site wind fencing for larger projects can also keep blowsand from being deposited onto the site or traveling through the site.

☐ A perimeter watering system consisting of portable irrigation equipment may be an effective mitigation system to protect surrounding residences and businesses. The portable watering system may be used in place of or in conjunction with watering trucks. The local jurisdiction may also be provided access to this equipment.

Remember...

**DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK,  
REGARDLESS OF CONSTRUCTION STATUS**

- ☐ Construction site accesses are to be improved with 1.5" gravel maintained to a depth of 4" , at least 20' wide, and extending 100 feet into the site. If the project site is not balanced, a wheel washing system and/or ribbed steel plates should be placed in the roadway before the vehicle enters the graveled area to clean the tires and prevent trackout.
- ☐ Equipment staging areas are to be treated with 1.5" gravel maintained to a depth of 4".
- ☐ Employee parking areas are to be covered with 1.5" gravel maintained to a depth of 4" or treated with chemical dust suppressants at a 4 to 1 ratio on at least a monthly basis to prevent fugitive dust.
- ☐ Chemical dust suppressants are to be mixed at a ratio of 20 to 1 and applied to all disturbed surfaces that are proposed to remain inactive for a period of at least 10 consecutive days. These products are effective in preventing and controlling dust. Recordkeeping is necessary to demonstrate compliance.
- ☐ All project sites greater than 100 acres shall monitor daily wind speeds and AQMD forecasted wind events (call 1.800.CUT.SMOG, press one for air quality information, and then press five for Coachella Valley wind forecasts). Operators shall maintain these records for review by any local code enforcement officer or AQMD inspector.
- ☐ An environmental observer whose primary duty is to oversee dust control at the site is to be used for construction projects greater than 100 acres and/or sites with more than 50 acres of active construction. The environmental observer is tasked with monitoring dust abatement measures and authorized to deploy additional water trucks and other dust control actions (i.e., wind fencing, street sweepers, chemical dust suppressants, etc.) as necessary to prevent or control fugitive dust.
- ☐ Other (specify): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Remember...**

**DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK,  
REGARDLESS OF CONSTRUCTION STATUS**

**Plan Review Checklist  
Finish Grading Phase**

- ☐ Water applied continuously to all disturbed portions of the site by means of water truck/water pull as necessary to maintain sufficient visible moisture on the soil surface. For reference, one 2,000 gallon water truck can treat approximately 4 acres of active construction per hour. Also, for cut and fill activities, one 10,000 gallon water pull is estimated to be necessary for each 7,000 cubic yards of daily earth-movement. Multiple 4,000-gallon water trucks may be used in place of a 10,000-gallon water pull. Touch and visual contrast are reasonably good indicators of soil moisture. Surface areas that are dry to the touch and appear lighter-colored require the application of additional water to prevent visible or fugitive dust. Require the Applicant to specify the number of watering vehicles available for dust control during finish grading and during off-hours as well as availability of back-up water trucks if the site experiences dust control problems.
- ☐ Water towers are necessary for projects with more than 10 acres of active construction. Without a water tower, it can take up to 30 minutes to fill a 2,000 gallon water truck. Also, multiple water towers are necessary for projects that use water pulls as filling one 10,000 gallon water pull can drain a water tower which takes up to 40 minutes to refill.
- ☐ Wind fencing is necessary between the site and nearby residences or businesses to reduce fugitive dust. Off-site upwind fencing and on-site wind fencing for larger projects can also keep blowsand from being deposited onto the site or traveling through a site.
- ☐ Chemical dust suppressants are to be applied at a concentration of at least 10 to 1 to finish graded areas once final elevations have been reached. For areas that will remain inactive for longer periods, vegetation can be a cost-effective alternative to chemical stabilization. Wind fencing or other obstructions can keep the stabilized area free from future disturbances.
- ☐ Construction site access(es) are to be improved with 1.5" gravel maintained to a depth of at least 4" with a minimum width of at least 20', extending 100 feet into the project site.
- ☐ Equipment staging areas are to be treated with 1.5" gravel maintained to a depth of 4".
- ☐ Internal roadway networks are to be treated with chemical dust suppressants at a minimum rate of at least 4 to 1 and retreated on a monthly basis once final roadway elevations have been reached.
- ☐ Employee parking areas are to be treated with chemical dust suppressants at a mix ratio of at least 4 to 1 and retreated on at least a monthly basis or covered with 1.5" gravel maintained to a depth of 4" to prevent fugitive dust.
- ☐ Other (specify): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Remember...****DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK,  
REGARDLESS OF CONSTRUCTION STATUS**

**Plan Review Checklist  
Construction Phase**

- ☐ Water applied continuously to all disturbed portions of the site by means of water truck/water pull is necessary to maintain sufficient visible moisture on the soil surface. For reference, one 2,000 gallon water truck can treat approximately 4 acres of active construction per hour. Touch and visual contrast are reasonably good indicators of soil moisture. Surface areas that are dry to the touch and appear lighter-colored require the application of additional water to prevent visible or fugitive dust. Require the Applicant to specify the number of watering vehicles available for dust control during the construction phase and during off-hours as well as availability of back-up water trucks if the site experiences dust control problems.
- ☐ Wind fencing is necessary between the site and nearby residences or businesses. Off-site upwind fencing and on-site wind fencing for larger projects can also keep blowsand from being deposited onto the site or traveling through the site. Block walls, if part of the final project, can replace wind fencing during the construction phase.
- ☐ Chemical dust suppressants are to be applied at a concentration of at least 20 to 1 to finish graded areas once final elevations have been reached. For areas that will remain inactive for longer periods, vegetation can be a cost-effective alternative to chemical stabilization. Wind fencing or other obstructions can keep the stabilized area free from future disturbances.
- ☐ Construction site accesses are to be improved with 1.5" gravel, maintained to a depth of 4", with a width of at least 20', extending 100' into the project site. Paving internal roadways can substitute for gravel.
- ☐ Internal roadway networks are to be paved as early as feasible in the construction phase. Street sweeping of internal and/or external access roads will likely be required to control entrained road dust.
- ☐ Employee parking areas are to be treated with chemical dust suppressants at a mix ratio of no less than 4 to 1 and retreated on a monthly basis, or more frequently if fugitive dust is observed. If internal roadway is complete, employees are to be instructed to park on paved roads.
- ☐ Other (specify): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Remember...****DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK,  
REGARDLESS OF CONSTRUCTION STATUS**

## RULE 403 IMPLEMENTATION HANDBOOK

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### REASONABLY AVAILABLE CONTROL MEASURES

Paragraph (d)(3) of Rule 403 allows activities outside the South Coast Air Basin (see Figure 2-1) to implement reasonably available control measures in lieu of best available control measures. Additionally, as specified by subparagraph (f)(3)(D) of Rule 403, any person seeking approval of a fugitive dust emissions control plan for projects outside the South Coast Air Basin must demonstrate to the satisfaction of the District that the given activity is employing all reasonably available fugitive dust control measures.

The District has prepared the attached listing of reasonably available fugitive dust control measures for a variety of source categories. This list is based on the U.S. Environmental Protection Agency's reference document entitled, "Control of Open Fugitive Dust Sources," Midwest Research Institute, September 1988.

The District encourages the use of those dust control measures that minimize the use of potable water. When water is needed, reclaimed water should be utilized to the greatest extent feasible.



# RULE 403 IMPLEMENTATION HANDBOOK

## REASONABLY AVAILABLE CONTROL MEASURES

The left column contains a listing of the sources of fugitive dust which are intended for emission control under District Rule 403 and a listing of control measures and high-wind measures. The right column contains a description of the reasonably available fugitive dust control measures for each of the sources.

Source: (1) Land Clearing/Earth-Moving

### CONTROL MEASURES

### DESCRIPTION

- |                                |  |
|--------------------------------|--|
| (A) Watering                   | (1) Application of water by means of trucks, hoses and/or sprinklers prior to conducting any land clearing. This will increase the moisture content of the soils; thereby increasing its stability.  |
|                                | (2) Pre-application of water to depths of proposed cuts.   |
|                                | (3) Once the land clearing/earth moving activities are complete, a second application of water can generate a thin crust that stabilizes the disturbed surface area provided that it is not disturbed. (Security fencing can be used to prevent unwanted future disturbances of sites where a surface crust has been created). |
| (B) Chemical stabilizers       | (1) Only effective in areas which are not subject to daily disturbances.   |
|                                | (2) Vendors can supply information on product application and required concentrations to meet the specifications established by the Rule.  |
| (C) Wind fencing               | (1) Three- to five-foot barriers with 50% or less porosity located adjacent to roadways or urban areas can be effective in reducing the amount of windblown material leaving a site.   |
|                                | (2) Would likely be used in conjunction with other measures (e.g., watering, chemical stabilization, etc.) to ensure that visible emissions do not cross a property line.  |
| (D) Cover haul vehicles        | (1) Entire surface area of hauled earth should be covered once vehicle is full.  |
| (E) Bedliners in haul vehicles | (1) When feasible, use in bottom-dumping haul vehicles.  |

### HIGH WIND MEASURE

- (a) Cease all active operations; or  
 (b) Apply water within 15 minutes to any soil surface which is being moved or otherwise disturbed.

Source: (2) Unpaved Roads

**CONTROL MEASURES****DESCRIPTION**

- |                            |   |
|----------------------------|---|
| (F) Paving                 | (1) Requires street sweeping/cleaning if subject to material accumulation.  |
| (G) Chemical stabilization | (1) Vendors can supply information as to application methods and concentrations to meet the specifications established by the Rule<br>(2) Not recommended for high volume or heavy equipment traffic use. |
| (H) Watering               | (1) In sufficient quantities to keep surface moist.<br>(2) Required application frequency will vary according to soil type, weather conditions, and vehicular use.  |
| (I) Reduce speed limits    | (1) 15 mile per hour maximum. May need to be used in conjunction with watering or chemical stabilization to prevent visible emissions from crossing the property line.                                    |
| (J) Reduce vehicular trips | (1) Access restriction or redirecting traffic to reduce vehicle trips by a minimum of 60 percent.   |
| (K) Gravel                 | (1) Gravel maintained to a depth of four inches can be an effective measure.<br>(2) Should only be used in areas where paving, chemical stabilization or frequent watering is not feasible.               |

**HIGH WIND MEASURE**

- (c) Apply a chemical stabilizer (to meet the specifications established by the Rule) prior to wind events; or  
 (d) Apply water once each hour; or  
 (e) Stop all vehicular traffic.

January 1998

## RULE 403 IMPLEMENTATION HANDBOOK

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Source: (3) Storage Piles

### CONTROL MEASURES

#### DESCRIPTION

- |  |  |
|--|--|
| (L) Wind sheltering                      | (1) Enclose in silos.<br>(2) Install three-sided barriers equal to height of material, with no more than 50 percent porosity.  |
| (M) Watering                             | (1) Application methods include: spray bars, hoses and water trucks.<br>(2) Frequency of application will vary on site-specific conditions.  |
| (N) Chemical stabilizers                 | (1) Best for use on storage piles subject to infrequent disturbances.  |
| (O) Altering load-in/load-out procedures | (1) Confine load-in/load-out procedures to leeward (downwind) side of the material.<br>(2) May need to be used in conjunction with wind sheltering to prevent visible emissions from crossing the property line. |
| (P) Coverings                            | (1) Tarps, plastic, or other material can be used as a temporary covering.<br>(2) When used, these should be anchored to prevent wind from removing coverings.   |

### HIGH WIND MEASURE

- (f) Apply chemical stabilizers (to meet the specifications established by the Rule) prior to wind events; or  
(g) Apply water once per hour; or  
(h) Install temporary covers.

January 1999

Source: (4) Paved Road Track-Out

**CONTROL MEASURES**

**DESCRIPTION**

- |                                |  |
|--------------------------------|--|
| (Q) Chemical stabilization     | (1) Most effective when used on areas where active operations have ceased.                 |
|                                | (2) Vendors can supply information on methods for application and required concentrations. |
| (R) Sweep/clean roadways       | (1) Either sweeping or water flushing may be used.   |
| (S) Cover haul vehicles        | (1) Entire surface area should be covered once vehicle is full.                            |
| (T) Bedliners in haul vehicles | (1) When feasible, use in bottom dumping vehicles.   |
| (U) Site access improvement    | (1) Pave internal roadway system.  |
|                                | (2) Most important segment, last 100 yards from the connection with paved public roads     |

**HIGH WIND MEASURE**

- (i) Cover all haul vehicles; and  
(i) Clean streets with water flushing, unless prohibited by the Regional Water Quality Control Board.

January 1999

## RULE 403 IMPLEMENTATION HANDBOOK

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Source: (5) Disturbed Surface Areas/ Inactive Construction Sites

### CONTROL MEASURES

#### DESCRIPTION

- (Q) Chemical stabilization
- (1) Most effective when used on areas where active operations have ceased.
  - (2) Vendors can supply information on methods for application and required concentrations.
- (R) Watering
- (1) Requires frequent applications unless a surface crust can be developed.
- (S) Wind fencing
- (1) Three- to five-foot barriers with 50% or less porosity adjacent to roadways or urban areas can be effective in reducing the amount of wind blown material leaving a site.
- (T) Vegetation
- (1) Establish as quickly as possible when active operations have ceased.
  - (2) Use of drought tolerant, native vegetation is encouraged.

### HIGH WIND MEASURES

- (k) Apply chemical stabilizers (to meet the specifications established by the Rule); or
- (l) Apply water to all disturbed surface areas 3 times per day.

## RULE 403 IMPLEMENTATION HANDBOOK

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### BEST AVAILABLE CONTROL MEASURES

Rule 403, paragraph (d)(2) requires active operations [defined in Rule 403, paragraph (c)(1)] within the South Coast Air Basin (see Figure 2-1) to implement at least one best available control measure for each fugitive dust source type on site. Additionally, as specified by subparagraph (f)(3)(D) of Rule 403, any person seeking approval of a fugitive dust emissions control plan for projects within the South Coast Air Basin must demonstrate to the satisfaction of the AQMD that the given activity is employing all best available fugitive dust control measures.

The AQMD has prepared the attached listing of best available fugitive dust control measures for a variety of source categories. This list is based on the U.S. Environmental Protection Agency's reference document entitled, "Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures," Office of Air and Radiation, September 1992.

The AQMD encourages the use of those dust control measures that minimize the use of potable water. When water is needed, reclaimed water should be utilized to the greatest extent feasible.

# RULE 403 IMPLEMENTATION HANDBOOK

## BEST AVAILABLE CONTROL MEASURES

The left column contains a listing of the sources of fugitive dust which are intended for emission control under District Rule 403 and a listing of control measures and high-wind measures. The right column contains a description of the best available fugitive dust control measures for each of the sources.

Source: (1) Land Clearing/Earth-Moving

### CONTROL MEASURES

### DESCRIPTION

(A) Watering (pre-grading)

- (1) Application of water by means of trucks, hoses and/or sprinklers prior to conducting any land clearing. This will increase the moisture content of the soils; thereby increasing its stability.
- (2) Pre-application of water to depths of proposed cuts.

(A-1) Watering (post-grading)

- (1) In active earth-moving areas water should be applied at sufficient frequency and quantity to prevent visible emissions from extending more than 100 feet from the point of origin.

(A-2) Pre-grading planning

- (1) Grade each phase separately, timed to coincide with construction phase; or
- (2) Grade entire project, but apply chemical stabilizers or ground cover to graded areas where construction phase begins more than 60 days after grading phase ends.

(B) Chemical stabilizers

- (1) Only effective in areas which are not subject to daily disturbances.
- (2) Vendors can supply information on product application and required concentrations to meet the specifications established by the Rule.

(C) Wind fencing

- (1) Three- to five-foot barriers with 50% or less porosity located adjacent to roadways or urban areas can be effective in reducing the amount of windblown material leaving a site. Must be implemented in conjunction with either measure (A-1) or (B).

(D) Cover haul vehicles

- (1) Entire surface area of hauled earth should be covered once vehicle is full.

(E) Bedliners in haul vehicles

- (1) When feasible, use in bottom-dumping haul vehicles.

### HIGH WIND MEASURE

- (a) Cease all active operations; or
- (b) Apply water within 15 minutes to any soil surface which is being moved or otherwise disturbed.

RULE 403 IMPLEMENTATION HANDBOOK

Source: (2) Unpaved Roads

CONTROL MEASURESDESCRIPTION

- |                            |   |
|----------------------------|---|
| (F) Paving                 | (1) Requires street sweeping/cleaning if subject to material accumulation.  |
| (G) Chemical stabilization | (1) Vendors can supply information as to application methods and concentrations to meet the specifications established by the Rule<br>(2) Not recommended for high volume or heavy equipment traffic use. |
| (H) Watering               | (1) In sufficient quantities to keep surface moist.<br>(2) Required application frequency will vary according to soil type, weather conditions, and vehicular use.  |
| (I) Reduce speed limits    | (1) 15 mile per hour maximum. May need to be used in conjunction with watering or chemical stabilization to prevent visible emissions from crossing the property line.                                    |
| (J) Reduce vehicular trips | (1) Access restriction or redirecting traffic to reduce vehicle trips by a minimum of 60 percent.   |
| (K) Gravel                 | (1) Gravel maintained to a depth of four inches can be an effective measure.<br>(2) Should only be used in areas where paving, chemical stabilization or frequent watering is not feasible.               |

HIGH WIND MEASURE

- (a) Apply a chemical stabilizer (to meet the specifications established by the Rule ) prior to wind events; or  
 (b) Apply water once each hour; or  
 (c) Stop all vehicular traffic.



**RULE 403 IMPLEMENTATION HANDBOOK****Source: (3) Storage Piles****CONTROL MEASURES****DESCRIPTION****(L) Wind sheltering**

- (1) Enclose in silos.
- (2) Install three-sided barriers equal to height of material, with no more than 50 percent porosity.

**(M) Watering**

- (1) Application methods include: spray bars, hoses and water trucks.
- (2) Frequency of application will vary on site-specific conditions.

**(N) Chemical stabilizers**

- (1) Best for use on storage piles subject to infrequent disturbances.

**(O) Altering load-in/load-out procedures**

- (1) Confine load-in/load-out procedures to leeward (downwind) side of the material.  
Must be used in conjunction with either measure (L), (M), (N), or (P).

**(P) Coverings**

- (1) Tarps, plastic, or other material can be used as a temporary covering.
- (2) When used, these should be anchored to prevent wind from removing coverings.

**HIGH WIND MEASURE**

- (a) Apply chemical stabilizers (to meet the specifications established by the Rule) prior to wind events; or
- (b) Apply water once per hour; or
- (c) Install temporary covers.

**RULE 403 IMPLEMENTATION HANDBOOK**

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Source: (4) Paved Road Track-Out

**CONTROL MEASURES****DESCRIPTION**

Compliance with District Rule 403.

Paragraph (d)(5).

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**RULE 403 IMPLEMENTATION HANDBOOK****Source: (5) Disturbed Surface Areas/ Inactive Construction Sites****CONTROL MEASURES****DESCRIPTION**

- |                            |   |
|----------------------------|---|
| (Q) Chemical stabilization | (1) Most effective when used on areas where active operations have ceased.<br>(2) Vendors can supply information on methods for application and required concentrations.  |
| (R) Watering               | (1) Requires frequent applications unless a surface crust can be developed.   |
| (S) Wind fencing           | (1) Three- to five-foot barriers with 50% or less porosity adjacent to roadways or urban areas can be effective in reducing the amount of wind blown material leaving a site. Must be used in conjunction with either measure (Q), (R), or (T). |
| (T) Vegetation             | (1) Establish as quickly as possible when active operations have ceased.*   |

**HIGH WIND MEASURES**

- (a) Apply chemical stabilizers (to meet the specifications established by the Rule); or  
 (b) Apply water to all disturbed surface areas 3 times per day.

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\* Use of drought tolerant, native vegetation is encouraged.

TABLE 1

**BEST [REASONABLY]\* AVAILABLE CONTROL MEASURES FOR HIGH WIND CONDITIONS**

<b>FUGITIVE DUST SOURCE CATEGORY</b>	<b><u>CONTROL MEASURES</u></b>
<b>Earth-moving</b>	(1A) Cease all active operations; OR (2A) Apply water to soil not more than 15 minutes prior to moving such soil.
<b>Disturbed surface areas</b>	(0B) On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR (1B) Apply chemical stabilizers prior to wind event; OR (2B) Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR (3B) Take the actions specified in Table 2, Item (3c); OR (4B) Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
<b>Unpaved roads</b>	(1C) Apply chemical stabilizers prior to wind event; OR (2C) Apply water twice [once] per hour during active operation; OR (3C) Stop all vehicular traffic.
<b>Open storage piles</b>	(1D) Apply water twice [once] per hour; OR (2D) Install temporary coverings.
<b>Paved road track-out</b>	(1E) Cover all haul vehicles; OR (2E) Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
<b>All Categories</b>	(1F) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 1 may be used.

\* Measures in [brackets] are reasonably available control measures and only apply to sources not within the South Coast Air Basin.

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**TABLE 2**  
**DUST CONTROL ACTIONS FOR EXEMPTION FROM PARAGRAPH (d)(4)\***

<b><u>FUGITIVE DUST SOURCE CATEGORY</u></b>	<b><u>CONTROL ACTIONS</u></b>
<b>Earth-moving (except construction cutting and filling areas, and mining operations)</b>	<p>(1a) Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR</p> <p>(1a-1) For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.</p>
<b>Earth-moving: Construction fill areas:</b>	<p>(1b) Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and the California Air Resources Board and the U.S. EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.</p>

\* Measures in [brackets] are reasonably available control measures and only apply to sources not within the South Coast Air Basin.

TABLE 2 (Continued)

<b><u>FUGITIVE DUST SOURCE CATEGORY</u></b>	<b><u>CONTROL ACTIONS</u></b>
<b>Earth-moving: Construction cut areas and mining operations:</b>	(1c) Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
<b>Disturbed surface areas (except completed grading areas)</b>	(2a/b) Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 [70] percent of the unstabilized area.
<b>Disturbed surface areas: Completed grading areas</b>	(2c) Apply chemical stabilizers within five working days of grading completion; OR  (2d) Take actions (3a) or (3c) specified for inactive disturbed surface areas.
<b>Inactive disturbed surface areas</b>	(3a) Apply water to at least 80 [70] percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR  (3b) Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR  (3c) Establish a vegetative ground cover within 21 [30] days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR  (3d) Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.

\* Measures in [brackets] are reasonably available control measures and only apply to sources not within the South Coast Air Basin.

TABLE 2 (Continued)\*

<b><u>FUGITIVE DUST SOURCE CATEGORY</u></b>	<b><u>CONTROL ACTIONS</u></b>
<b>Unpaved Roads</b>	<p>(4a) Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8 hour work day]; OR</p> <p>(4b) Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR</p> <p>(4c) Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.</p>
<b>Open storage piles</b>	<p>(5a) Apply chemical stabilizers; OR</p> <p>(5b) Apply water to at least 80 [70] percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR</p> <p>(5c) Install temporary coverings; OR</p> <p>(5d) Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile.</p>
<b><u>All Categories</u></b>	<p>(6a) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 2 may be used.</p>

\* Measures in [brackets] are reasonably available control measures and only apply to sources not within the South Coast Air Basin.

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AQMD Recommendations

**TABLE 3**

**TRACK-OUT CONTROL OPTIONS**

**PARAGRAPH (d)(5)(B)**

**CONTROL OPTIONS**

(1)	Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and a width of at least 20 feet.
(2)	Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device.
(3)	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

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# **Appendix B**

## **Standard Plan List**

## County of Riverside Standard Plans List

CURBS & DRIVEWAY	
201	Type A-8 Curb
204	Type "D" Curb
212	Asphalt Concrete Dikes
DRAINAGE	
300	Curb Inlet Catch Basin and Specs
302	Combination Inlet Catch Basin No. 2
306	Asphalt Concrete Overside Drain
311	Gutter Depression for Curb Opening Catch Basin
312	Gutter Depression for Grate Opening Catch Basin
SIDEWALKS	
401	Sidewalk and Curb
403	Curb Ramp
GEOMETRICS	
818	Utility Trench Backfill
LIGHTING	
1001	Arterial Highway Lighting
TRAFFIC	
1200	IISNS Straight Arm
1201	Type E Loop Detector Sawcut & Placement Detail
1202	Case "A" Detection Input
1203	Case "B" Detection Input
1204	Video Detection Zone Detail
1205	Case "C" Video Detection Input
1206	Case "D" Video Detection Input
1207	Traffic Signal Detail Sheet
1208	Striping Details
1222	Sign Post Installation Notes

## Riverside County Flood Control and Water Conservation District Standard Plans List

CATCH BASINS	
CB109	Special Connections to Catch Basin
MANHOLES	
MH251	Manhole No. 1
MH254	Manhole No. 4
JUNCTION STRUCTURES	
JS227	Junction Structure No. 2
JS229	Junction Structure No. 4
MISCELLANEOUS	
M801	Chain Link Fence Details
M803	Concrete Collar for Pipe 12 Inches through 66 Inches

## City of Riverside Standard Plans List

### STREET DRAWINGS

200	Curb and Gutter
210	Curb Transitions
302	Driveway Approaches
304	Wheelchair Ramps
325	Sidewalk

### DRAIN DRAWINGS

400	Catch Basin Type 1 (Back of Curb)
407	Catch Basin
422	Junction Structure C
425	Cleanout Box
431	Manhole EZ

### TRAFFIC DRAWINGS

663	Traffic Signal Street Name Signs
667	Electrical Service Details – Underground, Signals and Lighting
670	Type “D” Detector

## City of Riverside Public Utilities Standard Plans List

UGS-100	Conduits and Fittings
UGS-100.1	General Specifications for Conduit Installation
UGS-115.1	Riser Pole Conduit Installation with Stand-Off Brackets
UGS-800	Street Light Requirements
UGS-801	Street Light Standard Details

## Standard Plans For Public Works Construction Standard Plans List

### STREET IMPROVEMENTS

122-2	Cross and Longitudinal Gutters
140-3	Median Taper

### FLOOD CONTROL AND STORM DRAIN FACILITIES

304-3	Grating Catch Basin – Alley (Longitudinal)
311-3	Frame and Grating for Catch Basins
342-2	Transition Structure – RCB to Pipe

## Caltrans 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)
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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	Legend - Soil (Sheet 1 of 2)
A10G	Legend - Soil (Sheet 2 of 2)
	<b>PAVEMENT MARKERS, TRAFFIC LINES, AND PAVEMENT MARKINGS</b>
A20A	Pavement Markers and Traffic Lines, Typical Details
A20B	Pavement Markers and Traffic Lines, Typical Details
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
	<b>EXCAVATION AND BACKFILL</b>
A62C	Limits of Payment for Excavation and Backfill - Bridge
A73C	Delineators, Channelizers and Barricades
	<b>METAL BEAM GUARD RAILING - TYPICAL LAYOUTS FOR STRUCTURES</b>
A77F1	Metal Beam Guard Railing - Typical Layouts for Structure Approach
	<b>METAL BEAM GUARD RAILING - CONNECTIONS DETAILS AND TRANSITION</b>
	<b>RAILING TO BRIDGE RAILINGS, ABUTMENTS AND WALLS</b>
A77J4	Metal Beam Guard Railing - Transition Railing (Type WB)
	<b>FENCES</b>
A85	Chain Link Fence
A85A	Chain Link Fence Details
RSP A85B	Chain Link Fence Details
	<b>CURBS, DRIVEWAYS, DIKES, CURB RAMPS AND ACCESSIBLE PARKING</b>
A87A	Curbs and Driveways
A87B	Hot Mix Asphalt Dikes
	<b>DRAINAGE INLETS, PIPE INLETS AND GRATES</b>
D71	Drainage Inlet Markers
D75B	Concrete Pipe Inlets
	<b>GUTTER AND INLET DEPRESSIONS</b>
D78C	Inlet Depressions - Hot Mix Asphalt Shoulders
	<b>PIPE CULVERT HEADWALLS, ENDWALLS, WINGWALLS AND JUNCTION</b>
	<b>STRUCTURE</b>
D89	Pipe Culvert Headwalls - Straight and "L"
	<b>FLARED END SECTIONS</b>
D94B	Concrete Flared End Sections
	<b>TEMPORARY CRASH CUSHIONS, RAILING AND TRAFFIC SCREEN</b>
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)
T4	Temporary Traffic Screen

T5	Temporary Terminal Section (Type K)
	<b>TEMPORARY TRAFFIC CONTROL SYSTEMS</b>
RSP T11	Traffic Control System for Lane Closure on Multilane Conventional Highways
	<b>TEMPORARY WATER POLLUTION CONTROL</b>
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)
T62	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
	<b>BRIDGE DETAILS</b>
B0-1	Bridge Details
B0-3	Bridge Details
B0-5	Bridge Details
B0-13	Bridge Details
	<b>RETAINING WALLS</b>
RSP B3-1A	Retaining Wall Type 1 (Case 1)
RSP B3-3A	Retaining Wall Type 1A (Case 1)
RSP B3-5	Retaining Wall Details No. 1
	<b>BOX GIRDER DETAILS</b>
B7-1	Box Girder Details
	<b>DECK DRAINS</b>
B7-6	Deck Drains - Types D-1 and D-2
B7-8	Deck Drainage Details
	<b>UTILITY OPENING</b>
B7-10	Utility Opening - Box Girder
B7-11	Utility Details
	<b>CAST-IN-PLACE PRESTRESSED GIRDER</b>
B8-5	Cast-In-Place Prestressed Girder Details
	<b>CHAIN LINK RAILING, CABLE RAILING AND TUBULAR HAND RAILING</b>
B11-51	Tubular Hand Railing
	<b>BRIDGE CONCRETE BARRIERS</b>
B11-54	Concrete Barrier Type 26
B11-55	Concrete Barrier Type 732
	<b>WATER SUPPLY LINE (BRIDGE)</b>
B14-5	Water Supply Line (Details) (Pipe Sizes Less Than 4")
	<b>SOUND WALLS</b>
B15-1	Sound Wall Masonry Block on Footing Detail (1)
B15-2	Sound Wall Masonry Block on Footing Detail (2)
B15-9	Sound Wall Masonry Block Miscellaneous Details
	<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>ELECTRICAL SYSTEMS - LEGEND, NOTES AND ABBREVIATIONS</b>
ES-1A	Electrical Systems (Legend, Notes and Abbreviations)
ES-1B	Electrical Systems (Legend, Notes and Abbreviations)
ES-1C	Electrical Systems (Legend, Notes and Abbreviations)

	<b>ELECTRICAL SYSTEMS - SERVICE EQUIPMENT AND WIRING DIAGRAMS</b>
ES-2E	Electrical Systems (Service Equipment Enclosure and Typical Wiring Diagram, Type III - B Series)
ES-2F	Electrical Systems (Service Equipment Enclosure and Typical Wiring Diagram Type III - C Series)
	<b>ELECTRICAL SYSTEMS - CONTROLLER CABINETS</b>
ES-3C	Electrical Systems (Controller Cabinet Foundation Details)
	<b>ELECTRICAL SYSTEMS - SIGNAL HEADS, SIGNAL FACES AND MOUNTINGS</b>
ES-4B	Electrical Systems (Pedestrian Signal and Ramp Metering)
	<b>ELECTRICAL SYSTEMS - DETECTORS</b>
ES-5B	Electrical Systems (Detectors)
ES-5D	Electrical Systems (Curb Termination and Handhole)
	<b>ELECTRICAL SYSTEMS - LIGHTING STANDARDS</b>
ES-6A	Electrical Systems (Lighting Standard, Types 15 and 21)
ES-6B	Electrical Systems (Electrolier Anchorage and Grouting for Types 15 and 21, Barrier Rail Mounted)
	<b>ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING STANDARDS</b>
ES-7E	Electrical Systems (Signal and Lighting Standard - Case 3 Signal Mast Arm Loading, Wind Velocity = 100 mph and Signal Mast Arm Lengths 15' to 45')
	<b>ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING STANDARD DETAILS</b>
ES-7N	Electrical Systems (Signal and Lighting Standard - Detail No. 2)
	<b>ELECTRICAL SYSTEMS - STRUCTURE INSTALLATIONS</b>
ES-9B	Electrical Systems (Conduit Riser and Expansion Fitting, Structure Installations)
ES-9D	Electrical Systems (Structure Pull Box Installations)
ES-9E	Electrical Systems (Flush Soffit, Pendant soffit and Wall Luminaire, Structure Installations)
ES-9F	Electrical Systems (Flush Soffit Luminaire Details)