

BRIDGE REPAIR CALTRANS BRIDGE NO. 54C0077

CITY OF COLTON SANTA ANA RIVER BRIDGE SOUTH LA CADENA DRIVE

General Notes

1. ALL WORK SHALL COMPLY WITH LATEST VERSION OF STANDARD SPECIFICATIONS STATE OF CALIFORNIA BUSINESS, TRANSPORTATION AND HOUSING AGENCY, ISSUED BY DEPARTMENT OF TRANSPORTATION, UNLESS OTHERWISE MODIFIED HERE. COPIES OF THIS BOOK MAY BE OBTAINED AT

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DEPARTMENT OF TRANSPORTATION
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TELEPHONE (916) 445-3520

2. IN CASE OF ANY DISCREPANCIES CONTACT THE ENGINEER, FRED BASHARDOOST, PE AT 714-926-8646.

3. IN CASE OF CONFLICT, DRAWINGS, GENERAL NOTES AND SPECIAL PROVISIONS GOVERN OVER STANDARD SPECIFICATIONS.

4. PRECAUTIONARY MEASURES MUST BE TAKEN TO PREVENT DEBRIS FROM FALLING INTO SANTA ANA RIVER BELOW BRIDGE.

5. CONTRACTOR SHALL SECURE ALL NECESSARY ENVIRONMENTAL CLEARANCES PRIOR TO COMMENCEMENT OF THE WORK.

6. EQUALS CAN BE USED FOR ALL ITEMS IF APPROVED BY ENGINEER UNLESS NOTED OTHERWISE.

7. CONCRETE SHALL CONTAIN 400 MIN. TO 475 MAX. KG/CUBIC METER OF TYPE III HIGH EARLY STRENGTH PORTLAND CEMENT AND ATTAIN 34.5 MPA IN 28 DAYS.

8. AGGREGATE SHALL CONFORM TO ASTM C330. COMBINED GRADATION SHALL BE AS SHOWN IN THE TABLE:

Sieve Sizes	Percentage Passing 25-mm Max
50-mm	100
37.5-mm	100
25-mm	90-100
19-mm	55-100
12.5-mm	—
9.5-mm	45-75
4.75-mm	35-60
2.36-mm	27-45
1.18-mm	20-35
600-µm	12-25
300-µm	5-15
150-µm	1-8
75-µm	0-4

9. REINFORCING BARS SHALL BE LOW-ALLOY STEEL DEFORMED BARS CONFORMING TO THE REQUIREMENTS IN ASTM DESIGNATION A 706/A 706M.

10. NO TRAFFIC WILL BE PERMITTED ON THE PAVEMENT BEFORE A PERIOD OF 7 DAYS HAS ELAPSED AFTER THE CONCRETE HAS BEEN PLACED, NOR BEFORE THE CONCRETE HAS DEVELOPED A MODULUS OF RUPTURE OF AT LEAST 3.8 MPA. CONCRETE THAT FAILS TO ATTAIN A MODULUS OF RUPTURE OF 3.8 MPA WITHIN 7 DAYS SHALL NOT BE OPENED TO TRAFFIC UNTIL DIRECTED BY THE ENGINEER.

11. STEEL BARS, PLATES AND SHAPES SHALL BE ASTM DESIGNATION: A 36/A 36M OR A 575, A 576.

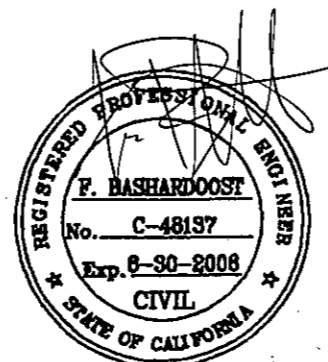
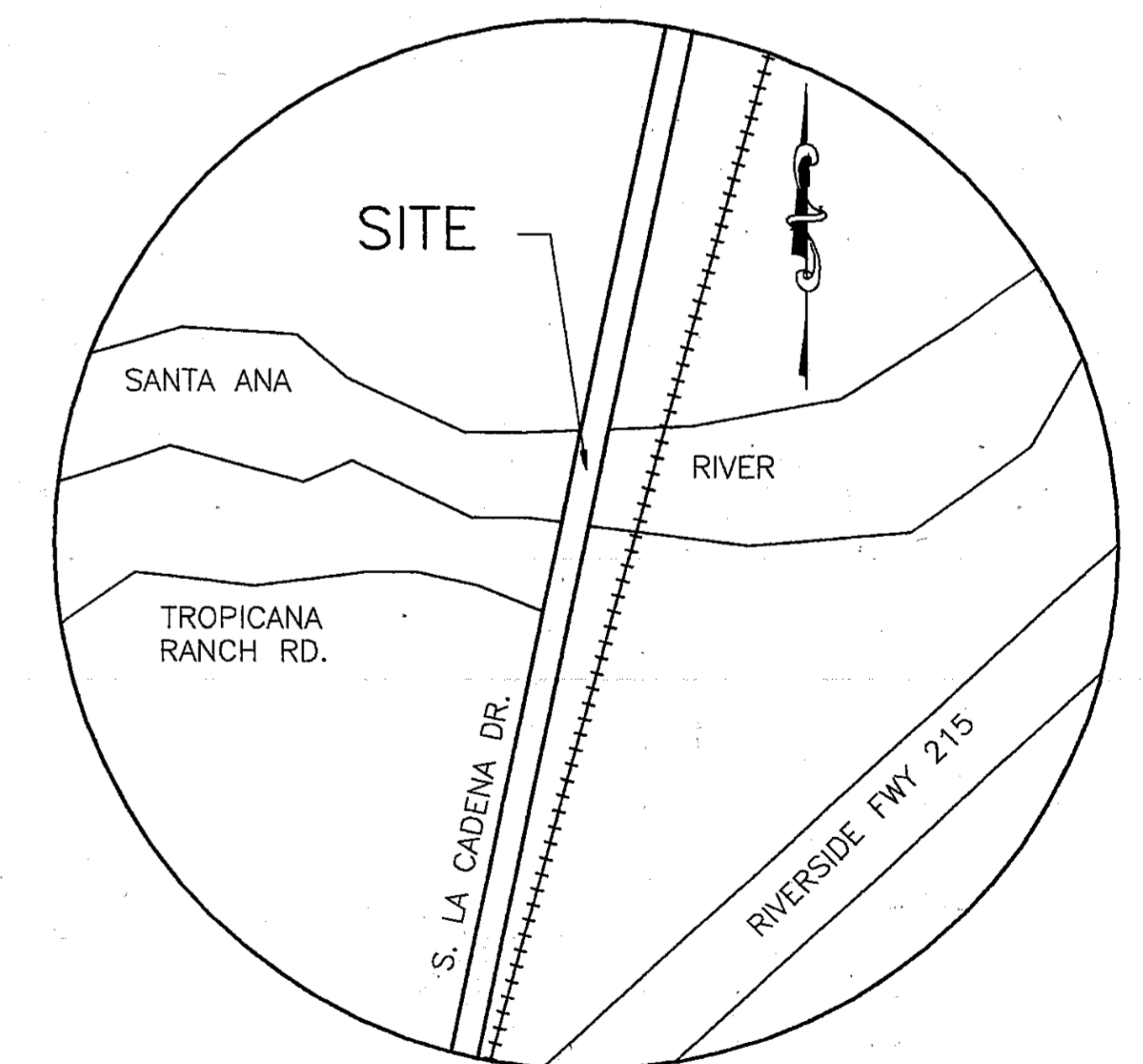
12. THE EPOXY-COATED DOWELS SHALL CONFORM TO THE REQUIREMENTS IN ASTM DESIGNATION: A 775/A 775M.

13. DOWELS ADHESIVE SHALL BE HILTI HY-150.

14. STUDS SHALL BE NELSON H4L16X200 (H4L5/8X7-7/8").

15. ALL NEW STRUCTURAL STEEL SHALL BE GALVANIZED AFTER FABRICATION, ACCORDING TO SECTION 75.

16. PAINTING SHALL BE PERFORMED ACCORDING TO SECTION 91. NEW PAINT SHALL MATCH EXISTING.



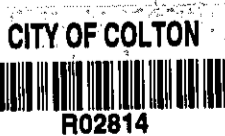
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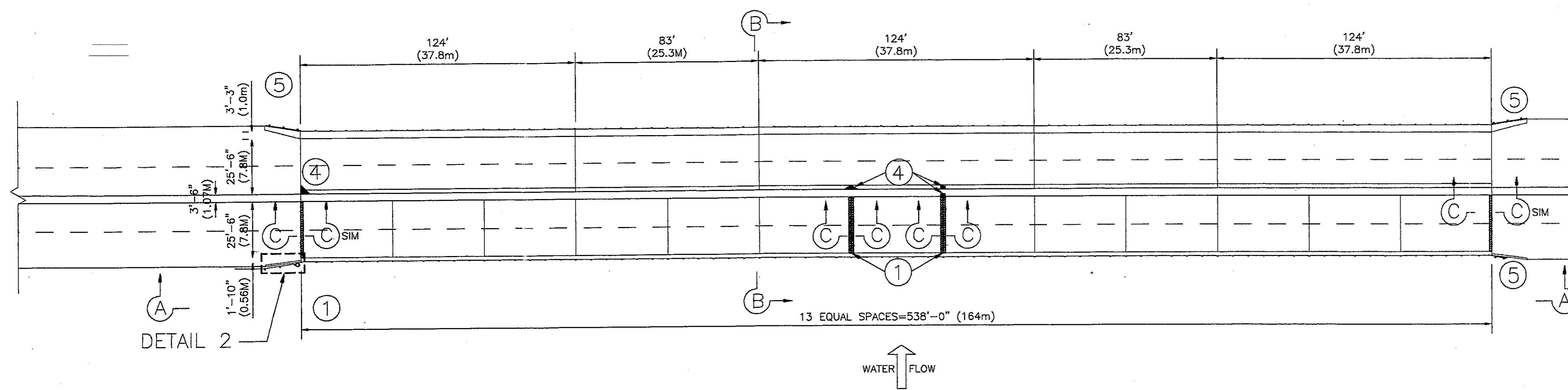
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CITY OF COLTON
PUBLIC SERVICES DEPARTMENT

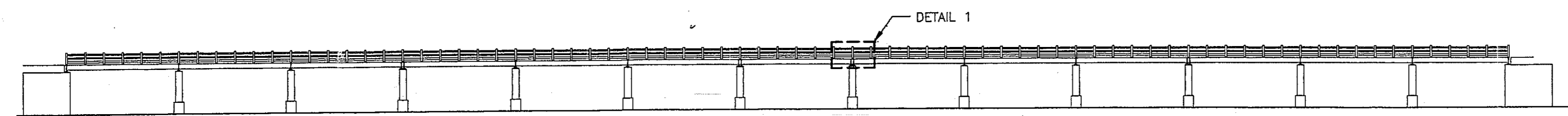
CITY ENGINEER
NAME: AMR JAKHER
R.C.E. 50932
APPROVED: *[Signature]*
PLAN NO. M-204

REVISIONS	DATE	APPR.
SANTA ANA RIVER BRIDGE CALTRANS BRIDGE NO. 54C0077	9/30/07	
COVER SHEET	9-20-05	
ADDRESS: S. LA CADENA DRIVE		





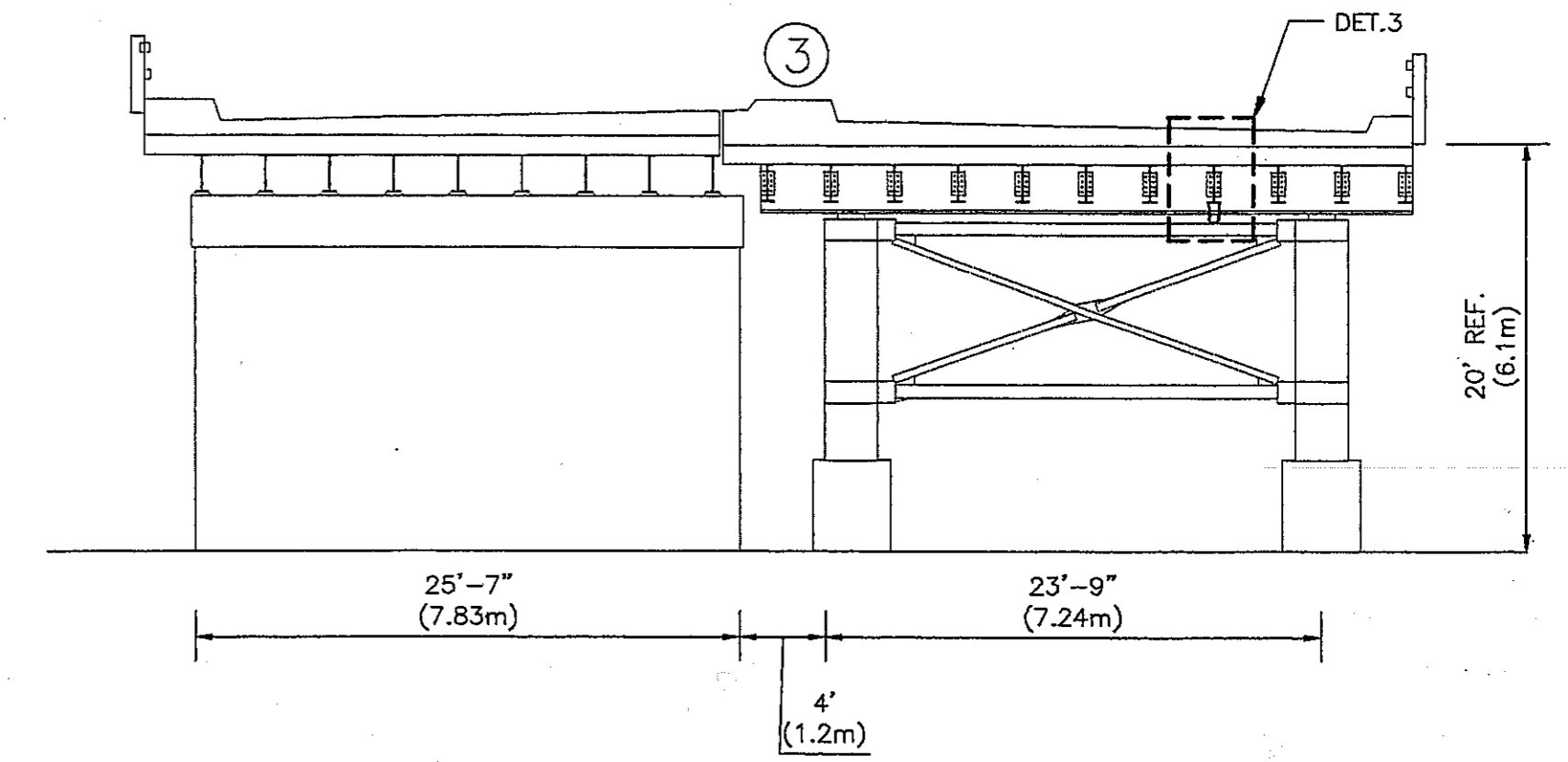
PLAN
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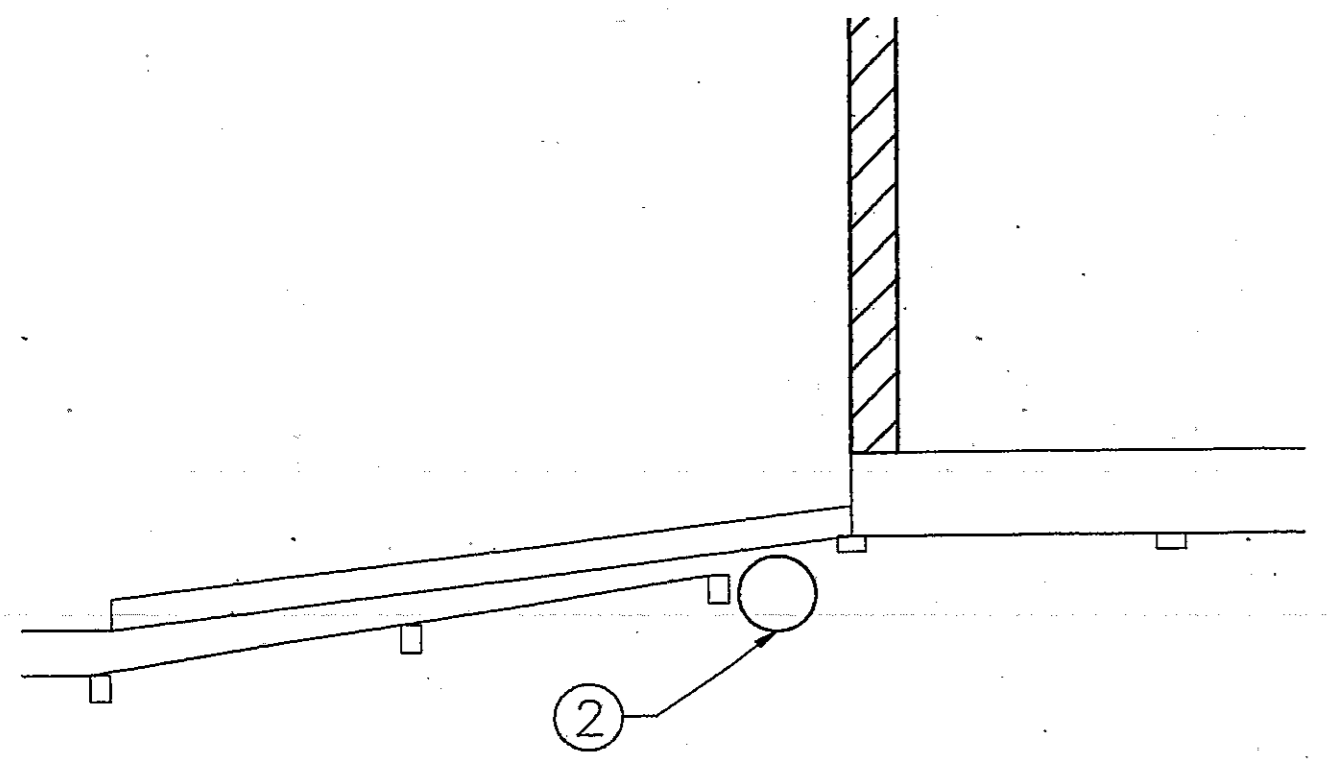
SECTION A-A LOOKING EAST
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CONSTRUCTION NOTES

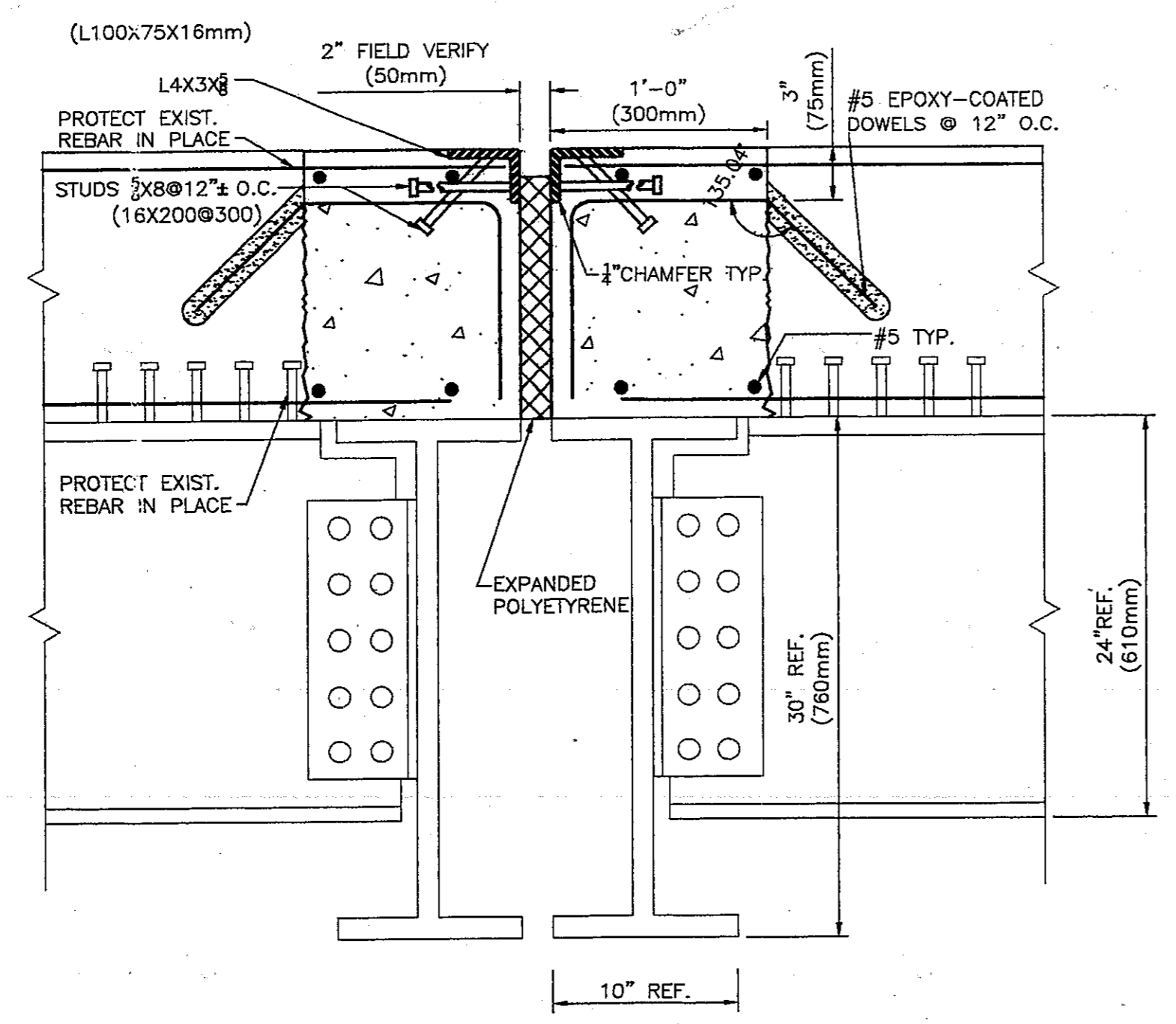
- SEE SPECIAL PROVISIONS, SHEET 2, FOR PROCEDURE OF WORK.
- 1.REMOVE PORTIONS OF THE CONCRETE DECK AS OUTLINED ON THE DRAWING.
 - 2.EXCAVATE AND PLUMB EXISTING RAILINGS.
 - 3.SPOT BLAST, CLEAN AND PAINT RUSTED AND CORRODED STEEL GIRDERS AND BENT CAPS. SURFACE CLEAN AND RESTORE TOP COAT AT REMAINING GIRDERS.
 - 4.REPAIR SPALLED JOINTS.
 - 5.INSTALL RAILINGS.
 - 6.REPAIR BEAM FLANGES.



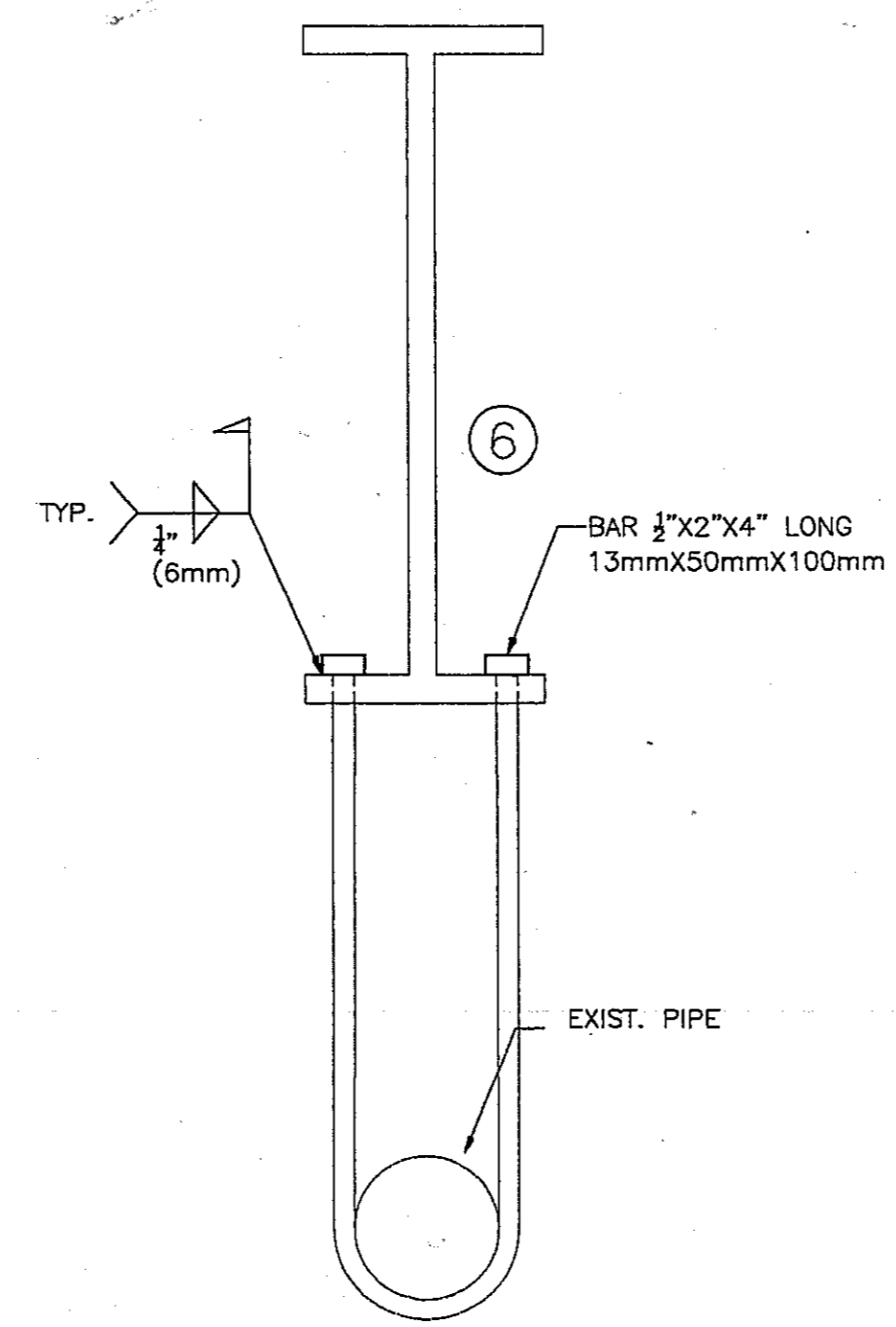
SECTION B-B
SCALE 1:100



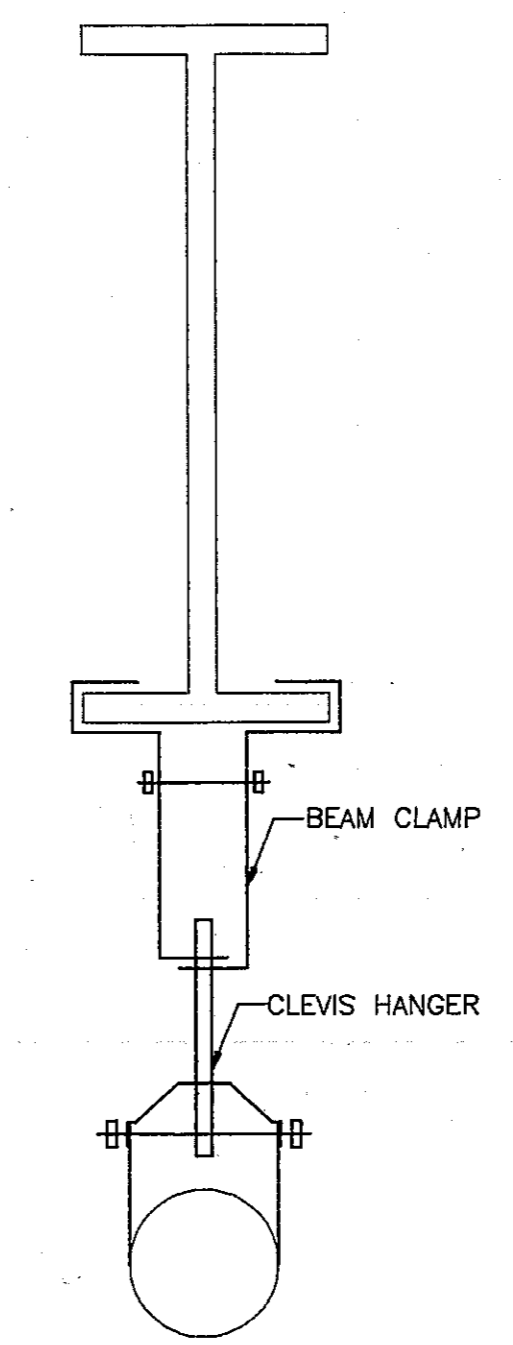
DETAIL 2
SCALE 1:50



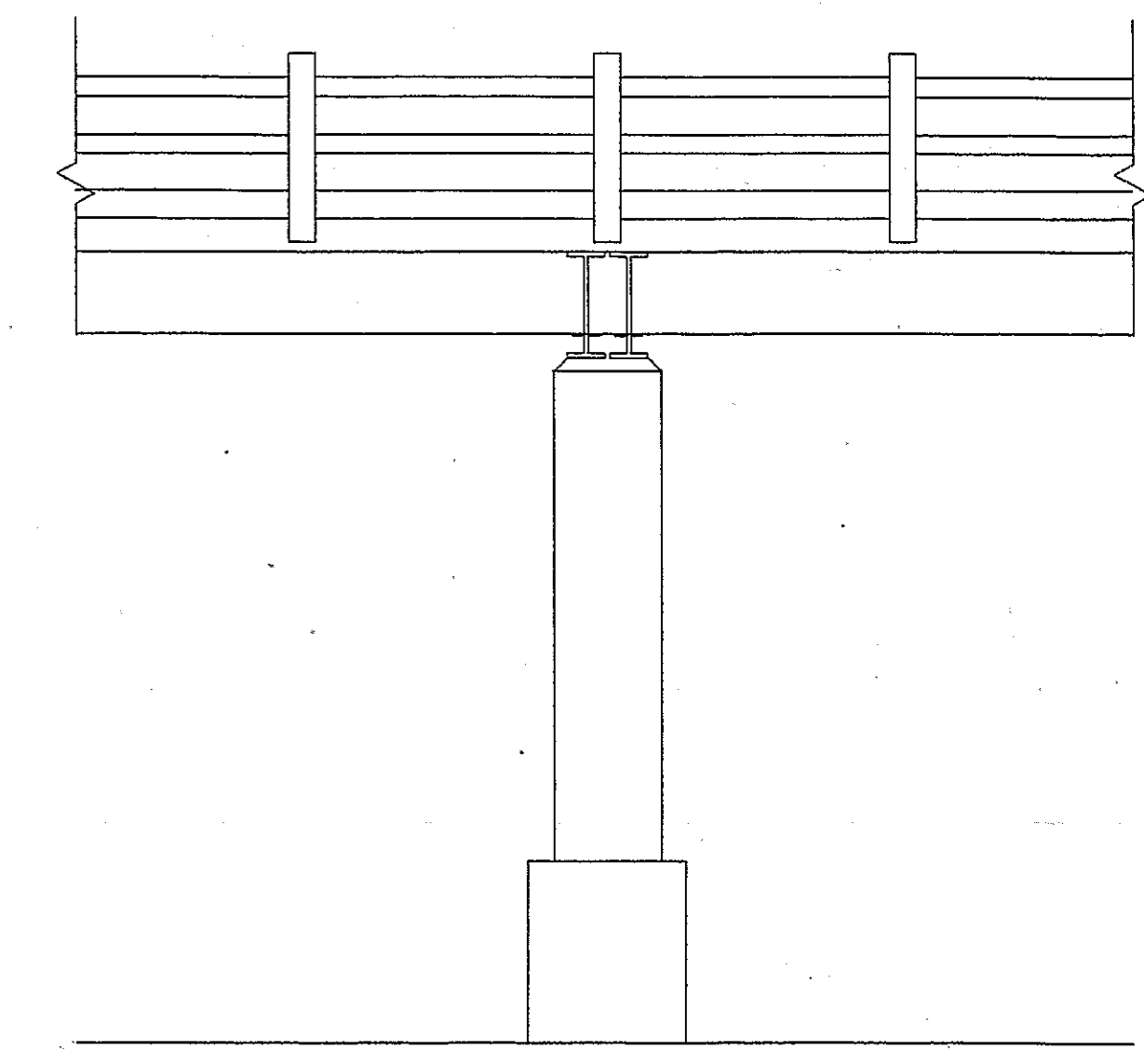
SECTION C-C
SCALE 1-1/2"=1'-0"



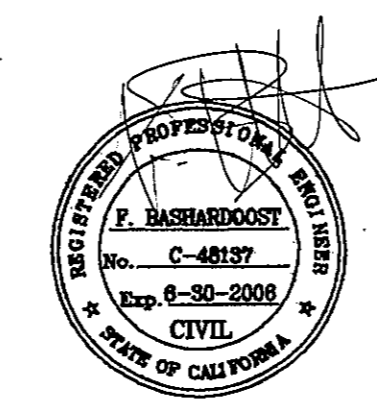
DETAIL 3(EXIST.)
SCALE 1-1/2"=1'-0"



DETAIL 3(NEW)
SCALE 1-1/2"=1'-0"



DETAIL 1
SCALE 1:50



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CITY OF COLTON
PUBLIC SERVICES DEPARTMENT
CITY ENGINEER
NAME: AMER JAKHER
R.C.E. 50932
APPROVED: [Signature] DATE: 9/30/07
PLAN NO. M-204

REVISIONS		DATE	APPR.

SANTA ANA RIVER BRIDGE
CALTRANS BRIDGE
NO.54C0077
STRUCTURAL REPAIRS
ADDRESS: S. LA. CADENA DRIVE

SCALE
NO. 50932
DATE: 9-20-05
SHEET 1 OF 4

SPECIAL PROVISIONS

1-REPAIR PORTIONS OF THE CONCRETE DECK

Outlines of rectangular areas, shall be cut with a diamond bladed saw to a minimum depth of 50 mm. Concrete between the saw cut and the joint shall be removed using a pneumatic hammer. Damage to the concrete pavement beyond the limits to be removed shall be repaired at the Contractor's expense.

Contractor shall dispose all removed concrete, steel, and reinforcing in conformance with "Disposal of Materials Outside the Highway Right of Way," of CalTrans Standard Specifications.

Protect longitudinal reinforcement bars, shear connectors, steel stringers and beams in place.

Clean the exposed faces of the concrete using abrasive blasting, either sand blasting or high pressure (20 MPa to 40 MPa) water blasting. Exposed surface of concrete shall have a minimum 7 mm amplitude.

After abrasive blasting, the exposed concrete area shall be cleaned with moisture-free, oil-free compressed air to remove debris. Air compressors shall deliver air at a minimum of 3.4 m³ per minute and develop 0.63-MPa of nozzle pressure.

Drill and install dowels. The diameters of the drilled holes shall be 6 mm larger than the nominal diameter of the dowels.

2-EXCAVATE AND PLUMB EXISTING RAILING

Excavate around concrete railing and plumb.

If concrete railing is damaged inform the Engineer.

3-SPOT BLAST, CLEAN AND PAINT RUSTED AND CORRODED STEEL GIRDERS AND BENT CAPS. SEE SHEET 3.

4-REPAIR SPALLED JOINTS

This work shall consist of removing unsound or damaged concrete from spalled areas at transverse or longitudinal joints shown on the plans and filling the area with a fast-setting patching grout in conformance with these special provisions.

MATERIALS

Fast-Setting Grout

Fast-setting grout shall be, at the option of the Contractor, any of the following:

- A. either of the following magnesium phosphate grouts:
 1. single component water activated, or
 2. dual component with a prepackaged liquid activator
- B. modified high alumina based grout, or
- C. hydraulic cement based grout.

The Contractor may use accelerating admixtures conforming to the requirements in ASTM Designation: C 494, Type C and to the provisions in Section 90-4, "Admixtures," of the Standard Specifications, except that the chloride content of the accelerating admixture shall be less than one percent by mass. Fast-setting grout shall conform to the following requirements:

Property	Test Method	Requirements
Compressive Strength		
at 3 hours, MPa	California Test 551	21 min.
at 24 hours, MPa	California Test 551	35 min.
Flexural Strength		
at 24 hours, MPa	California Test 551	3.5 min.
Bond Strength: at 24 hours		
SSD Concrete, MPa	California Test 551	2.1 min.
Dry Concrete, MPa	California Test 551	2.8 min.
Water Absorption, %	California Test 551	10 max.
Abrasion Resistance		
at 24 hours, grams	California Test 550	25 max.
Drying Shrinkage at 4 days, %	ASTM Designation: C 596	0.13 max.
Soluble Chlorides by mass, %	California Test 442	0.05 max.
Water Soluble Sulfates* by mass, %	California Test 417	0.25 max.

* Test to be a cube specimen, fabricated in conformance with the requirements in ASTM Designation: C 109, cured at least 14 days and then pulverized to 100% passing the 300 µm sieve.

Clean, uniformly rounded aggregate filler may be used to extend the prepackaged grout. The moisture content of the aggregate filler shall not exceed 0.5-percent by mass. Grading of the aggregate filler shall conform to the following:

Sieve Size	Percentage Passing
6.5 mm	100
1.18 mm	0-5

The amount of aggregate filler shall conform to the fast-setting grout manufacturer's recommendation, but in no case shall the amount of aggregate filler exceed 30 percent of the volume of the grout mix. Fast-setting grout shall be formulated for a minimum initial set time of 15 minutes and a minimum final set time of 25 minutes at 21°C. The materials, prior to use, shall be stored in a cool, dry environment.

Mix water used with water activated material shall be free from oil and shall not contain more than 2000 parts per million of chlorides as Cl, nor more than 1500 parts per million of sulfates as SO₄. Water for curing shall not contain impurities in sufficient amounts to cause discoloration of the concrete surface or produce etching of the surface.

The quantity of water or liquid activator to be blended with the dry component for magnesium phosphate grout shall conform to the limits recommended by the manufacturer.

Addition of retarders, when needed, shall conform to the fast-setting grout manufacturer's recommendations.

Silicone Joint

Joint Bond Breaker

Joint bond breaker material shall be either corrugated cardboard with a 0.15-mm polyethylene covering or expanded polystyrene material.

Bonding Agent

Bonding agent shall be as recommended by the fast-setting grout manufacturer.

SPALL REPAIR PROCEDURE

Concrete Removal

Outlines of rectangular areas, as marked by the Engineer, shall be cut with a diamond bladed saw to a minimum depth of 50 mm. Unsound and damaged concrete between the saw cut and the joint, and to the depth of the saw cut, shall be removed by methods that will not damage the concrete pavement that is to remain in place. Damage to the concrete pavement beyond the limits to be removed shall be repaired at the Contractor's expense. A pneumatic hammer greater than 7 kg shall not be used for removal of concrete.

Concrete pavement removed to repair spalled joints shall become the property of the Contractor and shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Materials Outside the Highway Right of Way," of the Standard Specifications.

Cleaning

After the repair area has been cleared of unsound concrete, the exposed faces of the concrete shall be thoroughly cleaned. Cleaning shall be by abrasive blasting, either sand blasting or high pressure water blasting. Water blasting equipment for concrete cleaning shall be capable of producing a blast pressure of 20 MPa to 40 MPa.

After abrasive blasting, the exposed concrete area shall be cleaned with moisture-free, oil-free compressed air to remove debris. Air compressors shall deliver air at a minimum of 3.4 m³ per minute and develop 0.63-MPa of nozzle pressure.

Joint Bond Breaker Installation

A joint bond breaker shall be placed along the joint, and extend 25 mm beyond the edges of the patch. Joint bond breaker shall be the same width as the existing joint.

Bonding Agent Application

Bonding agent shall be mixed on site in small quantities and mixed in conformance with the manufacturer's instructions. Bonding agent shall be applied in a thin, even coat by using a stiff bristle brush scrubbing the entire area including the patch walls.

Mixing Fast-Setting Grout

Fast-setting grout shall be mixed in a small mobile drum or paddle mixer in conformance with the manufacturer's instructions and these special provisions.

The components of prepackaged, dual component magnesium phosphate grout with a prepackaged liquid activator shall be as supplied by the manufacturer. Portions of components shall not be used. Water shall not be added to dual component magnesium phosphate grout.

Magnesium phosphate grout shall not be mixed in containers or worked with tools containing zinc, cadmium, aluminum, or copper. Modified high alumina based grout shall not be mixed in containers or worked with tools containing aluminum.

Placement of Fast-Setting Grout

Magnesium phosphate grout shall be placed on a dry surface. The grout shall air cure with no curing medium applied. The repaired area shall be protected from public traffic for at least two hours after the grout sets.

High alumina based grout and hydraulic cement based grout may be placed on either a dry or damp surface, in conformance with the manufacturer's instructions. Curing shall be in conformance with the manufacturer's instructions. When curing compound is recommended by the manufacturer, either curing compound (1) or (2) that conforms to Section 90-7.01B, "Curing Compound Method," of the Standard Specifications may be used. The repaired area shall be protected from public traffic for at least two hours after the grout sets.

Resealing Joints

Existing joints where sealant was removed shall be cleaned, resealed and recessed below the final surface as shown on the plans in conformance with the joint sealant manufacturer's instructions and these special provisions.

MEASUREMENT AND PAYMENT

Repair spalled joints will be measured by the square meter of the pavement surface area repaired. The contract price paid per square meter for repair spalled joints shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in repairing spalled joints, including removal and disposal of portions of concrete pavement involved in repairing spalled joints, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

5-INSTALL RAILING

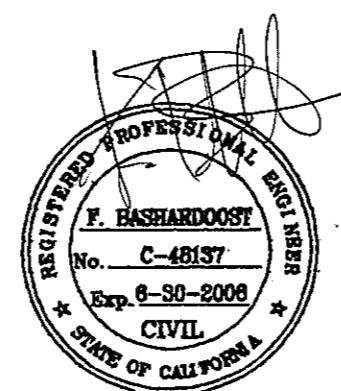
Install new railing according to standard details A77A, A77B, A77C, and A77FA.

6-REPAIR BEAM FLANGES

Where U-bolts are installed on bottom flanges of beams, replace with combination Cooper B-Line beam clamp model B3050-5 and pipe hanger model B-3100-6 or Engineer approved equal.

Repair the holes in bottom flanges by welding a patch bar as shown on detail.

Welding shall be in accordance to Section 55 of Standard Specifications.



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BENCHMARK

CITY OF COLTON
 PUBLIC SERVICES DEPARTMENT

CITY ENGINEER
 NAME: AMER JAKHER
 R.C.E. 50932
 APPROVED: [Signature]
 PLAN NO. M-204

REVISIONS	DATE	APPR.
SANTA ANA RIVER BRIDGE CALTRANS BRIDGE NO.54C0077		
SPECIAL PROVISIONS		
ADDRESS: S. LA CADENA DRIVE		

3-SPOT BLAST, CLEAN AND PAINT RUSTED AND CORRODED STEEL GIRDERS AND BENT CAPS

All paint colors shall match existing. Exposed metal surfaces of the existing structure, except where galvanized, shall be cleaned and painted in conformance with the provisions in Section 59-2, "Painting Structural Steel," and Section 91, "Paint," of the Standard Specifications and these special provisions.

Whenever the Standard Specifications refer to "Steel Structures Painting Council," the reference shall be replaced with "SSPC: The Society for Protective Coatings."

Prior to performing any painting or paint removal, the Contractor shall submit to the Engineer, in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 3 copies of a separate Painting Quality Work Plan (PQWP) for each item of work for which painting or paint removal is to be performed. As a minimum, each PQWP shall include the following:

- The name of each Contractor or subcontractor to be used.
- One copy each of all current "SSPC: The Society for Protective Coatings" specifications or qualification procedures which are applicable to the painting or paint removal to be performed. These documents shall become the permanent property of the Department.
- Proposed methods and equipment to be used for any paint application.
- Proof of each of any required certifications, SSPC-QP 1 or SSPC-QP 2.

1. In lieu of certification in conformance with the requirements in SSPC-QP 1 for this project, the Contractor may submit written documentation showing conformance with the requirements in Section 3, "General Qualification Requirements," of SSPC-QP 1.

CLEANING

Exposed metal surfaces shall be steam cleaned as provided in Section 59-2.05, "Steam Cleaning," of the Standard Specifications. Steam cleaning shall be performed with fresh water, and the temperature of the steam produced shall be between 135°C and 190°C at the nozzle.

At the option of the Contractor, a high pressure water wash system using fresh water with a nozzle pressure between 17 MPa and 21 MPa may be substituted for steam cleaning apparatus. Addition of biodegradable detergent to the high pressure water wash will not be required.

Gloss on the existing paint shall be removed without removing sound paint so that 60 degree specular gloss is less than 6 when measured in conformance with ASTM Designation: D523.

Areas containing rust or other foreign substances that are not removable by steam cleaning and rinsing or high pressure water washing, and which would hinder the bonding of new paint, shall be spot blast cleaned with abrasive blasting as required in Section 59-2.03, "Blast Cleaning," of the Standard Specifications. Blast cleaning shall not be performed until the surfaces are thoroughly dry.

Mineral and slag abrasives used for blast cleaning existing steel shall conform to the requirements of Abrasive Specification No. 1, "Mineral and Slag Abrasives," of the "SSPC: The Society for Protective Coatings" and shall not contain hazardous material. Mineral and slag abrasives shall comply with the requirements for Class A, Grade 2 to 3 as defined therein.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications and a Material Safety Data Sheet shall be furnished prior to use for each shipment of blast cleaning material for cleaning existing steel.

PAINING

Paint shall be applied to existing metal surfaces in conformance with the following requirements:

A. Precede each specified undercoat by a stripe coat on all edges, corners, seams, crevices, interior angles, junctions of joining members, weld lines, and similar surface irregularities. This stripe coat shall be of sufficient thickness to completely hide the surface being covered and shall be followed as soon as practical by the application of the full undercoat to its specified thickness.

B. Blast cleaned areas shall be coated with the following paint system in the order listed:

- First undercoat paint conforming to the requirements for Red Primer Paint-Waterborne, Formula FWB-145C, shall be applied in one or more applications to a dry film thickness of not less than 50 µm nor more than 75 µm.
- Second undercoat paint conforming to the requirements for Pink Primer Paint-Waterborne, Formula FWB-146C, shall be applied in one or more applications to a dry film thickness of not less than 50 µm nor more than 75 µm.
- The total dry film thickness of undercoats shall be not less than 100 µm nor more than 150 µm.

C. After the total dry film thickness of undercoats has been applied, metal surfaces shall receive the following finish coats in the order listed:

- First finish coat paint conforming to the requirements for Light Green Finish Paint-Waterborne, Formula FWB-163C, shall be applied in one or more applications to a dry film thickness of not less than 40 µm nor more than 75 µm.
- Second finish coat paint conforming to the requirements for Matching Finish Paint-Waterborne, Formula FWB-163C, shall be applied in one or more applications to a dry film thickness of not less than 40 µm nor more than 75 µm.

A minimum of 12 hours drying time shall be allowed before applying the succeeding undercoat or finish coat.

The total dry film thickness on areas that have been blast cleaned shall be not less than 180 µm nor more than 300 µm. The total dry film thickness of new paint on areas not blast cleaned shall be not less than 80 µm nor more than 150 µm.

PAYMENT

Steam cleaning and rinsing, high pressure water washing or sanding of exposed surfaces of existing structural steel will be paid for at a lump sum price for clean structural steel (existing bridge).

The contract lump sum price paid for clean structural steel (existing bridge) shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in steam cleaning, high pressure water washing and sanding of exposed surfaces of existing structural steel, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Blast cleaning and undercoat painting of blast cleaned areas will be measured by the square meter of spot blast cleaned areas and will be paid for as spot blast clean and paint undercoat.

The contract price paid per square meter for spot blast clean and paint undercoat shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in spot blast cleaning and painting undercoat on existing surfaces, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Finish coat painting of exposed surfaces of existing structural steel will be paid for at a lump sum price for paint structural steel (existing bridge).

The contract lump sum price paid for paint structural steel (existing bridge) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in finish coat painting the exposed surfaces of existing structural steel, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Blast cleaning and first undercoat painting of blast cleaned areas will be measured by the square meter of spot blast cleaned areas and will be paid for as spot blast clean and paint undercoat.

The contract price paid per square meter for spot blast clean and paint undercoat shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in spot blast cleaning and painting first undercoat on existing surfaces, 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 second undercoat and finish coat painting of exposed surfaces of existing structural steel will be paid for at a lump sum price for paint structural steel (existing bridge).

The contract lump sum price paid for paint structural steel (existing bridge) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in the second undercoat and finish coat painting the exposed surfaces of existing structural steel, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

**STATE OF CALIFORNIA
Department of Transportation Specification
Red Primer Paint
(Waterborne Formula FWB-145C)**

SCOPE

This specification covers a pre-mixed waterborne paint formulated for use as a prime coat on properly prepared metal surfaces.

This coating is intended for spray application. Limited application can be made by brushing and rolling.

REQUIREMENTS

General:

This specification is intended to specify paint that will meet service requirements for bridge construction and maintenance. All properties listed shall be maintained for a minimum of one year after acceptance. If the vendor is making this paint for the first time, the Transportation Laboratory in Sacramento must be consulted.

Materials:

The raw materials for use in the paint formula shall conform to the specifications designated or paint material code number hereinafter specified.

QUALITY ASSURANCE

The inspection, sampling, testing, packaging and marking of the coating shall comply with State of California Specification 8010-XXX-99, *Coatings, Protective, Quality Assurance Requirements*.

Unless otherwise permitted by the Maintenance Engineer, paint shall be sampled at the place of manufacture and application will not be permitted until the paint has been approved by the Maintenance Engineer. Raw materials and copies of batch records used in the manufacture of the paint shall be submitted as requested by the Maintenance Engineer.

All tests will be conducted in accordance with the latest test methods of the American Society for Testing and Materials, Federal Test Method Standard No. 141, and methods in use by the Transportation Laboratory.

Patents:

The contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the work, and agrees to indemnify and save harmless the State of California, and its duly authorized representatives from all suits at law or action of every nature for, or on account of, the use of any patented materials, equipment, devices, or processes.

Description

This specification covers a ready-mixed, waterborne paint formulated for use on blast-cleaned steel surfaces exposed to the air. This coating is intended for spray application. Limited application can be made by brushing or rolling.

Composition

Paint shall be mixed in the following proportions and sequence:

Component	Weight percent	(LB/100 gallons)
Water	14.03	164
Defoamer	(1) 0.20	2.3
Thickener	blend (2) ~0.13	~1.5
Water	blend (2) 0.86	10.0
Hydroxypropyl Methylcellulose (2.5% solution in water, pH adjusted to 8.5-9.0)	(3) 4.02	47.0
Surfactant (30% in water)	(4) 0.90	10.5

Hold back part of water initially to get good grind viscosity. Grind under high shear to achieve specified grind. Do not exceed 38° C during this operation. Add remainder of water after grind is achieved.

Component	Weight percent	(LB/100 gallons)
Calcium Phosphosilicate	(5) 5.60	65.5
Magnesium Silicate	(6) 18.22	213.0
Red Iron Oxide	(7) 2.74	32.0

Reduce speed and slowly add stabilized latex. Stabilize latex by first adjusting to pH 3.5 with 28% ammonium hydroxide, then blend with surfactant solution. (Failure to make this adjustment will result in an unacceptable batch of material.)

Component	Weight percent	(LB/100 gallons)
Vinyl acrylic latex	(8) 50.30	588.0
Surfactant (30% in water)	(4) 2.00	23.4
Mix thoroughly, then add coalescent		
Coalescent	(9) 1.00	11.7

Characteristics

Density, grams per milliliter, ASTM D-1475	1.38 to 1.41
Pigment by weight of paint, percent, ASTM D-3723	25.6 to 27.0
Nonvolatile content, weight percent, ASTM D-2369, Procedure B	57.0 to 59.0
Nonvolatile content, volume percent, ASTM D-2697	40.7 to 42.7
Finesness of grind, Hegman, ASTM D-1210	4 to 5
pH	4.0 to 4.5
Consistency, ASTM D-562, grams (Equivalent KU)	200 to 300 (82 to 95)
High-shear viscosity, ASTM D-4287, 0 to 5-P cone, shear rate 12 000 s ⁻¹	0.4 to 0.8 P
Drying time, 100 µm wet film, ASTM D-1640 set to touch, hours	1 maximum
dry through, hours	4 maximum

- Colloid® 646 (Rhône-Poulenc)
- Rheology MQR-708 (Rohm and Haas)
- Methocel® F12MS (Dow Chemical)
- Pluronic® F-87 (BASF Wyandotte)
- Halox® CW-491 (Halox Pigments)
- Specific gravity 2.7 to 2.85, oil absorption* 30 ± 2, pH 9.5 ± 0.5, finesness of grind, Hegman, (ASTM D-1210) 3.5 to 4.0, median particle size 6 to 7 µm, maximum 75 µm, platy particle shape, 99% passing a 45 µm mesh sieve, dry brightness 87 ± 2%.
- Synthetic iron oxide, spheruloidal particle shape, Fe2O3 98% minimum, oil absorption* 20 ± 3, specific gravity 5.2 ± 0.1, 99.9% passing 45 µm mesh sieve. Water soluble matter 0.15% maximum, easy dispersible type recommended.
- Haloflex® 202 (Zeneca)
- 2,2,4-Trimethylpentanediol-1,3-dimethylbutylate

*Oil absorption values determined according to ASTM D-281.

PAINT SHALL BE PACKAGED IN POLYPROPYLENE OR HIGH DENSITY POLYETHYLENE PAILS AND LIDS ONLY.

**STATE OF CALIFORNIA
Department of Transportation Specification
Red Primer Paint
(Waterborne Formula FWB-146C)**

SCOPE

This specification covers a pre-mixed waterborne paint formulated for use as a prime coat on properly prepared metal surfaces.

This coating is intended for spray application. Limited application can be made by brushing and rolling.

REQUIREMENTS

General:

This specification is intended to specify paint that will meet service requirements for bridge construction and maintenance. All properties listed shall be maintained for a minimum of one year after acceptance. If the vendor is making this paint for the first time, the Transportation Laboratory in Sacramento must be consulted.

Materials:

The raw materials for use in the paint formula shall conform to the specifications designated or paint material code number hereinafter specified.

QUALITY ASSURANCE

The inspection, sampling, testing, packaging and marking of the coating shall comply with State of California Specification 8010-XXX-99, *Coatings, Protective, Quality Assurance Requirements*.

Unless otherwise permitted by the Maintenance Engineer, paint shall be sampled at the place of manufacture and application will not be permitted until the paint has been approved by the Maintenance Engineer. Raw materials and copies of batch records used in the manufacture of the paint shall be submitted as requested by the Maintenance Engineer.

All tests will be conducted in accordance with the latest test methods of the American Society for Testing and Materials, Federal Test Method Standard No. 141, and methods in use by the Transportation Laboratory.

Patents:

The contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the work, and agrees to indemnify and save harmless the State of California, and its duly authorized representatives from all suits at law or action of every nature for, or on account of, the use of any patented materials, equipment, devices, or processes.

Description

This specification covers a ready-mixed, waterborne paint formulated for use on blast-cleaned steel surfaces exposed to the air. This coating is intended for spray application. Limited application can be made by brushing or rolling.

Composition

Paint shall be mixed in the following proportions and sequence:

Component	Weight percent	(LB/100 gallons)
Water	14.05	164
Defoamer	(1) 0.20	2.3
Thickener	blend (2) ~0.13	~1.5
Water	blend (2) 0.86	10.0
Hydroxypropyl Methylcellulose (2.5% solution in water, pH adjusted to 8.5-9.0)	(3) 4.02	47.0
Surfactant (30% in water)	(4) 0.90	10.5

Hold back part of water initially to get good grind viscosity. Grind under high shear to achieve specified grind. Do not exceed 38° C during this operation. Add remainder of water after grind is achieved.

Component	Weight percent	(LB/100 gallons)
Calcium Phosphosilicate	(5) 5.61	65.5
Magnesium Silicate	(6) 18.25	213.0
Red Iron Oxide	(7) 1.29	15.0
Titanium Dioxide	(8) 1.29	15.0

Reduce speed and slowly add stabilized latex. Stabilize latex by first adjusting to pH 3.5 with 28% ammonium hydroxide, then blend with surfactant solution. (Failure to make this adjustment will result in an unacceptable batch of material.)

Component	Weight percent	(LB/100 gallons)
Vinyl acrylic latex	(9) 50.39	588.0
Surfactant (30% in water)	(4) 2.00	23.4
Mix thoroughly, then add coalescent		
Coalescent	(10) 1.00	11.7

Characteristics

Density, grams per milliliter, ASTM D-1475	1.38 to 1.41
Pigment by weight of paint, percent, ASTM D-3723	25.5 to 27.0
Nonvolatile content, weight percent, ASTM D-2369, Procedure B	57.0 to 59.0
Nonvolatile content, volume percent, ASTM D-2697	40.7 to 42.7
Finesness of grind, Hegman, ASTM D-1210	4 to 5
pH	4.0 to 4.5
Consistency, ASTM D-562, grams (Equivalent KU)	200 to 300 (82 to 95)
High-shear viscosity, ASTM D-4287, 0 to 5-P cone, shear rate 12 000 s ⁻¹	0.4 to 0.8 P
Drying time, 100 µm wet film, ASTM D-1640 set to touch, hours	1 maximum
dry through, hours	4 maximum

- Tenol® 681 (Rohm and Haas Company)
- Surfynol® 104A (Rohm and Haas Company)
- Acrysol® RM-825 (Rohm and Haas Company)
- Bubble Breaker 3056A (Witco)
- ASTM D-476, Type IV
- 98% minimum CaCO₃ having an average particle size of 5 µm or less, a maximum particle size of 25 µm and containing no less than 80% particle size of less than 10 µm. Oil absorption (ASTM D-281) shall be less than 22.
- Aquasac 700 (McWhorter, Inc.) or EPS 2504 (Engineered Polymer Solutions, Inc.)
- 2,2,4-Trimethylpentanediol-1,3-dimethylbutylate

*Oil absorption values determined according to ASTM D-281.

PAINT SHALL BE PACKAGED IN POLYPROPYLENE OR HIGH DENSITY POLYETHYLENE PAILS AND LIDS ONLY.

**STATE OF CALIFORNIA
Department of Transportation Specification
Red Primer Paint
(Waterborne Formula FWB-163C)**

SCOPE

This specification covers a pre-mixed waterborne paint formulated for use as a finish coat on properly prepared metal surfaces.

This coating is intended for spray application. Limited application can be made by brushing and rolling.

REQUIREMENTS

General:

This specification is intended to specify paint that will meet service requirements for bridge construction and maintenance. All properties listed shall be maintained for a minimum of one year after acceptance. If the vendor is making this paint for the first time, the Transportation Laboratory in Sacramento must be consulted.

Materials:

The raw materials for use in the paint formula shall conform to the specifications designated or paint material code number hereinafter specified.

QUALITY ASSURANCE

The inspection, sampling, testing, packaging and marking of the coating shall comply with State of California Specification 8010-XXX-99, *Coatings, Protective, Quality Assurance Requirements*.

Unless otherwise permitted by the Maintenance Engineer, paint shall be sampled at the place of manufacture and application will not be permitted until the paint has been approved by the Maintenance Engineer. Raw materials and copies of batch records used in the manufacture of the paint shall be submitted as requested by the Maintenance Engineer.

All tests will be conducted in accordance with the latest test methods of the American Society for Testing and Materials, Federal Test Method Standard No. 141, and methods in use by the Transportation Laboratory.

Patents:

The contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the work, and agrees to indemnify and save harmless the State of California, and its duly authorized representatives from all suits at law or action of every nature for, or on account of, the use of any patented materials, equipment, devices, or processes.

Description

This specification covers a light or dark green, waterborne paint formulated for use as a finish coat on properly prepared metal surfaces. This coating is intended for spray application. Limited application can be made by brushing or rolling.

Composition

Paint shall be mixed in the following proportions and sequence:

Component	Weight percent
Water	4.8
Dispersant	(1) 0.75
Surfactant	(2) 0.21
Thickener	(3) 0.19 to 0.22
Defoamer	(4) 0.11

Hold back part of water initially to get good grind viscosity. Do not exceed 37°C during this operation. Add remainder of water after grind is achieved.

Component	Weight percent
Titanium Dioxide	(5) 0.6
Calcium Carbonate	(6) 10.7
Pre-dispersed Colorant	8.0 maximum

Colorants selected shall be compatible, light-fast, glycol-free, and alkali resistant. They shall be carefully selected so as to not adversely affect the coating formulation. Colorants shall not contain lead, chromes or zinc.

Let down paste slowly:

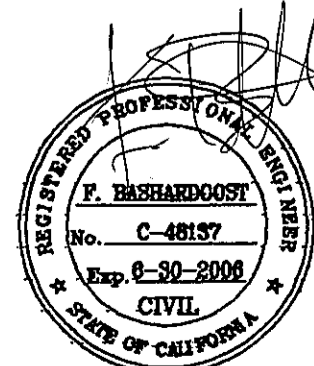
Styrenated Acrylic Emulsion	(7) 61 to 62
Coalescing Solvent	(8) 7.0
Ammonium Hydroxide (28%)	~0.2
(add as necessary to adjust pH)	
Water	5 to 6
(add as necessary to adjust nonvolatile content and viscosity)	

Characteristics

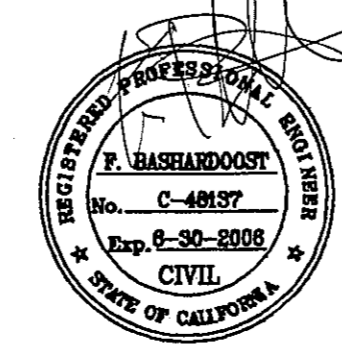
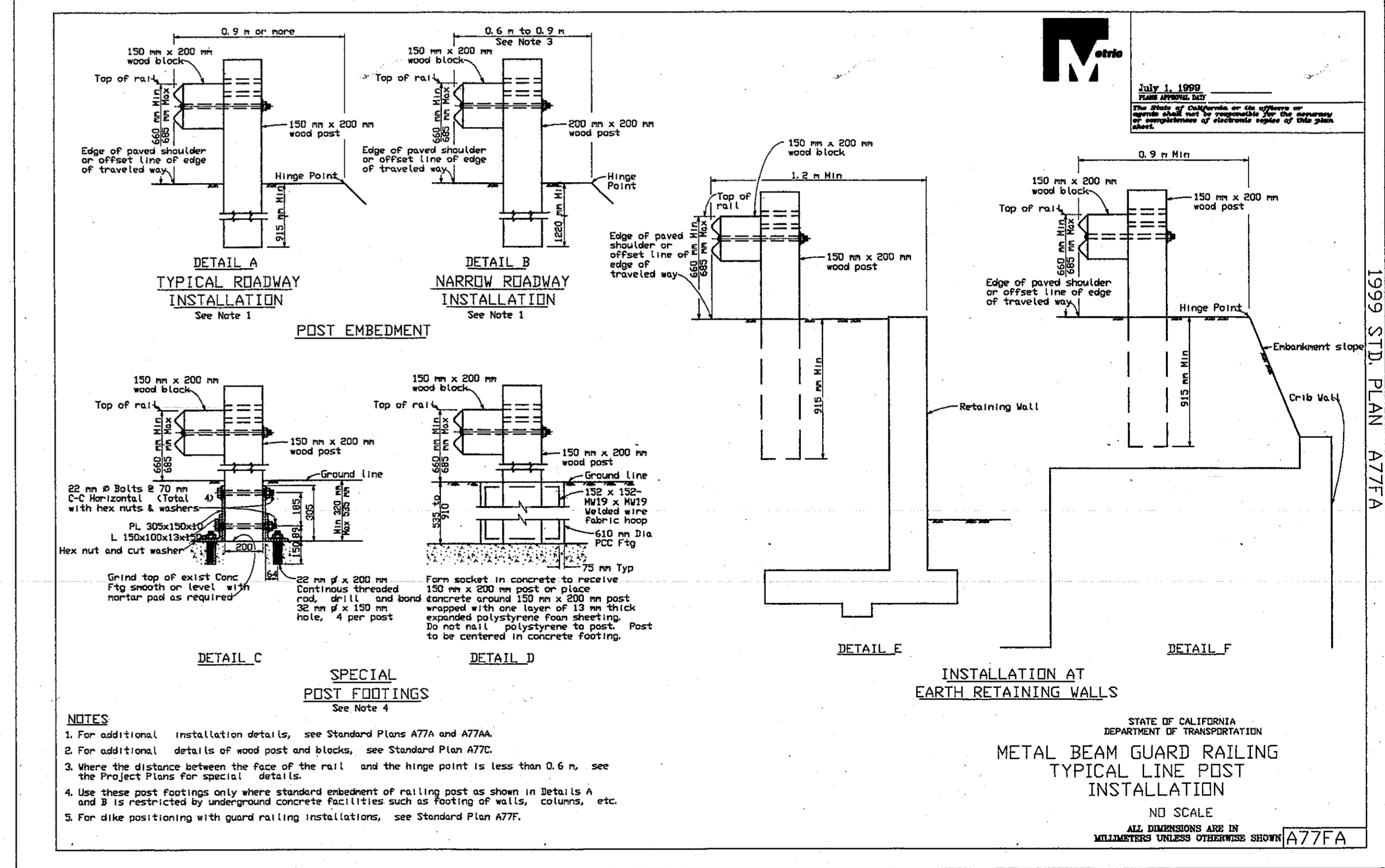
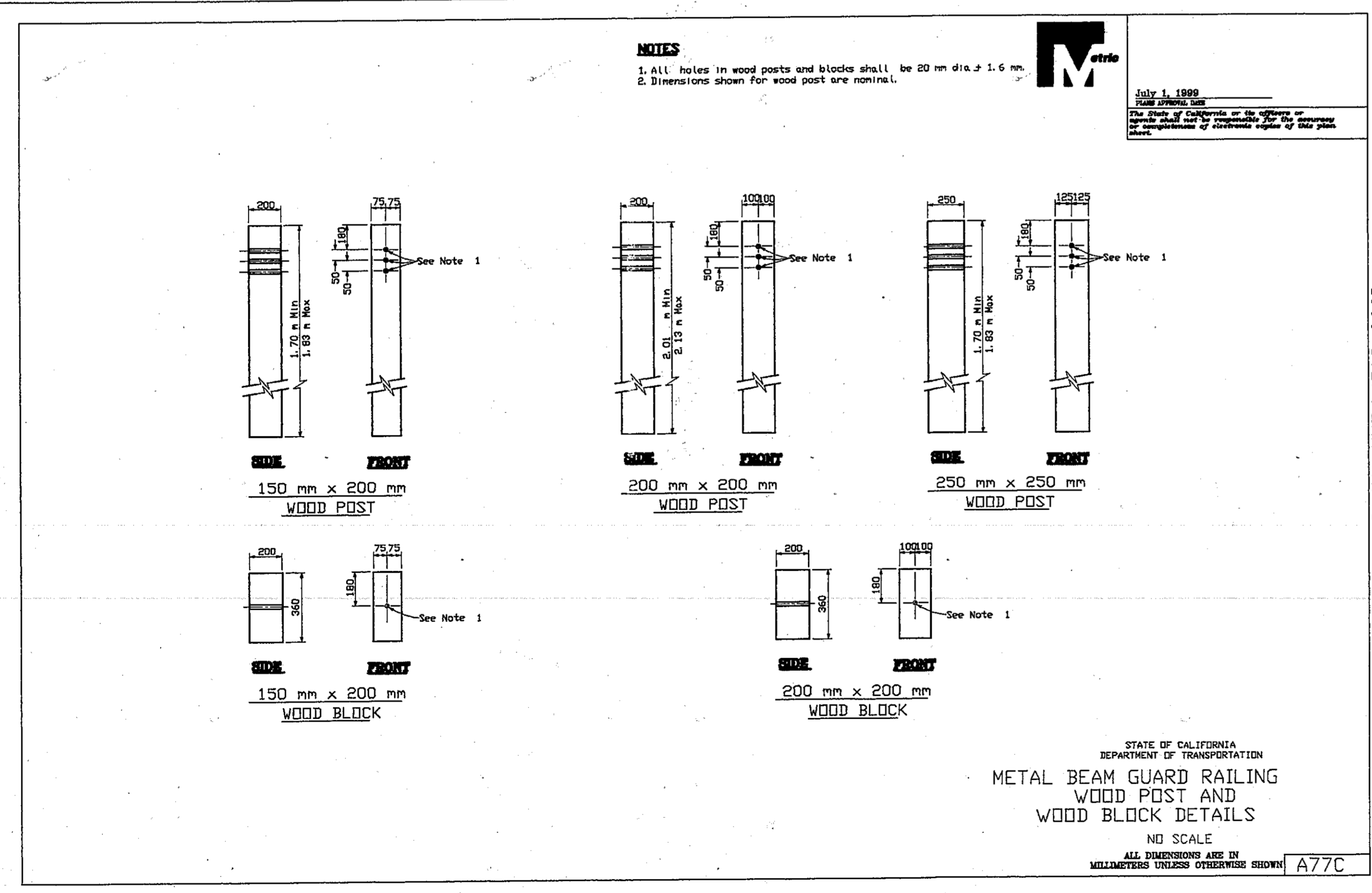
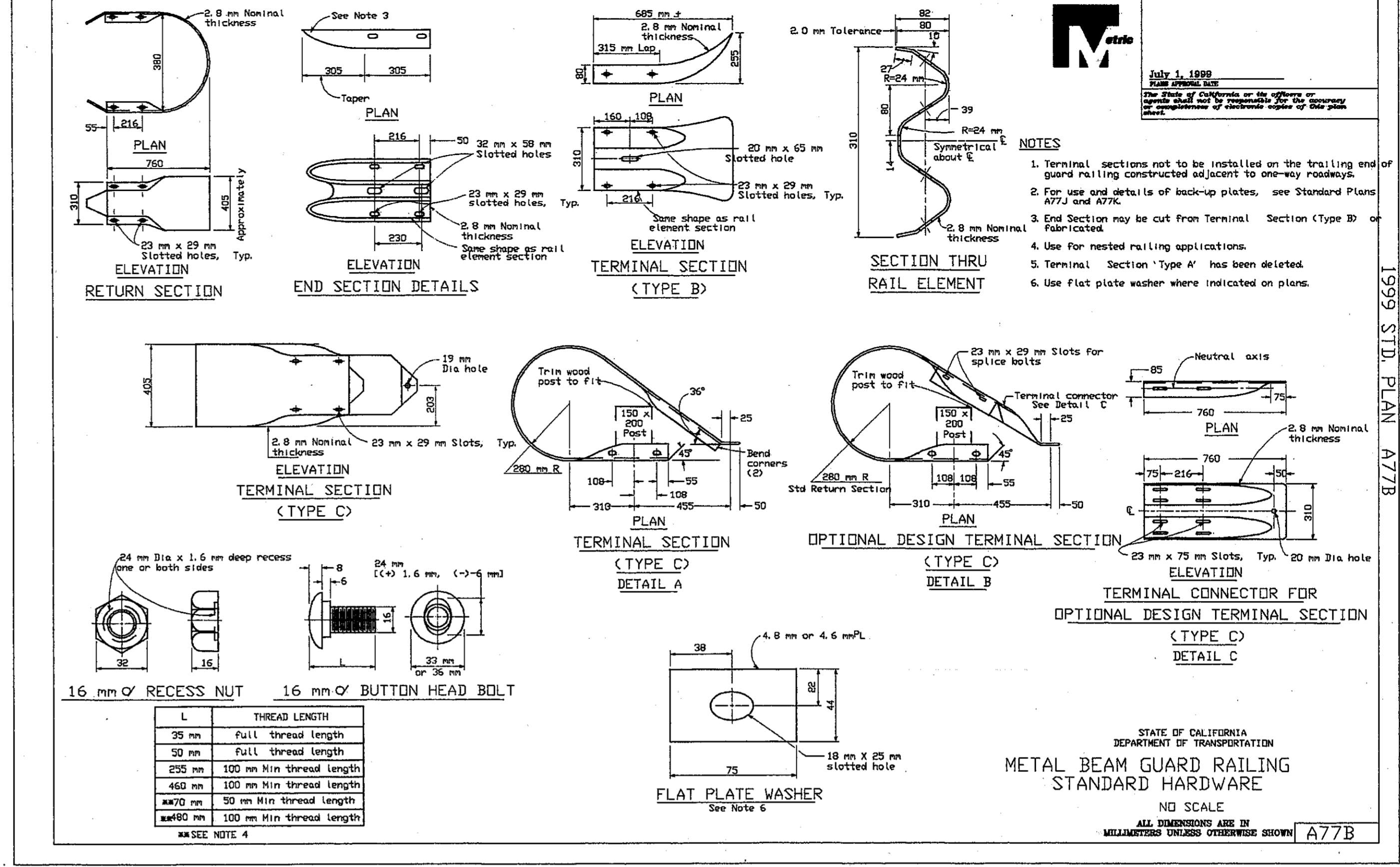
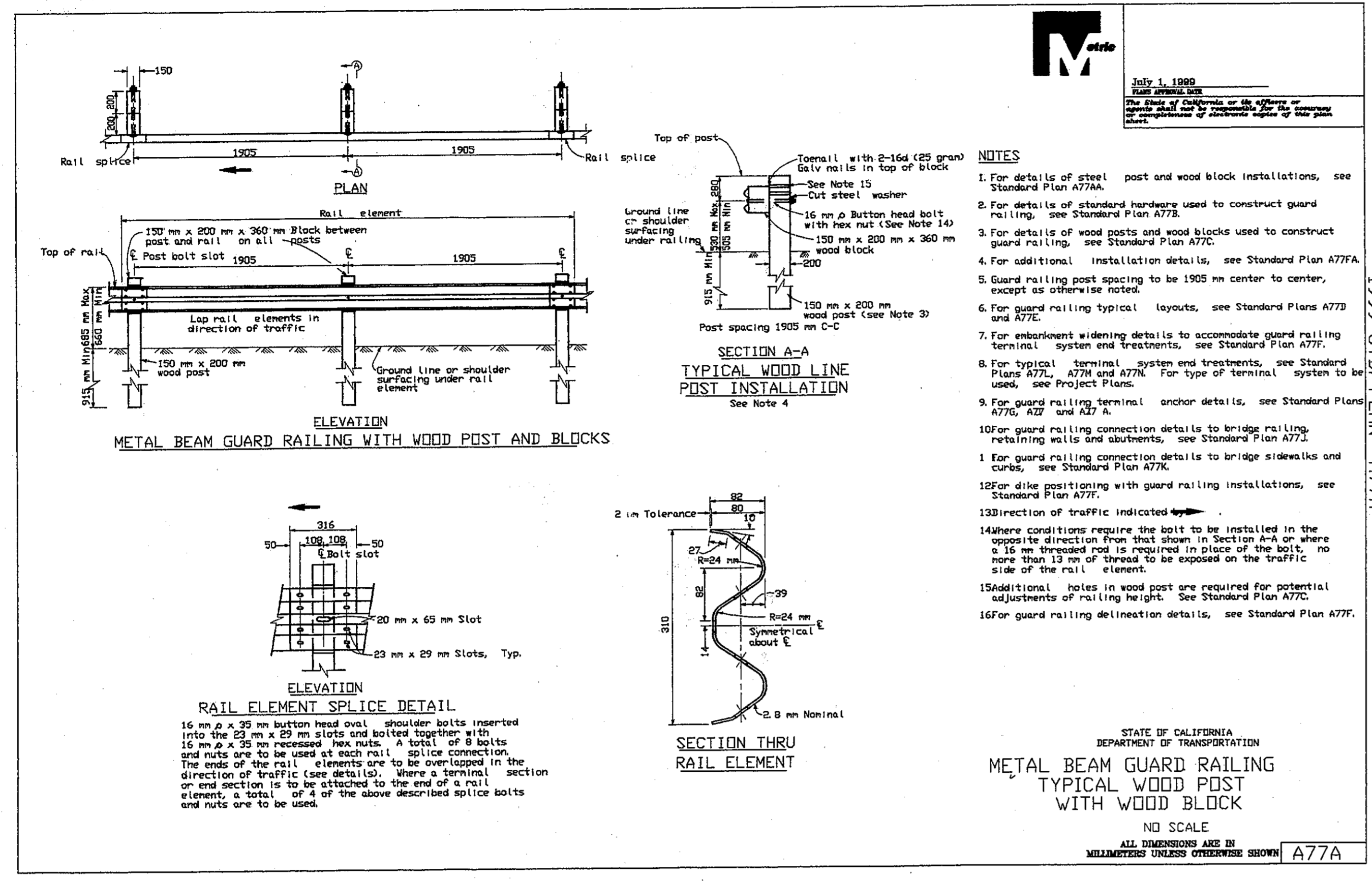
Density, grams per milliliter, ASTM D-1475	1.11 to 1.14
Pigment by weight of paint, percent, ASTM D-3723	13.0 to 14.6
Nonvolatile content, weight percent, ASTM D-2369, Procedure B	44.0 to 46.5
Nonvolatile content, volume percent, ASTM D-2697	37.0 to 38.5
Finesness of grind, Hegman, ASTM D-1210	6 minimum
Contrast ratio, ASTM D-2805, 150 µm clearance applicator	8.0 to 9.0
pH	175 to 225
Consistency, ASTM D-562, grams (Equivalent KU)	(77 to 86)
High-shear viscosity, ASTM D-4287, 0 to 5-P cone, shear rate 12 000 s ⁻¹	0.5 P maximum
Drying time, 100 µm wet film, ASTM D-1640 set to touch, hours	1 maximum
dry through, hours	2 maximum

Color to match Federal Standard 595B color number 14090 unless otherwise specified. When used as a two-coat finish paint system over Caltrans specified primers, the first finish coat shall match Federal Standard 595B color number 14223.

- Tenol® 681 (Rohm and Haas Company)
- Surfynol® 104A (Rohm and Haas Company)
- Acrysol® RM-825 (Rohm and Haas Company)
- Bubble Breaker 3056A (Witco)
- ASTM D-476, Type IV
- 98% minimum CaCO₃ having an average particle size of 5 µm or less, a maximum particle size of 25 µm and containing no less than 80% particle size of less than 10 µm. Oil absorption (ASTM D-281) shall be less than 22.
- Aquasac 700 (McWhorter, Inc.) or EPS 2504 (Engineered Polymer Solutions, Inc.)
- 2,2,4-Trimethylpentanediol-1,3-dimethylbutylate



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BENCHMARK	CITY OF COLTON PUBLIC SERVICES DEPARTMENT		REVISIONS	DATE	APPR.
	CITY ENGINEER NAME: AMBA JATHAR R.C.E. 50932 APPROVED: [Signature] PLAN NO. M-204				
SANTA ANA RIVER BRIDGE CALTRANS BRIDGE NO.54C0077			DATE: 9-20-05		
RAILING DETAILS			SHEET 4 of 4		
ADDRESS: S. LA CADENA DRIVE					