Authorization and coordination from the Engineer is required for each traffic signal system shutdown. Traffic signal system shutdowns shall be limited to periods between the hours of 9:00 A.M. and 3:00 P.M.

The Contractor may request authorization from the Engineer to use temporary overhead conductors for temporary traffic signal operation.

Equip existing flashing beacons with portable flashing beacons during flashing beacon shutdown. Portable flashing beacons shall conform to the provisions in Section 12-3.05, "Portable Flashing Beacons" of the Standard Specifications or as directed by the Engineer.

If directed by the Engineer, a generator shall be furnished, connected, and maintained to keep traffic signal or flashing beacon system running in normal operation. All matters pertaining to the operation of existing traffic signal equipment shall be coordinated and cooperated with Riverside County's traffic signal operation division.

Temporary "Stop" signs furnished and installed shall be 48 inches in size.

Temporary "Stop Ahead" signs furnished and installed shall be equipped with portable flashing beacons.

G. Remove, Reinstalling or Salvaging Electrical Equipment

Removing, reinstalling or salvaging shall conform to provisions in Section 86-7 "Removing, Reinstalling or Salvaging Electrical Equipment", of the Standard Specifications.

H. Foundations

Foundations shall conform to the provisions in Section 51, "Concrete Structures", and Section 86-2.03, "Foundations", of the Standard Specifications and these Special Provisions.

Portland cement concrete shall conform to Section 90-2, "Minor Concrete", of the Standard Specifications and shall be Class 3 except pole foundations shall be Class 2.

Construct Type 332 controller cabinet foundation per Standard Plans ES-3C.

Vibrate all foundation concrete to eliminate air pockets.

I. Standards, Poles, Steel Pedestals and Posts

Standards, poles, steel pedestals, and posts shall conform to the provisions in Section 86-2.04, "Standards, Poles, Steel Pedestals and Posts", of the Standard Specifications and these Special Provisions.

Type 1A pole material shall be spun aluminum unless otherwise specified.

Poles installed at the near-right approach of each intersection shall be banded conforming to the strap and saddle method per Standard Plans RS4 for the emergency installation of stop signs.

DECORATIVE BASES AND SCROLLS

The base manufacturer shall have been making decorative two-piece bases for the last five years or with experience to the satisfaction of the City Engineer. Contractor shall submit a statement of qualifications with the following minimum criteria:

a. Identify at least ten (10) traffic signals that have been retrofitted with decorative bases by the same crew within the last three (3) years; and

b. Provide a minimum three (3) references for the decorative base Contractor. At least one (1) reference shall be from a public agency.

Decorative bases shall be installed on each traffic signal pole including 1A poles. The decorative bases shall be a two piece cast aluminum component, A356 Aluminum or better, and shall be Corsican Style as manufactured by South Coast Lighting and Design located at 1391 Calle Avanzado, San Clemente, CA 92673, (949) 276-8850 or approved equal. A hand hole cover shall be fabricated into one half of the base and lined up to match the hand hole location for the pole. A notch shall but cut into the top of the base for each crosswalk pedestrian push button assembly. The bases shall be fitted to each type of pole such that it will mount flush to the pole and to the concrete pavement. The bases shall have the City of Murrieta seal embedded into one half of the base on the hand hole cover. The seal shall be 4.6-inches in diameter and shall be painted the same as the base except in two-tone color. The raised elements of the seal shall be sanded to leave the raised elements a bare aluminum finish. The seal shall be fabricated from the following detail:

A sample seal shall be fabricated and submitted to the City for approval prior to installation. Tamper-proof screws shall be installed to fasten the bases to the poles. A sample cut sheet for the base can be provided by the City. The size of the base will vary depending on the pole type; Contractor shall measure the poles in the field and verify dimensions prior to manufacturing of the bases. Any revisions to be dimension of the bases shall be approved by the City Engineer. South Coast Lighting part numbers by pole type are provided in Table 216-1.3.1 for reference. Painting of the bases shall conform with Section 310-5.3.1.

Decorative scrolls shall be installed on each luminaire arm. The decorative scrolls and straps shall be "S" Type as manufactured by South Coast Lighting and Design located at 1391 Calle Avanzado, San Clemente, CA 92673, (949) 276-8850 or approved equal. Painting of the decorative scrolls shall conform with Section 310-5.3.1.

Table 216-1.3.1 – South Coast Lighting Part Numbers

Part	South Coast Lighting Part Number
Base - Type 29 Pole	BCCOR3142-T29
Base - Type 24 Pole	BCCOR2542-T24
Base - Type 19 Pole	BCCOR2542-T19
Base – Type 1A Pole (steel)	BCCOR1827-T1A
Base – Type 1A Pole (aluminum)	BCCOR1827-T1A-ALUM
Scroll – Type 29 Pole	SCR-S-2F-T29-MURRIETA GRN
Scroll – Type 24 Pole	SCR-S-2F-T24-MURRIETA GRN
Scroll – Type 19 Pole	SCR-S-2F-T19-MURRIETA GRN

Signal mast arms shall be installed in accordance with the "Signal Arm Connection Details" of the Standard Plans unless otherwise specified.

If required by the serving electric utility, and confirmed by the Engineer, State Certified Electric Workers shall be utilized for the installation of standards, steel pedestals, and posts in accordance with State of California High Voltage Safety Orders.

J. Conduits

Conduit to be installed underground shall be the rigid non-metallic type per Section 86-2.05A of the State Standard Specifications, unless noted otherwise on the Plans. All conduit shall contain a 3/16" pull rope. All conduit shall be no less than 2 inches in diameter. All conduit designed to hold fiber optic cable shall have a No. 8 THWN tracer wire installed within the conduit. Twenty-four (24) inches of wire shall be provided at each conduit termination point.

When a standard coupling cannot be used for coupling metal type conduit, a UL listed threaded union coupling, as specified in the third paragraph in Section 86-2.05C, "Installation," of the State Standard Specifications, or a concrete-tight split coupling shall be used.

After conductors/cables have been installed, the ends of conduits terminating in pull boxes, and in service and controller cabinets shall be sealed with an approved type of sealing compound.

Conduits for detectors and fiber-optic cable shall be placed behind the curb or sidewalk using directional drilling or trenching methods only. Jacking will not be permitted. "Trenching in Pavement" method shall only be permitted if directional drilling or trenching is not feasible due to site constraints, as approved by the City Engineer. A minimum of three (3) attempts shall be made using drilling before trenching will be considered. Conduit runs shown on the Plans across the roadway may be installed by "Trenching in Pavement Method" **as determined by the County inspector**. The trench shall be backfilled with 590 lbs. cement/cubic yard of slurry cement per Section 19-3.062D and Section 86-2.05 of the State Standard Specifications to within 0.20 ft., maximum, of finish surface. Hot asphalt concrete patch (D2-PG-64-10) shall be placed and compacted to a flush surface (no crown). Existing asphalt concrete edges shall be sawcut and tack coated with SS-1h at 0.10 gal./S.Y.

K. Pull Boxes

Grout shall be placed in the bottom of all pull boxes. Fiber-optic pull boxes shall be number six with extension (6E). **All number six pull boxes shall have Fiberlite-type lids**. All conduits into fiber-optic pull boxes shall have forty-five (45) degree bends with a minimum radius not less than six (6) times the inside diameter of the conduit. All pull boxes installed as part of this project are assumed to be installed within existing sidewalk locations, and include all items necessary to complete each installation, including removal of existing sidewalk panel, sawcutting at the next available joint, demolition and removal of the existing sidewalk panel, excavation, setting each pull box, backfilling, and any necessary concrete. Replacement of new sidewalk panel shall be per City Standard Drawing Number 320. Pull boxes used for interconnect shall be placed at 400 foot spacing, unless otherwise shown on the plans.

L. Conductors, Cables and Wiring

Conductors and Cables shall conform to the provisions in Section 86-2.08, "Conductors and Cables", of the Standard Specifications and these Special Provisions.

Wiring shall conform to the provisions in Section 86-2.09, "Wiring", of the Standard Specifications and these Special Provisions.

Specific cabling and wiring requirements for various systems or components shall be in accordance with the Special Provisions entitled to each herein.

Signal cable shall be installed continuously without splicing from the controller cabinet to each traffic signal pole. Traffic signal conductors, multiple circuit conductors, and signal cable conductors shall not be spliced unless otherwise shown

All outer cable jacket for 12 conductor cable shall be removed from the traffic signal standard hand hole to the terminal block located at the side mount traffic signal head.

Where splice is required, Type C or Type T splice shall be used and insulated as shown in the Standard Plans, ES-13A.

Where splice is required, “Liquid Electrical Tape” or equivalent in black color shall be used to provide a watertight electrical insulating coating with “Method B” as shown in the Standard Plans, ES-13A.

Minimum luminaire wiring shall be No. 10 AWG, including wiring within poles and mast arms.

M. Bonding and Grounding

Bonding and grounding shall conform to the provisions in Section 86-2.10, "Bonding and Grounding", of the Standard Specifications and these Special Provisions.

Grounding jumper shall be attached by a 3/16 inch or larger brass bolt in the signal standard or controller pedestal and shall be run to the conduit, ground rod or bonding wire in the adjacent pull box.

Grounding jumper shall be visible after cap has been poured on foundation.

For equipment grounding jumper a No. 8 bare copper wire shall run continuously in all circuits except a No. 12 bare copper wire shall run continuously in conduits that contain only signal interconnect cable and/or loop detector cable.

N. Service

Service shall conform to the provisions in Section 86-2.11, "Service", of the Standard Specifications and these Special Provisions.

Service equipment enclosure shall be Type III-CF, as shown on the Standard Plans, ES-2F, and shall conform to the following:

1. 120 / 240 volt, 2 meter service unless otherwise shown on the plans.
2. Circuit breakers required:
    - 2 - 100 Amp 2 pole (signal main and lighting main)
    - 1 - 30 Amp 1 pole (luminaires)
    - 1 - 30 Amp 1 pole (signals)
    - 1 - 15 Amp 1 pole (luminaire photoelectric control)
3. Cabinet shall be fabricated from aluminum sheeting and finish shall be anodic coating in accordance with Section 86-3.04A "Cabinet Construction".
4. Circuit breakers shall be marked with identifying labels for each circuit breaker.

Type V photoelectric control contactor and test switch assembly shall be installed in the service cabinet. Photoelectric control contactors shall be as follows:

1. Luminaires - 60 Amp electrically held contact
2. Street name signs - 30 Amp electrically held contact

A GFCI outlet shall be installed on the interior side of service cabinet door.

Photo Electric Control assembly shall be installed within the circuit breaker compartment of the service equipment enclosure, and accessible to the Engineer after installation of electrical meters.

Direct burial service conductors are not allowed.

The Contractor shall be responsible for contacting the power company, arranging and providing for the electrical service connection, and ensuring that adequate notice is provided to the serving electric company in advance of need. *The County of Riverside will pay all electric company fees required.*

The service equipment enclosure shall be a minimum of 15 feet from the controller cabinet, and a minimum of 10 feet from all utility poles, unless otherwise directed by the Engineer.

Service Identification

The service address shall be shown on the front upper panel of the service equipment enclosure, and the meters shall be labeled “LS3” (lighting meter) and “TC1” (signal meter) by lettering applied to the exterior of the enclosure in accordance with these special provisions, or as directed by the Engineer.

Lettering markings shall be black with a two-inch minimum size in block letter form. Markings shall be applied to a brushed aluminum, stainless steel, or other non-corroding metallic plate, as approved by the Engineer. Plate shall be white in color. All paint and markings shall conform in all respects to Federal Specification TT-E-489, latest revision, Class A, Air Drying. Said plate shall be affixed in a permanent manner by riveting or with stainless steel bolts and nuts. Bolts shall be peened after tightening. All materials used for affixing address plate shall be non-corroding. The Engineer shall approve all alternate materials and methods prior to installation.

O. Testing

Testing and Field Testing shall conform to the provisions in Section 86-2.14, "Testing", of the Standard Specifications and these Special Provisions.

Specific testing requirements for various systems and components shall be in accordance with the Special Provisions entitled to each herein.

The complete controller assembly and Battery Backup System shall be delivered to the following location or location as directed by the Engineer for testing:

Traffic Signal Shop
Riverside County Transportation Department
McKenzie Highway Operations Center
2950 Washington Street
Riverside, California 92504
Telephone (951) 955-6894

A minimum of 15 working days for operational testing and adjustment is required. An additional 15 working days period shall be allowed for retesting should the equipment fail.

The conflict monitor unit shall be tested in the field before signal turn on.

P. Model 170E Controller Assembly And Type 332l Cabinet

Model 170E controller assembly or assemblies shall be furnished and installed by Contractor.

In addition to the provisions in Section 86-3, “Controller Assemblies," of the State Standard Specifications, the complete control system, including the Model 332L cabinet, shall conform to the

California Business, Transportation, and Housing Agency, Department of Transportation, "Transportation Electrical Equipment Specifications (TEES)," dated 2009, and any subsequent addenda.

The above-referenced document is available from the State of California, Bids and Documents Section, Sacramento, for a fee.

The controller cabinet shall be fabricated from anodized aluminum and supplied by McCain, Inc.

The Model 170E controller shall have a hole or “knock-out” in the top of the case to accommodate a fiber-optic jumper.

The controller assembly shall be equipped with a pull-out shelf with internal document storage compartment mounted below the 170E controller position (per the Caltrans 332L specification) and a fiber-optic splice tray (Corning CCS Rack Mountable Closet Connector with 4 CCH connector panels, each containing 12 ST connectors (48 total) or City approved equal) mounted above the 170E controller position.

The controller cabinet shall contain two (2) cabinet lights (one for each door) and one (1) cabinet fan. The controller cabinet shall contain one (1) front door alarm switch, wired with a 242 isolator. The controller cabinet shall be equipped for full 8-phase operation and supplied with 16 (each) 222 EDI detectorsl.

Contractor shall supply the Model 170E controller. The controller unit shall be furnished complete with a "FO400 fiber-optic modem" and a Model 412C PROM module configured for Method No. 2, Memory Select No. 4. The software program shall be McCain MC1/McCain 200CA/McCain 233RV and is to be furnished and installed by Contractor. The cabinet, controller, and software program shall be supplied by the same manufacturer. Two (2) complete manuals and four (4) complete cabinet wiring diagrams shall be supplied in accordance with the above-referenced 2009 TEES Specifications and any subsequent addenda.

Contractor shall arrange to have a signal technician, qualified to work on the control equipment and employed by the control equipment manufacturer or its representative, present at the time the equipment is turned on.

Q. Vehicle Signal Faces And Signal Heads

Vehicle signal assemblies and auxiliary equipment shall conform to the provisions in Section 86-4, "Traffic Signal Faces and Fittings", of the Standard Specifications and these Special Provisions.

Vehicle new signal heads shall be made of either die-cast or mold-cast aluminum in accordance with Section 86-4.01A, “Signal Sections,” of the State Standard Specifications.

All new indications shall be Contractor-furnished, illuminated with 12” LEDs, meet the latest ITE LED specifications, and shall conform with Dialight LED manufacturers’models listed below, or city approved equal. All green circular and arrow indications shall be clear lens (not tinted).

	DIALIGHT
Indications	**Model No.**
• Red 12 Signals	- 433-1210-003XL
• Yellow 12 Signals	- 433-3230-901XL
• Green 12 Signals	- 433-2270-001XL
• Red Arrow	- 432-1314-001XOD
• Yellow Arrow	- 431-3334-901XOD
• Green Arrow	- 432-2374-001XOD

R. Countdown Pedestrian Signals

Type A pedestrian signals shall conform to the provisions in Section 86-4.03, “Pedestrian Signal Faces,” of the State Standard Specifications and these Special Provisions. All new pedestrian signal heads shall include a pedestrian change interval countdown display.

All new countdown pedestrian combination optical units shall meet the latest ITE LED specifications as manufactured by GE, model number listed below, or city approved equal, and shall be fully compliant for MUTCD countdown applications

	GE
Indications	**Model No.**
• Pedestrian Heads	- PS7-CFF1-26A-J

A single head constructed of a one-piece aluminum die casting shall house all messages. The housing door shall be one piece injection molded polycarbonate and shall be hinged to the housing by integral cast hinges. A weather-tight gasket shall prevent moisture and dust from entering the housing between the door and the housing. A visor shall be included with horizontal and diagonal louvers.

S. Pedestrian Push-Button Assemblies

Pedestrian push-button assemblies shall comply with the June 20, 1994, Architectural and Transportation Barriers Compliance Board Interim Final Ruling on the Americans with Disabilities Act Accessibility Guidelines and the following requirements:

1. The housing for the unit shall be made of 356 Aluminum heat treated to meet Spec. T-6. It shall be of a telescoping, vandal-proof design. The color shall match the ped push button assembly.

2. The plunger/actuator surface shall have a diameter of 2" or greater. It shall be made of anodized aluminum and assembled with all stainless steel components so as not to be corrosive. The actuator shall be conical in shape with the cone extending .404" above the bezel of the switch housing in the neutral position.

3. The microswitch component shall be a dust-proof, water-resistant type. It shall be a single-pole, precision, snap-acting type. It shall also be U.L. listed and CSA certified and meet the requirements for NEMA TS-1 and TS-2.

4. The complete switching unit shall have an operating force of 3 lbs. and a minimum release force of 3 lbs. Pre-travel shall be .062", minimum. Over-travel shall be .062", minimum.

5. Units shall permit recessed mounting in existing standard type pedestrian push-button assemblies without modification.

T. Detectors

Loop detector sensor units, magnetic detector amplifiers, magnetic sensing elements, and asphaltic concrete sealant for inductive detector loop installation will be Contractor-furnished as provided under these Special Provisions.

Loop detector units shall be **EDI Model 222 Inductive Loop Detector**.

Loop wire shall be Type 2 and loop detector lead-in cable shall be Type B per Section 86-5.01A(4) of the State Standard Specifications.

The following paragraph is added to Section 86-5.01A(4), "Installation Details," of the State Standard Specifications:

Slots cut in the pavement shall be washed clean, blown out, and thoroughly dried before installing conductors. Residue resulting from slot-cutting operations shall not be permitted to flow across shoulders or lanes occupied by public traffic and shall be removed from the pavement surface before any such material flows off of the pavement surface. Residue from slot-cutting operations shall be disposed of outside the highway right of way in accordance with Section 16-1.03D, "Disposal of Materials".

The spacing of the Type E detector loops, shown on State Standard Plan ES-5B, is changed to ten (10) feet, fifteen (15) feet, and thirty (30) feet. All Type E limit line loops shall have no less than three (3) wraps/turns. The sides of the slot shall be vertical, and the minimum radius of the slot entering and leaving the circular part of the loop shall be 1½ inches. Slot width shall be a maximum of ¾ inch. Slots shall be filled with elastomeric sealant or hot-melt rubberized asphalt sealant.

U. LED Luminaires

Luminaires shall conform to the provisions in Section 86-6, "Lighting", of the Standard Specifications and these Special Provisions.

Luminaires shall conform to the following Standards and Special Provisions:

Standards

- ANSI/NFPA 70, National Electrical Code
- FCC 47 CFR Part 15, Code Of Federal Regulations (CFR) testing standard for electronic equipment
- IEEE C62.41, Guide on the Surge Environment in Low-Voltage (1000 V and Less) AC Power Circuits
- IESNA LM-79, Electrical and Photometric Measurements of Solid-State Lighting Products
- IESNA LM-80, Approved Method for Measuring Lumen Maintenance of LED Light Sources
- IESNA TM-15, Luminaire Classification System for Outdoor Luminaires
- NEMA SSL 3-2010, High-Power White LED Binning for General Illumination
- UL1598, Standard for Safety of Luminaires

Led Luminaires

Material and specifications for each luminaire are as follows:

- Luminaire shall be Navion LED, model NVN-AE-03-E-U-T3-10K-U-AP or approved equal.
- Each luminaire shall consist of an assembly that utilizes LEDs as the light source. The complete luminaire shall consist of a housing, LED array, and electronic driver (power supply).
- Each luminaire shall be rated for a minimum operational life of 60,000 hours at an average operating time of 11.5 hours per night at 40ºC (104ºF).
- The rated operating temperature range shall be -40°C (-40ºF) to +40°C (104ºF).
- Each luminaire is capable of operating above 50ºC (122ºF), but not expected to comply with photometric requirements at elevated temperatures.
- Photometry must be compliant with IESNA LM-79.
- Each luminaire shall meet all parameters of this specification throughout the minimum operational life when operated at the average nighttime temperature.
- The individual LEDs shall be constructed such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire.
- Luminaire shall be constructed such that LED modules may be replaced or repaired without replacement of whole luminaire.
- Each luminaire shall be listed with Underwriters Laboratory, Inc. under UL1598 for luminaires in wet locations.

Technical Requirements

2. Electrical

   b. Luminaire shall have a minimum efficacy of 70 lumens per watt and shall consume no more than 160 watts. The luminaire shall not consume power in the off state.

   b. Operation Voltage: The luminaire shall operate from a 60 HZ ±3 HZ AC line over a voltage ranging from 108 VAC to 305 VAC. The fluctuations of line voltage shall have no visible effect on the luminous output.

   c. Power Factor: The luminaire shall have a power factor of 0.9 or greater.

   d. THD: Total harmonic distortion (current and voltage) induced into an AC power line by a luminaire shall not exceed 20 percent.

   e. Surge Suppression: The luminaire on-board circuitry shall include surge protection devices (SPD) to withstand high repetition noise transients as a result of utility line switching, nearby lightning strikes, and other interference. The SPD protects the luminaire from damage and failure for common (Line-to-Ground) and differential (Line-to-Line) mode transient peak currents up to 10 kA (minimum). SPD conforms to UL 1449. SPD performance has been tested per procedures in ANSI/IEEE C62.41-2:2002 category C high exposure and ANSI C136.2 10kV BIL. The SPD shall fail in such a way as the Luminaire will no longer operate. The SPD shall be field replaceable.

   f. Operational Performance: The LED circuitry shall prevent visible flicker to the unaided eye over the voltage range specified above.

   g. RF Interference: LED Drivers must meet Class A emission limits referred in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of electronic noise.

2. Photometric Requirements
   a. Optical Assemblies: LEDs shall be provided with discreet over optical elements to provide an IESNA Type III distribution. Additional distributions for glare control shall be utilized when direct source must be mitigated. Mitigation must take place without external shielding elements. Optical assemblies shall have a minimum efficiency of 85% regardless of distribution type. All LEDs and optical assemblies shall be mounted parallel to the ground. All LEDs shall provide the same optical pattern such that catastrophic failures of individual LEDs will not constitute a loss in the distribution pattern.
   b. No more than 3% of the total luminaire lumens shall be in the 80º to 90º range and no lumens will be emitted above 90º. BUG rating shall not exceed B2-U0-G3.
   c. Light Color/Quality: The luminaire shall have a correlated color temperature (CCT) of 4,000K +/-275K. The color rendition index (CRI) shall be greater than 70.
   d. 75% or more of the total luminaire lumens shall be to the street side of the luminaire.
   e. The optical assembly of the luminaire shall be protected against dust and moisture intrusion per the requirements of IP-66 (minimum) to protect all optical components.
   f. Luminaire manufacturer shall provide the LED manufacturers LM-80 report.
      - LM-80 report shall be at a drive current of 1000mA or less
      - LM-80 report shall be a minimum of 10,000 hours
      - LM-80 report shall show lumen depreciation of 1% or less for all LED case temperatures on the report including 55ºC, 85ºC, 105ºC

3. Thermal Management

   a. The thermal management (of the heat generated by the LEDs) shall be of sufficient capacity to assure proper operation of the luminaire over the expected useful life.
   b. The LED manufacturer's maximum thermal pad temperature for the expected life shall not be exceeded.

c. Thermal management shall be passive by design. The use of fans or other mechanical devices shall not be allowed.
d. The luminaire shall have a minimum heat sink surface such that LED manufacturer's maximum junction temperature is not exceeded at maximum rated ambient temperature.
e. The heat sink material shall be aluminum.

4. Physical and Mechanical Requirements

a. Thermally conductive extruded aluminum heat sinks shall be secured to a clear anodized extruded aluminum door frame with a cast aluminum end cap for optimum cooling. The cast aluminum electrical compartment shall be separate from the LED array to ensure cooler operating temperatures of the driver. Access to the electrical compartment shall be tool-less by use of stainless steel latches. Driver and surge module shall be secured to the swing down door which can easily be removed and exchanged without the use of tools by separating a quick disconnect electrical connection. Housing shall be designed to prevent the buildup of water on the top of the housing. Each optical assembly shall be field rotatable and shall have "street side" and "house side" cast into the optics to indicate beam pattern. Each optic shall be electrically connected with a quick disconnect plug and secured to the housing with four stainless steel screws.

b. Luminaire shall include cast in pipe stops, leveling steps and a four bolt mounting system capable of accommodating 1¼" to 2" ID pipe (1 5/8" to 2 3/8" OD).

c. The maximum weight of the luminaire shall be 30 lbs and the maximum effective projected area shall not exceed 1.4 sq ft.

d. The housing shall meet the requirements for NEMA/UL wet location, be UL listed and gray in color with a flat or semi-gloss sheen.

e. Luminaire options to include a NEMA photocontrol receptacle and dimming driver.

f. The power supply shall be contained inside the luminaire and a minimum IP rating of IP-65.

g. The assembly and manufacturing process for the LED luminaire shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration. Luminaire shall withstand vibration, meeting ANSI C136.31 American Standard for Roadway and Area Lighting Equipment – Luminaire Vibration for normal and bridge operation (3G minimum).

5. Materials

a. Housing and door frame shall be aluminum with a nominal 2.5 mil thick paint finish able to withstand a 3000 hour salt spray test as specified in ASTM Designation: B117. Housing shall have a minimum IP rating of IP-65.
b. Each refractor or lens shall be made from UV inhibited high impact optical grade material and be resistant to scratching.

c. All aluminum used in housing and brackets shall be a marine grade alloy with less than 2% copper. All exposed aluminum shall be anodized.

d. Polymeric materials (if used) of enclosures containing either the power supply or electronic components of the luminaire shall be made of UL94VO flame retardant materials. The len(s) of the luminaire are excluded from this requirement.

e. Paint or powder coating of the housing shall conform to the requirement of the Caltrans Standard Specifications.

Identification

Each LED luminaire shall have the manufacture's name, trademark, model number, serial number, date of manufacture (month-year), and lot number as identification permanently marked inside each unit and the outside of each packaging box.

The operation characteristics such as rated voltage and rated power in watts and Volt-Ampere shall be permanently marked inside each LED luminaire unit.

Quality Assurance

LED luminaire manufacturer shall provide 5-year warranty on LED luminaires that includes LEDs, housing, drivers and finish.

LED luminaire manufacturer shall not use IESNA LM-80 data to predict luminaire lifetime and shall demonstrate a suitable testing program incorporating high heat, high humidity and thermal shock test regimens to ensure system reliability and to substantiate lifetime claims.

Electrical and light technical properties shall be recorded for each LED luminaire during manufacture. This should include lumen output, CCT, and CRI at a minimum. Each luminaire shall utilize a unique serial numbering scheme. Technical properties must be made available for a minimum of 5 years after the date of manufacture.

Luminaires shall be fully assembled and individually electrically tested prior to shipment.

Submittals

Product data submitted for approvals shall include, but not limited to materials, finishes, photometric performance, photometric layouts, dimensional information and LM-79 report for each luminaire conducted by National Voluntary Laboratory Accreditation Program (NVLAP), accredited photometric laboratory.

Delivery, Storage and Handling

Deliver luminaires and components carefully to avoid breakage, bending and scoring finishes. Do not install damaged equipment.

Store luminaires and accessories in original cartons and in clean dry space; protect from weather and construction traffic.

Each luminaire shall be furnished without the photoelectric unit receptacle.

Each luminaire shall have a 5-amp inline fuse installed inside the standard's hand hole.

V. Reflective Mast-Arm-Mounted Street Name Signs

Reflective mast-arm-mounted street name signs shall be Type SG, manufactured by Safeway Sign Company or City-approved equal. Dimensions of the sign shall be per the plans. The reflective sheeting for the sign background shall be 3M diamond grade VIP blue #3995. The reflective sheeting for the lettering, City of Murrieta 'Gem' logo, and a one-inch (1") border around the sign with one-inch (1") radiused corners shall be 3M diamond grade VIP #3990. Street name lettering shall be MUTCD font Series EM, 8-inch U.C., 6-inch L.C. Block number lettering shall be MUTCD font Series D, 3-inch. Contractor shall provide sign material submittal to the City Engineer for approval prior to installation.

MAST-ARM SIGN HANGER ASSEMBLIES

Mast-arm-mounted street name signs shall be installed on signal mast arms at the locations shown on the Plans. The street name signs and mounting hardware will be Contractor-furnished as provided in these Special Provisions. The sign panels are shown on the Traffic Signal Plans. The hanger assembly is similar to that shown for internally illuminated street name signs on State Standard Plan ES-7P. The mounting hardware and sign shall be assembled, and the assembly shall be attached to the mast arm using 0.75-inch x 0.03-inch stainless steel band in a manner similar to the strap and saddle bracket method shown on State Standard Plan RS4. The band shall be wrapped at least twice around the mast arm, tightened, and secured with non-corroding metal clips in the same manner as for strap and saddle bracket sign mounting. The sign panel shall be leveled and all hardware tightened securely.

W. Modulated Light Signal Detection System (Emergency Vehicle Preemption System)

Each modulated light signal detection system shall conform to the details shown on the plans and these special provisions.

The emergency vehicle preemption system shall be a dual-priority, optically activated traffic signal preemption system.

Preemption Description

The system will employ optical communication to identify the presence of designated priority vehicles and cause the traffic signal controller to advance to and/or hold a desired traffic signal display selected from set phases normally available. The system provided shall properly receive an optical strobe pulse, decode the strobe pulse, and provide a NEMA-defined ground true input to the traffic signal controller. For controllers not equipped with internal preemption capabilities, external logic shall be provided to force the controller from a non-selected movement to the selected movement by skipping all intervening phases. This communication is a line-of-sight path of up to 2,500 feet. The system requires no attention of the vehicle operator other than a simple "Emitter On" switch located in the vehicle which is to remain "ON" until the end of the emergency run. The system shall operate on a first-come, first-served basis. The system shall interface with existing traffic signal controllers, as described above, without compromising normal operation or existing safety provisions. The traffic signal controller with internal preemption, or the external logic device, shall operate on a first-come-first-served basis and shall be capable of overriding lower priority systems as monitored by a "pulsing" NEMA ground true input. This controller or interface logic shall yield control to inputs of greater importance, such as railroads, etc. The optical control system shall consist of optical emitter assemblies (if required), optical detector and controller interface assemblies, and optical detector cables. All equipment shall be new and not refurbished.

Matched System Components

To ensure desired performance, the system will provide components matched and proven through integrated testing and functional experience of several intersections. The matched component system will offer compatibility with all types of optical emitters. Optical emitters (if required) shall transmit at a strobe rate of 14.035 Hz ±0.030 and shall be tuned to activate Tomar STROBECOM II detectors or City approved equal. Optical detector and controller interface assemblies shall properly decode a single-bulb Tomar STROBECOM II emitter or City approved equal, shall be self testing, and tuned per the above specifications. Optical detector and controller interface assemblies shall decode a band of 14.035 Hz +1-0.05. Matched components will provide future system compatibility of all priority control devices.

1. Optical Emitter Assembly (None required for this project.)
2. Optical Detector and Controller Interface Assembly
3. This equipment shall interface between an existing City optical emitter and the controller unit providing the following functions while not compromising the existing fail-safe provisions:

a. Deliver sufficient power to optical detector heads required for the intersection installation.
b. Control sensitivity of the optical signal and distinguish the flash rate of the electrical signals from the optical emitter.
c. Deliver a NEMA ground true input to controller unit.

Optical Detector Cable

Cable shall meet the requirements of IPCEA-S-61-402/NEMA WC 5, Section 7.4. 600-volt control cable 75°C, Type B, and the following:

1. The cable shall contain three (3) conductors, each of which shall be #20 (7x28) stranded, tinned copper with 25 mil minimum average thickness low-density polyethylene insulation. Insulation shall be color coded as follows: 1-yellow; 1-blue; 1-orange.
2. The shield shall be aluminized polyester film with a nominal 20% overlap. A #20 (7x28) stranded, tinned, bare drain wire shall be placed between the insulated conductors and the shield and in contact with the conductive surface of the shield.
3. The jacket shall be black PVC with minimum ratings of 600 volts and 80°C and a minimum thickness of 45 mil. The jacket shall be marked as required by IPCEA/NEMA.
4. The finished outside diameter of the cable shall not exceed 0.35 inch.
5. The capacitance as measured between any conductor and the other conductors and the shield shall not exceed 48 pico farads per foot at 1,000 Hz.

System Operation

1. Priority control sequence shall be activated by an optically transmitted signal of 14.035 Hz ±0.05, or upon the actuation of a test switch.
2. The system shall provide a NEMA-defined ground true, steady-state input to controller or auxiliary logic unit.

System Component Specifications

1. Optical Detector and Controller Interface Assembly

   The optical detector shall be a lightweight, weatherproof device capable of sensing and transforming pulsed optical energy into electrical signals for use by the controller interface assembly to provide NEMA-defined ground true logic.

   The optical detector shall receive power from the controller interface assembly or controller cabinet voltage regulation to be operational at NEMA-defined 24VDC logic levels.

   The optical detector must be responsive to the optical emitter at a distance of 2,500 feet (760 m).

   The optical detector must deliver the necessary electrical signal to the controller cabinet through up to 1,000 feet (305 m) of optical detector cable.

2. System Equipment

   System design shall, when used in conjunction with appropriate auxiliary devices, be capable of providing basic, high-priority, and low-priority service.

   The system shall be capable of recognizing the following pulse rates as delivered by an optical emitter:

   9.63 Hz ±.110 Hz as Low Priority
   14.035 Hz ±.05 Hz as High Priority

Reliability

All equipment supplied as part of these specifications shall be intended for use in or on emergency vehicles and shall operate properly under any combination of the following environmental conditions:

1. Temperature Range: -30°F (-34°C) to 140°F (60°C)
2. Relative Humidity: 0 to 90%
3. Vehicle Battery Voltage: 10 to 18 volts

Qualifications

The Tomar STROBECOM II is considered preapproved.

Prior to bid date, Contractor shall request and receive written permission from City for any other equipment.

Responsibilities

1) The manufacturer and/or manufacturer's representative (dealer) are to provide quality service before, during, and after installation of the priority control system. Contractor is to arrange to have Dealer come to the job site and determine best location for placement of optical detector heads prior to heads being mounted. Contractor to mount heads as directed by Dealer.
2) The manufacturer and/or manufacturer's representative must provide certified, trained technicians; traffic systems industry experience; and operational knowledge of priority control systems.
3) Prior to bid/quote activity, the manufacturer or its authorized representative shall be required to conduct field surveys of intersection control equipment to determine the most appropriate installation design for each location.
4) After an award, the manufacturer or its authorized representative shall be responsible for system documentation including the following:
    a. Acquiring all relevant controller information.
    b. Determine the desired priority approaches.
    c. Supply interface information to installer.
    d. Assist in system checkout prior to acceptance by:
    * Verifying proper installation per recommended interfaces
    * Verifying that optical ranges are properly set
    * Verifying that controller timings are properly set.
    e. Instruct emergency vehicle operators or their representatives, when requested, in the operation of the system.
    f. Manufacturer's technical support shall include technical service and design engineering.

Guaranteed Warranty

Manufacturer shall warrant that, provided the priority control system has been properly installed, operated, and maintained, component parts* that prove to be defective in workmanship and/or material during the first 10 years from date of shipment from manufacturer shall be covered in a documented system protection plan.

* Component parts exclude emitter lamps. Lamp warranty period for new emitter shall be one (1) year from the date of installation.

Certificate Of Insurance

The manufacturer shall provide a certificate of insurance protection for $5,000,000. This certificate assures the user that the manufacturer is insured against civil damage if proved to be at fault for an accident due to equipment failure within the system.

X. Fiber Optic Communications

Existing fiber optic systems shall not be disconnected for more than three (3) contract days.

Fiber Optic Cable (Multi-Mode)

A. Contractor shall furnish and install Corning Cable (Part #006KW4-T4B0 D20), or approved equal, with the following minimum salient characteristics. Six (6) fiber 850 nm, outdoor OFNR outdoor breakout cable with Corning CSB4 62.5/125/500/900 FDDI grade optical fibers. Each optical fiber shall be surrounded by a 500-mm primary acrylate buffer with a secondary Hytrel polymer buffered up to 900 mm. PVC buffered cables are not acceptable. Each fiber is reinforced with armid yarn in a numerically coded 2.4-mm UL 1666 PVC jacket. Subunits shall be planetarily stranded around a non-metallic, thermally stable strength member that does not allow plastic compression or expansion of the cable. Yarn or plastic central members are not permitted. The stranded core shall be wrapped in a flame-retardant core wrap and covered with a flame-retardant UL 1666 jacket incorporating a ripcord to facilitate easy removal during termination. The inner UL-listed breakout cable shall be overjacketed with a linear low-density polyethylene black jacket, 0.040-inch minimum wall thickness, and two (2) ripcords to facilitate removal of the outer jacket and to expose inner UL-rated riser cable. Outer cable jacket shall be marked with name of manufacturer and fiber type every 10 inches. Length markers shall be printed sequentially at 2-foot intervals.

   Contractor shall coil 10 feet (minimum) fiber cable in each pullbox conduit run, and 10 feet (minimum) fiber cable in controller cabinet.

   Bi-directional tests shall be conducted using an OTDR in accordance with TIA/EIA-526-7 Method B for each fiber path, inclusive of all jumper cables, pigtails, and patch panels. The Contractor shall demonstrate that the attenuation for each fiber path, termination, and splice, individually and as a whole, comply with the loss budgets required by the specifications. Fibers shall be tested at 1310 nm and 1550 nm. The Contractor shall submit OTDR traces for approval, clearly annotating each item (connector, jumper cable, pigtail, splice, etc.) and identifying the measured loss.

B. **Fiber/Subunits Characteristics**. The fiber optic core shall consist of a Corning 62.5/125 CSB4 multimode optical fiber. Each fiber shall consist of a central glass optical fiber surrounded by a 500-mm primary acrylate buffer with a secondary hard elastomeric polymer buffer up to 900 mm. PVC buffers are not acceptable.

   Multimode optical fiber shall be Corning CSB4 multimode optical fiber. The fiber shall have:

   Core Diameter: 62.5 um

   Cladding Diameter: 125.0 um plus or minus 2.0 um

   Cladding Non-Circulatory: < 2.0%

   Core Cladding Offset: < 3.0 um

   Coating Diameter: 500 um

   Dispersion Slope: < 0.092 PS/(mm2/km)

   Numerical Aperture: 0.275 ±0.015

Each optical fiber shall be coated and reinforced with armid yarn and a protective flame-retardant UL 1666 jacket contained within a tight 2.4-mm buffered unit. The fiber shall not contain splices.

The entire length of fiber shall be subjected to a tensile-proof stress equivalent of 100 kpsi (.0070 GN/NZ) maximum attention. Multimode fiber shall not exceed 3.75 dB/km at the 850 nm wavelength and 1.2 dB/km at the 1300 nm wavelength. Minimum bandwidth for multimode fiber shall be 160 MHZ/km at 850 nm and 500 MHZ/km at 1300 nm. Temperature and humidity induced attenuation shall be < 0.3 dB for temperatures -20°C to +70°C and relative humidity 4% to 98%.

C. Stiffening Member. The cable core shall contain one (1) central stiffening member (yarn or plastic are not permitted), which will allow for the proper installation of a pulling eye. This member shall not contain splices.

D. Jacketing. The inner fiber optic breakout cable shall have a Nomex core tape and a flame-retardant OFNR PVC jacket. The overall jacket shall be linear low-density polyethylene and shall enclose the entire cable. PVC jackets are not acceptable overall. The outer jacket shall be clearly marked in contrasting color. The cable jacket shall have a nominal wall thickness of 0.040 inch and two (2) ripcords. The jacket shall be free of holes, splits, blisters, and surface flaws. Cable diameters shall not exceed 0.550 inch nominal.

The cable shall have the following mechanical, environmental, and flame characteristics:

Maximum Pulling: as per EIA-FOTP-33

2.4 mm subunit 300 Newtons, for a bend radius of 5 cm at maximum load

20X OD Cable: 2500 Newtons per cable

Crush Resistance: EIA-FOTP-42 subunit 250 Newtons/cm, cable 900 Newtons/cm

Impact Resistance: EIA-FOTP-25 subunit 50 impact, cable 100 impact

Flexing (non-armored): EIA-FOTP-104 subunit 1000 cycles, cable 2000 cycles

Maximum Vertical Rise: subunit 50 feet, cable 90 feet

Operating Temperature: -20°C to +70°C

Storage Temperature (non-flexing): -40°C to 70°C

Installation Temperature: 0°C to 70°C

Flexibility Text: UL1666 OFNR inner jacket

Polyethylene UV Stabilized Overall Jacket

Fiber Optic Cable (Single-Mode)

The fiber optic components shall be compatible, designed for the purpose intended, and manufactured by a company regularly engaged in the production of material for the fiber optic industry. All cable, components, or assemblies shall be best quality, non-corroding, with a design life of at least twenty (20) years. All components or assemblies of the same type shall be from the same manufacturer. All components shall be the size and type required for the specified fiber. All fiber optic cables shall be listed by UL for the purpose they are providing and shall conform to the NEC standards.

Contractor shall coil 10 feet (minimum) fiber cable in each pullbox conduit run, and 20 feet (minimum) fiber cable in pullbox immediately adjacent to controller cabinet.

The single mode fiber optic (SMFO) cables shall meet the following requirements:

Fibers per cable:	6 Fibers
Maximum attenuation:	0.35 dB/km at 1310 nm 0.3 dB/km at 1550 nm
Cladding diameter:	125.0 microns
Core diameter:	8.3 microns nominal
Core eccentricity:	< 1.0 micron (0.3 micron typical)
Temperature range:	-34ºC to +74ºC
Coating diameter:	245 ± 10 microns
Cable construction:	Loose tube
Outer jacket:	Polyethylene
Bending radius:	10x outside diameter of cable minimum
Tensile strength:	600 pounds
Central strength member:	Dielectric
Mode field diameter:	9.3 ± 0.5 microns at 1310 nm
Zero dispersion wavelength:	1300 to 1320 nm
Zero dispersion slope:	< 0.092 picosec/nm2-km
Cutoff wavelength:	1260 nm
Point discontinuities at 1300 nm:	< 0.1 dB

The SMFO cables shall be constructed using reverse oscillation or S-Z stranding to allow a length of buffer tube to be separated from the cable without cutting of the complete tube.

Optical fibers shall be distinguishable from others in the same buffer tube by means of color coding according to the following:

1. Blue (BL)	5. Slate (SL)	9. Yellow (YL)
2. Orange (OR)	6. White (WT)	10. Violet (VL)
3. Green (GR)	7. Red (RD)	11. Rose (RS)
4. Brown (BR)	8. Black (BK)	12. Aqua (AQ)

The colors shall be targeted in accordance with the Munsell color shades and shall meet EIA/TIA-598A “Color Coding of Fiber Optic Cables.” The color formulation shall be compatible with the fiber coating and the buffer tube filling compound, and be heat stable. It shall not fade or smear or be susceptible to migration and it shall not affect the transmission characteristics of the optical fibers and shall not cause fibers to stick together. The 6-fiber branch cable shall include one buffer tube containing 6 fibers.

The cable shall contain at least one (1) ripcord under the jacket for easy sheath removal. The jacket or sheath shall be marked with the manufacturer's name, the words “Optical Cable” or “Fiber Optic Cable,” the number of fibers, “SM” or “Single Mode,” year of manufacture, and sequential measurement markings at a minimum of every three (3) feet. The actual length of the cable shall be within 1 percent of the length marking. The marking shall be in a contrasting color to the cable jacket (yellow or white are preferred). The height of the marking shall be approximately one-tenth of an inch.

All SMFO cables shall be in accordance with ANSI/ICEA S-87-640 mechanical and environmental specifications and have a minimum pull strength of 600 lbf (2700 N) for fiber counts over 12 fibers.

All fiber optic cables shall be terminated on ST connectors.

The SMFO cable shall be tested after installation to verify the integrity of the fiber optic cable system and its performance. The Contractor shall perform testing on every fiber of each SMFO cable using power meter and OTDR testing methods in accordance with EIA/TIA 526-7 test procedures. Splices testing an attenuation of 0.1 dB or greater or mated connectors testing an attenuation of 0.5dB or greater shall be remade. If any fibers are out of specification, the entire SMFO cable run shall be replaced at no cost to the City.

Power meter tests shall be conducted in accordance with TIA/EIA-526-7 Method A.2 for each connected fiber circuit to demonstrate connectivity from origin to destination, in accordance with the project plans. A test check-off sheet of each fiber path shall be submitted to the Engineer. Power meter tests shall be conducted after all splices have been made and all connectors, jumper cables, and pigtails are in place. Testing shall be conducted at the equipment interfaces. For circuits with multiple devices, the connectors shall be coupled together at the equipment interface and the entire circuit shall be tested.

Bi-directional tests shall be conducted using an OTDR in accordance with TIA/EIA-526-7 Method B for each fiber path, inclusive of all jumper cables, pigtails, and patch panels. The Contractor shall demonstrate that the attenuation for each fiber path, termination, and splice, individually and as a whole, comply with the loss budgets required by the specifications. Fibers shall be tested at 1310 nm and 1550 nm. The Contractor shall submit OTDR traces for approval, clearly annotating each item (connector, jumper cable, pigtail, splice, etc.) and identifying the measured loss.

Passive Cable Assemblies And Components

The F/O cable assemblies and components shall be compatible components, designed for the purpose intended, and manufactured by a company regularly engaged in the production of material for the fiber optic industry. All components or assemblies shall be best quality, non-corroding, with a design life of at least 20 years. All components or assemblies of the same type shall be from the same manufacturer.

Fiber Optic Cable Assemblies

A. Connectors. Connectors shall be 3M 6100 ST type connectors.

B. Fiber Optic Modem Cable Assembly

Interface Cable—Interface cable shall consist of six No. 22, stranded, tinned copper conductors. Each conductor shall be insulated with 0.010-inch, minimum nominal thickness, color-coded polypropylene material. Conductors shall be in twisted pairs. Each pair shall be wrapped with an aluminum polyester shield and shall have a No. 22 or larger, stranded, tinned copper drain wire inside the shielded pair.

The cable jacket shall be polyvinyl chloride, rated for a minimum of 300 volts and 60°C, and shall have a nominal wall thickness of 0.040-inch, minimum. The cable shall be 3 feet long with a

connector for termination to the Model 170 controller and a bare wire termination to the asynchronous fiber optic modem. The connector shall meet the following requirements:

Amphenol or Equivalent

Part	Number
Shield	201378-2
Block	201298-1
Guide Pin	200390-4
Socket	200389-4

The cable shall have the following pin configuration:

F/O Modem	Model 170 Controller		
Function	Pin #		Function
Ground	N		DC Ground
N/C			
Data Out	L		Rx Data
Data Ground	N		DC Ground
Data In	K		Tx Data
	J	Jumper	RTS
	M	Jumper	CTS

C. Fiber Optic Modems. The fiber optic modems shall be capable of operating in a full duplex mode of operation, employing asynchronous RS-232 data link protocols. The fiber optic modem shall operate in a daisy chain communications mode up to 9600 baud.

The fiber optic modems shall have an emergency backup power source that allows for continued daisy chain operation when the 170 controller is removed or if the power to the modem has been turned off. This backup power source may be a non-rechargeable battery. This backup power source shall provide uninterrupted operation of the daisy chain interconnect system both upstream and downstream from the affected modem for a period of 24 hours based on a half duty cycle.

The fiber optic modems provided for the intersection of X STREET AND Y STREET, shall be model FO400, and shall be multi mode communication type, manufactured by Traffic Fiber Sytems. The fiber optic modem shall derive its operating power source from the 170 controller.

Splice Enclosure

Contractor to supply and install splice enclosure, Corning model SCF-4C18-01, or City approved equal. All fiber to be terminated per callouts on project plans. Payment for splice enclosure shall be included in the lump sum (LS) item for “Signal and Lighting”.

Payment

Payment for conforming to these provisions for furnishing all labor, materials, tools, equipment, and incidentals and installation of the Fiber Optic System shall be included in the contract price paid per linear foot for “12 Single Mode Fiber Optic Cable,” and no additional compensation will be allowed therefore.

Y. Battery Backup System (BBS)

Contractor to supply and install battery back-up system (BBS), Myers model BC100HZ w/ MP2000E & (4) 79Ah Batteries, or City approved equal with Ethernet port, per Caltrans Specifications dated July 7, 2010. [See Caltrans specifications in Appendix C, titled: "Battery Backup System Specifications:".] Cabinet shall be external option. Manufacturer shall provide testing results upon deliver of BBS in accordance with Section 4, Section 8 titled "Quality Assurance". Payment for battery back-up system shall be included in the lump sum (LS) item for "Signal and Lighting".

Z. Signal Interconnect System

If the 2-Lane option is selected for award, the Signal Interconnect System shall consist of:

- 2" Interconnect Conduit and Tracer Wire
- No. 6 Pull Boxes

Fiber optic cable will not be required.

If the 4-Lane option is selected for award, the Signal Interconnect System shall consist of:

- 2" Interconnect Conduit and Tracer Wire
- Single Mode Fiber Optic Cable
- No. 6 Pull Boxes

Installation of the different elements of the Signal Interconnect System shall be per the plans, sections J, "Conduits," X, "Fiber Optic Communications," and K, "Pull Boxes," in these special provisions and the applicable sections in Section 86, "Electrical Systems", of the latest edition Standard Specifications, amendments to the Standard Specifications, and these Special Provisions..

Payment

2-Lane Option

Full compensation for Signal Interconnect System shall be considered as included in the contract price paid per linear foot for 2" INTERCONNECT CONDUIT AND TRACER WIRE; and per each for No. 6 PULL BOX; and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidents and for doing all the work including furnishing, transporting, and installing conduits, signal interconnect cables, and pull boxes, potholing required for utility verification prior to all conduit installation and incidents and for doing all the work specified herein, and no additional compensation will be allowed therefor.

4-Lane Option

Full compensation for Signal Interconnect System shall be considered as included in the contract price paid per linear foot for 2" INTERCONNECT CONDUIT AND TRACER WIRE, and 12 SINGLE MODE FIBER OPTIC CABLE; and per each for No. 6 PULL BOX; and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidents and for doing all the work including furnishing, transporting, and installing conduits, signal interconnect cables, and pull boxes, potholing required for utility verification prior to all conduit installation and incidents and for doing all the work specified herein, and no additional compensation will be allowed therefor.

AA. Payment Method

See Signal and Lighting subsection N, "Service" for payment of all electric company fees required.

The contract price paid per **Lump Sum** for Signal and Lighting shall include full compensation for furnishing all labor, materials, tools, equipment, modify controller assembly, foundations, pole and mast arm mounted regulatory signs, documents, programming, testing, potholing required for utility verification prior to all conduit installation and incidents and for doing all the work specified herein, elsewhere in these Special Provisions, and plans including the complete installation of an operational traffic signal and lighting system and no additional compensation shall be allowed therefor.

APPENDIX A

AQMD RECOMMENDATIONS

Dust Abatement Attachments

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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:	**SCAQMD 1-800-CUT-SMOG**	← 3 ½ " Bold Numbers

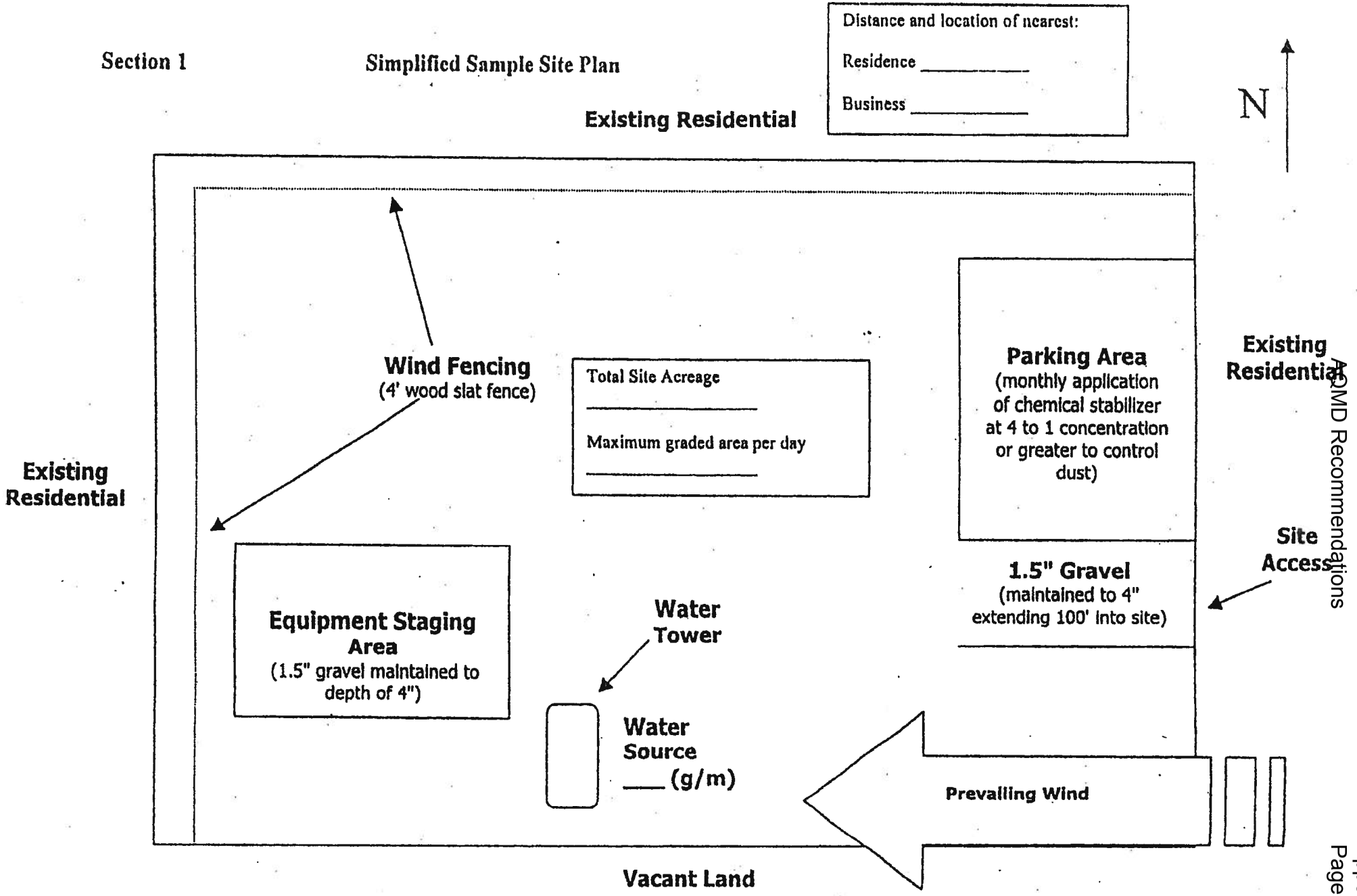
"Title Case" means the first letter of a word is capitalized and subsequent letters are lower case.

(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 #	**909-**	← 4" Bold Numbers
2" Title Case Letters →	Phone Number:	**SCAQMD 1-800-CUT-SMOG**	← 4 ½" Bold Numbers
2" Title Case Letters →	**COUNTY OF RIVERSIDE TRANSPORTATION DEPARTMENT**		

Section 1

Simplified Sample Site Plan



Remember...
DUST CONTROL IS REQUIRED 24 HOURS A DAY, 7 DAYS A WEEK, REGARDLESS OF CONSTRUCTION STATUS

AQMD Recommendations

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

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.

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 (2) Not recommended for high volume or heavy equipment traffic use.
(H) Watering	(1) In sufficient quantities to keep surface moist. (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. (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.

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. (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. (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.

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
(j) Clean streets with water flushing, unless prohibited by the Regional Water Quality Control Board.

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.

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.

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.

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 (2) Not recommended for high volume or heavy equipment traffic use.
(H) Watering	(1) In sufficient quantities to keep surface moist. (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. (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.

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.

Source: (4) Paved Road Track-Out

CONTROL MEASURES	DESCRIPTION
Compliance with District Rule 403.	Paragraph (d)(5).

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. 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.

* Use of drought tolerant, native vegetation is encouraged.

TABLE 1

BEST [REASONABLY]* AVAILABLE CONTROL MEASURES FOR HIGH WIND CONDITIONS

FUGITIVE DUST SOURCE CATEGORY	CONTROL MEASURES
Earth-moving	(1A) Cease all active operations; OR (2A) Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	(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.
Unpaved roads	(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.
Open storage piles	(1D) Apply water twice [once] per hour; OR (2D) Install temporary coverings.
Paved road track-out	(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.
All Categories	(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.

TABLE 2
DUST CONTROL ACTIONS FOR EXEMPTION FROM PARAGRAPH (d)(4)*

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS	
Earth-moving (except construction cutting and filling areas, and mining operations)	(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
	(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.
Earth-moving: Construction fill areas:	(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.

* Measures in [brackets] are reasonably available control measures and only apply to sources not within the South Coast Air Basin.

TABLE 2 (Continued)*

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS	
Earth-moving: Construction cut areas and mining operations:	(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.
Disturbed surface areas (except completed grading areas)	(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.
Disturbed surface areas: Completed grading areas	(2c)	Apply chemical stabilizers within five working days of grading completion; OR
	(2d)	Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	(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)*

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS	
Unpaved Roads	(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
	(4b)	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR
	(4c)	Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	(5a)	Apply chemical stabilizers; OR
	(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
	(5c)	Install temporary coverings; OR
	(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.
All Categories	(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.

* Measures in [brackets] are reasonably available control measures and only apply to sources not within the South Coast Air Basin.

TABLE 3

TRACK-OUT CONTROL OPTIONS

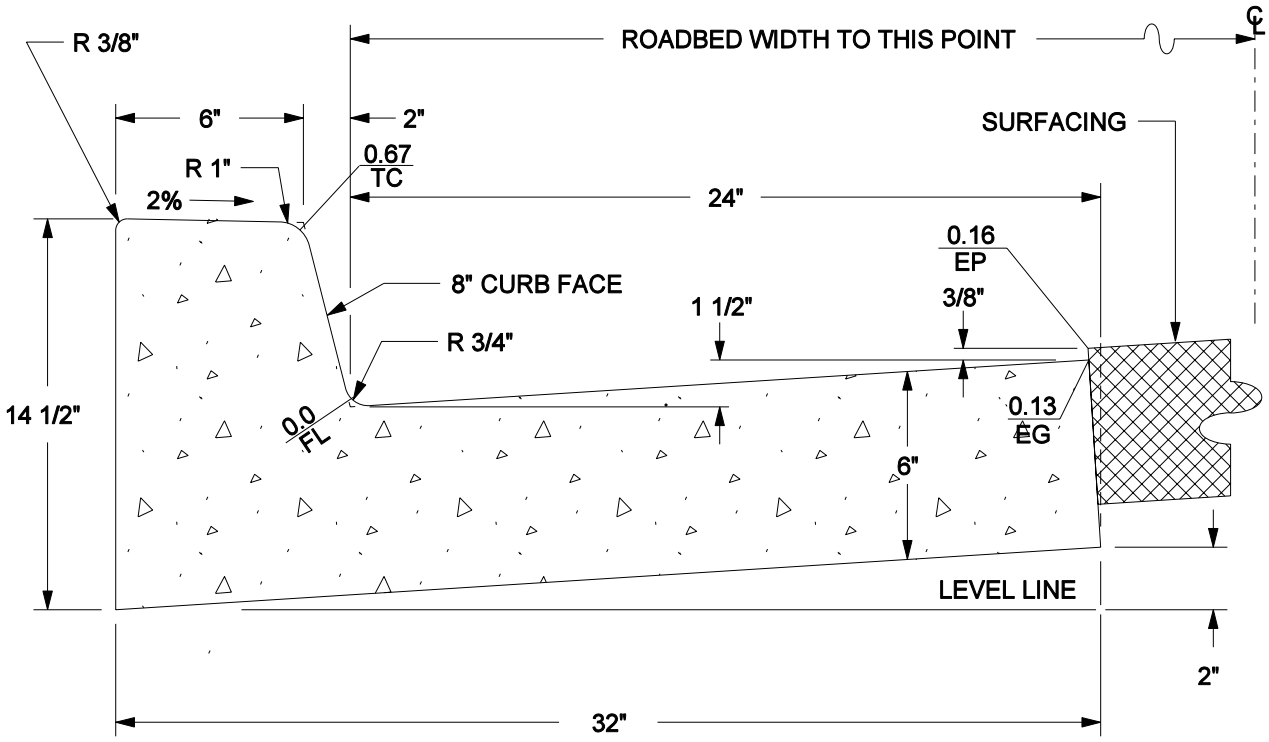
PARAGRAPH (d)(5)(B)

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.

APPENDIX B

REFERENCE DRAWINGS



CLASS "B" CONCRETE

1.73 CU. FT. / L.F.

1 CU. YD. = 15.60 L.F.

ABBREVIATIONS:

TC = TOP OF CURB
FL = FLOWLINE
EG = EDGE OF GUTTER
EP = EDGE OF PAVEMENT

APPROVED BY:

DIRECTOR OF TRANSPORTATION
GEORGE A. JOHNSON, RCE 42328

DATE: 05/01/07

REGISTERED PROFESSIONAL ENGINEER
GEORGE A. JOHNSON
No. CE 42328
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

COUNTY OF RIVERSIDE

TYPE A-8 CURB

STANDARD NO. 201

REVISIONS		REV.	BY:	APR'D	DATE	REV.	BY:	APR'D	DATE
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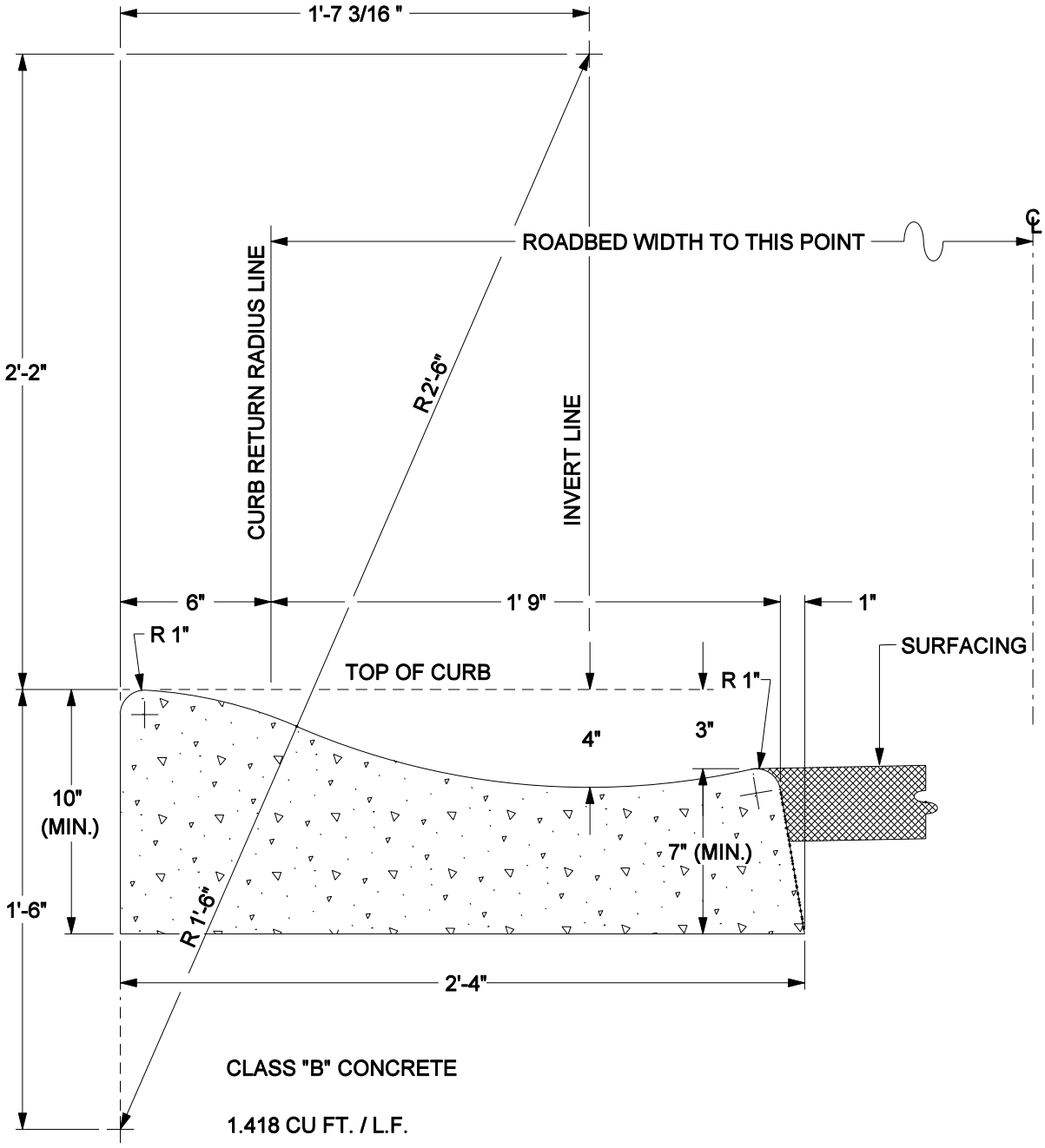
2-90, 11-04		2				5			
		3				6			



CLASS "B" CONCRETE

1.418 CU FT. / L.F.

1 CU. YD. = 19.05 L.F.

APPROVED BY:

DATE: 05/01/07

DIRECTOR OF TRANSPORTATION
GEORGE A. JOHNSON, RCE 42328

REGISTERED PROFESSIONAL ENGINEER
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No. CE 42328
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

COUNTY OF RIVERSIDE

TYPE "C" CURB

STANDARD NO. 202

REVISIONS		REV.	BY:	APR'D	DATE	REV.	BY:	APR'D	DATE
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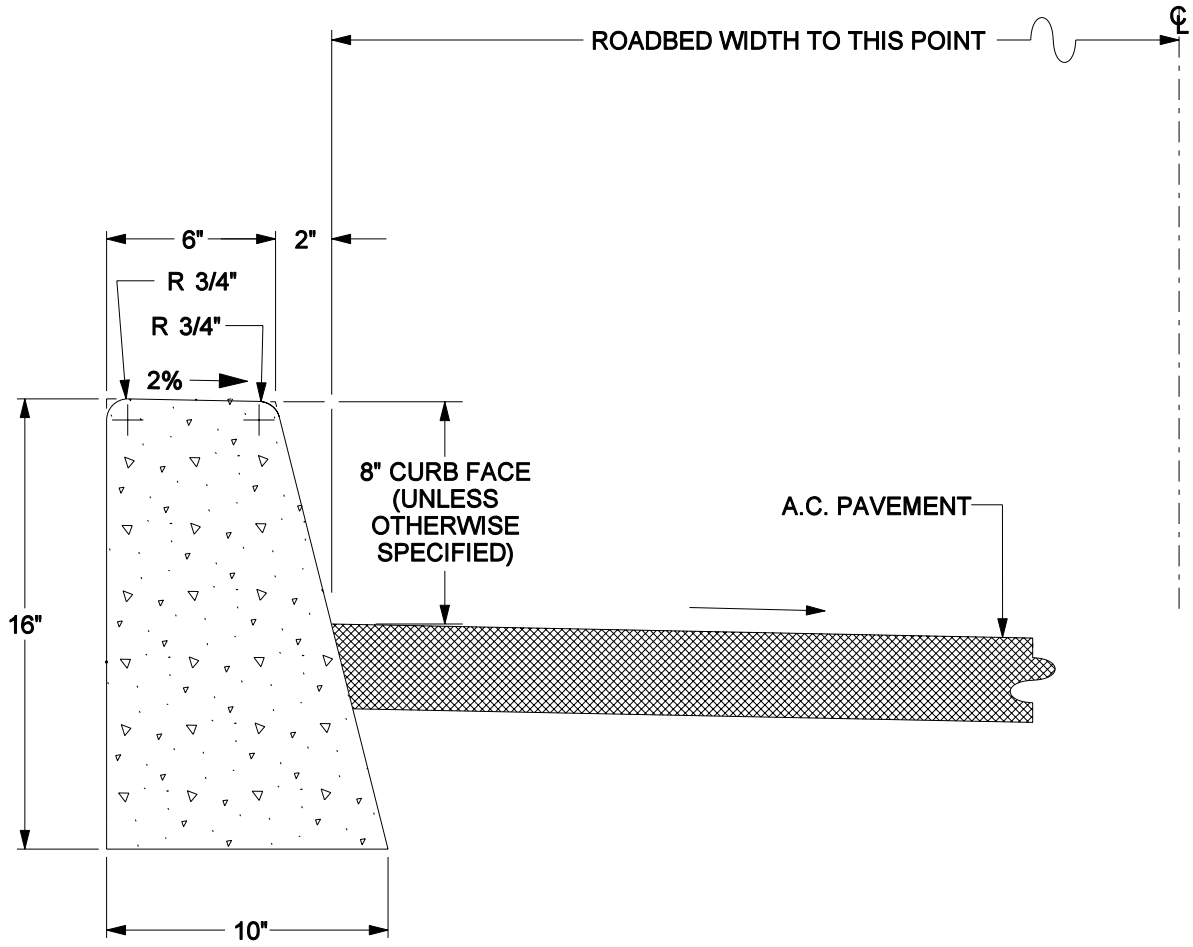
2-90, 11-04		2				5			
		3				6			



CLASS "B" CONCRETE

0.888 CU FT. / L.F.

1 CU. YD. = 30.41 L.F.

APPROVED BY:

DIRECTOR OF TRANSPORTATION
GEORGE A. JOHNSON, RCE 42328

DATE: 05/01/07

REGISTERED PROFESSIONAL ENGINEER
GEORGE A. JOHNSON
No. CE 42328
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

COUNTY OF RIVERSIDE

TYPE "D" CURB

STANDARD NO. 204

REVISIONS		REV.	BY:	APR'D	DATE	REV.	BY:	APR'D	DATE
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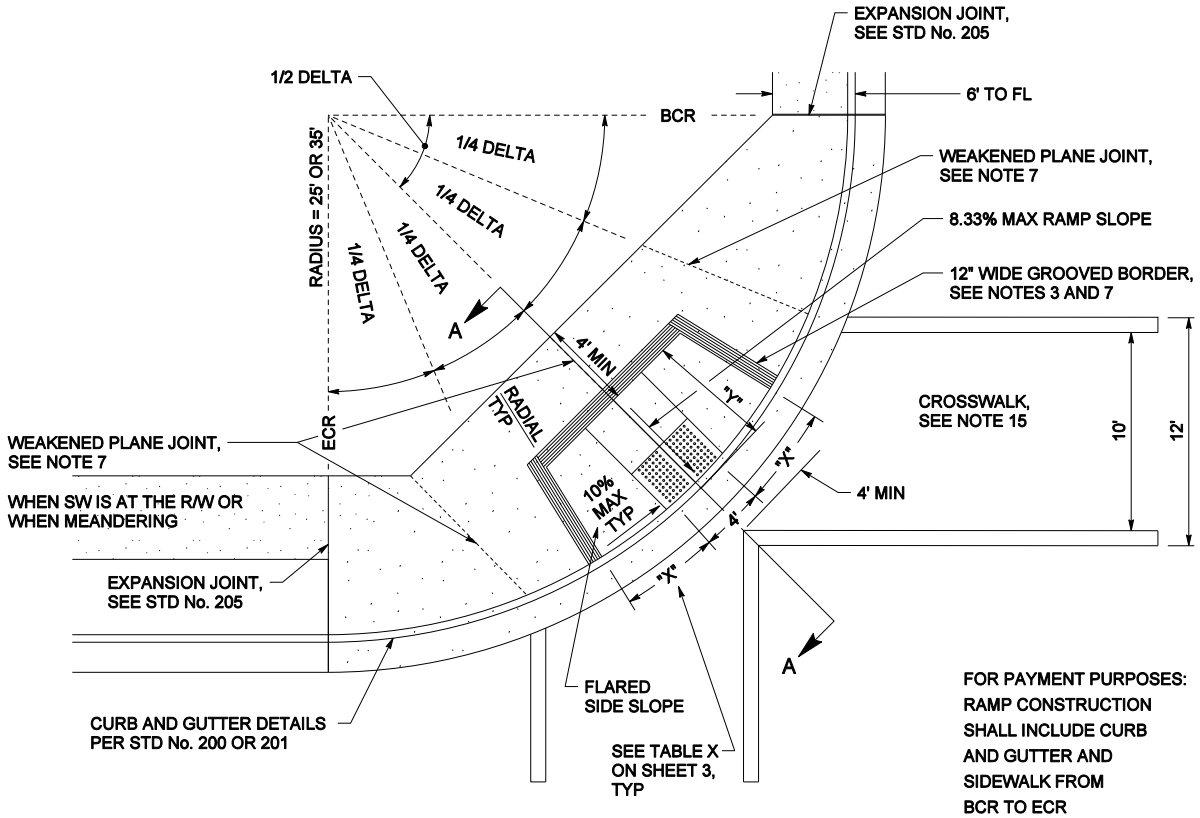
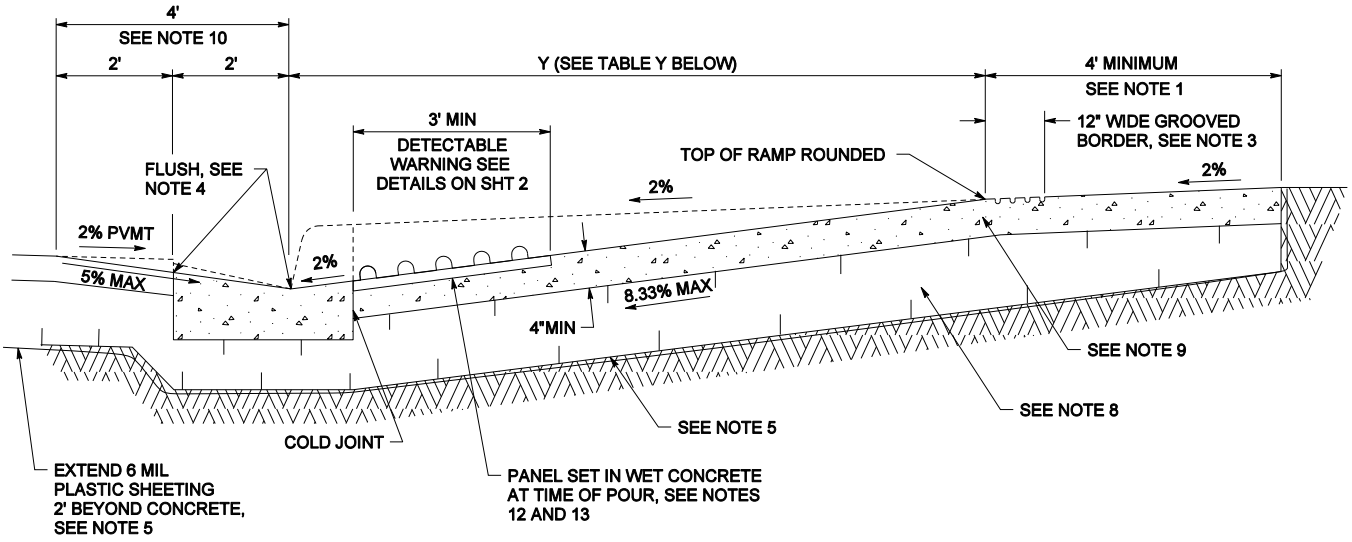
11-04		2				5			
		3				6			





SECTION A-A

TABLE Y

CF	Y
6"	7.90'
8"	10.53'

$$Y = \frac{\text{CURB FACE (FT)}}{6.33\%}$$

FOR NOTES SEE SHEET 7 OF 7
SEE NOTE 16 FOR CONSTRUCTION TOLERANCES

APPROVED BY:

DATE: 11/15/04

DIRECTOR OF TRANSPORTATION DATE
JUAN C. PEREZ, RCE 49568

REGISTERED PROFESSIONAL ENGINEER
No. _____
Exp. _____
CIVIL
STATE OF CALIFORNIA

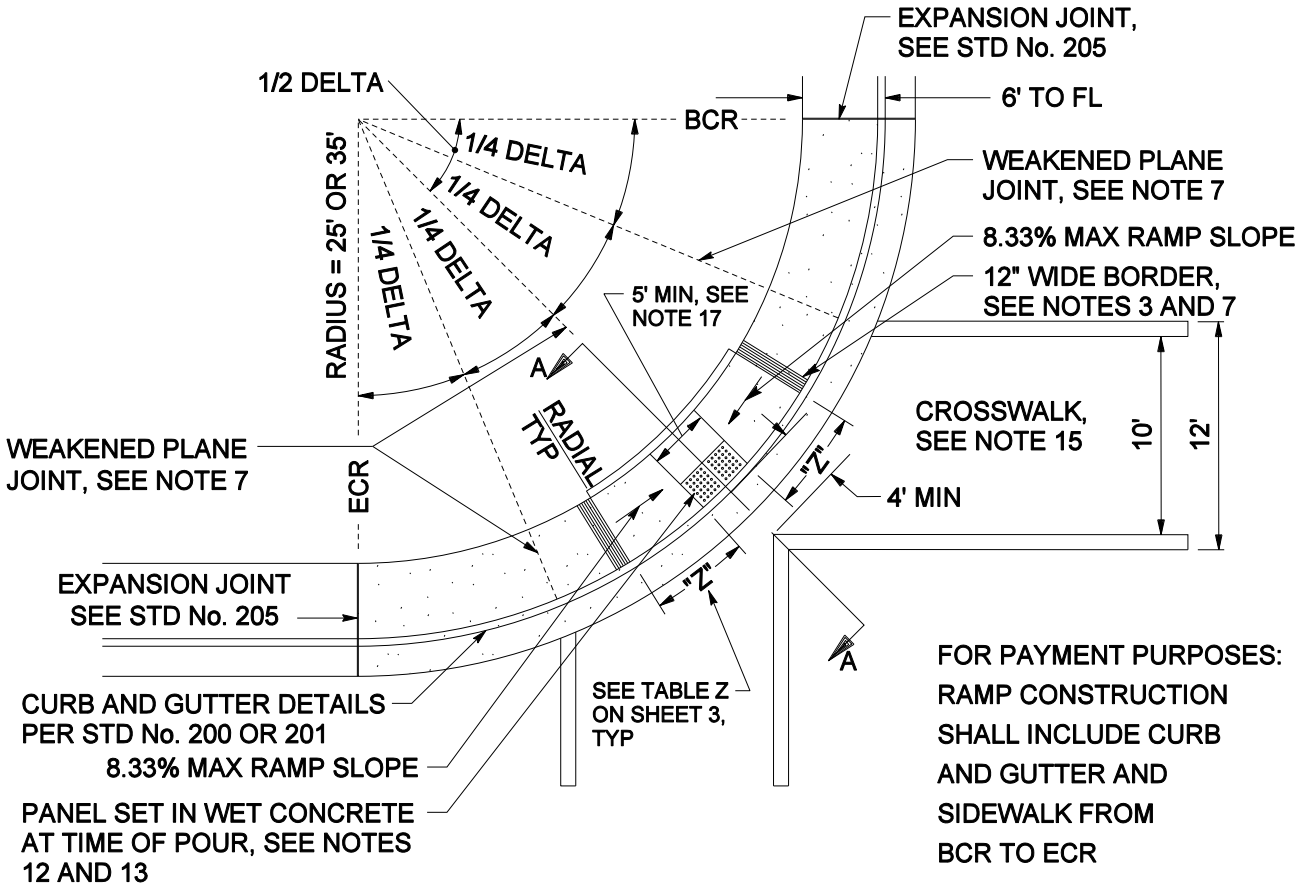
COUNTY OF RIVERSIDE

CURB RAMP
CASE A

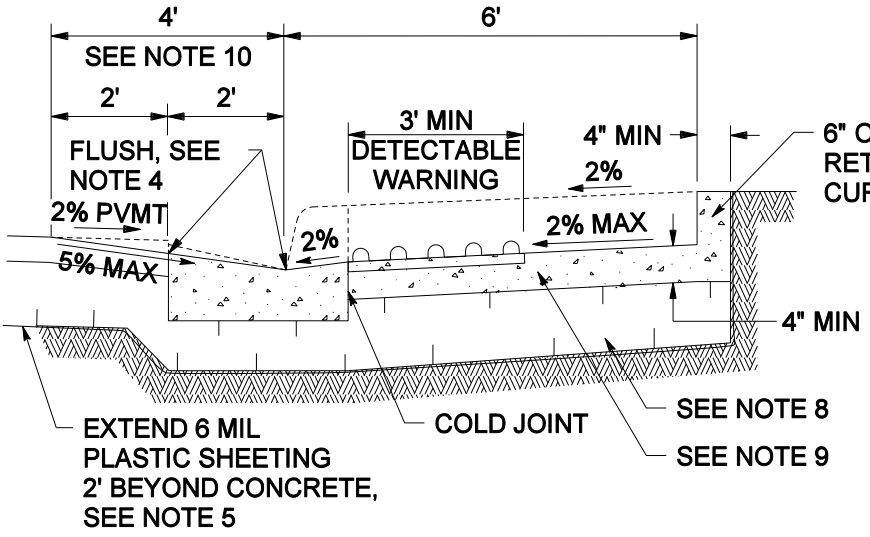
NO SCALE

STANDARD No. 403 (1 OF 7)

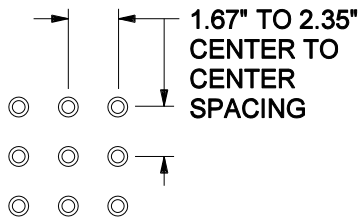
REVISIONS		REV	BY:	APR'D	DATE	REV	BY:	APR'D	DATE
8-77, 5-80	11-04	1	JK	JP	08-05-10				
10-81, 6-82		2							
9-88, 2-90		3							



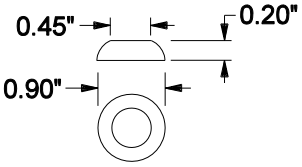
FOR PAYMENT PURPOSES: RAMP CONSTRUCTION SHALL INCLUDE CURB AND GUTTER AND SIDEWALK FROM BCR TO ECR



SECTION A-A



RAISED TRUNCATED DOME PATTERN
DETECTABLE WARNING SURFACE
SEE NOTES 12 & 13



RAISED TRUNCATED DOME
SEE NOTE 11

FOR NOTES SEE SHEET 7 OF 7
SEE NOTE 16 FOR CONSTRUCTION TOLERANCES

APPROVED BY:

DATE: 11/15/04

DIRECTOR OF TRANSPORTATION DATE
JUAN C. PEREZ, RCE 49568

REGISTERED PROFESSIONAL ENGINEER
No.
Exp.
CIVIL
STATE OF CALIFORNIA

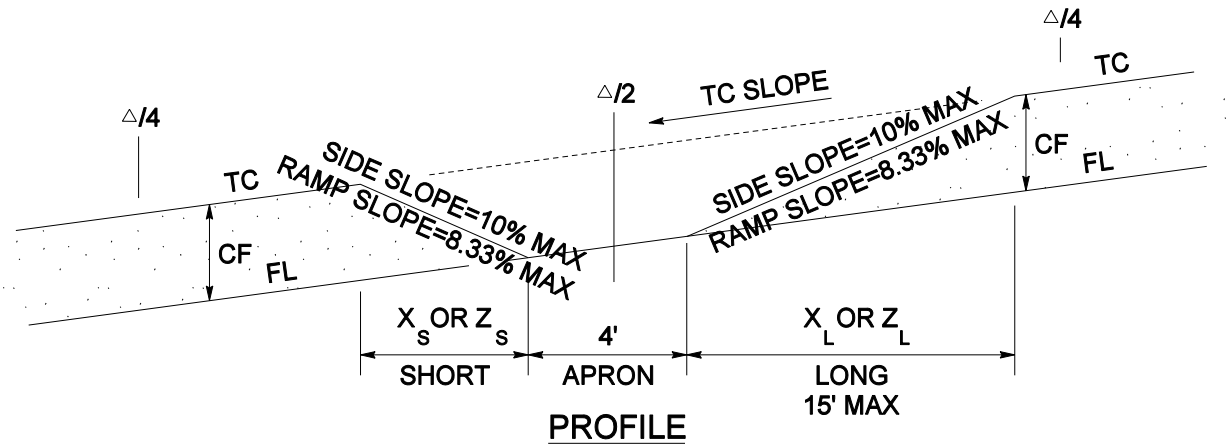
COUNTY OF RIVERSIDE

CURB RAMP
CASE B

NO SCALE

STANDARD No. 403 (2 OF 7)

REVISIONS		REV	BY:	APR'D	DATE	REV	BY:	APR'D	DATE
8-77, 5-80	11-04	1	JK	JP	08-05-10				
10-81, 6-82		2							
9-88, 2-90		3							



PROFILE

TABLE X - CASE A FLARED SIDE SLOPES

CF (IN)	RADIUS (FT)	SIDE SLOPE	X	TC GRADE (ALONG CURB RETURN)					
				1%	2%	3%	4%	5%	6%
6"	35'	10%	X_S	4.6	4.2	3.9	3.6	3.4	3.2
			X_L	5.6	6.3	7.2	8.4	10.0	12.5
8"	35'	10%	X_S	6.1	5.6	5.2	4.8	4.5	4.2
			X_L	7.5	8.4	9.6	11.2	13.4	15.0*

TABLE Z - CASE B AND C RAMP SLOPES

CF (IN)	RADIUS (FT)	RAMP SLOPE	Y	TC SLOPE (ALONG CURB RETURN)					
				1%	2%	3%	4%	5%	6%
6"	35'	8.33%	Y_S	5.4	4.8	4.4	4.1	3.8	3.5
			Y_L	6.8	7.9	9.4	11.5	15.0*	15.0*
8"	35'	8.33%	Y_S	7.1	6.4	5.9	5.4	5.0	4.6
			Y_L	9.1	10.5	12.5	15.0*	15.0*	15.0*

* NOTE: MAXIMUM ADA SLOPES HAVE BEEN EXCEEDED. ENGINEER IS REQUIRED TO FILE A DESIGN EXCEPTION FOR TECHNICAL INFEASIBILITY.

TO CALCULATE "X" DIMENSION:

$$X_S \text{ OR } Y_S \text{ (FT)} = \frac{\text{SHORT SIDE (DOWN SLOPE): CURB FACE (FT)}}{\text{SIDE OR RAMP SLOPE + TC SLOPE}} \qquad X_L \text{ OR } Y_L \text{ (FT)} = \frac{\text{LONG SIDE (UP SLOPE): CURB FACE (FT)}}{\text{SIDE OR RAMP SLOPE - TC SLOPE}}$$

ENGINEER TO SHOW X_S, X_L, Y_S, AND Y_L ON IMPROVEMENT PLANS

SEE NOTE 16 FOR CONSTRUCTION TOLERANCES

APPROVED BY:

DATE: 11/15/04

DIRECTOR OF TRANSPORTATION DATE
JUAN C. PEREZ, RCE 49568

REGISTERED PROFESSIONAL ENGINEER
No. Exp.
CIVIL
STATE OF CALIFORNIA

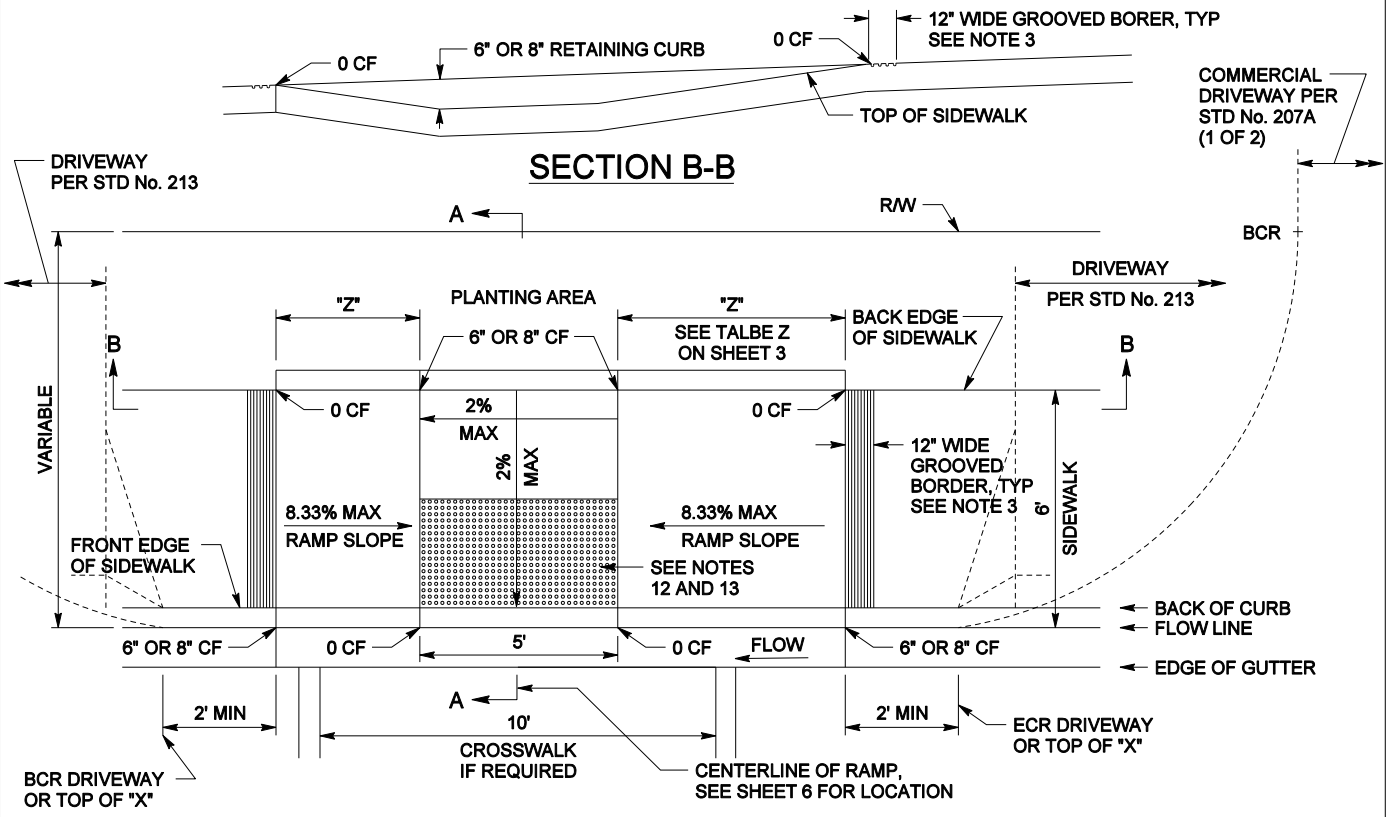
COUNTY OF RIVERSIDE

CURB RAMP PROFILE

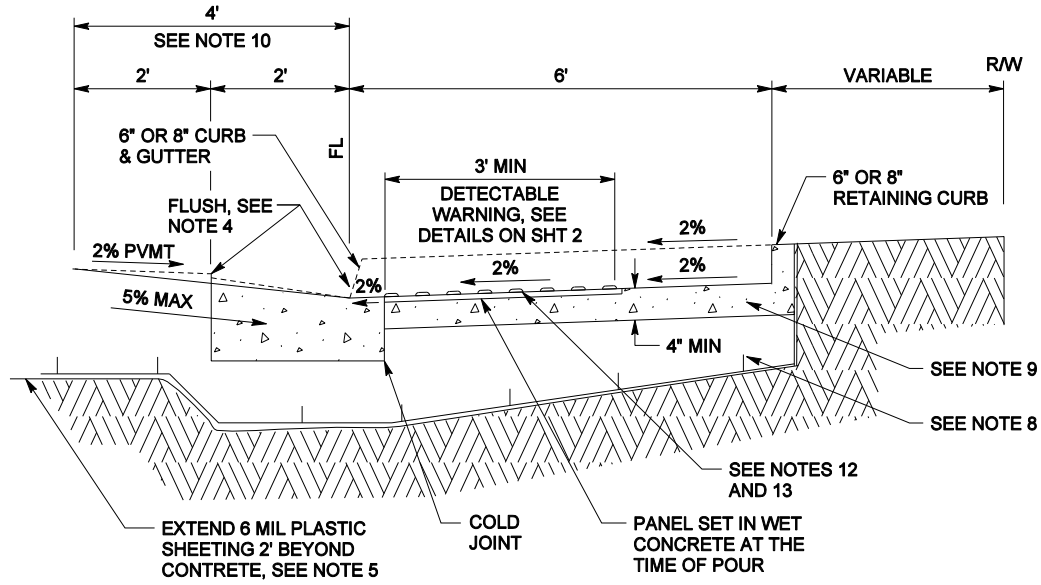
NO SCALE

STANDARD No. 403 (3 OF 7)

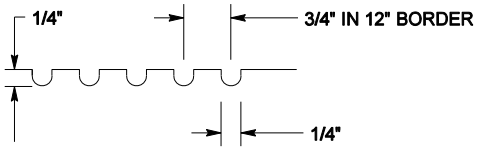
REVISIONS		REV	BY:	APR'D	DATE	REV	BY:	APR'D	DATE
8-77, 5-80	11-04	1	JK	JP	08-05-10				
10-81, 6-82		2							
9-88, 2-90		3							



SECTION B-B



SECTION A-A



GROOVING DETAIL

FOR NOTES SEE SHEET 7 OF 7
SEE NOTE 16 FOR CONSTRUCTION TOLERANCES

APPROVED BY:

DATE: 00/00/00

DIRECTOR OF TRANSPORTATION DATE
JUAN C. PEREZ, RCE 49568

REGISTERED PROFESSIONAL ENGINEER
No. Exp.
CIVIL
STATE OF CALIFORNIA

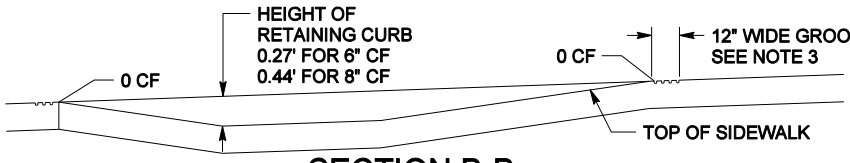
COUNTY OF RIVERSIDE

CURB RAMP-CASE C
"T" INTERSECTION WITH SIDEWALK AT CURB

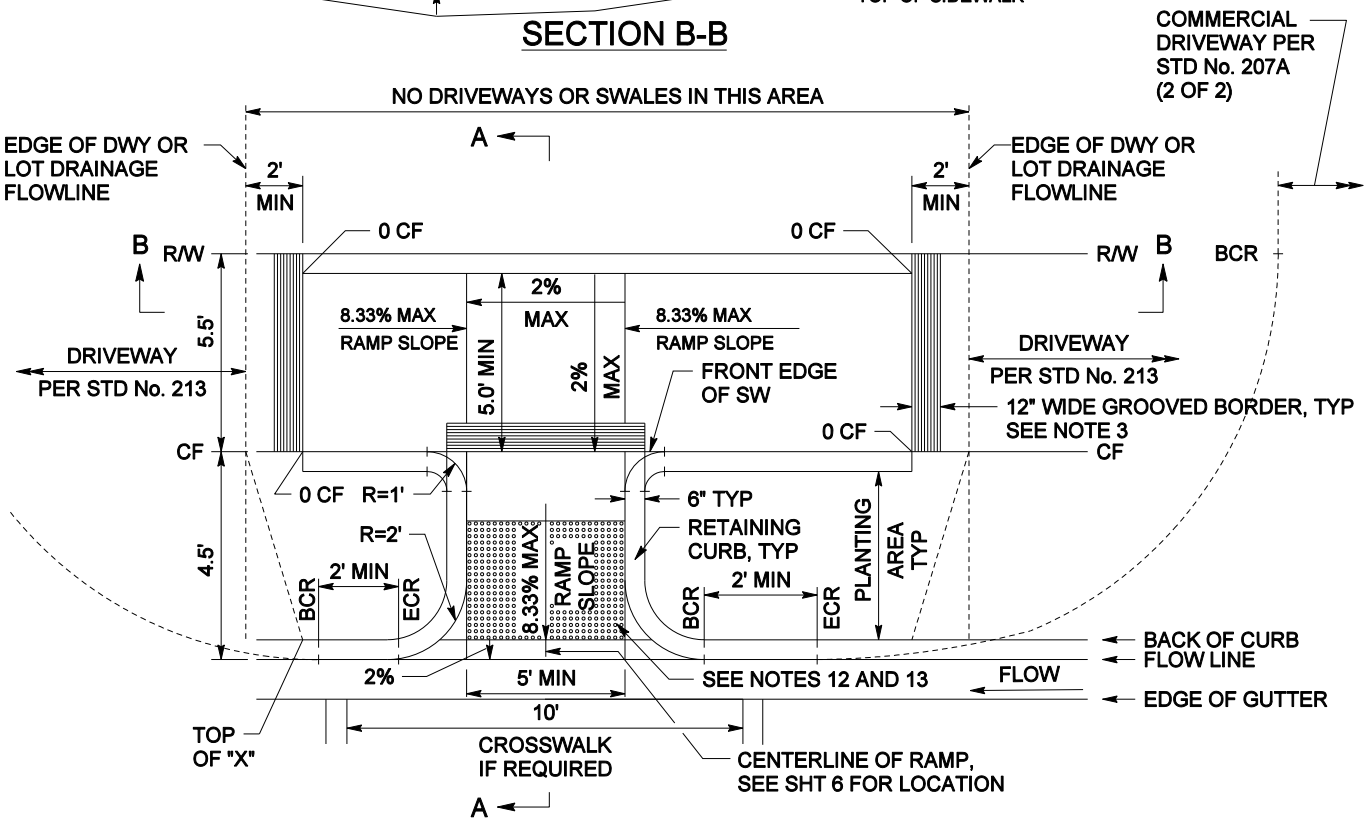
NO SCALE

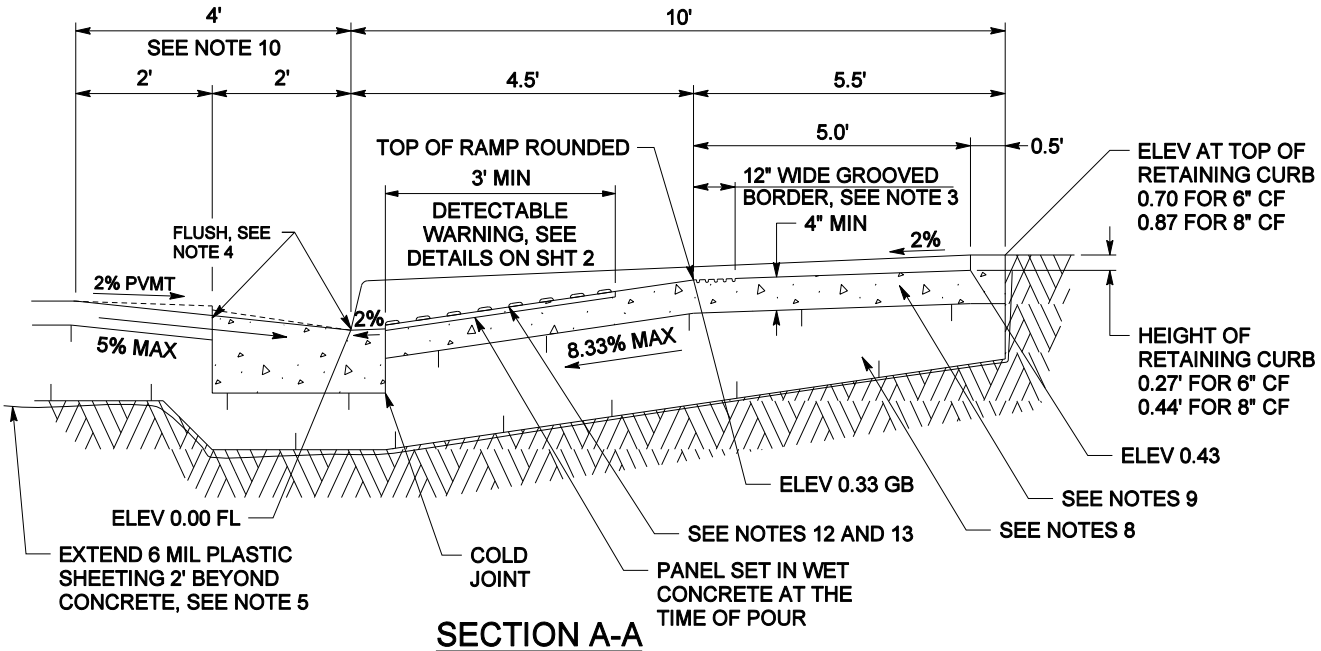
STANDARD No. 403 (4 OF 7)

REVISIONS		REV	BY:	APR'D	DATE	REV	BY:	APR'D	DATE
		1	JK	JP	08-05-10				
		2							
		3							



SECTION B-B





SECTION A-A

FOR NOTES SEE SHEET 7 OF 7
SEE NOTE 16 FOR CONSTRUCTION TOLERANCES

APPROVED BY:

DATE: 00/00/00

DIRECTOR OF TRANSPORTATION — DATE
JUAN C. PEREZ, RCE 49568

REGISTERED PROFESSIONAL ENGINEER
No. ____
Exp. ____
CIVIL
STATE OF CALIFORNIA

COUNTY OF RIVERSIDE

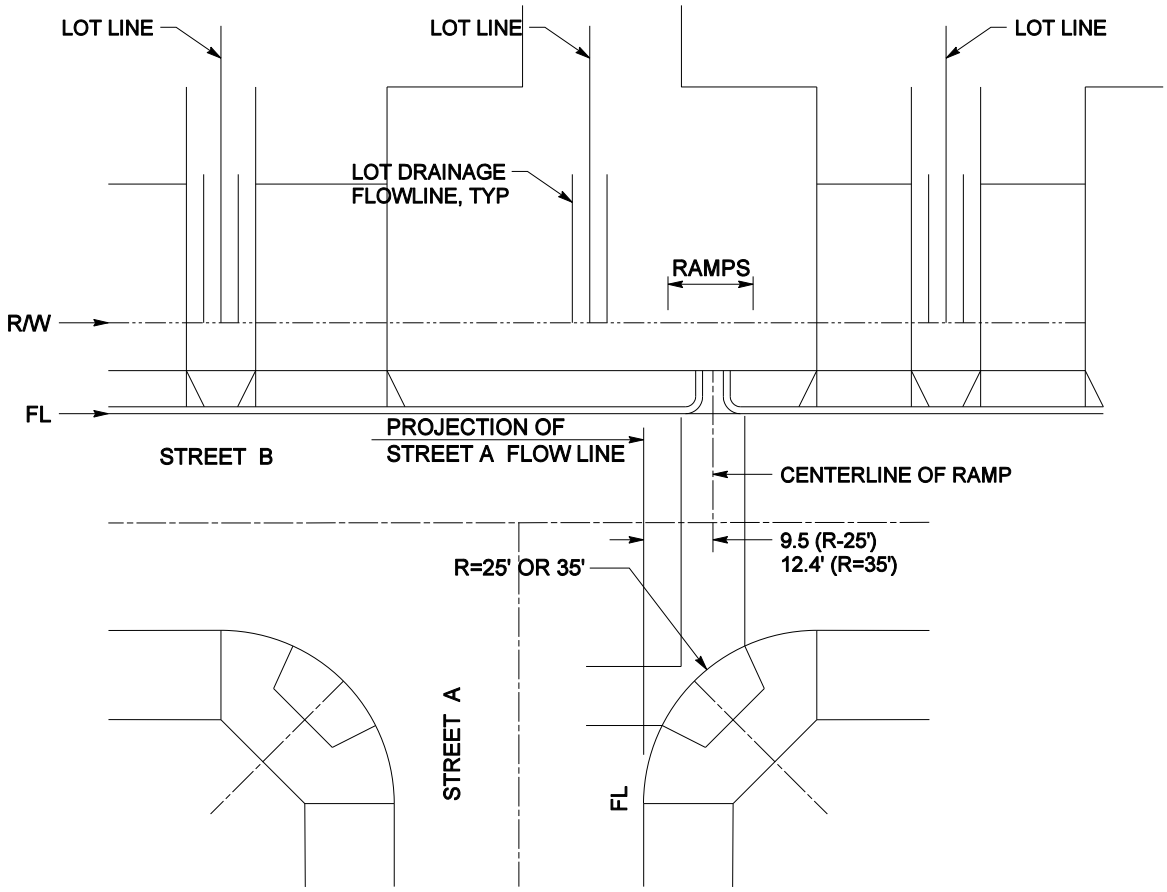
CURB RAMP-CASE D
"T" INTERSECTION WITH SIDEWALK AT R/W

NO SCALE

STANDARD No. 403 (5 OF 7)

REVISIONS		REV	BY:	APR'D	DATE	REV	BY:	APR'D	DATE
		1	JK	JP	08-05-10				
		2							
		3							

DRIVEWAYS TO BE LOCATED TO NOT CONFLICT
WITH REQUIRED RAMP LOCATION. SEE STD No. 403,
SHEET 4 AND 5 OF COUNTY ORDINANCE No. 461.
AVOID LOCATING DRIVEWAYS WITHIN INTERSECTION.



RAMP LOCATION AT "T" INTERSECTION
(RIGHT TURN SIDE OF STREET A)

CASES C AND D

APPROVED BY:

DIRECTOR OF TRANSPORTATION DATE
JUAN C. PEREZ, RCE 49568

REGISTERED PROFESSIONAL ENGINEER
No.
Exp.
CIVIL
STATE OF CALIFORNIA

COUNTY OF RIVERSIDE

CURB RAMP
LOCATION AT "T" INTERSECTIONS

NO SCALE

STANDARD No. 403 (6 OF 7)

REVISIONS		REV	BY:	APR'D	DATE	REV	BY:	APR'D	DATE
		1	JK	JC	08-05-10				
		2							
		3							

NOTES:

1. IF DISTANCE FROM CURB TO BACK OF SIDEWALK IS TOO SHORT TO ACCOMMODATE RAMP AND 4' LANDING, THEN USE THE CASE"B" RAMP.
2. THE MINIMUM SIDEWALK WIDTH IS 5' FROM BACK OF CURB TO FACE OF RETAINING CURB.
3. THE RAMP SHALL HAVE A 12" WIDE BORDER WITH GROOVES 1/4" WIDE AND 1/4" DEEP APPROXIMATELY 3/4" ON CENTER. PLACED ON THE LEVEL SIDEWALK (NOT ON THE RAMP). SEE GROOVING DETAIL ON SHEET 4.
4. TRANSITIONS FROM RAMPS TO WALKS, GUTTERS, OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
5. WHEN ABUTTING SOIL HAS A HIGH SULFATE CONTENT, SPECIAL CONSIDERATIONS ARE REQUIRED. SEE SPECIFICATIONS (SECTION 16.04).
6. FLARED SIDE SLOPE VARIES UNIFORMLY FROM A MAXIMUM OF 10% AT CURB TO CONFORM WITH LONGITUDINAL SIDEWALK SLOPE ADJACENT TO THE TOP OF THE RAMP.
7. CONSTRUCT WEAKENED PLANE JOINTS AT 1/4 DELTAS WHEN RADIUS EQUALS 35' AND AT INSIDE EDGE OF GROOVED BORDER WHEN RADIUS EQUALS 25'.
8. IF EXPANSIVE SOIL IS ENCOUNTERED, THEN RAMP SHALL BE CONSTRUCTED OVER CLASS 2 AGGREGATE MATERIAL.
9. CONCRETE SHALL BE CLASS B.
10. MAXIMUM SLOPES OF ADJOINING GUTTERS: THE ROAD SURFACE AND GUTTER SURFACE SHALL NOT EXCEED 5% WITHIN 4' OF THE CURB RAMP.
11. DETECTABLE WARNING SURFACES ARE REQUIRED ON ALL CURB RAMPS THAT ENTER INTO A VEHICULAR TRAVEL WAY.
12. CURB RAMPS SHALL HAVE A YELLOW DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH AND 3'-0" DEPTH OF THE RAMP. DETECTABLE WARNING SURFACES SHALL CONSIST OF A PANEL SET INTO WET CONCRETE AND CONFORM TO THE DETAILS ON THIS STANDARD. NO BOLT DOWN OR GLUE DOWN ALLOWED FOR NEW RAMP CONSTRUCTION.
13. THE EDGE OF THE DETECTABLE WARNING SURFACE NEAREST THE STREET SHALL BE BETWEEN 6" AND 8" FROM THE GUTTER FLOWLINE.
14. UTILITY PULL BOXES, MANHOLES, VAULTS AND ALL OTHER UTILITY FACILITIES ARE NOT TO BE LOCATED WITHIN THE BOUNDARIES OF THE CURB RAMP. EXISTING STRUCTURE TO BE RELOCATED OR ADJUSTED TO GRADE BY THE OWNER PRIOR TO, OR IN CONJUNCTION WITH, CURB RAMP CONSTRUCTION.
15. CROSSWALK STRIPING ONLY IF SHOWN ON IMPROVEMENT PLANS. CROSSWALK STRIPING, WHEN CALLED FOR, PER STD No. 403 (1 OF 7).
16. TO MEET AMERICAN WITH DISABILITIES ACT STANDARDS, MAXIMUM STATED SLOPES ARE ABSOLUTE AND NO CONSTRUCTION TOLERANCES WILL BE ALLOWED TO INCREASE THE SLOPES.
17. FOR CASE B, THE LEVEL LANDING AT THE BOTTOM OF THE RAMPS SHALL BE 5' WIDE. EXISTING CASE B LANDINGS THAT ARE 4' WIDE ARE ACCEPTABLE.

APPROVED BY:

DATE: 11/15/04

DIRECTOR OF TRANSPORTATION DATE
JUAN C. PEREZ, RCE 49568

REGISTERED PROFESSIONAL ENGINEER
No. _____
Exp. _____
CIVIL
STATE OF CALIFORNIA

COUNTY OF RIVERSIDE

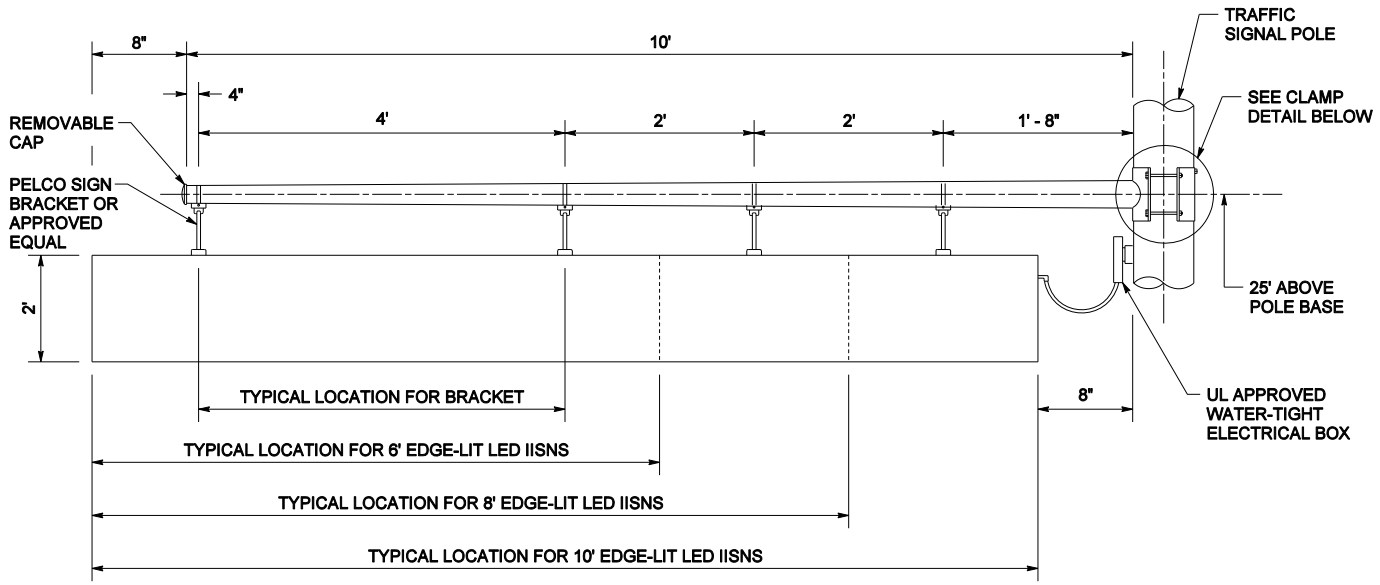
CURB RAMP
CONSTRUCTION NOTES

NO SCALE

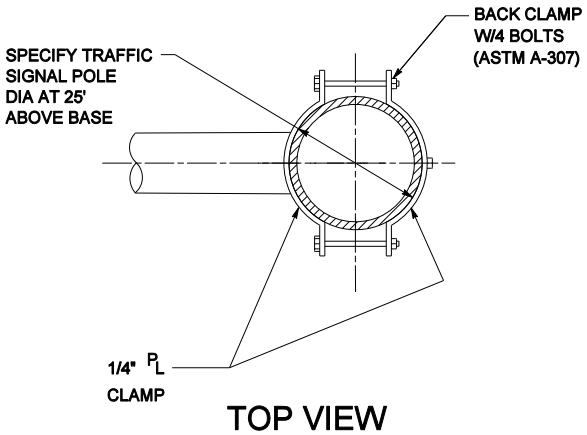
STANDARD No. 403 (7 OF 7)

REVISIONS		REV	BY:	APR'D	DATE	REV	BY:	APR'D	DATE
8-77, 5-80	11-04	1	JK	JP	08-05-10				
10-81, 6-82		2							
9-88, 2-90		3							

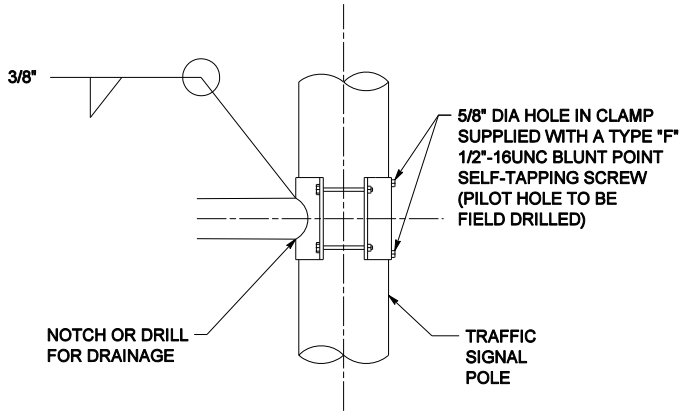
NOTE:
SIGN LOCATI0N MAY VARY DEPENDING
ON HEIGHT OF SIGNAL MAST ARM.



IISNS STRAIGHT ARM MOUNTING



TOP VIEW



ELEVATION

CLAMP DETAIL

APPROVED BY:

DIRECTOR OF TRANSPORTATION — DATE
JUAN C. PEREZ, RCE 49568

REGISTERED PROFESSIONAL ENGINEER
No. ____
Exp. ____
CIVIL
STATE OF CALIFORNIA

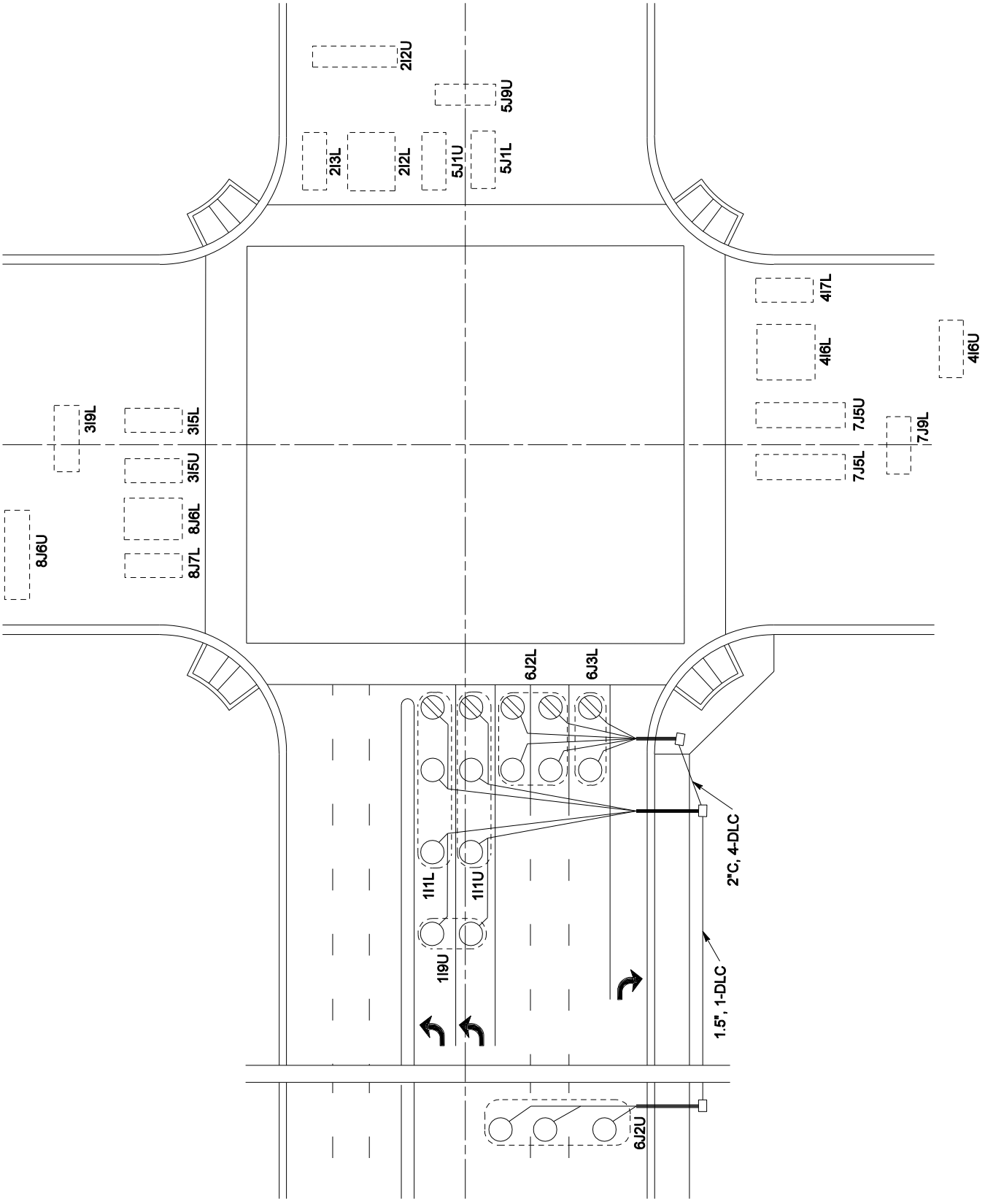
COUNTY OF RIVERSIDE

IISNS STRAIGHT ARM

NO SCALE

STANDARD No. 1200

REVISIONS		REV	BY:	APR'D	DATE	REV	BY:	APR'D	DATE
		1	JK	JP	08-05-10				
		2							
		3							



APPROVED BY:

DIRECTOR OF TRANSPORTATION — DATE
JUAN C. PEREZ, RCE 49568

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

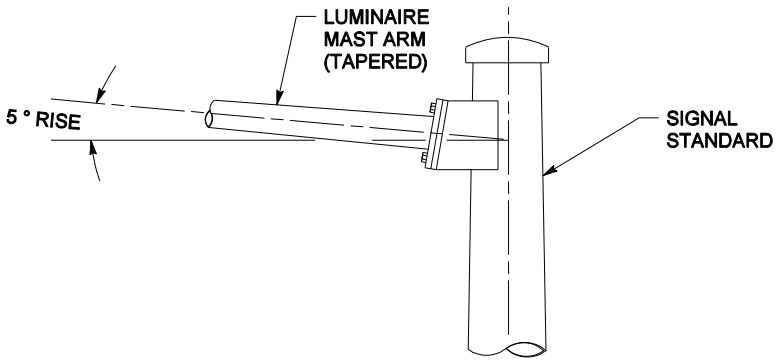
COUNTY OF RIVERSIDE

CASE "A" DETECTION INPUT

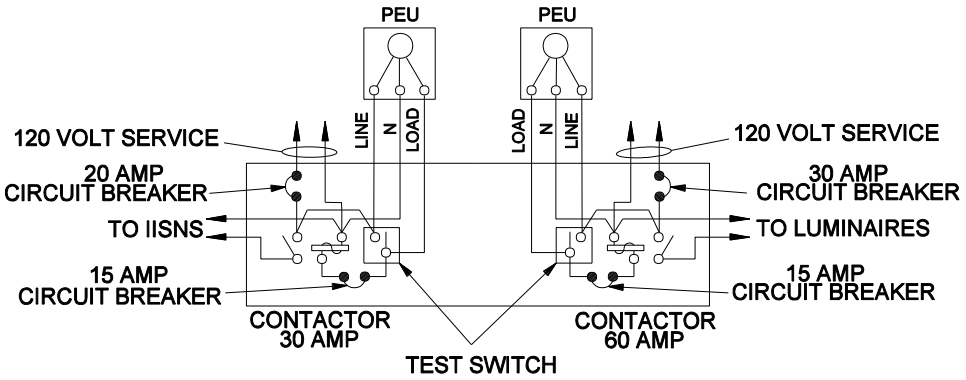
NO SCALE

STANDARD No. 1202

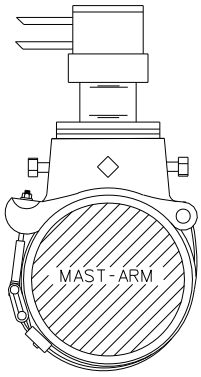
REVISIONS		REV	BY:	APR'D	DATE	REV	BY:	APR'D	DATE
		1	JK	JP	08-05-10	4			
		2				5			
		3				6			



STRAIGHT LUMINAIRE MAST ARM DETAIL



DUAL PEC WIRING DIAGRAM



MOUNTING CLAMP FOR OPTICAL DETECTOR

APPROVED BY:

DIRECTOR OF TRANSPORTATION — DATE
JUAN C. PEREZ, RCE 49568

REGISTERED PROFESSIONAL ENGINEER
No. ____
Exp. ____
STATE OF CALIFORNIA CIVIL

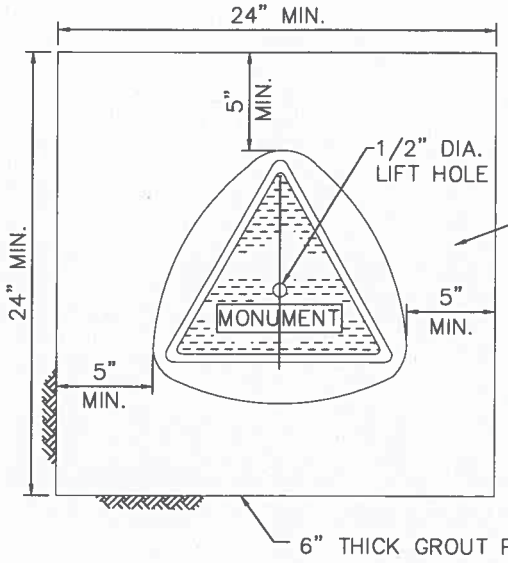
COUNTY OF RIVERSIDE

TRAFFIC SIGNAL DETAIL SHEET

NO SCALE

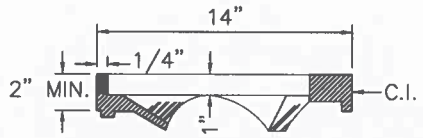
STANDARD No. 1207

REVISIONS		REV	BY:	APR'D	DATE	REV	BY:	APR'D	DATE
		1	JK	JP	08-05-10	4			
		2				5			
		3				6			

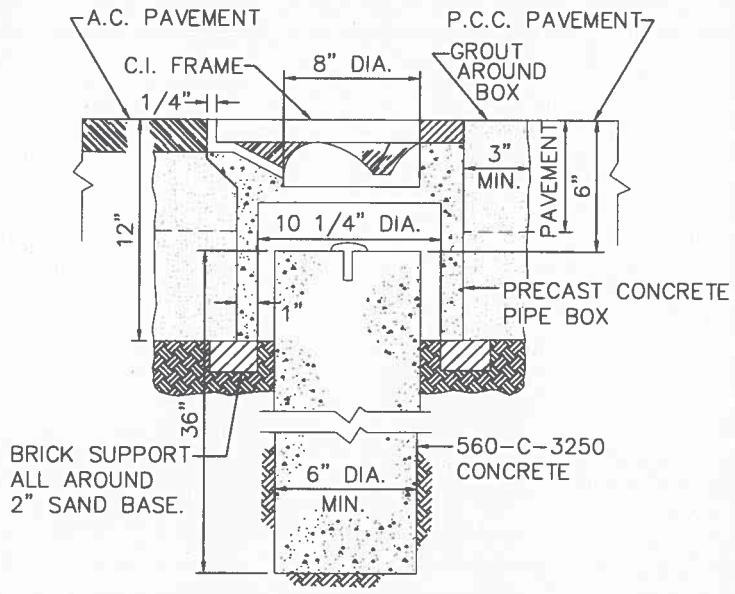


SLOPE SURFACE OF GROUT PAD TO DRAIN AWAY FROM COVER, AND TO MEET EXISTING GRADE.

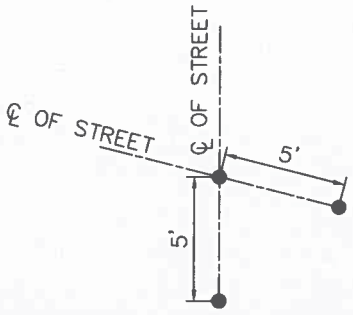
PLAN–IN UNPAVED AREA



RISER RING



TYPICAL MONUMENT SECTION IN PAVED AREA



ALTERNATE LOCATION OF MONUMENT. TIE DISTANCES SHOWN ON FINAL SUB–DIVISION MAP IF ALTERNATE LOCATION IS USED.

LOCATION OF STREET SURVEY MONUMENT

TO BE USED AT INTERSECTION STREETS ONLY. NOT AT B.C./E.C. MONUMENT LOCATIONS IN STREETS

CITY OF MURRIETA
DEPARTMENT OF PUBLIC WORKS

REVISIONS	
5/92	
APPROVED 1/14/10	

STREET CENTERLINE INTERSECTION MONUMENT

STD. NO.

617b

SHEET 2 OF 3

NOTES:

1. COVER AND FRAME TO BE CAST WITH PIPE BOX.
2. MONUMENT BASE MAY BE CAST IN PLACE OR PRECAST.
3. FORM AND TAPER EXPOSED UPPER 6" OF CAST IN PLACE BASE TO TOP DIAMETER OF 5". (PRECAST BASE SHALL BE SAND BACKFILLED).
4. MONUMENT MARKER SHALL BE A DOMED BRASS, 3" IN DIAMETER.
5. MONUMENT LOCATION:
   A) SET ON ALL CENTERLINE INTERSECTIONS UNLESS ACTUAL LOCATION IS MODIFIED BY THE AGENCY AND SHOWN IN MODIFIED LOCATION ON MAP. WHEN CENTERLINE INTERSECTION IS IMPARTIAL, OFFSET 5 FEET ON CENTERLINE OF MAJOR STREET, (SEE DETAIL ON SHEET 2). IF NEITHER CENTERLINE CAN BE OCCUPIED, TWO MONUMENTS WILL BE SET INLINE AROUND THE FRONT ON THE PERIMETER OF A 10-FOOT DIAMETER CIRCLE, WHOSE CENTER IS THE POINT.

   B) SET ON CENTERLINE AT INTERVALS NOT EXCEEDING 1000 FEET ON STRAIGHT RUNS.

   C) SET ON CENTERLINE AT POINTS OF CURVATURE.

   D) SET ON CENTER AT CENTER POINTS OF CUL-DE-SACS.

   E) SET ON CENTERLINE WHEN CENTER POINT OF CUL-DE-SAC IS OFFSET FROM CENTERLINE.

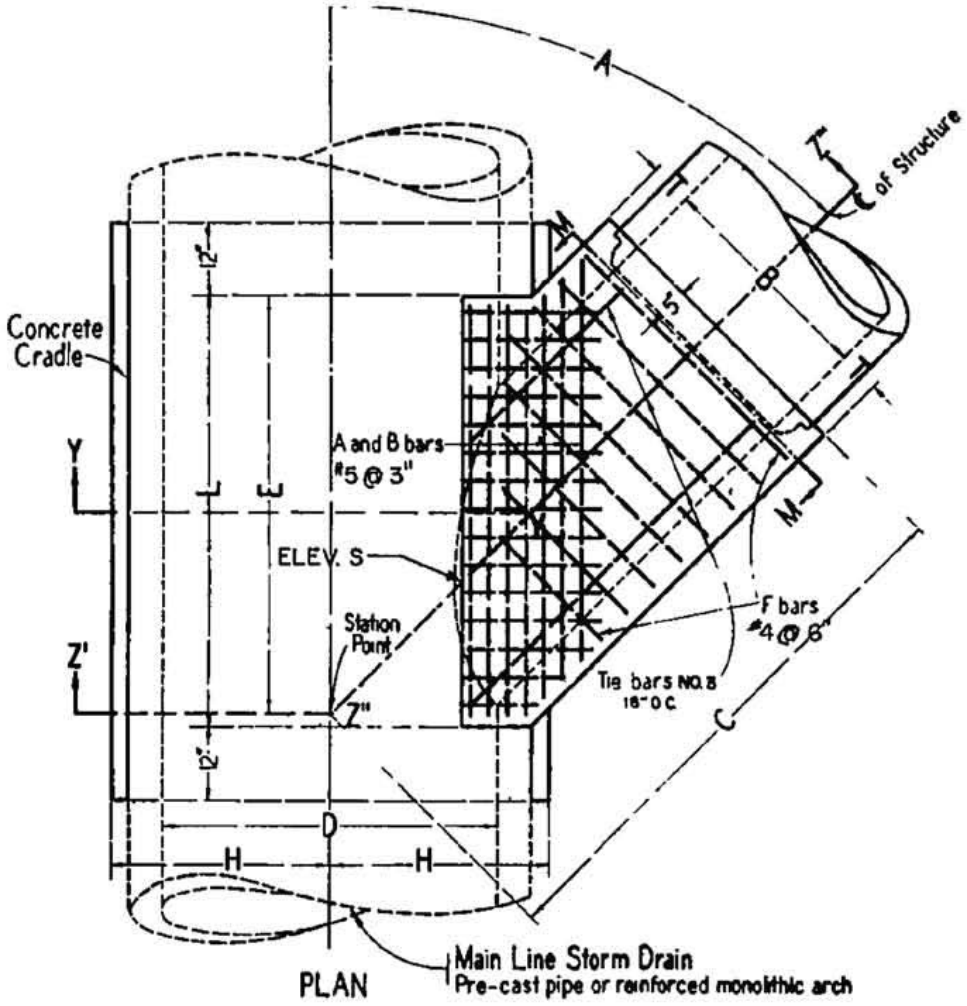
   F) THESE STANDARDS MAY BE MODIFIED BY THE AGENCY IN CASES WHERE STRICT COMPLIANCE THERWITH RESULTS IN MORE MONUMENTS THAN IS CONSIDERED NECESSARY. THE FOLLOWING TECHNIQUE FOR REDUCING THE NUMBER OF MONUMENTS WILL BE ROUTINE.

   G) SUBSTITUTION OF ONE MONUMENT ON THE "POINT OF INTERSECTION" FOR MONUMENTS AT THE "BEGINNING OF CURVE" AND THE "ENDING OF CURVE" WHEN THE "POINT OF INTERSECTION" FALLS WHITHIN THE PAVEMENT AREA.

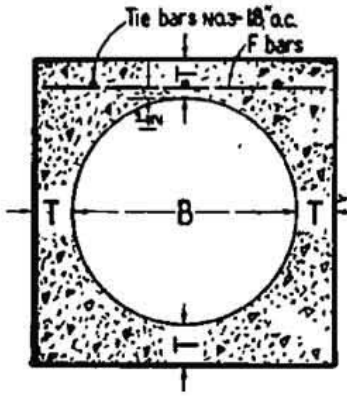
   H) A MONUMENT MAY BE DELETED WHCIH IS OTHERWISE REQUIRED BY THESE STANDARDS WHEN ITS POSITION CAN BE DETERMINED BY TURNING ONE ANGLE FROM A POINT ON A STRAIGHT LINE BETWEEN TWO OTHER MONUMENTS, PROVIDING SUCH POINT IS NOT MORE THAN 300 FEET FROM THE POINT ON WHICH THE DELETED MONUMENT WOULD HAVE BEEN PLACED.

CITY OF MURRIETA
DEPARTMENT OF PUBLIC WORKS

REVISIONS		STREET CENTERLINE MONUMENT	STD. NO. 617c
5/92			
APPROVED 1/14/10			SHEET 3 OF 3

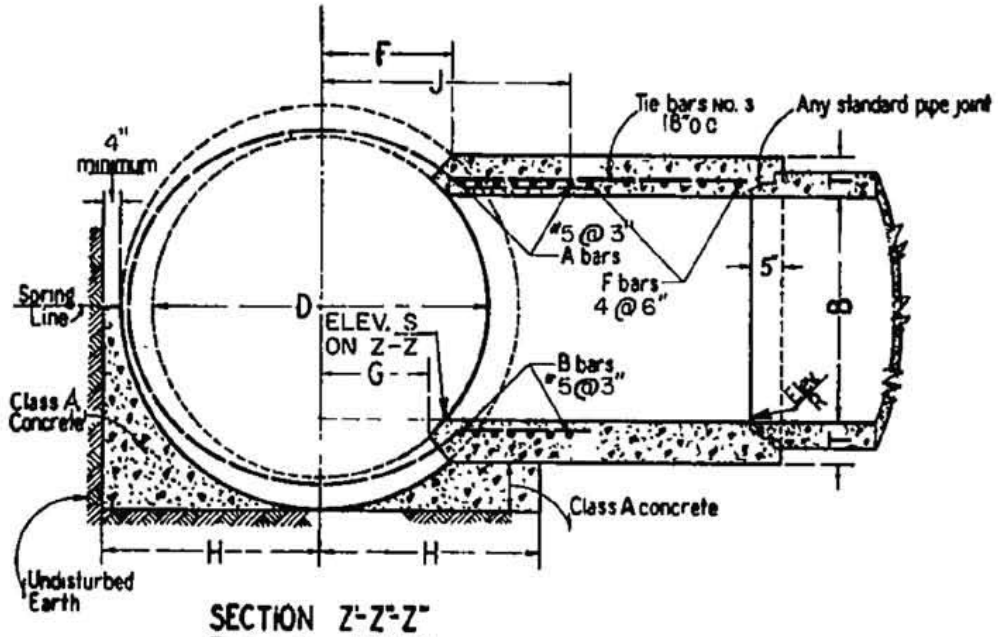


PLAN



SECTION M-M

TABLE OF VALUES FOR T	
B	T
12"	4"
15"	4½"
18"	4½"
21"	5"
24"	5½"
27"	5½"
30"	6"
33"	6½"
36"	6½"
39"	7"



SECTION Z'-Z"-Z"
Projected on Y-Y-Z"

CITY OF RIV. STD. NO. 421
L.A.C.F.C.D. STD. NO. 2-D112

REGISTERED PROFESSIONAL ENGINEER
WARREN D. WILLIAMS
No. 32338
Exp. 12-31-04
CIVIL
STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

APPROVED BY:

CHIEF ENGINEER

DATE: April 5, 2004

R.C.E. NO. 32338

JUNCTION STRUCTURE NO. 2

STANDARD DRAWING NUMBER JS227
SHEET 1 OF 2

NOTES FOR JUNCTION STRUCTURE NO. 2

1. VALUES for A, B, C, D, E, F, G, L, Elevation R, and Elevation S shown on improvement plan.

2. PIPE shall be cradled in class A concrete extending longitudinally to points 1 ft. beyond the limits of L H=½ outside diameter of pipe + 4" as a minimum. Cradle may be omitted on side opposite lateral inlet when constructed in connection with existing pipe storm drain.

3. A AND B BARS shall be carried to point not less than J distance from center line, $J=\frac{7D}{12}+6"$.

4. RECTANGULAR OPENING in main line pipe shall be cut within these limits normal to pipe surface without damaging steel. Values for F, G, and L on improvement plan.

5. TRANSVERSE REINFORCEMENT in pipe shall be cut in center of opening and bent to uniform distance from top and bottom of junction structure.

6. STRUCTURAL CONCRETE shall be CLASS "A"

7. REINFORCING STEEL shall be round, deformed, straight bars, 1½" clear from inside face of concrete unless otherwise shown.

8. STEEL SCHEDULE as shown.

9. MONOLITHIC ARCH: When Junction Structure No. 2 is specified with reinforced monolithic arch storm drain, value D shall refer to the clear span of the arch. Reinforcing steel shall be cut and bent into junction structure the same as for pipe. Concrete cradle under reinforced monolithic arch is not required.

10. FLOOR of structure shall be steel-troweled to springing line.

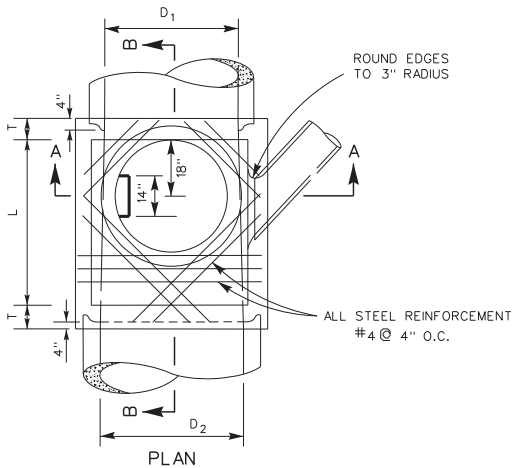
CITY OF RIV. STD. NO. 421
L.A.C.F.C.D. STD. NO. 2-0112
CITY OF L.A. STD. NO. B-1529

REGISTERED PROFESSIONAL ENGINEER
WARREN D. WILLIAMS
No. 32336
Exp. 12-31-04
CIVIL
STATE OF CALIFORNIA

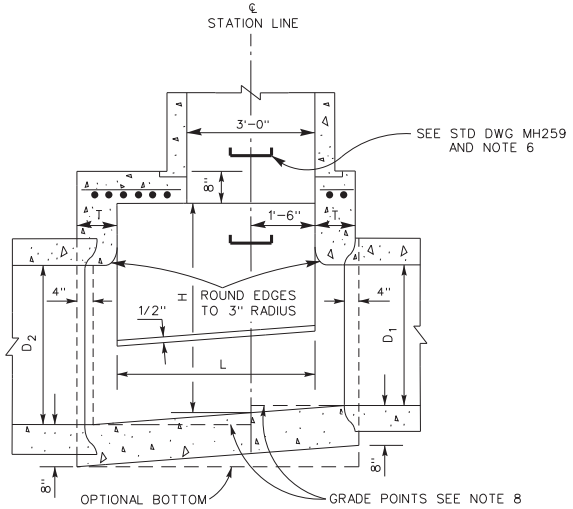
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPROVED BY:
CHIEF ENGINEER
DATE: April 5, 2004
R.C.E. NO. 32336

JUNCTION STRUCTURE NO. 2

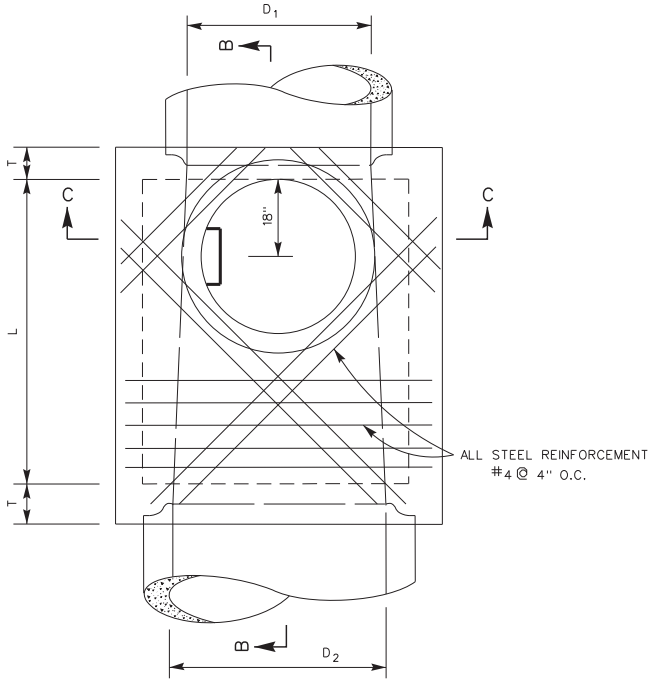
STANDARD DRAWING NUMBER JS227
SHEET 2 OF 2



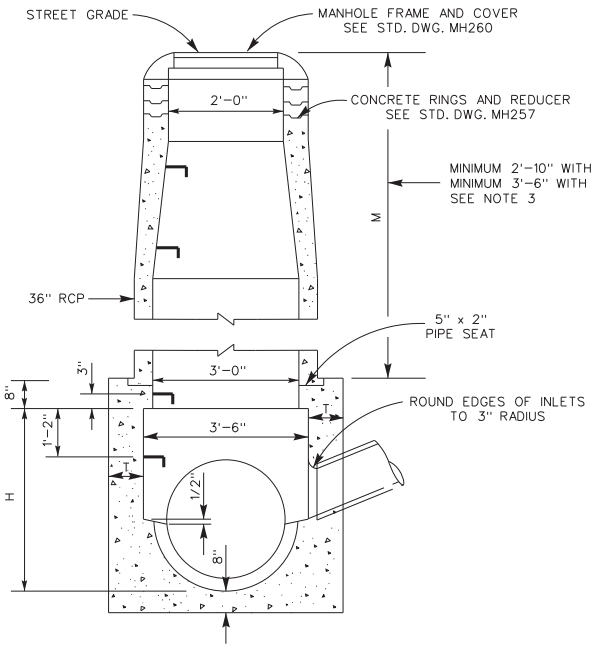
PLAN
(SHAFT NOT SHOWN)



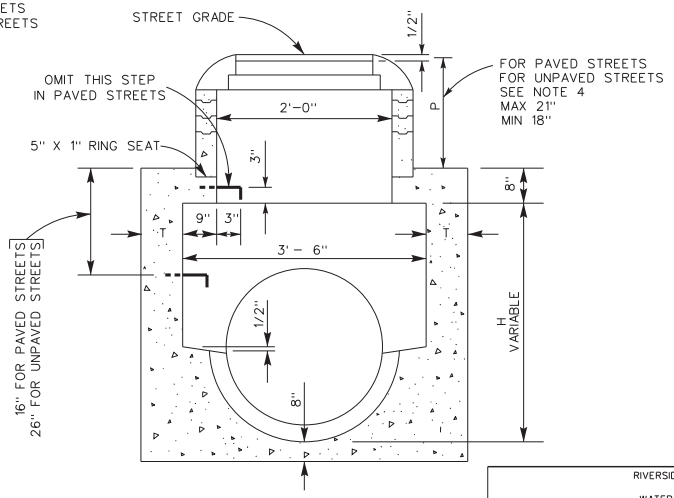
SECTION B–B



DETAIL N PLAN
(SHAFT NOT SHOWN, SEE NOTE 3)



SECTION A–A



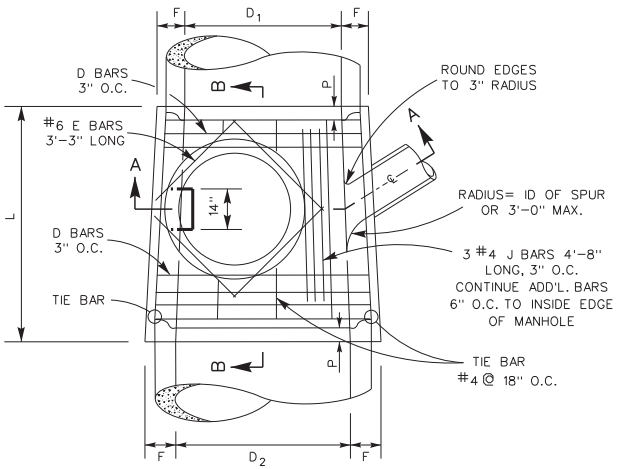
SECTION C–C

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT		
RECOMMENDED FOR APPROVAL BY: CHIEF, DESIGN & CONSTRUCTION DATE: JANUARY 2011 R.E. No. 44684	APPROVED BY: CHIEF ENGINEER DATE: JANUARY 2011 R.C.E. NO. 32336	MANHOLE NO. 1 STANDARD DRAWING NUMBER MH251 SHEET 1 OF 2

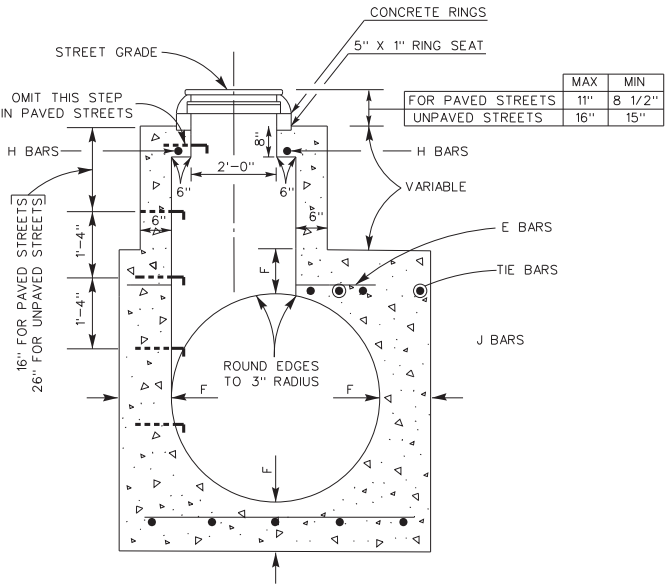
NOTES

1. HEIGHT H SHALL BE NOT LESS THAN 4'–0" BUT MAY BE INCREASED AT OPTION OF CONTRACTOR PROVIDED THAT THE VALUE OF M SHALL NOT BE LESS THAN THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED. FOR H (IN SEC. C–C) SEE NOTE 4.
2. LENGTH L SHALL BE 4' UNLESS OTHERWISE SHOWN ON IMPROVEMENT PLAN. L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS, AT THE OPTION OF CONTRACTOR, EXCEPT THAT ANY CHANGE IN LOCATION OF MANHOLE MUST BE APPROVED BY THE ENGINEER.
3. SHAFT SHALL BE CONSTRUCTED AS PER SECTION C–C AND DETAIL N WHEN DEPTH M FROM STREET GRADE TO TOP OF BOX IS LESS THAN 2'–10 1/2" FOR PAVED STREETS OR 3'–6" FOR UNPAVED STREETS.
4. DEPTH P MAY BE REDUCED TO AN ABSOLUTE LIMIT OF 6" WHEN LARGER VALUES OF P WOULD REDUCE H (IN SECTION C–C) TO BE 3'–6" OR LESS.
5. T SHALL BE 8" FOR VALUES OF H UP TO AND INCLUDING 8'.
   T SHALL BE 10" FOR VALUES OF H OVER 8'.
6. STEPS SHALL BE 3/4" ROUND, GALVANIZED STEEL AND ANCHORED NOT LESS THAN 4" IN THE WALLS OF STRUCTURES. UNLESS OTHERWISE SHOWN, STEPS SHALL BE SPACED 16" ON CENTER. THE LOWEST STEP SHALL BE NOT MORE THAN 2' ABOVE THE INVERT.
7. REINFORCING STEEL SHALL BE ROUND, DEFORMED, BARS, NO. 4 AND 1 1/2" CLEAR FROM INSIDE FACE OF CONCRETE.
8. STATIONS REFER TO PLAN AND PROFILE SHEETS. ELEVATIONS AT ℄ AND PROLONGED INVERT GRADE LINE. SEE NOTE 2 FOR SHIFTING LOCATION.
9. RINGS, REDUCER AND PIPE FOR ACCESS SHAFT SHALL BE SEATED IN CEMENT MORTAR AND NEATLY POINTED OR WIPED INSIDE SHAFT.
10. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRINGLINE.
11. CONCRETE SHALL BE CLASS "A".
12. WHERE PRESSURE MANHOLE NO. 1 IS SPECIFIED ON PLANS SEE STD DWG MH256 AND MH258.

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT		
RECOMMENDED FOR APPROVAL BY:	APPROVED BY:	MANHOLE NO. 1
CHIEF, DESIGN & CONSTRUCTION	CHIEF ENGINEER	
DATE: JANUARY 2011 R.E. No. 44684	DATE: JANUARY 2011 R.C.E. NO. 32336	STANDARD DRAWING NUMBER MH251 SHEET 2 OF 2

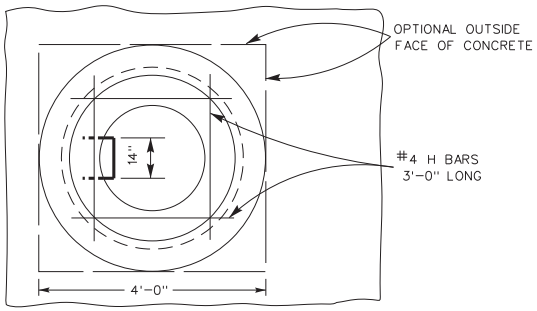


PLAN
(SHAFT NOT SHOWN)

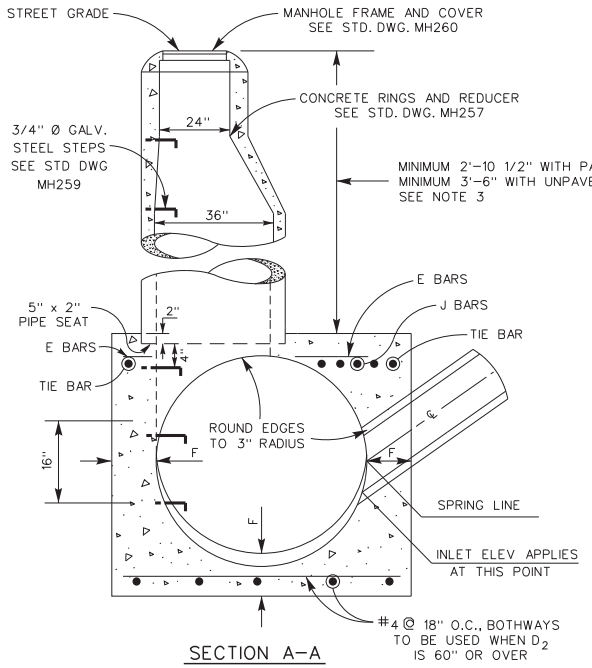


	MAX	MIN
FOR PAVED STREETS	11"	8 1/2"
UNPAVED STREETS	16"	15"

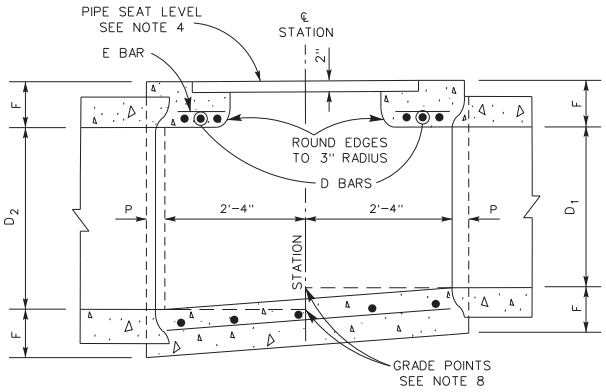
DETAIL M
(SEE NOTE 3)



PLAN



SECTION A–A



SECTION B–B

TABLE OF VALUES FOR "F"			
* D_2, D_1	F	* D_2, D_1	F
36"	6 1/2"	78"	11 3/4"
39"	7"	84"	12 1/2"
42"	7 1/2"	90"	13 1/4
45"	7 3/4"	96"	14"
48"	8"	102"	15 1/2"
51"	8 1/2"	108"	16"
54"	9"	114"	16 1/2"
57"	9 1/4"	120"	17"
60"	9 1/2"	126"	17"
63"	10"	132"	17 1/2"
66"	10 1/4"	138"	17 1/2"
69"	10 3/4"	144"	18"
72"	11"		

* USE D_2, OR D_1 WHICHEVER IS GREATER

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY:
CHIEF, DESIGN & CONSTRUCTION
DATE: JANUARY 2011 R.E. No. 44684

APPROVED BY:
CHIEF ENGINEER
DATE: JANUARY 2011 R.C.E. NO. 32336

MANHOLE NO. 2

STANDARD DRAWING NUMBER MH252
SHEET 1 OF 2

NOTES

1. TABLE OF VALUES FOR F ARE ON PLAN SHEET 1.
2. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTER LINE OF STORM DRAIN WHEN DIAMETER D_1 IS 48" OR LESS, IN WHICH CASE PLACE E BARS SYMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE AND OMIT J BARS.
3. DETAIL M WHEN DEPTH OF MANHOLE FROM STREET GRADE TO TOP OF BOX IS LESS THAN 2'–10 1/2" FOR PAVED STREET OR 3'–6" FOR UNPAVED STREET, CONSTRUCT MONOLITHIC SHAFT AS PER DETAIL M. SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED AS PER DETAIL M. WHEN DIAMETER D_1 IS 48" OR LESS, CENTER OF SHAFT MAY BE LOCATED AS PER NOTE 2.
4. THICKNESS OF DECK SHALL VARY WHEN NECESSARY TO PROVIDE LEVEL PIPE SEAT, BUT SHALL NOT BE LESS THAN TABULAR VALUES FOR F SHOWN ON PLAN SHEET 1.
5. REINFORCING STEEL SHALL BE ROUND, DEFORMED, STRAIGHT BARS, 1 1/2" CLEAR FROM INSIDE FACE OF CONCRETE UNLESS OTHERWISE SHOWN.
6. STEPS SHALL BE 3/4" ROUND, GALVANIZED STEEL AND ANCHORED NOT LESS THAN 4" IN THE WALLS OF STRUCTURE UNLESS OTHERWISE SHOWN THE SPACING SHALL BE 16". THE LOWEST STEP SHALL BE NOT MORE THAN 2'–0" ABOVE THE INVERT. SEE STD DWG MH259.
7. RINGS, REDUCER AND PIPE FOR ACCESS SHAFT BE SEATED IN CEMENT MORTAR AND NEATLY POINTED OR WIPED INSIDE SHAFT.
8. STATIONS OF MANHOLES SHOWN ON PLAN APPLY AT CENTER OF SHAFT ELEVATIONS SHOWN AT STATIONS REFER TO PROLONGED INVERT GRADE LINES.
9. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRINGLINE.
10. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT THE SPRINGLINE.
11. LENGTH L AND EMBEDMENT P SHALL HAVE THE FOLLOWING VALUES, UNLESS OTHERWISE SHOWN ON THE PLAN
    FOR D_2 = 96" OR LESS, L= 5'–6", P= 5'
    D_2 = OVER 96", L= 6'–0", P= 8"
    L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS WHEN L IS GREATER THAN THAT SHOWN ABOVE IS SPECIFIED D BARS SHALL BE CONTINUED 6" O.C.
12. D BARS SHALL BE #4 FOR D_2 = 39" OR LESS #5 FOR D_2 42" TO 84" INCLUSIVE AND #6 FOR D_2 = 90" OR OVER TIE BARS SHALL BE #4 BARS.
13. STRUCTURAL CONCRETE SHALL BE CLASS "A".
14. CENTERLINE OF INLET PIPE TO INTERSECT INSIDE FACE OF CONE AT SPRINGLINE UNLESS SHOWN OTHERWISE.
15. WHERE PRESSURE MANHOLE NO. 2 IS SPECIFIED ON PLANS SEE STD DWG MH256 AND MH258.

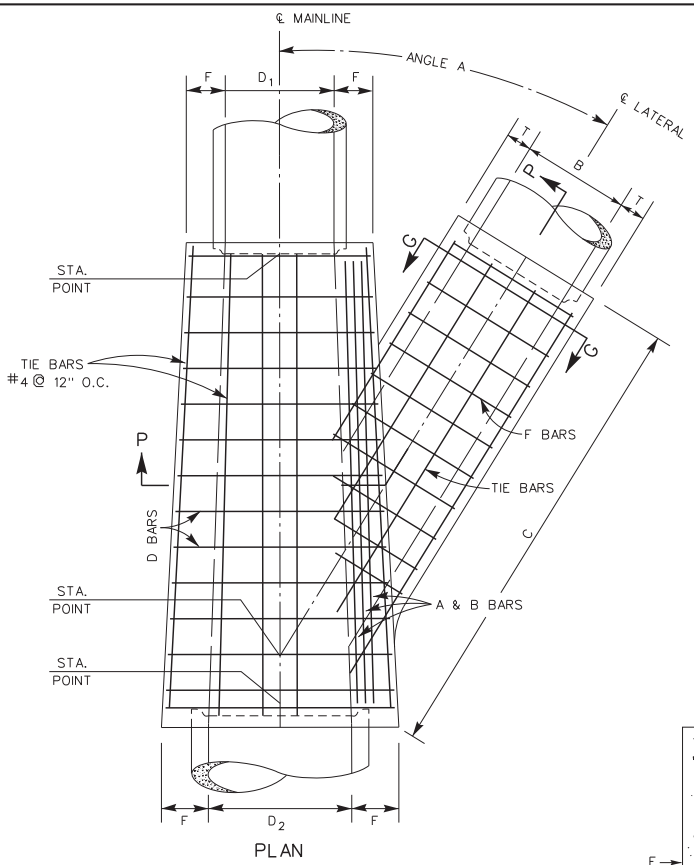
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY:
CHIEF, DESIGN & CONSTRUCTION
DATE: JANUARY 2011 R.E. No. 44684

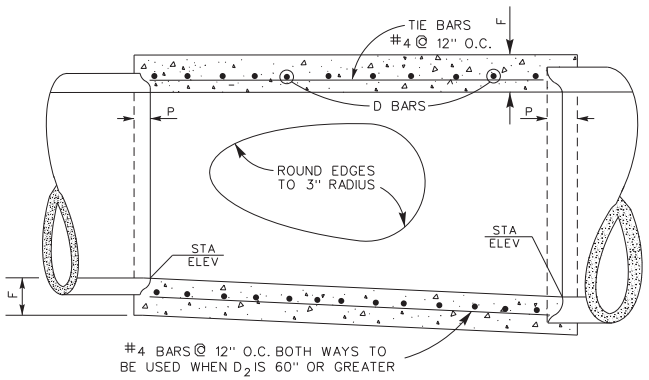
APPROVED BY:
CHIEF ENGINEER
DATE: JANUARY 2011 R.C.E. NO. 32336

MANHOLE NO. 2

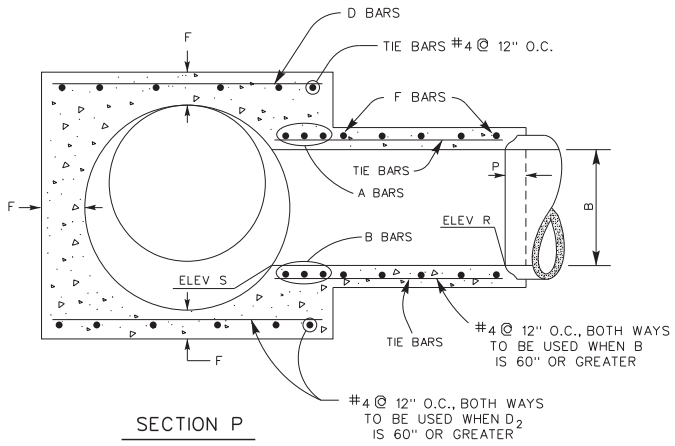
STANDARD DRAWING NUMBER MH252
SHEET 2 OF 2



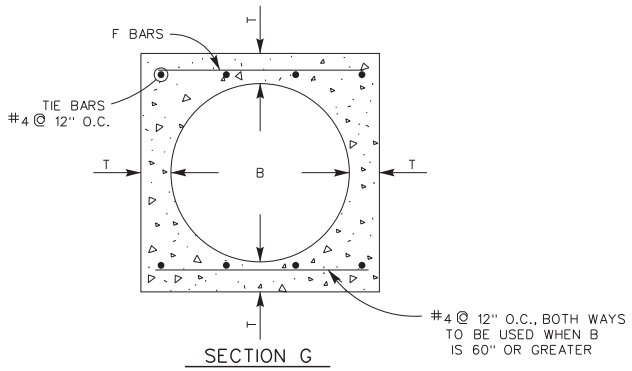
PLAN



LONGITUDINAL SECTION



SECTION P



SECTION G

TABLE

*D2, D1, OR B	F OR T	A OR B BARS	D OR F BARS	P
12	4	#5 @ 3" O.C.	#4 @ 6" O.C.	5"
18	4 1/2			
24	5 1/4			
30	6			
36	6 1/2			
42	7 1/2	#6 @ 3" O.C.	#5 @ 6" O.C.	
48	8			
54	9			
60	9 1/2			
66	10 1/4			
72	11			
84	12 1/2			
90	13 1/4	#7 @ 3" O.C.	#6 @ 6" O.C.	8"
96	14			
102	15 1/2			
108	16			
114	16 1/2			
120	17			
126	17			
132	17 1/2			
138	17 1/2			
144	18			

* USE D_2, OR D_1, WHICHEVER IS GREATER, OR B

NOTES

1. NUMBER OF A&B BARS SHOWN IS REPRESENTATIONAL. SEE TABLE FOR SPACING & BAR COUNT.
2. VALUES FOR A, B, C, D_1, D_2, ELEV. R AND ELEV. S ARE SHOWN ON IMPROVEMENT PLAN. LENGTH OF THE STRUCTURE MAY BE INCREASED TO MEET PIPE ENDS USING D BARS IN EXTENDED PORTION OF SAME DIMENSION AND SPACING AS SPECIFIED.
3. CONCRETE SHALL BE CLASS "A". FLOOR OF THE STRUCTURE SHALL BE STEEL-TROWELED TO SPRING LINE. STRUCTURE SHALL BE POURED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING AT THE SPRING LINE A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY.
4. REINFORCING STEEL CLEAR COVER SHALL BE 1½" ON INSIDE. TIE BARS SHALL BE NO.4 AND SPACED 12" C/C.
5. WHEN DIMENSION "C" IS NOT SPECIFIED THE SPUR SHALL NOT BE CONSTRUCTED AND A & B BARS SHALL BE OMITTED.
6. THE MAXIMUM COVER ABOVE THIS STRUCTURE SHALL BE 25'. IF THE COVER EXCEEDS 25', A SPECIAL STRUCTURE SHALL BE DESIGNED FOR THE COVER AND DETAILED ON THE PROJECT DRAWINGS.

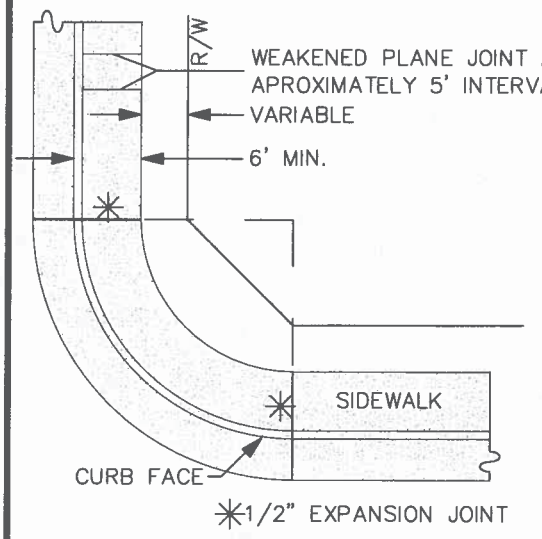
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY:
CHIEF, DESIGN & CONSTRUCTION
DATE: JANUARY 2011 R.E. No. 44684

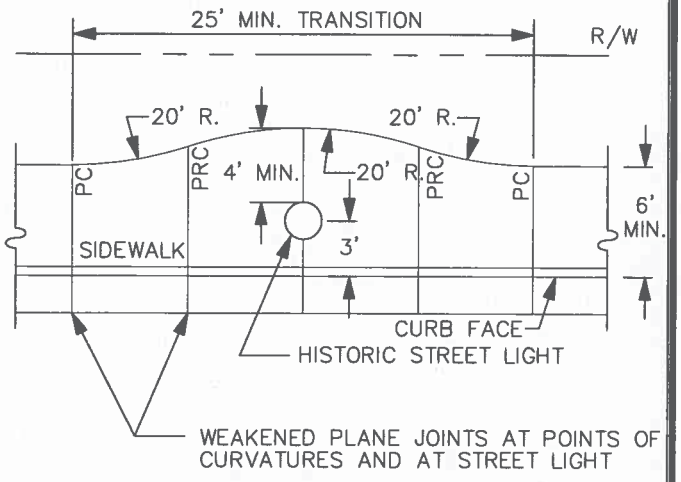
APPROVED BY:
CHIEF ENGINEER
DATE: JANUARY 2011 R.C.E. NO. 32336

TRANSITION STRUCTURE NO. 3

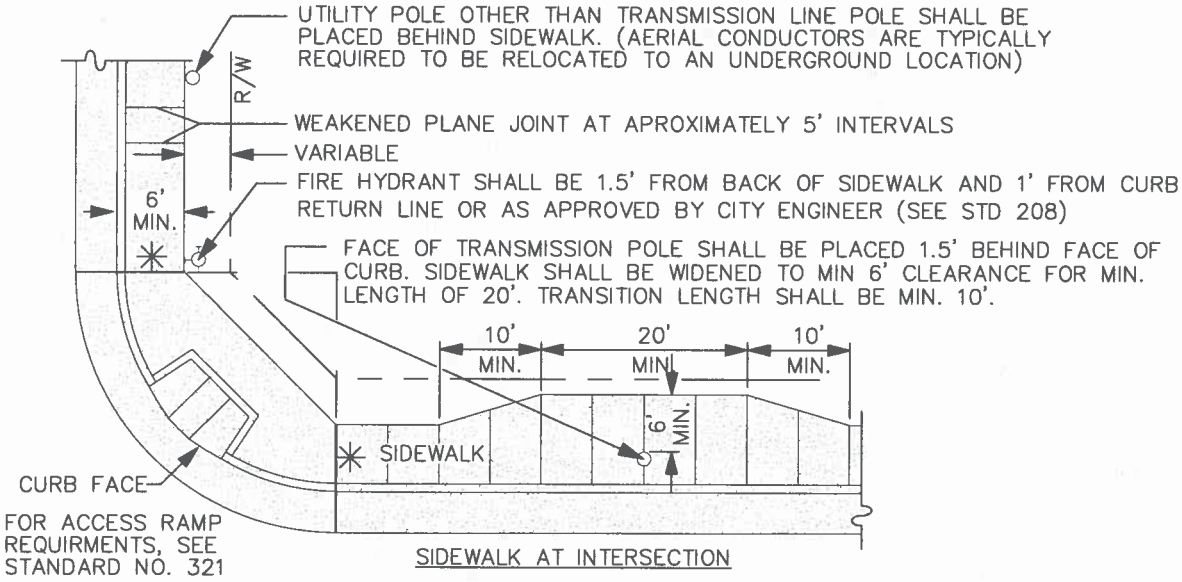
STANDARD DRAWING NUMBER TS303



SIDEWALK ON INSIDE OF KNUCKLE



SIDEWALK TRANSITION AT HISTORIC STREET LIGHT



SIDEWALK AT INTERSECTION

1/2" EXPANSION JOINT

NOTE:

1. VARIABLE DISTANCES TO BE SHOWN ON APPLICABLE TYPICAL ROAD SECTION STANDARD.
2. CONCRETE SHALL BE 560-C-3250, 4" MINIMUM THICKNESS.
3. THE TRANSITION FOR THE HISTORIC STREET LIGHT MAY BE USED FOR OTHER UTILITY POLES WHEN APPROVED BY THE CITY ENGINEER.

CITY OF MURRIETA
DEPARTMENT OF PUBLIC WORKS

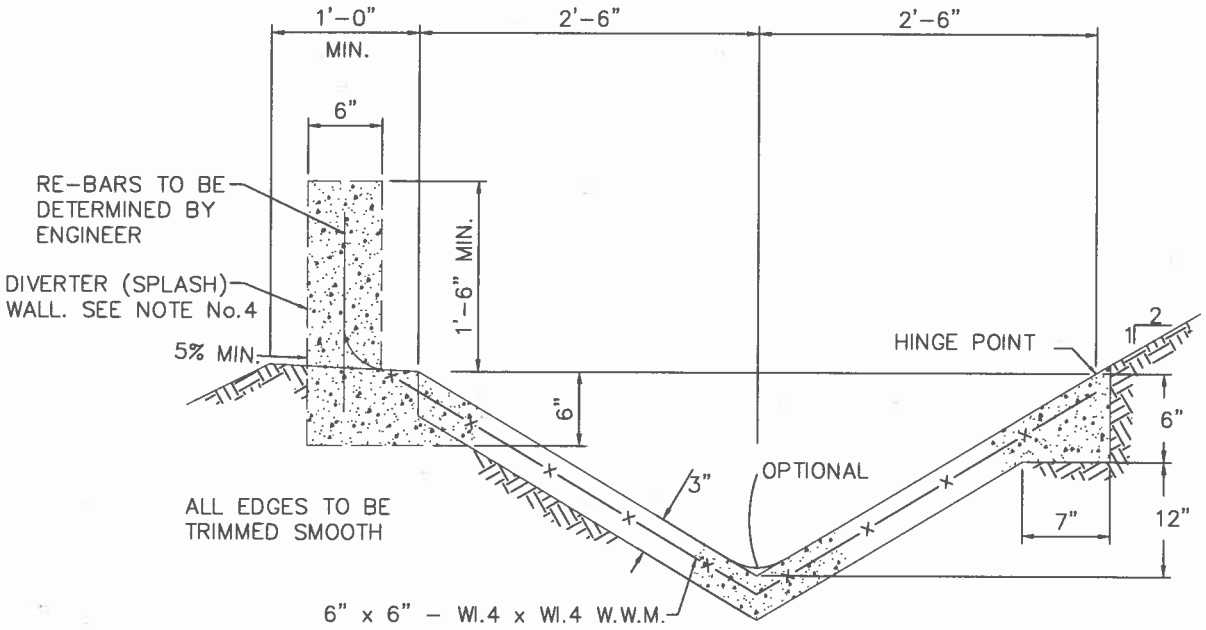
REVISIONS	
5/92	
10/98	
APPROVED 1/14/10	

SIDEWALK, FIRE HYDRANT, AND UTILITY POLE LOCATION (SIDEWALK AT CURB)

STD. NO.

319a

SHEET 1 OF 2



TERRACE DRAIN

NOTES:

1. CONCRETE SHALL SHALL BE 560-C-3250. CONCRETE MAY BE PNEUMATICALLY PLACED AND SHALL CONFORM TO SECTION 2621 OF THE UNIFORM BUILDING CODE.
2. REINFORCING SHALL BE 6"x6"-WI.4 x WI.4 WELDED WIRE MESH (W.W.M.) OR APPROVED EQUAL.
3. GROUND SHALL BE PRE-WETTED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO PLACEMENT OF CONCRETE. MOISTURE LOSS RETARDANT SHALL BE USED WHEN REQUIRED BY THE CITY ENGINEER.
4. CONCRETE OR CONCRETE BLOCK DIVERTER (SPLASH) WALL TO BE CONSTRUCTED WHEN DOWN DRAIN TERMINATES AT TERRACE DRAIN. SEE PLAN FOR LOCATION AND DETAILS.

CITY OF MURRIETA
DEPARTMENT OF PUBLIC WORKS

REVISIONS	
5/92	
APPROVED 1/14/10	

TERRACE DRAIN

STD. NO.

415a

SHEET 1 OF 3

APPENDIX C

ATTACHMENT "C" FOR RISK LEVEL 1 REQUIREMENTS

ATTACHMENT C
RISK LEVEL 1 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 1 dischargers shall comply with the narrative effluent standards listed below:

   a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

   b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

2. Numeric – Risk Level 1 dischargers are not subject to a numeric effluent standard.

B. Good Site Management "Housekeeping"

1. Risk Level 1 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 1 dischargers shall implement the following good housekeeping measures:

   a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

   b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

2. Risk Level 1 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

d. Cover waste disposal containers at the end of every business day and during a rain event.

e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

g. Implement procedures that effectively address hazardous and non-hazardous spills.

h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:

i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

ii. Appropriate spill response personnel are assigned and trained.

i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

3. Risk Level 1 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.

   b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.

   c. Clean leaks immediately and disposing of leaked materials properly.

4. Risk Level 1 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   b. Contain fertilizers and other landscape materials when they are not actively being used.

   c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.

   d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.

5. Risk Level 1 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 1 dischargers shall do the following:

a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

d. Ensure retention of sampling, visual observation, and inspection records.

e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

6. Risk Level 1 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

C. Non-Storm Water Management

1. Risk Level 1 dischargers shall implement measures to control all non-storm water discharges during construction.

2. Risk Level 1 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 1 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 1 dischargers shall implement effective wind erosion control.

2. Risk Level 1 dischargers shall provide effective soil cover for inactive[1] areas and all finished slopes, open space, utility backfill, and completed lots.

3. Risk Level 1 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 1 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

2. On sites where sediment basins are to be used, Risk Level 1 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

F. Run-on and Runoff Controls

Risk Level 1 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 1 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.

2. Risk Level 1 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended

[1] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 1 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

4. For each inspection required, Risk Level 1 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

5. Risk Level 1 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:

   a. Inspection date and date the inspection report was written.

   b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

   c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.

   d. A description of any BMPs evaluated and any deficiencies noted.

   e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

   f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

   g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

   h. Photographs taken during the inspection, if any.

   i. Inspector’s name, title, and signature.

H. Rain Event Action Plan

Not required for Risk Level 1 dischargers.

I. Risk Level 1 Monitoring and Reporting Requirements

Table 1 - Summary of Monitoring Requirements

Risk Level	Visual Inspection					Sample Collection	
	Quarterly non-Storm Water Discharge	Pre-Storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
1	X	X		X	X		

1. **Construction Site Monitoring Program Requirements**

   a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.

   b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Programs to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.

   c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. **Objectives**

   The CSMP shall be developed and implemented to address the following objectives:

   a. To demonstrate that the site is in compliance with the Discharge Prohibitions;

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and

d. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

3. **Risk Level 1 - Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

a. Risk Level 1 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.

b. Risk Level 1 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.

c. Risk Level 1 dischargers shall conduct visual observations (inspections) during business hours only.

d. Risk Level 1 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.

e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 1 dischargers shall visually observe (inspect):

i. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

ii. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, the discharger shall implement appropriate corrective actions.

iii. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

f. For the visual observations (inspections) described in e.i and e.iii above, Risk Level 1 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

g. Within two business days (48 hours) after each qualifying rain event, Risk Level 1 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.

h. Risk Level 1 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. **Risk Level 1 – Visual Observation Exemptions**

a. Risk Level 1 dischargers shall be prepared to conduct visual observation (inspections) until the minimum requirements of Section I.3 above are completed. Risk Level 1 dischargers are not required to conduct visual observation (inspections) under the following conditions:

i. During dangerous weather conditions such as flooding and electrical storms.

ii. Outside of scheduled site business hours.

b. If no required visual observations (inspections) are collected due to these exceptions, Risk Level 1 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the visual observations (inspections) were not conducted.

5. **Risk Level 1 – Monitoring Methods**

Risk Level 1 dischargers shall include a description of the visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures in the CSMP.

6. **Risk Level 1 – Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

   i. Risk Level 1 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

   ii. Risk Level 1 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).

   iii. Risk Level 1 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 1 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

7. **Risk Level 1 – Non-Visible Pollutant Monitoring Requirements**

   a. Risk Level 1 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

   b. Risk Level 1 dischargers shall ensure that water samples are large enough to characterize the site conditions.

   c. Risk Level 1 dischargers shall collect samples at all discharge locations that can be safely accessed.

   d. Risk Level 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

   e. Risk Level 1 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the

presence of pollutants identified in the pollutant source assessment required (Risk Level 1 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

f. Risk Level 1 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

g. Risk Level 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.[2]

h. Risk Level 1 dischargers shall keep all field /or analytical data in the SWPPP document.

8. **Risk Level 1 – Particle Size Analysis for Project Risk Justification**

Risk Level 1 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

9. **Risk Level 1 – Records**

Risk Level 1 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 1 dischargers shall retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.

c. The date and approximate time of analyses.

d. The individual(s) who performed the analyses.

[2] For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, and the analytical techniques or methods used.

f. Rain gauge readings from site inspections.

g. Quality assurance/quality control records and results.

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.6 above).

i. Visual observation and sample collection exception records (see Section I.4 above).

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

APPENDIX D

ATTACHMENT “D” FOR CLINTON KEITH ROAD EXTENSION WARM SPRINGS CREEK BRIDGE 14” WATER PIPELINE IMPROVEMENTS

Riverside County
Perris, California

Clinton Keith Road Extension
Warm Springs Creek Bridge 14" Water Pipeline Improvements

Work Order # - 11-349

A PUBLIC WORKS PROJECT

March 11, 2015

Contents:

Conditions of the Contract
Specifications

Paul D. Jones, II, P.E. - General Manager

Safety is of paramount and overriding importance to Eastern Municipal Water District

Visit our website at www.emwd.org to view currently advertised projects

TABLE OF CONTENTS

EASTERN MUNICIPAL WATER DISTRICT
Clinton Keith Road Extension
Warm Springs Bridge 14" Water Pipeline Improvements

BIDDER'S 3-YEAR EXPERIENCE RECORD & RESUMES OF KEY PERSONNEL

After the bid opening, apparent low bidder will be requested to provide a ***detailed 3-year*** experience record showing successful completion of similar work on the attached form.

Additionally, bidder must include resumes of key personnel proposed to work on this project.

These documents should be submitted to the County within 5 business days of request.

DETAILED 3-YEAR EXPERIENCE RECORD

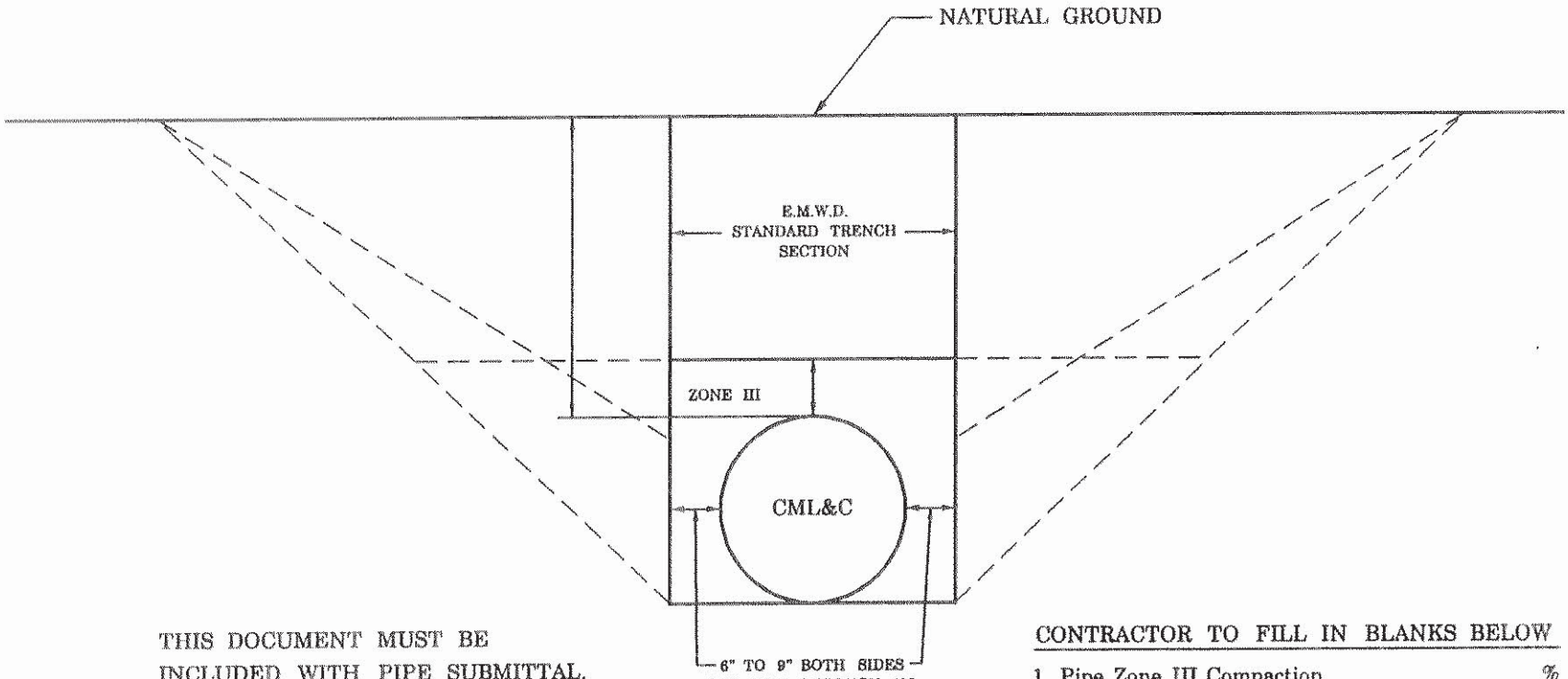
PLEASE USE ADDITIONAL SHEETS

YEAR					
TYPE/DESCRIPTION OF WORK					
VALUE OF WORK PERFORMED					
LOCATION OF WORK (CITY)					
ENGINEER / CONTACT PERSON Address & phone #					
OWNER / (CONTACT PERSON Address & phone #					

BIDDER'S RESUMES

(ATTACH HERE)

MANUFACTURER'S PIPE ZONE DENSITY CHART



THIS DOCUMENT MUST BE INCLUDED WITH PIPE SUBMITTAL. NO ALTERATIONS OR CONDITIONS ARE ALLOWED.

CONTRACTOR TO FILL IN BLANKS BELOW

1. Pipe Zone III Compaction _____ %
2. Cyl. Plate Thickness _____
3. Mortar Lining Thickness _____
4. Mortar Coating Thickness _____
5. Proposed Slope Construction:
   Slope Ratio _____
   a. Show above in red
6. Pipe Manufacturer _____
7. Authorized Signature of
   Pipe Manufacturer _____

sectbs8.dgn

GENERAL CONDITIONS
Section E - Inspection and Tests

E-01. This section of the specifications supplements that paragraph of the General Conditions of this specification entitled "Inspection and Testing of Materials".

A. Progress Reports. The Contractor shall furnish the District full information as to the progress of the work in its various parts and shall give the District timely notice of the Contractor's readiness for inspection. The District reserves the right to charge to the Contractor any additional cost of inspection and test when articles or materials are not ready at the time inspection is requested by the Contractor.

B. Inspection at Mill. Inspection will be made during manufacture of material. If the inspection or test, whether preliminary or final, is made on the premises of the Contractor, the Contractor shall furnish, without additional charge, all reasonable facilities and assistance for the safe and convenient inspection and test required by the Engineer.

C. Mill Test Reports. Whenever required by the Engineer the District shall be furnished promptly with complete certified copies of mill test reports showing chemical and physical properties of the materials to be furnished under the contract and also copies of rolling mill reports.

D. Samples or Test Specimens. Samples or test specimens of all materials, appliances, and fittings for delivery under these specifications or for incorporation in the products manufactured or fabricated hereunder shall be prepared at the Contractor's expense, except as otherwise specified herein, and shall be furnished to the Engineer, carriage prepaid, in such quantities and sizes as may be required by him for proper examination and in ample time for completion of all necessary tests or analyses before the time in which the Contractor desires to deliver or make use of same. Chemical tests and analyses, except those furnished by the Contractor under sub-paragraph (c) hereof, will be made by, or at the expense of, the District.

E. Inspection of Materials Not Locally Produced. When the Contractor intends to purchase materials, fabricated products, or equipment from sources located more than 100 miles outside the geographical limits of EMWD’s main office, the contractor will be responsible for the actual costs incurred for one inspector (EMWD staff or consultant employed by EMWD) to inspect the materials, equipment or process. Assume $600/day per production day run. This approval shall be obtained before producing any material or equipment. The inspector shall judge the materials by the requirements of the plans and specifications. The Contractor shall forward reports required by the Engineer. No materials or equipment shall be shipped nor shall any processing, fabrication or treatment of such materials be done without proper inspection. Approval shall not relieve the Contractor of responsibility for complying with the contract requirements.

010313

GENERAL CONDITIONS
Section F - Labor & Construction

C O N T E N T S

GENERAL REQUIREMENTS

F-08. REPORTS, RECORDS AND DATA

A. General. The Contractor shall submit to the District such of his schedules and schedules of each of his subcontractors as the District may request concerning work performed or to be performed under this contract, including schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records, and other data.

Before proceeding with construction, the Contractor shall furnish the District with information, plans and prints for all structures, articles, machinery or fabricated materials to be entered into permanent construction which are by these specifications and/or plans to be furnished by the Contractor and of which detailed plans are not furnished by the District. Such information, plans and prints shall be submitted to the District for approval and shall become the property of the District.

B. Asbuilt Project Record Documents. The Contractor shall maintain, at the job site, one complete set of Contract Specifications, Addenda, Change Orders and other directions, approved submittals, including one set of full size plans marked to show any deviations which have been made from the plans or approved shop drawings, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated or which were not indicated on the plans. Said record drawings shall be supplemented by any detailed sketches as necessary or directed, to indicate fully the work as actually constructed.

Current asbuilt record drawings shall be accessible to the District at all times during the construction period. They shall be reviewed with the District at regular intervals.

Asbuilt Record Plans and Specifications shall be clearly and correctly annotated by the Contractor to show all changes made during the construction process at the time the changed Work is installed.

Upon completion and prior to final inspection of the Work, the Contractor shall submit the Record Plans and Specifications to the District for review, and shall make such revisions or corrections as may be necessary for them to be a true, complete, and accurate record of the Work in the opinion of the District. When approved, the Contractor shall deliver the Asbuilt Record Drawings and Specifications to the District. If requested by the District, transparencies shall be furnished for record drawings of piping, electrical, and instrumentation information.

F-10. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

A. Required Forms. The Contractor shall deliver to the District at the Pre-Construction Conference or within such additional time as may be allowed by the District, the following: (Additional forms may be required as called out in Standard form EN-48)

FormssuppliedbytheDistrict

1. Insurance Certificate(s);

2. EN-29 or Schedule of Values: Breakdown of the Contract Price showing sizes and quantities of equipment items;

3. EN-61: Satisfactory evidence of placement of orders for all materials;

4. EN-57: Shoring Plan, including Cal OSHA form 421-2 Activity Notification;

5. Contractor’s Financial Qualification form;

6. Authorized Signatures;

7. C-11: Workers’ Compensation Certificate;

8. EN-183: Verification of pre-approved materials list;

9. EN-84: Specific Operating Safety Procedure - Exhibit “B” of Section 01000-General Safety Requirements;

10. EN-2: 24-hour emergency telephone numbers;

11. EN-146: Certified Payroll Form;

12. Prevailing Wage Rate;

13. C-13: Certificate by Single Instrument Supplier (if applicable)

14. Employee Safety & Health Training Records

15. Subcontractors List/Worker Classification

16. Contractor’s Financial Qualification Form

17. Maintenance Bond for Pumping Equipment (if applicable)

Contractor'sForms

1. Project Control Schedule

2. DOSH Permit (copy); (Dept. of Occupational Safety & Health)

3. Listing of all directly contracted subcontractors (CC. 3098a)

4. Injury & Illness Prevention Program;

5. Other documentation, as required

The costs provided in the EN-29, Breakdown of Contract Price will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price. In lieu of the EN-29, the Schedule of Values (refer to Section 01026) shall be the basis for payment of contract work and will be used to establish payment for any “extra work” i.e., work requested which is beyond the scope of the original contract.

The Contractor shall, prior to mobilizing or commencing any contract work, submit and receive District approval of Proof of Insurance, Injury and Illness Prevention Program, and EN-84, Specific Operating Safety Procedure.

The Contractor shall be responsible to submit and receive District approval of the EN-29 Breakdown of Contract Price or Schedule of Values (see Section 01026, if applicable) by the 10th of the month for processing of the monthly pay estimate. Submittal and approval of the EN-29 or Schedule of Values beyond the 10th of the month will result in the pay estimate to be processed the following month.

The Contractor shall revise and update the Project Control Schedule as scheduling changes occur, and shall supply the District and his subcontractors with copies of the Project Control Schedule and its updates. District acceptance of revised Project Control Schedules shall be subject to the conditions of paragraph called Retention.

B. Contractor’s Project Control Schedule. The Contractor’s Project Schedule shall consist of a simple Critical Path Method analysis in chart form reflecting workable logic, and showing proper duration, expected methods, and mile posts, and shall conform to the work and time set forth in the contract. It shall clearly indicate all construction activities, sub-activities, and mile posts on a time-oriented basis, with the critical path fully identified. The following minimum information shall be included for each activity and critical path item:

1. Date of initial submittal, as applicable.
2. Ordering dates for long lead-time items.
3. Dates for materials on the site.
4. Start-work dates.
5. Complete-work dates.

6. Testing and clean-up dates.
7. Final contract completion date.

The schedule shall show a maximum of three critical paths, with only enough points or items to present the above information. Partial schedules will not be accepted without the approval of the District. The Contractor to submit a CD with
4 copies of each submitted schedule, using Primavera P6 (or later version) or Suretrak Project Manager.

Treatment plant, lift station and pump station charts shall be updated and resubmitted monthly; pipeline and other projects shall be updated and resubmitted monthly or as necessary to reflect changes in scheduling. All slippages and
missed mile posts shall be flagged, with a narrative attached describing proposed corrective actions.

F-26. USE OF MATERIALS FOUND ON WORK SITE

The Contractor may be permitted to use soil, stone, or other natural materials discovered on the work site upon prior written consent of the District if said materials meet the requirements of these specifications. Ownership of all such materials shall remain with the District throughout any use or installation thereof.

WORK

F-27. LINES, GRADES AND MEASUREMENTS

All lines and grades will be given by the District, and the Contractor shall provide such materials and give such assistance as may be required. The Contractor shall carefully preserve all bench marks, monuments, survey markers, and stakes, so far as possible. SHOULD ANY STAKES OR POINTS BE REMOVED OR DESTROYED UNNECESSARILY BY ANY ACT OF THE CONTRACTOR OR HIS EMPLOYEES THEY SHALL BE RESET AT THE CONTRACTOR'S EXPENSE. The Contractor shall inform the District within 48 hours in advance of the times and places at which he intends to work in order that lines and grades may be furnished, that inspection may be provided, and that necessary measurements for records and payments may be made with minimum inconvenience.

All work shall conform to lines, elevations and grades shown on the construction plans. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variations shall be reported to the District Engineer or Inspector. In the absence of such report, the contractor shall be responsible for any error in the grade of the finished work.

No direct payment shall be made for the cost to the Contractor of any of the work for delay occasioned by giving lines and grades, or making other necessary measurements, or by inspection.

F-28. PLANS AND SPECIFICATIONS

The Contractor shall keep on the work site a copy of the plans and specifications and shall at all times give the District access thereto. The Contractor shall check all dimensions and quantities on the drawings or schedules herein contained or given to him by the District, and shall notify the District of all errors therein which may be discovered. He shall not take advantage of any error or omission in these specifications or in the plans or schedules, because full instructions will be furnished by the District should such error or omission be discovered, and the Contractor shall carry out such instructions as if originally specified.

Where bore holes are shown pictorially on the plans, they are for the convenience of the Contractor, reflecting the information contained in the soils report of borings obtained and on file in the District office. The District assumes no responsibility for the accuracy of the information presented as it may affect the project at other than those specific locations, and directs the Contractor to investigate the soils conditions independently, as required for his use.

F-29. EQUIPMENT AND MATERIAL ITEMS

A. National Sanitation Foundation (NSF) Requirements. Per Title 22 Chapter 16 of the California Code of Regulations, any and all materials (pipe, valves, tanks, etc.) that come into contact with potable drinking water, either directly or indirectly, shall be certified by NSF in accordance with NSF/ANSI Standard 61 for potable water contact. Contractor shall include documentation with material submittals demonstrating conformance with NSF 61 certification as required.

B. Listed on Proposal. Equipment and material items to be furnished which are required to be listed on the Proposal, with the name of the manufacturer, shall be new items of new manufacture unless specified otherwise. Award of a contract under this proposal (bid) will not imply approval by the District of a manufacturer listed by the bidder. However, if a manufacturer is acceptable to the District, the successful bidder shall furnish the items from the manufacturer indicated. Any manufacturer listed in the contract may be substituted, changed, or omitted by the successful bidder, subject to the approval of the District, without subjecting the District to any liability for the substitution, change or omission.

The listing of any manufacturer in the contract does not, and is not intended to, grant any right, title or interest in the contract for the benefit of the named manufacturer. Each contracting bidder shall inform in writing each named manufacturer that the so named is listed for information purposes only and may be substituted, changed, or omitted by the successful bidder, subject to the approval of the District, without subjecting the District to any liability for the substitution, change or omission.

The successful bidder shall reimburse the District for any expenses incurred by the District as a result of the successful bidder's failure to so notify each named manufacturer or supplier.

C. Requests for Substitutions or Equals. References in the Contract Documents to any material, item of equipment, or type of construction by manufacturer's name, make, catalog number, or other proprietary identification shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition in those instances where "or approved equal" is specified. Bids shall be based on the products or types of construction so referred to and identified in the Contract Documents, or, in those instances allowing "approved equal", on substitute or equal items approved by the District prior to the receipt of bids. Bidders wishing to propose substitute or equal materials, equipment items, or types of construction shall, not later than the tenth day preceding the date set for receipt of bids, submit a written request fully and technically describing each proposed item and its intended use, and setting forth all variations in costs pertaining to the application. Manufacturers may use the same procedure. Bidders will be notified of approved substitute or equal items by Addendum only.

After receipt of bids, if the Contractor wishes to propose a substitute or equal item for any specified use by brand or trade name, he shall, as soon as this intent is known, furnish his written request and all required data to substantiate the proposed substitution or equal, and setting forth all variations in costs pertaining to the application. If, in the opinion of the District, there is sufficient time to review the submitted data, it will decide if the item is in fact equal in quality and utility to the specified item. No proposed substitute or equal shall be ordered or installed without the written approval of the District, and it shall be understood and agreed that the decision of the District in this matter shall be final and binding.

D. Submittals

1. General. Unless otherwise specified or directed by the District, the Contractor shall submit to the District for its review and approval all shop drawings, samples, materials lists, equipment data, instructions manuals, record documents, manufacturers' equipment manuals, and other submittals required by the Contract Documents. Submittals and their contents shall be properly prepared, identified, and transmitted as provided herein. Except for record documents and instructional manuals for operation and maintenance, submittals shall be reviewed and accepted before the material or equipment covered by the submittal is delivered to the site.

   The Project Control Schedule required under section titled Construction Schedule and Periodic Estimates shall be coordinated to this requirement.

2. Method of Submittal. The Contractor shall deliver submittals by means of dated and signed “Contractor’s Submittal Transmittal Form” (EN-50) identifying as to initial or resubmittal status, and fully describing the submittal contents. Submittals are not acceptable directly from subcontractors, suppliers or manufacturers. Submittals shall be numbered as prescribed by the District at the preconstruction conference. In each transmittal the Contractor shall state the Drawing Numbers and Specification Sections, Articles, and paragraphs to which the submittal pertains. Accompanying
   data sheets, catalogs, and brochures shall be identified in the same manner. Where several types or models are included the Contractor shall delete non-applicable portions or specifically indicate which portions are intended and applicable.

   Each submittal shall include 4 sets of black-line printed copies and 4 CDs in the latest version of Adobe Acrobat, consolidated to one portable document file (PDF) format, searchable from Table of Contents and Bookmarks. No copies shall be returned to the contractor, only the EN-14 Shop Drawing Transmittal form noting review comments and submittal status.

3. Deviations. The Contractor shall verify on the “Contractor’s Submittal Transmittal Form” (EN-50) either that the submittal meets all the requirements specified, or that the submittal deviates from the requirements specified. The deviation shall be clearly indicated or described including all other changes required to correlate the Work. The Contractor shall state in writing all variation in costs. The Contractor shall be liable for any such deviation not so submitted, and for any deviation not approved by the District in writing.

4. Schedule of Submittals. The Project Control Schedule required under section titled Construction Schedule and Periodic Estimates shall allow not less than fifteen (15) working days for the review of submittals, not including the time necessary for delivery or mailing, and shall cause no delay in the Work or the work of any other contractor. Extension of the Contract Time will not be granted because of the Contractor's failure to make timely and correctly prepared and presented submittals with allowance for the checking and review periods.

   The Contractor shall include the submittal process in the Project Control Schedule.

5. Contractor's Review and Approval. Every submittal of shop drawings, samples, materials lists, equipment data, instruction manuals and other submittals upon which the proper execution of the Work is dependent shall bear the Contractor's review and approval stamp meaning that the Contractor:

   a) has reviewed, checked and approved the submittal and has coordinated the contents with requirements of the Work and the Contract Documents including related work;

   b) has determined and verified all quantities, field measurements, field construction criteria, materials, equipment catalog numbers, and similar data;

   c) has verified the Work covered by the submittal and guarantees that the intent of the contract documents will fully apply thereto. The Contractor's stamp shall be dated and signed by the Contractor in every case.

6. Incomplete Submittals. Incomplete submittals, including those not correctly transmitted, not correctly titled and identified, or not bearing the Contractor's review and approval stamp, may be returned to the Contractor without review.

7. Corrections and Resubmittals. The Contractor shall make all required corrections and shall resubmit 4 copies and 4 CDs in the latest version of Adobe Acrobat, consolidated to one portable document file (PDF) format, searchable from Table of Contents and Bookmarks of each submittal until found in conformance with design concept of the project and in general compliance with the plans and specifications. The Contractor shall direct specific attention in writing to revisions other than corrections called for on previous submittals, and shall state in writing all variations in costs and his assumption of the cost of related changes the same as is required for in subsection titled Method of Transmittal.

   Costs incurred by the District as a result of additional reviews of a particular submittal after the second time it has been reviewed shall be borne by the Contractor. Reimbursement to the District will be made by deducting such costs from the Contractor's subsequent partial payments. This reimbursement will be calculated based on a flat work rate of $120/hour.

8. Check of Reviewed Comments. The Contractor shall check and review the EN-14 Shop Drawing Transmittal form for correction and ascertain if the corrections result in extra cost to him above that included under the Contract Documents and shall give written notice to the District within five days if, in his opinion, such extra costs result from corrections. By failing to so notify the District or by starting any Work covered by a submittal, the Contractor waives all claims for extra costs resulting from required corrections.

9. Review and Acceptance. Submittals will be reviewed only for conformance with the design concept of the Project and with the information given in the Contract Documents. Shop drawings and submittals shall be provided, at the Contractor's expense, when required by the plans or specification, or requested by the District.

   Materials shall not be furnished or fabricated, nor any work done for which shop drawings or submittals are required, before those shop drawings or submittals have been reviewed. Neither review nor approval of shop drawings or submittals by the District shall relieve the Contractor from the responsibility for errors, omissions, or deviations from the Contract Documents, unless such deviations were specifically called to the attention of the District in the letter of transmittal. The Contractor shall be responsible for the correctness of the submittals and shop drawings, including shop fits, field connections, and results obtained by use of such drawings.

10. Conformance. Work shall conform to the accepted submittals and all other requirements of the Contract Documents unless subsequently revised by an appropriate modification, in which case the Contractor shall prepare and submit revised submittals as may be required.

    The Contractor shall not proceed with any related Work which may be affected by the Work covered under submittals until the applicable submittals have been submitted and reviewed, particularly where piping, machinery, and equipment and the required arrangements and clearances are involved.

11. Interrelated Submittals. Except where the preparation of a submittal is dependent upon the acceptance of a prior submittal, all submittals pertaining to the same class or portion of the Work shall be submitted simultaneously.

12. Shop Drawings

    a) Complete Data. Shop drawings shall contain details and information fully outlining the pertinent Contract Document requirements and such other information as may be specified or required for review. Each submittal shall be complete with respect to dimensions, design criteria, materials, connections, bases, foundations, anchors, and the like, and shall be accompanied by technical and performance data as necessary to fully illustrate the information in the shop drawings. Unless the required data are included in instruction manuals or equipment data submitted prior to or with the shop drawings, the Contractor shall submit with the shop drawings complete catalog and technical data for all manufactured products, materials, machinery, and equipment covered by the shop drawing submittal. The following information shall be included:

    (i) Manufacturer's specifications and details.

    (ii) Applicable technical data and performance curves.

    (iii) Preparation, assembly, and installation instructions with allowable tolerances.

    (iv) Connection requirements.

    (v) Pre-startup servicing and operating methods.

(vi) Other data and information necessary to demonstrate that the proposed items conform to the Contract Documents.

b) Title Block and Identification. On each shop drawing submittal, the Contractor shall provide a space for the District's representative's acceptance or correction stamp and a title block showing:

(i) Name and address of the Work. (ii)

Name and address of Contractor.

(iii) Name and address of subcontractor, manufacturer, supplier, or distributor, as applicable.

(iv) Name and address of District.

(v) Date, scale of drawings, and identification number.

(vi) Contractor's review and approval stamp.

13. Samples.

a) General. When specified or otherwise required for clarity, each submittal shall include two sets of samples. One set of accepted samples and all unaccepted samples will be returned to the Contractor. Samples of value retained by the District will be returned to the Contractor after completion of the Work if the Contractor's first transmittal for the sample requests its return.

b) Paints and Coatings. Submit samples of field-applied paint and coating finishes, colors, and covering at least 60 days prior to start of such finishing operations.

14. Materials Furnished Under Approved Materials List. The Contractor may provide materials listed on EMWD’s Approved Materials List by listing the materials by description, manufacturer and model number. The description must be the same as listed in the Approved Materials List included in the appendix section of the Specifications and must include paragraph number and page number on which the item appears on the List.

The Contractor would not be required to make a formal submittal on any material listed in this manner with the exception of pipe. The District requires a formal submittal on pipe whether or not it is on EMWD’s Approved Materials List.

15. Operations and Maintenance.

a) General. The Contractor shall obtain data from the various manufacturers and submit three (3) copies in the form of instruction and mechanical systems manuals covering all mechanical equipment and machinery installed in the Work. These submittals will be reviewed by the District and revised and resubmitted as deemed necessary.

b) Contents. Each manual shall have an index listing the contents. Information in the manuals shall include but not be limited to:

(i) general, introduction and overall equipment description, purpose, functions, and simplified theory of system operation; specifications;

(ii) installation instructions, procedures, sequences, and precautions including tolerances for level, horizontal, and vertical alignment;

(iii) grouting requirement including grout spaces and materials;

(iv) list showing lubricants for each item of mechanical equipment, approximate quantities needed per year, and recommended lubrication intervals; where possible, types of lubricants shall be consolidated with equipment manufacturers' approval to minimize the number of different lubricants required for plant maintenance;

(v) startup and beginning operation procedures;

(vi) operational procedures;

(vii) shut down procedures;

(viii) short and long term inactivation procedures;

(ix) maintenance, calibration, and repair instruction;

(x) parts lists and spare parts recommendations;

(xi) lists of all special tools, instruments, accessories, and special lifting and handling devices required for periodic maintenance, repair, adjustment, and calibration;

(xii) MSDS for each item as appropriate; and

(xiii) other information as may be specified or required for approval.

c) Format and Organization

(i) Use drawings and pictorials to illustrate the printed text as necessary to fully present the information.

(ii) Where information covers a family of similar items of equipment, identify the applicable portions by heavy weighted arrows, boxes or circles, or strike-out the inapplicable information. Nonconforming data are not acceptable and will be returned for rework and resubmittal.

(iii) Contractor shall incorporate into books all Manufacturers' Equipment Manuals including those specified in pertinent Sections of the Specifications. These books shall be organized by Equipment Class in same manner and sequence as the Specifications, i.e., Mechanical, Electrical, Instrumentation, etc.

(iv) Within each book or manual, provide a Table of Content

d) Manual Binding. Bind all books in sturdy hard covers fastened to provide full view of contents on each page, and ease of making content additions or replacements. No book shall be more than four inches thick.

Permanently label face of cover and bound edge of each book "MANUFACTURERS' INSTRUCTION MANUAL," and indicate Class of Equipment, i.e., Mechanical, Electrical, Instrumentation, etc., or name specific equipment unit, number books consecutively BOOK I, BOOK II, etc. If more than one Class of Equipment is contained in a book, separate each class with a tabbed stiff divider insert page.

e) Manual Submittals shall include three copies of each manual, one of which will be returned to the Contractor marked to show the required corrections or acceptance. When accepted, the Contractor shall deliver six copies to the District unless otherwise specified.

16. Revision of Submittals. Whenever an equipment modification occurs the Contractor shall submit information and data corresponding to the changed requirements for acceptance. After completion of any required operational tests the Contractor shall submit revised or additional information and data for the instruction manuals and equipment data as the District may require. Revisions shall be processed following the procedures required for previously accepted submittals.

The Contractor shall be responsible for any material furnished him and for the care of all work until its completion and final acceptance, and he shall at his own expense replace damaged or lost material and repair damaged parts of the work, or the same may be done at his expense by the District. He shall remove from the vicinity of the completed work all plant, buildings, rubbish, unused material, concrete forms, etc., belonging to him or used under his direction during construction, and in the event of his failure to do so the same may be removed by the District at the expense of the Contractor.

Unless otherwise provided in the Special Conditions, the District will not accept ownership of surplus material, and the Contractor shall dispose of surplus material from the work, in accordance with the requirements of this specification.

F-31. MATERIALS, WORKMANSHIP AND TESTS

All work shall be done and completed in conformance with these plans and specifications.

A. Contractor to Furnish. The Contractor shall submit samples, specimens, or test pieces of such materials to be furnished or used in the work as the District may require. All materials must be of the specified quality and equal to approve sample, if samples have been submitted.

The Contractor shall furnish without cost to the District such quantities of concrete, concrete aggregates, and other construction materials as may be required for test purposes, and shall place at the District's disposal all available facilities for and cooperate in the sampling and testing of all materials and workmanship. A temporary concrete test cylinder curing cabinet conforming to ASTM C31 shall be furnished and located as directed by the District. EN-29 Breakdown of Contract Price or Schedule of

Values (from section 01026), whichever is required, shall be submitted and approved by the District prior to the tenth (10th) of the month for a monthly pay estimate to be processed.

B. Overloading. No part of the Work on new and existing structures, scaffolding, shoring, sheeting, construction machinery and equipment, or other permanent and temporary facilities shall be loaded with weights or subjected to stresses or pressures that result in an overloading condition. The Contractor shall bear the cost of correcting damage caused by overloading or excessive stresses or pressures.

C. Use of Explosives. The Contractor shall comply with all laws, ordinances, regulations, codes, and orders governing the transportation, storage and use of explosives. The Contractor shall exercise extreme care not to endanger life or property, and shall be responsible for all injury or damage resulting from the use of explosives for or on the Work.

No blasting shall be done in the vicinity of existing structures above or below the ground without prior written consent of the owner thereof and the District. This consent shall not relieve the Contractor of his responsibility for injury or damage resulting from the use of explosives for or on the Work.

D. Verification of Installed Work. The Contractor shall correct all defects in installed Work of the Contract before subsequent related or connected Work is applied or installed. Where the Contract Documents require a material or item of equipment to be applied or installed under the supervision, inspection, or direction of the supplier or manufacturer, or his representative, the supplier, manufacturer, or his representative shall inspect the applicable installed Work and issue a letter to the District stating the corrections required to or approval of the installed Work.

E. Manufacturers' Instructions. Unless otherwise provided in the Contract Documents, the Contractor shall apply, install, erect, connect, use, clean, condition, and operate manufactured articles, materials, and equipment in accordance with the various manufacturers' instructions including those in the instruction manuals. The Contractor shall compare the requirements of the various manufacturers' instructions with the requirements of the Contract Documents, shall promptly notify the District in writing of any difference between such requirements, and shall not proceed with any of the Work affected by such differences until an interpretation or clarification is issued. The Contractor shall bear all costs for any error in the Work resulting from his failure to so compare the various requirements and notify the District of any such differences.

F. Field Office for Use by District. If called for in the Special Conditions, Contractor shall furnish and maintain a field office of minimum 200 sq. ft. floor area, located as directed, and furnish and pay for utilities and services for the office. In addition to any requirements set forth in the Special Conditions, the office shall contain the following. The office shall be of finished weather-tight insulated construction and have at least 3 screened windows, lockable doors, resilient tile flooring, uniform lighting, grounded duplex convenience receptacles, heating, and an air conditioner. The office shall be equipped with not less than one standard office desk, one desk chair, three office chairs, one 6-slot vertical plan rack, one 36 in. by 72 in. reference table, one full height nominal 9 sq. ft. closet with six adjustable shelves and lockable door, and one 4-drawer legal size lockable metal file cabinet. A telephone shall be furnished with outside telephone bell. Bottled drinking water and adequate sanitary facilities shall be furnished and maintained. All foregoing facilities and equipment shall be installed and connected before work on site is started, at the sole cost and expense of the Contractor.

G. Mechanical Equipment and Testing. After all equipment is installed and all facilities are ready to operate, all equipment shall be tested for a period not to exceed seven (7) days by operating either under actual or simulated operating conditions before final acceptance is given. All defects of material or workmanship which appear during this test period shall be corrected by the Contractor. After such corrections are made, the 7-day test may be run again before final acceptance, required by the District.