A laminating adhesive that can produce a resilient oil and water-resistant bond shall be used to adhere the extruded aluminum frame and the honeycomb core to the sheet aluminum. Edge and interior delamination occur when a 0.010-inch thick feeler gauge of 1/2 inch in length can be inserted into a depth of more than 1/2 inch between the extruded aluminum frame and the sheet aluminum. Laminated panel sign with delamination will be rejected.

Laminated panels shall be able to resist a wind load of 33 pounds per square foot for the following simple span lengths with a bending safety factor of 1.25:

Panel Type	Nominal Panel Thickness	Simple Span Length
A	one inch	9 feet 0 inch
B	one inch	9 feet 0 inch
	2-1/2 inch	14 feet 6 inches
H	2-1/2 inch	14 feet 6 inches

The tensile strength of laminated panels shall be at least 20 pounds per square inch when tested in accordance with the following modification and with ASTM Designations: C 297 and C 481, Cycle B after aging. Instead of spraying with hot water, the specimen shall be totally immersed in 158° F hot water. When requested by the Engineer or the Transportation Laboratory, at least one test sample of 12" x 12" in size shall be taken for every 2,000 square feet of the panel production cycle or of the total factory production order, whichever occurs first.

Rivets used to secure the sheet aluminum to the perimeter frame shall be fabricated from aluminum alloy 5052 and anodized or treated with a conversion coating to prevent corrosion. Size of the aluminum rivets shall be 3/16 inch in diameter and placed at the corners of the laminated panels. Color of the exposed portion of the rivets shall be the same color as the sign background or legend on which the rivets are placed. Rivets or stainless steel screws shall be placed in holes drilled during fabrication in the perimeter frame.

On laminated multiple panel signs, a closure H-Section shall be placed in the top channel of the bottom panel. Perimeter frame of adjoining panel shall accommodate the closure H-Section in the closed position.

For signs with a depth of 5 feet 0 inch or less, the laminated panels shall be fabricated with no horizontal joints,.splices or seams. For signs with a depth of greater than 5 feet 0 inch, the laminated panels may be fabricated in two panels.

The face of laminated panels shall be flat with a tolerance of ±3/32 inch per linear foot when measured across the plane of each panel in all directions. Where laminated panels adjoin, the gap between adjoining edges from one corner to the other corner shall not deviate by more than 1/32 inch. Non-adjoining edges from one corner to the other corner shall not deviate by more than 1/8 inch from a straight plane. The front and back sheet aluminum shall be flush with the perimeter frame. The panel edges shall be smooth.

Laminated panel signs shall be within +1/8 inch or -1/2 inch of the detailed dimensions. The difference in length between adjoining panels of multiple panel signs shall not be greater than 1/2 inch.

Roadside laminated panel signs shall be Type B or Type H. Type B panels shall have a nominal thickness of one inch or 2-1/2 inches. Type H panels shall have a nominal thickness of 2-1/2 inches.

The perimeter frame of Type B panels shall consist of extruded channel edges. The interior and exterior sides of the channels, except the sides touching the face and back sheet aluminum, shall be welded at the joint. Sealant shall be placed at the corners of the perimeter frame to prevent moisture penetration.

Each side of the vertical tube spacers of Type B panels shall be welded to the perimeter frame, except the sides touching the front and back sheet aluminum.

The perimeter frame of Type H panels shall consist of extruded channel edges on the vertical sides and consist of extruded tube channel edges on the horizontal sides. The perimeter frame shall be connected by self-tapping hex head stainless steel screws. Sealant shall be placed at the corners of the perimeter frame to prevent moisture penetration.

For Type H panels with a length of 17 feet or longer, centerline panel tube shall be placed along the horizontal centerline of the panel. The ends of the centerline panel tube shall be firmly affixed to the perimeter frame.

Each side of the vertical tube spacers of Type H panels shall be welded to the perimeter frame and the centerline panel tube, except the sides touching the front and back sheet aluminum.

The Contractor shall furnish mounting hardware for roadside laminated panel signs, such as closure H-sections, lags, bolts, nuts, and washers.

Overhead laminated panel signs shall be Type A and have a nominal thickness of one inch.

For overhead laminated signs with a length of 24 feet or less, the laminated panels shall be fabricated with no vertical joints, splices or seams. For signs with a length of greater than 24 feet, the length of each adjoining panel shall be as determined by the Engineer or as shown on the plans.

The perimeter frame of Type A overhead laminated panels shall be connected by self-tapping hex head stainless steel screws. Sealant shall be placed at the corners of the perimeter frame to prevent moisture penetration. The perimeter frame of Type A panels shall consist of extruded channel edges on the vertical sides and consist of modified "H" section extrusion on the horizontal sides. The modified "H" section extrusion acts as an integral retainer track for affixing the bolts to provide blind fastening of panels to the structure support.

The Contractor shall furnish mounting hardware for overhead laminated panel signs, such as closure H-sections, clamps, bolts, nuts, and washers. The clamps shall be cast aluminum alloy with a minimum tensile strength of 25 kips per square inch. Bolt torque used for installing clamps shall not exceed 100 inch-pounds.

MEASUREMENT AND PAYMENT

Furnishing signs (except for construction area signs) will be measured by the square foot and the quantity to be paid for will be the total area, in square feet, of the sign panel types installed in place.

The contract price paid per square foot for Furnish Sign of the types specified in the Engineer's estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in fabricating and furnishing the signs, including removable sign panel frame and fastening hardware, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for furnishing and installing protective overlay on signs shall be considered as included in the contract price paid per square foot for Furnish Sign of the various types and no separate payment will be made therefor.

10-1.85 ALTERNATIVE PIPE CULVERT:

Alternative pipe culverts must comply with Section 62, "Alternative Culverts," of the Standard Specifications.

The contract unit bid prices paid per linear foot for Alternative Pipe Culvert of the types specified in the Engineer's estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved including structures excavation and backfilling as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.86 PLASTIC PIPE:

Plastic pipe shall conform to the provisions in Section 64, "Plastic Pipe," of the Standard Specifications.

10-1.87 REINFORCED CONCRETE PIPE:

Reinforced concrete pipe shall conform to the provisions in Section 65, "Reinforced Concrete Pipe," of the Standard Specifications and these special provisions.

GENERAL

Where embankment will not be placed over the top of the pipe, a relative compaction of not less than 85 percent shall be required below the pipe spring line for pipe installed using Method 1 backfill in trench, as shown on Standard Plan A62D. Where the pipe is to be placed under the traveled way, a relative compaction of not less than 90 percent shall be

required unless the minimum distance between the top of the pipe and the pavement surface is the greater of 4 feet or one half of the outside diameter of the pipe.

Except as otherwise designated by classification on the plans or in the specifications, joints for culvert and drainage pipes shall conform to the plans or specifications for standard joints.

MATERIALS

The concrete for reinforced concrete pipe shall contain not less than 470 pounds of cementitious material per cubic yard and have a water–cementitious material ratio that does not exceed 0.40 by weight. Supplementary cementitious material is optional. Reinforcement shall have a minimum cover of 1 inch.

MEASUREMENT AND PAYMENT

The County does not pay any additional cost for use of optional supplementary cementitious material.

The County does not pay any additional cost for excess concrete cover over steel reinforcement.

10-1.88 CORRUGATED METAL PIPE:

Corrugated steel culverts shall conform to the provisions in Section 66, "Corrugated Metal Pipe," of the Standard Specifications and these special provisions.

Asphaltic mastic coating or polymeric sheet coating substituted for bituminous coating shall be placed on the outside and inside surfaces of the pipe.

Corrugated steel pipe shall be fabricated from zinc-coated steel sheet.

10-1.89 OVERSIDE DRAIN:

Steel entrance tapers, slip joints, metal pipe downdrain anchor assemblies, and steel flume and pipe downdrains shall conform to the provisions in Section 69, "Overside Drains," of the Standard Specifications and these special provisions.

Steel entrance tapers and pipe downdrains shall be fabricated from zinc-coated steel sheet.

10-1.90 DRAINAGE INLET MARKER:

GENERAL

Summary

This work includes installing drainage inlet markers.

Use only the type of drainage inlet marker shown on the project plans. If the project plans do not show a specific type, choose one type from the following list:

A. Thermoplastic
B. Metal medallion
C. Plastic medallion
D. Stamped concrete

Submittals

If you are using a prefabricated drainage inlet marker such as thermoplastic, metal medallion, or plastic medallion, submit a sample of marker at least 5 business days before installation.

If you are using a concrete stamp for the drainage inlet marker, submit a sample of the stamp at least 5 business days before concrete activities start.

Submit a Certificate of Compliance as specified in Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for prefabricated drainage inlet marker.

MATERIALS

Thermoplastic drainage inlet marker must:

A. Be free of lead and chromium
B. Comply with the following:

Property	Specifications	Requirements
Thickness, inches	Measured	0.080-0.160
Legend color (non-reflective)	Observed	Blue or Green
Background color (non-reflective)	AASHTO M 249	White
Skid Resistance	ASTM E 303	60 BPN

Metal drainage inlet marker must:

A. Be commercial grade stainless steel, aluminum, brass, or bronze
B. Be stamped from sheet metal or cast
C. Comply with the following:

Property	Specifications	Requirements
Thickness of metal, inches	Measured	0.055-0.138
Height of marker, inches	Measured	0.055-0.138
Skid Resistance	ASTM E 303	60 BPN

D. If metal marker is colored, it must comply with the following:

Property	Specifications	Requirements
Legend color (non-reflective)	Observed	Blue or Green
Background color (non-reflective)	Observed	White or bare metal

Plastic drainage inlet marker must:

A. Contain ultraviolet inhibitors
B. Comply with the following:

Property	Specifications	Requirements
Thickness, inches	Measured	0.025-0.060
Thickness (with dome), inches	Measured	0.055-0.120
Legend color (non-reflective)	Observed	Blue or Green
Background color (non-reflective)	Observed	White
Weathering Resistance	ASTM D1435	1 year without yellowing, fogging, or pitting

CONSTRUCTION

Install prefabricated drainage inlet markers by:

A. Mechanically cleaning and preparing the surface
B. Attaching the prefabricated drainage inlet markers to the surface with adhesives, fasteners, or heat as recommended by the manufacturer

Install stamped concrete drainage inlet markers by:

A. Imprinting uncured concrete with an approved drainage inlet marker concrete stamp
B. Producing stamped concrete surfaces that are free from blemishes

MEASUREMENT AND PAYMENT

Drainage Inlet Marker is measured as units determined from actual count in place.

The contract price paid per each for Drainage Inlet Marker includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing Drainage Inlet Markers, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.91 WELDED STEEL PIPE CASING (BRIDGE):

Welded steel pipe casings under approach slabs shall be of the size shown and shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications and these special provisions.

Casings shall be installed at each abutment, and casings shall be extended to the length shown on the plans.

WORKING DRAWINGS

Working drawings for temporary support of casing pipe at the abutments shall be submitted for approval in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings" of the Standard Specifications.

MATERIALS

Casing pipe

Casing pipe shall be welded steel pipe conforming to the provisions in Section 70-1.02B, "Welded Steel Pipe," of the Standard Specifications, except that the pipe shall be treated in accordance with the following requirements, prior to shipping. Exterior surfaces of welded steel pipe shall be cleaned and coated in conformance with the requirements in ANSI/AWWA C213 or at the option of the Contractor, cleaned, primed, and coated in accordance with specifications of ANSI/AWWA C214.

Pipe wrapping tape

Wrapping tapes for pipe in contact with the ground shall be a pressure sensitive polyvinyl chloride or polyethylene tape having thickness of 50 mils, minimum.

CONSTRUCTION

If a blockout is provided in the bridge abutment wall for casing pipe, the space between the casing pipe and bridge abutment wall shall be filled with mortar conforming to the provisions in Section 51-1.135,"Mortar" of the Standard Specifications.

Wrapping and coating pipe

Damaged coating on steel pipe casing in contact with earth shall be wrapped as follows:

A. Pipe to be wrapped shall be thoroughly cleaned and primed as recommended by the tape manufacturer.
B. Tapes shall be tightly applied with 1/2 uniform lap, free from wrinkles and voids to provide not less than a 100—mil thickness.
C. Field joints and fittings for wrapped pipe shall be covered by double wrapping 50—mil thick tape. Wrapping at joints shall extend a minimum of 6 inches over adjacent pipe

coverings. Width of tape for wrapping fittings shall not exceed 2 inches. Adequate tension shall be applied so tape will conform closely to contours of joint.

Where a welded steel pipe casing passes through the abutment wall, the welded steel pipe casing shall be additionally wrapped with 2 layers of 15—pound asphalt-felt building paper, securely taped or wired in place.

MEASUREMENT AND PAYMENT

Measurement and payment for Welded Steel Pipe Casing (Bridge) for each size listed in the Engineers Estimate shall conform to the provisions in Sections 70-1.04,"Measurement" and 70-1.05,"Payment" of the Standard Specifications.

Full compensation for furnishing and installing , mortar and building paper, and casing shall be considered as included in the contract prices paid per linear foot for the sizes of Welded Steel Pipe Casing (Bridge) involved, and no additional compensation will be allowed therefor.

10-1.92 SLOPE PROTECTION:

Slope protection shall be placed or constructed in conformance with the provisions in Section 72, "Slope Protection," of the Standard Specifications.

Rock slope protection fabric must be Class 8 .

10-1.93 SLOPE PAVING:

Slopes under the ends of bridges, where shown on the plans, shall be paved in conformance with the provisions in Section 72-6, "Slope Paving," of the Standard Specifications and these special provisions.

The location of construction joints shall be subject to the approval of the Engineer.

Placement of slope paving shall be scheduled so that the work, including placement, finishing, and application of curing, is completed in any section bounded by permissible construction joints on the same day that the work is started in that section.

Prior to placing the permanent slope paving, the Contractor shall construct a test panel at least 4' x 6' at the site for approval by the Engineer. The test panel shall be constructed of the same materials as are proposed for the permanent work and shall be finished and cured as specified for the permanent work. Additional test panels shall be constructed as necessary until a panel is produced which conforms to the requirements herein, before constructing other slope paving.

The color and texture of the finished slope paving shall match the existing slope paving.

10-1.94 MISCELLANEOUS CONCRETE CONSTRUCTION:

Minor Concrete (Curb and Gutter), Minor Concrete (Curb), Minor Concrete (Sidewalk), Minor Concrete (Curb Ramp), Minor Concrete (Gutter Depression) and Minor Concrete (Gutter) shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," of the Standard Specifications and these special provisions.

Curb ramp detectable warning surface shall consist of raised truncated domes constructed or installed on curb ramps in conformance with the details shown on the plans and these special provisions. At the option of the Contractor, the detectable warning surface shall be prefabricated, cast-in-place, or stamped into the surface of the curb ramp. The color of the detectable warning surface shall be yellow conforming to Federal Standard 595B, Color No. 33538.

Prefabricated detectable warning surface shall be in conformance with the requirements established by the Department of General Services, Division of State Architect and be attached in conformance with the manufacturer's recommendations.

Cast-in-place and stamped detectable warning surfaces shall be painted in conformance with the provisions in Section 59-6, "Painting Concrete," of the Standard Specifications.

The finished surfaces of the detectable warning surface shall be free from blemishes.

Prior to constructing the cast-in-place or stamping the detectable warning surface, the Contractor shall demonstrate the ability to produce a detectable warning surface conforming to the details shown on the plans and these special provisions by constructing a 24" x 24" test panel.

The manufacturer shall provide a written 5-year warranty for prefabricated detectable warning surfaces, guaranteeing replacement when there is defect in the dome shape, color fastness, sound-on-cane acoustic quality, resilience, or attachment. The warranty period shall begin upon acceptance of the contract.

Full compensation for constructing or furnishing and installing curb ramp detectable warning surfaces shall be considered as included in the contract price paid per cubic yard for minor concrete (curb ramp) and no separate payment will be made therefor.

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. Quantities of minor concrete shown in the Engineer's Estimate, in curbs, gutter, sidewalks, gutter depressions and curb ramps will be paid for at the contract price per cubic yard for minor concrete (curb & gutter, as an individual item or combinations thereof) will be paid for at the contract price per linear foot for minor concrete.

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. The above prices and payments shall include full compensation for furnishing all labor, materials (including adhesive, or reinforcing steel and dowels for anchoring curbs to existing pavement), tools, equipment, and incidentals, and for doing all the work involved in constructing curbs, curb & gutter, sidewalks, gutter depressions and curb ramps, complete in

place, including subgrade preparation, as shown on the plans, and as specified in these specifications and the special provisions, and as directed by the Engineer.

Aggregate for minor concrete (textured paving) shall conform to the grading specified for fine aggregate in Section 90-3.03, "Fine Aggregate Grading," of the Standard Specifications. Aggregate for grout shall conform to the following grading:

Sieve Sizes	Percentage Passing
No. 4	100
No. 8	90 - 100
No. 16	60 - 100
No. 30	35 - 70
No. 50	15 - 35
No. 100	2 - 15

Samples of the colors specified for textured paving are available for review by prospective bidders at the office of the Department of Transportation District 8. Portland cement concrete closely conforming to the colors specified for textured paving are available through commercial concrete sources.

A sample of sufficient size, of each type and color of the textured paving, to demonstrate the textured paving, including color hardener, curing and finishing compounds, for both grouted and ungrouted finishes, shall be submitted to the Engineer for written approval.

Textured paving shall not be placed on the project prior to approval by the Engineer of the samples prepared and submitted by the Contractor. In the event more than one sample of each type and color of textured paving to be placed is required by the Engineer, each additional sample will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

Welded wire fabric, of the size and type shown on the plans and conforming to the provisions in Section 52, "Reinforcement," of the Standard Specifications, shall be placed in the textured paving areas as shown on the plans.

Aggregate base shall be Class 2 and shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications.

The respective pattern types and colors of concrete for textured paving shall be placed at the locations shown on the plans, struck off and compacted until a layer of mortar is brought to the surface. The concrete shall be screeded to the required grade and cross section and floated to a uniform surface.

Floor color hardener shall be applied to the plastic surface of the concrete by the "dry-shake" method using a minimum of 60 pounds of hardener per 100 square feet. Hardener shall be applied in 2 applications, shall be wood-floated after each application, and shall be trowelled only after the final floating. The resultant color of the floor hardener shall closely conform to the colors specified on the plans for the respective areas.

The forming tools for the textured paving shall be applied to form the patterned surfaces while the concrete is still in the plastic stage of set.

Textured paving areas shall be cured by the curing compound method. The curing compound shall be curing compound (6) conforming to the provisions in Section 90-7.01B, "Curing Compound Method," of the Standard Specifications.

The textured paving shall be grouted in the sidewalk areas shown on the plans. The grout shall be placed after initial curing of that portion of the textured paving. The grout shall be spread over the textured concrete surface and consolidated by methods recommended by the grout manufacturer and approved by the Engineer. Surplus grout shall be removed by a squeegee and damp burlap rag or by other approved methods before the curing seal is applied to the grouted areas.

Curing seal and other deleterious substances shall be removed from the impressions in the textured areas, to receive the grout, before the grout is placed. Cleaning and removal methods shall not stain or discolor those portions of the textured paving to remain exposed after grouting. Methods of cleaning the impressions in textured areas to be grouted shall be approved by the Engineer.

The textured pattern and grout of the textured paving in sidewalk areas shall continue through the curb ramps, except for the grooved areas and the detectable warning surface area, if any, of the curb ramps.
For payment purposes, the area in square feet of minor concrete (textured paving) will be determined from horizontal measurements of the finished textured paving.

The contract price paid per square foot for minor concrete (textured paving) shall include full compensation for furnishing all labor, materials (including welded wire fabric, where required, and aggregate base), tools, equipment, and incidentals, and for doing all the work involved in constructing textured paving, including grouted areas, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.95 MISCELLANEOUS IRON AND STEEL:

Miscellaneous iron and steel shall conform to the provisions in Section 75, "Miscellaneous Metal," of the Standard Specifications .

10-1.96 MISCELLANEOUS METAL (BRIDGE):

Miscellaneous metal (bridge) shall conform to the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

Attention is directed to "Welding" of these special provisions.

Miscellaneous metal (bridge) shall consist of the miscellaneous bridge metal items listed in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications.

10-1.97 BRIDGE DECK DRAINAGE SYSTEM:

Bridge deck drainage systems shall conform to the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

Self-tapping screws used for sleeve connections shall be hex-head stainless steel, installed in holes drilled to fit the self-tapping screws, conforming to the requirements of ASTM Designation:

A 276, Type 304.

Bridge Deck Drainage Systems will be measured and paid for by the pound in the same manner specified for miscellaneous metal (bridge) in Section 75-1.06, "Measurement," and Section 75-1.07, "Payment," of the Standard Specifications.

Full compensation for drainage pipe supports and inlet grate shall be considered as included in the contract price paid per pound for Bridge Deck Drainage System, and no additional compensation will be allowed therefore.

10-1.98 MARKERS AND DELINEATORS:

Markers and delineators shall conform to the provisions in Section 82, "Markers and Delineators," of the Standard Specifications and these special provisions.

Markers and delineators on flexible posts shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions. Flexible posts shall be made from a flexible white plastic which shall be resistant to impact, ultraviolet light, ozone, and hydrocarbons. Flexible posts shall resist stiffening with age and shall be free of burns, discoloration, contamination, and other objectionable marks or defects which affect appearance or serviceability.

Retroreflective sheeting for metal and flexible target plates shall be the retroreflective sheeting designated for channelizers, markers, and delineators conforming to the requirements in ASTM Designation: D 4956-95 and in conformance with the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

10-1.99 METAL BEAM GUARD RAILING:

Metal beam guard railing shall be constructed in conformance with the provisions in Section 83-1, "Railings," of the Standard Specifications and these special provisions.

Attention is directed to "Order of Work" of these special provisions.

Line posts shall be wood, steel, or plastic. Blocks shall be wood or plastic.

Metal beam guard railing elements and required backup plates, terminal sections, end caps, and return caps shall conform to the requirements of Type 2 W-Beam as shown in AASHTO Designation: M 180.

ALTERNATIVE IN-LINE TERMINAL SYSTEM

Alternative in-line terminal system shall be furnished and installed as shown on the plans and in conformance with these special provisions.

The allowable alternatives for an in-line terminal system shall consist of one of the following or a Department approved equal.

A. TERMINAL SYSTEM (TYPE SKT) - Terminal system (Type SKT) shall be a SKT 350 Sequential Kinking Terminal manufactured by Road Systems, Inc., located in Big Spring, Texas, and shall include items detailed for terminal system (Type SKT) shown on the plans. The SKT 350 Sequential Kinking Terminal can be obtained from the distributor, Universal Industrial Sales, P.O. Box 699, Pleasant Grove, UT 84062, telephone (801) 785-0505 or from the distributor, Gregory Highway Products, 4100 13th Street, S.W., Canton, OH 44708, telephone (330) 477-4800.

B. TERMINAL SYSTEM (TYPE ET) - Terminal system (Type ET) shall be an ET-2000 PLUS (4-tube system) extruder terminal as manufactured by Trinity Industries, Inc., and shall include items detailed for terminal system (Type ET) shown on the plans. The ET-2000 PLUS (4-tube system) extruder terminal can be obtained from the manufacturer, Trinity Industries, Inc., P.O. Box 99, 950 West 400S, Centerville, UT 84014, telephone (800) 772-7976.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The Certificate of Compliance shall certify that the terminal systems furnished conform to the contract plans and specifications, conform to the prequalified design and material requirements, and were manufactured in conformance with the approved quality control program.

Terminal systems shall be installed in conformance with the manufacturer's installation instructions and these requirements. Each terminal system installed shall be identified by painting the type of terminal system in neat black letters and figures 2 inches high on the backside of the rail element between system posts numbers 4 and 5.

For terminal system (Type ET) the steel foundation tubes with soil plates attached shall be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes shall be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer shall be moistened and

thoroughly compacted. The wood terminal posts shall be inserted into the steel foundation tubes by hand and shall not be driven. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts shall be coated with a grease which will not melt or run at a temperature of 149° F or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

For terminal system (Type SKT) the soil tubes shall be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes shall be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer shall be moistened and thoroughly compacted. Wood posts shall be inserted into the steel foundation tubes by hand. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts shall be coated with a grease which will not melt or run at a temperature of 149° F or less. The edges of the wood posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

Surplus excavated material remaining after the terminal system has been installed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

The contract unit price paid per each for Alternative In-Line Terminal System shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing Alternative In-Line Terminal System, complete in place, including excavation, backfill and disposal of surplus material, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

ALTERNATIVE FLARED TERMINAL SYSTEM

Alternative flared terminal system shall be furnished and installed as shown on the plans and in conformance with these special provisions.

The allowable alternatives for a flared terminal system shall consist of one of the following or a Department approved equal.

A. TERMINAL SYSTEM (TYPE FLEAT) - Terminal system (Type FLEAT) shall be a Flared Energy Absorbing Terminal 350 manufactured by Road Systems, Inc., located in Big Spring, Texas, and shall include items detailed for terminal system (Type FLEAT) shown on the plans. The Flared Energy Absorbing Terminal 350 can be obtained from the distributor, Universal Industrial Sales, P.O. Box 699, Pleasant Grove, UT 84062; telephone (801) 785-0505 or from the distributor, Gregory Highway Products, 4100 13th Street, S.W., Canton, OH 44708, telephone (330) 477-4800.

B. TERMINAL SYSTEM (TYPE SRT) - Terminal system (Type SRT) shall be an SRT-350 Slotted Rail Terminal (8-post system) as manufactured by Trinity Industries, Inc., and shall include items detailed for terminal system (Type SRT) shown on the plans. The SRT-350 Slotted Rail Terminal (8-post system) can be obtained from the

manufacturer, Trinity Industries, Inc., P.O. Box 99, 950 West 400S, Centerville, UT 84014, telephone (800) 772-7976.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The Certificate of Compliance shall certify that the terminal systems furnished conform to the contract plans and specifications, conform to the prequalified design and material requirements, and were manufactured in conformance with the approved quality control program.

Terminal systems shall be installed in conformance with the manufacturer's installation instructions and these requirements. Each terminal system installed shall be identified by painting the type of terminal system in neat black letters and figures 2 inches high on the backside of the rail element between system posts numbers 4 and 5.

For terminal system (Type SRT), the steel foundation tubes with soil plates attached shall be, at the Contractor's option, either driven, with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes shall be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer shall be moistened and thoroughly compacted. The wood terminal posts shall be inserted into the steel foundation tubes by hand and shall not be driven. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts shall be coated with a grease which will not melt or run at a temperature of 149° F or less. The edges of the wood terminal posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

For terminal system (Type FLEAT), the soil tubes shall be, at the Contractor's option, driven with or without pilot holes, or placed in drilled holes. Space around the steel foundation tubes shall be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer shall be moistened and thoroughly compacted. Wood posts shall be inserted into the steel foundation tubes by hand. Before the wood terminal posts are inserted, the inside surfaces of the steel foundation tubes to receive the wood posts shall be coated with a grease which will not melt or run at a temperature of 149° F or less. The edges of the wood posts may be slightly rounded to facilitate insertion of the post into the steel foundation tubes.

Surplus excavated material remaining after the terminal system has been installed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

The contract unit price paid per each for Alternative Flared Terminal System shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing alternative flared terminal system, complete in place, including excavation, backfill and disposal of surplus material, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.100 CHAIN LINK RAILING:

Chain link railing shall conform to the provisions in Section 83-l, "Railings," of the Standard Specifications and these special provisions.

The chain link fabric shall be 9-gage (0.148-inch diameter), Type IV, Class B, bonded vinyl coated fabric, conforming to the requirements in AASHTO Designation: M 181.

The strength of the bond between the coating material and steel of the bonded vinyl coated chain link fabric shall be equal to or greater than the cohesive strength of the polyvinyl chloride (PVC) coating material.

10-1.102 CONCRETE BARRIER:

Concrete barriers shall conform to the provisions in Section 83-2, "Barriers," of the Standard Specifications.

Concrete barrier (Type 26 Modified) will be measured and paid for as concrete barrier (Type 26 Modified).

Concrete barrier (Type 732A) will be measured and paid for as concrete barrier (Type 732A).

Concrete barrier (Type 736) will be measured and paid for as concrete barrier (Type 736).

Concrete barrier (Type 736B Modified) will be measured and paid for as concrete barrier (Type 736B Modified).

10-1.103 THRIE BEAM BARRIER:

Thrie beam barrier shall conform to the provisions in Section 83-2, "Barriers," of the Standard Specifications and these special provisions.

Attention is directed to "Order of Work" of these special provisions.

10-1.104 TRANSITION RAILING (TYPE WB):

Transition railing (Type WB) shall be furnished and installed in conformance with details shown on the plans, the provisions in Section 83-2, "Barriers," of the Standard Specifications and these special provisions.

The 10-gage rail elements shall conform to the requirements of Class B, Type 1 thrie beam guard railing as shown in AASHTO Designation: M 180. End caps shall conform to the requirements of Class A, Type 1 thrie beam guard railing as shown in AASHTO Designation: M 180.

Surplus excavated material remaining after the transitional railing (Type WB) has been constructed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

The contract unit price paid per each for Transition Railing (Type WB) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing Transition Railing (Type WB), complete in place, including drilling holes for wood posts, driving posts, backfill, and disposal of surplus material, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.105 THERMOPLASTIC TRAFFIC STRIPE AND PAVEMENT MARKING (SPRAYABLE):

Thermoplastic traffic stripes (traffic lines) and pavement markings shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

Thermoplastic material shall be free of lead and chromium, and shall conform to the requirements in State Specification PTH-02ALKYD.

Retroreflectivity of the thermoplastic traffic stripes and pavement markings shall conform to the requirements in ASTM Designation: D 6359-99. White thermoplastic traffic stripes and pavement markings shall have a minimum initial retroreflectivity of 250 mcd m^{-2} lx^{-1}. Yellow thermoplastic traffic stripes and pavement markings shall have a minimum initial retroreflectivity of 150 mcd m^{-2} lx^{-1}.

Where striping joins existing striping, as shown on the plans, the Contractor shall begin and end the transition from the existing striping pattern into or from the new striping pattern a sufficient distance to ensure continuity of the striping pattern.

Thermoplastic traffic stripes shall be applied at the minimum thickness and application rate as specified below. The minimum application rate is based on a solid stripe of 4 inches in width.

Minimum Stripe Thickness (inch)	Minimum Application Rate (lb/ft)
0.079	0.27
0.098	0.34

Thermoplastic traffic stripes and pavement markings shall be free of runs, bubbles, craters, drag marks, stretch marks, and debris.

10-1.106 PAVEMENT MARKERS:

Pavement markers shall be placed in conformance with the provisions in Section 85, "Pavement Markers," of the Standard Specifications and these special provisions.

The Contractor shall furnish the Engineer certificates of compliance for the pavement markers in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

Retroreflective pavement markers shall be marked as abrasion resistant on the body of the markers.

SECTION 10-2 HIGHWAY PLANTING AND IRRIGATION SYSTEMS

10-2.01 GENERAL:

The work performed in connection with highway planting and irrigation systems shall conform to the provisions in Section 20, "Erosion Control and Highway Planting," of the Standard Specifications and these special provisions.

The Contractor shall notify the Engineer not less than 72 hours prior to requiring initial access to the existing irrigation controllers. When the Engineer determines that access to the controllers is required at other times, arrangements will be made to provide this access.

When fluctuations of water pressure and water supply are encountered during normal working hours, plants shall be watered at other times, as often, and in sufficient amounts as conditions may require to keep the soil and plant roots moist during the life of the contract.

Full compensation for watering plants outside normal working hours shall be considered as included in the contract lump sum prices paid for highway planting and plant establishment work and no additional compensation will be allowed therefor.

PROGRESS INSPECTIONS

Progress inspections will be performed by the Engineer for completed highway planting and irrigation system work at designated stages during the life of the contract.

Progress inspections will not relieve the Contractor of responsibility for installation in conformance with the special provisions, plans and Standard Specifications. Work within an area shall not progress beyond each stage until the inspection has been completed, corrective

work has been performed, and the work is approved, unless otherwise permitted by the Engineer.

The requirements for progress inspections will not preclude additional inspections of work by the Engineer at other times during the life of the contract.

The Contractor shall notify the Engineer, in writing, at least 4 working days prior to completion of the work for each stage of an area and shall allow a minimum of 3 working days for the inspection.

Progress inspections will be performed at the following stages of work:

A. During pressure testing of the pipelines on the supply side of control valves.
B. During testing of low voltage conductors.
C. Before planting begins and after completion of the work specified for planting in Section 20-4.03, "Preparing Planting Areas," of the Standard Specifications.
D. Before plant establishment work begins and after completion of the work specified for planting in Section 20-4.05, "Planting," of the Standard Specifications.
E. At intervals of one month during the plant establishment period.

COST BREAK-DOWN

The Contractor shall furnish the Engineer a cost break-down for the contract lump sum items of highway planting and irrigation system. Cost break-down tables shall be submitted to the Engineer for approval within 15 working days after the contract has been approved. Cost break-down tables will be approved, in writing, by the Engineer before any partial payment will be made for the applicable items of highway planting and irrigation system involved.

Cost break-downs shall be completed and furnished in the format shown in the samples of the cost break-downs included in this section. Line item descriptions of work shown in the samples are the minimum to be submitted. Additional line item descriptions of work may be designated by the Contractor. If the Contractor elects to designate additional line item descriptions of work, the quantity, value and amount for those line items shall be completed in the same manner as for the unit descriptions shown in the samples. The line items and quantities given in the samples are to show the manner of preparing the cost break-downs to be furnished by the Contractor.

The Contractor shall determine the quantities required to complete the work shown on the plans. The quantities and their values shall be included in the cost break-downs submitted to the Engineer for approval. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-downs submitted for approval.

The sum of the amounts for the line items of work listed in each cost break-down table for highway planting and for irrigation system work shall be equal to the contract lump sum price bid for Highway Planting and Irrigation System, respectively. Overhead and profit shall be included in each individual line item of work listed in a cost break-down table.

No adjustment in compensation will be made in the contract lump sum prices paid for highway planting and irrigation system due to differences between the quantities shown in the cost break-downs furnished by the Contractor and the quantities required to complete the work as shown on the plans and as specified in these special provisions.

Individual line item values in the approved cost break-down tables will be used to determine partial payments during the progress of the work and as the basis for calculating an adjustment in compensation for the contract lump sum items of highway planting and irrigation system due to changes in line items of work ordered by the Engineer. When the total of ordered changes to line items of work increases or decreases the lump sum price bid for either Highway Planting or Irrigation System by more than 25 percent, the adjustment in compensation for the applicable lump sum item will be determined in the same manner specified for increases and decreases in the total pay quantity of an item of work in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications.

HIGHWAY PLANTING COST BREAK-DOWN

Contract No. 080G9804

UNIT DESCRIPTION	UNIT	APPROXIMATE QUANTITY	VALUE	AMOUNT
MULCH	CUYD	3		
SOIL AMENDMENT	CF	74		
COMMERCIAL FERTILIZER (PACKET)	EA	185		
PLANT (GROUP U)	EA	37		

TOTAL _____

IRRIGATION SYSTEM COST BREAK-DOWN

Contract No. 080G9804

UNIT DESCRIPTION	UNIT	APPROXIMATE QUANTITY	VALUE	AMOUNT
CHECK, TEST & REMOVE EXISTING IRRIGATION SYSTEM	LS	LUMP SUM		
CONTROL AND NEUTRAL CONDUCTORS	LS	LUMP SUM		
1" ELECTRIC REMOTE CONTROL VALVE	EA	1		
1 ½" ELECTRIC REMOTE CONTROL VALVE	EA	3		
2 ½" PLASTIC PIPE (PR 200)(SUPPLY LINE)	LF	200		
2" PLASTIC PIPE (PR 200)(SUPPLY LINE)	LF	80		
1 ½" PLASTIC PIPE (PR 200)(SUPPLY LINE)	LF	0		
1" PLASTIC PIPE (PR 200)(SUPPLY LINE)	LF	1900		
SPRINKLER (TYPE C-2)	EA	86		
1 ½" BALL VALVE	EA	2		

TOTAL _____

10-2.02 EXISTING HIGHWAY PLANTING:

In addition to the provisions in Section 20, "Erosion Control and Highway Planting," of the Standard Specifications, work performed in connection with existing highway planting shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.
In addition to the provisions in Section 20, "Erosion Control and Highway Planting," of the Standard Specifications, work performed in connection with existing highway planting shall conform to the provisions in "Existing Highway Facilities," of these special provisions.

10-2.03 EXISTING HIGHWAY IRRIGATION FACILITIES:

The work performed in connection with the various existing highway irrigation system facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions. All work performed to repair and maintain the existing irrigation system shall be considered as included in the contract lump sum price paid for Irrigation System and no additional compensation will be allowed therefor.

Water shall be maintained in conformance with the provisions in Section 20-5.025, "Maintain Existing Water Supply," of the Standard Specifications.

LOCATE EXISTING CROSSOVERS AND CONDUITS

Existing crossovers and conduits shown on the plans to be incorporated in the new work shall be located in conformance with the provisions for locating conduits in Section 20-5.03B, "Conduit for Irrigation Crossovers," of the Standard Specifications.

Unless otherwise directed by the Engineer, existing crossovers and conduits shown on the plans to be incorporated in the new work shall be located prior to performing work on irrigation systems.

If debris is encountered in the ends of conduits, the debris shall be removed prior to performing other work in the conduits. Removal of debris within the first 3 feet in these conduits shall be at the Contractor's expense.

CHECK AND TEST EXISTING IRRIGATION FACILITIES

Existing irrigation facilities that are to remain or to be relocated, and that are within those areas where clearing and grubbing or earthwork operations are to be performed, shall be checked for missing or damaged components and proper operation prior to performing clearing and grubbing or earthwork operations. Existing irrigation facilities outside of work areas that are affected by the construction work shall also be checked for proper operation.

A written list of existing irrigation system deficiencies shall be submitted to the Engineer within 5 working days after checking the existing facilities.

Deficiencies found during checking of the existing facilities shall be corrected as directed by the Engineer. Corrective work ordered by the Engineer will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

When existing irrigation facilities are checked, existing backflow preventers shall be tested for proper operation in conformance with the provisions in Section 20-5.03J, "Check and Test Backflow Preventers," of the Standard Specifications.

Existing backflow preventers shall be retested one year after the satisfactory completion of the previous test, and each year thereafter until the plant establishment period is completed. An additional test shall be provided not more than 10 days prior to acceptance of the contract.

Length of watering cycles for use of potable water from water meters for checking or testing existing irrigation facilities shall be as determined by the Engineer.

Additional repairs required for the existing irrigation system as ordered by the Engineer, except as otherwise provided for in "Existing Highway Irrigation Facilities" of these special

provisions, will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Additional repairs required for the existing irrigation system as ordered by the Engineer, except as otherwise provided for in "Maintain Existing Irrigation Facilities" of these special provisions, will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

MAINTAIN EXISTING IRRIGATION FACILITIES

Existing irrigation facilities shall be maintained throughout the life of the contract. Prior to the start of maintaining existing irrigation facilities work, the facilities shall be checked for proper operation, and repaired in conformance with the provisions in "Check and Test Existing Irrigation Facilities" of these special provisions.

After the existing facilities have been checked and repaired, the Contractor shall be responsible for the routine maintenance of existing irrigation systems. The work shall include, but not limited to, checking irrigation systems for proper operation and adjusting, repairing or replacing valves, valve boxes, sprinklers, risers, swing joints, wye strainers, valve assembly units, and filter assembly units.

The Contractor will not be responsible for maintaining existing water meters, underground pipe supply lines, control and neutral conductors, and electrical conduits. Except as otherwise specified in "Existing Highway Irrigation Facilities" of these special provisions, repair work to these facilities ordered by the Engineer will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Existing automatic irrigation systems shall be operated automatically during the life of the contract, except manual operation will be allowed for the work during plant replacement, fertilization, weed germination, and the repair of irrigation facilities.

Irrigation controllers shall be programmed by the Contractor for seasonal water requirements. During winter seasons irrigation systems shall be operated automatically a minimum of 2 minutes every 2 weeks.

Irrigation systems and facilities shall be checked for proper operation at least once every 30 days. When required, as determined by the Engineer, adjusting, repairing or replacing irrigation facilities shall be completed within 5 working days after checking the irrigation systems. Except as provided in these special provisions, repair and replacement of irrigation facilities shall conform to the provisions in "Existing Highway Irrigation Facilities" of these special provisions.

Except as provided in these special provisions, the contract lump sum price paid for irrigation systems shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in maintaining existing irrigation facilities, complete in place, including checking irrigation facilities, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

RELOCATE EXISTING IRRIGATION FACILITIES

Relocate existing irrigation facilities shall consist of relocating existing irrigation controllers, and other facilities shown on the plans or specified in these special provisions.

Relocate existing solar irrigation controllers shall consist of relocating the existing controllers, and controller enclosures; constructing concrete pads; and furnishing and installing electrical conduits, including control and neutral conductors. Conduits for control and neutral conductors shall terminate in separate new or relocated pull boxes located within 5 feet of the new concrete pads.

Existing irrigation facilities, shown on the plans to be relocated, that are, in the opinion of the Engineer, unsuitable for the purpose intended, shall be replaced in conformance with the provisions in Section 15-2.05, "Reconstruction," of the Standard Specifications.

After irrigation facilities have been relocated, the Contractor shall demonstrate that the relocated facilities function properly in the presence of the Engineer.

Full compensation for Relocate Existing Irrigation Facilities (Irrigation Controllers) shall be considered as included in the contract lump sum price paid for Irrigation System and no additional compensation will be allowed therefor.

10-2.04 HIGHWAY PLANTING:

The work performed in connection with highway planting shall conform to the provisions in Section 20-4, "Highway Planting," of the Standard Specifications and these special provisions.

HIGHWAY PLANTING MATERIALS

MATERIALS

Mulch

Mulch must be green material and must comply with the following:

A. The mulch provider must be a compost producer and a participant in the United States Composting Council (USCC) Seal of Testing Assurance (STA) program.
B. The green material producer must be fully permitted as a compost producer in accordance with requirements of the California Integrated Waste Management Board (CIWMB), Local Enforcement Agencies (LEA) and any other State and Local Agencies that regulate solid waste facilities. If exempt from State permitting requirements, the composting facility must certify that it follows all guidelines and procedures for production of compost meeting the environmental health standards of Title 14, California Code of Regulations, Division 7, Chapter 3.1, Article 7.

C. Green material may be derived from any single or mixture of chipped, shredded, or ground vegetation; or clean processed recycled wood products.

D. Compost green materials such that weed seeds, pathogens and deleterious materials are reduced as specified under Title 14, California Code of Regulations, Division 7, Chapter 3.1, Article 7, Section 17868.3.

E. Green material must not contain paint, petroleum products, herbicides, fungicides or other chemical residues harmful to animal life or plant growth. Compost must possess no objectionable odors.

F. Metal concentrations in green material must not exceed the maximum metal concentrations listed in Title 14, California Code of Regulations, Division 7, Chapter 3.1, Section 17868.2.

G. Green material must comply with the following table:

Physical and Chemical Requirements		
Property	Test Method	Requirement
pH	TMECC 04.11-A Elastometric pH 1:5 Slurry Method pH Units	6.0–8.5
Soluble Salts	TMECC 04.10-A Electrical Conductivity 1:5 Slurry Method dS/m (mmhos/cm)	0–10.0
Moisture Content	TMECC 03.09-A Total Solids & Moisture at 70+/- 5 deg C % Wet Weight Basis	N/A
Organic Matter Content	TMECC 05.07-A Loss-On-Ignition Organic Matter Method (LOI) % Dry Weight Basis	30–100
Maturity	TMECC 05.05-A Germination and Vigor Seed Emergence Seedling Vigor % Relative to Positive Control	 N/A N/A
Stability	TMECC 05.08-B Carbon Dioxide Evolution Rate mg CO_2-C/g OM per day	N/A
Particle Size	TMECC 02.02-B Sample Sieving for Aggregate Size Classification % Dry Weight Basis	Inches % Passing 3 99% 3/8 < 25% Max. Length 4 inches
Pathogen	TMECC 07.01-B Fecal Coliform Bacteria < 1000 MPN/gram dry wt.	Pass
Pathogen	TMECC 07.01-B Salmonella < 3 MPN/4 grams dry wt.	Pass
Physical Contaminants	TMECC 02.02-C Man Made Inert Removal and Classification: Plastic, Glass and Metal % > 4mm fraction	Combined Total: < 1.0
Physical Contaminants	TMECC 02.02-C Man Made Inert Removal and Classification: Sharps (Sewing needles, straight pins and hypodermic needles) % > 4mm fraction	None Detected

NOTE: TMECC refers to "Test Methods for the Examination of Composting and Compost," published by the United States Department of Agriculture and the United States Compost Council (USCC).

H. Before mulch application, submit a copy of the green material producer's Compost Technical Data Sheet and a copy of the compost producers STA certification. The Compost Technical Data Sheet must include laboratory analytical test results, directions for product use, and a list of product ingredients.

I. Before mulch application, submit a Certificate of Compliance under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

CONSTRUCTION

Application

Commercial Fertilizer (Packets)

Commercial fertilizer (packet) shall be slow or controlled release and shall be in a biodegradable packet form. The packet shall gradually release nutrients over a 12-month period. Each packet shall have a weight of 10 g ± 1 g and shall have the following guaranteed chemical analysis:

Ingredient	Percentage
Nitrogen	20
Phosphoric Acid	10
Water Soluble Potash	5

ROADSIDE CLEARING

Before preparing planting areas or commencing irrigation trenching operations for planting areas, trash and debris shall be removed from these areas as required under Construction Site Management of these special provisions.

The project area shall be cleared as specified herein:

A. Weeds shall be killed and removed within an area 6 feet in diameter centered at each plant location where the plants are to be planted more than 15 feet apart and are located outside of ground cover areas.

B. Weeds outside of mulched areas, plant basins, and ground cover shall be controlled by mowing. Limits of mowing shall extend from the weeds to be killed areas out to the edges of pavement, dikes, curbs, sidewalks, and fences.

C. Disposal of weeds killed during the initial roadside clearing will not be required, unless otherwise directed by the Engineer. When directed by the Engineer, killed weeds shall be disposed of and the disposal will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

After the initial roadside clearing is complete, additional roadside clearing work shall be performed as necessary to maintain the areas, as specified above, in a neat appearance until the start of the plant establishment period. This work shall include the following:

A. Trash and debris shall be removed.

B. Rodents shall be controlled.

C. Weeds in plant basins, including basin walls, shall be removed by hand pulling, after the plants have been planted.

D. Areas outside the areas specified to be cleared of weeds shall be mowed.

Weed Control

Weed control shall also conform to the following:

A. Stolon type weeds shall be killed with glyphosate.

B. Tumbleweeds shall be removed by hand pulling before the tumbleweeds reach a height of 6 inches.

C. Removed weeds shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

D. Areas to be mowed shall be mowed when weed height exceeds 12 inches. Weeds shall be mowed to a height of 2 inches to 6 inches.

E. Disposal of mowed material after initial roadside clearing will not be required, unless otherwise directed by the Engineer. When directed by the Engineer, mowed material shall be disposed of and the disposal will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

Roadside clearing work shall not include work required to be performed as clearing and grubbing as specified in Section 16, "Clearing and Grubbing," of the Standard Specifications.

PESTICIDES

Pesticides used to control weeds shall conform to the provisions in Section 20-4.026, "Pesticides," of the Standard Specifications. Except as otherwise provided in these special provisions, pesticide use shall be limited to the following materials:

Glyphosate

Glyphosate shall be used to kill stolon type weeds.

If the Contractor elects to request the use of other pesticides on this project, the request shall be submitted, in writing, to the Engineer not less than 15 days prior to the intended use of the other pesticides. Except for the pesticides listed in these special provisions, no pesticides shall be used or applied without prior written approval of the Engineer.
Pesticides shall not be applied within the limits of the plant basins. Pesticides shall not be applied in a manner that allows the pesticides to come in contact with the foliage and woody parts of the plants.

PREPARING PLANTING AREAS

Plants adjacent to drainage ditches shall be located so that after construction of the basins, no portion of the basin walls shall be less than the minimum distance shown on the plans for each plant involved.

PLANTING

Backfill material for plant holes must be a mixture of soil and soil amendment. The quantity of soil amendment shall be as shown on the Plant List. Thoroughly mix backfill material and uniformly distribute throughout the entire depth of the plant hole without clods and lumps.

Place commercial fertilizer packets in the backfill of each plant at the time of planting and at the rate shown on the Plant List to within 6 inches to 8 inches of the soil surface and approximately one inch from the roots. When more than one fertilizer packet is required per plant, the packets must be distributed evenly around the root ball.

Attention is directed to "Irrigation Systems Functional Test" of these special provisions regarding functional tests of the irrigation systems. Do not perform planting in an area until the functional test has been completed for the irrigation system serving that area.

Payment:
Full compensation for conforming to the requirements of this article (Highway Planting) including Materials, Construction, Roadside Clearing, Pesticides, Preparing Planting Areas, Planting at the locations shown on the plans, as specified in the Standard Specifications and these special provisions and as directed by the Engineer shall be paid for on a lump sum basis and no additional compensation will be allowed therefor.

10-2.05 PLANT ESTABLISHMENT WORK

The plant establishment period shall be Type 2 and shall not be less than 250 working days.

Plant establishment work for erosion control (Type D) areas will not be required except for removing trash and debris and mowing. Mowing shall be performed after the seeds have set and the erosion control vegetation has begun to die back.

Attention is directed to "Relief From Maintenance and Responsibility" in these special provisions regarding relief from maintenance and protection.

Weeds within plant basins, including basin walls and ground cover, shall be controlled by hand pulling.

Except as specified in these special provisions, disposal of mowed material will not be required unless ordered by the Engineer. Disposal of mowed material, as directed by the Engineer, will be paid for as extra work as provided in Section 4-1.03D,"Extra Work," of the Standard Specifications.

After 125 working days of the plant establishment period have been completed, replacement of plants the same size as originally specified.

Wye strainers shall be cleaned at least 15 days prior to the completion of the plant establishment period.

Previously installed filters shall be removed, cleaned and reinstalled at least 15 days prior to the completion of the plant establishment period.

The final inspection shall be performed in conformance with the provisions in Section 5-1.13, "Final Inspection," of the Standard Specifications and shall be completed a minimum of 20 working days before the estimated completion of the contract.

Payment:
Full compensation for conforming to the requirements of this article (Plant Establishment (250 Days)) as specified in the Standard Specifications and these special provisions and as directed by the Engineer shall be paid for on a lump sum basis and no additional compensation will be allowed therefor.

10-2.06 IRRIGATION SYSTEMS:

Irrigation systems shall be furnished and installed in conformance with the provisions in Section 20-5, "Irrigation Systems," of the Standard Specifications, except materials containing asbestos fibers shall not be used.

Method A pressure testing shall conform to the provisions in Section 20-5.03H(1), "Method A", of the Standard Specifications, except leaks that develop in the tested portion of the system shall be located and repaired after each test period when a drop of more than 5 pounds per square inch is indicated by the pressure gage. After the leaks have been repaired, the one hour pressure test shall be repeated and additional repairs made until the drop in pressure is 5 pounds per square inch or less.

VALVE BOXES

Valve boxes shall conform to the provisions in Section 20-2.24, "Valve Boxes," of the Standard Specifications, except as otherwise provided herein.

Valve boxes shall be precast portland cement concrete.

Covers for concrete valve boxes shall be concrete.

Valve boxes shall be identified on the top surface of the covers by labels containing the appropriate abbreviation for the irrigation facility contained in the valve box as shown on the plans. Valve boxes that contain remote control valves shall be identified by the appropriate letters and numbers (controller and station numbers). Labels for valve boxes shall conform to the provisions in Section 20-5.03F, "Valves and Valve Boxes," of the Standard Specifications.

Label material shall be plate plastic. Yellow colored polyurethane will not be accepted.

BALL VALVES

Ball valves shall be furnished and installed as shown on the plans and in conformance with these special provisions.

Ball valves shall be manufactured from Chlorinated Polyvinyl Chloride (CPVC) or polyvinyl chloride (PVC) and shall conform to the following:

Specification	Minimum Requirement
Non-shock cold water working pressure for 3/4-inch to 4-inch valves	235 psi
Non-shock cold water working pressure for 6-inch valves	150 psi
Seats	PTFE (Teflon)
O-Ring Seals	EPDM or Viton

Ball valves shall be of the same size as the pipeline which the valves serve, unless otherwise noted on the plans.

Ball valves shall be installed in a valve box.

ELECTRIC AUTOMATIC IRRIGATION COMPONENTS

Electric Remote Control Valves

Electric remote control valves shall conform to the provisions in Section 20-2.23, "Control Valves," of the Standard Specifications and the following:

A. Valves shall be brass construction.
B. Valves shall be angle pattern (bottom inlet) or straight pattern (side inlet) as shown on the plans.
C. Valve solenoids for (solar/battery) controller shall be DC latching and operate on 3.5 V.

Pull Boxes

Pull box installations shall conform to the provisions in Section 20-5.027I, "Conductors,

Electrical Conduits and Pull Boxes," of the Standard Specifications.

Conductors

Low voltage, as used in this section "Conductors," shall mean 36 V or less.

Low voltage control and neutral conductors in pull boxes and valve boxes, at irrigation controller terminals, and at splices shall be marked as follows:

A. Conductor terminations and splices shall be marked with adhesive backed paper markers or adhesive cloth wrap-around markers, with clear, heat-shrinkable sleeves sealed over the markers.
B. Non-spliced conductors in pull boxes and valve boxes shall be marked with clip-on, "C" shaped, white extruded polyvinyl chloride sleeves. Marker sleeves shall have black, indented legends of uniform depth with transparent overlays over the legends and "chevron" cuts for alignment of 2 or more sleeves.

Markers for the control conductors shall be identified with the appropriate number or letter designations of irrigation controllers and station numbers. Markers for neutral conductors shall be identified with the appropriate number or letter designations of the irrigation controllers.

New control and neutral conductors that are to replace existing control and neutral conductors shall be the same size and color as the existing control and neutral conductors being connected to.

The color of low voltage neutral and control conductor insulation, except for the striped portions, shall be homogeneous throughout the entire thickness of the insulation.

Insulation for conductors may be UL listed polyethylene conforming to UL44 test standards with a minimum insulation thickness of 41 mils for wire sizes 10AWG and smaller.

ARMOR-CLAD CONDUCTORS

Armor-clad conductors shall be used in direct burial applications from pull boxes adjacent to irrigation controller to remote control valves and other irrigation facilities in conformance with the details shown on the plans and these special provisions.

Armor-clad conductors shall conform to the following:

A. Conductors shall be the proper size for the application, and shall be solid, uncoated copper with a conductor size not less than 90 percent of the AWG diameter required.

B. At the Contractor's option, conductor insulation coverings shall be either of the following:

1. Polyvinyl chloride (PVC) conforming to UL style, Type UF 60°C, 600 V. Average thickness of insulation shall be not less than 60 mils, with a minimum thickness of 54 mils, or
2. UL listed polyethylene conforming to UL44 test standards with a minimum insulation thickness of 41 mils for wire sizes 10AWG and smaller.

C. Armor shall be a minimum 0.005-inch thick by 0.50-inch wide Type 304 stainless steel tape that is helically wrapped over each conductor with a 33 percent minimum overlap.

D. Outer jacket for conductors shall be sunlight resistant PVC and shall conform to the Insulated Power Cable Engineer's Association (ICEA) S-61-402, NEMA Standard WC5, and UL Listing 1263. Nominal thickness of the outer jacket shall be 30 mils with a minimum thickness of 24 mils.

At the option of the Contractor, conductors conforming to the provisions in Section 20-2.31D, "Conductors," of the Standard Specifications may be used when the conductors are installed in an electrical conduit.

IRRIGATION SYSTEMS FUNCTIONAL TEST

Functional tests for the irrigation controllers and associated automatic irrigation systems shall conform to the provisions in Section 20-5.027J, "Testing," of the Standard Specifications and these special provisions.

Tests shall demonstrate to the Engineer, through one complete cycle of the irrigation controllers in the automatic mode, that the associated automatic components of the irrigation systems operate properly. If automatic components of the irrigation systems fail a functional test, these components shall be repaired at the Contractor's expense and the testing repeated until satisfactory operation is obtained.

Associated automatic components shall include, but not be limited to, remote control valve actuator systems, remote control valves, and rain sensors.

Upon completion of work on an irrigation system, including correction of deficiencies and satisfactory functional tests for the systems involved, the plants to be planted in the area watered by the irrigation system may be planted provided the planting areas have been prepared as specified in these special provisions.

PIPE

Plastic Pipe

Plastic pipe supply lines must be polyvinyl chloride (PVC) 1120 or 1220 pressure rated pipe with the minimum pressure rating (PR) shown on the plans.

Plastic pipe supply lines less than 3 inches in diameter must have solvent cemented type joints. Primers must be used on the solvent cemented type joints.

Fittings for plastic pipe supply lines with a pressure rating (PR) of 315 must be Schedule 80.

THRUST BLOCK

Thrust blocks shall be installed in accordance with the plans and these special provisions.

Thrust blocks shall be installed on the main supply line at all changes in direction and terminus run.

SPRINKLERS

Sprinklers shall conform to the type, pattern, material, and operating characteristics listed in the "Sprinkler Schedule" shown on the plans.

FINAL IRRIGATION SYSTEM CHECK

A final check of existing and new irrigation facilities shall be performed not more than 40 working days and not less than 30 working days prior to acceptance of the contract.

The length of watering cycles using potable water measured by water meters for the final check of irrigation facilities will be determined by the Engineer.

Remote control valves connected to existing and new irrigation controllers shall be checked for automatic performance when the controllers are in automatic mode.

Unsatisfactory performance of irrigation facilities installed or modified by the Contractor shall be repaired and rechecked at the Contractor's expense until satisfactory performance is obtained, as determined by the Engineer.

Repair or replacement of existing irrigation facilities due to unsatisfactory performance shall conform to the provisions in "Existing Highway Irrigation Facilities" of these special provisions.

Nothing in this section "Final Irrigation System Check" shall relieve the Contractor of full responsibility for making good or repairing defective work or materials found before the formal written acceptance of the entire contract by the Director.

Full compensation for checking the irrigation systems prior to the acceptance of the contract shall be considered as included in the contract lump sum price paid for plant establishment work and no additional compensation will be allowed therefor.

SECTION 10-3. ELECTRICAL SYSTEMS

10-3.01 <u>DESCRIPTION:</u>

Lighting (City Street), Modify Signal and Lighting (Location 1), Modify Signal and Lighting (Removal, Location 1), Modify Signal and Lighting (Location 2), Modify Signal and Lighting (Removal, Location 2), Modify Lighting and Sign Illumination and, maintaining existing traffic management system elements during construction shall conform to the provisions in Section 86, "Electrical Systems," of the Standard Specifications and these special provisions.

Lighting equipment is included in the following structures:

A. Bridge No. 56-0730

Communication conduit is included in the following structures:

A. Bridge No. 56-0730

Traffic signal work shall be performed at the following locations:

A. Ramona Expressway at Route 215 Southbound Off-Ramp (Location 1)
B. Ramona Expressway at Route 215 Northbound Off-Ramp (Location 2)

10-3.02 COST BREAK-DOWN:

Cost break-downs shall conform to the provisions in Section 86-1.03, "Cost Break-Down," of the Standard Specifications and these special provisions.

The Engineer shall be furnished a cost break-down for each contract lump sum item of work described in this Section 10-3.

The cost break-down shall be submitted to the Engineer for approval within 15 days after the contract has been approved. The cost break-down shall be approved, in writing, by the Engineer before any partial payment for the items of electrical work will be made.

The cost break-down shall include the following items in addition to those listed in the Standard Specifications:

A. Battery backup system (BBS) cabinets
B. Battery backup system (BBS) batteries
C. Video image vehicle detection systems
D. Light emitting diode signal models
E. Light emitting diode pedestrian signal face modules
F. Wireless cellular data communications assembly

10-3.03 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS:

Traffic signal system shutdowns shall be limited to periods between the hours of 9:00 a.m. and 3:00 p.m.

Lighting and sign illumination systems shall be maintained during hours of darkness.

10-3.04 MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION:

Traffic Management System (TMS) elements include, but are not limited to traffic signal and communication system.

Existing TMS elements, including detection systems, identified on the plans and located within the project limits shall remain in place and be protected from damage. If the construction activities require existing TMS elements to be nonoperational or off line, and if temporary or portable TMS elements are not shown on the plans, the Contractor shall provide for temporary or portable TMS elements. The Contractor shall receive the Engineer's approval on the type of temporary or portable TMS elements and installation method.

Before work is performed, the Engineer, the Contractor, and the Department's Traffic Operations Electrical representatives shall jointly conduct a pre-construction operational status check of all existing TMS elements and each element's communication status with the Traffic Management Center (TMC), including existing TMS elements that are not shown on the plans and elements that may not be impacted by the Contractor's activities. The Department's Traffic Operations Electrical representatives will certify the TMS elements' location and status, and provide a copy of the certified list of the existing TMS elements within the project limits to the Contractor. The status list will include the operational, defined as having full functionality, and the nonoperational components.

The Contractor shall obtain written approval from the Engineer at least 72 hours before interrupting existing TMS elements' communication with the TMC that will result in the elements being nonoperational or off line. The Contractor shall notify the Engineer at least 72 hours before starting excavation activities.

The Contractor shall demonstrate that repaired or replaced elements operate in a manner equal to or better than the replaced equipment or as directed by the Engineer. If the Contractor fails to perform required repairs or replacement work, as determined by the Engineer, the State may perform the repair or replacement work and the cost will be deducted from monies due to the Contractor.

A TMS element shall be considered nonoperational or off line for the duration of time that active communications with the TMC is disrupted, resulting in messages and commands not transmitted from or to the TMS element.

The Contractor shall provide provisions for replacing existing TMS elements within the project limits, including detection systems, that were not identified on the plans or during the pre-construction operational status check that became damaged due to the Contractor's activities.

If the pre-construction operational status check identified existing TMS elements, then the Contractor, the Engineer, and the Department's Traffic Operations Electrical representatives shall jointly conduct a post construction operational status check of all existing TMS elements and each element's communication status with the TMC. The Department's Traffic Operations Electrical representatives will certify the TMS elements' status and provide a copy of the certified list of the existing TMS elements within the project limits to the Contractor. The status list will include the operational, defined as having full functionality, and the nonoperational components. TMS elements that cease to be functional between pre and post construction status checks shall be repaired at the Contractor's expense and as directed by the Engineer.

The Engineer will approve, in writing, the schedule for final replacement, the replacement methods and the replacement elements, including element types and installation methods before repair or replacement work is performed. The final TMS elements shall be new and of equal or better quality than the existing TMS elements.

PAYMENT

Maintaining Existing Traffic Management System Elements During Construction shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in maintaining existing traffic management system elements as shown on the plans, specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Maintain Existing Traffic Management System Elements During Construction is measured and paid for as Modify Signals and Lighting.

If no electrical work exists on the project and no TMS elements are identified within the project limits, the pre-construction operational status check will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Furnishing and installing temporary or portable TMS elements that are not shown on the plans, but are required when an existing TMS element becomes nonoperational or off line due to construction activities, will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

Furnishing and installing temporary or portable TMS elements and replacing TMS elements that are not shown on the plans nor identified during the pre-construction operational status check and were damaged by construction activities will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

If the Contractor is required to submit provisions for the replacement of TMS elements that were not identified, the provisions will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

10-3.05 CAST-IN-DRILLED-HOLE CONCRETE PILE FOUNDATIONS:

GENERAL

Summary

This work includes constructing cast-in-drilled-hole concrete pile foundations for traffic signal and lighting standards.

Comply with Section 86-2.03, "Foundations," of the Standard Specifications and "Piling" of these special provisions.

MATERIALS

Concrete must contain not less than 590 pounds of cementitious material per cubic yard.

CONSTRUCTION

For standards located in sidewalk areas, the pile foundation must be:

1. Placed to final sidewalk grade before the sidewalk is placed
2. Square for the top 4 inches

PAYMENT

Payment for cast-in-drilled-hole concrete pile foundations shall conform to the provisions in Section 86-8, "Payment," of the Standard Specifications.

10-3.06 STANDARDS, STEEL PEDESTALS, AND POSTS:

Standards, steel pedestals, and posts for traffic signal and lighting standards shall conform to the provisions in Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, "Steel Structures" of these special provisions, and the following requirements.

Steel bolts not designated on the plans as high-strength (HS) or stainless steel shall be for general applications and shall conform to the requirements in ASTM Designation: A 307.

Anchor bolts shall conform to the requirements in ASTM Designation: F 1554, Grade 36. High-strength (HS) anchor bolts shall conform to the requirements in ASTM Designation: F 1554, Grade 105.

The sign mounting hardware shall be installed at the locations shown on the plans.
Non-illuminated street name signs shall be installed on signal mast arms using a minimum 3/4" x 0.020" round edge stainless steel strap and saddle bracket. The strap shall be wrapped

at least twice around the mast arm, tightened, and secured with a 3/4" stainless strap seal. The sign panel shall be leveled and hardware securely tightened.

Handhole reinforcement rings for standards, steel pedestals, and posts shall be continuous around the handholes.

Type 1 standards shall be assembled and set with the handhole on the downstream side of the pole in relation to traffic or as shown on the plans.

10-3.07 CONDUIT:

Conduit to be installed underground shall be Type 3 unless otherwise specified.

The conduit in a foundation and between a foundation and the nearest pull box shall be Type 3.

When Type 3 conduit is placed in a trench (not in pavement or under portland cement concrete sidewalk), after the bedding material is placed and the conduit is installed, the trench shall be backfilled to not less than 4 inches above the conduit with minor concrete conforming to the provisions in Section 90-10, "Minor Concrete," of the Standard Specifications, except the concrete shall contain not less than 421 pounds of cementitious material per cubic yard. The remaining trench shall be backfilled to finished grade with backfill material.

Conduit runs shown on the plans to be located behind curbs may be installed in the street, within 3 feet of, and parallel with the face of the curb, by the trenching in pavement method in conformance with the provisions in Section 86-2.05C, "Installation," of the Standard Specifications. Pull boxes shall be located behind the curb or at the locations shown on the plans.

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

10-3.08 CONDUCTORS, CABLES, AND WIRING:

Splices shall be insulated by "Method B".The splicing and all materials shall conform to the requirements provided in Section 86-2.09, "Wiring," of the Standard Specifications. In "Method B" splicing, shown on Standard Plan ES-13A, shall be performed with the exception of the application of electrical insulation coating over the entire splice. Instead, heat-shrinking tubing shall be placed over the splice. In case of loop wire to loop detector lead-in cable splicing, both the loop Start wire and Finish wire splices shall be placed in the same heat-shrink tubing.

The diameter of the heat-shrink tubing shall be at least 3/4 inch for loop wire to loop detector lead-in cable splices.

Conductors shall be wrapped around projecting end of conduit in pull boxes, as shown on the plans. Cables shall be secured to the projecting end of conduit in pull boxes to prevent pulling of cables without removing the securing device.

Signal Interconnect Cable (SIC) shall be the 12-pair #20 type.

Splicing of signal interconnect cables and detector lead-in cables will not be allowed.

10-3.09 SERVICE:

Continuous welding of exterior seams in service equipment enclosures is not required.

Service equipment enclosures shall be the aluminum type.

Circuit breakers shall be the cable-in/cable-out type, mounted on non-energized clips.

All circuit breakers shall be mounted vertically with the up position of the handle being the "ON" position.

Each service shall be provided with up to 2 main circuit breakers which shall disconnect ungrounded service entrance conductors. Where the "Main" circuit breaker consists of 2 circuit breakers as shown on the plans or required in the special provisions, each of the circuit breakers shall have a minimum interrupting capacity of 10,000 A, rms.

10-3.10 NUMBERING ELECTRICAL EQUIPMENT:

Self-adhesive reflective numbers and edge sealer shall be Contractor-furnished.

The numbers and edge sealer shall be placed on the equipment where designated by the Engineer.

Where new numbers are to be placed on existing or relocated equipment, the existing numbers shall be removed.

Reflective numbers shall be applied to a clean surface. Only the edges of the numbers shall be treated with edge sealer.

Where shown on the plans, 5-digit, self-adhesive equipment numbers shall be placed for all electroliers, sign lighting, and service pedestals. On service pedestals, the numbers shall be placed on the front door. On electroliers, the numbers shall be placed as shown on the plans.

10-3.11 CONTROLLER CABINETS

The Model 332A cabinets shall conform to the provisions in Section 86-3.01, "Controller Assemblies," of the Standard Specifications and these special provisions.

Police panels will not be required.

Prior to shipping to the project site, each Model 332A cabinet shall be submitted to the Transportation Laboratory for acceptance testing.

The Engineer shall be notified when each Model 332A cabinet is ready for the functional test. The functional test will be conducted by State forces.

The following equipment shall be provided with each power distribution assembly:

1. Two each of Duplex NEMA 5-20R controller receptacle
2. One each of 30 A, 1-pole, 120 V(ac) Main circuit breaker
3. One each of 15 A, 1- pole, 120 V(ac) circuit breaker
4. Two each of 20 A, 1- pole, 120 V(ac) circuit breaker

Three shelves shall be furnished as shown on the plans. Each shelf shall be attached to the tops of 2 supporting angles with 4 screws. Supporting angles shall extend from the front to the back rails. The front of the shelf shall abut the front member of the mounting cage. The shelves shall be arranged as shown on the plans. The angles shall be designed to support a minimum of 50 pounds each. The horizontal side of each angle shall be a minimum of 3 inches. The angles shall be vertically adjustable.

Three terminal blocks shall be furnished as shown on the plans. Terminal blocks shall conform to the requirements in Chapter 6 of the TEES, except that the screw size shall be 8-32.

A maintenance manual shall be furnished for all controller units, auxiliary equipment, vehicle detector sensor units, control units, and amplifiers. The maintenance and operation manuals may be combined into one manual. The maintenance manual or combined maintenance and operation manual shall be submitted at the time the controllers are delivered for testing or, if ordered by the Engineer, before purchasing. The maintenance manual shall include the following:

1. Specifications
2. Design characteristics
3. General operation theory
4. Function of all controls
5. Trouble shooting procedure (diagnostic routine)
6. Block circuit diagram
7. Geographical layout of components
8. Schematic diagrams
9. List of replaceable component parts with stock numbers

10-3.12 STATE-FURNISHED CONTROLLER ASSEMBLIES:

The Model 170E and 2070 controller assemblies, excluding anchor bolts, will be State-furnished as provided under "Materials" of these special provisions.

The Contractor shall construct each controller cabinet foundation as shown on the plans for Model 332A (including furnishing and installing anchor bolts), shall install the controller

cabinet on the foundation, and shall make field wiring connections to the terminal blocks in the controller cabinet.

A listing of field conductor terminations, in each State-furnished controller cabinet, will be furnished free of charge to the Contractor at the site of the work.

State forces will maintain controller assemblies. The Contractor's responsibility for controller assemblies shall be limited to conforming to the provisions in Section 6-1.02, "State-Furnished Materials," of the Standard Specifications.

MANDATORY EQUIPMENT SOURCE

The contractor shall acquire the Controller Assemblies from the State of California, Department of Transportation (Caltrans), and shall compensate Caltrans for costs incurred in obtaining, testing, and supplying the Controller Assemblies. This fee does not supersede any other fee charges by Caltrans for review, inspection, or fieldwork performed by department staff as a result of the Contractors work. If the fee has not been paid prior to issuance of the Encroachment Permit to the Contractor by Caltrans, full payment shall be made to the Caltrans cashier prior to starting any traffic signal work authorized by the permit, and at least thirty days before the Controller Assemblies are needed for installation. The Contractor shall give the State's representative not less than ten working days written advanced notice prior to picking up the Controller Assemblies. If the Contractor fails to pick up equipment within three working days to Caltrans notification of arrival of the equipment to the warehouse, the Contractor will be responsible for any charges made by Caltrans for storing the equipment.

Full compensation for actual cost of obtaining, testing, and supplying the Controller Assemblies, as paid by the contractor to Caltrans, shall be made on a force account basis, in accordance with Section 9-1.03 of the Standard Specifications and these Special Provisions, up to the fixed bid price. No markups will be allowed. All incidental costs incurred by the Contractor shall be considered as included in the various items of work, and no compensations will be allowed therefore.

Attention is directed to the controller assembly Special Provisions herein with respect to the mandatory Material Source for that equipment.

Transportation and Installation:
The cost of picking up, transporting and installing the Controller Assemblies as specified in these Special Provisions and the Standard Specifications shall be considered as indicated in the lump sum price paid for Modify Signals and Lighting, and no additional compensation will be allowed therefore.

Any equipment that is damaged, after the Contractor has taken possession of the item, shall be repaired to the satisfaction of the Engineer to be un-repaired, it shall be replaced with the equivalent or better equipment, to be obtained from the mandatory equipment source, or other approve vendor. The total repair or replacement costs shall be borne by the Contractor.

10-3.13 LIGHT EMITTING DIODE SIGNAL MODULE:

GENERAL

Summary

This work includes installing LED signal module. Comply with Section 86, "Electrical Systems," of the Standard Specifications.

Use LED signal module as the light source for the following traffic signal faces:

A. 12-inch section
B. 12-inch arrow section

Submittals

Before shipping LED signal modules to job site, submit the following to the Transportation Laboratory:

A. Delivery form including district number, EA, and contact information
B. List containing all LED signal module serial numbers anticipated for use
C. LED signal modules

Quality Control and Assurance

Module must be one listed on the Pre-Qualified Products List for LED traffic signals at:

http://www.dot.ca.gov/hq/esc/approved_products_list

The State will test LED signal module shipments as specified in ANSI/ASQ Z1.4.. Testing will be completed within 30 days of delivery to the Transportation Laboratory. LED signal modules tested or submitted for testing must be representative of typical production units. LED and circular LED signal modules will be tested as specified in California Test 604. Arrow, U-turn, and bicycle LED signal modules will be tested as specified in California Test 3001. All parameters of the specification may be tested on the modules. LEDs must be spread evenly across the module. LED arrow indication must provide the minimum initial luminous intensity listed. Measurements will be performed at the rated operating voltage of 120 V(ac).

Delays resulting from submittal of non-compliant materials do not relieve you from executing the contract within the allotted time. Non-compliant materials will be rejected. You must resubmit new LED for retesting and pick up the failed units within 7 days of notification. You must provide new LED signal modules and allow a minimum of 30 days for the retest. You must pay for all shipping and handling costs related to testing and retesting. Delays resulting from resubmittal and retesting are your responsibility and no extra time will be allowed.

After testing, you must pick up the tested LED signal modules from the Transportation Laboratory and deliver to the job site.

Warranty

The manufacturer must provide a written warranty against defects in materials and workmanship for LED signal modules for a minimum period of 48 months after installation of LED signal modules. Replacement LED signal modules must be provided within 15 days after receipt of failed LED modules at your expense. The State pays for shipping the failed modules to you. All warranty documentation must be submitted to the Engineer before installation. Replacement LED signal modules must be delivered to State Maintenance Electrical Shop at 175 Cluster Street, San Bernardino, CA 92408.

MATERIALS

Minimum power consumption for LED signal module must be 5 W.

LED signal module must have an operational lifecycle rating of 48 months. During the operational lifecycle, LED signal module must meet all parameters of this specification.

LED signal module must be designed for installation in the door frame of standard traffic signal housing.

LED signal module must:

A. Be 4 pounds maximum weight
B. Be manufactured for 12-inch circular and arrow
C. Be from the same manufacturer
D. Be the same model for each size
E. Be sealed units with:

    1. 2 color-coded conductors for power connection, except for lane control LED signal modules use 3 color-coded conductors.
    2. Printed circuit board and power supply contained inside and complying with Chapter 1, Section 6 of TEES published by the Department.
    3. Lens that is:

        3.1. Integral to the units
        3.2. Convex or flat with a smooth outer surface
        3.3. Made of UV stabilized plastic or glass, and withstands UV exposure from direct sunlight for 48 months without exhibiting evidence of deterioration

    4. 1-piece EPDM gasket

F. Include 3-foot long conductors with quick disconnect terminals attached
G. Be sealed in door frames

H. Fit into existing traffic signal section housing and comply with ITE publication, Equipment and Material Standards, Chapter 2, "Vehicle Traffic Control Signal Heads"

Individual LEDs must be wired so catastrophic loss or failure of 1 LED will not result in loss of more than 5 percent of the signal module light output. Failure of an individual LED in a string must not result in loss of entire string or other indication.

No special tools for installation are allowed.

12-inch Arrow

Comply with Section 9.01 of ITE publication, Equipment and Material Standards, Chapter 2, "Vehicle Traffic Control Signal Heads" for arrow indications.

LED signal module must:

A. Be weather tight and connect directly to electrical wiring.
B. Be capable of optical unit replacement.
C. Be a single, self-contained device, ready for installation into traffic signal housing.
D. Have manufacturer's name, trademark, model number, serial number, lot number, month and year of manufacture, and required operating characteristics, including rated voltage, power consumption, and volt-ampere, permanently marked on the back of the module.
E. Have a symbol of module type and color. Symbol must be an inch in diameter. Color must be written out in 0.50 inch high letters next to the symbol.
F. Be AlInGaP technology for red and yellow indications and gallium nitride technology for green indications.
G. Be ultra bright type rated for 100,000 hours of continuous operation from -40 °C to +74 °C.
H. Have a maximum power consumption as follows:

Power Consumption Requirements

LED Signal Module Type	Power Consumption (Watts)					
	Red		Yellow		Green	
	25 °C	74 °C	25 °C	74 °C	25 °C	74 °C
12-inch circular	11	17	22	25	15	15
12-inch arrow	9	12	10	12	11	11

Lens may be tinted, or may use transparent film or materials with similar characteristics to enhance "ON/OFF" contrasts. Tinting or other materials to enhance "ON/OFF" contrast must not affect chromaticity and must be uniform across the face of the lens.

If polymeric lens is used, surface coating or chemical surface treatment must be applied for front surface abrasion resistance.

Power supply must be integral to the module.

Internal components must be adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Lens and LED signal module material must comply with the ASTM specifications for that material.

Enclosures containing either the power supply or electronic components of LED signal module, except lenses, must be made of UL94VO flame-retardant material.

If a specific mounting orientation is required, the LED signal module must have prominent and permanent vertical markings for accurate indexing and orientation within the signal housing. Markings must include an up arrow, or the word "UP" or "TOP."

LED signal module must meet or exceed the following values when operating at 25 °C:

Minimum Initial Intensities for Circular Indications (cd)

				12-inch		
Angle (v,h)				Red	Yellow	Green
2.5, ±2.5				399	798	798
2.5, ±7.5				295	589	589
2.5, ±12.5				166	333	333
2.5, ±17.5				90	181	181
7.5, ±2.5				266	532	532
7.5, ±7.5				238	475	475
7.5, ±12.5				171	342	342
7.5, ±17.5				105	209	209
7.5, ±22.5				45	90	90
7.5, ±27.5				19	38	38
12.5, ±2.5				59	119	119
12.5, ±7.5				57	114	114
12.5, ±12.5				52	105	105
12.5, ±17.5				40	81	81
12.5, ±22.5				26	52	52
12.5, ±27.5				19	38	38
17.5, ±2.5				26	52	52
17.5, ±7.5				26	52	52
17.5, ±12.5				26	52	52
17.5, ±17.5				26	52	52
17.5, ±22.5				24	48	48
17.5, ±27.5				19	38	38

Minimum Luminance for Arrows Indications (FL)

	Red	Yellow	Green
Arrow Indication	1,605	3,210	3,210

LED signal module must meet or exceed the following illumination values for 48 months when operating over a temperature range of -40 °C to + 74 °C. Yellow LED signal module must meet or exceed the following illumination values for 48 months, when operating at 25 °C:

Minimum Maintained Intensities for Circular Indications (cd)

				12-inch		
Angle (v,h)				Red	Yellow	Green
2.5, ±2.5				339	678	678
2.5, ±7.5				251	501	501
2.5, ±12.5				141	283	283
2.5, ±17.5				77	154	154
7.5, ±2.5				226	452	452
7.5, ±7.5				202	404	404
7.5, ±12.5				145	291	291
7.5, ±17.5				89	178	178
7.5, ±22.5				38	77	77
7.5, ±27.5				16	32	32
12.5, ±2.5				50	101	101
12.5, ±7.5				48	97	97
12.5, ±12.5				44	89	89
12.5, ±17.5				34	69	69
12.5, ±22.5				22	44	44
12.5, ±27.5				16	32	32
17.5, ±2.5				22	44	44
17.5, ±7.5				22	44	44
17.5, ±12.5				22	44	44
17.5, ±17.5				22	44	44
17.5, ±22.5				20	41	41
17.5, ±27.5				16	32	32

Minimum Maintained Luminance for ArrowIndications (FL)

	Red	Yellow	Green
Arrow Indication	1,610	3,210	3,210

LED signal module must comply with the following chromaticity requirements for 48 months when operating over a temperature range of -40 °C to +74 °C.

Chromaticity Standards (CIE Chart)

Red	Y: not greater than 0.308, or less than 0.998 -x
Yellow	Y: not less than 0.411, nor less than 0.995 - x, nor greater than 0.452
Green	Y: not less than 0.506 - 0.519x, nor less than 0.150 + 1.068x, nor more than 0.730 - x

LED signal module must operate:

A. At a frequency of 60 Hz ± 3 Hz, over a voltage range from 95 V(ac) to 135 V(ac), without perceptible flicker to the unaided eye. Fluctuations of line voltage must have no visible effect on luminous intensity of the indications. Rated voltage for measurements must be 120 V(ac).

B. Compatible with currently used controller assemblies, including solid state load switches, flashers, and conflict monitors. Comply with TEES Chapters 3 and 6. If a 20 mA alternating current or less is applied to the unit, the voltage read across the 2 leads must be 15 V(ac) or less.

Wiring and terminal block must comply with Section 13.02 of ITE publication, Equipment and Material Standards, Chapter 2, "Vehicle Traffic Control Signal Heads." Electrical connection for each Type 1 LED signal module must be 2 secured, color-coded, 3-foot long, 600 V(ac), 20 AWG minimum stranded jacketed copper wires. Wires must comply with NEC, rated for service at +105 °C.

LED signal module on-board circuitry must:

A. Include voltage surge protection to withstand high-repetition noise transients. The voltage surge protection must comply with NEMA Standard TS2, Section 2.1.6.
B. Comply with FCC, Title 47, SubPart B, Section 15 regulations for Class A emission limits for electronic noise.

LED signal module must provide a power factor of 0.90 or greater.

Total harmonic distortion from current and voltage induced into an alternating current power line by LED signal module must not exceed 20 percent at an operating temperature of 25 °C.

When power is applied to LED signal module, light emission must occur within 90 ms.

Red and Yellow Flashing LED Signal Module

10-3.14 BATTERY BACKUP SYSTEM:

GENERAL

Summary

This work includes installing battery backup system (BBS). Comply with Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and TEES.

The State will furnish BBS components as listed in "Materials" of these special provisions.

The Contractor shall furnish the external cabinet and batteries.

Submittals

Before shipping external cabinets to the jobsite, submit material list including contract number, cabinet serial numbers, and contact information to the Transportation Laboratory.

Submit a Certificate of Compliance for each external cabinet and batteries to the Engineer under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

Quality Control and Assurance

The State may test the cabinets.

Functional Testing

After complete installation, BBS functional test must be performed. Test for 30 minutes of continuous, satisfactory operation with utility power turned off. Perform test in the presence of the Engineer.

Warranty

Batteries must be warranted by the manufacturer to operate within a temperature range of -25 °C to +60 °C for 2 years.

Batteries must have a written warranty against defects in materials and workmanship from the manufacturer prorated for a period of 60 months after installation. You must provide the Engineer with all warranty documentation before installation. Replacement batteries must be available within 5 business days after receipt of failed batteries at no cost to the State except the cost of shipping the failed batteries. Replacement batteries must be delivered to Caltrans Maintenance Electrical Shop at 175 Cluster Street, San Bernardino, CA 92408.

MATERIALS

Batteries must:

A. Be deep cycle, sealed prismatic, lead-calcium-based, absorbed-glass mat and valve-regulated lead acid (AGM/VRLA) type
B. Have voltage rating of 12 V

C. Be group size 24
D. Be commercially available and stocked locally
E. Have a carrying handle
F. Be marked with date code, maximum recharge data, and recharge cycles
G. Have 2 top-mounted, threaded, stud posts that include all washers and nuts required for attaching 3/8-inch ring lugs of a State-furnished BBS battery harness
H. Include rubber insulating protective covers for protecting the lugs, posts, and wiring - red for positive terminal and black for negative terminal
I. Be new and fully-charged when furnished
J. Be free from damage or deformities

External cabinet must be one listed on the Pre-Qualified Products List at:

http://www.dot.ca.gov/hq/esc/approved_products_list/

External cabinet must be capable of housing:

A. 8 batteries
B. Inverter/charger unit
C. Power transfer relay
D. Manually-operated bypass switch
E. Required control panels
F. Wiring and harnesses

Dimensions and details for the external cabinet, for attaching the external cabinet to the Model 332A cabinet, and for wiring the State-furnished equipment will be available in an information handout as described in "Project Information" of these special provisions.

The following details must comply with Section 86-3.04, "Controller Cabinets," of the Standard Specifications and TEES:

A. Door construction, including material, thickness, coating, and welds
B. Frame
C. Door seals
D. Continuous stainless steel piano hinge or 4 leaves with 2 bolts on each side of each leaf, used to connect the door to external cabinet
E. Padlock clasp or latch and lock mechanism

The external cabinet must be ventilated by using louvered vents, filter, and a thermostatically controlled fan. Fan must be AC-operated from the same line output as the Model 332A cabinet. A 2-position terminal block must be provided on the fan panel, along with 10 feet of connected hookup wire.

The external cabinet surface must be anodized aluminum. Anti-graffiti paint must not be used.

The external cabinet must include all bolts, washers, nuts, and cabinet-to-cabinet coupler fittings necessary for mounting it to the Model 332A cabinet.

Fasteners for the external cabinet must include:

A. 8 cabinet mounting bolts that are 18-8 stainless steel hex head, fully-threaded, and 3/8" – 16 x 1"
B. 2 washers per bolt designed for 3/8-inch bolt and are 18-8 stainless steel 1-inch OD round flat type
C. K-lock nut per bolt: K-lock washer that is 18-8 stainless steel and hex-nut

External cabinet to Model 332A cabinet couplings must include a conduit for power connections between the 2 cabinets. Couplings must include:

A. 2-inch nylon-insulated steel chase nipple, T & B 1947 or equivalent
B. 2-inch sealing, steel locknut, T & B 146SL or equivalent
C. 2-inch nylon-insulated steel bushing, T & B 1227 or equivalent

CONSTRUCTION

Mount external cabinet to either the left or right side of Model 332A cabinet.

The typical side-mounting location of external cabinet is flush with the bottom of the Model 332A cabinet and approximately equidistant from the front and rear door edges.

MEASUREMENT AND PAYMENT

The contract unit price paid for battery backup system is included in the contract lump sum price paid for Modify Signals And Lighting including full compensation for furnishing all labor, materials (except State-furnished materials), tools, equipment, and incidentals and for doing all the work involved in assembling and installing battery backup system, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

MANDATORY EQUIPMENT SOURCE

The contractor shall acquire the battery backup assembly from the State of California Department of Transportation (Caltrans), and shall compensate the State of California for costs incurred in obtaining, testing and supplying a Battery Backup System Assembly. This fee does not supersede any other fee charged by Caltrans for review, inspection or fieldwork performed by department staff as a result of the contractors work. If the fee has not been paid prior to permit issuance, full payment shall be made to the district cashier prior to starting any traffic signal work authorized by this permit, and at least thirty days before the controller is needed for installation. The contractor shall give the State's representative not less than 10 working days written advance notice prior to picking up the controller assembly, however, when the controller assembly arrives to the Caltrans warehouse located in the City of San Bernardino, the contractor shall have three working days to pick up equipment upon notification. If the contractor fails to pick up equipment upon notification of its arrival to the warehouse, the contractor will be charged $50.00 a day for storing equipment. When the equipment is requested by the contractor or upon its arrival, Caltrans will provide a time and

location for picking up the battery backup assembly and shall be furnished by the Contractor.

Full compensation for the actual cost of obtaining, testing and supplying the battery backup assembly, as paid by Contractor to Caltrans, shall be made on a force account basis, in accordance with Section 9-1.03 of the Standard Specifications and these Special Provisions, up to the fixed bid price. No markups will be allowed. All incidental costs incurred by the contractor shall be considered as included signal and lighting, and no compensation will be allowed therefor.

Installation

The Contractor shall construct the controller cabinet foundations (including furnishing and installing anchor bolts), and shall install the controller cabinets on said foundations, and make all field wiring connections to the terminal blocks in the controller cabinets.

The Contractor shall install the Battery Backup System, its cabinet as specified, and all ancillary equipment.

The Battery Backup System shall be in accordance to the provisions of Section No. 86-3.03, "Model 170E and Model 2070 Controller Assemblies".

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

The cost of picking up and delivering each battery backup assembly shall be included in the Lump Sum price paid for the signal and lighting and no additional compensation shall be allowed therefor.

Any State furnished battery backup assembly that is damaged, after the Contractor has taken possession of the item, shall be repaired to the satisfaction of the Engineer. If the damaged battery backup assembly is considered irreparable it shall be replaced with a battery backup assembly meeting the provisions included in the County of Riverside Specifications, "BATTERY BACKUP SYSTEM ASSEMBLIES SPECIFICATIONS", available from the Engineer.

The total repair or replacement costs shall be borne by the Contractor.

The Battery Backup System monitoring unit shall be tested in the field before "Turn On".

The Contractor shall arrange to have a signal technician qualified to work on the controller and employed by the controller manufacturer or his representative, present at the time the equipment is turned on. It shall be the responsibility of the Contractor to implement and fund any battery backup system assembly modifications required to achieve the traffic signal operation as shown on the construction plans.

The qualified signal technician shall install any applicable program modules and shall program the assembly in accordance with Caltrans specifications.

10-3.15 LIGHT EMITTING DIODE PEDESTRIAN SIGNAL FACE MODULES:

GENERAL

Summary

This work includes installing LED pedestrian signal face (PSF) module into standard Type A pedestrian signal housing. Comply with Section 86, "Electrical Systems," of the Standard Specifications.

Submittals

Before shipping LED PSF modules to job site, submit the following to the Transportation Laboratory:

A. Delivery form including district number, EA, and contact information
B. List containing all LED PSF module serial numbers anticipated for use
C. LED PSF modules

Quality Control and Assurance

Module must be one listed on the Pre-Qualified Products List for LED traffic signals at:

http://www.dot.ca.gov/hq/esc/approved_products_list

The State will test LED PSF module shipments as specified in ANSI/ASQ Z1.4.. Testing will be completed within 30 days of delivery to the Transportation Laboratory. LED PSF modules tested or submitted for testing must be representative of typical production units. LED PSF modules will be tested as specified in California Test 606. All parameters of the specification may be tested on the modules.

Delays resulting from submittal of non-compliant materials do not relieve you from executing the contract within the allotted time. Non-compliant materials will be rejected. You must resubmit new LED for retesting and pick up the failed units within 7 days of notification. You must provide new LED PSF modules and allow a minimum of 30 days for the retest. You must pay for all shipping and handling costs related to testing and retesting. Delays resulting from resubmittal and retesting are your responsibility and no extra time will be allowed.

After successful testing, you must pick up the tested LED PSF modules from the Transportation Laboratory and deliver to the job site.

Warranty

The manufacturer must provide a written warranty against defects in materials and workmanship for LED PSF modules for a minimum period of 48 months after installation of LED PSF modules. Replacement LED PSF modules must be provided within 15 days after receipt of failed LED PSF modules at your expense. The State pays for shipping the failed modules to you. All warranty documentation must be submitted to the Engineer before installation. Replacement LED PSF modules must be delivered to State Maintenance Electrical Shop at 175 Cluster Street, San Bernardino, CA 92408.

MATERIALS

LED PSF module must:

A. Be from the same manufacturer.
B. Be installed in standard Type A pedestrian signal housing, "UPRAISED HAND" and "WALKING PERSON." Do not include reflectors.
C. Use LED as the light source.
D. Be designed to mount behind or replace face plates of standard Type A housing as specified in ITE publication, Equipment and Material Standards, Chapter 3, "Pedestrian Traffic Control Signal Indications" and the "California MUTCD."
E. Have a minimum power consumption of 10 W.
F. Use required color and be ultra bright type rated for 100,000 hours of continuous operation from -40 °C to +74 °C.
G. Be able to replace signal lamp optical units and pedestrian signal faces with both LED and incandescent light sources.
H. Fit into pedestrian signal section housings without modifications to the housing. The housing must comply with ITE publication, Equipment and Materials Standards, Chapter 3, "Pedestrian Traffic Control Signal Heads."
I. Be a single, self-contained device, not requiring on-site assembly for installation into standard Type A housing.
J. Have the following information permanently marked on the back of module:

    1. Manufacturer's name
    2. Trademark
    3. Model number
    4. Serial number
    5. Lot number
    6. Month and year of manufacture
    7. Required operating characteristics, as follows:

        7.1. Rated voltage
        7.2. Power consumption
        7.3. Volt-ampere (VA)
        7.4. Power factor

K. Have prominent and permanent vertical markings for accurate indexing and orientation within the signal housing if a specific mounting orientation is required. Markings must

include an up arrow, or the word "UP" or "TOP." Marking must be a minimum of 1-inch diameter.

Circuit board and power supply must be contained inside the LED PSF modules. Circuit board must comply with Chapter 1, Section 6 of TEES published by the Department.

Individual LEDs must be wired so catastrophic loss or failure of 1 LED will not result in loss of more than 5 percent of the PSF module light output. Failure of an individual LED in a string must not result in the loss of entire string or other indication.

LEDs must be evenly distributed in each indication. Do not use outline forms.

No special tools for installation are allowed.

Installation of the LED PSF module into pedestrian signal face must require only removal of lenses, reflectors, lamps, and existing LED modules.

Power supply for LED PSF module must be integral to the module. Power supply for each symbol must be isolated to avoid turn-on conflict.

Assembly and manufacturing processes for LED PSF module must assure that all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Material used for LED PSF module must comply with ASTM D 3935.

Enclosures containing either the power supply or electronic components of LED PSF module, except lenses, must be made of UL94VO flame-retardant material.

Color of "UPRAISED HAND" symbol must be portland orange.

Color of "WALKING PERSON" symbol must be lunar white.

Each symbol must not be less than 10 inches high and 6.5 inches wide. Uniformity ratio of illuminated symbols must not exceed 4 to 1 between highest and lowest luminance areas. Symbols must comply with ITE publication, Equipment and Material Standards, Chapter 3, "Pedestrian Traffic Control Signal Indications," and the "California MUTCD."

LED PSF module must maintain an average luminance value over 48 months of continuous use in signal operation for a temperature range of -40 °C to +74 °C. In addition, LED PSF modules must meet or exceed the following luminance values upon initial testing at 25 °C.

Luminance Values

PSF module	Luminance
UPRAISED HAND	1,094 FL
WALKING PERSON	1,547 FL

Color output of LED PSF module must comply with chromaticity requirements in Section 5.3 of ITE publication, Equipment and Material Standards, Chapter 3, "Pedestrian Traffic Control Signal Indications."

Measured chromaticity coordinates of LED PSF module must comply with the following chromaticity requirements for 48 months when operating over a temperature range of -40 °C to +74 °C.

Chromaticity Standards (CIE Chart)

UPRAISED HAND (portland orange)	Not greater then 0.390, nor less than 0.331, nor less than 0.997-X
WALKING PERSON (lunar white)	X: not less than 0.280, nor greater than 0.320 Y: not less than 1.055*X - 0.0128, nor greater than 1.055*X + 0.0072

LED PSF module maximum power consumption must not exceed the following values:

Power Consumption Requirements

PSF module	Power Consumption @ 24°C	Power Consumption @ 74°C
UPRAISED HAND	10.0 W	12.0 W
WALKING PERSON	9.0 W	12.0 W

Wiring and terminal block must comply with Section 13.02 of ITE publication, Equipment and Material Standards, Chapter 2, "Vehicle Traffic Control Signal Heads." The LED PSF module must be supplied with spade lugs and 3 secured, color-coded, 3-foot long, 600 V(ac), 20 AWG minimum stranded jacketed copper wires. Wires must comply with NEC, rated for service at +105 °C.

LED PSF module must operate:

A. At a frequency of 60 Hz ± 3 Hz over a voltage range from 95 V(ac) to 135 V(ac) without perceptible flicker to the unaided eye. Fluctuations of line voltage must have no visible effect on luminous intensity of the indications. Rated voltage for measurements must be 120 V(ac).
B. Compatible with currently used State controller assemblies including solid state load switches, flashers, and conflict monitors. Comply with TEES Chapters 3 and 6. If a 20 ma alternating current or less is applied to the unit, the voltage read across the 2 leads must be 15 V(ac) or less.

LED PSF module on-board circuitry must:

A. Include voltage surge protection to withstand high-repetition noise transients. The voltage surge protection must comply with NEMA Standard TS2, Section 2.1.6.

B. Comply with FCC, Title 47, SubPart B, Section 15 regulations for Class A emission limits for electronic noise.

LED PSF module must provide a power factor of 0.90 or greater.

Total harmonic distortion from current and voltage induced into an alternating current power line by LED PSF module must not exceed 20 percent at an operating temperature of 25 °C.

The LED PSF module circuitry must prevent perceptible light emission to the unaided eye when a voltage, 50 V(ac) or less is applied to the unit.

When power is applied to LED PSF module, light emission must occur within 90 ms.

The "UPRAISED HAND" and "WALKING PERSON" symbol indications must be electrically isolated from each other. Sharing a power supply or interconnect circuitry between the 2 indications is not allowed.

10-3.16 DETECTORS:

Loop detector sensor units will be State-furnished in conformance with the provisions in "Materials" of these special provisions.

Loop detector lead-in cable shall be Type B.

For Type E detector loops, 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 1-1/2 inches. Slot width shall be a maximum of 5/8 inch. Loop wire for circular loops shall be Type 2.

Slots of circular loops shall be filled with hot melt rubberized asphalt sealant.

Slots in portland cement concrete shall be filled with hot-melt rubberized asphalt sealant conforming to the provisions in Section 95-2.09, "Epoxy Sealant for Inductive Loops," of the Standard Specifications.

10-3.17 VIDEO IMAGE VEHICLE DETECTION SYSTEM:

GENERAL

Summary

This work includes installing video image vehicle detection system (VIVDS) for traffic signals.
Comply with Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications.

Submittals

Submit proposed list of materials before starting work. Submit drawings and other data before the completion of the contract. Submittals include:

Submittals

Item	Description
Certificate of compliance	For VIVDS as specified in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.
Site analysis report	Written analysis for each detection site, recommending the optimum video sensor placement approved by the manufacturer.
Lane configuration	Shop drawing showing detection zone setback, detection zone size, camera elevation, selected lens viewing angle, illustration of detection zone mapping to reporting contact output, and illustration of output connector pin or wire terminal for lane assignment.
Configuration record	Windows XP or later version of PC compatible CD containing the final zone designs and calibration settings to allow reinstallation.
Mounting and wiring information	Approved wiring and service connection diagrams wrapped in clear self-adhesive plastic, placed in a heavy duty plastic envelope, and secured to the inside of the cabinet door.
Communication protocol	Industry standard available in public domain. Document defining message structure organization, data packet length, message usability, and necessary information to operate a system from a remote Windows based personal computer.
Programming software	CD containing set up and calibration software that observes and detects the vehicular traffic, including bicycles, motorcycles, and sub-compact cars, with overlay of detection zones and allows adjustment of the detection sensitivity from a traffic signal application.
Detector performance DVD recordings and analysis	Performance analysis based on 24-hour DVD recording of contiguous activity for each approach. Include 2 contiguous hours of sunny condition, with visible shadows projected a minimum of 6 feet into the adjacent lanes, and two 1-hour night periods with vehicle headlights present.
Preventative maintenance parts documentation	Documentation containing equipment replacement parts list for preventative maintenance, including electrical parts, mechanical parts, and assemblies.
Acceptance testing schedule	Submit schedule for approval 15 days before acceptance testing of VIVDS. Acceptance testing is separate from detector performance and analysis.
Acceptance testing documentation	Documentation for using support equipment to perform acceptance testing without assistance.
Training	Submit training material for approval 30 days before training.
Warranty	Manufacturer's written warranty against defects in material and workmanship for VIS assemblies and VDU, for 24-month period after VIVDS installation.

Quality Control and Assurance

Training

Provide a minimum of 16 hours of training by a factory authorized representative for up to 12 students. Training content must include instructions for aligning, programming, adjusting, calibrating, and maintaining VIVDS. You must provide all materials and equipment for the training. Notify the Engineer 20 days before training and agree on a training time. If agreement cannot be reached, the Engineer will determine the time. Training area will be determined by the Engineer.

Warranty

After final acceptance of VIVDS, provide replacement video image sensor assembly (VIS) and video detection unit (VDU) within 10 days after receipt of failed units at no cost to the State, except the cost of shipping failed VIS and VDU. Deliver replacement VIS and VDU to: 175 Cluster Street, San Bernardino, CA 92408.

MATERIALS

Functional Requirements

VIVDS must include a VIS and mounting hardware assembly installed on a pole or mast-arm. Use a clamping device as mounting hardware on standards. Include VDU, image processor, extension module and communication card, power supply, surge suppression, cables, connectors, and wiring for connecting to the State-furnished Model 332A traffic controller cabinet.

VIS and zoom lens must be housed in an environmentally sealed enclosure, watertight and protected from dust, and must comply with NEMA 4 standards. Enclosure must include a thermostat controlled heater to prevent condensation and to ensure proper lens operation at low temperatures. Adjustable sun shield that diverts water from the camera's field of view must be included. Assembly must have waterproof connections for power, control and video signal cables, and wiring.

VIVDS must include necessary firmware, hardware, and software for designing the detection patterns or zones at the intersection or approach. Detection zones must be created with a graphic user interface designed to allow trained State employee to configure and calibrate a lane in less than 15 minutes. System must support normal operation of existing detection zones while a zone is being added or modified. Zone must flash or change color on a viewing monitor when vehicular traffic is detected.

Software and firmware must detect vehicular traffic presence, provide vehicle counts, set up detection zones, test VIVDS performance, and allow video scene and system operation viewing from a remote location. VIVDS must support a minimum of 2 separate detection patterns or zones that can be enacted by a remote operator.

VIVDS detection zone must detect vehicles by providing an output for presence and pulse. At least 1 detection output must be provided for each detection zone. One spare detection output must be provided for each approach. Detection performance must be achieved for each detection zone with a maximum of 8 user-defined zones for every camera's field of view.

VIVDS must detect the presence of vehicles under all types of adverse weather and environmental conditions, including snow, hail, fog, dirt, dust or contaminant buildup on the lens or faceplate, minor camera motion, and excessive vibration. If less than 95 percent detection accuracy results from low visibility conditions, the VIVDS must respond by selecting a fail-safe default pattern, placing a constant call mode for all approaches. VIVDS outputs must assume a fail-safe "on" or "call" pattern for presence detection if video signal or

power failure is not available and must recover from a power failure by restoring normal operations within 3 minutes without manual intervention. If powered off for more than 90 days, system must maintain the configuration and calibration information in memory.

Detection algorithm must be designed to accommodate naturally occurring lighting and environment changes, specifically the slow moving shadows cast by buildings, trees, and other objects. These changes must not result in a false detection or mask a true detection. VIVDS must not require manual interventions for day-night transition or for reflections from poles, vehicles or pavement during rain and weather changes. VIVDS must suppress blooming effects from vehicle headlights and bright objects at night.

Vehicle detection must call service to a phase only if a demand exists and extend green service to the phase until the demand is taken care of or until the flow rates have reduced to levels for phase termination. VIVDS must detect the presence of vehicular traffic at the detection zone positions and provide the call contact outputs to the Model 2070 with the following performance:

Detector Performance

Requirements	Performance during AMBER and RED interval	Performance during GREEN interval
Average response time after vehicle enters 3' into detection zone or after departing 3' past detection zone	≤ 1 Sec	≤ 100 ms
Maximum number of MISSED CALLS in 24-hour duration, where MISSED CALLS are greater than 5 sec. during AMBER and RED intervals and greater than 1 sec. during GREEN intervals (upon entering 3' of detection zone or after departing 3' past detection zone).	0	10
Maximum number of FALSE CALLS in 24-hour duration (calls greater than 500ms without a vehicle present)	20	20

Each camera and its mounting system must be less than 10 pounds and less than 1 square foot equivalent pressure area. Only 1 VIVDS camera must be mounted on a traffic signal or luminaire arm. Top of camera must not be more than 12 inches above top of arm.

VIVDS must be able to locally store, for each lane, vehicle count data in 5, 15, 30, and 60 minute intervals for a minimum period of 7 days and be remotely retrievable. VIVDS must count vehicular traffic in detection zone with a 95 percent accuracy or better over a 1-day period with a minimum range of 50 feet to the limit line for each approach.

VDU front panel must have indicators for power, communication, and presence of video input for each video sensor, and a real time detector output operation. Hardware or software test switch must be included to allow the user to place either a constant or momentary call for each approach. Indicators must be visible in daylight from 5 feet away.

A flat panel video display with a minimum 8-inch screen and that supports National Television Standards Committee (NTSC) video output must be furnished and installed in the Model 332A cabinet for viewing video detector images and for performing diagnostic testing. Display must be viewable in direct sunlight. Each VIVDS must have video system

connections that support the NTSC video output format, can be seen in each camera's field of view, and has a program to allow the user to switch to any video signal at an intersection. A metal shelf or pull-out document tray with metal top capable of supporting the VDU and monitor must be furnished and placed on an EIA 19 inch rack with 10-32 "Universal Spacing" threaded holes in the Model 332A cabinet. Furnished EIA 19 inch rack must comply with EIA standard EIA-310-B. System must allow independent viewing of a scene while video recording other scenes without interfering with the operation of the system's output.

VIVDS must have a serial communication port that supports sensor unit setup, diagnostics, and operation from a local PC compatible laptop with Windows XP or later version operating system. VIVDS must have an ethernet communication environment. VIVDS must include central and field software to support remote real-time viewing and diagnostics for operational capabilities through wide area network (WAN) or wireless.

Technical Requirements

System elements must be designed to operate continuously in an outdoor traffic monitoring and control environment, all day, every day. Manufactured electronic components must support a minimum mean time between failures (MTBF) value of 10 years.

Video sensor must use a charge-coupled device (CCD) element and support NTSC and RS170 video output formats with resolution of not less than 360 horizontal lines. Video sensor must include an auto gain control (AGC) circuit, have a minimum sensitivity to scene luminance from 0.1 lux to 10,000 lux, and produce a usable video image of vehicular traffic, under all roadway lighting conditions and regardless of the time of day. Video sensor must have a motorized lens with variable focus and zoom control with an aperture of f/1.4 or better. Focal length must allow ± 50 percent adjustment of the viewed detection scene.

Enclosed VIS must operate between –37 °C to +74 °C and zero percent to 95 percent relative humidity.

Sensor unit mounting hardware must be powder-coated aluminum, stainless steel, or treated to withstand 250 hours of salt fog exposure as specified in ASTM B 117 without any visible corrosion damage.

VDU, image processors, extension modules, and video output assemblies must be inserted into the controller input file slots using the edge connector to obtain limited 24V DC power and to provide contact closure outputs. Cabling the output file to a "D" connector on the front of the VDU is acceptable. No rewiring to the standard Model 332A cabinet is allowed. Controller cabinet resident modules must comply with the requirements in Chapter 1 and Sections 5.2.8, 5.2.8.1, 5.2.8.2, 5.4.1, 5.4.5, 5.5.1, 5.5.5, and 5.5.6 of TEES.

VIVDS must operate between 90 to 135 VAC service as specified in NEMA TS-1. VIS, excluding the heater circuit, must draw less than 10 watts of power. Power supply or transformer for the VIVDS must meet the following minimum requirements:

Minimum Requirements for Power Supply and Transformers

Item	Power Supply	Transformer
Power Cord	Standard 120VAC, 3 prong cord, 3 ft minimum length (may be added by Contractor)	Standard 120VAC, 3 prong cord, 3 ft minimum length (may be added by Contractor)
Type	Switching mode type	Class 2
Rated Power	Two times (2x) full system load	Two times (2x) full system load
Operating Temperature	-37 °C to 74 °C	-37 °C to 74 °C
Operating Humidity Range	From 5 percent to 95 percent	From 5 percent to 95 percent
Input Voltage	From 90 V to 135 V AC	From 90 V to 135 V AC
Input Frequency	60 Hz ± 3 Hz	60 Hz ± 3 Hz
Inrush Current	Cold start, 25 A max. at 115 V	N/A
Output Voltage	As required by VIVDS	As required by VIVDS
Overload Protection	From 105 percent to 150 percent in output pulsing mode	Power limited at >150 percent
Over Voltage Protection	From 115 percent to 135 percent of rated output voltage	N/A
Setup, Rise, Hold Up	800ms, 50ms,15ms at 115V AC	N/A
Withstand Voltage	I/P-0/P:3kV, I/P-FG:1.5kV, for 60 sec.	I/P-0/P:3kV, I/P-FG:1.5kV, for 60 sec
Working Temperature	Not to exceed 70°C@30% load	Not to exceed 70 °C@ 30 percent load
Safety Standards	UL 1012, TUV EN60950	UL 1585
EMC Standards	EN55022 Class B, EN61000-4-2, 3, 4, 5	N/A

Field terminated circuits must include transient protection as specified in IEEE Standard 587-1980, Category C. Video connections must be isolated from ground.

Wiring must be routed through end caps or existing holes. New holes for mounting or wiring must be shop-drilled.

VIVDS and support equipment required for acceptance testing must be new and as specified in the manufacturer's recommendations. Date of manufacture, as shown by date codes or serial numbers of electronic circuit assemblies, must not be older than 12 months from the scheduled installation start date. Material substitutions must not deviate from the material list approved by the Engineer.

CONSTRUCTION

For materials and installation comply with the manufacturer's recommendations. All equipment, cables, and hardware must be part of an engineered system that is designed by the manufacturer to fully inter-operate with all other system components. Mounting assemblies must be corrosion resistant. Connectors installed outside the cabinets and enclosures must be corrosion resistant, weather proof, and watertight. Exposed cables must be sunlight and weather resistant. Label cables with permanent cable labels at each end.

Install VDU in a State-furnished Model 2070 controller assembly. Install VIS power supply or transformer on a standard DIN rail using standard mounting hardware and power conductors wired to DIN rail mounted terminal blocks in the controller cabinet.

Wire each VIS sensor assembly to the controller cabinet with a wiring harness that includes all power, control wiring, and coaxial video cable. Attach harness with standard Mil type and rated plugs. Cable type and wire characteristics must comply with manufacturer's recommendations for the VIS to cabinet distance of the project. Wiring and cables must be continuous (without splices) between the VIS sensor and controller cabinet. Coil a minimum of 7 feet of slack in the bottom of the controller cabinet. For setup and diagnostic access, terminate serial data communication output conductors at TB-0 and continue for a minimum of 10 feet to a DB9F connector. Tape ends of unused and spare conductors to prevent accidental contact to other circuits. Label conductors inside the cabinet for the functions depicted the approved detailed diagrams.

Adjust the lens to view 110 percent of the largest detection area dimension. Zones or elements must be logically combined into reporting contact outputs that are equivalent to the detection loops and with the detection accuracy required.

Verify the performance of each unit, individually, and submit the recorded average and necessary material at the conclusion of the performance test. Determine and document the accuracy of each unit, individually, so that each unit may be approved or rejected separately. Failure to submit necessary material at the conclusion of testing invalidates the test. The recorded media serves as acceptance evidence and must not be used for calibration. Calibration must have been completed before testing and verification.

Verify the detection accuracy by observing the VIVDS performance and recorded video images for a contiguous 24-hour period. The recorded video images must show the viewed detection scene, the detector call operation, the signal phase status for each approach, the vehicular traffic count, and time-stamp to 1/100 of a second, all overlaid on the recorded video. Transfer the 24-hour analysis to DVD.

VIVDS must meet the detection acceptance criterion specified in table titled "Detector Performance."

Calculate the VIVDS's vehicular traffic count accuracy as $100[1-(|TC-DC|/TC)]$, where DC = detector's vehicular traffic count and TC = observed media-recorded vehicular traffic count.

The Engineer will review the data findings and accept or reject the results within 7 days. Vehicle anomalies or unusual occurrences will be decided by the Engineer. Data or counts not agreed by the Engineer will be considered errors and count against the unit's calibration. If the Engineer determines that the VIVDS does not meet the performance requirements, you must re-calibrate and retest the unit, and resubmit new test data within 7 days. After 3 failed attempts, you must replace the VIVDS with a new unit.

Notify the Engineer 20 days before the unit is ready for acceptance testing. Acceptance testing must be scheduled to be completed before the end of a normal work shift. You must demonstrate that all VIS cameras and VDUs satisfy the functional requirements.

PAYMENT

Full compensation for furnishing and installing video image vehicle detection system shall be considered as included in the contract lump sum price paid for signal and lighting per location includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing video image vehicle detection system, complete in place, including testing, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer, and no separate payment will be made therefor.

Repair, replacement, and retesting of VIVDS components due to failure or rejection is the Contractor's expense.

10-3.18 LUMINAIRES:

Ballasts shall be the lag regulator type.

10-3.19 PHOTOELECTRIC CONTROLS:

Contactors shall be the mechanical armature type.

10-3.20 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT:

Salvaged electrical materials shall be hauled to the Caltrans Banning Maintenance Station located at 2033 E. Ramsey Street, Banning, California 92220, and stockpiled.

The Contractor shall provide the equipment, as necessary, to safely unload and stockpile the material. A minimum notice of 2 business days shall be given prior to delivery.

10-3.21 DISPOSING OF ELECTRICAL EQUIPMENT:

Fluorescent light ballasts which contain polychlorinated biphenyls (PCBs) shall be disposed of in conformance with the California Department of Toxic Substances Control (DTSC) Regulations set forth in Title 22, Division 4.5, Chapter 42, of the California Code of Regulations.

Ballasts and transformers that contain polychlorinated biphenyl (PCB) are designated as extremely hazardous wastes and fluorescent tubing and mercury lamps are designated as

hazardous wastes under Title 22, Division 4.5, Chapter 11, Article 4.1 and Article 5, of the California Code of Regulations.

The State assumes generator responsibility for these wastes. The Engineer will prepare the Hazardous Waste Manifest for Shipment. Ballasts shall be packaged and transported to a hazardous waste disposal facility. The Contractor shall package and transport fluorescent lights to an appropriately permitted facility.

PAYMENT

Full compensation for hauling, stockpiling, and disposing of transformers, fluorescent tubing and mercury lamps and non-leaking fluorescent light ballasts shall be considered as included in the contract price paid for the various items of work and no additional compensation will be allowed therefor.

10-3.22 PAYMENT:

The contract lump sum price or prices paid for modify signals and lighting (removals) and modify signals and lighting shall include highway lighting at intersections in connection with signals only.

Other roadway lighting on the project shall be considered as included in the contract lump sum price paid for modify lighting and sign illumination.
Full compensation for hauling and stockpiling electrical materials shall be considered as included in the contract price paid for the item requiring the material to be salvaged and no additional compensation will be allowed therefor.

If any of the fabrication sites for the materials listed are located more than 300 air line miles from both Sacramento and Los Angeles, additional shop inspection expenses will be sustained by the State. Whereas it is and will be impractical and difficult to determine the actual increase in these expenses, it is agreed that payment to the Contractor for furnishing these listed materials from each fabrication site located more than 300 air line miles from both Sacramento and Los Angeles will be reduced $2,000:

1. Service equipment enclosures

The contract lump sum price paid for lighting (city street), shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in lighting (city street), complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Standard Plans List

The Standard Plan sheets applicable to this contract include, but are not limited to those indicated below. Applicable Revised Standard Plans (RSP) and New Standard Plans (NSP) indicated below are included in the project plans as Standard Plan sheets.

ACRONYMS, ABBREVIATIONS AND SYMBOLS

A10A	**Acronyms and Abbreviations (Sheet 1 of 2)**
A10B	**Acronyms and Abbreviations (Sheet 2 of 2)**
A10C	**Symbols (Sheet 1 of 2)**
A10D	**Symbols (Sheet 2 of 2)**

PAVEMENT MARKERS, TRAFFIC LINES, AND PAVEMENT MARKINGS

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

EXCAVATION AND BACKFILL

A62A	**Excavation and Backfill – Miscellaneous Details**
A62C	**Limits of Payment for Excavation and Backfill – Bridge**

OBJECT MARKERS, DELINEATORS, CHANNELIZERS AND BARRICADES

A73A	**Object Markers**
A73B	**Markers**
A73C	**Delineators, Channelizers and Barricades**

METAL BEAM GUARD RAILING – STANDARD RAILING SECTIONS

A77A1	**Metal Beam Guard Railing – Standard Railing Section (Wood Post with Wood Block)**
A77B1	**Metal Beam Guard Railing – Standard Hardware**
A77C1	**Metal Beam Guard Railing – Wood Post and Wood Block Details**
A77C2	**Metal Beam Guard Railing Steel Post, Notched Wood Block and Notched Recycled Plastic Block Details**
A77C3	**Metal Beam Guard Railing – Typical Line Post Embedment and Hinge**

	Point Offset Details
RSP A77C4	Metal Beam Guard Railing – Typical Railing Delineation and Dike Positioning Details

METAL BEAM GUARD RAILING – TYPICAL LAYOUTS FOR EMBANKMENTS

RSP A77E1	Metal Beam Guard Railing – Typical Layouts for Embankments

METAL BEAM GUARD RAILING – TYPICAL LAYOUTS FOR STRUCTURES

RSP A77F1	Metal Beam Guard Railing – Typical Layouts for Structure Approach
A77F5	Metal Beam Guard Railing – Typical Layouts for Structure Departure
A77H1	Metal Railing – End Anchor Assembly (Type SFT)

METAL BEAM GUARD RAILING – CONNECTIONS DETAILS AND TRANSITION RAILING TO BRIDGE RAILINGS, ABUTMENTS AND WALLS

RSP A77J1	Metal Beam Guard Railing – Connections to Bridge Railings without Sidewalks Details No. 1
RSP A77J4	Metal Beam Guard Railing – Transition Railing (Type WB)
A77K2	Metal Beam Guard Railing – Connections to Bridge Railings with Sidewalks Details No. 2

METAL BEAM GUARD RAILING – TERMINAL SYSTEM END TREATMENT

A77L1	Metal Beam Railing – Terminal System (Type SRT)
A77L3	Metal Beam Railing – Terminal System (Type ET)

THRIE BEAM BARRIER – STANDARD BARRIER SECTIONS

A78A	Thrie Beam Barrier – Standard Barrier Railing Section (Wood Post with Wood Block)
RSP A78C1	Thrie Beam Barrier – Standard Hardware Details
A78C2	Thrie Beam Barrier – Post and Block Details
A78D1	Thrie Beam Barrier – at Fixed Objects in Median

CURBS, DRIVEWAYS, DIKES, CURB RAMPS AND ACCESSIBLE PARKING

RSP A87A	Curbs and Driveways
A87B	Asphalt Concrete Dikes
RSP A88A	Curb Ramp Details
A88B	Curb Ramp and Island Passageway Details

PAVEMENTS

RSP P1	Jointed Plain Concrete Pavement
RSP P10	Concrete Pavement – Dowel Bar Details
RSP P18	Concrete Pavement – Lane Schematics and Isolation Joint Detail
RSP P20	Concrete Pavement – Joint Details
RSP P30	Jointed Plain Concrete Pavement – End Panel Pavement Transitions

DRAINAGE INLETS, PIPE INLETS AND GRATES

NSP D71	Drainage Inlet Markers
D72	Drainage Inlets
RSP D74B	Drainage Inlets
D74C	Drainage Inlets Details
RSP D77A	Grate Details
D77C	Alternative Hinged Cover for Type OL and OS Inlets and Trash Rack for Type OCP Inlet

GUTTER AND INLET DEPRESSIONS

D78A	Gutter Depressions

CONCRETE PIPE – DIRECT DESIGN METHOD

D79	Precast Reinforced Concrete Pipe – Direct Design Method

PIPE DOWNDRAINS, ANCHORAGE SYSTEMS AND OVERSIDE DRAINS

D87D	Overside Drains

CONSTRUCTION LOADS ON CULVERTS AND STRUT DETAILS

D88	Construction Loads on Culverts

FLARED END SECTIONS

D94A	Metal and Plastic Flared End Sections
D94B	Concrete Flared End Sections

PIPE COUPLING AND JOINT DETAILS

D97C	Corrugated Metal Pipe Coupling Details No. 3 – Helical and Universal Couplers
RSP D97D	Corrugated Metal Pipe Coupling Details No. 4 – Hugger Coupling Bands
RSP D97E	Corrugated Metal Pipe Coupling Details No. 5 – Standard Joint
RSP D97F	Corrugated Metal Pipe Coupling Details No. 6 – Positive Joint
D97H	Reinforced Concrete Pipe or Non-Reinforced Concrete Pipe – Standard and Positive Joints
NSP D97I	Corrugated Polyvinyl Chloride Pipe with Smooth Interior – Standard and Positive Joints
NSP D97J	Composite Steel Spiral Rib Pipe with Smooth Interior – Standard Joint

STRUCTURAL SECTION DRAINS

D99B	Edge Drain Outlet and Vent Details

PLANTING AND IRRIGATION

RSP H1	Planting and Irrigation – Abbreviations
RSP H2	Planting and Irrigation – Symbols

H3	Planting and Irrigation Details
H4	Planting and Irrigation Details
RSP H5	Planting and Irrigation Details
H6	Planting and Irrigation Details
RSP H7	Planting and Irrigation Details
RSP H8	Planting and Irrigation Details
H9	Planting and Irrigation Details

TEMPORARY CRASH CUSHIONS, RAILING AND TRAFFIC SCREEN

RSP T1A	Temporary Crash Cushion, Sand Filled (Unidirectional)
RSP T1B	Temporary Crash Cushion, Sand Filled (Bidirectional)
RSP T2	Temporary Crash Cushion, Sand Filled (Shoulder Installations)
T3	Temporary Railing (Type K)
T4	Temporary Traffic Screen

PROJECT FUNDING SIGNS

RSP T7	Construction Project Funding Identification Signs
T10A	Traffic Control System for Lane and Complete Closures on Freeways and Expressways
T14	Traffic Control System for Ramp Closure

TEMPORARY WATER POLLUTION CONTROL

T51	Temporary Water Pollution Control Details (Temporary Silt Fence)
RSP T56	Temporary Water Pollution Control Details (Temporary Fiber Roll)
T57	Temporary Water Pollution Control Details (Temporary Check Dam)
T58	Temporary Water Pollution Control Details (Temporary Construction Entrance)
NSP T61	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
NSP T62	Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)
NSP T65	Temporary Water Pollution Control Details [Temporary Fence (Type ESA)]

BRIDGE DETAILS

B0-1	Bridge Details
B0-3	Bridge Details
B0-5	Bridge Details

PILES

B2-3	16" and 24" Cast-In-Drilled-Hole Concrete Pile

RETAINING WALLS

B3-3	Retaining Wall Type 1A

B3-8	Retaining Wall Details No. 1
B3-9	Retaining Wall Details No. 2

JOINT SEALS

RSP B6-21	Joint Seals (Maximum Movement Rating = 2")

BOX GIRDER DETAILS

B7-1	Box Girder Details

DECK DRAINS

B7-6	Deck Drains – Types D-1 and D-2
B7-8	Deck Drainage Details

UTILITY OPENING

B7-10	Utility Opening – Box Girder

CAST-IN-PLACE PRESTRESSED GIRDER

B8-5	Cast-In-Place Prestressed Girder Details

CHAIN LINK RAILING, CABLE RAILING AND TUBULAR HAND RAILING

B11-47	Cable Railing
B11-52	Chain Link Railing Type 7

BRIDGE CONCRETE BARRIERS

B11-54	Concrete Barrier Type 26
B11-55	Concrete Barrier Type 732
B11-56	Concrete Barrier Type 736

WATER SUPPLY LINE (BRIDGE)

B14-5	Water Supply Line (Details) (Pipe Sizes Less Than 4")

ROADSIDE SIGNS

RS1	Roadside Signs, Typical Installation Details No. 1
RS2	Roadside Signs – Wood Post, Typical Installation Details No. 2
RS4	Roadside Signs, Typical Installation Details No. 4

OVERHEAD SIGNS (LIGHTWEIGHT)

S45	Overhead Signs – Lightweight, Type C, Connection Details
S46	Overhead Signs – Lightweight, Sign Panel Mounting Details, Laminated Panel – Type A
S47	Overhead Signs – Lightweight, Light Fixture Mounting Details
S48	Overhead Signs – Lightweight Post Details
S49	Overhead Signs – Lightweight Foundation Details

OVERHEAD AND ROADSIDE SIGNS PANELS

S81	Overhead Laminated Sign – Single or Multiple Panel, Type A (1" Thick)
S86	Laminated Panel Details – Extrusions for Type A, B and H Panels
S87	Type A-1 Mounting Hardware – Overhead Laminated Type A Panel, Truss and Lightweight Sign Structures
S88	Type A-2 Mounting Hardware – Overhead Laminated Type A Panel, Bridge Mounted and Tubular Sign Structures

ELECTRICAL SYSTEMS – SYMBOLS AND ABBREVIATIONS

RSP ES-1A	Electrical Systems (Symbols and Abbreviations)
RSP ES-1B	Electrical Systems (Symbols and Abbreviations)
RSP ES-1C	Electrical Systems (Symbols and Abbreviations)

ELECTRICAL SYSTEMS – SERVICE EQUIPMENT AND WIRING DIAGRAMS

ES-2A	Electrical Systems (Service Equipment)
RSP ES-2C	Electrical Systems (Service Equipment Notes, Type III Series)
RSP ES-2E	Electrical Systems (Service Equipment and Typical Wiring Diagram, Type III – B Series)
RSP ES-2F	Electrical Systems (Service Equipment and Typical Wiring Diagram Type III – C Series)

ELECTRICAL SYSTEMS – CONTROLLER CABINETS

ES-3C	Electrical Systems (Controller Cabinet Details)

ELECTRICAL SYSTEMS – SIGNAL HEADS, SIGNAL FACES AND MOUNTINGS

ES-4A	Electrical Systems (Signal Heads and Mountings)
ES-4B	Electrical Systems (Signal Heads and Mountings)
RSP ES-4C	Electrical Systems (Signal Heads and Mountings)
RSP ES-4D	Electrical Systems (Signal Heads and Mountings)
ES-4E	Electrical Systems (Signal Faces and Mountings)

ELECTRICAL SYSTEMS – DETECTORS

RSP ES-5A	Electrical Systems (Detectors)
ES-5B	Electrical Systems (Detectors)
ES-5C	Electrical Systems (Detectors)
ES-5D	Electrical Systems (Detectors)

ELECTRICAL SYSTEMS – LIGHTING STANDARDS

RSP ES-6A	Electrical Systems (Lighting Standard, Types 15 and 21)
ES-6B	Electrical Systems (Lighting Standard, Types 15 and 21, Barrier Rail Mounted Details)

ELECTRICAL SYSTEMS – SIGNAL AND LIGHTING STANDARD, PUSH BUTTON POSTS AND TYPE 15TS STANDARD

ES-7A	Electrical Systems (Signal and Lighting Standards, Push Button Posts and Type 15TS Standard)
RSP ES-7D	Electrical Systems (Signal and Lighting Standard – Case 2 Arm Loading, Wind Velocity = 100 mph, Arm Lengths 15' to 30')
RSP ES-7E	Electrical Systems (Signal and Lighting Standard – Case 3 Arm Loading, Wind Velocity = 100 mph, Arm Lengths 15' to 45')
RSP ES-7F	Electrical Systems (Signal and Lighting Standard – Case 4 Arm Loading, Wind Velocity = 100 mph, Arm Lengths 25' to 45')
RSP ES-7G	Electrical Systems (Signal And Lighting Standard – Case 5 Arm Loading, Wind Velocity = 100 mph, Arm Lengths 50' to 55')

ELECTRICAL SYSTEMS – SIGNAL AND LIGHTING STANDARD DETAILS

ES-7M	Electrical Systems (Signal and Lighting Standards – Details No. 1)
ES-7N	Electrical Systems (Signal and Lighting Standards – Details No. 2)

ELECTRICAL SYSTEMS – PULL BOX DETAILS

ES-8	Electrical Systems (Pull Box Details)

ELECTRICAL SYSTEMS – ELECTRICAL DETAILS, STRUCTURE INSTALLATIONS

RSP ES-9A	Electrical Systems (Electrical Details, Structure Installations)
ES-9B	Electrical Systems (Electrical Details, Structure Installations)
RSP ES-9C	Electrical Systems (Electrical Details, Structure Installations)
ES-9D	Electrical Systems (Electrical Details, Structure Installations)

ELECTRICAL SYSTEMS – ISOFOOTCANDLE DIAGRAMS AND FOUNDATION DETAILS

ES-10	Electrical Systems (Isofootcandle Diagrams)
ES-11	Electrical Systems (Foundation Installations)

ELECTRICAL SYSTEMS – SIGN ILLUMINATION EQUIPMENT AND CONTROLS

ES-15C	Electrical Systems (Sign Illumination Equipment)
RSP ES-15D	Electrical Systems (Lighting and Sign Illumination Control)

ATTACHMENTS

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 Inspections					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.

OFFICE OF
CLERK OF THE BOARD OF SUPERVISORS
1st FLOOR, COUNTY ADMINISTRATIVE CENTER
P.O. BOX 1147, 4080 LEMON STREET
RIVERSIDE, CA 92502-1147
PHONE: (951) 955-1060
FAX: (951) 955-1071

KECIA HARPER-IHEM
Clerk of the Board of Supervisors

KIMBERLY A. RECTOR
Assistant Clerk of the Board

May 5, 2011

THE PRESS ENTERPRISE
ATTN: LEGALS
PO BOX 792
RIVERSIDE, CA 92501

FAX (951) 368-9018
E-MAIL: legals@pe.com

RE: NOTICE INVITING BIDS: INTERSTATE 215 at RAMONA EXPRESSWAY/CAJALCO EXPRESSWAY

To Whom It May Concern:

Attached is a copy for publication in your newspaper for **TEN (10) TIMES:**

Sunday	- May 8, 2011	Friday	- May 13, 2011
Monday	- May 9, 2011	Saturday	- May 14, 2011
Tuesday	- May 10, 2011	Sunday	- May 15, 2011
Wednesday	- May 11, 2011	Monday	- May 16, 2011
Thursday	- May 12, 2011	Tuesday	- May 17, 2011

We require your affidavit of publication immediately upon completion of the last publication.

Your invoice must be submitted to this office in duplicate, WITH TWO CLIPPINGS OF THE PUBLICATION.

NOTE: PLEASE COMPOSE THIS PUBLICATION INTO A SINGLE COLUMN FORMAT.

Thank you in advance for your assistance and expertise.

Sincerely,

Mcgil
Cecilia Gil, Board Assistant to
KECIA HARPER-IHEM, CLERK OF THE BOARD

3.46 of 04-26-11

Gil, Cecilia

From: PE Legals <legals@pe.com>
Sent: Thursday, May 05, 2011 8:17 AM
To: Gil, Cecilia
Subject: RE: FOR PUBLICATION: I215 at RAMONA / CAJALCO EXPRESSWAY

Received for publication on 5/8, 5/17

enterprise media
Publisher of The Press-Enterprise

From: Gil, Cecilia [mailto:CCGIL@rcbos.org]
Sent: Thursday, May 05, 2011 7:58 AM
To: PE Legals
Subject: FOR PUBLICATION: I215 at RAMONA / CAJALCO EXPRESSWAY

Good Morning!

Here's the 1st one this morning: Notice Inviting Bids for above-mentioned project, for publication from May 8 to May 17, 2011. Please confirm. THANK YOU!

Cecilia Gil
Board Assistant to the
Clerk of the Board of Supervisors
951-955-8464

THE COUNTY ADMINISTRATIVE CENTER IS CLOSED EVERY FRIDAY UNTIL FURTHER NOTICE.
PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING.

NOTICE INVITING BIDS

County of Riverside, herein called Owner, invites sealed proposals for:

INTERSTATE 215 AT
RAMONA EXPRESSWAY / CAJALCO EXPRESSWAY
INTERCHANGE IMPROVEMENTS
IN THE COUNTY OF RIVERSIDE

PROJECT No. B8-0691

Proposal shall be delivered to the Riverside County Transportation Department, 14th Street Annex, 3525 14th Street, Riverside, California 92501, telephone (951) 955-6780 not later than 2:00 p.m., on Wednesday, June 1, 2011, to be promptly opened in public at said address. Each proposal shall be in accordance with plans, specifications, and other contract documents, dated July 2010, and prepared by County of Riverside, whose address is same as the above, from whom they may be obtained upon deposit of $135 per full size plan set (or $65 per half size plan set [11"x17"], plus mailing. No refund. Prospective bidders may preview the plans, specifications and other contract documents, at no charge prior to purchase, at the above noted location.

The Contractor is required to have a Class "A" license at the time of bid submission.

Engineering Estimate:	$5,251,000.00 - $6,127,000.00
Bid Bond	10 %
Performance Bond	100%
Payment Bond	100%
Working Days	250 Working Days

www.tlma.co.riverside.ca.us/trans

Dated: May 5, 2011

Kecia Harper-Ihem, Clerk of the Board
By: Cecilia Gil, Board Assistant

enterprise media

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BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE
P.O. BOX 1147
RIVERSIDE CA 92502

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Ad Desc.: I215 PROJECT NO. B8-0691

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper of general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673 and under date of August 25, 1995, Case Number 267864; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

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05-17-11

I Certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: May. 17, 2011
At: Riverside, California

BOARD OF SUPERVISORS

P.O. BOX 1147
COUNTY OF RIVERSIDE
RIVERSIDE CA 92502

Ad #: 10644479

PO #:

Agency #: _____

Ad Copy:

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PROJECT No. B8-0691

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www.tlma.co.riverside.ca.us/trans

Dated: May 5, 2011 — Kecia Harper-Ihem, Clerk of the Board
By: Cecilia Gil, Board Assistant 5/8-5/17