

City of Oakley

ADDENDUM NO. 1 to contract documents for
OAKLEY RECREATION CENTER INTERSECTION IMPROVEMENT
AND SIGNALIZATION PROJECT, CIP # 194

BID OPENING DATE: May 18, 2017 2:00 PM

Notice is hereby given that the following clarifications and revisions are made to the above referenced contract documents:

Updates to the Plans and Specifications pages:

Specifications Part I:

- Section A. Unit Price Schedule

Specifications Part III:

- Section 10-1.11 "Pavement Reinforcing Fabric" was deleted and replaced with new section 10-1.11 "Earthwork".
- Section 10-1.12 "Portland Cement Concrete" Materials section was revised.
- Section 10-1.17 "Traffic Signals" was revised.
- Section 10-1.19 "Landscape and Irrigation" was added

Plans:

- Plan sheet E-1

All bidders shall acknowledge receipt and acceptance of Addendum No. 1 by signing in the space provided at the end of this Addendum and submitting the signed addendum with their proposal.



Jason Kabalin

Associate Engineer
May 10, 2017

Contractor Signature

Date

Company Name

A. UNIT PRICE SCHEDULE

The undersigned, Pursuant to and in compliance with your Notice to Contractors and the Contract Documents relating to the **OAKLEY RECREATION CENTER, INTERSECTION IMPROVEMENT AND SIGNALIZATION**, including Addenda No. _____, _____, _____, as Bidder, declares that the only persons or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any other person, firm, or corporation; that he has carefully examined the location of the proposed work, the annexed proposed form of contract, and the plans therein referred to; and he proposes and agrees if this proposal is accepted that he will contract with the City of Oakley in the form of the scope of the contract annexed hereto, to provide all necessary machinery, tools, apparatus, and other means of construction, and to do all the work and furnish all the materials specified in the contract, in the manner and time therein prescribed, and according to the requirements of the Engineer as therein set forth, and that he will take in full payment therefore the following item prices, to wit:

BID ITEMS

ITEM NO.	DESCRIPTION OF ITEM	EST. QTY	U/M	UNIT PRICE	TOTAL
1	Mobilization	1	LS		
2	Traffic and Pedestrian Control System and Construction Area Signs	1	LS		
3	Clearing and Grubbing	5,000	SF		
4	Storm Water Pollution Prevention Plan (SWPPP)	1	LS		
5	Storm Water Pollution Control Implementation	1	LS		
6	Remove and Dispose of Asphalt Concrete Pavement and Base	157	SY		
7	Remove Curb and Gutter, Curb and Dikes	LF	460		
8	Remove Concrete	SF	1,780		
9	Remove Trees	EA	7		
10	Remove Traffic Striping and Markings and Prepare Lead Compliance plan	1	LS		
11	HMA (TYPE A)	110	TON		
12	Roadway Excavation	188	CY		
13	City Standard Sidewalk	795	SF		
14	Stamped Concrete	310	SF		
15	City Standard Curb & Gutter	140	LF		
16	City Standard Vertical Curb	225	LF		
17	Curb Ramp (Caltrans Case A)	2	EA		
18	Curb Ramp (Caltrans Case C)	2	EA		

ITEM NO.	DESCRIPTION OF ITEM	EST. QTY	U/M	UNIT PRICE	TOTAL
19	Curb Ramp (Caltrans Case F)	1	EA		
20	Aggregate Base (CL-2)	98	CY		
21	New City Standard Inlet	1	EA		
22	15" PVC Pipe	90	LF		
23	Adjust Utility Structures to Grade	1	LS		
24	Relocate Sign	1	LS		
25	Adjust SSMH to Grade	1	LS		
26	Reconstruct City Monument	1	LS		
27	Relocate Back Flow Preventer	1	LS		
28	New Traffic Signal	1	LS		
29	Street Lighting	1	LS		
30	Signing and Striping	1	LS		
31	Landscape and Irrigation	1	LS		

Total Bid (Items 1-31) \$ _____
(Numbers)

Dollars

(Written)

Pursuant to the Public Contract Code § 20103.8c the lowest bid shall be “the lowest total of the bid prices on the base contract and those additive or deductive items that when taken in order from a specifically identified list of those items in the solicitation, and added to, or subtracted from, the base contract, are less than, or equal to, a funding amount publicly disclosed by the local agency before the first bid is opened.” In this case, the funding amount publically disclosed is the Engineer’s Estimate, which totals \$581,865.

Tack coat shall be applied to all vertical edges to be paved against including curb faces and gutter lips. The Contractor shall protect concrete surfaces that are not to be paved against from tack coat spray or splash. Any tack coat more than one inch above the paving surface shall be removed by power washing or other means.

MEASUREMENT AND PAYMENT

No separate payment will be made for work or other features as required and outlined in this Section. Full compensation for such work and features shall be considered to be included in the unit costs in the Bid Schedule for items which include hot mix asphalt. No additional compensation for tack coat will be allowed.

10-1.11 EARTHWORK

GENERAL

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the 2015 Caltrans Standard Specifications and these special provisions.

MATERIALS

Suitable material from excavation may be used as fill in areas that require embankment. Unsuitable material shall become the property of the Contractor and shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the 2015 Caltrans Standard Specifications.

CONSTRUCTION

Where a portion of the existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw before removing the surfacing.

MEASUREMENT AND PAYMENT

The contract price paid per cubic yard for ROADWAY EXCAVATION shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, including sawcutting, drain ditches, and slope rounding, as shown on the plans, specified in the 2015 Caltrans Standard Specifications and these Special Provisions and directed by the Engineer.

10-1.12 PORTLAND CEMENT CONCRETE

GENERAL

Existing and new concrete facilities including curbs, curbs and gutters, sidewalks, curb ramps, and commercial and private driveways shall be removed and replaced or constructed at the locations indicated on the plans or as directed by the Engineer.

Concrete curbs, sidewalks, gutters, driveways, curb ramps and detectable warning surfaces shall comply with Section 73, "Concrete Curbs and Sidewalks" of the 2015 Caltrans Standard Specifications.

MATERIALS

Portland Cement Concrete

PCC for concrete pavement must comply with section 90-1, "General," of the Standard Specifications.

Reinforcement must comply with Section 52, "Reinforcement," of the Standard Specifications. Minor Concrete for curbs, curb and gutter, sidewalks, and commercial and private driveways must comply with Section 90-2, "Minor Concrete" of the Standard Specifications.

Concrete Mix Design

The Contractor shall furnish a concrete mix design for the Engineer at least ten working days prior to the start of the work, based on the following guidelines:

General concrete facilities including curb, gutter, sidewalk, medians, and curb ramps shall meet the following requirements:

Compressive Strength:	Compressive Strength: 2500 psi @ 28 days
Maximum Slump:	5 inches

Driveways and driveway approaches shall meet the following requirements:

Compressive Strength:	2000 psi @ 3 days, 4000 psi @ 28 days
Maximum Slump:	4 inches

The Contractor shall be responsible for all costs associated with the required mix design. All concrete shall include two (2) pounds of liquid lamp black per cubic yard of concrete. Liquid lamp black color shall be "Davis A 8090 black" or approved equal.

Quality Assurance Field Testing

Field testing shall include testing for concrete slump as per ASTM C-143 and compressive strength (C39). Such testing shall be at a frequency determined by the Engineer and shall be performed by the Owner's laboratory at the Owner's expense. The Contractor shall furnish the concrete necessary for casting test cylinders.

Detectable Warning Surface

The contractor shall furnish and install detectable warning surface material on curb ramps in conformance with Caltrans Standard Details. On all new concrete construction, detectable warning surface shall be 'wet-set' system embedded into new concrete. Surface applied or 'mat' systems for detectable warning surface material only allowed if prior approval is made by the City's Engineer.

CONSTRUCTION

Contractor shall supply a certificate of compliance at time of each concrete placement.

All work shall conform to the provisions of Section 90, "Concrete," of the Standard Specifications. All curb ramps shall comply with Title 24 and current UBC requirements.

The existing concrete shall be sawcut full depth prior to removal. Any concrete broken due to the Contractor's failure to comply with these requirements shall be removed and replaced at the

10-1.17 TRAFFIC SIGNALS

GENERAL

The work shall consist of furnishing all the labor, materials, tools, and equipment necessary to construct and complete in an efficient, operative, and workmanlike manner the installation of traffic signal systems in accordance with the Plans and these Technical Provisions. The Work also includes the exploratory excavations by potholing at the locations of all proposed light poles. **Traffic Signals shall conform to the provisions in Section 86, "General" and Section 87, "Electrical Systems" of the 2015 Standard Specifications and these Special provisions.**

The controller cabinet schematic wiring diagram and intersection sketch shall be combined into one drawing and placed in the cabinet drawer. When the cabinet door is open, the drawing shall be oriented with the intersection.

The Contractor shall provide to the Engineer a copy of all purchase orders for equipment and materials used in reference to traffic signals within five days of when such orders are placed. The Contractor shall also provide copies of all correspondence with equipment and materials suppliers concerning availability, delivery dates, anticipated delays, and shipment notices within five days of each letter. References to costs may be omitted. Consideration for recommending time extensions for materials and equipment delivery delays will not be made unless these provisions are met.

The Contractor shall furnish two maintenance and operation manuals for all cabinets, controller units, vehicle detector sensor units, and any other auxiliary equipment furnished. The maintenance manual and operation manual 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, previous to purchase.

The maintenance manual shall include, but not be limited to, the following items:

- 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

The Contractor is not required to furnish the manuals if they have recently supplied hardware to Contra Costa County. Manuals are required if furnished hardware is different than that recently supplied.

The Contractor shall be responsible for locating and marking the positions of all signal standards and pull boxes. The Engineer may assist the Contractor in locating the above items. The Engineer shall approve all locations before any work is performed.

MATERIALS

Standards, Steel Pedestals and Posts

Standards shall conform to Section 86-1.02J, "Standards, Poles, Pedestals, and Posts," of the Caltrans Specifications and with the Standard Plans except as modified herein.

Only a side tenon at the end of the signal mast arm will be acceptable. Spacing of tenons shall be as indicated on the plans.

Handholes for signal standards shall be located 90deg. clockwise from the traffic signal mast arm. Sheet steel shall have a minimum yield of 48,000 psi.

All signal standards shall have a minimum of 2 inches and a maximum of 3 inches of grout installed between the bottom of the base plate and the finish grade.

The City will furnish to the contractor the following materials for installation. The contractor shall furnish all additional materials, including foundations, for the proper installation of each pole. The contractor shall pick up City furnished materials at the City maintenance yard.

Pole Type	Quantity
27-4-100 with 45' Signal mast arm	1
26-4-100 with 45' Signal mast arm and 15' Luminaire mast arm	1
19-4-100 with 25' Signal mast arm and 15' Luminaire mast arm	1
17-3-100 with 20' Signal mast arm and 15' Luminaire mast arm	1
15TS with 15' Luminaire mast arm	1
1-B	3
PBA Post	3

On all signal standards, the Contractor shall install an aluminum, flexible sign, 6-8" wide and 4-6" high, indicating that posting anything to the signs is prohibited. The sign shall be installed in the field after the poles have been erected, above the pedestrian push button (or in the direction of the intersection if there is no pushbutton). The Contractor shall submit a sample of the sign to City staff for approval prior to installing any of the signs. A sample is provided below:



Conduit

Conduit which is installed underground shall be Type 3, rigid, nonmetallic type, Schedule 40. All conduits shall enter a pullbox with a 90 degree elbow, unless permitted otherwise by the Engineer. All conduits shall have a ¼ inch pull rope installed in them. Bell ends or bushings shall be installed on all conduits.

After conductors have been installed, the ends of conduits terminating in pull boxes and controller cabinets shall be sealed with a sealing compound approved by the Engineer.

Conduit runs shown on the plans to be located behind curbs may be installed in the street. Trenching for conduit installation within the street section is PERMITTED if delay to any vehicle will not exceed 10 minutes. The top of the installed conduit shall be a minimum of 12 inches below finish grade in the street section. The trench shall be backfilled with commercial quality concrete.

All trenches shall be finish paved within 24 hours of the installation of the Portland cement concrete backfill. If the Contractor does not comply with this section, the Engineer will order the work done by others and deduct the cost of doing the work from monies due the Contractor.

When rigid non-metallic conduit is placed in a trench other than in the street section, and after the conduit installed, the trench shall be backfilled with PCC Slurry. No native material backfill will be permitted.

The conduit in a foundation and between a foundation and the nearest pullbox shall be the rigid metallic type.

All trenching, conduit installation, and backfill is to be done before the final overlay of the street. No work is to be done in the street after the final overlay of the street has been completed.

Pullboxes

Pullbox sumps shall be constructed from 1 ½" minimum clean/washed river run rock. All pull boxes shall be "PCC Type", unless permitted otherwise by the Engineer.

Reinforced plastic/fiberglass lids for pull boxes, in sidewalks or islands, are permitted, unless shown otherwise on the plans. All 20" x 42" pullboxes shall be furnished with split lids, and shall be labeled "Traffic Signal."

Conductors and Cables

Conductors and Cables shall conform to Section 86-1.02F, "Conductors and Cables," of the Caltrans Specifications and with the Standard Plans except as modified herein.

Identification bands shall be constructed from a nylon cable tie with at least a 3/8-inch by 3/4-inch label flag attached. The marking pen shall be one recommended by the manufacturer of the cable tie or it shall be an indelible marking pen compatible with writing on the nylon material. No other method of labeling will be acceptable. All phase conductors shall be labeled in the pullbox nearest their termination, and in the controller cabinet. Phase conductors shall be labeled with phase designation. Lighting conductors (street or sign) shall be labeled as appropriate. Spare conductors need not be labeled.

The Contractor shall provide to the Engineer a Certificate of compliance from the Manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all the conductors and cables furnished for the project.

Service

The Contractor shall furnish and install the Type III-AF Service Equipment Cabinet for switchgear as shown on the signal plans and as provided in the Standard Specifications, and these Special Provisions.

Service cabinet shall conform to the following:

- 1) All hinges shall be continuous stainless steel piano type.
- 2) Cabinet shall be constructed from stainless steel. Interior may be constructed from cold rolled galvanized steel. Inside paneling shall be white; exterior shall be white RAL#9001 Coating process shall be "powderpaint."
- 3) A copy of the service cabinet wiring diagram shall be furnished to the Engineer for approval prior to fabrication of the cabinet.
- 4) The meter enclosure shall be provided with factory-installed bypass facilities as required by the serving utility.
- 5) The exterior dimensions of the cabinet shall not exceed 65in high; 13in wide; and 9in deep.
- 6) All interior bussing shall be copper.
- 7) All exterior seams shall be welded.
- 8) "POP RIVETS" shall not be used for assembly of the exterior of the cabinet. "POP RIVETS", bolts, or nuts shall not be visible from the exterior.
- 9) The luminaire termination points shall be capable of holding up to four conductors.
- 10) The serving utility terminations shall be in the meter area.
- 11) Wiring shall be labeled with permanent, clip sleeve wire markers. Felt, pencil, and stick back markers are not acceptable.
- 12) The lexan window shall be no less than ¼ inch and shall be sealed.
- 13) All circuit breakers shall be installed in a vertical position.
- 14) The service neutral shall be terminated in the customer area of the cabinet.
- 15) Items 1 thru 17, and 20 thru 25 shall be furnished as shown on Standard Plan Sheet ES-2D. Item 15 shall be 2P, and Sign/Highway Lighting shall be 120 Volts.
- 16) All overlapping exterior seams and doors shall meet the requirements for Type 3R enclosures specified in the NEMA Enclosure Standards.
- 17) The bottom of the lowest circuit breaker shall be 24 inches minimum above the bottom of the service equipment enclosure.
- 18) Provisions shall be made in the cabinet for a PEU for Lighting. Lens shall be ¼ inch and shall be sealed. PEU shall be located away from oncoming automobile headlights.
- 19) Manufacturer shall install a key lock in the door.

The neutral conductor shall run from the service equipment enclosure to the controller cabinet without splicing to any other neutral conductor.

Uninterrupted Power Supply

Contractor shall provide an "Uninterrupted Power Supply (UPS)" for each signal location, which shall provide a minimum of 2 hours of "full" operation run time for each traffic signal, and then revert to flash operation at a preset battery voltage level. Manufacturer shall verify the number of LED signal heads at each intersection, and provide the number of batteries necessary for the 2-hour operation at each site. A minimum of three (3) batteries shall be provided. The UPS shall be integrated within the service cabinet in a manner recommended by the manufacturer. The UPS shall be a TESCO Controls Model No. 27-22BBS, or approved equal, and shall conform to the following:

Enclosure

UPS and batteries shall be enclosed within the service pedestal. All shelves and hardware shall be stainless steel construction. Enclosure shall have fully framed side hinged outer doors with swaged close tolerance sides for flush fit with drip lip and closed cell neoprene flange compressed gaskets. Front door shall incorporate a full-length stainless steel piano hinge, pad- lockable draw latch (center area on door – latch side, no hasps), and shall provide a Best Lock key lock. There shall be no exposed nuts, bolts, screws, rivets or other fasteners on the exterior of the enclosure. Battery connectors shall be Anderson Connectors with silver plated contacts. Batteries shall be installed in fixed position framed trays for seismic safety and be readily accessible for maintenance. Batteries shall be mounted allowing airflow front and back. Enclosure shall include two transfer bypass switches, one for UPS bypass the second for auxiliary generator. All switches must be panel mounted on interior dead front panel board. UV resistant plastic laminated nameplates shall identify all controls and major components. A plastic covered wiring diagram will be attached to the inside of the front door. A flash initiation relay and associated wiring shall be furnished for installation in the controller cabinet. All components shall be factory wired and conform to required NEMA, NEC and UL standards. A chassis ground point shall be provided. Panel shall be UL 508 Industrial Control Panel rated.

UPS Panel Minimum Features

- 1) Generator transfer switch, with UPS bypass, and lockable metallic, 30-amp external reverse service plug.
- 2) UPS bypass and UPS isolation switch.
- 3) Necessary relays and wiring for flash output to controller cabinet.
- 4) Dead front safety panel board with all switches, indicating fuses, plugs, and isolation fuses for each battery pre-wired with phenolic nameplates.
- 5) All nameplates shall be screwed on phenolic engraved type.
- 6) All wire terminating lugs shall be full wrap around type.
- 7) All batteries shall be captive spaced from external cabinet sides in earthquake proof buckets.
- 8) Cabinet ventilation shall be by (qty. 4) 4" x ¼" louvers top and bottom with encapsulated bug screens, cleanable filters and a 100CFM fan to completely exchange air 25 times per minute.
- 9) All DC terminals and connections shall incorporate safety covers such that the safety covers are in place for every normal maintenance mode.

UPS Unit Minimum Specifications

UPS unit shall provide a true sine-wave output with minimum 1400 Volt-Amp continuous capacity. UPS must provide for utility service isolation when in operation. The minimum rating for wattage output will be 950 watts. The UPS shall be capable of running an intersection with all LED lights for 120 minutes. The unit shall operate off-line, with transfer time of 2 ms or less, with battery condition indicator, with automatic test provisions, and with hot-swappable batteries (all batteries in system). UPS will automatically recharge batteries from full discharge to 95% capacity within 6 hours. UPS will provide on-line operation for a minimum input range of 92 to 145 VAC, provide full load output of 120VAC –10% / +4% at 60 Hz +/- 0.05% over a temperature range of –37°C to +74°C and be a UL Approved Design. The UPS unit will be delivered with maintenance manuals and schematic diagrams.

UPS Unit Minimum Features

- 1) 1400VA950 Watts
- 2) Surge energy withstand 480 Joules, 6.5kA
- 3) Common mode clamping 0 ns < 5 ns typical UL 1449
- 4) Conditioned power – Computer quality

- 5) Transient lighting protection – 160 Joules
- 6) Transfer to battery time – 2 ms
- 7) Retransfer to utility – 2 ms
- 8) Each battery shall be 24 volts @ 18 AH with heavy duty Anderson plugs and isolated fused (dead front panel mounted 30 amp) connections to the UPS for greater system reliability and maintainability. Series wiring is unacceptable.
- 9) Fan cooling shall be fused for locked rotor current.
- 10) Cooling air shall be ducted to cool the front and back of each battery with air space on all four sides and top of each battery.
- 11) UPS covers shall be 60% open on both sides to diminish the environmental reaction to extreme temperatures.
- 12) Includes a DB9 Computer Interface Port.
- 13) Low voltage safety design at 24V DC. (Higher voltage DC systems are unacceptable).

UPS Communications Module

- 1) Smart Slot Relay I/O Module;
 - Input #1 Turn the UPS on.
 - Input #2 Turn the UPS off.
 - Input #3 Start the UPS self-test.
 - Input #4 Shut down the UPS (when on battery).
 - Output #1 The UPS is on-battery (during a power failure, self-test or run time calibration).
 - Output #2 UPS has a low battery – Programmable.
 - Output #3 The protected load is not receiving power from the UPS.
 - Output #4 Replace the UPS batteries.
 - Output #5 The UPS is overloaded.
 - Output #6 Any UPS fault or self-test failure.

Batteries

Batteries shall be maintenance-free, type AGM/VRLA (Absorbed Glass Mat/ Valve Regulated Lead Acid), such as APC Smart-UPS RMXL or approved equal. Pre-wired with heavy-duty 50 amp silver-plated Anderson Connectors to each battery individually. (Series or parallel wiring will not be acceptable)

Enclosure Temperature Compensation

Operating temperature shall be a minimum -37 °C to +74°C.

Power System Analyzer and Conflict Resolution Module

The UPS shall incorporate an integrated Power System Analyzer and Conflict Resolution Module. The Analyzer will evaluate and make limited adjustments to the incoming utility power and will automatically transfer load to the UPS battery back-up power if utility power is lost. When utility power becomes available, the system will automatically return to normal operation.

The Conflict Resolution Module will provide automatic UPS failure detection and automatically isolate the failed UPS and transfer the load back to utility power. Once the failure has been corrected, the system will return to normal operation. This system shall include the following as a minimum:

Triple Bypass System for Offline UPS

- 1) SPACT- Smart Power Analyzer with Conflict Monitor Isolation and Transfer Module.
- 2) Watchdog Timer- Redundant 5ms delay and hard transfer to utility power.

- 3) The outboard Smart Transfer Switch shall not interrupt the normal controller function. Transfer time shall be 2ms.
- 4) Onboard Smart I/O module will execute lockout of battery backup system upon Smart detection of any inverter UPS fault. If UPS resets itself, it will automatically be available for backup.

Power Conflict Monitor (PCM)

The PCM shall be a totally redundant failsafe system. The PCM monitors load bus power available continuously. If load bus power fails for 50ms the PCM will transfer and isolate the UPS and guarantee that commercial power will be locked on.

Smart Battery Charger: Shall charge from shut off discharge to 95% fully charged in less than 6hrs. Batteries shall be ambient enclosure compensated to less than 120°. The battery charger shall utilize Smart Cell Technology to extend battery life.

Intelligent Battery Management

Cell Guard- Improved reliability results from a precision battery charging system, and automatic true-load battery tests. Redundant overcharge protection contributes to longer battery life. SmartBoost and SmartTrim regulate under and over voltages without switching to battery.

Battery Replacement Warning- The UPS shall automatically perform a self-test every two weeks. Through software, or the push of a button, self-tests may be performed at any time.

Fast Recharge Time- The UPS battery charging system shall be microprocessor controlled to precisely charge batteries in less time than legacy UPS systems, to make the system available more quickly for subsequent power disturbance.

QuickSwap- The 60 second, user friendly, hot-swappable battery replacement system shall allow safe and easy replacement of batteries while your system is up and running

Warranty- Manufacturers shall provide a two-(2) year factory-repair warranty for parts and labor on the UPS. Batteries shall be warranted for full replacement for two (2) years. The warranty shall be included in the total bid price, and shall begin on the day the unit is turned on.

Model 2070E-3B Controller Assembly

Model 2070E-3B Controller Assembly components shall conform to the provisions in Section 86, "General" and Section 87, "Electrical Systems" of the 2015 Standard Specifications and these Special provisions.

Contractor shall provide for the following:

- 1) All convenience receptacles shall be Ground Fault Interrupter (GFI) type.
- 2) All labeling shall be either silk screen or phenolic/engraved.
- 3) EPROM socket U3 of the 412C shall be of the "0" insertion force type, i.e. the EPROM chips shall be installed or removed without the use of tools.
- 4) Provide a test switch panel in the cabinet, for Phases 1 thru 8 Detector inputs, PPB's, EVA, EVB, EVC, EVD, RR1, and RR2; and shall include a "master off". Switches shall be of the on-off-momentary contact type.
- 5) Provide an 18in fluorescent light in the cabinet.
- 6) The PDA and the Cabinet Power Supply shall be combined into one unit. Unit shall be currently approved by CALTRANS.
- 7) Controller cabinet shall be provided with dual exhaust fans.

Components, Model 2070E-3B Controller Assembly

The Contractor shall furnish a Model 2070E-3B controller unit, a wired controller cabinet, and all auxiliary equipment required to provide the traffic signal operation specified. All "Local" and "Submaster" programs shall function as specified in the Contra Costa County's "Central Master System Software Description", a copy of which can be obtained from the County's Traffic Division, 255 Glacier Dr, Martinez, 94553. Controllers shall be provided with a restart switch installed on the inside of the controller unit (not on front panel).

Manufacturer shall provide a digital I/O Wraparound Connector for C1, and a Communications Wraparound Connector for C2 for each controller; and diagnostics for each System Memory Module if they have not recently supplied hardware to Contra Costa County. The system memory modules shall provide for 32K EPROM, 4K RAM, by switch selection use 2764, 27128, or 27256 EPROMS, and shall be battery backed up using a 30-day lithium battery. EPROM's for use in the System Memory Modules shall have a maximum rating of 250 ns.

The Contractor shall arrange to have a signal technician, employed by the controller/cabinet manufacturer or his representative and qualified to work on the controller/cabinet, present at the project site at the time the equipment is activated.

Signal Faces and Signal Heads

Terminal compartments, MAS and MAT mounts, and slip fitters shall be bronze; framework, elbows and curved washers shall be galvanized steel or bronze. All signal head sections shall be 12 inch. All signal heads shall be "bagged/covered" until the day the signal is turned on. "Bagging shall consist of burlap that has been securely tied to the heads with wire or strong rope; TAPE SHALL NOT BE USED. Contractor may also use "aluminum crosses" installed inside the signal visor. Aluminum crosses shall be constructed from a minimum of 3-inch wide aluminum strips. Bagging or installing crosses shall in no way damage the finish on the signal head or visor.

"KO" type seals are not acceptable for sealing unused pipe thread connections to terminal compartments, or top/bottom of signal heads. Connections shall be sealed with threaded fittings with a rubber gasket, or by the use of a "beauty plug" designed for such purpose.

Gaskets for the heads shall be installed on the outside of the housing to provide a watertight seal, and the Contractor shall take extra care to ensure that the gaskets are properly installed.

All signal head housings shall be the metallic type.

All vehicle signal indications shall be light emitting diode (LED) type and shall conform to these plans and special provisions. Any existing incandescent vehicle signal indications shall be retrofitted with LEDs.

All signal sections shall be furnished with LED modules as described below:

Light Emitting Diode (LED) Signal Modules

Traffic signal faces shall use light emitting diode (LED) signal modules as the light source in conformance with these special provisions.

Type 1 LED signal modules shall be installed in the doorframes of standard traffic signal housings. Lamp sockets, reflectors, reflector holders and lenses used with incandescent lamps shall not be used when Type 1 LED signal modules are installed.

LED signal modules, including green, yellow, red, circular balls and arrow indications shall be

from the same manufacturer, and each size shall be the same model.

Type 1 LED signal modules shall be sealed units with two color-coded conductors for power connection, a printed circuit board, a power supply, a lens and a gasket. LED signal modules shall be weatherproof after installation and connection. Circuit boards and power supplies shall be contained inside Type 1 LED signal modules. Circuit boards shall conform to the requirements in Chapter 1, Section 6 of the "Transportation Electrical Equipment Specifications," (TEES) published by the Department.

Conductors for Type 1 LED signal modules shall be one meter in length with quick disconnect terminals attached, and shall conform to the provisions in Section 86-4.01C, "Electrical Components," of the Standard Specifications.

Lenses of Type 1 LED signal modules shall be integral to the units, shall be convex with a smooth outer surface and shall be made of ultraviolet (UV) stabilized plastic or glass. The lenses shall be capable of withstanding ultraviolet exposure from direct sunlight for a minimum period of 36 months without exhibiting evidence of deterioration.

Type 1 LED signal modules shall be sealed in doorframes with one-piece ethylene propylene rubber (EPDM) gaskets.

LEDs used in signal modules shall be of Aluminum Indium Gallium Phosphide (AlInGaP) technology for red and yellow indications and of Gallium Nitride (GaN) technology for green indications. LEDs shall be the ultra bright type rated for 100,000 hours of continuous operation from -40 °C to +74 °C.

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

Maximum power consumption requirements for LED signal modules shall be as follows:

LED Signal Module	Power Consumption in Watts					
	Red		Yellow		Green	
	25°C	74°C	25°C	74°C	25°C	74°C
12-inch circular	11	17	22	25	12	12
8-inch circular	8	13	13	16	10	10
12-inch arrow	9	12	10	12	13	13

Physical and Mechanical Requirements

Installation of LED signal modules shall only require the removal of the optical unit components such as the lens, lamp module, gaskets and reflector. LED signal modules shall be weather tight, fit securely to the housing and connect directly to electrical wiring.

Arrow modules shall conform to the requirements in Section 9.01 of the Institute of Transportation Engineers (ITE) Publication: Equipment and Materials Standards, "Vehicle Traffic Control Signal Heads" for arrow indications. LEDs shall be spread evenly across the illuminated portion of the arrow area.

LED Signal Module Lens

The LED signal module shall be capable of replacing the optical unit. The lens may be tinted or

may use transparent film or materials with similar characteristics to enhance “ON/OFF” contrasts. The use of tinting or other materials to enhance “ON/OFF” contrast shall not affect chromaticity and shall be uniform across the face of the lens.

If a polymeric lens is used, a surface coating or chemical surface treatment shall be used to provide front surface abrasion resistance.

Environmental Requirements

LED signal modules shall be rated for use in the operating temperature range of -40 °C to +74 °C.

LED signal modules shall be protected against dust and moisture intrusion in conformance with the requirements in NEMA Standard 250-1991 for Type 4 enclosures to protect internal components.

Construction

LED signal modules shall be single, self-contained devices, not requiring on-site assembly for installation into existing traffic signal housings. The power supply for LED signal modules shall be integral to the module.

Assembly and manufacturing processes for LED signal modules shall be designed to assure all internal components will be adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Materials

Materials used for lenses and LED signal modules shall conform to the requirements in ASTM Specifications for the materials.

Enclosures containing the power supply or electronic components of LED signal modules shall be made of UL94VO flame-retardant materials. Lenses of LED signal modules are excluded from this requirement.

Module Identification

LED signal modules shall have the manufacturer’s name, trademark, model number, serial number, lot number, month and year of manufacture, and required operating characteristics permanently marked on the back of the module. Required operating characteristics shall include rated voltage, power consumption and volt-ampere (VA).

Type 1 LED signal modules shall have prominent and permanent vertical markings for correct indexing and orientation within the signal housings. Markings shall consist of an up arrow or the word “UP” or “TOP.”

Photometric Requirements

Initial luminous intensity values for LED signal modules, operating at 25 °C, shall meet or exceed the following minimum values:

Circular Indications (in cd)

Angle (v,h)	8-inch			12-inch		
	Red	Yellow	Green	Red	Yellow	Green
2.5, ±2.5	157	314	314	399	798	798
2.5, ±7.5	114	228	228	295	589	589
2.5, ±12.5	67	133	133	166	333	333

2.5, ±17.5	29	57	57	90	181	181
7.5, ±2.5	119	238	238	266	532	532
7.5, ±7.5	105	209	209	238	475	475
7.5, ±12.5	76	152	152	171	342	342
7.5, ±17.5	48	95	95	105	209	209
7.5, ±22.5	21	43	43	45	90	90
7.5, ±27.5	12	24	24	19	38	38
12.5, ±2.5	43	86	86	59	119	119
12.5, ±7.5	38	76	76	57	114	114
12.5, ±12.5	33	67	67	52	105	105
12.5, ±17.5	24	48	48	40	81	81
12.5, ±22.5	14	29	29	26	52	52
12.5, ±27.5	10	19	19	19	38	38
17.5, ±2.5	19	38	38	26	52	52
17.5, ±7.5	17	33	33	26	52	52
17.5, ±12.5	12	24	24	26	52	52
17.5, ±17.5	10	19	19	26	52	52
17.5, ±22.5	7	14	14	24	48	48
17.5, ±27.5	5	10	10	19	38	38

Arrow Indications (in cd/m²)

	Red	Yellow	Green
Arrow Indication	5,500	11,000	11,000

Measured chromaticity coordinates of LED signal modules shall conform to the chromaticity requirements of the following table, for a minimum period of 36 months, over an operating temperature range of -40°C to +74°C.

Chromaticity Standards

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 less 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 modules tested or submitted for testing shall be representative of typical production units. Circular LED modules shall be tested in conformance with California Test 604. Optical testing shall be performed with LED signal modules mounted in standard traffic signal sections without visors or hoods attached to the signal sections.

LEDs for arrow indications shall be spread evenly across the illuminated portion of the arrow area. Arrow LED signal modules shall be tested in conformance with California Test 3001. Optical testing shall be performed with LED signal modules mounted in standard traffic signal sections without visors or hoods attached to the signal sections. LED arrow signal section indication shall provide minimum initial luminous intensity as listed herein. Measurements shall be performed at the rated operating voltage of 120 V(ac).

Electrical

Maximum power consumption requirements for LED signal modules shall not exceed those listed

in "General." LED signal modules shall operate at a frequency of 60 Hz \pm 3 Hz over a voltage range from 95 V (ac) to 135 V (ac) without perceptible flicker. Fluctuations of line voltage shall have no visible effect on luminous intensity of the indications. Rated voltage for all measurements shall be 120 V (ac).

Wiring and terminal blocks shall conform to the requirements of Section 13.02 of the ITE Publication: Equipment and Material Standards, (Vehicle Traffic Control Signal Heads). Two secured, color coded, 1 meter long, 600 V, 20 AWG minimum, jacketed wires, conforming to the National Electronic Code, rated for service at +105 °C, shall be provided for electrical connection for each Type 1 LED signal module.

LED signal module on-board circuitry shall include voltage surge protection to withstand high repetition noise transients in conformance with the requirements in Section 2.1.6 of NEMA Standard TS2-1992.

LED signal modules shall be operationally compatible with currently used controller assemblies including solid state load switches, flashers and conflict monitors. When a current of 20 milliamperes (ac) or less is applied to the unit, the voltage read across the two leads shall be 15 V (ac) or less.

LED signal modules and associated on-board circuitry shall conform to the requirements in Federal Communications Commission (FCC) Title 47, SubPart B, Section 15 regulations concerning the emission of electronic noise.

LED signal modules shall 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 modules shall not exceed 20 percent at an operating temperature of 25 °C.

Quality Control Program

LED signal modules shall be manufactured in conformance with a vendor quality control (QC) program. The QC program shall include two types of testing: (1) design qualification and (2) production quality. Production quality testing shall include statistically controlled routine tests to ensure minimum performance levels of LED signal modules built to meet these specifications.

Documentation of the QC process and test results shall be kept on file for a minimum period of seven years.

LED signal module designs not satisfying design qualification testing and the production quality testing performance requirements specified herein shall not be labeled, advertised or sold as conforming to these specifications.

Identification of components and subassemblies of LED signal modules, which may affect reliability and performance, shall be traceable to the original manufacturers.

Design Qualification Testing

Design qualification testing (DQT) shall be performed by the manufacturer, or an independent testing lab hired by the manufacturer on new LED signal module designs, and on existing designs when a major design change has been implemented. Failure to conform to the requirements of any design qualification test shall be cause for rejection.

A major design change is defined as a design change, electrical or physical, which changes any of the performance characteristics of the LED signal module, results in a different circuit configuration for the power supply, or changes the layout of the individual LEDs in the signal module.

Two LED modules for each design shall be used for DQT. The two LED signal modules shall be selected at random. These signal modules shall be submitted to the Transportation Laboratory after the DQT is complete. Testing data shall be submitted with the modules to the Transportation Laboratory for verification of DQT data.

LED signal modules shall be energized for a minimum of 24 hours, at 100 percent on-time duty cycle, at a temperature of 74 °C before performing any DQT.

After burn-in, LED signal modules shall be tested for rated initial luminous intensity in conformance with the provisions in "Photometric Requirements." Before measurement, LED signal modules shall be energized at rated voltage, with 100 percent on-time duty cycle, for a time period of 30 minutes. Photometrics, luminous intensity and color measurements for yellow LED signal modules shall be taken immediately after the modules are energized. The ambient temperature for these measurements shall be 25 °C. Test results for this testing shall record the current, voltage, total harmonic distortion (THD) and power factor (PF) associated with each measurement.

LED signal modules shall be tested by measuring for chromaticity (color) in conformance with the provisions in "Photometric Requirements." A spectra radiometer shall be used for this measurement. The ambient temperature for this measurement shall be 25 °C.

LED signal modules shall be tested by measuring the current flow in amperes. The measured current values shall be used for quality comparison of production quality assurance on production modules.

LED signal modules shall be tested by measuring the power factor. A commercially available power factor meter may be used to perform this measurement.

LED signal modules shall be tested by measuring the total harmonic distortion. A commercially available total harmonic distortion meter may be used to perform this measurement.

LED signal modules shall be tested in conformance with the provisions in "Electrical," with reference to Class A emission limits referenced in Federal Communications Commission (FCC) Title 47, SubPart B, Section 15.

LED signal modules shall be tested for compatibility with the controller unit, conflict monitor and load switch. Each signal module shall be connected to the output of a standard load switch connected to an alternating current voltage supply between the values of 95 and 135 V (ac) with the input to the load switch in the "OFF" position. The alternating current voltage developed across each LED signal module so connected shall not exceed 15 V rms as the input alternating current voltage is varied from 95 V (ac) rms to 135 V (ac) rms.

LED signal modules shall be tested for transient immunity in conformance with the provisions in "Electrical," and conforming to the procedure described in NEMA Standard TS2-1992.

Mechanical vibration testing shall be performed on LED signal modules in conformance with the

requirements in MIL-STD-883, Test Method 2007, using three 4-minute cycles along each x, y, and z axis, at a force of 2.5 Gs, with a frequency sweep from 2 Hz to 120 Hz. The loosening of the lens, internal components, or other physical damage shall be cause for rejection.

Temperature cycling shall be performed on LED signal modules in conformance with the requirements of MIL-STD-883, Test Method 1010. The temperature range shall conform to the provisions in "Environmental Requirements." A minimum of 20 cycles shall be performed with a 30 minute transfer time between temperature extremes and a 30 minute dwell time at each temperature. LED signal module under test shall be non-operating. Failure of LED signal modules to function properly or evidence of cracking of LED signal module lenses or housings after temperature cycling shall be cause for rejection.

Moisture resistance testing shall be performed on LED signal modules in conformance with the requirements in NEMA Standard 250-1991 for Type 4 enclosures. Evidence of internal moisture after testing shall be cause for rejection.

Production Quality Testing

Production quality testing shall be performed on each LED signal module prior to shipment. Failure to conform to the requirements of any production quality test shall be cause for rejection. The manufacturer shall retain test results for seven years for warranty purposes.

LED signal modules shall be tested for rated initial intensity after burn-in. The burn-in period shall consist of signal modules being energized at rated voltage for a 30 minute stabilization period before the measurements are made. A single point measurement with a correlation to the minimum initial luminous intensity requirements of "Photometric Requirements" for circular modules may be used. The ambient temperature for this measurement shall be +25°C.

LED signal modules shall be tested for luminous intensity requirements in "Photometric Requirements."

LED signal modules shall be tested for required power factor after burn-in.

LED signal modules shall be tested by measuring current flow in amperes after burn-in. The measured current values shall be compared against current values resulting from design qualification measurements under "Design Qualification Testing." The current flow shall not exceed the rated value. The measured ampere values with rated voltage shall be recorded as volt-ampere (VA) on the product labels.

LED signal modules shall be visually inspected for any exterior physical damage or assembly anomalies. The surface of the lens shall be free of scratches, abrasions, cracks, chips, discoloration, or other defects. Any such defects shall be cause for rejection.

Certificate of Compliance

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer, in conformance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall certify that the LED signal modules comply with the requirements of these specifications. The certificate shall also include a copy of all applicable test reports on the LED signal modules.

Quality Assurance Testing (Random Sample Testing)

The City of Oakley may perform random sample testing on all shipments. Random sample testing will be completed within 30 days after delivery to the Contra Costa County Signal

Maintenance Shop. Circular LED signal modules shall be tested in conformance with California Test 604 and these special provisions. Arrow signal modules shall be tested in conformance with California Test 3001 and these special provisions. Optical testing shall be performed with the module mounted in a standard traffic signal section, but without a visor or hood attached to the section or housing. The number of modules tested shall be determined by the quantity of each model in the shipment. The sample size shall conform to ANSI/ASQC Z1.4. The Contra Costa County Signal Maintenance Shop shall determine the sampling parameters to be used for the random sample testing. All parameters of the specification may be tested on the modules. Acceptance or rejection of the shipment shall conform to ANSI/ASQC Z1.4 for random sampled shipments.

Maintenance Period and Replacement Modules

Five extra modules of each size and type that are furnished for this project shall be delivered to the Engineer for use as replacements for modules that may fail during the one-year maintenance period. When the maintenance period has expired, the LED signal modules being held for use as replacements will become the property of the County. Any units that have been used to replace defective modules shall be replaced in kind by the manufacturer, at no cost to the County.

Warranty

The manufacturer shall provide a written warranty against defects in materials and workmanship for the LED signal modules for a period of 48 months after installation of the modules. Modules that fail during this period shall be replaced at no cost to the County, except that County forces will change out the modules in the field. The replacement modules shall be delivered F.O.B. to the Contra Costa County Signal Maintenance Shop, 2467 Waterbird Way, Martinez, CA. Deliveries shall be made on Monday through Thursday between 8:00 AM and 5:00 PM. Replacement modules shall be provided promptly after receipt of modules that have failed at no cost to the County except cost of shipping of the failed modules to the manufacturer. All warranty documentation shall be given to the County prior to installation.

Pedestrian Signals (Countdown)

Pedestrian signals shall be LED Type HAND/MAN countdown type; LeoTek TSL-PED-16-CIL, or approved equal. Terminal compartments shall be bronze; framework, elbows and curved washers shall be bronze, or galvanized steel.

All pedestrian heads, visors and frameworks shall be "factory powder coat" painted in lieu of conventional painting. All heads shall be factory assembled with their respective frameworks and tagged by location and intersection. Pedestrian heads and frameworks, as a unit, shall be installed by the contractor's workers at the job site. Extreme care shall be taken by the contractor's workers during the installation of the signals, frameworks and heads. Any scar marks, or cosmetic damage to the equipment caused from tools or installation processes shall be cause for rejection.

The factory powder coat finish shall be applied as described below:

- 1) Pretreatment Process
 - Acid etch degreasing bath
 - Clean water rinse
 - Iron phosphate adhesion bath
 - Clean water rinse
 - Non-chromate acidulated seal bath

- 2) Thermal set process
 - Convey parts through drying oven for 10 minutes at 300 to 400 deg/F.
 - Apply polyester or epoxy-based dry powder coating at 75-90 KV.

-Convey parts through curing oven for thermal setting for 20 minutes at 400 deg/F.

Pedestrian Push Buttons

Pedestrian push buttons shall be the Campbell Company Accessible Pedestrian System (APS) type, or approved equal. All push buttons shall be mounted 36 inches above the adjacent pavement and installed per manufacturer's specifications.

All pedestrian push button assemblies shall be ADA Compliant and shall meet the requirements of California Building Code Section 1117B.5.9, 'Traffic-control Devices,'

Video Detection System

Video/Radar Processors shall be Iteris Model Vantage Edge2 Processors (VEC-EDGE201N-PAK) or approved equal.

A switch shall be provided to switch between video feeds and Mouse controls. Iteris Model EDGE CONNECT or Approved Equal.

A surge panel shall be installed prior to system turn on.

Hybrid Radar/Video Detectors shall be Iteris Model Vantage Vector (VECTOR) or Approved Equal. Each hybrid detector shall detect up to 600' beyond the unit for approaching vehicles.

LED Safety Lighting

LED safety lighting shall conform to Section 86-1.02K(1), "LED Luminaires," of the Caltrans Standard Specifications.

All new intersection and non-intersection cobra head style and theme lighting shall be Light Emitting Diode (LED).

LED Street Name Sign

The Contractor shall supply and install Southern Manufacturing Clean Profile LED illuminated street name sign, or approve equal

Warranty Agreement

The traffic signal systems and equipment, and all improvements installed under these specifications, shall be covered by the Warranty and Repair Agreement found in the Proposal and Contract Book. The Contractor prior to acceptance of the work as complete shall execute this agreement.

Workmanship

All facilities shall be installed in a professional and workmanlike manner. Any portion of the signal system, which is not installed in a professional manner, shall be removed and reinstalled correctly, to the satisfaction of the Engineer.

CONSTRUCTION

Foundations

Foundations shall be placed at the back edge of a 4ft or 6ft sidewalk, or, 3ft from face of curb in a sidewalk wider than 6ft, as shown on the plans, or as directed by the Engineer. At locations where utility conflicts prevent the construction of a standard CIDH foundation, the Contractor shall attempt to adjust the traffic signal/street light location to permit construction of a standard CIDH foundation, subject to the approval of the Engineer. If no alternative location is available, or if the location is not

approved by the Engineer, the Contractor shall construct an alternative traffic signal/street light foundation. Contractor shall be responsible for coordinating signal foundation and power with utility companies included in bid item. Contractor shall coordinate with utility companies at no additional cost to contract if conflict is encountered. No additional compensation will be allowed for relocating signal/lighting pole foundations if conflict is encountered.

Standards, Steel Pedestals and Posts

All work related to Standards, steel pedestals and posts shall conform to Section 87-1.03J, "Standards, Poles, Pedestals, and Posts," of the Caltrans Specifications and Caltrans Standard Plans.

Conduit

Conduit runs shown on the plans to be located behind curbs may be installed in the street. Trenching for conduit installation within the street section is PERMITTED if delay to any vehicle will not exceed 10 minutes. The top of the installed conduit shall be a minimum of 12 inches below finish grade in the street section. The trench shall be backfilled with commercial quality concrete.

All trenches shall be finish paved within 24 hours of the installation of the Portland cement concrete backfill. If the Contractor does not comply with this section, the Engineer will order the work done by others and deduct the cost of doing the work from monies due the Contractor.

When rigid non-metallic conduit is placed in a trench other than in the street section, and after the conduit installed, the trench shall be backfilled with PCC Slurry. No native material backfill will be permitted.

Pullboxes

All pull boxes shall be located behind the curb or at the locations shown on the plans. Grout in the bottom of pull boxes will not be required.

Conductors and Wiring

At least 6 feet of slack shall be provided in the pullbox nearest each signal standard, for those conductors terminating in that standard; and 3 feet of slack shall be provided in each conductor in all other pullboxes. The wire bundle entering the controller cabinet shall be coiled in the bottom of the cabinet in order to obtain as much slack as possible.

Straight splices in signal neutral and multiple lighting conductors shall be insulated in conformance with Method B, tap splices in signal neutral and multiple lighting conductors shall be Type C, and conductors shall be spliced by the use of C-shaped compression connectors; as shown on State Standard Plan ES-13. Separate neutral conductors shall be run from the nearest pullbox to each "vehicle and pedestrian signal" terminal block. All other signal phase conductors shall be installed with no splices between the controller and the signal or pedestrian device terminal compartment terminal strip. All anchor bolts shall be visibly bonded to the system ground. A continuous No. 8 ground shall be installed in all conduits.

New conductors for traffic signal equipment shall not be spliced.

Conductors shall not be pulled into conduits until the pull boxes have been set to grade, rock sumps have been installed, and conduits have been bonded and grounded. A continuous No. 8 ground shall be installed in all conduits. All pullboxes shall be inspected and approved prior to pulling any conductors. Conductors shall not be pulled into conduits unless the Engineer is present to observe the operation. The ends of all unused cables shall be sealed.

Service

The Contractor shall pay all required utility fees and costs related to providing electric service connections at the site of the work. Contractor shall be reimbursed for the utility fees for service hookup paid to PG&E. Engineer will arrange for inspection of service cabinet at no cost to Contractor.

Where service point is shown in the plans as "service point to be determined", labor and materials costs for the entire service conduit connection from the service cabinet or controller cabinet to the service location of the serving utility company shall be considered as included in the contract lump sum price paid for "Traffic Signal", and no additional compensation will be allowed therefore.

Model 2070E-3B Controller Assembly

Attention is directed to the provisions in Section 87-1.03Q, "Cabinets," of the 2015 Caltrans Standard Specifications and these special provisions. Field wiring terminal strips shall be capable of accepting up to four (4) conductors for each phase. The controller cabinet shall be furnished with the "detector input sidepanel harness" option.

An additional controller shelf shall be installed in each cabinet, for a future submaster controller, or writing surface. Shelf shall be full width and depth in the rack. A storage drawer shall also be furnished for storing manuals and time cards. Drawer shall be full width, installed below the local controller, and shall include a writing surface.

A twelve position terminal strip shall be provided for termination of the interconnect wiring. Two C2 connectors and a C20 connector with 6 FT cables shall be wired to the twelve position interconnect terminal strip in the cabinets to provide for interconnect to the local, and a submaster if specified, or back to the Central Master.

The Model 332 Controller Cabinets shall be constructed from stainless steel. The cabinet shall be delivered to the County for testing.

The Contractor shall arrange for the Central Master Controller in Martinez to be modified as necessary to bring the hardware and software up to current "system" requirements by the firm producing the 2070E-3B software to provide the display and generation of color graphics, for remote field diagnostics of the new intersections being installed.

Pedestrian Signals (Countdown)

Gaskets for the mounting of pedestrian signal heads shall be installed on the outside of the housing to provide a watertight seal, and the Contractor shall take extra care to ensure that the gaskets are properly installed.

Video Detection System

The contractor shall arrange to have a technician, qualified to work on the video detection system and employed by the Video detection manufacturer or his/her representative present to setup and configure the System a minimum of six (6) weeks in advance due to technicians schedule. The City Transportation Engineer shall be notified prior to completion of Video Detection System installation at the intersection. All Video Detection System equipment installation, cable termination, connections, camera alignment procedures, system setup, configuration, and programming of detector zones shall be completed prior to or during the pre turn-on work.

The manufacturer shall supply two sets of operation and installation manuals.

The Video Detection System shall be provided with a standard 3 year warranty.

Potholing

The Contractor shall conduct exploratory excavations by potholing to verify or to discover the actual locations and the size of existing underground utilities and improvements. Potholing shall be done at each proposed location of signal poles to occur at least fourteen (14) calendar days in advance of any excavation or construction in that area, to avoid possible delay in the progress of the Work.

The Contractor's proposed method of potholing and schedule for potholing shall be submitted to the Engineer for approval, at least one week prior to the commencement of operation. Any utilities damaged during potholing shall be immediately reported to the Engineer and repairs made immediately in accordance with the requirements of this Contract.

MEASUREMENT AND PAYMENT

The contract lump sum price paid for NEW TRAFFIC SIGNAL shall include full compensation for furnishing all labor, materials, tools, equipment, testing, and incidentals, including foundations, poles, mast arms, signal and pedestrian heads, luminaires, conduits, conductors, pull boxes, video detection systems, controller cabinet assembly, temporary relocation of existing flashing beacon, and **REMOVAL/SALVAGE AND INSTALLATION OF EXISTING FLASHING BEACON SYSTEM** at the intersection of O'Hara Ave./Covered Wagon Dr, including new pole foundations and anchor bolts and as directed by the city Engineer, and all other required equipment for the intended operation of the signal, and for doing all the work involved in completing traffic signal work as shown on the Plans, and as specified in the Standard Specifications and these Technical Provisions, and no additional compensation will be allowed.

10-1.18 LIGHTING AND ELECTRICAL SYSTEMS

GENERAL

The Work shall consist of furnishing, installing, and relocating street lighting poles, pull boxes, pole numbers, in-line fuses, conduit, cable, trenching and backfilling, repairing pavement and curb/gutter as necessary and all other materials and appurtenances in accordance with the Plans and these Technical Provisions. The end result shall be a system complete and in operation to the satisfaction of the Engineer.

The Work also includes the exploratory excavations by potholing at the locations of all proposed light poles.

MATERIALS

All materials delivered to the job shall be new, best quality of their respective grades, in accordance with these Technical Provisions and packed in their original sealed containers. All materials to be installed shall bear the Underwriters Laboratories, Inc., UL Label.

The Contractor shall use materials mentioned in these Technical Provisions as standard, or an approved equal from the latest edition of the City's Approved Material List, and in no case will a substitute be allowed without written approval of the Engineer.

Contractor shall submit proposed lighting and electrical system components, including but not limited to cut sheets for lights and fixtures, conduit and pull boxes, conductors and fusing, bonding and grounding, to the City Engineer for approval.

Conductors and Wiring

Splicing shall conform to the following methods as specified in Section 87-1.03H, "Conductor and Cables Splices," of the Caltrans Standard Specifications or approved equal. Multiple lighting conductors shall only be spliced in pull boxes.

Field Tests

Field tests shall conform to Section 87-1.01D(2), "Quality Control," of the Caltrans Standard Specifications except as modified herein.

The Contractor shall be responsible for maintaining the lighting system during the functional test period. Payment for testing shall be the responsibility of the Contractor.

Pole Identification Plates

The City Engineer will assign pole identification numbers as required. The Contractor shall furnish and install pole identification plates at the request of the City and as indicated in the City standard Plans, and as directed by the City Engineer.

Temporary Lighting

The temporary lighting shall conform to section 87-20, "Temporary Electrical Systems," of the Caltrans standard specifications and as shown in the plans.

MEASUREMENT AND PAYMENT

The contract lump sum price paid for STREET LIGHTING WORK shall include full compensation for furnishing all labor, materials, tools, equipment, testing, and incidentals, including relocation of poles, foundations, pull boxes, conduit, and wires, and for doing all the work involved in completing the street lighting work as shown on the Plans, City Standard Drawings, and as specified in the City Standard Specifications and these Technical Provisions, including exploratory excavations by potholing, pavement removal and restoration, and sidewalk removal and restoration, and no additional compensation will be allowed.

10-1.19 LANDSCAPE AND IRRIGATION

GENERAL

Description of Work

Order and furnish all labor, materials, supplies, tools and transportation and perform all operations in connection with and reasonably incidental to the complete installation of the automatic sprinkler irrigation systems as shown on the Drawings.

All work shall be done in conformance to the applicable provisions of the Standard Specifications except as modified herein. Payment for work, equipment and materials not specifically covered herein shall be included in the payment for related items of work. No additional payment will be made for work, equipment or materials not covered in these Technical Specifications, but necessary to insure a completed project as specified.

All articles and services covered by this Specification shall meet or exceed the safety standards

established under the Federal Occupational Safety and Health Act of 1970, together with all amendments in effect as of the date of this Specification.

Codes and Standards

All work and materials shall be in full accordance with the current rules and regulations of the National Electric Code; the Uniform Plumbing Code, published by the Western Plumbing Officials Association; and other applicable State or local laws or regulations. Nothing in these Drawings or Specifications is to be construed to permit work not conforming to these codes.

When the Specifications call for materials or construction of a better quality or larger size than required by the above-mentioned rules and regulations, the provision of the Specifications shall take precedence over the requirements of the said rules and regulations.

The subcontractor shall furnish without any extra charge any additional material and labor when required by the compliance with these rules and regulations, though the work be not mentioned in these particular Specifications or shown on the Drawings.

The subcontractor shall erect and maintain barricades, guards, warning signs, and lights as necessary or required by OSHA regulations for the protection of the public or workmen.

Any existing buildings, equipment, piping, pipe covering sewers, sidewalks, landscaping, etc., damaged by the subcontractor during the course of his work shall be replaced or repaired by the subcontractor in a manner satisfactory to the Owner's Agent and at subcontractor's own expense, and before the final payment is made. The subcontractor shall be responsible for damage caused by leaks in the piping systems being installed by him. He shall repair, at his own expense, all damage so caused, in a manner satisfactory to the Owner's Agent.

The subcontractor shall pay for all permits, licenses, and fees required.

The subcontractor, personally or through an authorized and competent representative, shall supervise the work constantly, and shall as far as possible keep the same foreman and workmen on the job from commencement to completion. The workmanship of the entire job must in every way be first class, and only experienced and competent workmen will be allowed on the job.

Staking

The irrigation contractor shall stake out the irrigation system as shown on the Drawings. Stakes shall be approved by Landscape Architect before construction is started. Any changes, deletions or additions shall be determined at this check.

Submittals

Within 15 days after award of contract and prior to installation, submit six copies of materials list. Include manufacturer, model number, and description of all materials and equipment. Include sealants, cements, lubricants and other proprietary items.

Submit two copies of catalog information on materials which are to be submitted for substitution. No substitution will be permitted without prior written approval by the Owner's Agent. A complete material list shall be submitted prior to performing any work.

Record Drawings and Controller Charts

The subcontractor shall maintain in good order, in the field office, one complete set of blue line prints of all sprinkler drawings which form a part of the Contract, showing all water lines, sprinklers, valves, controllers and stub-outs. Any work not installed as indicated on the Drawings, shall be

recorded and dimensioned accurately from the building walls on these prints. All as-built markups shall be indicated in red.

All underground stub-outs for future connections and valves shall be located and dimensioned accurately from building walls on these record drawings.

Upon completion of the work, obtain reproducible prints from Architect and neatly correct the prints to show the as-built conditions.

Record Drawings shall be accepted by Architect before controller charts are prepared. Provide three (3) controller charts for each controller supplied. Charts shall be laminated 11 x 17, showing areas covered by each controller. Chart shall be an electrostatic copy and a different color shall be used to indicate area of coverage for each station. Enlarge valve sequence to be readable when drawing is reduced. After being completed and accepted, seal by plastic laminating. Laminating sheets shall be a minimum of 10 mil thick.

Operations and maintenance manuals

Deliver to owner at least 10 days prior to completion of construction, 2 complete sets of the following data. Data shall be on 8 1/2 inch by 11 inch sheets, in a 3-ring binder.

- a. Index sheet stating Contractor's address and telephone number and list of equipment with name and addresses of local manufacturer's representatives.
- b. Catalog and parts sheets on all material and equipment installed under this Section.
- c. Complete operating and maintenance instructions for all equipment.
- d. Complete and dated manufacturer's warranties for all materials used.

Irrigation Maintenance Schedule to include, but not be limited to, routine inspection, adjustment, and repair of the irrigation system and its components. After the system has been installed and approved, subcontractor shall instruct the Owner's representative in complete operation and maintenance of the irrigation system.

MATERIALS

Pipe and Fittings

Main lines (constant pressure) shall be PVC 1120 Schedule 40 solvent weld pipe, Type 1, and shall conform to ASTM D1785. Use Schedule 40 and Schedule 80 PVC solvent weld fittings.

Lateral lines (non pressure) shall be 1120 Schedule 40 PVC plastic pipe Type 1, and shall conform to ASTM D1785. Use Schedule 40 PVC solvent weld fittings.

Fittings shall be solvent Weld socket fittings: Schedule 40, Type 1, Grade 1, PVC and shall conform to ASTM D2466. Schedule 80, Type 1, Grade 1 PVC and shall conform to ASTM D2467. Solvent cement and primer for PVC solvent-weld pipe and fittings shall be of type recommended by pipe manufacturer. Connections between main lines and remote control valves shall be of Schedule 80 PVC (threaded both ends) nipples and fittings. Risers shall be as follows: Schedule 80 PVC threaded nipples and Schedule 80 PVC ells as shown on the construction details.

Quick Coupling Valves

Quick Coupling valves shall be brass construction, 1-inch connection, two-piece body, locking vinyl top, single slot and lug. Provide one 1-inch single lug key and 1-inch hose swivel for every 5-6 quick couplers.

Quick Coupling valves shall be restrained with cast iron restrainers that attach securely to the base of the valve. Restrainers shall make contact with the hex flats of the valve and be secured by a single bolt.

Isolation Valves

Gate valves shall be brass construction conforming to ASTM B 62 with screw-in bonnet, non-rising stem, operating wheel and threaded connections.

Remote Control Valves

Remote control valves shall be globe pattern constructed of heavy duty glass-filled nylon and stainless steel with internal and external bleed. Operating pressure shall be 20 to 200 psi and flow range shall be .25-200 gpm. All internal parts shall be removable from the top.

Ball valves shall be Schedule 80 PVC full port design. PVC ball valves to be installed upstream of each remote control valve.

Each valve shall have a plastic tag denoting its controller and station number.

Control Wire

Copper with UL approval for direct burial in ground, size #12-1 for common wire and size #14-1 for control wire. Common ground wire shall have white insulating jacket; control wire shall have insulating jacket of color other than white. Provide a separate ground wire for each controller.

Splices shall be made with 3M DBR/Y-6 connectors.

Valve Boxes

High density polyethylene construction with UV inhibitors. Lid shall be green in color and have stainless steel bolt-down mechanism. Boxes, lids, and bolts shall be from the same manufacturer. Plastic valve boxes shall be by Carson, NDS Pro Series, or equal.

The lid shall be marked as follows:

1. Remote Control Valves – “Irrigation Control Valve” or “ICV” with the station number in one inch (1”) high white enamel or heat branded numbers and letters.
2. All other valves - “Irrigation Control Valve” or “ICV”.

Bubblers

Bubblers shall be as listed on the Drawings and shall be pressure compensating.

Miscellaneous Materials and Equipment

Solvent cement and primer for solvent weld joints shall be of make and type approved by manufacturer(s) of pipe and fittings. Cement shall be maintained at proper consistency throughout use. Pipe joint compound shall be non-hardening, non-toxic materials designed specifically for use on threaded connections in water carrying pipe. Performance shall be same as Rector Seal 100 W.

Drain rock: 3/4 inch washed pea gravel.

Provide to the Owner, at completion of the Maintenance Period, three (3) each of all operating and servicing keys and wrenches required for complete maintenance and operation of all heads and valves. Include all wrenches necessary for complete disassembly of all heads and valves.

Provide two (2) each of quick coupler keys and hose swivels.

CONSTRUCTION

Preparation

Schedule and coordinate placement of materials and equipment in a manner to effect the earliest completion of work in conformance with construction and progress schedule.

Contractor shall field verify the static water pressure at the project site prior to commencing work or ordering irrigation materials. If contractor fails to verify static water pressure prior to commencing work, contractor shall assume responsibility for all costs required to make system operational.

Examine areas and conditions under which work of this section is to be performed. Do not proceed with work until necessary conditions have been corrected.

Handling and Storage

Protect work and materials from damage during construction and storage as directed by Architect.

Handle plastic pipe carefully; especially protecting it from prolonged exposure to sunlight. Store sub-surface dripline and polyethylene tubing in cool dry place out of sunlight during installation.

Layout

Layout work as accurately as possible in accordance with diagrammatic drawings.

Where site conditions do not permit location of piping, valves and heads where shown, notify Architect immediately and determine relocation in a joint conference.

Run pipelines and automatic control wiring in common trenches whenever practical.

Excavating and Trenching

Excavation shall be in all cases ample in size to permit the pipes to be laid at the elevations intended and to permit ample space for joining.

Depth of trenches shall be enough to provide minimum cover from finish grade to top of pipe in trenches, as follows:

1. 18 inch minimum cover over main lines to the control valves and quick coupling valves.
2. 18 inch minimum cover over direct burial control wires from controller to valves.
3. 12 inch minimum cover over the valve controlled lines to sprinkler heads.
4. 24 inch minimum cover over sleeves.

Restore surfaces, existing underground installations, etc., damaged or cut as a result of excavations, to original conditions in a manner approved by the Architect.

Where other utilities interfere with irrigation trenching and pipe work, adjust the trench depth as instructed by Architect.

Assembling Pipelines

All pipes shall be assembled free from dirt and pipe scale. Field cut ends shall be reamed only to full pipe diameter with rough edges and burrs removed.

Solvent Weld Joint

1. Prepare joint by first making sure the pipe end is square, then deburring the pipe end and cleaning the pipe and fitting of dirt.
2. Dry-insert pipe into fitting to check for missizing. Pipe should enter fitting 1/3 to 2/3 depth of socket.
3. Coat the inside socket surface of the fitting and the external surface of the male end of the pipe with P-70 primer (manufactured by Weld-On), immediately followed by Weld-On 711 cement liberally applied to the male end of the pipe and lightly applied to the inside of the socket. Then, apply a second coat of cement to the pipe end.
4. Insert pipe immediately into fitting and turn it 90° to distribute cement and remove air bubbles. The pipe must seat to the bottom of the socket and fitting. Check alignment of the fitting. Pipe and fitting shall be aligned properly without strain to either.
5. Hold joint still for approximately thirty (30) seconds and then wipe the excess cement from the pipe and fitting.
6. Cure joint a minimum of thirty (30) minutes before handling and at least six (6) hours before allowing water in the pipe.

Threaded Joint:

1. Field threading of plastic pipe or fittings is not permitted. Factory-formed threads only will be permitted.
2. Factory-made nipples shall be used wherever possible.
3. All threaded joints shall be made up with pipe joint compound. Apply compound to male threads only.
4. Where assembling to threaded plastic fitting, take up joint no more than one full turn beyond hand tightening.
5. Where assembling soft metal (brass or copper) or plastic pipe, use a strap type friction wrench only; do not use a metal-jawed wrench.

Cap or plug openings as pipeline is assembled to prevent entrance of dirt or obstruction. Remove caps or plugs only when necessary to continue assembly.

Where pipes or control wires pass through sleeves, provide a removable non-decaying plug at ends of sleeve to prevent entrance of earth.

Remote Control Valves and Quick Coupling Valves

Install where shown on Drawings and group together where practical. Limit one remote control valve per box with no exceptions.

Locate valve boxes 12 inches from and perpendicular to walk edges, buildings and walls. Provide 12 inches between valve boxes where valves are grouped together.

Thoroughly flush main line before installing the valve.

Label control line wire at each valve with a 2½" x 2½" polyurethane I.D. tag, indicating identification number of the valve (controller and station number). Attach a label to control wire.

Install quick coupling valves on double swing-joint assemblies of Schedule 80 PVC risers and fittings.

Valve Boxes

Install one valve box for each type of valve.

Install boxes 12 inches from walk or header and 12 inches apart. Short side of rectangular boxes shall be parallel to walk or header. Install 2 inches above finish grade in groundcover areas.

Install common bricks as shown and as required to keep box stable. Install gravel sump after compaction of all trenches.

Bubblers

Thoroughly flush lines before installing drip tubing or bubblers. Locate bubblers as shown in the Drawings and Detail.

Automatic Control Wiring

Run lines along mains where practical. Tie wires in bundles with pipe wrapping tape at 10' intervals and allow slack for contraction between strappings. Loop a minimum of three (3) feet of extra wire in each valve box; both control wire and ground wire.

Connections shall be made as shown on plans. Splicing will be permitted only on runs exceeding 2500'. Locate all splices at valve locations within valve boxes.

Where control lines pass under paving, they shall pass through Schedule 40 electrical PVC conduit.

Common wire and control wires shall be tagged with 1/4" wide embossed plastic labeling tape, showing controller and station number designation.

Pipe Testing

Notify City Engineer at least three (3) days in advance of testing. Perform testing at his own expense.

Center load piping with a small amount of backfill to prevent arching or slipping under pressure. No fitting shall be covered. Apply the following tests after weld plastic pipe joints have cured at least 24 hours.

1. Test live (constant pressure) and quick coupling valve lines hydrostatically at 125 PSI minimum. Lines shall be filled with water and pressure gauge connected to the pipe line. After lines have reached the 125 PSI, (use hydraulic pump or other safe method – do not use an air compressor) cut off the source of pressure. Lines will be approved if test pressure is maintained for six (6) hours. Should leaks develop during the test period, they shall be located and repaired and retested in the same method. The subcontractor shall make tests and repairs as necessary until test conditions are met.
2. Test remote control valve controlled lines with water at line pressure and visually inspect for leaks. Retest after correcting defects.
3. Remake faulty joints with new materials. Do not use cement or caulking to seal leaks.

Cleanup

When work of this section has been completed, and at such other times as may be directed, remove all trash, debris, surplus materials and equipment from the site.

MEASUREMENT AND PAYMENT

All work shall be done in conformance with the applicable provisions of the Standard Specifications.

The contract lump sum price paid per for LANDSCAPE AND IRRIGATION shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in installing LANDSCAPE AND IRRIGATION, including removing existing plantings, irrigation valve boxes and irrigation heads, relocating irrigation valve boxes, installing new valve boxes, gate valves, new 6" sleeves, new wires, splice boxes, mainline, bubblers, installing new plantings, soil amendment and mulch, complete in place, as shown on the plans, as specified in these specifications and plans, and the special provisions and as directed by the Engineer.

10-1.20 TRAFFIC STRIPING, MARKINGS, RAISED PAVEMENT MARKERS, DELINEATORS, AND SIGNS.

GENERAL

Thermoplastic traffic stripes and painted traffic stripes (traffic lines), and pavement markings shall conform to the provisions in Sections 84-1, "General," 84-2, "Traffic Striping and Pavement Markings" of the 2015 Caltrans Standard Specifications and these Special Provisions. Pavement markers shall conform to Section 81-3 "Pavement Markers" of the 2015 Caltrans Standard Specification and these special provisions.

Delineators shall conform to Section 81-2, "Delineators", and Road Signs shall conform to Section 82-2 "Sign Panels" and Section 82-3 "Roadside Signs" of the 2015 Caltrans Standard Specifications and these special provisions.

MATERIALS

Thermoplastic

Section 84-2.02, "Materials" of the Standard Specifications is deleted. The thermoplastic material shall conform to State Specifications 8010-41G-21. Glass beads to be applied to the surface of the molten thermoplastic material shall conform to the requirements of State Specification 8010-22L-22 (Type II), or AASJTP Designation: M 247 (Type 1). State Specifications for thermoplastic material and glass beads may be obtained from the Transportation Laboratory, P.O. Box 19128, Sacramento, CA. 95819, (916) 739-2400.

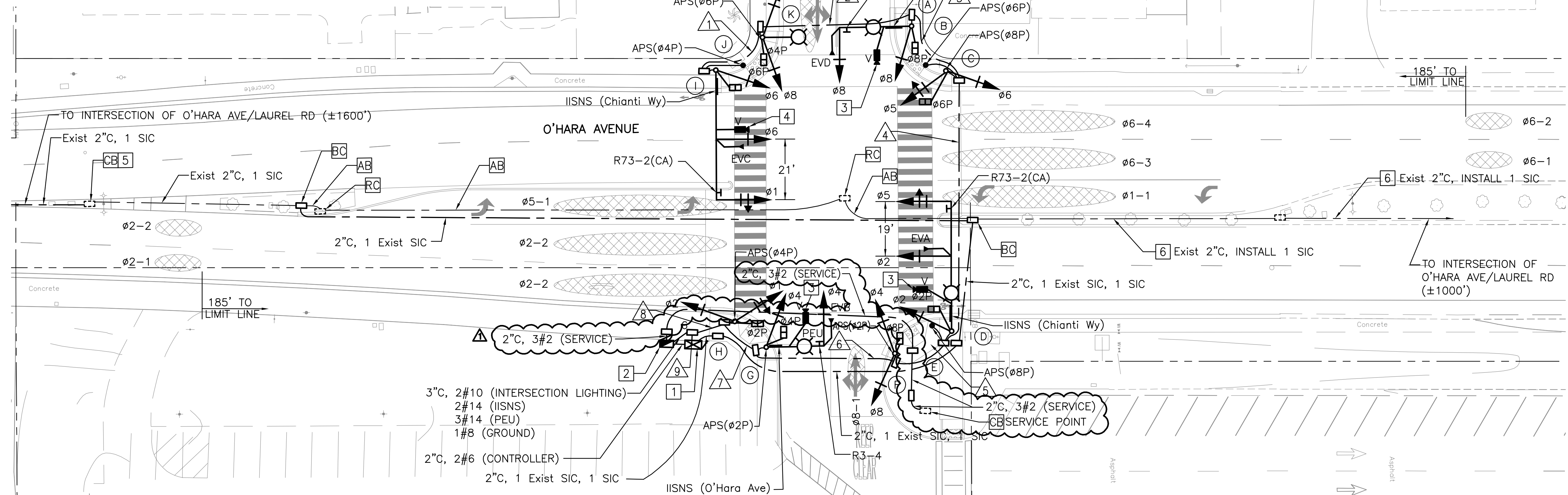
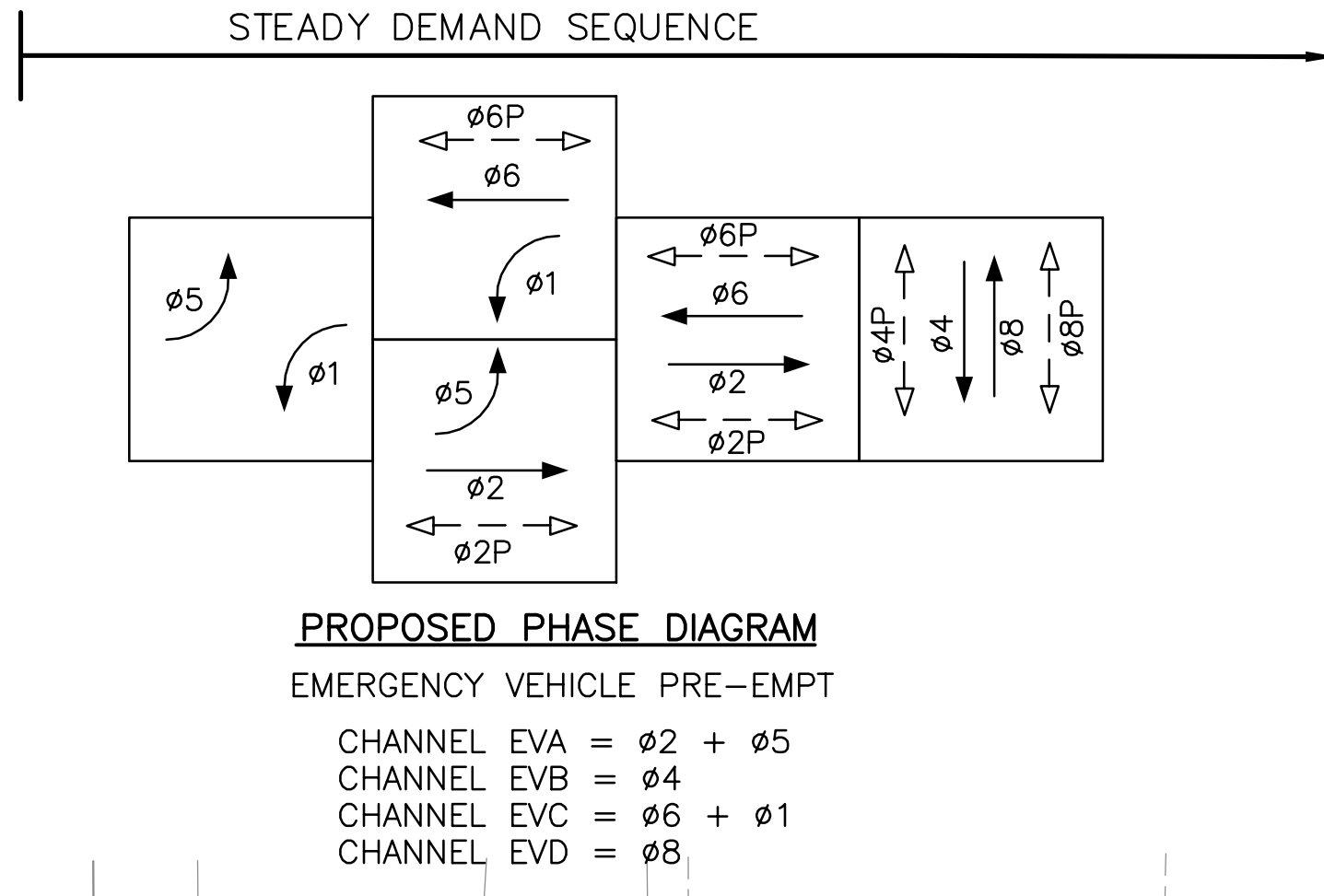
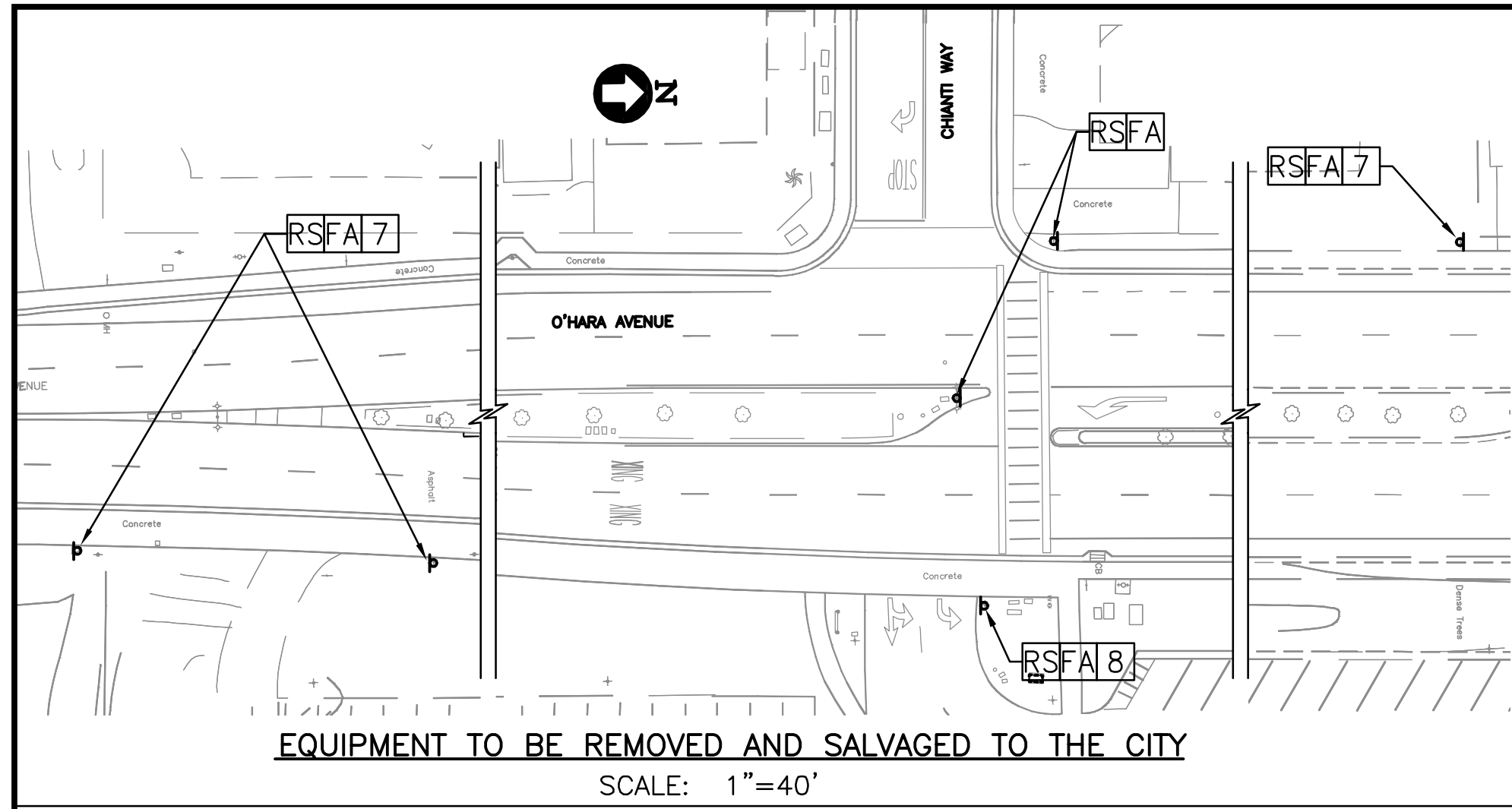
Thermoplastic material for traffic stripes shall be applied at a minimum thickness of 0.125-inch. A primer of the type recommended by the manufacturer of the thermoplastic material shall be applied over all existing painted stripes and pavement legends to be covered with thermoplastic material as shown on the plans.

CONSTRUCTION

All construction shall conform to the respective provisions of the Standard Specifications, manufacturer's installation requirements, and the Special Provisions.

Existing Striping and Markings

Date: 04/24/17	Revisions
Scale: AS NOTED	APPENDIX 1
Design: TC	
Drawn: TC	
Approved: JW	
Job No: 20167137	



GENERAL NOTES: (FOR ELECTRICAL WORK ONLY, SHEETS E-1 TO E-2)

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST VERSION OF THE CONTRA COSTA COUNTY STANDARD PLANS, 2014 CA MUTCD, CALTRANS STANDARD PLANS AND SPECIFICATIONS DATED MAY 2015 WITH SUBSEQUENT REVISIONS
- CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT (U.S.A) AT 1-800-227-2600 OR 811 AT LEAST TWO FULL WORKING DAYS PRIOR TO ALL EXCAVATION WORK.
- CONTRACTOR SHALL VERIFY OVERHEAD AND UNDERGROUND CLEARANCE REQUIREMENTS WITH PG&E, AT&T AND OTHER AFFECTED UTILITIES PRIOR TO THE START OF WORK.
- DEMOLITION OF EXISTING FEATURES SHALL BE LIMITED TO THE ITEMS SHOWN ON THE PLANS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE ALL EXISTING IMPROVEMENTS DAMAGED BY HIS OPERATIONS, AT HIS EXPENSE.
- THE LOCATION OF ALL PULL BOXES, CONDUITS AND OTHER EQUIPMENT SHOWN ON THIS PLAN ARE APPROXIMATE AND MAY BE CHANGED TO SUIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
- ALL NEW PULL BOXES SHALL NOT BE PLACED WITHIN DRIVEWAY AND CURB RAMP AREAS.
- CONTRACTOR SHALL VERIFY AND MAINTAIN EXISTING CONDUITS AND CONDUCTORS FOR EXISTING STREET LIGHTING SYSTEM. IF EXISTING CONDUITS AND CONDUCTORS FOR STREET LIGHTING IS DISTURBED BY CONSTRUCTION, THE CONTRACTOR SHALL INSTALL NEW CONDUITS AND CONDUCTORS AT HIS EXPENSE.
- THIS PLAN IS ACCURATE FOR ELECTRICAL WORK ONLY.
- THE CONTRACTOR SHALL CONTACT PG&E FOR NEW SERVICE CONNECTIONS AND VERIFY WITH PG&E REGARDING SERVICE PULL BOX, CONDUIT, AND CONDUCTOR REQUIREMENTS PRIOR TO BEGINNING OF WORK.
- ALL PULL BOXES SHALL BE No. 5, UNLESS OTHERWISE NOTED ON THE PLAN. STREET LIGHTING PULL BOX COVERS SHALL BE INSCRIBED "STREET LIGHTING", SIGNAL INTERCONNECT PULL BOX COVERS SHALL BE INSCRIBED "INTERCONNECT" TRAFFIC SIGNAL PULL BOX COVERS SHALL BE INSCRIBED "TRAFFIC SIGNAL". "CALTRANS" INSCRIPTION SHALL NOT BE USED.
- LED INTERNALLY ILLUMINATED STREET NAME SIGN SHALL BE SOUTHERN MANUFACTURING MODEL: CLEAN PROFILE LED ILLUMINATED SIGN, OR APPROVED EQUAL.
- ALL NEW ELECTRICAL STANDARDS INCLUDING PPB POSTS SHALL BE PAINTED BLACK TO MATCH COLOR OF LED POST-TOP DECORATIVE STREET LIGHT POLES. CONTRACTOR SHALL PROVIDE PAINT CHIP SAMPLE TO THE CITY FOR APPROVAL.
- TRAFFIC SIGNAL POLES WILL BE FURNISHED BY THE CITY. CONTRACTOR SHALL COORDINATE WITH CITY TO ARRANGE PICK UP OF SIGNAL POLES AT THE CITY'S MAINTENANCE YARD.

PROJECT NOTES:

- FURNISH AND INSTALL MODEL 2070 CONTROLLER IN MODEL 332 CABINET. FRONT DOOR OF CONTROLLER CABINET SHALL FACE NORTH.
- FURNISH AND INSTALL TYPE III-AF SERVICE EQUIPMENT ENCLOSURE WITH BATTERY BACKUP SYSTEM. DOOR SHALL FACE WEST. SEE SHEET E-2 FOR WIRING DIAGRAM.
- FURNISH AND INSTALL HYBRID ITERIS VIDEO DETECTION CAMERA OR APPROVED EQUIVALENT ON LUMINAIRE MAST ARM. INSTALL VIDEO DETECTION SYSTEM IN CONTROLLER CABINET.
- FURNISH AND INSTALLS HYBRID ITERIS VIDEO DETECTION CAMERA OR APPROVED EQUIVALENT ON SIGNAL MAST ARM WITH 5' RISER.
- FROM EXISTING PULL BOX, CAREFULLY REMOVE THE EXISTING SIC CABLE FROM CONDUITS LEADING TO THE EXISTING CONTROLLER AT THE INTERSECTION OF O'HARA AVE/W. CYPRESS RD. CUT EXISTING SIC SO THAT IT IS LONG ENOUGH TO REACH THE NEW CONTROLLER AT THIS INTERSECTION AND REINSTALL IN NEW CONDUITS.
- FURNISH AND INSTALL 1 SIC IN EXISTING CONDUIT TO TRAFFIC SIGNAL CONTROLLER LOCATED AT O'HARA AVE/W. CYPRESS RD INTERSECTION AND INSTALL IN EXISTING CABINET PER CITY REQUIREMENTS.

7 CONTRACTOR SHALL MAINTAIN EXISTING PEDESTRIAN WARNING SYSTEM IN OPERATION AT ALL TIMES UNTIL THE TRAFFIC SIGNAL IS COMPLETED AND TURNED ON. AFTER COMPLETION OF THE TRAFFIC SIGNAL, CONTRACTOR SHALL RELOCATE THE EXISTING PEDESTRIAN WARNING SYSTEM (INCLUDING BUT NOT LIMITED TO POLES, FLASHING BEACONS, PUSH BUTTONS, AND SIGNS) TO THE INTERSECTION OF O'HARA AVENUE AND COVERED WAGON DRIVE. NEW FOUNDATIONS AND ANCHOR BOLTS SHALL MATCH THE EXISTING. EXACT LOCATION OF ALL EQUIPMENT TO BE DETERMINED BY THE ENGINEER.

8 CONTRACTOR SHALL TEMPORARILY RELOCATE EXISTING FLASHING BEACON POLE TO A NEW LOCATION AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL PROVIDE A NEW FOUNDATION AND ALL THE MATERIALS NEEDED FOR THE INSTALLATION OF THE POLE.

LEGEND

