CITY OF STOCKTON
PUBLIC WORKS DEPARTMENT

SPECIAL PROVISIONS

FOR CONSTRUCTION OF

HAMMER LANE WIDENING PROJECT
PHASE IIIB

PROJECT NO. PW1427

PREPARED BY: Mark Thomas & Company, Inc.
DATE: May 18, 2016
The special provisions contained herein have been prepared by or under the direction of the following Registered Persons.

**ROADWAY**

Kenneth E. Doty  
No. 47228  
Exp. 12-31-17  
STATE OF CALIFORNIA

**ELECTRICAL (ROADWAY)**

Kristin Calia  
No. 62461  
Exp. 9-30-17  
STATE OF CALIFORNIA

**LANDSCAPE**

Erik R. Smith  
RLA 4585  
8-31-16  
STATE OF CALIFORNIA
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Project No. PW1427

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THE CITY OF STOCKTON PUBLIC WORKS DEPARTMENT

SPECIAL PROVISIONS
FOR
HAMMER LANE – PHASE IIIB WIDENING PROJECT
PROJECT NO. PW1427

SECTION 1 SPECIFICATIONS AND PLANS

1-1.01 Specifications

The work defined herein shall be done in accordance with the latest version of the City of Stockton, Department of Public Works, Standard Specifications and Standard Plans, the 2010 version of the State of California, Department of Transportation Standard Specifications and Standard Plans, and the latest version of the California Manual Uniform Traffic Control Devices insofar as the same may apply in accordance with the following Special Provisions. Since the City of Stockton is not subject to the STATE CONTRACT ACT, the Department of Transportation Standard Specifications shall not be applicable to the extent that said Specifications implement said ACT.

References to Standard Specification Section numbers shall apply to the City of Stockton Standard Specifications and the Caltrans Standard Specifications as appropriate.

In case of conflict or discrepancy between any of the Contract Documents, the order of documents listed below shall be the order of precedence, with the first item listed having the highest precedence.

1. Governing Code
2. Contract Change Order (changes last in time are first in precedence)
3. Addenda to Contract Agreement
4. Contract Agreement
5. Permits
6. Notice Inviting Bids and Instructions to Bidders
7. Special Provisions
8. Project Drawings
9. City of Stockton Standard Specifications
10. Caltrans Standard Specifications
11. City of Stockton Standard Drawings
12. Caltrans Standard Plans
The bidder shall examine carefully the site of the work and the plans and specifications therefor. The bidder shall investigate to his satisfaction all site conditions to be encountered; the character, quality and quantity of surface, subsurface materials or obstacles to be encountered; the work to be performed; the materials to be furnished and installed; and the requirements of the proposal, plans, specifications, and contract. If omissions, discrepancies or apparent errors are found in the plans and specifications prior to the date opening, the bidder shall submit a written request for a clarification. The clarification will be given in the form of addenda to all bidders if time permits.

1-1.02 Terms and Definitions

Wherever in the Standard Specifications, Special Provisions, Notice to Contractors, Proposal, Contract, or other contract documents the following terms are used, the intent and meaning shall be interpreted as follows:

- State, City or Owner -- City of Stockton
- Director -- Director of Public Works, City of Stockton
- Standard Specifications -- City of Stockton Latest Standard Plans and Specifications and any amendments and revisions thereto
- Caltrans Specifications -- State of California, Department of Transportation 2010 Standard Plans and Specifications
- Laboratory -- City of Stockton Public Works Department Laboratory or consultant’s laboratory
- Department -- Public Works Department, City of Stockton
- Engineer -- City Engineer, City of Stockton, acting either directly or through authorized Engineer agents and consultants
- MUTCD -- Latest Manual on Uniform Traffic Control Devices and MUTCD Latest California Supplement

In Caltrans Standard Specifications and these Special Provisions, all references to “State”, “Caltrans”, or Department” shall be interpreted as “The City of Stockton”.

Special Provisions  Page 2
1-1.03 Coordination and Interpretation of Plans, Standard Specifications, and Special Provisions

The Standard Specifications, the Standard Plans, project plans, special provisions, contract change orders and all supplementary documents are essential parts of the contract, and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary, and to describe and provide for a complete work.

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Standard Specifications, these special provisions or the plans, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform to them as part of the contract. In the event of any doubt or question arising respecting the true meaning of the Standard specifications, these special provisions or the plans, reference shall be made to the Engineer, whose decision thereon shall be final.

In the event of any discrepancy between any drawing and the figures written thereon, the figures shall be taken as correct. Detail drawings shall prevail over general drawings.
SECTION 3    CONTRACT AWARD AND EXECUTION

3-1.01    Contract Award

If the City awards the Contract, the award is made to the lowest responsible bidder within 90 days after the day of the bid opening.

Bidders and subcontractors are required to be available the day of bid opening to answer questions.

The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed.

3-1.02    Contract Execution

The bidder’s attention is directed to the provisions in Section 3, “Contract Award and Execution,” of the Caltrans Standard Specifications and these Special Provisions for the requirements and conditions concerning award and execution of the contract. Bid protests are to be delivered to the following address:

                            Attention: Rosa Alvarez
                            City of Stockton
                            Public Works Department
                            22 E. Weber Avenue, Room 301
                            Stockton, CA 95202

The contract shall be executed by the successful bidder and shall be returned, together with the contract bonds, to the City so that it is received within 10 working days after the bidder has received the contract for execution. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the address noted above.
SECTION 4  BEGINNING WORK, TIME OF COMPLETION & LIQUIDATED DAMAGES

4-1.01  Begin of Work

The Contractor shall begin work after the contract has been approved by the city Attorney and within ten (10) days after being given notice to proceed or otherwise as may be stated in the Special Provisions. Once started the Contractor shall diligently prosecute the same to completion within the time limit provided in the special provisions. The Contractor shall follow the sequence of construction and progress of work as specified in Section 10-1.01, "Order of Work", of these Special Provisions.

The Contractor shall diligently prosecute all work items to completion.

Bidders will be required to carefully examine these Special Provisions and attachments to judge for themselves as to the nature of the work to be done and the general conditions relative thereto and the submission of a proposal hereunder shall be considered prima-facie evidence that the bidder has made the necessary investigation and is satisfied with respect to the conditions to be encountered, the character, quantity and quality of the work performed. For work to be completed, contractors are advised to visit and review the job site prior to the submission of their bid.

Bidders must be thoroughly competent and capable of satisfactorily performing the work covered by the proposal, and when requested shall furnish such statements relative to previous experience on similar work, the plan or procedure proposed, and the organization and the equipment available for the contemplated work, and any other as may be deemed necessary by the City Engineer in determining such competence and capability.

It shall be understood that the Contractor shall be required to perform and complete the proposed work in a thorough and workmanlike manner, and to furnish and provide in connection therewith all necessary labor, tools, implements, equipment, materials and supplies.

4-1.02  Time of Completion

Attention is directed to the provisions in Section 8, "Prosecution and Progress", of the Caltrans Standard Specifications and these Special Provisions.

The performance of the work and the furnishing of materials shall commence no later than ten (10) days from the Notice to Proceed or the actual start of field work, whichever is earlier, and shall be diligently prosecuted to completion, with the exception of the plant establishment and maintenance period, before the expiration of the working days specified in this section from the date of said commencement.
Subject to approval of the Engineer, the plant establishment period of one thousand and ninety five (1,095) calendar days may begin after approval by the Engineer of completion of all the planting work and may overlap the contract working days. The actual start of field work shall also not occur prior to submittal of the Contractor’s project schedule and DAS(140) form as required. Full compensation for any costs required to comply with the provisions in this section shall be considered to be included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

The Contractor shall diligently prosecute the contract work to completion, except plant establishment, within two hundred and ninety (290) working days. The days to finish the punch list, provided by the City, are included in the Working Days.

Upon completion of all of the work included herein, including all approved contract change orders and punch list work (excluding plant establishment work), the Contractor may request the Engineer issue a Notice of Partial Completion for the work items so completed for the purposes of relief of maintenance and release of retention for the work items so completed as well as termination of the assessment of working days. Approval for relief of maintenance and issuance of a Notice of Partial Completion shall be at the sole discretion of the Engineer. Working days shall continue to accrue until issuance of the Notice of Partial Completion.

Upon the filing of the Notice of Partial Completion, the Contractor shall diligently pursue completion of the final paperwork and project closeout. At the discretion of the Engineer, additional liquidated damages may be assessed if the final paperwork and project closeout are not processed, due to the fault of the Contractor, within 45 calendar days of the Notice of Partial Completion.

Upon completion of the plant establishment work, a final Notice of Completion will be filed.

Should the Contractor choose to work on a Saturday, Sunday, or on a holiday recognized by the labor unions and/or the City of Stockton, or in excess of a normal eight (8) hour work day, the Contractor shall reimburse the City of Stockton the actual cost of engineering, inspection, testing, superintendent, and/or other overhead expenses, which are directly chargeable to the contract. Should such work be undertaken at the request of the City, reimbursement will not be required.

4-1.03 Liquidated Damages

Attention is directed to the provisions in Section 8-1.10, "Liquidated Damages", of the Caltrans Standard Specifications and these Special Provisions.

The Contractor shall pay liquidated damages to the City of Stockton in the amount of $5,400 (five thousand and five hundred dollars) per day for each and every calendar day that the work, with the exception of the plant establishment and maintenance
period, remains incomplete after the expiration of the contract working days specified in these Special Provisions.

Full compensation for any costs required to comply with the provisions in this section shall be considered to be included in the prices paid for the various contract items of work, and no additional compensation will be allowed therefor.
5-1.01 Project Appearance

Attention is directed to Sections 4-1.13, "Cleanup," and 5-1.31 “Job Site Appearance,” of the Caltrans Standard Specifications and these Special Provisions.

The Contractor shall maintain a neat appearance to the work.

Broken concrete and debris developed during demolition, clearing and grubbing shall be disposed of concurrently with its removal. Contractor shall pay to the City of Stockton the sum of Two Hundred Fifty Dollars ($250) for every calendar day where debris has remained on the job site overnight.

During construction, the Contractor shall remove all rubbish and debris as it is generated. Upon completion of the work, the Contractor shall remove all equipment, debris, and shall leave the site in a neat, clean condition all to the satisfaction of the Engineer.

The Contractor shall conduct and cause all working forces at the site to maintain the site in a neat, orderly manner throughout the construction operations. The work shall be conducted in a manner that will control the dust. When ordered to provide dust control, the Contractor shall use water to reduce the dusty conditions all to the satisfaction of the Engineer.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefor.

5-1.02 Maintaining Public Convenience and Safety

Attention is directed to Sections 7-1.08, "Public Convenience", 7-1.09, "Public Safety", of Standard Specifications and Sections 7-1.03 and 7-1.04 respectively of the Caltrans Standard Specifications, Section 12, "Temporary Traffic Control", of the Caltrans Standard Specifications, and Section 10-1.02 "Maintaining Traffic" of these Special Provisions. Nothing in these Special Provisions shall be construed as relieving the Contractor from his responsibility as provided in said sections.

5-1.03 Trench Safety

The Contractor shall furnish all labor, equipment and materials required to design, construct and remove all shoring, sheeting, lagging, cribbing, piling, or types of support for the walls of any open excavation required for the construction of the project.
In making excavations for any project, the Contractor shall be fully responsible for providing and installing adequate sheeting, shoring and bracing as may be necessary as a precaution against slides or cave-ins and to fully protect all existing improvements of any kind from damage.

Wherever applicable, the Contractor shall obtain a permit from the Division of Industrial Safety (Cal-OSHA) and shall submit a copy of the approved permit to the Engineer prior to the start of excavation. The cost of the permit shall be included in the total bid cost. Nothing in this section shall be construed to impose tort liability on the awarding body or any of its employees.

The criteria given by the California Department of Industrial Relations are MINIMAL. In addition to shoring any excavation, it shall be the Contractor's responsibility to provide any and all additional shoring required to support the sides of the excavation against the effects of loads which may exceed those derived by using the criteria set forth by said governing agency. The Contractor shall be solely responsible for any damages which may result from the Contractor's failure to provide adequate shoring to support the excavations under any or all of the conditions of loading which may exist or which may arise during construction.

Full compensation for any costs required to comply with the provisions in this section shall be considered to be included in the prices paid for the various contract items of work, and no additional compensation will be allowed therefor.

5-1.04 Public Convenience

Contractor's attention is directed to the Maintaining Traffic Section of these Special Provisions.

The Contractor shall notify San Joaquin Regional Transit District (RTD) a minimum of five (5) working days prior to beginning work. The Contractor shall coordinate with RTD if any bus stops and bus routes are affected.

The Contractor shall inform the City Fire Department, City Police Department, City Traffic Department, Municipal Utilities District (MUD), and all affected utilities no later than seventy-two (72) hours before work is to begin.

The Contractor shall provide the City with the name and telephone number (business, home, mobile, and pager) of three (3) representatives available at all times during the duration of the contract. Said names and telephone numbers shall be provided to the City of Stockton Public Works, Fire, and Police Departments.

The Contractor shall circulate printed form letters, approved by the Engineer, explaining the project to be done and the length of time inconvenience will be caused by the project and deliver same to the residents and businesses to be affected at least seventy-two (72) hours before work is to commence on their street. In addition, the Contractor shall provide temporary "No Parking" signs posted seventy-two (72) hours
in advance of the work. Such signs shall be placed no further than fifty (50) feet apart. The additional "No Parking" signs shall be removed upon completion of the work and the opening of the street to traffic. It shall be the Contractor's responsibility to remove any vehicles obstructing his operations.

Adequate ingress and egress shall be maintained for fire, police and other emergency vehicles. The Contractor shall provide adequate and continuous ingress and egress for all adjacent properties, except for the limited period of time it is necessary to perform work at a specific property. The Contractor shall coordinate limited closures with tenants or owners, as required by these Special Provisions, and as directed by the Engineer.

Full compensation for conforming to the provisions in this section shall be included in the prices paid for various bid items, and no additional compensation will be made therefor.

5-1.05 Public Safety

The Contractor shall provide for safety of traffic and public in conformance with the Provision in Section 7-1.09 “Public Safety” of the Standard Specifications and Section 7-1.04 “Public Safety” of the Caltrans Standard Specifications, and Section 10-1.02 “Maintaining Traffic” of these Special Provisions.

All safety devices, their maintenance, and use shall conform to the latest requirements of OSHA and shall conform to the applicable provisions of the "Temporary Traffic Control", Latest MUTCD California Supplement, and the current edition of the "Manual on Uniform Traffic Control Devices"(MUTCD). It shall be the complete responsibility of the Contractor to protect persons from injury and to avoid property damage. Adequate barricades, construction signs, flashers, and other such safety devices, as required, shall be placed and maintained during the progress of the construction work, until the project is completed. Whenever required, flagmen shall be provided to control traffic.

The Contractor shall install temporary railing (Type K) between a lane open to public traffic and an excavation, obstacle, or storage area when the following conditions exist:

A. Excavations - the near edge of the excavation is twelve (12) feet or less from the edge of the lane, except:

1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
2. Excavations less than one (1) foot deep.
3. Trenches less than one (1) foot wide for irrigation pipe or electrical conduit, or excavations less than one (1) foot in diameter.
4. Excavations parallel to the lane for the purpose of pavement widening or
reconstruction.

5. Excavations in side slopes, where the slope is steeper than 1:4 (vertical:horizontal).

6. Excavations protected by existing barrier or railing.

B. Temporarily Unprotected Permanent Obstacles - the work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or the Contractor, for the Contractor's convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.

C. Storage Areas - material or equipment is stored within twelve (12) feet of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these Special Provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section, "Public Safety", and in Section 7-1.04, "Public Safety", of the Caltrans Standard Specifications, shall be offset a minimum of fifteen (15) feet from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than one (1) foot transversely to ten (10) feet longitudinally with respect to the edge of the traffic lane.

If the fifteen (15) foot minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall be placed as shown on the plans, as specified in the Standard Specifications or these special provisions or where ordered by the Engineer and shall conform to the provisions in Section 12, "Temporary Traffic Control," of the Caltrans Standard Specifications and these special provisions.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08, "Type K Temporary Railing", of the Caltrans Standard Specifications. Temporary railing (Type K), conforming to the details shown on the 2010 Standard Plan T3, may be used.

Reflectors on temporary railing (Type K) shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials," of these special provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following areas, the Contractor shall close the adjacent traffic lane unless otherwise provided in the Caltrans Standard Specifications and these Special Provisions:
<table>
<thead>
<tr>
<th>Approach Speed of Public Traffic {Posted Limit, Miles Per Hour}</th>
<th>Work Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 45</td>
<td>Within 6 feet of a traffic lane but not on a traffic lane</td>
</tr>
<tr>
<td>35 to 45</td>
<td>Within 3 feet of a traffic lane but not on a traffic lane</td>
</tr>
</tbody>
</table>

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 10 feet without written approval from the Engineer.

The Contractor shall provide for the proper routing of vehicles and pedestrian traffic in a manner that will hold congestion and delay of such traffic to practicable minimum by furnishing, installing, and maintaining all necessary temporary signs, barricades, and other devices and facilities, as approved by the City Traffic Engineer. As the work progresses, the Contractor shall relocate, subject to the City Traffic Engineer's approval, such devices and facilities as necessary to maintain proper routing. The Contractor shall notify the City Traffic Engineer a minimum of twenty-four (24) hours prior to the relocation of any traffic control devices.

When work is not in progress on a trench or other excavation that requires closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

**Temporary Crash Cushion Module**

This work shall consist of furnishing, installing and maintaining sand filled temporary crash cushion modules in groupings or arrays at each location shown on the plans, specified in the special provisions or directed by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in accordance with the details shown on the plans and these special provisions.

**General**

Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash
The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be removed during a work period for access to the work provided that the exposed fixed obstacle is 15 feet or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

Materials

At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either of the following types or equal:

Energite Inertial Modules

Manufacturer: Energy Absorption Systems, Inc.
One East Wacker Drive
Chicago, IL 60601-2076
Telephone (312) 467-6750

Distributor (Northern):
Traffic Control Service, Inc.
8585 Thys Court
Sacramento, CA 95828
Telephone (800) 884-8274
FAX (916) 387-9734

Distributor (Southern):
Traffic Control Service, Inc.
1881 Betmor Lane
Anaheim, CA 92805
Telephone (800) 222-8274

or Fitch Inertial Modules

700-3 Union Parkway
Ronkonkoma, NY 11779

Distributor:
Singletree Sales Company
1533 Berger Drive
San Jose, CA 95112
Telephone (800) 822-7735

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color as furnished by the vendor, with black lids. The modules shall exhibit good
workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and quality of the types specified above may be utilized. If used Fitch modules requiring a seal are furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.

Modules shall be filled with sand in accordance with the manufacturer's directions, and to the sand capacity in pounds for each module as shown on the plans. Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water, as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at his expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at his expense.

Installation – Temporary crash cushion modules shall be placed on movable pallets or frames conforming to the dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of crash cushion array is within 12 feet of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods approved by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in permanent work.

**Crash Cushion (Absorb 350)**

Crash cushion (Absorb 350) shall be furnished and installed as shown on plans for drainage work along Pershing Avenue and in conformance with these special provisions or where designated by the Engineer. Crash cushion (Absorb 350) shall be manufactured by Barrier System Inc., and shall include all items detailed for crash cushion (Absorb 350) shown on the plans.

Crash cushion (Absorb 350) shall be a Category 3 temporary traffic control device and be on the Department's Highway Safety Features list. This list is maintained by the Division of Engineering Services and can be found at:
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. This Certificate of Compliance shall certify that the crash cushion (Absorb 350) conforms to the prequalified design and material requirements, and was manufactured in conformance with the approved quality control program.

At the completion of drainage work, crash cushion (Absorb 350) shall become the property of the Contractor and shall be removed from the site of the work.

Repairing units damaged by public traffic will be paid for as extra work as provided in Section 5-1.14, “Extra Work” of these special provisions. Units damaged beyond repair by public traffic when ordered by the Engineer, shall be removed and replaced immediately by the Contractor. Units replaced due to damage by public traffic will be measured and paid for as crash cushion (Absorb 350).

Crash cushion (Absorb 350) regardless of length or modules required for each unit, will be measured by the unit as determined from the actual count in place in the completed work.

The contract unit price paid for crash cushion (Absorb 350) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all work the work involved in furnishing, installing, maintaining, and removing from the site of the work when no longer required (including those damaged by public traffic) crash cushion (Absorb 350), complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for conforming to the provisions in this section, including furnishing and installing temporary railing (Type K) and temporary crash cushion modules wherever required, shall be considered as included in the contract prices paid for the various items of work involved, and no additional compensation will be allowed therefor.

Full compensation for furnishing, installing, moving, and removing of all necessary traffic control devices including, but not limited to, signing, striping, barricades, and flagging shall be included in the bid item for “Traffic Control System”, as shown on the bid schedule, and no additional compensation will be allowed therefor. Section 12-1.03, "Flagging Costs", of the Caltrans Standard Specifications is deleted.

5-1.06 Sound Control Requirements

Sound control shall conform to the provisions in Section 14-8.02, "Noise Control", of the Caltrans Standard Specifications and these Special Provisions.
Attention is directed to Title 8 “Health and Safety”, Chapter 8.20 “Noise Regulations”, of the Stockton Municipal Code.

The Contractor shall limit his hours of operation to 8:00 a.m. to 4:00 p.m. Monday thru Saturday and no work shall be conducted on Sundays or Holidays. If work needs to be conducted at times beyond these limits, the Contractor shall request an exemption from the Engineer 10 working days before the anticipated time of work. The Engineer will accept or deny the request at least 3 working days before anticipated time of work.

The noise level from the Contractor's operations, not exceed 86 dBA at a distance of fifty (50) feet from the project limits. This requirement shall not relieve the Contractor from responsibility for complying with other ordinances regulating noise level.

This requirement shall not relieve the Contractor from responsibility for complying with local ordinances regulating noise level. Contractor shall submit a request for exemption from the sound ordinances, through the City, for specific operations requiring night-time work per the lane requirement charts.

Contractor shall avoid staging equipment within 200 feet of residences and locate all stationary noise generating construction equipment (i.e. air compressors, portable power generators, etc.), as far as practical from residences. Temporary noise barrier shall be utilized to screen and minimize the noise generated by the construction equipment.

Trucks shall use designated truck routes to and from the project site. Truck traffic shall not be permitted within residential areas. Prior approval from the City shall be obtained if trucks have to pass through residential areas. The Contractor shall notify the residents 48 hours before the trucks will be using the route.

The noise level requirement shall apply to the equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefor.

5-1.07 Dust Control

Dust control shall conform to the provisions in Section 14-9.03 "Dust Control" of the Caltrans Standard Specifications and these Special Provisions.
Use of water except for recycled, reclaimed, or other non-potable water for the purpose of dust control or other construction uses unless for health or safety purposes is prohibited. All dust control operations shall be performed by the Contractor at the time, location and in the amount ordered by the Engineer. The application of either water or dust palliative shall be under the control of the Engineer at all times."
Watering shall conform to the provisions of Section 17 "Watering," of the Caltrans Standard Specifications and these Special Provisions.

All disturbed areas, including storage piles, which are not being actively utilized for construction purposes that day, shall control dust emissions using water, dust palliatives, or covered with a tarp or other suitable cover or vegetative ground cover approved by the Engineer. After any addition, or subtraction, of materials from the surface of an outdoor storage pile, the pile shall reestablish control of dust emissions.

When materials are transported on- or off-site, all materials shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.

Any construction site with 150 or more vehicle trips per day shall prevent carryout and trackout. All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of the day. A blower shall not be used. A dry rotary brush shall not be used unless sufficient wetting is used before to limit the visible dust emissions. Trackout by vehicles shall be immediately removed when it extends 50 or more feet from the construction site.

The Contractor shall provide a plan, for approval by the City and the San Joaquin Valley Air Pollution Control District, demonstrating that the heavy duty (>50 horsepower) off-road vehicles to be used in the construction of the project, including owned, leased and subContractor vehicles, will achieve a project wide fleet average 20 percent nitrogen oxides (NOx) reduction and 45 percent particulate reduction compared to the most recent California Air Resources Board fleet average at the time of Notice to Proceed was given.

Full compensation for conforming to the provisions in this section shall be considered as included in prices paid for the various contract items of work involved, and no additional compensation will be allowed therefor.

5-1.08 Indemnification and Insurance

Indemnification and Insurance shall conform to the provisions in Section 7-1.12, "Indemnification and Insurance", of the Standard Specifications and Sections 7-1.05 “Indemnification” and 7-1.06 “Insurance” of the Caltrans Standard Specifications and the following:

"The Contractor shall indemnify and hold harmless the City of Stockton and all officers and employees thereof connected with the work, including, but not limited to, the
Director of Public Works and the City Engineer from all claims, suits, or actions of every name, kind, and description brought forth on account of injuries to or death of any person, including, but not limited to, workmen and the public, or damage to property resulting from the performance of the Contractor, except as otherwise provided by statute. The duty of the Contractor to indemnify and hold harmless includes the duties to defend as set forth in Section 2778 of the Civil Code.

The Contractor waives any and all rights to any type of expressed or implied indemnity against the City, its officers, or employees. It is the intent of the parties that the Contractor shall indemnify and hold harmless the City, its officers, and employees from any and all claims, suits, or actions as set forth above regardless of the existence or degree of fault or negligence on the part of the City, the Contractor, the subcontractor, or employee of any of these, other than the active negligence of the City, its officers, and employees.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefor.

5-1.09 Preservation of Property

The Contractor’s attention is directed to Section 5-1.36 “Property and Facility Preservation” of the Caltrans Standard Specification and these Special Provisions.

Existing improvements, utility and adjacent property shall be protected from damage resulting from the Contractor’s operations. The Contractor shall repair or replace features damaged as a result of construction operations to match existing pre-construction conditions at no additional cost to the City. Features shall include, but are not limited to, landscaping and structural improvements such as sod, shrubbery, fencing, irrigation systems, concrete work and masonry. Any feature that interferes with construction shall be removed and replaced by the Contractor.

Should any direct or indirect damage or injury result to any public or private property by or on account of any act, omission, neglect, or misconduct, in the execution of the work, or as a consequence of the non-execution thereof on the part of the Contractor or any of his employees or agents, such property shall be restored by and at the expense of the Contractor to a condition equivalent to that existing before the damage or injury occurred by repairing or rebuilding the same, or by otherwise making restitution in an acceptable manner for such damage or injury.

The Contractor shall remove graffiti within 24 hours of graffiti being placed on improvements, materials or equipment within the work zone. This requirement shall apply to both existing improvements and Contractor provided items. The removal method and appearance of the items after removal shall be as approved by the Engineer.
Full compensation for conformance with this provision shall be considered as included in the prices paid for the various contract items and no additional compensation will be allowed therefor.

### 5-1.10 Rights in Land

All work, material storage, equipment parking, or any other activity associated with the project shall be confined to the project limits within the street rights-of-way. The Contractor's use of any other private or public property exclusively in connection with this project shall be by a written agreement between the property owner and the Contractor. A certified copy of any such agreement shall be furnished to the Engineer prior to the use of such property by the Contractor.

The Contractor shall confirm the acquisition of rights-of-way (or rights-of-entry) by City prior to beginning construction. The Contractor shall not work outside the provided rights-of-way without the written permission of the property owner. The Contractor is further advised that actual use of said rights-of-entry may be subject to the need for temporary rearrangement of surface or subsurface improvements, utility or non-highway facilities, protection of said items, or the repair of said items to match existing pre-construction conditions. The Contractor's attention is directed to “Preservation of Property” section in these Special Provisions regarding damages caused as a result of construction of the project.

Full compensation for conforming to the provisions in this section shall be considered as included in prices paid for the various contract items of work involved, and no additional compensation will be allowed therefor.

### 5-1.11 Staging Area

The street right-of-way shall be used only for activities that are necessary to perform the required work. The Contractor shall not occupy the right-of-way or allow others to occupy the right-of-way for material storage or other purposes that are not necessary to perform the required work.

The Contractor shall secure at his own expense any area required for storage of equipment or materials, or for other purposes.

### 5-1.12 Construction Staking

The Contractor shall be responsible for providing all necessary construction stakes and marks to establish the lines and grades for the construction and completion of the work, including but not limited to, control and base lines, offset lines, cut/fill grade stakes, temporary survey stakes, tie-out protection, corner records, records of survey, and resetting of monuments as required. Tie-outs to existing monuments are to be provided to the City by the Contractor prior to starting work.
The Contractor shall employ a Land Surveyor or Civil Engineer registered in the State of California to perform all necessary construction staking and survey work. All construction stakes and marks set by the Contractor’s Land Surveyor or Civil Engineer, shall be carefully preserved by the Contractor. In case such stakes and marks are destroyed or damaged, they shall be promptly replaced, at the direction of the Engineer, at no additional cost to the City.

The Contractor shall preserve all monumentation potentially affected by the work in accordance with Section 8771 of the Professional Land Surveyors Act in the Business and Professions Code of the State of California. Locations of known existing monumentation within the area of work shall be completed and appropriate documentation submitted to the City Engineer prior to beginning work. Unless otherwise specified, all construction staking or survey work be performed by an appropriately licensed land surveyor or civil engineer.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in establishing the lines and grades, as specified in these Special Provisions and Standard Specifications, shall be included in the contract prices paid for various items of work, and no additional compensation will be made therefor.

5-1.13 Changes

The City reserves the right to make such alterations, deviations, additions to, or omissions from the plans and specifications, including the right to increase or decrease the quantity of any item or portion of the work or to omit any item or portion of the work, as may be deemed by the Engineer to be necessary or advisable and to require such extra work as may be determined by the Engineer to be required for the proper completion or construction of the whole work contemplated, without adjustment in the unit price as bid.

Attention is directed to Section 4-1.03, “Changes,” of the Standard Specifications. Any such changes will be set forth in a contract change order, which will specify, in addition to the work to be done in connection with the change made, adjustment of contract time, if any, and the basis of compensation for such work. A contract change order will not become effective until approved by the City Manager and/or City Council.

5-1.14 Extra Work

New and unforeseen work will be classed as extra work when determined by the Engineer that the work is not covered by any of the various items for which there is a bid price or by combinations of those items. In the event portions of this work are determined by the Engineer to be covered by some of the various items for which there is a bid price or combinations of those items, the remaining portion of the work will be classed as extra work. Extra work also includes work specifically designated as extra work in the plans or specifications.
The Contractor shall do the extra work and furnish labor, material and equipment therefore upon receipt of an approved contract change order or other written order of the Engineer, and in the absence of an approved contract change order or other written order of the Engineer, the Contractor shall not be entitled to payment for the extra work.

If, in the opinion of the Engineer, such work cannot reasonably be performed concurrently with other items of work, and if a controlling item of work is delayed thereby, an adjustment of contract time will be made.

Payment for extra work required to be performed pursuant to the provisions in this Section 5-1.14, in the absence of an executed contract change order, will be made by force account as provided in Section 9-1.04 “Force Account” of the Caltrans Standard Specifications.

5-1.15 Stop Notice

Section 9-1.16E(4) of the Caltrans Standard Specifications is amended to read as follows:

“At its option, the Department of Public Works may at anytime retain from the amounts due the Contractor sufficient amount to cover claims which there are filed pursuant to Section 3179 et seq. of the Code of Civil Procedures.”

5-1.16 Pre-Construction Meeting

The City of Stockton Public Works Department will schedule a pre-construction meeting with the Contractor following award of the contract and prior to commencing work (Contact 937-8134). This meeting will be held in the City of Stockton, Public Works Department.

5-1.17 Post-Construction Meeting

The Contractor shall attend a post-construction meeting that will be arranged by the Public Works Department (Contact 937-8134) after completion of work and prior to acceptance and final payment. The project Design Engineer and the Project Inspector will also attend this meeting. The purpose of the meeting will be to discuss the project and any related issues that can help improve future Public Works construction projects. This meeting will be held in the City of Stockton, Public Works Department. At this meeting the Contractor shall submit a marked up set of record drawings/as-built plans.
5-1.18 As-Built/Record Drawings

The Contractor shall maintain a complete set of drawings on-site for the purpose of keeping up to date all field modifications. This plan set shall be available for review by the project Inspector and the Engineer. These plans shall be provided to the Inspector after the completion of construction at the Post-Construction Meeting and prior to the final payment. All revisions, modifications, and/or changes shall be marked clearly. Notes and dimensions shall be in red and be clear and legible. These plans will be used by the Engineer to mark up the original plan sheets with the revisions made during construction.

A list shall be maintained of any trees removed during the course of construction by the Contractor or his Subcontractor, identifying the location, size, and species (common name). This list shall be submitted at the Post-Construction meeting.

A list shall be maintained of the pole numbers of street lights that are removed during the course of construction by the Contractor or his Subcontractor and shall be submitted at the post-construction meeting.

Full compensation for furnishing the As-Built/Record Drawings shall be considered included in the prices paid for the various bid items of work, and no additional compensation will be considered therefor.

5-1.19 Maintaining Existing and Temporary Electrical Systems

Maintaining existing electrical systems shall conform to the provisions of Section 86-1.06, "Maintaining Existing and Temporary Electrical Systems," of the Caltrans Standard Specifications and these Special Provisions. Existing traffic signal systems shall be kept in effective operation for the benefit of the traveling public during the progress of the work, except when shut down is permitted. The traffic signal shutdowns shall be limited to the hours of 9:00 a.m. to 3:30 p.m., and shall be permitted only during the switch over from existing to new controller operation, unless prior approval is obtained from the Engineer.

Temporary standards with signal equipment may be required during the construction of the new installation. The Contractor shall provide temporary equipment if he or the Engineer deems necessary. The cost of the temporary system shall be included in the prices paid for installation of traffic signals and modification of traffic signals and no additional compensation shall be allowed.

The Contractor shall notify the Engineer and Police Department 24 hours prior to any operational shutdown of existing signal system.

The contractor shall be responsible for the maintenance of the entire existing signal system from the first day Contractor starts working on it to the final acceptance. The contractor shall respond to the notice of signal failure from, by The City of Stockton,
within two (2) hours and make repairs to the signal system as necessary. If the contractor fails to respond within the specified time, the City’s maintenance staff will repair the signal system. Any costs associated with the repair shall be billed to the contractor. In addition, a penalty of $500 shall be charged to the Contractor for each maintenance call-out where the Contractor does not respond within 2 hours of notification.

The Contractor shall notify the Engineer and Police Department 24 hours prior to any operational shutdown of existing signal system.

Full compensation for performing the work in these specifications shall be included in the prices paid for the various contract items of work, and no additional compensation will be allowed therefor.

5-1.20 Acceptance of Contract

When the Engineer has made the final inspection and determines that the contract work has been completed in all respects in accordance with the Standard Specifications and Plans, and the balancing change order has been agreed to and signed by the Contractor, the Engineer will file a "Notice of Completion" with the County Recorder and immediately upon and after such filing, the Contractor will be relieved of the duty of maintaining and protecting the work as a whole, and will not be required to perform any further work thereon, and the Contractor shall be relieved of the Contractor's responsibility for injury to persons or property or damage to the work which occurs after such filing.

Final inspections will be performed by the Engineer. The Engineer reserves the right to add items to project’s punch list as deemed necessary. Contractor shall not be granted additional working days for the completion on the punch list.

5-1.21 Differing Site Conditions

Differing Site Conditions shall conform to the provisions in Section 4-1.06, "Differing Site Conditions, of the Caltrans Standard Specifications.

5-1.22 Suspension of Work

In addition to the requirements in Section 8-1.06, “Suspensions,” of the Caltrans Standard Specifications the following shall apply:

Suspensions Of Work Ordered by the Engineer – If the performance of all or any portion of the work is suspended or delayed by order of the Engineer in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and if the Contractor believes that additional compensation and contract time is due as a result of such suspension or delay, the Contractor shall submit to the Engineer a request in writing for an adjustment to the
Contract. The request for adjustment shall be submitted within seven (7) calendar
days of receipt of the notice to resume work from the Engineer and shall set forth
the reasons and support for such adjustment. Upon receipt of the request for
adjustment to the Contract, the Engineer will evaluate the Contractor’s request. If
the Engineer agrees that the cost or the time or cost and time required for the
performance of the Contract has increased as a result of such suspension; that the
suspension was caused by conditions beyond the control of and not the fault of the
Contractor, its suppliers or Subcontractors at any approved tier; and that the
suspension was not caused by weather, the Engineer at his discretion may make
an adjustment (excluding profit) and modify the Contract in writing accordingly.
The Engineer will notify the Contractor of his determination whether or not an
adjustment of the Contract is warranted. No Contract adjustment will be allowed
unless the Contractor has submitted the request for adjustment within the time
prescribed. No Contract adjustment will be allowed under the provisions specified
in this section for work suspended or delayed by any other cause which is not by
order of the Engineer in writing, or for which an adjustment is provided for or
excluded under any term or condition of this Contract.

5-1.23 Removal of Asbestos or Hazardous Substances

When the presence of asbestos or hazardous substances are not shown on the plans
or indicated in the specifications and the Contractor encounters materials which the
Contractor reasonably believes to be asbestos or a hazardous substance as defined in
Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous
substance has not been rendered harmless, the Contractor may continue work in
unaffected areas reasonably believed to be safe, and shall immediately cease work in
the affected area and report the condition to the Engineer in writing.

Any asbestos cement pipe to be removed shall be disposed of in accordance with
Section 25914 of the Health and Safety Code. If asbestos cement pipe is encountered,
the Contractor shall stop work in the area and cover it back until a properly certified
Contractor can remove the pipe.

Any asbestos cement water pipe removed due to conflicts with the proposed
improvements shall be paid for as extra work subject to the requirements in Section 5-
1.14 “Extra Work” of these Special Provisions. Removal and disposal of an asbestos
cement water pipe which is removed at the Contractor’s convenience will be done at
the Contractor’s expense.

5-1.24 Construction Waste Disposal and Recycling

The Contractor shall recycle all applicable construction waste material. Waste
material may be disposed of at FTG Construction Materials, Inc. located at 915 West
Anderson Street in Stockton (209) 334-4038 or another approved recycler. The
Contractor shall recycle as much construction waste material as possible and shall
keep construction waste materials separated, as necessary, to keep them acceptable for the intended recycler.

In order to comply with the California Integrated Waste Management Act of 1989, Assembly Bill 939, the City of Stockton requires that permitted construction and demolition projects recycle at minimum fifty percent (50%) by weight of all materials generated by the projects to divert project waste from the landfills.

The Contractor is required to complete and submit a Construction/Demolition (C&D) Recycling Plan prior to receiving a Notice to Proceed. The Contractor’s attention is directed to the City of Stockton website at http://www.stocktongov.com/recycle/pages/CDprogram.cfm for instructions and forms for the Recycling Plan.

The Contractor must also complete the Construction and Demolition (C&D) Debris Recycling Report within sixty (60) days of construction or demolition project completion (Notice of Completion). The completed form must be accompanied by the official weight tags or receipts verifying the information provided in the report. The Contractor’s attention is directed to the City of Stockton website at http://www.stocktongov.com/recycle/pages/CDprogram.cfm for instructions and forms for the Recycling Report.

5-1.25 “Vehicle Code” and “Weight Limitation”

In accordance with Section 591 of the Vehicle Code, the City has determined that, in areas within the limits of the project which are open to public traffic, the Contractor shall comply with the requirements set forth in Divisions 11, 12, 13, 14 and 15 of the Vehicle Code. Attention is directed to the statement in Section 591 that this section shall not relieve the Contract from the duty of exercising due care. The Contractor shall take all necessary precautions for the safe operation of his equipment and for the protection of the public from injury and damage from the operation of his equipment.

5-1.26 Inspection

All work under this contract shall be under the control and inspection of the City Engineer or her appointed representative. The Contractor shall contact Rosa Alvarez, Project Manager, at (209) 937-8134 at the City of Stockton for a preconstruction conference prior to beginning construction.

5-1.27 Monument Preservation

The Contractor shall preserve all monumentation affected by the work included in this contract in accordance with Section 8771 of the Professional Land Surveyors Act in the Business and Professions Code of the State of California. Locations of existing monumentation known to the Engineer that are within the area of work in this contract
have been indicated on the plans. Contractor’s licensed surveyor shall tie down existing monuments and submit the information to the Engineer.

Full compensation for conformance with this provision shall be considered as included in the prices paid for the various contract items and no additional compensation will be allowed therefor.

5-1.28 Design Firm May Not Bid on Construction Contract

No Engineering or architectural firm which has provided design services for a project shall be eligible to bid on the contract to construct the project except that the design Engineer may submit a bid and may provide construction surveying and staking services to the construction Contractor(s). The firms ineligible to bid include the prime Contractor for design, subcontractors for portions of the design, and affiliates of either said prime Contractor or said subcontractors. An affiliate is a firm which is subject to the control of the same persons who control said prime Contractor or said subcontractors through joint ownership or otherwise.

5-1.29 Progress Schedule

Attention is directed to "Cooperation" and "Obstructions" of these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7, "Legal Relations and Responsibility," of the Standard Specifications.

A. SUMMARY

1. Contractor shall produce required Progress Schedules, including the initial, original, and monthly updates (described below), required under this Contract in accordance with the requirements of this Section.

2. Contractor shall develop a weekly bar chart schedule with a three week look ahead. The Contractor will attend a weekly construction meeting with the Engineer and the City. The look ahead schedule, Requests for Information (RFI), Field Order Directives (FOD) and general management issues relating to the work being conducted will be discussed during this weekly meeting.

3. Contractor shall facilitate monthly Progress Schedule Update Meetings.

4. Upon Notice of Award of Contract, Contractor shall immediately commence development of the Original Progress Schedule to ensure compliance with requirements of this Section.

5. Contractor’s obligations under this Section are hereby deemed material obligations justifying the City’s remedies for default if Contractor fails to
perform. Nothing in this Section or the lack of an express statement that any other contract Document provision is or is not material shall be considered in determining whether any such other provision is material.

6. Contractor shall employ competent scheduling personnel, or a schedule consultant, with experience performing scheduling.

B. GENERAL

1. Progress Schedule shall be the basis for monitoring and evaluating job progress, payment requests, and time extension requests.

2. By submitting a bid, Contractor represents it has reviewed the work required by the Contract Documents, including, but not limited to, the availability of materials, labor, equipment and supplies, constraints upon Contractor’s own forces and resources, reasonable anticipated weather conditions and other factors, and agrees that the Contract Time and Liquidated Damages are reasonable under the circumstances.

3. City or City’s representative may review the Progress Schedules for compliance with the Contract Documents. If the Contractor’s Progress Schedule does not comply with the requirements of the Contract Documents, it may be returned to the Contractor for revisions necessary to bring the Progress Schedule into compliance with the Contract Documents. City’s review or acceptance of the Progress Schedule shall not relieve Contractor of its responsibility for errors therein and shall not be regarded as a waiver of such errors by City. Contractor shall not be entitled to any claim or right of delay, acceleration, or other impact upon Contractor that may occur as a result of such errors.

4. Should Contractor fail or refuse for any reason, to properly and timely submit to Engineer, Contractor’s Progress Schedule, Contractor agrees it thereby waives any claim it may have then or that may arise in the future for delay, acceleration, impact, or the like, no matter how characterized.

5. By submission of its Progress Schedule to Engineer for review, Contractor represents that it has reviewed the Progress Schedule with each of its subcontractors, and each subcontractor has agreed that as to the subcontractor’s portion of the work, the Progress Schedule is reasonable, and further that each subcontractor will devote the resources necessary to complete its portion of the work as shown on the Progress Schedule.

6. Failure of Progress Schedule to include any element of the Work or any inaccuracy in Progress Schedule will not relieve Contractor from any responsibility for accomplishing the Work in accordance with the Contract. City’s acceptance of Progress Schedule shall be for its use in monitoring
and evaluating job progress, payment requests, and time extension requests, and delays and shall not, in any manner, impose a duty of care upon the City, or act to relieve Contractor of its responsibility for means and methods of construction.

7. Updating, changing, or revising of any schedule or narrative submitted to Engineer by Contractor under this Contract, or Engineer’s review or acceptance of any such schedule or narrative shall not have the effect of amending or modifying, in any way, the contractual completion date or milestone dates or of modifying or limiting, in any way, Contractor’s obligations under this Contract.

8. Failure by Contractor to include any element of work required for performance of the Work on the detailed construction schedule shall not excuse Contractor from completing all Work required within the Contract Time.

C. PROGRESS SCHEDULE FORMAT AND FLOAT

1. Contractor Original Progress Schedule, and all updates or revisions thereto, shall:
   
a. Use the Critical Path Method (CPM), time-scaled network diagram showing continuous flow from left to right, computer generated with a software program equal to Microsoft Project. Include copies of the complete Progress Schedule on computer readable compact disks.

b. Demonstrate adequate planning for the work including a practical plan to complete the work within the Contract Time.

c. Break up the Work into activities with durations of no more than 15 days, or as deemed acceptance by City. Project calendars shall reflect the nature of the activity to which they are assigned. Contractor shall provide a brief description of each work activity in a separate written document.

d. Identify all major work activities, including but not limited to, equipment, materials, building elements, items requiring City or Engineer’s prior approval, submittals and review of submittals, procurements, off-site fabrication, system test dates, scheduled overtime, dates of City furnished items, dates for access to specific sites, dates for City or third party furnished utilities, connection and relocation of existing utilities, commissioning periods required by the specifications, punch list correction, and connection to and/or penetration of existing structures.

e. Indicate planned mobilization of materials, equipment, and work force.
f. Indicate planned sequence of early operations of procurement, including submittals.

g. Incorporate a minimum of ten (10) working days of City’s review of each submittal.

h. Indicate all dependencies and logic between activities.

i. Identify all work activities, which constitute the critical path.

j. For each activity, show early start, late start, early finish, late finish, durations measured in days, float, predecessor, and successor activities, and planned workday/week for the activity.

k. Incorporate milestone completion dates.

l. Not indicate the completion of the work required under these Contract Documents later than the contractual completion date set forth in these Contract Documents. If the Progress Schedule indicates a completion date sooner than the contractual completion date set forth in Section 4, “Beginning of Work, Time of Completion and Liquidated Damages,” of these Special Provisions, then Contractor shall not be entitled to any right for delay, acceleration, or other impact that prevents Contractor from completing the work earlier than the contractual completion date set forth in these Contract Documents.

2. “Critical” work activities are those which if delayed or extended, will delay the scheduled completion of the total of the Work required under these Contract Documents. All other work activities are not “critical” and have greater float than the critical work activities. Float is the amount of time that a work activity that is not “critical” can be delayed or extended without delaying the completion of the total of the work required under these Contract Documents. The critical path calculation method which generates critical work activities for all submitted schedules shall be consistent throughout the project and utilize Primavera System “retained logic” option throughout the project or “progress override” throughout the project. Notwithstanding the calculation method shall always utilize Primavera Systems “forward and backward pass” option for automatic calculation.

3. If the Progress Schedule indicates a completion date sooner than the contractual completion date and has been accepted by City, the Progress Schedule is considered to have Project Float. The Project Float is defined as the time between the scheduled completion of the Work and the contractual completion date.
4. Float (including Project Float) Ownership: Neither City nor Contractor owns float. The Project owns the Float in that Float is a resource available to both the City and Contractor. As such, liability for delay of the contractual completion date rests with the party whose actions, last in time, actually cause delay to the contractual completion date.

   a. For example, if Party A is responsible for delaying an activity for ten days and if the amount of float for that activity is fifteen days, then Party A is not responsible for delaying the project as the contractual completion date would be unaffected.

   b. However, if subsequently, Party B delays the same activity for eight days then Party B is responsible for delaying the project three days, the difference between the remaining float and the amount of delay.

D. ORIGINAL PROGRESS SCHEDULE

1. Contractor shall submit the Original Progress Schedule for review at the Preconstruction Meeting and it shall serve as Contractor’s Progress Schedule for up to 30 days after the date the Contract has been approved by City.

2. The Original Progress Schedule must indicate the Contractor’s detailed plan for the Work to be completed in the first 30 days of the Contract and shall include details of planned mobilization of plant and equipment; sequence of early operations; submittal activities; and procurement of materials and equipment. Show the remainder of all Work beyond 30 days in summary form. The Original Progress Schedule must be accepted by the Engineer prior to beginning any Work other than mobilization activities. Acceptance of the Original Progress Schedule shall be limited to conformance with sequencing, coordination and milestone requirements of the Contract Documents. Contractor shall make corrections necessary to obtain acceptance of the Engineer and to comply with Contract Documents requirements and shall adjust schedule to incorporate any missing information requested. Contractor shall resubmit the Original CPM Schedule if requested by the Engineer. The Original Schedule shall represent the Contractor’s detailed plan for the completion of the Work including all administrative, submittal and procurement activities. The Original Progress Schedule and all updates shall comply with all requirements and standards of this Section.

E. MONTHLY PROGRESS SCHEDULE UPDATES

1. Following acceptance of Contractor’s Original Progress Schedule, Contractor shall monitor progress of Work and adjust the Progress Schedule
each month to reflect actual progress and any anticipated changes to planned activities.

a. Timely receipt by City of each required Monthly Progress Schedule Update in full compliance with all of these Contract Documents shall be a condition precedent to City’s obligation to pay or request payment for Contractor, sums due under this Contract.

b. Each Progress Schedule Update submitted shall be complete, including all information requested for the Original Progress Schedule submittal and all information under this Section.

c. Each Progress Schedule Update shall continue to show all Work activities including those already completed. These completed activities shall reflect “as built” information by indicating when activities were actually started and completed, and Contractor warrants the accuracy of as-built information as shown.

d. Each Progress Schedule Update should be submitted with three copies and the electronic version on or before the 15th of each month.

e. Contractor shall make corrections to Progress Schedule Update necessary to comply with Contract requirements and shall adjust Progress Schedule Update to incorporate any missing information requested by City. Contractor shall resubmit Progress Schedule if requested by City.

2. Contractor shall meet with City to review and discuss each Progress Schedule (i.e. Initial, Original and monthly updates) within one week after each Progress Schedule has been submitted to City. This meeting will occur monthly and be facilitated by the Contractor.

a. At this meeting, at a minimum, the following items will be reviewed: percent complete for each activity; Time Impact Evaluations (TIEs) for Change Orders (see below) and Time Extension Requests; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.

b. These meetings are considered a critical component of overall Progress Schedule submittal; Contractor shall have appropriate personnel attend. At a minimum, Contractor’s General Superintendent and Scheduler shall attend these meetings.

c. Contractor should plan on the meeting taking no less than two hours.
3. Within five days after Progress Schedule meeting, Contractor shall submit the revised Progress Schedule.

F. LOOK AHEAD SCHEDULE

Contractor shall produce a three-week “look ahead,” detailed daily bar chart schedule every week for discussion during the weekly construction meeting. The three-week “look ahead” shall be a snapshot of the Progress Schedule showing the activities to be worked on during the current and following weeks. These “look ahead” schedules shall be derived directly from the most recent Progress Schedule update which has been updated to include actual progress in the interim period and shall reflect an accurate plan for the period depicted. Total Float for each activity on the “look ahead” schedules shall be clearly shown. The City will utilize the “look ahead” schedules to assess Contractor’s short-term progress and plan its own activities. The three-week “look ahead” schedule shall be reviewed at all the weekly meetings.

G. PROGRESS SCHEDULE REVISIONS

1. Reflecting actual progress on the Progress Schedule Updates is not considered a “revision” to the Progress Schedule. However, revisions to activity durations and sequences are a part of the scheduling process.

2. To reflect revisions to the Progress Schedule, Contractor shall provide City with a written narrative that includes a full description and reasons for each revision. For revisions affecting the sequence of Work, Contractor shall provide a schedule diagram that compares the original sequence to the revised sequence of Work. Contractor shall provide the written narrative and schedule diagram for revisions three days in advance of the monthly Progress Schedule update meeting. Clearly show and discuss any changes in the critical path.

3. Progress Schedule revisions shall not be incorporated by Contractor into any Progress Schedule Update until City has reviewed and accepted the revisions. City may request further information and justification for Progress Schedule revisions. Contractor shall provide City with a complete written narrative response to these requests within three days.

4. If City does not accept Contractor’s revisions, and Contractor disagrees with City’s position, Contractor has seven days from receipt of City’s letter rejecting revisions to provide a written narrative providing full justification and explanation for the revision. Contractor’s failure to respond in writing within the seven days of City’s written rejection of a Progress Schedule revision shall be contractually interpreted as acceptance of City’s position, and Contractor waives its rights to subsequently dispute or file a claim regarding City’s position. If Contractor files a timely response as provided in
this paragraph, and the parties are still unable to agree, Contractor’s sole right shall be to file a claim as provided in Section 7-1.07, “Claims,” of the Standard Specifications.

5. At City’s discretion, Contractor can be required to provide Subcontractor certifications of performance regarding proposed Progress Schedule revisions affecting said Subcontractors.

H. RECOVERY SCHEDULE

1. If, in the opinion of the City, the Contractor is 21 days behind schedule for an individual milestone completion date or for the contractual completion date, the Contractor shall submit to the City, within seven days of City notification, the proposed revisions to recover the lost time. As part of this submittal, Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of Work. If requested by the City, the Contractor shall show the intended critical path; secure appropriate Subcontractor and supplier consent to the recovery Schedule; submit a narrative explaining trade flow and construction flow duration changes, added/deleted activities, critical path changes and identify all near critical paths and man hour loading assumptions for major Subcontractors.

2. The revisions shall not be incorporated into any Progress Schedule Update until City has reviewed and accepted the revisions.

3. If City does not accept Contractor’s revisions, City and Contractor shall follow the procedures in paragraphs G(3), G(4) and G(5) of this Section.

4. At City’s discretion, Contractor may be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

I. TIME IMPACT EVALUATION (TIE) FOR CHANGE ORDERS AND OTHER DELAYS

1. When Contractor is directed to proceed with changed work, Contractor shall prepare and submit, within 14 days from the direction to proceed, a TIE that includes both a written narrative and a schedule diagram depicting how the changed work affects other schedule activities. The schedule diagram shall show how Contractor proposes to incorporate the changed work in the Progress Schedule, and how it impacts the current Progress Schedule Update; critical path or otherwise. Contractor is also responsible for requesting time extensions based on the TIEs impact on the critical path. The diagram shall be tied to the main sequence of scheduled activities to
enable City to evaluate the impact of changed work to the scheduled critical path.

2. Comply with the requirements of paragraph I(1) of this Section for all types of delays such as, but not limited to, Contractor/SubContractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.

3. All costs associated with the preparation of TIEs and the process of incorporating TIEs into the current Progress Schedule update, shall be considered included in the markup percentages identified in the Caltrans Standard Specifications for Change Orders. Contractor shall provide City with four copies of each TIE.

J. TIME EXTENSIONS

1. Contractor is responsible for requesting time extensions for time impacts that, in the opinion of Contractor, impact the critical path of the current Progress Schedule Update. Notice of time impacts shall be given to the Engineer.

2. Where an event for which City is responsible impacts the contractual completion date, Contractor shall, at City’s request, provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. Also include a detailed cost breakdown of the labor, equipment, and material Contractor would expend to mitigate City-caused time impact. Submit mitigation plan to City within 14 days from the City’s request to prepare the plan.

3. Failure to request time extensions, provide TIE, or provide the required mitigation plan will result in Contractor waiving its rights to a time extension and cost to mitigate the delay.

4. No additional Contract Time will be granted under the Contract Documents for cumulative effect of changes.

5. City will not be obligated to consider any time extension request unless requirements of Contract Documents are complied with.

6. Failure of Contractor to perform in accordance with the current Progress Schedule Update shall not be excused by submittal of time extension requests.

7. Notwithstanding any other provision of this Section, if Contractor does not submit a TIE within the required 14 days for any issue, Contractor hereby agrees that Contractor does not require a time extension for that issue.
Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for developing and providing the progress schedule, updates, and attending weekly construction meetings shall be included in the lump sum price paid for “Progress Schedule (Critical Path),” and no additional compensation will be allowed therefor.

5-1.30 Watering

Watering shall conform to the provisions in Section 17, “Watering,” of the Caltrans Standard Specifications. The Contractor shall be responsible for obtaining the necessary permits and meters from the City of Stockton Municipal Utility Department and Fire Department for connecting to the City’s water system. Cost of permit, meters and water used shall be Contractor’s responsibility.

5-1.31 Water Pollution Control

Discharges of storm water from the project must comply with NPDES General Permit for "Storm Water Discharges Associated with Construction and Land Disturbance Activities" (Order No. 2009-0009-DWQ, NPDES No. CAS000002) hereinafter called the "Permit." Manage work activities to reduce the discharge of pollutants to surface waters, groundwater, or municipal separate storm sewer systems including work items shown in the Bid Item List for:

1. Prepare Storm Water Pollution Prevention Plan. SWPPP preparation includes obtaining SWPPP approval, amending the SWPPP, preparing a CSMP and a SAP, and monitoring and inspecting WPC practices at the job site.
3. Storm Water Sampling and Analysis Day. Storm Water Sampling and Analysis Day includes reporting of storm water quality per qualifying rain event. If specified for the risk level, the work includes preparation, collection, analysis, and reporting of storm water samples for turbidity, pH, and other constituents.
4. Rain Event Action Plan. If specified for the project risk level, REAP preparation includes preparing and submitting REAP forms and monitoring weather forecasts.

Do not start work until:

1. SWPPP is approved.
2. WDID is issued.
3. SWPPP review requirements have been fulfilled. If the RWQCB requires time for SWPPP review, allow 30 days for the RWQCB to review the SWPPP as specified under "Submittals" of these special provisions.
This project is Risk Level 2

Definitions and Abbreviations

**active and inactive areas:** (1) Active areas have soil disturbing work activities occurring at least once within 14 days, and (2) Inactive areas are areas that have not been disturbed for at least 15 days.

**BMPs:** Best Management Practices are water pollution control practices.

**construction phase:** Construction phases are (1) Highway Construction including work activities for building roads and structures, (2) Plant Establishment including maintenance on vegetation installed for final stabilization, and (3) Suspension where work activities are suspended and areas are inactive.

**CSMP:** Construction Site Monitoring Program.

**NAL:** Numeric Action Level.

**NEL:** Numeric Effluent Limit.

**NPDES:** National Pollutant Discharge Elimination System.

**NOI:** Notice of Intent.

**normal working hours:** The hours you normally work on this project.

**Preparation Manual:** The Department's "Storm Water Pollution Prevention Plan and Water Pollution Control Program Preparation Manual."

**QSD:** Qualified SWPPP Developer.

**QSP:** Qualified SWPPP Practitioner.

**qualified rain event:** A qualified rain event is a storm that produces at least 0.5 inch of precipitation with a 48 hour or greater period between storms.

**REAP:** Rain Event Action Plan.

**RWQCB:** Regional Water Quality Control Board.

**SAP:** Sampling and Analysis Plan.

**SSC:** Suspended Sediment Concentration.

**SWRCB:** State Water Resources Control Board.

**SWPPP:** Storm Water Pollution Prevention Plan.

**WDID:** Waste Discharge Identification Number.

**WPC:** Water Pollution Control.

**WPC Manager:** Water Pollution Control Manager. The WPC Manager implements water pollution control work described in the SWPPP and oversees revisions and amendments to the SWPPP.

Submittals

Within 20 days after contract approval, start the following process for SWPPP approval:

1. Submit 3 copies of the SWPPP and allow 20 days for the Engineer's review. If revisions are required, the Engineer provides comments and specifies the date that the review stopped.
2. Change and resubmit the SWPPP within 15 days of receipt of the Engineer's comments. The Engineer's review resumes when the complete SWPPP is resubmitted.

3. When the Engineer approves the SWPPP, submit an electronic and 4 printed copies of the approved SWPPP.

4. If the RWQCB reviews the approved SWPPP, the Engineer submits one copy of the approved SWPPP to the RWQCB for their review and comment. RWQCBs requiring time to review SWPPPs include:

4.1. Lahontan for projects in the Lake Tahoe Hydrologic Unit and the Mammoth Lakes Hydrologic Unit

5. If the Engineer requests changes to the SWPPP based on RWQCB comments, amend the SWPPP within 10 days.

Submit:

1. Storm water training records including training dates and subjects for employees and subcontractors. Include dates and subjects for ongoing training, including tailgate meetings.

2. Employee training records:

   2.1. Within 5 days of SWPPP approval for existing employees
   2.2. Within 5 days of training for new employees
   2.3. At least 5 days before subcontractors start work for subcontractor's employees

Prepare a Storm Water Annual Report for the reporting period from July 1st to June 30th. For the prior reporting period, submit the report no later than July 15th if construction occurs from July 1st through June 30th or within 15 days after contract acceptance if construction ends before June 30th.

Submit the Storm Water Annual Report as follows:

1. Submit 2 copies of the Storm Water Annual Report and allow 10 days for the Engineer's review. If revisions are required, the Engineer provides comments and specifies the date that the review stopped.

2. Change and resubmit the Storm Water Annual Report within 5 days of receipt of the Engineer's comments. The Engineer's review resumes when the complete Storm Water Annual Report is resubmitted.

3. When the Engineer accepts the Storm Water Annual Report, insert the WPC Manager's signed certification and the Engineer's signed certification.

Submit one electronic copy and 2 printed copies of the accepted Storm Water Annual Report.
Submit as required:

1. NAL Exceedance Reports
2. NEL Exceedance Reports
3. Visual Monitoring Reports
4. Inspection Reports
5. BMP Status Report

At least 5 days before operating any construction support facility, submit:

1. A plan showing the location and quantity of WPC practices associated with the construction support facility
2. A copy of the NOI approved by the RWQCB and the SWPPP approved by the RWQCB if you will be operating a batch plant or a crushing plant under the General Industrial Permit.

Quality Control and Assurance

Training

Provide storm water training for:

1. Project managers
2. Supervisory personnel
3. Employees involved with WPC work

Train all employees, including subcontractor's employees, in the following subjects:

1. WPC rules and regulations
2. Implementation and maintenance for:
   2.1. Temporary Soil Stabilization
   2.2. Temporary Sediment Control
   2.3. Tracking Control
   2.4. Wind Erosion Control
   2.5. Material pollution prevention and control
   2.6. Waste management
   2.7. Non-storm water management
   2.8. Identifying and handling hazardous substances
   2.9. Potential dangers to humans and the environment from spills and leaks or exposure to toxic or hazardous substances

Employees must receive initial WPC training before working on the job site.

Conduct weekly training meetings covering:

1. WPC BMP deficiencies and corrective actions
2. BMPs that are required for work activities during the week
3. Spill prevention and control
4. Material delivery, storage, use, and disposal
5. Waste management
6. Non-storm water management procedures

Training for personnel to collect water quality samples must include:

1. SAP review
2. Health and safety review
3. Sampling simulations

If you operate construction support facilities, protect storm water systems or receiving waters from the discharge of potential pollutants by using WPC practices.

Construction support facilities include:

1. Staging areas
2. Storage yards for equipment and materials
3. Mobile operations
4. Batch plants for PCC and HMA
5. Crushing plants for rock and aggregate
6. Other facilities installed for your convenience such as haul roads

If you operate a batch plant to manufacture PCC, HMA, or other material; or a crushing plant to produce rock or aggregate; obtain coverage under the General Industrial General Permit. You must be covered under the General Industrial Permit for batch plants and crushing plants located:

1. Outside of the job site
2. Within the job site that serve one or more contracts

Discharges from manufacturing facilities such as batch plants must comply with the general waste discharge requirements for Order No. 97-03-DWQ, NPDES General Permit No. CAS000001, issued by the SWRCB for "Discharge of Stormwater Associated with Industrial Activities Excluding Construction Activities." For the General Industrial Permit, go to:

http://www.waterboards.ca.gov/

You may obtain copies of the Preparation Manual from the Publication Distribution Unit. The mailing address for the Publication Distribution Unit is:

State of California
Department of Transportation
Publication Distribution Unit
The Preparation Manual and other WPC references are available at the Department's "Construction Storm Water and Water Pollution Control" Web site. For the Web site, go to:


Water Pollution Control Manager

Assign one WPC Manager to implement the SWPPP. The WPC Manager must comply with the Permit qualifications for a QSP and a QSD. You may assign a different QSD to prepare the SWPPP.

The QSD must have the following qualifications:

1. Department approved storm water management training described in the Department's "Construction Storm Water and Water Pollution Control" web site
2. Registration or certification described in the Permit

The QSP must meet the qualifications of the QSD or have the following certifications:

1. Department approved storm water management training described in the Department's "Construction Storm Water and Water Pollution Control" web site
2. Certification described in the Permit

At the job site, the WPC Manager must:

1. Be responsible for WPC work
2. Be the primary contact for WPC work
3. Oversee the maintenance of WPC practices
4. Oversee and enforce hazardous waste management practices
5. Have the authority to mobilize crews to make immediate repairs to WPC practices
6. Ensure that all employees have current water pollution control training
7. Implement the approved SWPPP and amend the SWPPP when required

WPC Manager must oversee:

1. Inspections of WPC practices identified in the SWPPP
2. Inspections and reports for visual monitoring
3. Preparation and implementation of REAPs
4. Sampling and analysis
5. Preparation and submittal of:

5.1. NAL exceedance reports
5.2. NEL exceedance reports
5.3. SWPPP annual certification
5.4. Annual reports
5.5. BMP status reports

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

General

SWPPP work includes preparing a SWPPP including a CSMP, obtaining SWPPP approval, amending the SWPPP, inspecting and reporting on WPC practices at the job site. The SWPPP must comply with the Preparation Manual and the Permit. The SWPPP must be submitted in place of the water pollution control program under Section 7-1.01G, "Water Pollution," of the Standard Specifications.

You may request, or the Engineer may order, changes to the WPC work. Changes may include the addition of new WPC practices. Additional WPC work will be paid for as extra work under Section 5-1.14, "Extra Work," of these Special Provisions. The SWPPP must include sections as specified for the project risk level as follows:

1. For risk level 1:
   1.1. Schedule
   1.2. CSMP

2. For risk level 2:
   2.1. Schedule
   2.2. CSMP
   2.3. Adherence to Effluent Standards for NALs
   2.4. REAP

3. For risk level 3:
   3.1. Schedule
   3.2. CSMP
   3.3. Adherence to Effluent Standards for NALs and NELs
   3.4. REAP

The SWPPP must include WPC practices for:
1. Storm water and non-stormwater from areas outside of the job site related to project work activities such as:

   1.1. Staging areas
   1.2. Storage yards
   1.3. Access roads

2. Activities or mobile operations related to contractor obtained NPDES permits

3. Construction support facilities

The SWPPP must include a copy of permits obtained by the Department such as Fish & Game permits, US Army Corps of Engineers permits, RWQCB 401 Certifications, and RWQCB Waste Discharge Requirements for Aerially Deposited Lead Reuse.

Amend the SWPPP annually and resubmit it by July 15th.

Amend the SWPPP if:

1. Changes in work activities could affect the discharge of pollutants
2. WPC practices are added by change order work
3. WPC practices are added at your discretion
4. Changes in the amount of disturbed soil are substantial
5. Objectives for reducing or eliminating pollutants in storm water discharges have not been achieved
6. There is a Permit violation

Whenever you amend the SWPPP, follow the same process specified for SWPPP approval.

Retain a printed copy of the approved SWPPP at the job site.

SWPPP Schedule

The SWPPP schedule must:

1. Describe when work activities will be performed that could cause the discharge of pollutants into storm water
2. Describe WPC practices associated with each construction phase
3. Identify soil stabilization and sediment control practices for disturbed soil areas
Construction Site Monitoring Program (CSMP)

General
The QSD must prepare a CSMP as part of the SWPPP. The CSMP must be developed before starting work and be revised to reflect current construction activities as necessary. The CSMP must include sections for the project risk level as follows:

1. For risk level 1:
   1.1. Visual Monitoring
   1.2. SAP for Non-Visible Pollutants

2. For risk level 2:
   2.1. Visual Monitoring
   2.2. SAP for Non-Visible Pollutants
   2.3. SAP for sediment and turbidity
   2.4. SAP for pH

3. For risk level 3:
   3.1. Visual Monitoring
   3.2. SAP for Non-Visible Pollutants
   3.3. SAP for sediment and turbidity
   3.4. SAP for pH
   3.5. SAP for receiving waters
   3.6. SAP for temporary active treatment systems

Visual Monitoring
The WPC Manager must oversee the performance of visual inspections for qualifying rain events. For each qualifying rain event, perform visual inspections and record observations during normal working hours as follows:

1. Record the time, date, and rain gauge reading
2. Observe:

   2.1. Within 2 days before the storm:
      2.1.1. Drainage areas for spills, leaks, or uncontrolled pollutants
      2.1.2. Proper implementation of WPC practices
      2.1.3. Storm water storage areas for leaks and adequate freeboard
2.2. Every 24 hours during the storm:
   2.2.1. WPC practices for effective operation
   2.2.2. WPC practices needing maintenance and repair

2.3. Within 2 days after the storm event:
   2.3.1. Discharge locations
   2.3.2. WPC practices to evaluate the design, implementation, and effectiveness
   2.3.3. To identify where additional WPC practices may be needed

Perform non-stormwater discharge visual inspections as follows:

1. At least once during each of the following periods:
   1.1. January through March
   1.2. April through June
   1.3. July through September
   1.4. October through December

2. Observe flowing and contained storm water for the presence of floating and suspended materials, sheen on the surface, discoloration, turbidity, odors, and sources of observed pollutants

3. Observe the job site for the presence of authorized and unauthorized non-stormwater discharges and their sources

The WPC Manager must prepare visual inspection reports that include the following:

1. Name of personnel performing the inspection, inspection date, and date inspection report completed
2. Storm and weather conditions
3. Locations and observations
4. Corrective actions taken

Maintain visual inspections reports at the job site as part of the SWPPP.

**Sampling and Analysis Plan (SAP)**

**General**
Include a SAP in the CSMP to monitor the effectiveness of WPC practices. The SAP must comply with the Preparation Manual. Assign trained personnel to collect water quality samples. Document their training in the SAP.
Describe the following water quality sampling procedures in the SAP:

1. Sampling equipment
2. Sample preparation
3. Collection
4. Field measurement methods
5. Analytical methods
6. Quality assurance and quality control
7. Sample preservation and labeling
8. Collection documentation
9. Sample shipping
10. Chain of custody
11. Data management and reporting
12. Precautions from the construction site health and safety plan
13. Laboratory selection and certifications

Whenever assigned field personnel take samples, comply with the equipment manufacturer's recommendation for collection, analysis methods, and equipment calibration.

Samples taken for laboratory analysis must follow water quality sampling procedures and be analyzed by a State-certified laboratory under 40 CFR Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants."

The SAP must identify the State-certified laboratory, sample containers, preservation requirements, holding times, and analysis method. For a list of State-certified laboratories, go to:

http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx

Include procedure for sample collection during precipitation.

Retain water quality sampling documentation and analytical results with the SWPPP at the job site.

Show pollutant sampling locations on SWPPP drawings.

If discharges or sampling locations change because of changed work activities or knowledge of site conditions, amend the SAP.

If the project is risk level 2 or risk level 3, include procedures for collecting and analyzing at least 3 samples for each day of each qualifying rain event. Describe the collection of effluent samples at all locations where the storm water is discharged off-site.
Analytical Results and Evaluation
Submit an electronic copy (in file format .xls, .txt, .csv, .dbs, or .mdb) and a printed copy of water quality analytical results, and quality assurance and quality control within 48 hours of field analysis sampling, and within 30 days for laboratory analysis. Also provide an evaluation of whether the downstream samples show levels of the tested parameter that are higher than the control sample.

Electronic water quality analysis results must have the following information:

1. Sample identification number
2. Contract number
3. Constituent
4. Reported value
5. Analytical method
6. Method detection limit
7. Reported limit

SAP for Non-Visible Pollutants
The SAP must include a description of the sampling and analysis strategy for monitoring non-visible pollutants.

The SAP must identify potential non-visible pollutants present at the job site associated with any of the following:

1. Construction materials and waste
2. Existing contamination due to historical site usage
3. Application of soil amendments, including soil stabilization materials, with the potential to change pH or contribute toxic pollutants to storm water

SWPPP drawings must show the locations planned for storage and use of potential non-visible pollutants.

The SAP must include sampling procedures for the following conditions when observed during a storm water visual inspection. For each of the following, collect at least one sample for each qualifying storm event:

1. Materials or waste containing potential non-visible pollutants that are not stored under watertight conditions.
2. Materials or waste containing potential non-visible pollutants that are stored under watertight conditions, but a breach, leakage, malfunction, or spill is observed; the leak or spill has not been cleaned up before precipitation; and material or waste could discharge non-visible pollutants to surface waters or drainage system.
3. Chemical applications, including fertilizer, pesticide, herbicide, methyl methacrylate concrete sealant, or non-pigmented curing compound used
during precipitation or within 24 hours preceding precipitation, and could discharge pollutants to surface waters or drainage system.

4. Applied soil amendments, including soil stabilization materials that could change pH levels or contribute toxic pollutants to storm water runoff and discharge pollutants to surface waters or drainage system, unless available independent test data indicates acceptable concentrations of non-visible pollutants in the soil amendment.

5. Storm water runoff from an area contaminated by historical usage of the site that could discharge pollutants to surface waters or drainage systems.

The SAP must provide sampling procedures and schedule for:

1. Sample collection during the first 2 hours of each rain event that generate runoff
2. Sample collection during normal working hours
3. Each non-visible pollutant source
4. Uncontaminated control sample

The SAP must identify locations for sampling downstream and control samples, and reasons for selecting those locations. Select control sample locations where the sample will not come in contact with materials, waste, or areas associated with potential non-visible pollutants or disturbed soil areas.

SAP for Sediment and Turbidity

If the project is risk level 2 or risk level 3, sample and analyze for turbidity:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Method</th>
<th>Detection Limit (Min)</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turbidity</td>
<td>Field test with calibrated portable instrument</td>
<td>1</td>
<td>NTU</td>
</tr>
</tbody>
</table>

If the project is risk level 3 and the turbidity NEL has been exceeded, sample and analyze for SSC:
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Method</th>
<th>Detection Limit (Min)</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSC</td>
<td>ASTM Method D3977-97</td>
<td>5</td>
<td>Mg/L</td>
</tr>
</tbody>
</table>

SAP for pH

If the project is risk level 2 or risk level 3, sample and analyze for pH:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Method</th>
<th>Detection Limit (Min)</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>Field test with calibrated portable instrument</td>
<td>0.2</td>
<td>pH units</td>
</tr>
</tbody>
</table>

SAP for Receiving Waters

If the project is risk level 3, describe procedures for obtaining samples from representative and accessible locations:

1. Upstream of the discharge point
2. Downstream of the discharge point

Show receiving water sampling locations on SWPPP drawings.

If there are several discharge points, describe procedures for obtaining samples from a single upstream and a single downstream location.

**Rain Event Action Plan (REAP)**

REAP work includes preparing and submitting REAP forms and monitoring weather forecasts. The WPC Manager must submit a REAP to protect the job site at least 48 hours before a predicted rain event.

Prepare a REAP when the National Weather Service is predicting at least a 50 percent probability of precipitation within 72 hours.

For the REAP, use approved forms and include:
1. Site location
2. Risk level
3. Contact information including 24-hour emergency phone numbers for:
   3.1. WPC Manager
   3.2. Erosion and sediment control providers or subcontractors
   3.3. Storm water sampling providers or subcontractors
4. Storm Information
5. Construction phase information for:
   5.1. Highway Construction including active and inactive areas for work activities for building roads and structures
   5.2. Plant Establishment including maintenance on vegetation installed for final stabilization where areas are inactive
   5.3. Suspension where work activities are suspended and areas are inactive
6. Construction phase information including:
   6.1. Construction activities
   6.2. Subcontractors and trades on the job site
   6.3. Pre-storm activities including:
      6.3.1. Responsibilities of the WPC Manager
      6.3.2. Responsibilities of the crew and crew size
      6.3.3. Stabilization for active and inactive disturbed soil areas
      6.3.4. Stockpile management
      6.3.5. Corrective actions taken for deficiencies identified during pre-storm visual inspection
   6.4. Activities to be performed during storm events including:
      6.4.1. Responsibilities of the WPC Manager
      6.4.2. Responsibilities of the crew and crew size
      6.4.3. BMP maintenance and repair
   6.5. Description of flood contingency measures

You must have the REAP onsite at least 24 hours before a predicted rain event. A printed copy of each REAP must be at the job site as part of the SWPPP. Implement the REAP including mobilizing crews to complete activities no later than 24 hours before precipitation occurs.
IMPLEMENTATION REQUIREMENTS

SWPPP Implementation
Obtain, install, and maintain a rain gauge at the job site. Observe and record daily precipitation.
Monitor the National Weather Service Forecast Office on a daily basis. For forecasts, go to:

http://www.srh.noaa.gov/forecast

Whenever you or the Engineer identifies a deficiency in the implementation of the approved SWPPP:

1. Correct the deficiency immediately, unless the Engineer agrees to a later date for making the correction
2. Correct the deficiency before precipitation occurs

If you fail to correct the deficiency by the agreed date or before the onset of precipitation, the Department may correct the deficiency and deduct the cost of correcting the deficiency from payment.

Continue SWPPP implementation during any temporary suspension of work activities. Install WPC practices within 15 days or before predicted precipitation, whichever occurs first.

Numeric Action Levels (NALs)

If the project is risk level 2 or risk level 3, then it is subject to NALs:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Method</th>
<th>Detection Limit (Min)</th>
<th>Unit</th>
<th>Numeric Action Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>Field test with calibrated portable instrument</td>
<td>0.2</td>
<td>pH units</td>
<td>Lower NAL = 6.5, Upper NAL = 8.5</td>
</tr>
<tr>
<td>Turbidity</td>
<td>Field test with calibrated portable instrument</td>
<td>1</td>
<td>NTU</td>
<td>250 NTU</td>
</tr>
</tbody>
</table>
Numeric Effluent Limits (NELs)

If the project is risk level 3, then it is subject to NELs:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Method</th>
<th>Detection Limit (Min)</th>
<th>Unit</th>
<th>Numeric Effluent Limit</th>
</tr>
</thead>
</table>
| pH        | Field test with calibrated portable instrument | 0.2     | pH units | Lower NEL = 6.0  
               Upper NEL = 9.0 |
| Turbidity | Field test with calibrated portable instrument | 1       | NTU     | 500 NTU               |

The storm event daily average for storms up to the 5-year, 24-hour storm, must not exceed the NEL for turbidity. The daily average sampling results must not exceed the NEL for pH.

Storm Water Sampling and Analysis Day

Storm Water Sampling and Analysis Day work includes preparation, collection, analysis, and reporting of storm water samples for turbidity, pH, and other constituents. If the project is risk level 2 or risk level 3, and there is a qualified rain event that produces runoff, comply with the project’s SAP for preparation, collection, analysis, and reporting of storm water samples. Collect:

1. Samples for each non-visible pollutant source and a corresponding uncontaminated control sample
2. Samples for turbidity, pH, and other constituents as specified
3. At least 3 samples for each day of each qualifying rain event
4. Samples for all locations where the storm water is discharged off-site

Perform sample collection during:

1. First 2 hours of each qualified rain event that produces runoff
2. Normal working hours

If the project is risk level 3, obtain receiving water samples. You are not required to physically collect samples during dangerous weather conditions such as flooding or electrical storms.
If downstream samples show increased levels, assess WPC practices, site conditions, and surrounding influences to determine the probable cause for the increase.

**Inspection**

The WPC Manager must oversee inspections for WPC practices identified in the SWPPP:

1. Before a forecasted storm
2. After precipitation that causes site runoff
3. At 24-hour intervals during extended precipitation
4. On a predetermined schedule, a minimum of once a week

The WPC Manager must oversee daily inspections of:

1. Storage areas for hazardous materials and waste
2. Hazardous waste disposal and transporting activities
3. Hazardous material delivery and storage activities
4. WPC practices specified under "Construction Site Management" of these special provisions

The WPC Manager must use the Storm Water Site Inspection Report provided in the Preparation Manual.

The WPC Manager must prepare BMP status reports that include the following:

1. Location and quantity of installed WPC practices
2. Location and quantity of disturbed soil for the active or inactive areas

Within 24 hours of finishing the weekly inspection, the WPC Manager must submit:

1. Copy of the completed site inspection report
2. Copy of the BMP status report

**REPORTING REQUIREMENTS**

**Storm Water Annual Report**

Storm Water Annual Report work includes certifications, monitoring and inspection results, and obtaining Storm Water Annual Report acceptance. The WPC Manager must prepare a Storm Water Annual Report. The report must:

1. Use an approved report format
2. Include project information including description and location
3. Include storm water monitoring information including:
   3.1. Summary and evaluation of sampling and analysis results including laboratory reports
3.2. Analytical methods, reporting units, detections limits for analytical parameters
3.3. Summary of corrective actions
3.4. Identification of corrective actions or compliance activities that were not implemented
3.5. Summary of violations
3.6. Names of individuals performing storm water inspections and sampling
3.7. Logistical information for inspections and sampling including location, date, time, and precipitation
3.8. Visual observations and sample collection records

4. Include documentation on training for:

4.1. Individuals responsible for NPDES permit compliance
4.2. Individuals responsible for BMP installation, inspection, maintenance, and repair
4.3. Individuals responsible for preparing, revising, and amending the SWPPP

**NAL Exceedance Report**
If the project is risk level 2 or risk level 3 and an effluent sample exceeds a NAL, notify the Engineer and submit a NAL Exceedance Report no later than 48 hours after the conclusion of the storm event. The report must:

1. Include the following field sampling results and inspections:

   1.1. Analytical methods, reporting units, and detection limits
   1.2. Date, location, time of sampling, visual observation and measurements
   1.3. Quantity of precipitation of the storm event

2. Description of BMPs and corrective actions taken to manage NAL exceedance

**NEL Violation Report**
If the project is risk level 3 and an NEL is exceeded, notify the Engineer and submit a NEL Violation Report within 6 hours. The report must:

1. Include the following field sampling results and inspections:

   1.1. Analytical methods, reporting units, and detection limits
   1.2. Date, location, time of sampling, visual observations and measurements
   1.3. Quantity of precipitation of the storm event
2. Description of BMPs and corrective actions taken to manage NEL exceedance

If the project is risk level 2 or risk level 3, submit all sampling results to the Engineer no later than 48 hours after the conclusion of a storm event.

PAYMENT

The contract lump sum price paid for prepare storm water pollution prevention plan includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing, obtaining approval of, and amending the SWPPP and CSMP, inspecting water pollution control practices, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

For projects with 60 working days or less, payments for SWPPP are made as follows:

1. After the Engineer approves the SWPPP, the Department includes up to 75 percent of the bid item price in the monthly progress estimate
2. After contract acceptance, the Department pays for the remaining percentage of the bid item price

For projects with more than 60 working days, payments for SWPPP are made as follows:

1. After the Engineer approves the SWPPP, the Department includes up to 50 percent of the bid item price in the monthly progress estimate
2. The Department pays 40 percent of the bid item price over the life of the contract
3. After contract acceptance, the Department pays for the remaining 10 percent of the bid item

If risk level 2 or 3, the Department pays $500 for each Rain Event Action Plan submitted. The contract unit price paid for Rain Event Action Plan includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparation and submittal of REAP forms, and monitoring weather forecasts as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The Department does not adjust payment for an increase or decrease in the quantity of rain event action plans submitted. Section 9-1.06, "Changed Quantity Payment Adjustment," of the Caltrans Standard Specifications does not apply.

The Department pays $2,000 for each Storm Water Annual Report submitted. The contract unit price paid for Storm Water Annual Report includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparation and submittal of Storm Water Annual Report as specified.
in the Standard Specifications and these special provisions, and as directed by the Engineer.

The Department does not adjust payment for an increase or decrease in the quantity of storm water annual reports submitted. Section 9-1.06, "Changed Quantity Payment Adjustments," of the Caltrans Standard Specifications does not apply.

The work to complete the final Storm Water Annual Report contract item is excluded from Section 5-1.20, "Acceptance of Contract," of these Special Provisions.

If risk level 2 or 3, the contract unit price paid for storm water sampling and analysis day includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparation, collection, analysis, and reporting of storm water samples per qualifying rain event as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The Department does not adjust payment for an increase or decrease in the quantity of storm water sampling and analysis day. Section 9-1.06, "Changed Quantity Payment Adjustments," of the Caltrans Standard Specifications does not apply.

You may request or the Engineer may order laboratory analysis of storm water samples. Laboratory analysis of storm water samples will be paid for as extra work under Section 5-1.14, "Extra Work," of these Special Provisions.

The Department does not pay for the preparation, collection, laboratory analysis, and reporting of storm water samples for non-visible pollutants if WPC practices are not implemented before precipitation or if a failure of a WPC practice is not corrected before precipitation.

The Department does not pay for implementation of WPC practices in areas outside the highway right-of-way not specifically provided for in the plans or in the special provisions.

The Department does not pay for WPC practices installed at your construction support facilities.

WPC practices for which there are separate bid items of work are measured and paid for as those bid items of work.

For each failure to submit a completed Storm Water Annual Report, the Department withholds $10,000. This withhold is in addition to other withholds under Section 9-1.16E(3) "Performance Failure Withholds," of the Caltrans Standard Specifications. Each failure to comply with any part of these special provisions and each failure to implement water pollution control practices are considered separate performance failures.
5-1.32 Hazardous Material

If evidence of soil contamination is encountered during excavation activities, contact the engineer, and work within 50 feet of the find shall be halted immediately and shall not be resumed until permitted, in writing, by the Engineer. The soil shall be tested for contaminates. Any soil found to contain hazardous material concentrations above any federal or state remediation levels will be classified in accordance with Title 22 of the California Code of Regulations, and removed to a suitable off-site facility. If testing indicates that the concentrations were below regulatory action levels, the soil may be used on-site or disposed of at a Class II or Class III landfill.

Full compensation for conforming to the above requirements shall be considered as included in the contract prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

Any additional excavation required outside the roadway prism due to removal of contaminated soil, required of the Contractor will be paid for as extra work as provided in Section 5-1.14, "Extra Work," of these Special Provisions.

5-1.33 Migratory Bird Protection Provisions

Attention is directed to the Federal Migratory Bird Treaty Act (15 USC 703-711) 50 CFR Part 21 and 50 CFR Part 10, the California Department of Fish and Game Code Sections 3503, 3513, and 3800, and the California Endangered Species Act that protect threatened and endangered species and migratory birds, their occupied nests, and their eggs from disturbance or destruction.

There is a possibility of Swainson’s hawks, White-tailed Kites, Anna’s Humming Bird, Great Horned Owl and other endangered species are nesting within the project limits.

February 15 through Sept 1 is considered the nesting season. All construction activities are prohibited within 100 feet of an active nest without a written authorization from the Engineer. Prior to beginning work disturbing the ground or vegetation, the Contractor shall hire a qualified ornithologist to conduct a pre-construction survey for nesting birds. From February 15 to April 30, the pre-construction survey shall be conducted no more than 14 days prior to the initiation of construction activities. From May 1 to August 1, the pre-construction survey shall be conducted no more than 30 days prior to the initiation of construction activities. The Engineer will approve the beginning of work disturbing the ground or vegetation between February 15 and August 1.

If evidence of bird nesting is discovered, the Contractor shall not disturb the nesting birds or nests until the birds have naturally left the nests. If evidence of nesting is discovered after beginning work, the Contractor shall immediately stop work and notify the Engineer and the Department of Fish and Game. Construction activity shall not resume until permitted, in writing, by the Department of Fish and Game.
Between August 2 and February 14, potential nesting habitat, which is to be removed with the project, can be removed without a pre-construction survey for active nesting birds.

Attention is directed to Section 8-1.06, "Suspensions," of the Caltrans Standard Specifications.

Nothing in this section shall relieve the Contractor from providing for public safety in conformance with the provisions in Section 5-1.05, "Public Safety," of these Special Provisions.

Full compensation for conforming to the requirements (including the pre-construction surveys and temporary fence) in these special provisions shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

5-1.34 Archeological Resources

Within the project work area, construction or related activities which involve ground disturbance, may uncover archeological resources, such as chipped or ground stone, historic debris, or human bone. The Contractor's construction activities, within 100 feet of the find, shall be halted and the Engineer notified immediately. Construction activity shall not resume until permitted, in writing, by the Engineer. The Engineer shall call a qualified archeologist, at the City's expense, to the site to assess the significance of the find and, if necessary, develop appropriate treatment measures in consultation with the City and other appropriate agencies.

Ground disturbance includes, but is not limited to, excavation, scarification of ground surface, clearing and grubbing, grading, and auger borings.

Should human skeletal material or other archaeological finds be uncovered, the County coroner shall be contacted to determine if the remains are of Native American origin or if the cause of death needs to be investigated further.

In the event that any skeletal remain or artifact is found, and if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of the skeletal remain or artifact being found, the City shall grant the Contractor additional contract working days for such delays and no other compensation shall be allowed. Contractor must submit a written request to the Engineer requesting the extension of contract working days.

The City reserves the right to use other forces for exploratory work to identify the extent of areas requiring archaeological evaluation or recovery. Contractor labor, equipment and materials required to assist the archaeologist shall be paid as extra work as provided in Section 5-1.14, “Extra Work,” of these Special Provisions.
All archaeological materials found during project activity shall be recorded or described in a report submitted to the Central California Information Center at California State University – Stanislaus.

Full compensation for conforming to the above requirements shall be considered as included in the contract prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

Any additional excavation required due to discovery of archaeological remains, required of the Contractor will be paid for as extra work as provided in Section 5-1.14, “Extra Work,” of these Special Provisions.

5-1.35 Relief from Maintenance and Responsibility

Delete the entire section in Caltrans and replace it with the following: Upon the request of the Contractor, the Director may relieve the Contractor of the duty of maintaining and protecting certain portions of the work which have been completed in all respects in accordance with the requirements of the contract and to the satisfaction of the Engineer, and thereafter except with the Contractor’s consent, the Contractor will not be required to do further work thereon. In addition, such action by the Director will relieve the Contractor of responsibility for injury or damage to said completed portions of the work resulting from use by public traffic or from the action of the elements or from any other cause but not from injury or damage resulting from the Contractor’s own operations or from the Contractor’s negligence.

However, nothing in this section 5-1.35 providing for relief from maintenance and responsibility will be construed as relieving the Contractor of full responsibility for making good defective work of materials found at any time before the formal written acceptance of the entire contract by the Director.

5-1.36 Guaranty and Warranty Bond

The Contractor hereby unconditionally guarantees that the work will be done in accordance with the requirements of the contract, and further guarantees the work of the contract to be and remain free of defects of workmanship and materials for a period of one (1) year from the date of acceptance of the work as complete, unless a longer guarantee period is specifically required. The Contractor hereby agrees to repair or replace any and all work, together with any other adjacent work which may be displaced in so doing, that may prove to be not in accordance with the requirements of the contract or that may be defective in its workmanship or material within the guarantee period specified, without any expense whatsoever to the City, ordinary wear and tear and unusual abuse or neglect excepted.

The Contractor further agrees, that within ten (10) calendar days after being notified in writing by the Public Works Department of any work not in accordance with the
requirements of the contract or any defects in the work, the Contractor will commence and prosecute with due diligence all work necessary to fulfill the terms of this guarantee, and to complete the work within a reasonable period of time, and in the event of the Contractor fails to so comply, the Contractor does hereby authorize the City to proceed to have such work done at the Contractor’s expense and the Contractor will pay the cost thereof upon demand. The City will be entitled to all costs, including reasonable attorney’s fees, necessarily incurred upon the Contractor’s refusal to pay such costs.

Notwithstanding the foregoing paragraph, in an event of an emergency constituting an immediate hazard to the health and safety of the City’s employees, property or the public at large, the City may undertake at the Contractor’s expense without prior notice all work necessary to correct such hazardous condition when it was caused by work of the Contractor not being in accordance with contract requirements.

The Faithful Performance bond will be retained by the City of Stockton for twelve (12) months following recordation of the Notice of Completion (or partial completion) to guarantee correction of failure attributed to workmanship and materials. Upon recordation of the Notice of Completion (or partial completion), the amount of the Faithful Performance bond may be reduced to 10% of the actual cost of the constructed improvements.

No warranty bond will be required for the plant establishment work.

5-1.37 Pre-construction Survey

The Contractor shall perform a pre-construction survey of all existing structures, pavements, and other aboveground facilities within the project limits prior to beginning any work, noting their condition by means of photographs and digital video supplemented by written documentation, where applicable.

Color photographs shall be taken at locations that are appropriate to show pre-existing conditions. Each photograph shall show the date and time the photograph was taken and clearly be labeled showing the location, viewing direction, and any special feature noted. Two 4” x 6” copies of each photograph and a copy of the digital video shall be submitted to the Engineer. The photographs shall be indexed, inserted in plastic viewing folder and submitted in 3-ring binders.

Full compensation for pre-construction survey shall be included in the contract price for the various items of work involved, and no other additional compensation will be allowed therefor.
SECTION 7 MEASUREMENT AND PAYMENT

7-1.01 General

Attention is directed to Section 9 “Payment,” of the Caltrans Standard Specifications, and these Special Provisions. All measurements and payments for this work shall conform to all applicable provisions on Section 9 of the Caltrans Standard Specifications.

All materials designated to be removed shall become the property of the Contractor, unless otherwise noted, and shall be disposed in accordance with local, State, and Federal laws and ordinances.

Full compensation for disposal of materials and performing the work in these Special Provisions shall be included in the prices paid for the various contract items of work, and no additional compensation will be allowed therefor.

Payment for the items as listed in the bid forms shall constitute full compensation for furnishing all materials, labor, tools, equipment and incidentals necessary to perform all work required to provide the project improvements, complete in place, as specified. Except as otherwise provided in Sections 4-1.03, “Changes,” of the Standard Specifications and Section 4-1.06 Differing Site Conditions of the Caltrans Standard Specifications, compensation for incidental work items shown or required to be completed for which there is no separate pay item specified, shall be deemed as included in the other pay items as specified and no additional compensation will be allowed therefor.

7-1.02 Lump Sum Bid Items

Value schedules for each lump sum bid item shall be prepared and submitted to the Engineer as set forth in Section 9-1.00, "Lump Sum Contracts", of the City Standard Specifications. The Contractor shall prepare and submit a detailed Schedule of Values acceptable to the Engineer prior to the first progress payment request. Unless otherwise approved by the Engineer, materials on hand, but not incorporated into the work, shall not be included for measurement or for purposes of payment.

7-1.03 Payments

Attention is directed to Sections 9-1.16, "Progress Payments", and 9-1.17, "Payment After Contract Acceptance", of the Caltrans Standard Specifications, and Sections 9-1.06, "Partial Payments", and 9-1.07B, "Final Payment and Claims", of the Standard Specifications. No partial payment will be made for any materials that are furnished on hand, but not yet installed or incorporated in the work.
7-1.04 Final Payment and Claims

After the work is completed, the Engineer will provide a proposed balancing change order, in writing, stating the total amount payable to the Contractor, including therein an itemization of said amount, segregated as to contract item quantities, extra work and any other basis for payment, and shall also show therein all dedications made or to be made for prior payments and amounts to be kept or retained under the provisions of the contract. All prior estimates and payments shall be subject to correction in the proposed balancing change order. The Contractor shall check the balancing change order and submit a written statement of all claims the Contractor has arising under or by virtue of the contract. No claim will be considered that was not included in which a notice or protest is required under the provision in Sections 5-1.13, “Changes,” 4-1.02, “Time of Completion,” 4-1.03, “Liquidated Damages,” of these Special Provisions and Section 5-1.36D, “Nonhighway Facilities,” of the Caltrans Standard Specifications unless the Contractor has complied with the note or protest requirements in said sections. On the Contractor’s approval, or if the Contractor files no claim prior to signing the balancing change order, the following will take place:

1. The balancing change order, when signed by the Contractor, indicates that the Contractor agrees to the quantities contained therein as final quantities and the City of Stockton is then to process payment up to 90% of the entire contract.

2. Upon Final Execution of the Balancing Change Order, the City will file the Notice of Partial Completion, which constitutes their acceptance of the work.

3. Thirty five (35) days after the date the Notice of Partial Completion is recorded, the Retention will be released and constitutes the final payment for the work.

If the Contractor files claims prior to signing the balancing change order, the City will revise the balancing change order accordingly if the claims are approved. Such balancing change order and payment shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor except as otherwise provided in 9-1.21, “Clerical Errors.”

The claims filed by the Contractor shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of said claims. The Engineer will consider and determine the Contractor’s claims and it will be the responsibility of the Contractor to furnish within a reasonable time such further information and details as may be required by the Engineer to determine the facts or contentions involved in the Contractor’s claims. Failure to submit such information and details will be sufficient cause for denying the claims.

The Director of Public Works will make the final determination of any claims, which remain in dispute after review by the Engineer administering the contract. A board or person designated by said Director will review such claims and make a written
recommendation thereon. The Contractor may meet with the Review Board or their staff to make a presentation in support of such claims.

Upon final determination of the claims, the Engineer shall then make and issue the Engineer’s final balancing change order in writing and within 30 days thereafter the City will pay the entire sum, if any, found due thereon. Such final balancing change order shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in and 9-1.21 “Clerical Errors.”

7-1.05 Notice of Potential Claim

The Contractor shall not be entitled to the payment of any additional compensation for any cause, or for the happening of any event, thing, or occurrence, including any act or failure to act, by the Engineer, unless he has given the Engineer due written notice of potential claim as hereinafter specified, provided, however, that compliance with this Section shall not be a prerequisite for matters within the scope of the protest provisions under Section 5-1.13, “Changes” or Section 4-1.02, “Time of Completion” of these Special Provisions or within the notice provisions in Section 8-1.10, “Liquidated Damages” of the Caltrans Standard Specifications not to any claim which is based on differences in measurements or errors of computation as to Contract quantities. The written notice of potential claim shall set forth the items and reasons which the Contractor believes to be eligible for additional compensation, the description of work, the nature of the additional costs and the total amount of the potential claim. If based on an act or failure to act by the Engineer, written notice for potential claim must be given to the Engineer prior to the Contractor commencing work; in all other cases, written notice for potential claims must be given to the Engineer within 15 days after the happening of the event, thing or occurrence giving rise to the potential claim.

It is the intention of this Section that potential differences between the parties of this Contract be brought to the attention of the Engineer at the earliest possible time appropriate action may be taken and settlement may be reached. The Contractor hereby agrees that he shall have no right to additional compensation for any claim that may be based on any act or failure to act by the Engineer or any event, thing or occurrence for which no written notice of potential claim was filed.

7-1.06 Alternative Dispute Resolution

Section 5-1.43E, “Alternative Dispute Resolution,” and Section 9-1.22 “Arbitration,” of the Caltrans Standard Specification is deleted from this Contract in its entirety.
SECTION 8 MATERIALS

8-1.01 Prequalified and Tested Signing and Delineation Material

The Department maintains the following list of Prequalified and Tested Signing and Delineation Materials. The Engineer shall not be precluded from sampling and testing products on the list of Prequalified and Tested Signing and Delineation Materials.

The manufacturer of products on the list of Prequalified and Tested Signing and Delineation Materials shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-3.05E, “Certificates of Compliance,” of the Caltrans Standard Specifications for each type of traffic product supplied.

For those categories of materials included in the list of Prequalified and Tested Signing and Delineation Materials, only those products shown within the listing may be used in the work. Other categories of products, not included in the list of Prequalified and Tested Signing and Delineation Materials, may be used in the work provided they conform to the requirements of the Caltrans Standard Specifications.

Materials and products may be added to the list of Prequalified and Tested Signing and Delineation Materials if the manufacturer submits a New Product Information Form to the New Product Coordinator at the Transportation Laboratory. Upon a Department request for samples, sufficient samples shall be submitted to permit performance of required tests. Approval of materials or products will depend upon compliance with the specifications and tests the Department may elect to perform.

The list of approved pre-qualified and tested signing and delineation materials and products can be found at the California Department of Transportation Web Site:


8-1.02 Submittals

The following is a list of anticipated submittals for the project. The list is provided to aid the Contractor in determining the scope of work but is not intended to be all inclusive and additional submittals may be required:

- Contractor Safety Plan
- Critical Path Schedule
- Traffic Handling/Construction Staging Plans
- Storm Water Pollution Prevention Plan
- Hot Mix Asphalt Mix Design
- Pavement Reinforcement Fabric
- Portland Cement Concrete Mix Design
The Contractor shall submit 3 copies of the submittal to the Engineer. The Engineer will have 10 working days to review the submittal. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the submittal within 5 working days of receipt of the Engineer's comments. The Engineer will have 10 working days to review the revisions. Upon the Engineer's approval of the submittal, 3 additional copies of the submittal, incorporating the required changes, shall be submitted to the Engineer. In order to allow construction activities to proceed, the Engineer may conditionally approve the submittal while minor revisions are being completed.

The submittals will be reviewed and returned to the Contractor with the following designations:

- Approved
- Approved with Minor Corrections
- Rejected: Revise and Resubmit
- Rejected
SECTION 9  DESCRIPTION OF WORK

9-1.01 Description of Work

The work to be performed consists of furnishing all labor, materials, tools, transportation, supplies, equipment, appurtenances, fuel, and power, unless specifically excepted, necessary, or required to provide complete operating roadways, as further delineated on the plans and described in these Special Provisions.

The work, in general, consists of constructing new pavement, Hot Mix Asphalt overlay, pavement grinding, removing and replacing curb, gutter, sidewalk, driveways and wheelchair ramps, relocating and installing traffic signals and street lighting, landscaping, modifying fiber optic signal interconnect, traffic striping, markings and pavement marker.

The work includes, but is not necessarily limited to, the following:

1. Removal of wood fence;
2. Removal of trees;
3. Removal of and disposal of existing pavement and existing facilities not scheduled to be incorporated into the new work and removal and disposal of deleterious materials;
4. Removal of chain link, barb wire and wire mesh fence;
5. Relocation of chain link gate;
6. Pavement grinding;
7. Construction and modifications of drainage facilities;
8. Construction of new curb, gutter, sidewalk and driveways;
9. Construction of new wheelchair ramps;
10. Construction of wood fence;
11. Construction of wood gate;
12. Construction of concrete base for public art;
13. Roadway widening;
14. Base failure repair and HMA overlay;
15. Construct raised medians;
16. Roadside sign removal, salvaging, relocation and installation of new signs;
17. Coordinate all work in cooperation with PG&E, Comcast and all the other utility companies, who may be relocating their facilities;
18. Adjust to new grades the tops of all existing maintenance holes, valve boxes, and other utility boxes;
19. Install street landscaping and irrigation system;
20. Maintain a 3 year plant establishment period;
21. Install EcoStorm Plus filter;
22. Modify the traffic signal and roadway safety lighting at the Pershing Avenue and Hammer Lane intersection;
23. Modify the traffic signal at the Alexandria Place and Hammer Lane intersection;
24. Modify the traffic signal at the Thornton Road and Hammer Lane intersection;
25. Roadway safety lighting, including maintaining the lighting systems during construction;
26. Temporary signals to maintain operation during construction;
27. Removal and reinstallation of fiber optic cables at traffic signal controllers;
28. Such other items or details, not mentioned above, that are required by the Plans, Standard Specifications and these Special Provisions shall be performed, furnished, placed, constructed, or installed.

All other work as may be necessary as indicated on the plans, in the specifications, and as required by the Engineer.

9-1.02 Quantities

The following estimate of the quantities of work to be done and materials to be furnished are approximate only, and are intended as a basis for the comparison of bids. The City does not expressly or by implications agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work without increase or decrease in the unit price bid or to omit portions of the work that may be deemed necessary or expedient by the Engineer.

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<th>Description</th>
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<td>8-Foot Wood Gate</td>
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<td>(S)</td>
<td>Thermoplastic Traffic Stripe</td>
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</table>

**Traffic Signal Systems**

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<tr>
<th>Item No.</th>
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<tr>
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<td>85</td>
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<td>Hammer Lane/Pershing Avenue Signal Modification</td>
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<tr>
<td>86</td>
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<td>Hammer Lane/Thornton Road Signal Modification</td>
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<td>87</td>
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<td>Hammer Lane Traffic Signal Interconnect</td>
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<tr>
<td>91</td>
<td>(S)</td>
<td>Temporary Signal - Hammer Lane/Thornton Road</td>
<td>LS</td>
<td>1</td>
</tr>
</tbody>
</table>
Each bidder shall bid each item of Base Bid Schedule. Failure to bid an item shall be just cause for considering the bid as non-responsive. The City reserves the right to include or delete any Schedule or portion thereof, or to reject all bids. Bid items unit prices hold for the life of the Contract. Adjustment to any unit prices is not allowed.

Official bid documents, including plans and specifications are available online at http://www.stocktongov.com/business/bidflash.cfm. All bids submitted for this project must conform to the requirements of the official bid documents, including plans and specifications.
SECTION 10  CONSTRUCTION DETAILS

10-1.01 Order of Work

The order of work shall conform to the Contractor's approved project schedule described in Section 5-1.29, "Progress Schedule", of these Special Provisions.

The Order of Work of these Special Provisions requires that the Contractor shall expeditiously schedule the project work and his construction operations to achieve the following:

1) To maintain continuous access along and across Hammer Lane and to the adjacent businesses, side streets and residences.

2) To maintain continuous pedestrian access along one side of Hammer Lane and across each of the signalized intersections within the project area.

3) To minimize the period of time that streets are under construction or in disarray,

4) To minimize the inconvenience to businesses in the project area and the inconvenience to the general public,

5) To minimize interruption to emergency services, postal service and trash collection and delivery services along the Project streets.

As soon as the Contractor is awarded the Contract, the first item of work shall be to submit the Notice of Intent (NOI) to the Central Valley Regional Water Quality Control Board for the purpose of obtaining a National Pollution Discharge Elimination System (NPDES) permit. Full compensation for conforming to the requirements in obtaining permits, including cost of the permit, shall be considered as included in the contract prices paid for the various item of work and no additional compensation will be allowed thereafter.

The Contractor shall submit written statement from vendor that the order for electrical material has been received and accepted by vendor. Such statement shall mention the date that the materials will be shipped. Electrical material shall conform to Section 86-1.04 “Equipment List and Drawings” of the Caltrans Standard Specifications and these Special Provisions.

All permits and approvals as may be required for this project shall be secured or ordered immediately after award of the contract or their acquisition timing determined, such that the same is not cause for delay. The cost of the permits shall be included in the total bid costs. The Contractor shall obtain a road encroachment permit (no fee) prior to start of construction from the City of
Stockton Permit Center located at 345 N. El Dorado Street, Suite 200, Stockton, CA.

The Contractor shall begin work after the contract has been approved by the City attorney and within 10 working days from the date of issuance of the Notice to Proceed by the City, unless otherwise approved by and at sole discretion of City, and shall diligently pursue full completion of all work, including contract close out in accordance with Section 7-1.04, “Final Payment and Claims,” of these Special Provisions within the number of working days specified.

The Contractor shall arrange the construction schedule and staging to allow for cooperation and coordination with utility companies that are relocating existing facilities within the project area.

At the start of construction the Contractor shall contact Don Seelye at (209) 474-4364, ds6913@att.com of AT&T to coordinate and schedule the fiber optics work inside the traffic controller cabinet at Hammer Lane and Pershing Avenue.

Non-conflicting work between stages may be constructed simultaneously subject to approval by the Engineer.

The Contractor is advised that any specified staging, phasing or sequencing of work items may not be all inclusive as to the total work items to be completed under this contract. The Contractor shall be responsible for all scheduling and coordinating necessary for timely completion of any such work items for which staging, phasing or sequencing is not specifically shown, but which are required to be completed under this contract, including additional work pursuant to Section 5-1.13 "Changes" of these Special Provisions.

Full compensation for any additional costs incurred to comply with the provisions in this section shall be considered to be included in the contract prices for the various items of work and no additional compensation will be allowed therefor.

10-1.02 Maintaining Traffic

The project streets are not to be closed to traffic without prior approval of the City Traffic Engineer. Lane closures on the project streets are allowed only on weekdays from 9:00 a.m. to 3:30 p.m. and 8:00 p.m. to 6:00 a.m. and from 9:00 a.m. to 3:30 p.m. on Saturdays.

No lane closures, shoulder closures, or other traffic restrictions will be allowed on designated legal holidays. Designated legal holidays are: January 1\textsuperscript{st}, Martin Luther King, Jr’s birthday, the second Monday in February, the third Monday in February, the last Monday in May, July 4\textsuperscript{th}, the first Monday in September, Columbus Day, November 11\textsuperscript{th}, Thanksgiving Day, the day after Thanksgiving and December 25\textsuperscript{th}.

When a designated legal holiday falls on a Sunday, the following Monday shall be a
designated holiday. When a designated legal holiday falls on a Saturday, the preceding Friday shall be a designated legal holiday.

Lane closures shall conform to the provisions in the Traffic Control System for Lane Closure section of these special provisions.

The Contractor shall notify the Engineer forty-eight (48) hours in advance of any night or weekend work to be performed on this Contract. Any proposed night or weekend work must be shown on the initial CPM baseline schedule. If night or weekend work is done for the convenience of the Contractor, the Contractor shall pay the City for overtime inspection if the Contractor also works a normal day shift. Contractor may submit a request for extended hours. Any changes must have the consent approval from the City Traffic Engineer. A minimum of one through lane in each direction of travel shall be open for use by public traffic at all times.

The Contractor shall schedule and conduct operations, including those of sub-consultants, so as to comply with these requirements. In the event unauthorized lane closures extend outside the limits specified, the Contractor shall pay a penalty of $250 per occurrence.

The Construction Staging sheets included in the project plans are conceptual in nature and are not intended to be all inclusive nor the de facto method of staging the project. The staging plans were developed based on the best information available related to the status of the right of way acquisition and utility relocation that was ongoing at the time they were prepared. Prior to beginning work, the Contractor shall verify the status of the right of way acquisition and utility relocation and shall submit a traffic control/staging plan for approval prior to starting work.

Adequate and continuous ingress and egress shall be maintained throughout the project area for fire, police, and other emergency vehicles. The Contractor shall provide adequate and continuous ingress and egress for all adjacent properties except for the limited period of time it is necessary to perform work at a specific property. Contractor shall notify and make arrangements with the users of the specific property to minimize any inconvenience to the property user during the period of time that work is being performed as required by these special provisions and as directed by the Engineer. The Contractor shall cooperate with local authorities relative to handling traffic through the area and shall make his own arrangements relative to keeping the work area clear of parked vehicles. When commercial driveways are closed for construction of the new driveways, the Contractor shall provide adequate signing directing incoming and outgoing traffic to the nearest available driveway for access the property affected by the construction. Advance signing shall be placed as required when the available driveway is located upstream of the driveway that is closed for construction.

Contractor shall inform the City Fire Department, City Police Department, and the City Traffic Department no later than 24 hours before work is to begin on any street. Any
changes to the Contractor’s schedule shall be promptly reported so that these departments are fully informed at all times of the locations of driveway and lane closures.

Contractor shall coordinate with San Joaquin Regional Transit District (SJRTD), telephone number (209) 943-1111, for any necessary bus stop closures. Contractor shall not close bus stops without approval from SJRTD. The Contractor shall notify the Stockton Unified School District forty-eight (48) hours in advance of any construction that may cause inconveniences to the school bus traffic.

Attention is directed to Part 6 of the California MUTCD, Sections 7-1.08, "Public Convenience", 7-1.09, "Public Safety", of Standard Specifications and Sections 7-1.03 and 7-1.04 respectively of the Caltrans Standard Specifications, Section 12, "Temporary Traffic Control", of the Caltrans Standard Specifications and to the Section entitled "Public Safety" elsewhere in these special provisions, and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09 “Public Safety” of the Standard Specifications.

In the Standard Plans, Note 10 on Standard Plan T10, Note 9 on Standard Plan T10A, Note 5 on Standard Plan T11, Note 6 on Standard Plan T12, Note 5 on Standard Plan T13, and Note 4 on Standard Plan T14 are revised to read:

All traffic cones used for night lane closures shall have reflective cone sleeves as specified in the specifications.

During the hours of darkness traffic cones shall be affixed with reflective cone sleeves. The reflective sheeting of sleeves on the traffic cones shall be visible at 1,000 feet at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Reflective cone sleeves shall conform to the following:

1. Removable flexible reflective cone sleeves shall be fabricated from the reflective sheeting specified in the special provisions, have a minimum height of 13 inches and shall be placed a maximum of 3 inches from the top of the cone. The sleeves shall not be in place during daylight hours.

2. Permanently affixed semitransparent reflective cone sleeves shall be fabricated from the semitransparent reflective sheeting specified in the special provisions, have a minimum height of 13 inches, and shall be placed a maximum of 3 inches from the top of the cone. Traffic cones with semitransparent reflective cone sleeves may be used during daylight hours.

3. Permanently affixed double band reflective cone sleeves shall have 2 white reflective bands. The top band shall be 6 inches in height, placed a maximum
of 4 inches from the top of the cone. The lower band shall be 4 inches in height, placed 2 inches below the bottom of the top band. Traffic cones with double band reflective cone sleeves may be used during daylight hours.

The type of reflective cone sleeve used shall be at the option of the Contractor. Only one type of reflective cone sleeve shall be used on the project.

Pedestrian walkways shall be provided through construction areas within the right of way as shown on the plans and as specified herein. Pedestrian walkways shall be provided with surfacing of Hot Mix Asphalt, portland cement concrete or timber. Surface shall be skid resistant and free of irregularities.

The Contractor shall provide pedestrian access during all construction operations. At least one walkway shall be available at all times. If the Contractor's operations require the closure of one walkway, then another walkway shall be provided nearby, off the traveled roadway.

Walkways shall be maintained in good condition by the Contractor. Walkways shall be kept clear of obstructions.

The Contractor shall cause the least possible disruption to the affected properties and restore suitable pedestrian access immediately following completion of the active work in progress.

Full compensation for providing said pedestrian facilities shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

Notifications

Provide 72-hour advance notification to the occupants of property immediately adjacent to the project for which the existing access will be affected. When night work must be performed, 72-hour notice must be given to all residences within 300 feet of the work. All written notifications must be approved by the City before they are sent to occupants of property.

Notifications shall be by written notice placed on or near each storefront entrance on commercial buildings, and on the front door of each residence. For adjacent apartment complexes, notice to the apartment manager and posting in a common area shall be sufficient. Residential notices shall be tucked neatly in door jambs, handles, or partially under door mats. Notifications shall not be glued, stapled, taped, tacked or otherwise attached to the property, unless placed on a billboard made for public notices. Take care to stay on designated walkways during delivery of notifications, not track mud or debris, and be polite to citizens encountered.
The notice shall include a brief description of the work, date(s), time(s) and expected duration of closure(s), scheduled date of completion and Contractor contact person’s name and telephone number. Notice shall be submitted and approved by the Engineer prior to any work is done. Should a change in the work schedule occur after the residents and/or businesses have been notified, the Contractor shall notify the residents and/or businesses of the change within 24 hours of the originally scheduled starting date.

When the construction abuts existing parking lots, every effort shall be made to minimize impacts to parking and circulation within the parking lot. Where required, parking stalls are to be temporarily designated “COMPACT” stalls and Class I barricades used to separate parked vehicles from the work area.

When the construction requires prohibiting parking, “No Parking” signs shall be posted along the construction zone. The signs shall include the dates and times that no parking periods will be in effect. “No Parking” signs shall be mounted on Class I barricades and placed not more than 50 feet apart. Signs shall be posted a minimum of 72 hours in advance of the construction and immediately removed upon completion. Should the Contractor not commence work after 72 hours from the placement of the signs, the signs shall be removed. If a vehicle is parked in a properly posted no parking area and is prohibiting the progression of work, the Contractor shall notify the Stockton Police Department to arrange for removal of the vehicle.

At least 72 hours prior to the beginning of overlay operations, the Contractor shall notify all residents, businesses and agencies by an approved, written notice detailing streets and limits of work to be done and the hours of work.

The Contractor shall provide the City with three (3) names and telephone numbers of representatives who are available for maintenance of traffic control at all times. The Contractor shall provide these names to the Traffic Section of the Police Department.

10-1.03 Traffic Control System for Lane Closure

A traffic control system shall consist of closing traffic lanes in accordance with the details shown on the plans, the provisions of Section 12, "Temporary Traffic Control," of the Caltrans Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" elsewhere in these special provisions and these special provisions.

The provisions in this section will not relieve the Contractor from the responsibility to provide such additional devices or take such measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications and 7-1.04, “Public Safety,” of the Caltrans Standard Specifications.

During traffic striping operations and pavement marker placement operations using bituminous adhesive, traffic shall be controlled, at the option of the Contractor, with
either stationary or moving type lane closures. During all other operations traffic shall be controlled with stationary type lane closures. The Contractor's attention is directed to the provisions in Section 84-1.03B, "Protection From Damage," and Section 85-1.03, "Construction," of the Caltrans Standard Specifications.

If any component in the traffic control system is displaced, or ceases to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the component to its original condition or replace the component and shall restore the component to its original location.

Stationary Type Lane Closure – When lane closures are made for work periods only, at the end of each work period, all components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. All components shall be stored at Contractor Staging Area, approved by the Engineer, within the limits of the City right of way.

Each vehicle used to place, maintain and remove components of a traffic control system on multilane streets shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining, or removing the components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining, or removing the components when operated within a stationary type lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on the vehicles which are doing the placing, maintaining and removing of components of a traffic control system, and shall be in place before a lane closure requiring its use is completed.

Moving Type Lane Closure – Flashing arrow signs used in moving lane closures shall be truck-mounted. Changeable message signs used in moving lane closure operations shall conform to Section 12-3.12, "Portable Changeable Message Signs," of the Standard Specifications, except the signs shall be truck-mounted and the full operation height of the bottom of the sign may be less than 7 feet above the ground, but should be as high as practicable.

Truck-mounted crash cushions (TMCC) for use in moving lane closures shall be any of the following approved models, or equal:
(1) Hexfoam TMA Series 3000 and
Alpha 1000 TMA Series 1000 and
Alpha 2001 TMA Series 2001

Manufacturer: Energy Absorption Systems, Inc.
Distributor(Northern): Traffic Control Service, Inc.
One East Wacker Drive 8585 Thys Court
Chicago, IL  60601-2076 Sacramento, CA  95828
Telephone (312) 467-6750 Telephone (800) 884-8274
FAX (916) 387-9734

Distributor(Southern):
Traffic Control Service, Inc.
1881 Betmor Lane
Anaheim, CA  92805
Telephone (800) 222-8274

(2) Cal T-001 Model 2 or Model 3

Manufacturer: Hexcel Corporation
Distributor: Hexcel Corporation
11711 Dublin Blvd. 11711 Dublin Blvd.
P.O. Box 2312 P.O. Box 2312
Dublin, CA  94568 Dublin, CA  94568
Telephone (510) 828-4200 Telephone (510) 828-4200

(3) Renco Rengard Model Nos. CAM 8-815 and RAM 8-815

Manufacturer: Renco Inc.
Distributor: Renco Inc.
1582 Pflugerville Loop Road 1582 Pflugerville Loop Road
P.O. Box 730 P.O. Box 730
Pflugerville, TX  78660-0730 Pflugerville, TX  78660-0730
Telephone (800) 654-8182 Telephone (800) 654-8182

Each TMCC shall be individually identified with the manufacturer's name, address, TMCC model number, and a specific serial number. The names and numbers shall
each be a minimum 1/2 inch high, and located on the left (street) side at the lower front corner. The TMCC shall have a message next to the name and model number in 1/2 inch high letters which specifies the allowable clearance between the bottom of the TMCC and the ground for proper impact performance. Any TMCC which is damaged or appears to be in poor condition shall not be used unless recertified by the manufacturer. The Engineer shall be the sole judge as to whether used TMCCs supplied under this contract need recertification. Each unit shall be certified by the manufacturer to meet the requirements for TMCCs in accordance with the standards established by the Transportation Laboratory Structures Research Section.

Approvals for new TMCC designs proposed as equal to the above approved models shall be in accordance with the procedures (including crash testing) established by the Transportation Laboratory Structures Research Section. For information regarding submittal of new designs for evaluation contact:

Transportation Laboratory
Structures Research Section
P.O. Box 19128
5900 Folsom Boulevard
Sacramento, CA 95819

New TMCCs proposed as equal to approved TMCCs or approved TMCCs determined by the Engineer to need recertification shall not be used until approved or recertified by the Transportation Laboratory Structures Research Section.

Payment

The contract lump sum price paid for “Traffic Control System” shall include full compensation for furnishing all labor, materials (including signs, flagging, changeable message signs, arrowboards, etc.), tools, equipment and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the traffic control system as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The provisions in Section 12-1.03, “Flagging Costs,” in the Caltrans Standard Specification concerning sharing the costs of the flaggers do not apply. The costs to furnish flaggers, including transporting flaggers, to provide passage of public traffic through the work will be the sole responsibility of the Contractor.

The adjustment provisions in Section 5-1.13, "Changes," of these Special Provisions, shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. Such adjustment will
be included in the cost of the contract change order, and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 5-1.14, “Extra Work,” of these Special Provisions, will be paid for as a part of the extra work.

10-1.04 Construction Area Signs

Construction area signs shall be furnished, installed, maintained, and removed when no longer required in accordance with the provisions in Section 12, "Temporary Traffic Control," of the Standard Specifications and these Special Provisions.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to commencing any excavation for construction area sign posts. The regional notification centers include but are not limited to the following:

<table>
<thead>
<tr>
<th>Notification Center</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underground Service Alert-Northern California (USA)</td>
<td>811 1-800-227-2600</td>
</tr>
<tr>
<td>Underground Service Alert-Southern California (USA)</td>
<td>811 1-800-227-2600</td>
</tr>
</tbody>
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All excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes.

Sign substrates for stationary mounted construction area signs shall be aluminum. Reflective sheeting for stationary mounted construction area signs shall be 3M “Diamond Grade Fluorescent Work Zone Sheeting” or approved equal.

Type IV reflective sheeting for sign panels for portable construction area signs shall conform to the requirements specified under "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

The Contractor may be required to cover certain signs during the progress of work. Signs that are no longer required or that convey inaccurate information to the public shall be immediately covered or removed, or the information shall be corrected. Covers for construction area signs shall be of sufficient size and density to completely block out the complete face of the signs. The retroreflective face of the covered signs...
shall not be visible either during the day or at night. Covers shall be fastened securely so that the signs remain covered during inclement weather. Covers shall be replaced when they no longer cover the signs properly.

The San Joaquin Council of Governments project funded sign as shown on the plans is considered a Construction Area Sign.

Construction area signs shown on the plans, except those signs required for traffic control system for lane closure and unless otherwise specified in these special provisions, will be paid for on a lump sum basis, which lump sum price shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in furnishing construction area signs required for the direction of public traffic through or around the work and for erecting or placing, maintaining (including covering and uncovering as needed) and, when no longer required, removing construction area signs at locations shown on the plans.

**10-1.05 Temporary Pavement Delineation**

Temporary pavement delineation shall be furnished, placed, maintained and removed in accordance with the provisions in Section 12-3, “Traffic-Handling Equipment and Devices of the Caltrans Standard Specifications and these special provisions. Nothing in these special provisions shall be construed as to reduce the minimum standards specified in the Manual of Traffic Controls published by the Department or as relieving the Contractor from the responsibilities specified in Section 7-1.09, "Public Safety," of the Standard Specifications and 7-1.04, “”Public Safety,” of the Caltrans Standard Specifications and these Special Provisions.

**General**

Whenever the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place prior to opening the traveled way to public traffic. Laneline or centerline pavement delineation shall be provided at all times for traveled ways open to public traffic. Edgeline delineation shall be provided at all times for traveled ways open to public traffic.

All work necessary, including any required lines or marks, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation.

The Contractor shall maintain all temporary traffic stripes and markings throughout the duration of their use.
Temporary pavement markers and removable traffic tape which is applied to the final layer of surfacing or existing pavement to remain in place or which conflicts with a subsequent or new traffic pattern for the area shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

**Temporary Laneline and Centerline Delineation**

Whenever lanelines or centerlines are obliterated and temporary pavement delineation to replace the lines is not shown on the plans, the minimum laneline and centerline delineation to be provided for that area shall be temporary reflective pavement markers placed at longitudinal intervals of not more than 24 feet. The temporary reflective pavement markers shall be the same color as the laneline or centerline the pavement markers replace. Temporary reflective pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (6 months or less) in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

Temporary reflective pavement markers shall be placed in accordance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers in areas where removal of the pavement markers will be required.

Temporary laneline or centerline delineation consisting entirely of temporary reflective pavement markers placed on longitudinal intervals of not more than 24 feet, shall be used on lanes opened to public traffic for a maximum of 14 days. Prior to the end of the 14 days the temporary pavement delineation for the next stage of work or the permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within the 14 days, the Contractor shall provide additional temporary pavement delineation and the cost thereof shall be borne by the Contractor. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining and removing the temporary reflective pavement markers, used for temporary laneline and centerline delineation for those areas where temporary laneline and centerline delineation is not shown on the plans and for providing equivalent patterns of permanent traffic lines for those areas when required, shall be considered as included in the contract prices paid for the items of work that obliterated the laneline and centerline pavement delineation and no separate payment will be made therefor.

**Temporary Edgeline Delineation**

On multilane roadways whenever edgelines are obliterated and temporary pavement delineation to replace those edgelines is not shown on the plans, the edgeline
delineation to be provided for those areas adjacent to lanes open to public traffic shall be as follows:

Temporary pavement delineation for right edgelines shall, at the option of the Contractor, consist of either a solid 4-inch wide traffic stripe of the same color as the stripe the temporary edgeline delineation replaces, or traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 50 feet.

Temporary pavement delineation for left edgelines shall, at the option of the Contractor, consist of either solid 4-inch wide traffic stripe of the same color as the stripe the temporary edgeline delineation replaces, or traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 50 feet; or temporary reflective pavement markers placed at longitudinal intervals of not more than 6 feet. Temporary pavement markers used for temporary left edgeline delineation shall be one of the types of temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (6 months or less) in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

Four-inch wide traffic stripe placed for temporary edgeline delineation which will require removal shall conform to the requirements of temporary traffic stripe (tape) specified herein. Where removal of the 4-inch wide traffic stripe will not be required painted traffic stripe conforming to the requirements of temporary traffic stripe (paint) specified herein may be used. The quantity of temporary traffic stripe (tape) or temporary traffic stripe (paint) used for this temporary edgeline delineation will not be included in the quantities of tape or paint to be paid for.

The lateral offset for traffic cones, portable delineators or channelizers used for temporary edgeline delineation shall be as determined by the Engineer. If traffic cones or portable delineators are used as temporary pavement delineation for edgelines, the Contractor shall provide personnel to remain at the jobsite to maintain the cones or delineators during all hours of the day that they are in use.

Channelizers used for temporary edgeline delineation shall be the surface mounted type and shall be orange in color. Channelizer bases shall be cemented to the pavement in the same manner provided for cementing pavement markers to pavement in the section of these special provisions entitled "Pavement Markers," except epoxy adhesive shall not be used to place channelizers on the top layer of pavement. Channelizers shall be, at the Contractor's option, one of the surface mount types (36") listed in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

Temporary edgeline delineation shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.
The quantity of channelizers used as temporary edgeline delineation will not be included in the quantity of channelizers to be paid for. Full compensation for furnishing, placing, maintaining and removing the temporary edgeline delineation for those areas where temporary edgeline delineation is not shown on the plans shall be considered as included in the contract prices paid for the items of work that obliterated the edgeline pavement delineation and no separate payment will be made therefor.

**Temporary Traffic Stripe (Paint)**

Temporary traffic stripe consisting of painted traffic stripe shall be applied and maintained at the locations shown on the plans. The painted temporary traffic stripe shall be complete in place at the location shown, prior to opening the traveled way to public traffic. Removal of painted temporary traffic stripe will not be required.

At the Contractor's option, temporary removable striping tape listed in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions may be used instead of painted temporary traffic stripes. Contractor shall maintain temporary striping tape at all times. If the Engineer determines that this option of striping is not working, Contractor shall use temporary traffic stripe paint in place of the temporary striping tape. When traffic stripe tape is used in place of painted temporary traffic stripes, the tape will be measured and paid for as temporary traffic stripe (paint).

When painted traffic stripe is specified for temporary left edgeline delineation, temporary reflective pavement markers placed at longitudinal intervals of not more than 6 feet may be used in place of the temporary painted traffic stripe. Temporary reflective pavement markers shall be one of the types of temporary pavement markers listed for long term day/night use (6 months or less) in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions. When temporary reflective pavement markers are used in place of temporary painted traffic stripe, payment for those temporary pavement markers will be made on the basis of the theoretical quantity of temporary traffic stripe (paint), required for the left edgeline the temporary pavement markers replace.

The contract prices paid per lineal foot for painted temporary traffic stripe (paint) shall include full compensation for furnishing all labor, materials, tools, equipments, and incidentals and for doing all the work involved in applying painted temporary traffic stripe (paint), complete in place, as shown on the plans, as specified in these special provisions, and no additional compensation will be allowed therefor.

Full compensation for removing conflicting striping shown on the Stage Construction plans shall be considered as included in the contract unit price paid for temporary traffic stripe and no separate payment will be made therefor.
Temporary Pavement Marking (Paint)

Temporary pavement marking consisting of painted pavement marking shall be applied and maintained at the locations shown on the plans. The painted temporary pavement marking shall be complete in place at the location shown, prior to opening the traveled way to public traffic. Removal of painted temporary pavement marking will not be required.

At the Contractor's option, temporary removable pavement marking tape or permanent pavement marking tape listed in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions may be used instead of painted temporary pavement markings. When pavement marking tape is used, regardless of which type of tape is placed, the tape will be measured and paid for as temporary pavement marking (paint).

The contract prices paid per square foot for painted temporary pavement marking (paint) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in applying painted temporary pavement marking (tape), complete in place, as shown on the plans, as specified in these special provisions, and no additional compensation will be allowed therefor.

Full compensation for removing conflicting pavement marking shown on the Stage Construction plans shall be considered as included in the contract unit price paid for temporary pavement marking and no separate payment will be made therefor.

10-1.06 Barricades

Barricades shall be furnished, placed and maintained at the locations shown on the plans, specified in the Standard Specifications or in these special provisions or where designated by the Engineer. Barricades shall conform to the provisions in Section 12, "Temporary Traffic Control," of the Caltrans Standard Specifications and these special provisions.

Attention is directed to "Prequalified and Tested Signing and Delineation Materials" of these special provisions regarding retroreflective sheeting for barricades.

Construction area sign and marker panels conforming to the provisions in Section 12-3.06, "Construction Area Signs," of the Caltrans Standard Specifications shall be installed on barricades in a manner determined by the Engineer at the locations shown on the plans.

Sign panels for construction area signs and marker panels installed on barricades shall conform to the provisions in Section 12-3.06B(2), "Stationary Mounted Signs," of the Caltrans Standard Specifications.
Full compensation for furnishing, installing, maintaining, and removing construction area signs and marker panels on barricades shall be considered as included in the contract unit price paid for the type of barricade involved and no separate payment will be made therefor.

Barricades shown on the plans as part of a traffic control system will be paid for as provided in "Traffic Control System for Lane Closure" of these special provisions and will not be included in the count for payment of barricades.

Barricades will be measured as units from actual count on the number of barricades designated on the plans or ordered by the Engineer. After initial placement of barricades, and if ordered by the Engineer, the barricades shall be moved from location to location and the cost thereof will be paid as extra work as provided in Section 5-1.14, “Extra Work” of these Special Provisions. The contract unit price paid for Barricade (Type III) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing, placing, maintaining, repairing, replacing, and removing the barricades, as shown on the plans, as specified in the Standard Specifications, these special provisions, and as directed by the Engineer.

10-1.07 Channelizers (Surface Mounted)

Channelizers shall conform to the provisions in Section 12, "Temporary Traffic Control," of the Caltrans Standard Specifications and these special provisions.

Channelizers shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

When no longer required for the work as determined by the Engineer, channelizers and underlying adhesive used to cement the channelizer bases to the pavement shall be removed. Removed channelizers and adhesive shall become the property of the Contractor and shall be removed from the site of work.

Channelizers (surfaced mounted) will be measured by the unit from actual count designated on the plans or ordered by the Engineer. The contract unit price paid for channelizers (surfaced mounted) shall include full compensation for furnishing all labor, material, tools, equipment, and incidentals, and for doing all the work involved in furnishing, placing, maintaining, repairing, replacing and removing channelizers, complete in place, as shown on the plans, as specified in the Standard Specifications, these special provisions, and as directed by the Engineer.

10-1.08 Channelizers (Free Standing)

Channelizers shall conform to the provisions in Section 12, "Temporary Traffic Control," of the Caltrans Standard Specifications and these special provisions.
Channelizers shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

When no longer required for the work as determined by the Engineer, channelizers shall be removed.

Full compensation for furnishing all labor, material, tools, equipment, and incidentals, and for doing all the work involved in furnishing, placing, maintaining, repairing, replacing and removing channelizers, complete in place, as shown on the plans, shall be considered as included in the contract prices paid for “Traffic Control System” as specified in these special provisions, and as directed by the Engineer.

10-1.09 Existing Pavement Repairs

At no additional cost to the City, existing street pavement located outside of the limits of work which are damaged as a result of the Contractor’s construction operation or traffic detour, shall be saw cut and removed at least six (6) inches beyond the failed area(s) as directed by the Engineer. Pavement repair shall be by removal and disposal from the site of the existing failed pavement, excavation, and pavement replacement and compaction with full-depth Hot Mix Asphalt which meets the necessary pavement structural design strength and thickness for the Traffic Index of the street.

Contractor shall repair existing asphalt, concrete or any other pavement which has been damaged or removed as a result of the Contractor’s or subcontractor’s project work. The Contractor shall not be responsible for damages caused by others (such as utility company forces).

10-1.10 Temporary Fence

Temporary fence shall conform to the provisions in Section 80 “Fences” of the Caltrans Standard Specifications and these Special Provisions. Temporary fence shall be free standing and six (6) feet high.

Attention is directed to “Remove Fence” and “Relocate Chain Link Gate” of these Special Provisions.

Full compensation for furnishing all labor, materials, tools, equipment and installing (including any relocation of the fence to perform work), maintaining and removing temporary fence shall be included in the contract price paid per lineal foot for “Temporary Fence,” and no additional compensation will be allowed therefor.
SECTION 11  MOBILIZATION

11-1.01  Mobilization

Mobilization shall conform to the provisions in Section 9-1.16D, “Mobilization," of the Caltrans Standard Specifications and these special provisions.

The contract lump sum price paid for mobilization shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in mobilization.
SECTION 15    EXISTING FACILITIES

15-1.01    Existing Roadway Facilities

When necessary to remove street name and traffic control signs, the Contractor shall notify the Engineer 48 hours in advance of said removal.

All existing traffic control signs to remain shall be maintained and protected from damage. If relocation is necessary to facilitate the construction, the Contractor shall notify the Engineer 48 hours prior to said relocation. The City Traffic Engineer shall approve where the sign is to be temporarily relocated. The cost for removal and relocation of traffic control signs shall be considered included in the unit bid price for Remove and Salvage Roadside Sign and Relocate Roadside Sign, and no additional compensation will be allowed therefor.

The Contractor shall maintain the existing traffic signals in working order until the new traffic signals are operational and shall respond to the reported problem according to the requirements in Section 5-1.19 “Maintaining Existing and Temporary Electrical Systems” of these special provisions.

15-1.02    Preparing Existing Roadbed

Prior to placing any Hot Mix Asphalt overlay on an existing roadbed, the existing roadbed shall first be cleaned of all dirt and extraneous material.

When ordered by the Engineer, a leveling course of the material to be placed shall be spread upon the existing roadbed in accordance with the specifications for the type of material being placed, and no compensation other than the contract price or prices being paid for the material will be made for such work.

Broken, failed, or other unsatisfactory portions of the existing roadbed shall be removed and disposed of. The areas and depths to be removed shall be as ordered by the Engineer. The area in the exposed spaces shall be watered and compacted, after which the space shall be filled with material as directed by the Engineer. The cost of all such work will be paid for as extra work as provided in Section 5-1.14, “Extra Work,” of these Special Provisions.

Except as otherwise provided, full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in preparing existing roadbed as shown on the plans, as specified herein, and as directed by the Engineer shall be considered as included in the contract price paid for “Hot Mix Asphalt (Type A)”.

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15-1.03 Abandon Storm Drain Pipe

Existing storm drain pipe where shown on the plans to be abandoned, shall be abandoned.

Storm drain pipes, 12 inches in diameter and larger, shall be backfilled with sand by any method, acceptable to the Engineer, which completely fills the pipe. Sand backfill material shall be clean, free draining, and free from roots and other deleterious substances.

All pipes to be abandoned, shall be sealed with a tight fitting plug or wall of minor concrete not less than six (6") inches thick, or by a tight brick wall not less than eight (8") inches thick with cement mortar joints where they connect to structures which are to remain. Where abandoned pipes are in conflict with proposed improvements within this contract, the portion of the abandoned pipe shall be removed and the remaining open ends sealed with a concrete plug or wall, or a brick and mortar wall.

Full compensation for conforming to the requirements of this provision shall be considered as included in the contract unit price paid for “Abandon Storm Drain Pipe”, and no additional compensation will be allowed therefor.

15-1.04 Remove Existing Traffic Stripes and Pavement Markers

Existing traffic stripes, pavement markings and pavement markers, when no longer required for traffic lane delineation as directed by the Engineer, shall be removed and disposed of. Covering existing traffic stripes or pavement marking with black paint or “blackening” is not acceptable. Removal of traffic stripes and pavement markings shall conform to Section 15-2.02C “Remove Traffic Stripes and Pavement Markings” of the Caltrans Standard Specifications.

Attention is directed to "Water Pollution Control" of these special provisions.

Nothing in these special provisions shall relieve the Contractor of the Contractor's responsibilities as specified in Section 5-1.05, "Public Safety," of these special provisions and Section 7-1.04 “Public Safety” of the Caltrans Standard Specifications.

Full compensation for removal of traffic stripe, pavement markers and pavement markings shall be considered as included in the contract price paid for the various items of work and no additional compensation will be allowed therefor.

15-1.05 Remove Concrete Curb, Curb and Gutter, Sidewalk and Driveway

Concrete curb, curb and gutter, sidewalk and driveway, in conflict with the proposed improvements, shall be removed in accordance with Section 15-3 “Concrete Removal” of the Caltrans Standard Specifications.
Remove Concrete Curb, Curb and Gutter, Sidewalk and Driveway will be measured by the cubic yard and paid for as a final pay item in accordance with Section 9-1.02(C), “Final Pay Item Quantities,” of the Caltrans Standard Specifications.

Concrete removed shall be disposed of outside the City right of way in accordance with the Caltrans Standard Specifications.

Where no joint exists between concrete to be removed and concrete to remain in place, the concrete shall be cut in a neat line to a minimum depth of 0.17-foot with a power driven saw before concrete is removed.

Where concrete has been removed outside the roadway prism, the backfilled areas shall be graded to drain and blend in with the surrounding terrain.

Concrete to be removed which has portions of the same structure both above and below ground will be considered as concrete above ground for compensation.

Broken pieces of concrete shall be immediately removed from the job site and disposed of. NO PORTIONS OF BROKEN CONCRETE SHALL REMAIN ON THE JOB SITE OVERNIGHT.

15-1.06 Remove and Salvage Roadside Signs

Existing roadside signs, at locations shown on the plans to be removed shall be removed and disposed of.

Sign panels, not shown to be relocated, shall be salvaged and delivered to the City Corporation Yard.

Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

Full compensation for removing existing roadside signs and salvaging sign panels shall be considered as included in the contract unit price paid for “Remove and Salvage Roadside Sign” and no separate payment will be made therefor.

15-1.07 Remove Drainage Structures and Pipes

All materials removed shall be disposed of outside the City right of way in accordance with Section 5-1.24 “Construction Waste Disposal and Recycling” of these special provisions and the Caltrans Standard Specifications.

The Contractor is alerted to the possible presence of asbestos cement pipe within the limits of the project.
Attention is directed to Section 5-1.23 “Removal of Asbestos or Hazardous Substances” of these Special Provisions.

All voids left from removals shall be backfilled in layers not exceeding 8" thickness with select native material and shall be compacted to 90% relative compaction at optimum moisture content. Where the removed structure is within the limits of the roadway (existing and widened), the top 12" shall be paved with Hot Mix Asphalt in accordance with Section 39, "Hot Mix Asphalt,” of the Standard Specifications and these special provisions, except that all costs associated with paving with Hot Mix Asphalt shall be considered as included in the contract price paid for removing the structure.

Full compensation for furnishing all labor, materials, tools, equipment, backfilling, etc., and incidentals for the removal of drainage structures and pipes shall be included in the contract unit price for Remove Drainage Structure and contract price paid per lineal foot of Remove Storm Drain Pipe and no additional compensation will be allowed therefor.

15-1.08 Remove Fence

Existing fence where shown on the plans to be removed shall be removed and disposed of.

The Contractor shall install a temporary 6 foot high chain link after the existing fence has been removed from the following properties located at:

i) 1636 West El Camino Avenue;
ii) 1608 West El Camino Avenue;
iii) 1548 West El Camino Avenue;
iv) 1313 West Joan Avenue;

All properties shall be secured each night before the Contractor quits work.

Removed fence material shall become the property of the Contractor and shall be disposed of outside the City right of way in accordance with Section 5-1.24, “Construction Waste Disposal and Recycling,” of these special provisions and the Caltrans Standard Specifications.

Full compensation for removing of concrete footings, removing and salvaging fence material and backfilling holes shall be considered as included in the contract price paid per lineal foot for “Remove Fence” and no additional compensation will be allowed therefor.
15-1.09  Relocate Fire Hydrant

Where shown on the plans, existing fire hydrants shall be removed and relocated in conformance with the Plans and these specifications.

The Contractor shall coordinate with Phil Simon, City of Stockton Fire Department, (209) 937-8801 prior to relocating existing fire hydrants. If the Fire Department determines that a new fire hydrant is warranted, the Fire Department will provide the new hydrant to the Contractor for installation. The Contractor shall submit a system outage request to the City of Stockton Municipal Utilities Department seven (7) days prior to relocating existing fire hydrants.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for relocating existing fire hydrants shall be included in the contract unit price paid for “Relocate Fire Hydrant”, and no additional compensation will be allowed therefor.

15-1.10  Relocate Fire Sprinkler

Existing fire sprinkler where shown on the plans to be relocated shall be removed and relocated.

The Contractor shall coordinate with Phil Simon, City of Stockton Fire Department, (209) 937-8801 prior to relocating existing fire sprinkler. The Contractor shall contact representative of Bay Alarm Company, (209) 465-5661 to coordinate monitoring outage seven (7) days prior relocating fire sprinkler. The Contractor shall submit a system outage request to the City of Stockton Municipal Utilities Department seven (7) days prior to relocating existing fire sprinkler.

Existing bollards where shown on the plans to be removed shall be removed. The Contractor shall place three (3) new bollards as shown on the Plans to protect relocated fire sprinkler.

Full compensation for furnishing all labor, materials, tools, equipment, removing bollards, placing bollards, coordination and incidentals for relocating existing fire sprinkler, shall be included in the contract unit price paid for “Relocate Fire Sprinkler,” and no additional compensation will be allowed therefor.

15-1.11  Relocate Metered Water Service

Existing metered water services that are in conflict with the proposed improvements shall be removed and replaced with a new complete metered water service per City Standard Drawings No. 93, 94 and 94A. Existing valves and meters and box, where existing, shall be salvaged and reused. If an existing valve, meter or box cannot be reused, Contractor shall coordinate with City of Stockton Municipal Utilities Department to obtain a replacement. Contractor shall trace the water service to determine existing location of service pipe at new back of walk. Final location shall
conform to City Standard Drawings No. 93, 94 and 94A. The Contractor shall submit a system outage request to the City of Stockton Municipal Utilities Department seven (7) days prior to relocating existing metered water services.

Full compensation for furnishing all labor, materials, tools, equipment, coordination and incidentals for relocating existing metered water services, from the water main to the meter, shall be included in the contract unit price paid for “Relocate Metered Water Service,” and no additional compensation will be allowed therefor.

15-1.12 Relocate Roadside Sign

Existing roadside signs shall be removed and relocated to the new location shown on the plans.

Each roadside sign shall be installed at the new location on the same day that the sign is removed from its original location.

The roadside sign shall be installed in accordance with the City of Stockton Standard Plans No. 36, 36A and 36B.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for relocating roadside signs shall be included in the contract unit price paid for “Relocate Roadside Sign,” and no additional compensation will be allowed therefor.

15-1.13 Relocate Fence

Existing fence where shown on the plans to be relocated shall be removed and relocated.

The Contractor shall salvage any excess fences that have been removed to the property owners.

Full compensation for removing of concrete footings, backfilling holes shall be considered as included in the contract price paid per lineal foot for “Relocate Fence,” and no additional compensation will be allowed therefor.

15-1.14 Remove Gate

Existing gate where shown on the plans to be removed shall be removed.

Attention is directed to “Remove Fence” of these Special Provisions for coordination with the property owner.

Removed gate material shall become the property of the Contractor and shall be disposed of outside the City right of way in accordance with Section 5-1.24,
“Construction Waste Disposal and Recycling,” of these special provisions and the Caltrans Standard Specifications.

Full compensation for removing of concrete footings, backfilling holes, shall be considered as included in the contract unit price paid for “Remove Gate,” and no additional compensation will be allowed therefor.

15-1.15 **Modify Maintenance Hole**

Maintenance holes shown on the plans to be modified shall be modified according to the plan details and Section 15-2.04 “Reconstruction,” of the Caltrans Standard Specifications.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for modifying maintenance holes shall be included in the contract unit price paid for “Modify Maintenance Hole,” and no additional compensation will be allowed therefor.

15-1.16 **Reconstruct Maintenance Hole**

Maintenance holes shown on the plans to be reconstructed shall be reconstructed according to the plan details and Section 15-2.04 “Reconstruction,” of the Caltrans Standard Specifications.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for reconstructing maintenance holes shall be included in the contract unit price paid for “Reconstruct Maintenance Hole,” and no additional compensation will be allowed therefor.

15-1.17 **Reconstruct Fence**

Existing fence where shown on the plans to be reconstructed shall be removed and reconstructed at the location shown on the plans. The reconstructed fence shall match the style of the existing fence it is connected too.

Any excess fence material shall become the property of the Contractor and shall be disposed of outside the City right of way in accordance with Section 5-1.24, “Construction Waste Disposal and Recycling,” of these special provisions and the Caltrans Standard Specifications.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for removing of concrete footings, backfilling holes shall be considered as included in the contract price paid per lineal foot for “Reconstruct Fence,” and no additional compensation will be allowed therefor.
15-1.18 Reconstruct Brick Column

Existing brick columns and walls where shown to be reconstructed shall be removed and reconstructed as shown on the plans.

Any excess brick material shall become the property of the Contractor and shall be disposed of outside the City right of way in accordance with Section 5-1.24, "Construction Waste Disposal and Recycling," of these special provisions and the Caltrans Standard Specifications.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for removing the brick wall and column, reconstructing the brick wall and column and backfilling holes shall be considered as included in the contract price paid per each for "Reconstruct Brick Column," and no additional compensation will be allowed therefor.

15-1.19 Adjust Frames and Covers and Utility Boxes to Grade

Frames and covers and frames and grates of existing manholes, utility boxes, or other facilities shall be adjusted to grade in accordance with the provisions in Section 15-2.10, "Adjust," of the Caltrans Standard Specifications and these special provisions. The Contractor shall protect all existing facilities from damage.

Existing maintenance hole frame and covers, lamp holes, survey monuments, detector hand hole covers, monitoring wells, fire hydrant and water valve boxes shall be adjusted to the new finished grade as following.

All castings shall be brought to finish grade after the final pavement lift has been installed. The maintenance hole openings shall be temporarily covered by suitable means, preferably with building paper. A circular or square saw cut at least twelve (12) inches deep using diamond pavement cutters shall be made at least twelve (12) inches (six (6) inches for covers less than ten (10) inches diameter size from the maintenance hole). If square saw cuts are used, the diagonal of the square shall align with the direction of travel. Smooth and clean cut of pavement is mandatory. Jackhammer can be used to break and remove the material after the saw cut, however, the use of a Jackhammer may not be allowed in lieu of a pavement saw.

The maintenance holes and valves shall be raised by installing concentric grade rings (pre-cast concrete) and/or leveling mortar. The Contractor shall furnish grade rings fitting the configuration of the existing frame.

The concrete used shall comply with provisions of standard specifications section 90-10 "Minor Concrete" of the Standard Specifications. Use of high early-strength modified concrete is recommended. The concrete shall be placed up to 1.5 inches lower than the surface of the adjacent pavement. A final lift of 1.5 inches of hot mix asphalt shall be placed only after concrete is totally dry.
All finished adjusted frames and covers shall be level with or 0.125 inches lower than adjacent pavement surface. The work shall be performed so as to present a neat and thorough workmanlike appearance upon completion, and result in a smooth ride over it. A six-foot straight-edge will be placed over the utility cover to check for this requirement.

Any damage to the existing facilities caused by the Contractor shall be repaired or replaced to the satisfaction of the Engineer.

The catch basin frame, grate, steel pull box, etc., shall be adjusted to grade using new materials, and the existing frame and grate shall be reused to the extent possible as directed by the Engineer in the field.

All valve box replacement, other than the City of Stockton’s, shall be at the expense of the owner of the utility.

Upon completion of placement of overlay on each street, all utility covers (maintenance hole, water valve, lamp hole, and detector hand hole covers, etc.) shall be clean and free of any hot mix asphalt and shall seat securely in their frames.

Existing electrical/traffic pull boxes will be adjusted to new finish grade. Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for the adjusting the pull boxes shall be included in the unit prices paid for various lighting and signalization items of work and no additional compensation will be allowed therefor.

Water valve boxes shall remain accessible at all times and shall be adjusted to grade after each lift of paving is placed. The contract unit price paid for “Adjust Valve/Meter Box to Grade” for each water valve boxes includes full compensation for it being adjusted after each lift of paving.

Locations of storm drain and sanitary sewer maintenance holes shall be tied-out prior to paving and shall be field-painted or otherwise referenced during pavement widening and overlay so that they can be located and adjusted to grade after the final paving is placed. Full compensation for field tie-out and marking as specified shall be deemed as included in the compensation paid for “Adjust Maintenance Hole to Grade”.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for adjusting existing maintenance hole frames and covers, water valve box, and water meter box shall be included in the unit prices paid for “Adjust Maintenance Hole to Grade” or “Adjust Valve/Meter Box to Grade”, and no additional compensation will be allowed therefor.
15-1.20 Modify Pull Box

Existing pull box without grounding rod shall be modified by adding a new grounding rod in accordance with the City of Stockton Standard Plans No. 111 and 111A.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for installing ground rods into existing pull boxes shall be included in the unit price paid for “Modify Pull Box” and no additional compensation will be allowed therefor.

15-1.21 Obstructions

Attention is directed to Sections 5-1.36D, "Nonhighway Facilities," and 15, "Existing Facilities," of the Caltrans Standard Specifications and these special provisions.

The Contractor's attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workmen and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipelines greater than 6 inches in diameter or pipelines operating at pressures greater than 60 psi gauge; underground electric supply system conductors or cables, with potential to ground of more than 300 volts, either directly buried or in duct or conduit which do not have concentric grounded conductors or other effectively grounded metal shields or sheaths.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include but are not limited to the following:

<table>
<thead>
<tr>
<th>Notification Center</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underground Service</td>
<td>811</td>
</tr>
<tr>
<td>Alert-Northern California (USA)</td>
<td>1-800-227-2600</td>
</tr>
<tr>
<td>Underground Service</td>
<td>811</td>
</tr>
<tr>
<td>Alert-Southern California (USA)</td>
<td>1-800-227-2600</td>
</tr>
</tbody>
</table>

The following utility facilities will be relocated during the progress of the contract. The Contractor shall notify the Engineer, in writing, prior to doing work in the vicinity of the facility. The utility facility will be relocated within the listed working days, as defined in Section 4-1.02,"Time of Completion," of these special provisions, after the notification is received by the Engineer:
Utility | Location | Working Days
--- | --- | ---
Estimated Stage 1 | AT&T – Fiber Optic | 2

The Contractor shall notify the utility company through the Engineer 15 working days prior to needing work done and shall coordinate work limits and cooperate with the utility company.

Notice is given to the Contractor that utility relocation and construction work by other forces, including but not limited to Pacific Gas & Electric, and AT&T will be in progress in the project area during the Contractor’s construction operations. The Contractor shall cooperate with the other forces engaged in such work and shall be required, if necessary, to expedite the timely completion of the project work on schedule, to work simultaneously in the same project area or other areas of the project site at the discretion of the Engineer.

The Contractor will be allotted additional working days to the time of completion for the project relocation work if the utility company’s work is a cause of delay on the current controlling operation for the completion of this project work. However, no adjustment in compensation will be allowed. The cost for the work under this Section of the Special Provision shall be included in various bid items and no additional compensation will be allowed therefor.

The Contractor shall complete any required potholing PRIOR to beginning construction unless otherwise approved by the Engineer. In the event the Contractor elects to pothole in conjunction with other items of work, the Contractor waives all rights to claims for additional compensation for delays resulting from conflicting utilities that could have been avoided had the Contractor completed potholing prior to beginning work as specified. Compensation for required potholing shall be considered to be included in the various items of work and no additional compensation will be allowed therefor.

The Contractor shall preserve USA markings throughout the duration of the project or reference such markings where proposed improvements will destroy the markings. Contractor shall provide the City with USA reference tags for confirmation.
SECTION 16  CLEARING AND GRUBBING

16-1.01  Clearing and Grubbing

Clearing and grubbing shall be in accordance with Section 16, “Clearing and Grubbing” of the Standard Specifications and these Special Provisions:

The work under this section of the Special Provisions shall include removing, salvaging, relocation, and/or disposal of existing street improvements including: bollards, fence materials, sod, bushes, shrubs, tree stumps, bricks, and all other obstructions required to be removed to construct the proposed improvements to the design alignment and grade and all other items to be removed and disposed of from the site as shown in the Plans. All debris, vegetative matter, concrete, bricks, rubble, excess materials, materials to be removed and disposed of and all other deleterious materials shall become the property of the Contractor and shall be removed and disposed of from the site. Existing materials which are to be removed and salvaged shall be delivered to the City corporation yard.

All excavated and other waste materials shall be disposed of from the project site immediately after removal. Where new construction conflicts with the roots of trees to remain, the Contractor shall hand prune roots smaller than one (1") inch diameter and shall cut off roots one (1") inch diameter and larger and paint the stub with an asphaltic base tree paint, tree seal, or equal. The paint shall be allowed to cure twenty-four (24) hours before backfilling. All roots encountered beneath the proposed surface improvements shall be removed.

If, in the opinion of the Engineer and the City’s arborist, a tree has been damaged due to lack of reasonable care by the Contractor’s operation and cannot be saved, the Contractor shall remove and replace the tree with equal size and type when so ordered by the Engineer at no additional cost to the City.

The Contractor shall coordinate with the property owner located at 7909 North Pershing Avenue prior removing any plants and bushes to determine which plants or bushes need to be salvaged to the property owner.

Full compensation for conforming to the requirements of this provision shall be considered as included in the lump sum price paid for “Clearing and Grubbing” and no additional compensation will be allowed therefor.

16-1.02  Tree Removal

The trees which are adjacent to the roadway in conflict with the proposed improvements shall not be felled but shall be progressively cut down. All limbs, twigs, and leaves shall be removed from the site as they are generated. On-site burning will not be permitted. The tree stumps shall be removed and the hole shall be backfilled.
and compacted with clement loam or equal. All roots shall be removed to a minimum of 3 feet in depth below the top of new curb elevations at median islands. Excavation limits for root removal is only applicable at tree locations. Should any direct or indirect damage or injury result to any public or private property by or on account of any act, omission, neglect, or misconduct, in the execution of the work, or as a consequence of the non-execution thereof on the part of the Contractor or any of his employees or agents, such property shall be restored by and at the expense of the Contractor to a condition equivalent to that existing before the damage or injury occurred by repairing or rebuilding the same, or by otherwise making restitution in an acceptable manner for such damage or injury. The Contractor shall notify the property owner of the tree(s) to be removed in writing at least two weeks prior to the tree removal.

Some trees to remain will need to be trimmed. If a tree needs to be trimmed in the opinion of the Engineer, the Contractor will trim the tree with reasonable care.

All tree materials, including debris, shall become the property of the Contractor who shall be responsible for its proper disposal. However, if the property owner desires the firewood, the Contractor shall allow the property owner to have the wood at no additional cost to the City.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for the tree trimming and removal shall be included in the lump sum price paid for “Street Planting,” and no additional compensation will be allowed therefor.

16-1.03 Modify, Maintain and Repair Existing Irrigation Systems

Sprinkler heads, irrigation system pipes, and irrigation control valves interfere with the proposed improvements shall be relocated behind the new back of sidewalk. Relocated sprinkler/irrigation systems shall be reconstructed to provide the same level of coverage as the existing system. The property owner shall be notified of the relocation three (3) working days prior to its initiation. The existing sprinkler/irrigation system relocation shall be completed within three (3) working days of the initiation of work. The Contractor shall water the plants at such other times, as often and in sufficient amounts as conditions may require to keep the soil and plant roots moist during these three (3) working days period. Salvaged irrigation material shall be returned to the property owner along with other privately owned facilities to be removed. All other excess material and salvaged materials that are not wanted by the property owner shall become the property of the Contractor and shall be disposed of away from the project site.

It is anticipated that the Contractor will affect the irrigation system of the properties along the southern side of Hammer Lane and at the northeast and northwest corners of Hammer Lane and Pershing Avenue intersection.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for the modifying, maintaining and repairing existing irrigation systems shall be
included in the lump sum unit price paid for “Modify/Maintain/Repair Existing Irrigation Systems,” and no additional compensation will be allowed therefor.
SECTION 19     EARTHWORK

19-1.01     Earthwork

Earthwork shall conform to Section 19, “Earthwork,” of the Standard Specifications and these Special Provisions. Wherever relative compaction is specified it shall be determined by Test Method No. Calif. 216 and 231.

Surplus excavated material shall become the property of the Contractor and shall be disposed of outside the City right of way in accordance with Section 5-1.24, “Construction Waste Disposal and Recycling,” of these special provisions and the Caltrans Standard Specifications.

Prior to paving, Contractor shall scarify existing subgrade to a minimum depth of twelve (12) inches and compact it to a relative compaction of 95% for the total width of the area to be paved.

Full compensation for excavating and backfilling for all pipes, curb, gutter and sidewalk shall be considered as included in the prices for the related improvements and no additional compensation will be allowed therefor.

19-2.01     Roadway Excavation

Roadway excavation shall comply with Section 19-2, “Roadway Excavation,” of the Caltrans Standard Specifications. The work shall consist of all excavation involved in the grading and construction of conventional pavement sections and full depth Hot Mix Asphalt sections. The work areas are defined on the improvement plans. The Contractor shall sawcut and remove the existing asphalt concrete pavement and medians needed to construct the new pavement sections.

Excavation associated with the construction of curb, gutter, sidewalk, driveways and conform work is paid for as part of the associated item of work.

Roadway Excavation will be measured by the cubic yard in the same manner specified for roadway excavation in conformance with the provisions in Section 19, "Earthwork," of the Standard Specifications.

Roadway Excavation will be measured and paid for as a final pay item in accordance with Section 9-1.02(C), “Final Pay Item Quantities,” of the Caltrans Standard Specifications.

The contract price paid per cubic yard for “Roadway Excavation” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in roadway excavation, as shown on the plans, as
specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

19-2.02 Remove Base and Surfacing

Existing base and bituminous surfacing shown on the plans to be removed shall be removed to a depth of at least two (2) feet below the grade of the existing surfacing. Prior excavation, the Contractor shall verify that there is no existing utilities within the work area. Resulting holes and depressions shall be backfilled with earthy material selected from excavation to the lines and grade established by the Engineer.

The material removed shall be disposed of outside the City's right of way in conformance with the provisions in Caltrans the Standard Specifications.

Remove Base and Surfacing will be measured by the cubic yard in the same manner specified for roadway excavation in conformance with the provisions in Section 19, "Earthwork," of the Caltrans Standard Specifications.

Remove Base and Surfacing will be measured and paid for as a final pay item in accordance with Section 9-1.02(C), “Final Pay Item Quantities,” of the Caltrans Standard Specifications.

The contract price paid per cubic yard for “Remove Base and Surfacing” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in removing base and surfacing, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

19-2.03 Controlled Density Fill

Controlled density fill shall consist of a workable mixture of aggregate, cementitious materials, and water and shall conform to the provisions for controlled low strength material in Section 19-3.02F, "Controlled Low Strength Material," of the Caltrans Standard Specifications and these special provisions.

Controlled density fill shall be used as structure backfill for pipe culverts.

Controlled density fill in new construction shall not be permanently placed higher than the basement soil. For trenches in existing pavements, permanent placement shall be no higher than the bottom of the existing pavement permeable drainage layer. If a drainage layer does not exist, permanent placement in existing pavements shall be no higher than one inch below the bottom of the existing asphalt concrete surfacing. The minimum height that controlled density fill shall be placed, relative to the culvert invert, is one half the diameter or one half the height for rigid culverts and 0.7 the diameter or 0.7 the height for flexible culverts. Controlled density fill shall be applied in equal lifts on both sides of the culverts.
The Contractor shall submit a mix design and test data to the Engineer for approval prior to excavating the trench for which controlled density fill is proposed for use. The test data and mix design shall provide for the following:

A. A 28-day compressive strength of 150 pounds per square inch. Compressive strength shall be determined in conformance with the requirements in ASTM Designation: D 4832.

B. Cement shall be any type of portland cement conforming to the requirements in ASTM Designation: C 150; or any type of blended hydraulic cement conforming to the requirements in ASTM Designation: C 595M or the physical requirements in ASTM Designation: C 1157M. Testing of cement will not be required.

C. Admixtures may be used in conformance with the provisions in Section 90-4, "Admixtures," of the Standard Specifications. Chemical admixtures containing chlorides as Cl in excess of one percent by weight of admixture, as determined in conformance with the requirements of California Test 415, shall not be used. If an air-entraining admixture is used, the maximum air content shall be limited to 20 percent. Mineral admixtures shall be used at the Contractor's option.

Materials for controlled density fill shall be thoroughly machine-mixed in a pugmill, rotary drum or other approved mixer. Mixing shall continue until the cementitious material and water are thoroughly dispersed throughout the material. Controlled density fill shall be placed in the work within 3 hours after introduction of the cement to the aggregates.

When controlled density fill is to be placed within the traveled way or otherwise to be covered by paving or embankment materials, the material shall achieve a maximum indentation diameter of 3 inches prior to covering and opening to public traffic. Penetration resistance shall be measured in conformance with the requirements in ASTM Designation: D 6024.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in mixing and pouring controlled density fill complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions shall be considered as included in the contract unit prices for the various sizes of drainage pipe and no additional compensation will be allowed therefor.

19-2.04 Base Failure Repairs

Base failure repair shall be performed by:

A. Excavating the marked (failed) area of the pavement and removing any wet and unstable material until a solid, dry surface is reached. If a dry surface is not visible
after fifteen (15) inches of excavation, the Contractor shall notify and follow the Engineer’s direction.

B. The street pavement section varies, approximately nine to fifteen (9 to 15) inches thick. If the existing section is greater than 12 inches, raise the subgrade to a 12” depth and fill with full depth Hot Mixed Asphalt (Type A) on top of Biaxial Geogrid unless otherwise directed by the Engineer.

C. Biaxial Geogrid BX1100 or approved equal material shall be installed at the base at those locations where it is directed by the Engineer.

D. Spray the tack-coat as per State Standard Specifications Section 39-4.02 to all vertical edges. The application rate shall be from 0.06 to 0.10 gallons per square yard as directed by the Engineer.

E. Construct the base of the street using Hot Mix Ashalt (Type A) as described in Section 39-1.03 “Hot Mix Asphalt” of these special provisions, in layers of no more than three (3) inches thick, to the appropriate depth as described on the plans. Asphalt Binder content in the mix shall not be below 4.9% in the field.

Base failure repairs shall be paid for by the actual area repaired (in square feet). It shall include full compensation for furnishing all labor, materials, tools, equipment, incidentals, traffic control, and doing all work involved in compaction, removal and disposal of materials as specified in these Special Provisions, Standard Specifications, and as directed by the Engineer. No additional compensation will be allowed therefor.

Biaxial Geogrid BX1100 or approved equal (material only, delivered at the job site or Contractor’s yard) shall be paid for by the square foot as a separate bid item. Full compensation for furnishing all labor, materials, tools, equipment, incidentals, traffic control, and doing all work involved in installing Biaxial Geogrid as specified in these Special Provisions, Standard Specifications, and as directed by the Engineer shall be paid for in contract price per square foot for “Base Failure Repairs” and no additional compensation will be allowed therefor.

Hot Mix Asphalt (material only, delivered at the job site) placed in Base Failure Repairs shall be paid for at the contract price per ton for “Hot Mix Asphalt (Type A)” in conformance with the provisions in Section 39-1.03 “Hot Mix Asphalt” of these special provisions. Full compensation for furnishing all labor, materials, tools, equipment, incidentals, traffic control, and doing all work involved in installing Hot Mix Asphalt as specified in these Special Provisions, Standard Specifications, and as directed by the Engineer shall be paid for in contract price per square foot for “Base Failure Repairs” and no additional compensation will be allowed therefor.
GEOGRIDS

General

Geogrids are polymer grid structures specifically fabricated for use as soil reinforcement. The Geogrid shall be biaxially oriented polymer grid structure providing positive interlock load transfer mechanism. All property values represent minimum average roll values (MARV).

Certification

The Contractor shall provide the Engineer a certificate stating the name of the manufacturer, product name and style, chemical composition of the material and any other pertinent information to fully describe the geotextile. The Manufacturer’s certificate shall state that the furnished geofrid meets MARV requirements of the specifications.

Product Substitution

The Contractor shall provide the Engineer a sample of the product along with all documentation and test results at least 5 days before the bid date. A sample installation at the cost of the Contractor may be required. The product must be approved by the Engineer before it can be installed.

Geogrid Property Requirements

The Geogrid supplied shall be a polypropylene or polyethylene material with the following requirements:

<table>
<thead>
<tr>
<th>Index Properties</th>
<th>Units</th>
<th>MD Values¹</th>
<th>XMD Values¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aperture Dimensions²</td>
<td>mm(in)</td>
<td>25(1.0)</td>
<td>33(1.3)</td>
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<tr>
<td>Minimum Rib Thickness²</td>
<td>mm(in)</td>
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<td>0.76(0.03)</td>
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<td>Tensile Strength @ 2% Strain³</td>
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<td>Tensile Strength @ 5% Strain³</td>
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<td>13.4(920)</td>
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<tr>
<td>Ultimate Tensile Strength³</td>
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<td>19.0(1,300)</td>
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<td>Structural Integrity</td>
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<tr>
<td>Flexural Stiffness⁵</td>
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<tr>
<td>Aperture Stability⁶</td>
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<tr>
<td>Durability</td>
<td>%SC/%SW/%GP</td>
<td>95/93/90</td>
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</tr>
<tr>
<td>Resistance to Installation Damage⁷</td>
<td>%</td>
<td>95/93/90</td>
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<tr>
<td>Resistance to Long Term Degradation⁸</td>
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Resistance to UV Degradation

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<th>Resistance to UV Degradation(^9)</th>
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<tbody>
<tr>
<td>%</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

Notes:

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4759. Brief descriptions of test procedures are given in the following notes.

2. Nominal dimensions.

3. True resistance to elongation when initially subjected to a load determined in accordance with ASTM D6637 without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties.

4. Load transfer capability determined in accordance with GRI-GG2-87 and expressed as a percentage of ultimate tensile strength.

5. Resistance to bending force determined in accordance with ASTM D5732-95, using specimens of width two ribs wide, with transverse ribs cut flush with exterior edges of longitudinal ribs (as a “ladder”), and of length sufficiently long to enable measurement of the overhang dimension. The overall Flexural Stiffness is calculated as the square root of the product of MD and XMD Flexural Stiffness values.

6. Resistance to in-place rotational movement measured by applying a 20 kg-cm moment to the central junction of a 9 inch x 9 inch specimen restrained at its perimeter in accordance with U.S. Army Corps of Engineers methodology for measurement to Torsional Rigidity.

7. Resistance to loss of load capacity or structural integrity when subjected to mechanical installation stress in clayey sand (SC), well graded sand (SW), and crushed stone classified as poorly graded gravel (GP). The geogrid shall be sampled in accordance with ASTM D5818 and load capacity shall be determined in accordance with ASTM D6637.

8. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.

9. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355.
SECTION 20 PLANTING AND IRRIGATION SYSTEMS

20-1.01 General

The work performed in connection with street planting and irrigation systems shall conform to the provisions in Section 20, “Landscape,” of the Standard Specifications and these special provisions.

When fluctuations of water pressure and water supply are encountered during normal working hours, the Contractor shall water the plants 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 price paid for plant establishment work and no additional compensation will be allowed therefor.

Submittals

1. Soil test and analysis for imported topsoil
2. Samples--submit the following:
   a. Imported topsoil (one liter bag)
   b. Root barrier
   c. Samples and manufacturers certificates for soil amendments
   d. One quart sample and manufacturers certificates for decomposed granite
   e. Mulch
3. Product data--submit manufacturers certificates for the following:
   a. Fertilizer: for packets.
4. "As-Built" Plan showing modifications to layout and quantities.
5. Maintenance schedule of watering for all sidewalk trees, conform areas, Public Art planter and median planters.

Progress Inspections

Progress inspections will be performed by the Engineer for completed street 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. After staking and layout of stabilized decomposed granite path.
B. During pressure testing of the pipelines on the supply side of control valves.
C. During testing of low voltage conductors.
D. Before planting begins and after completion of the work specified for planting in Section 20-4.03, "Preparing Planting Areas," of the Standard Specifications.
E. Before plant establishment work begins and after completion of the work specified for planting in Section 20-4.05, "Planting," of the Standard Specifications.
F. At intervals of one month during the plant establishment period.

20-1.01A Cost Breakdown

The Contractor shall furnish to the Engineer a cost break-down for the contract lump sum items and unit costs of Street Planting, Irrigation System, and Plant Establishment and Maintenance prior to beginning work on these items.

Each cost breakdown shall be completed in the format shown in this section. Units of work, in addition to the sample shown in this section, shall be designated by the Contractor. The Contractor shall designate units of work, the estimated quantity, value and amount for such units in the same manner as the bid item list should be provided.

The quantity given in the cost breakdown sample is approximate only, being a sample of the cost break-down to be furnished. The Contractor shall verify all quantities used in his cost breakdown. No adjustment in compensation will be made in the contract lump sum prices paid for street planting, irrigation system, or maintenance due to any differences between the quantities shown in the cost break-down furnished to the engineer and the quantities required to complete the work as shown on the plans and as specified in these special provisions.

The sum of the amounts shown for the units of work listed in each cost break-down for street planting, irrigation system, and plant establishment and maintenance work shall equal the contract lump sum price bid for said work. Overhead and profit shall be included in each individual unit listed in each cost breakdown. The cost breakdowns must be approved by the Engineer before any partial payment for these items will be made.
Approved cost breakdowns will be used to determine partial payments during the progress of the work and as the basis of calculating any adjustment in compensation for the items of street planting, irrigation system, and maintenance due to changes ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost break-down, the adjustment in compensation will be determined in the same manner specified for increases and decreases in the quantity of a contract item of work in accordance with Section 5-1.13, “Changes” of these Special Provisions.

STREET PLANTING COST BREAKDOWN

Project No. PW1427

<table>
<thead>
<tr>
<th>UNIT DESCRIPTION</th>
<th>UNIT</th>
<th>APPROX. QUANTITY</th>
<th>UNIT VALUE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove Trees</td>
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<tr>
<td>Stamped Concrete</td>
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<tr>
<td>Moisture Barrier</td>
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<tr>
<td>Stabilized Decomposed Granite Paving</td>
<td>SF</td>
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<tr>
<td>Decomposed Granite in Tree Wells</td>
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<tr>
<td>Imported Topsoil</td>
<td>CY</td>
<td>810</td>
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<tr>
<td>Cultivate</td>
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<td>Hydrosod</td>
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<td>Shrubs – 1 gallon</td>
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<td>Shrubs – 2 gallon</td>
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<td>Trees – 15 gallon</td>
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<td>Root Barrier</td>
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<td>Mulch – 3” Depth</td>
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<td>17,625</td>
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TOTAL STREET PLANTING

$________________
# IRRIGATION SYSTEM COST BREAKDOWN

## Project No. PW1427

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<thead>
<tr>
<th>UNIT DESCRIPTION</th>
<th>UNIT</th>
<th>APPROX. QUANTITY</th>
<th>UNIT VALUE</th>
<th>AMOUNT</th>
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<tbody>
<tr>
<td>Point of Connection – 1-½” Water Meter</td>
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<td>1-½” Backflow Preventer Assembly</td>
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<td>Backflow Preventer Enclosure</td>
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<td>Solar Automatic Controller (10 Sta)</td>
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<tr>
<td>Gate Valve</td>
<td>EA</td>
<td>7</td>
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<tr>
<td>1” Remote Control Valve with valve box and actuator</td>
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<td>Pull Box</td>
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<tr>
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<td>Quick Coupler Valve</td>
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<td>Main Lines – Schedule 40</td>
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<td>1,125</td>
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<td></td>
</tr>
<tr>
<td>Trenching (Frontage median to Hammer median) median to median</td>
<td>LF</td>
<td>1,125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lateral Lines</td>
<td>LF</td>
<td>4,525</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spray Heads</td>
<td>EA</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median Bubbler Assemblies</td>
<td>EA</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sidewalk Bubblers</td>
<td>EA</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subsurface Irrigation</td>
<td>SF</td>
<td>17,775</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL IRRIGATION SYSTEM** $________________
PLANT ESTABLISHMENT AND MAINTENANCE COST BREAKDOWN

Project No. PW1427

<table>
<thead>
<tr>
<th>UNIT DESCRIPTION</th>
<th>UNIT</th>
<th>APPROX. QUANTITY</th>
<th>UNIT VALUE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Establishment and Maintenance (1095 calendar days)</td>
<td>LS</td>
<td>Lump Sum</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL PLANT ESTABLISHMENT AND MAINTENANCE $___________
20-1.02 Stabilized Decomposed Granite Paving

The extent of work in this section includes the provision of materials and labor for the construction of all stabilized decomposed granite paving.

Decomposed granite, hereafter referred to as “DG” shall be yellow-brown or gold color as available from T.M.T Enterprises, Inc. (408) 432-9429, or approved equal. Material shall also conform to the following:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8”</td>
<td>100%</td>
</tr>
<tr>
<td>No. 4</td>
<td>85% - 95%</td>
</tr>
<tr>
<td>No. 8</td>
<td>75% - 95%</td>
</tr>
<tr>
<td>No. 30</td>
<td>35% - 55%</td>
</tr>
<tr>
<td>No. 200</td>
<td>10% - 20%</td>
</tr>
</tbody>
</table>

Stabilizer shall be PHP Organic Aggregate Binder, available from T.M.T Enterprises, Inc. (408) 432-9429, or equal, and added to the DG at the rate of 15 lbs per ton of DG.

Soil sterilent shall be chlorate-borate material with not less than 40% sodium chlorate and soluble in water to the extent of 3-1/2 lbs of product per gallon of water (“Chipman-Chlorax 40”, “Atrizine 80W”, or approved equal).

Materials shall be pre-mixed at the plant before being delivered to the site. No bucket mixing or on-site mixing will be allowed.

Soil sterilent shall be applied to the subgrade soil of areas to be paved prior to baserock operations; uniformly applied per manufacturer’s recommendations; minimum rate of 2.5 to 3.0 lbs./1000 square feet and watered with a minimum of 3 gallons/100 square feet. Contractor shall take all precautions necessary to avoid spray onto or runoff into planting areas.

Place and compact aggregate base.

DG mixture shall be deposited in such a manner as to minimize the necessity for spotting, picking up, or otherwise shifting the mixture. The mixture shall be compacted by use of light roller. The mixture shall not be screeded off or finished by floating. No steel tooling of edges shall be done.

The finished surface of the paving shall be kept moist for five days. Any cracks or wash-outs shall be filled in immediately.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing the stabilized decomposed granite, complete in place, including any additional amendments and
chemicals as required by the Engineer, shall be included in the lump sum unit price for “Street Planting” and no additional payment shall be made therefor.

20-1.03 Decomposed Granite in Tree Wells

The extent of work in this section includes the provision of materials and labor for the installation of all decomposed granite.

Decomposed granite shall be as described in Section 20-1.02.

DG mixture shall be deposited in such a manner as to minimize the necessity for spotting, picking up, or otherwise shifting the mixture. The mixture shall be compacted by use of light roller. The mixture shall not be screeded off or finished by floating. No steel tooling of edges shall be done.

No soil sterilant shall be applied in tree wells to receive decomposed granite.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing the decomposed granite, complete in place, including any additional amendments and chemicals as required by the Engineer, shall be included in the lump sum unit price for “Street Planting” and no additional payment shall be made therefor.

20-1.04 Imported Topsoil

Imported topsoil shall be fertile, friable soil of loamy character having a normal amount of humus (as report on soils test). The topsoil shall be free of subsoil, refuse, roots, rocks larger than 1/2” diameter, weeds and brush, herbacides (or other growth inhibiting chemicals), nematodes or other objectionable material.

An approved laboratory shall analyze all common physical and chemical soil properties prior to acceptance of the imported topsoil. Soils report and a soil sample shall be accepted by the City Representative prior to delivery of soil. Soil shall be sandy loam or loam in texture, and shall be pH 6.0 to 7.0 according to submitted soils report. The soil shall be nonsaline as determined on the saturation extract. Salinity shall not exceed 3.0 mmhos/cm, boron shall not exceed 1.0 ppm and the sodium absorption ratio (SAR) shall not exceed 6.0. Soil reaction as determined on a saturated paste shall fall between 5.5 and 7.5.

A certificate of soil test analysis for each stockpile shall be submitted and approved by the Engineer prior to use. Contractor shall install additives as required by the Engineer at no additional cost to the City. No planting work shall proceed until all topsoil requirements are met.

Topsoil shall be placed in all planter areas (8” layer minimum) and mixed in all container plant holes - 60% as listed in planting details.
Quantities of imported topsoil backfill on Engineer’s Estimate are approximate only and do not necessarily reflect the actual amount of imported topsoil that may be required. Contractor is responsible for verifying all quantities and furnishing and installing the required amounts of imported topsoil to complete the project in accordance with the plans, details and special provisions.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing the topsoil, complete in place, including soil testing, any additional amendments and chemicals as required by the Engineer, importing topsoil shall be included in the lump sum unit price for "Street Planting" and no additional payment shall be made therefor.

20-1.05 Growing Medium of Ground Cover Flats

To prevent weed contamination, the planting medium of all ground cover flats shall not contain chicken or other manure.

20-1.06 Water Barrier

Water barrier between import topsoil and existing asphalt, aggregate base and subgrade shall be .030” thick polyethylene rolls x 24” width.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and water barrier shall be considered as included in the lump sum unit price paid for “Street Planting” and no additional compensation will be allowed therefor.

20-1.07 Root Barrier


Full compensation for furnishing all labor, materials, tools, equipment and incidentals for installing root barriers shall be included in the lump sum price paid for “Street Planting”, and no additional compensation will be allowed therefor.

20-1.08 Street Planting

The work performed in connection with street planting shall be as shown on the plans and as specified in Section 20-7, “Highway Planting,” of the Caltrans Standard Specifications and these special provisions.
20-1.08A Mulch

Mulch shall be "walk on" bark - 3" depth as shown on ground cover planting detail for all ground cover areas, except Meidiland Roses. Meidiland Roses shall receive a minimum of 3" of bark mulch, with the mulch pulled back away from crown after planting.

With particle size 1/4" to 1-1/2" average. Unacceptable materials would be shredded cedar, gorilla hair, angel hair, etc. Contractor shall submit sample of mulch for approval.

Plant material that has been reduced to chips shall not be substituted for mulch, nor shall such chipped material be placed within areas designated on the plans to receive mulch.

20-1.08B Commercial Fertilizer

Commercial Fertilizer (Slow Release)

Commercial fertilizer (slow release) shall be determined from the soils analysis results. For purposes of bidding only, assume the following chemical analysis range:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>16-21</td>
</tr>
<tr>
<td>Phosphoric Acid</td>
<td>6-8</td>
</tr>
<tr>
<td>Water Soluble Potash</td>
<td>4-10</td>
</tr>
</tbody>
</table>

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 mass of 10 g ± 1 g and shall have the following guaranteed chemical analysis:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>20</td>
</tr>
<tr>
<td>Phosphoric Acid</td>
<td>10</td>
</tr>
<tr>
<td>Water Soluble Potash</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLANT CONTAINER SIZE</th>
<th>NUMBER OF PACKETS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Gallon</td>
<td>1</td>
</tr>
<tr>
<td>5-Gallon</td>
<td>3</td>
</tr>
<tr>
<td>15-Gallon</td>
<td>9</td>
</tr>
</tbody>
</table>
Space the packets evenly around the root ball halfway up backfill touching side of root ball. City’s Representative may require excavation of up to 5% of all plants selected at random for conformance review.

20-1.08C Organic Amendment

Soil amendment shall be determined from the soils analysis results for purposes of bidding only, assume shall be nitrogen-treated Redwood Sawdust or fir bark conforming to:

Physical Properties: 95% 100% passing, sieve size 6.35mm (1/4 inch), 80% 100% passing, sieve size 2.38mm (No. 8, 8 mesh), and 0% 30% passing, sieve size 500 micron (No. 35, 32 mesh)

Chemical Properties: Nitrogen Content (dry weight basis) - 0.4 0.6% iron content - minimum 0.08% dilute acid soluble Fe on dry weight basis, soluble salts - maximum 3.5 millimhos/centimeter @ 25 degrees C. as determined by saturation extract method; ash - 0 6.0%

20-1.08D Roadside Clearing

Prior to preparing planting areas and commencing irrigation trenching operations for planting areas, in addition to removing trash and debris, proposed planting areas shall be cleared as follows:

Weeds shall be cleared from within proposed ground cover areas and the area extending beyond the outer limits of such ground cover areas.

Weeds within plant basins shall be removed by hand pulling to the roots. The weed shall be pulled at the base of the plant.

After the initial roadside clearing is complete, additional roadside clearing work shall be performed as often 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 but not be limited to the following:

Trash and debris shall be removed.
Weeds shall be controlled.

Removed weeds shall be disposed of outside the highway right of way in accordance with the provisions in the Caltrans Standard Specifications.
Pesticides

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

- Glyphosate
- Sethoxydim
- Oxadiazon - (Preemergent)
- Oryzalin (Preemergent)
- Trifluralin (Preemergent)

If the Contractor elects to request the use of other pesticides on this project, such request shall be submitted in writing to the Engineer not less than 10 working days prior to the intended use of such other pesticides. Except for the pesticides listed in the preceding paragraph, no pesticides shall be used or applied without prior written approval from the Engineer.

Glyphosate shall be used to kill stolon type weeds. Oxadiazon shall be of the emulsifiable concentration or wettable powder type.

A minimum of 100 days shall elapse between applications of preemergents. Preemergents shall not be applied within 18 inches of plants. Growth regulators shall not be used. No pesticides, except cacodylic acid, diquat, fluazifop-butyl, glyphosate or sethoxydim shall be applied in such a manner as to allow them to come in contact with the foliage and woody parts of plants.

Pesticides for Meidiland Roses:

- BASF ‘Post’ - grasses only
- Fusilade 2000 - grasses only
- Surflan - preemergent

Plant Pits

Plant pits shall have their sides and bottoms loosened or otherwise broken to prevent glazed or compacted surfaces, and shall be as shown on the planting detail. Only unamended soil shall be used beneath the root ball; cultivate bottom of plant pit to improve porosity. Backfill around sides of rootball shall be the amended soil taken from adjacent prepared areas. Spread material excavated from plant pits onto adjacent areas as replacement. Should additional backfill be necessary, a mixture of one-third organic amendment/fertilizer mix and two-thirds topsoil may be used.
20-1.08G  Cultivation

Areas to be planted with ground cover shrubs, as shown on the plans, shall be cultivated.

Immediately prior to cultivation, soil amendment and commercial fertilizer shall be added to the areas to be cultivated. Incorporation rates shall be determined by the soils analysis. For purposes of bidding only, assume soil amendment shall be added at the rate of 6 cubic yards per 1,000 square feet and commercial fertilizer shall be applied at a rate of 30 pounds per 1,000 square feet. Soil amendment and fertilizer shall be incorporated to a homogeneously blended depth of 6 inches.

After cultivation is complete and the irrigation systems have been installed and the plant holes have been excavated and backfilled, no further planting work shall be done in the cultivated areas for a period of 15 days, except the soil shall be kept sufficiently moist to germinate weeds. Weeds that germinate shall be removed in accordance with the provisions in Section 20-7.03B, “Roadside Clearing” of the Caltrans Standard Specifications and these Special Provisions.

20-1.08H  Planting

Commercial fertilizer (slow release) shall be applied at the time of cultivation as specified in “Cultivation” of these Special Provisions.

Attention is directed to the requirements specified under “Irrigation Systems Functional Test” of these Special Provisions. Planting shall not be performed in any area until the functional test has been completed on the irrigation system serving that area.

20-1.08I  Payment

Full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in Street Planting as shown on the plans and as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer shall be included in the lump sum price paid for “Street Planting” and no additional compensation shall be allowed therefor.

20-1.09  Plant Establishment & Maintenance

The plant establishment period shall be Type 1 and shall be no less than 1095 calendar days, thirty six (36) months. Irrigation operation and maintenance shall be considered as included in the plant establishment period.

Contractor shall collect three (3) one-quart samples of the in-place topsoil 20 days after completion of planting and submit to, for maintenance period fertilizer recommendation. Test results shall be made available to the Landscape Architect.
Sample shall be a representative composite taken from several planting areas. Cost of soil test shall be paid for by the Contractor.

Commercial fertilizer used during the course of the maintenance period shall be determined by soils test required. For bidding purposes only, assume the use of ammonium sulfate (21-0-0) at 5 lbs. per 1000 SF, minimum one application every 6 months.

The center to center spacing of replacement plants for unsuitable ground cover plants shall be determined by the number of completed plant establishment calendar days at the time of replacement and the original spacing in accordance with the following:

<table>
<thead>
<tr>
<th>Original Spacing</th>
<th>Number of Completed Plant Establishment Calendar Days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-175</td>
</tr>
<tr>
<td>9&quot;</td>
<td>9&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>18&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>24&quot;</td>
<td>24&quot;</td>
</tr>
<tr>
<td>36&quot;</td>
<td>36&quot;</td>
</tr>
</tbody>
</table>

Days during the plant establishment period in which any electric automatic irrigation component is operated manually will not be credited as plant establishment calendar days, unless such manual operation is permitted by the Engineer, or is within the 5-day period specified in “Irrigation Systems” of these special provisions, for repairing any malfunction or damage to the irrigation systems. The Contractor is not required to pay for water or electricity during the Plant Establishment period.

Weeds within plant basins shall be controlled by hand pulling. Weeds in other areas (Pre-emergent in early spring and pesticides, at other times as needed) shall be controlled by any method approved by the Engineer. All trash (including, but not limited to, all bottles, cans, and paper) shall be removed as a part of the maintenance period.

At the option of the Contractor, plants of a larger container size than those originally specified may be used for replacement plants during the first 175 calendar days of the plant establishment period. The use of plants of a larger container size than those originally specified for replacement plants shall be at the Contractor's expense.
After 175 calendar days of the plant establishment period have been completed, replacement of plants, except for ground cover plants, shall be one gallon size for seedling, pot, and liner size plants; 5-gallon size for one gallon size plants; 15-gallon size for 5-gallon size plants; and 24-inch box size for 15-gallon size plants.

One application of a pre-emergent pesticide conforming to the requirements in “Pesticides” of these special provisions, shall be applied between 56 and 70 calendar days prior to completion of the plant establishment period.

The Contractor shall submit a watering schedule program, for each irrigation controller, to the Engineer for approval not less than 60 calendar days prior to the completion of the plant establishment period. If the Engineer determines the submitted watering schedule is unacceptable, the Contractor shall submit a revised watering schedule to the engineer for approval within 7 calendar days after receiving notice that the previously submitted schedule is unacceptable.

Written instructions shall be provided to the Engineer during the plant establishment period covering the use and adjustment of the installed irrigation controllers. The approved watering schedule program shall be implemented by the Contractor not less than 14 calendar days prior to the completion of the plant establishment period. Such programming shall not relieve the Contractor of his responsibility to apply sufficient water as conditions may require to keep the plants in a healthy condition. It shall be the responsibility of the Contractor to maintain the irrigation system as necessary to provide sufficient water to the new landscape during the plant establishment period. Compensation for repair of damage beyond control of Contractor (i.e. vandalism, public traffic) shall be extra work at force account. Include fixed bid of $10,000.00.

Contractor shall provide onsite irrigation training no more than 30 days prior to end of plant establishment period.

Plant Establishment Work shall include all irrigation (including adjusting sprinkler heads and replacing sprinklers), weeding, cultivation, spraying, pruning, replacement, re-staking, re-tying, adjusting, replacing sprinklers as needed, and other work necessary to keep the plant materials in a healthy growing condition including all labor, tools, materials, equipment, and incidentals to perform this work, and to keep the planting areas neat and attractive throughout the Plant Establishment Work period.

**Plant guarantee and replacement**

All plant materials furnished and installed under this contract shall be guaranteed against any and all poor, inadequate or inferior installation and workmanship throughout the plant establishment period. Any materials found to be dead, missing, or in poor condition during the plant establishment period shall be replaced immediately. Material to be replaced within the guarantee period shall be replaced by the Contractor within 30 days of written notification by the Engineer.
The commencement date of maintenance and of all Guarantees shall be noted in the Certificate of Project Acceptance, which will be signed by the Engineer. The start of the plant establishment period can precede Notice of Completion if approved by Engineer.

**Payment**

Full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in plant establishment and maintenance as shown on the plans and as specified in the Standard Specifications and these Special Provisions and as directed by the Engineer shall be included in the contract lump sum price paid for “Plant Establishment and Maintenance” and shall be paid quarterly or as agreed to with the Department, and no additional compensation will be allowed therefor.

### 20-1.10 Maintain Existing Planted Areas

Areas with existing plants to remain affected by the improvements shall be maintained throughout the life of the contract in conformance with these special provisions.

Existing plants shall be watered in conformance with the provisions in Section 20-1.03C, "Watering," of the State Standard Specifications.

Existing planted areas to be maintained shall be inspected for deficiencies by the Contractor in the presence of the Engineer. Deficiencies requiring corrective action shall include weeds; dead, diseased, or unhealthy plants; missing plant stakes and tree ties; inadequate plant basins; and other deficiencies needing corrective action to promote healthy plant life. The inspection shall be completed within 15 days after the start of work.

The Contractor shall perform work to maintain existing planted areas in a neat appearance and to promote healthy plant growth. The work shall include the following:

A. Weeds shall be killed and removed before the weeds reach the seed stage of growth or exceed 6 inches in length.
B. Weeds shall be removed from existing planted areas.
C. Pesticides for maintaining existing planted areas shall conform to the provisions in "Pesticides" of these special provisions.

### 20-1.11 Irrigation Systems

Irrigation systems shall be furnished and installed in accordance with the provisions, regarding work over or adjacent to existing underground facilities. Excavation for proposed irrigation facilities shall not be started until the existing underground facilities have been located and marked.

No payment will be made for irrigation controllers or electric remote control valves until wiring diagrams have been received by the Engineer.
All materials for irrigation systems, unless otherwise specified, shall be commercial quality.

Nipples shall be threaded. Vertical supply lines entering valve boxes shall be considered nipples.

Primers and paints for application on metal shall be the best quality grade of the type specified and shall be manufactured by a recognized paint manufacturer. Thinners and coloring tints shall conform to the paint manufacturer’s recommendations. Coatings shall not be thinned except as recommended by the paint manufacturer for application. Each application of paint shall be compatible with the previous application and shall be from paint made by the same manufacturer. Testing of primers and paints will not be required.

20-1.11A Flushing and Testing

Flushing and testing shall be done after all new sprinkler piping is in place. A full head of water shall be used to flush out the system with all heads removed. After the system is thoroughly flushed, risers shall be capped off and the system pressure tested.

20-1.11B Mainlines

All sprinkler lines upstream of remote control valves shall be tested for a period of not less than 24 hours and shall show no leakage or loss of pressure. Test pressure shall be 100 psi.

Unless otherwise directed by the Engineer, testing shall be accomplished by openings at the high points of the system. The valve controlling the admission of water into the section of pipe to be tested should be opened slowly and fully. After the system has been filled with water and all air expelled, all the valves controlling the section to be tested shall be closed, and the line remain in this condition for a period of not less than 24 hours.

20-1.11C Lateral Lines

All sprinkler lines downstream of remote control valves shall be tested under system pressure for a minimum of 24 hours. Any observable leaks shall be repaired. Minor leakage at swing/swivel joints is acceptable.

All leaks that are found shall be immediately corrected and the system again subjected to the same test.
All repairs of any damage to the pipes and their appurtenances, or to any other structures, resulting from or caused by these tests, shall be performed by the Contractor as the Engineer may direct, all without cost to the City.

At the conclusion of the pressure tests, the heads shall be installed and tested for operation in accordance with design requirements under normal operating pressure.

20-1.11D Irrigation Crossovers

Irrigation crossovers shall conform to these special provisions. Irrigation crossovers shall include water line crossover, sprinkler control crossover and appurtenances.

Water line crossover shall be class 200 PVC.

Crossover conduit shall be corrugated high density polyethylene (CHDPE) pipe.


20-1.11E Gate Valves (Isolation Valve)

Gate valves shall be bronze construction with operating wheel and screwed connections. Install the gate valve in a 9 in. diameter plastic valve box as detailed.

20-1.11F Valve Boxes

Valve boxes shall conform to the requirements in Section 20-3.02U, “Valve Boxes and Covers,” of the Caltrans Standard Specifications except as otherwise provided herein. Covers for concrete valve boxes shall be concrete, cast iron or steel. Cast iron and steel covers shall be hinged with brass hinge pins.

Covers for plastic valve boxes shall be glass fiber reinforced plastic or plastic with bolt down lid.

Valve boxes shall be identified on the top surface of the covers by stenciling with paint the appropriate abbreviations for the irrigation facilities contained in the valve boxes 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). The letters and numbers shall be 2 inches in height. The stenciling paint shall be a commercial quality epoxy resin base paint of a color which contrasts with the valve box covers.
20-1.11G Electric Automatic Irrigation Components

Solar Power Irrigation Controllers

Irrigation controllers (and controller enclosures) shall be as shown on the plans and shall be installed as detailed.

Electrical Remote Control Valves

Electric remote control valves shall conform to the provisions in Section 20-3.02R(3), "Control Valves," of the Caltrans Standard Specifications and the following:

A. Valves shall be brass construction, Griswold Model 2030 Solenoid Remote Control w/ Lema 1527 S/E Actuators.
B. Valves shall be angle pattern (bottom inlet) as shown on the plans.
C. Valve solenoids for (solar) controller shall be DC latching and operate on 3.5 V.

Conductors

Low voltage, as used in this subsection “Conductors,” shall mean 36 volts or less. (Verify UL Listed DB, 14 GUA.)

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

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. Splices are only allowed in pull boxes.

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.

The color of low voltage neutral and control conductor insulation shall be homogeneous throughout the entire thickness of the insulation. The neutral wire shall be white and hot wires shall be red. The extra or spare wires (see irrigation notes on legend sheet) shall be blue. Install spare wires in both directions from controllers.
Pull Boxes

Pull box installations shall conform to the provisions in Section 20-3.02E, “Conductors, Electrical Conduits and Pull Boxes,” of the Caltrans Standard Specifications.
(Note: These are low voltage control wires, not traffic pull boxes).

Irrigation Systems Functional Test

Functional tests for irrigation controllers and associated automatic irrigation system components shall conform to the provisions in Section 20-3.03P, “Irrigation System Functional Test,” of the Caltrans Standard Specifications and these special provisions. Tests shall consist of demonstrating 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, such components shall be repaired at the Contractor’s expense and the testing repeated until satisfactory operation is obtained.

Associated automatic irrigation system components shall include, but are not limited to, remote control valves and rain sensors.

20-1.11H Steel Pipe

Steel pipe supply lines and couplings and fittings for steel pipe shall conform to the provisions in Section 20-3.02M(2), “Galvanized Steel Pipe Supply Lines,” of the Caltrans Standard Specifications.

Galvanized steel pipe supply lines installed between water meters and backflow preventer assemblies shall be installed not less than 12 inches below finished grade, measured to the top of the pipe.

20-1.11I Plastic Pipe

Plastic pipe supply lines shall be Sch. 40 PVC as shown on the plans. Plastic pipe irrigation supply lines shall be installed not less than 18 inches below the finished grade, measured to the top of the pipe.

Class 200 plastic pipelines shall conform to the requirements of ASTM Designation: D 1785. Plastic pipe supply lines downstream from the remote control valves for sprinklers (cl. 200) shall have solvent cemented type joints and shall have a minimum cover of 12 inches. Primers shall be used on all solvent cemented type joints.

20-1.11J Water Meter and Connections

Water meters will be furnished by Stockton Municipal Utility District, at the locations noted on the plans (shown diagrammatically). The Contractor shall construct the point of connection for water meters, make all arrangements, apply and pay for permits, and
coordinate all work required. Contractor shall contact City of Stockton Public Works Department to request water meters upon completion of installation of flanged fittings to verify proper installation.

The City of Stockton Public Works Department shall pay for irrigation water used during construction and the Plant Establishment period.

20-1.11K Backflow Preventer Assembly

Backflow preventers shall be Febco reduced pressure (RP). Galvanized pipe shall be wrapped in 10 mil. vinyl per detail and covered with an insulating blanket as shown on the plans.

Pressure loss through the backflow preventer shall not exceed 12 psi at a flow rate of 60 GPM.

Full compensation for assemblies shall be considered as included in the contract lump sum price paid for the irrigation systems and no separate payment will be made therefor.

The contract lump sum price paid for the irrigation systems shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in furnishing and installing the backflow preventer, enclosure, and concrete pad complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

20-1.11L Backflow Preventer Assembly Enclosure

Enclosure (Strongbox SBBC 45CR with Polar Bearier insulating weather blanket sized as required) shall be installed over backflow preventer assembly and portland cement concrete pad. Enclosure shall be installed in accordance with the details shown on the plans and manufacturers details to assure proper locking.

20-1.11M Testing Backflow Preventers

New backflow preventers installed by the Contractor shall be tested for proper operation by a certified Backflow Preventer Tester & be subject to approval by Stockton M.U.D. Water Maintenance.

The backflow preventer tester shall hold a valid certification as a Backflow Preventer Tester from the county in which the device to be tested is located or, if the county does not have a certification program for Backflow Preventer Testers, the tester shall have a certificate from one of the following:
1. The University of Southern California Foundation for Cross-Connection Control and Hydraulic Research.
3. A county which has a certification program for Backflow Preventer Testers.

Testing for proper operation shall conform to the provisions of the county in which the testing is being performed or, if such procedures are not available, such tests shall conform to the provisions in the latest edition of the Cross-Connection Control Procedure and Practices manual, which is available from the California Department of Health Services, Sanitary Engineering Branch, 744 P Street, Sacramento, CA 95814.

Tests for new backflow preventers shall be satisfactorily completed after installation of the backflow preventer assembly and before operation of the irrigation systems.

The Contractor shall notify the Engineer at least 5 days prior to testing backflow preventers.

One copy of all test results for each backflow preventer and a valid certification from the Backflow Preventer Tester shall be furnished to the Engineer. New backflow preventers failing required tests shall be repaired or replaced at the Contractor’s expense.

Backflow preventers shall be retested one year after the satisfactory completion of the first tests or 10 days prior to completion of the plant establishment period, whichever occurs first. Backflow preventers failing required tests shall be repaired or replaced at the Contractor’s expense.

Full compensation for testing the backflow preventers shall be considered as included in the contract unit price paid for the irrigation systems involved and no separate payment will be made therefor.

20-1.11N Sprinklers

Sprinklers shall be the type, pattern and material and shall have the operating characteristics listed in the “Irrigation Legend” shown on the plans. Sprinklers may require minor relocation from that shown on the plans to provide uniform and complete coverage of the landscape. Contractor shall make all necessary adjustments at no additional costs to the owner.

20-1.11O Final Irrigation System Check

A final check of the new irrigation facilities shall be done not more than 28 calendar days prior to the acceptance of the contract.
Length of watering cycles for use of potable water from water meters for the final check of irrigation facilities will be determined by the Engineer, as needed for a complete operation and coverage without overspray.

All remote control valves connecting the new irrigation controllers shall be checked for automatic performance when controllers are in the automatic mode.

Unsatisfactory performance of irrigation facilities installed by the Contractor shall be repaired and rechecked at the Contractor's expense until satisfactory performance is obtained.

Nothing in this section, "Final Irrigation System Check," shall be construed as relieving the Contractor of full responsibility to make good or repair all defective work or materials found at any time before the formal written acceptance of the entire contract by the Director.

20-1.11P Irrigation Warranty

All irrigation materials furnished and installed under this contract shall be guaranteed against any and all poor, inadequate or inferior installation and workmanship throughout the plant establishment period. Any system breaks or materials found to be missing or in poor condition during the plant establishment period shall be replaced immediately at the discretion of the Engineer. Material to be replaced within the guarantee period shall be replaced by the Contractor within 3 days of written notification. The commencement date of maintenance and of all guarantees shall be noted in the Notice of Completion, which will be signed by the Engineer.

Full compensation for checking the irrigation systems prior to the acceptance of the contract shall be considered as included in the prices paid for the various contract items of irrigation systems involved and no additional compensation will be allowed therefor.

20-1.11Q Existing Irrigation Facilities

The work performed in connection with the various existing highway irrigation system facilities shall conform to the applicable provisions in Section 15, "Existing Facilities," of the State Standard Specifications and these special provisions.

Water shall be maintained in conformance with the applicable provisions in Section 20-3.03B(3), "Maintain Existing Water Supply," of the State Standard Specifications.

The Contractor shall document condition of existing irrigation facilities to remain and will be responsible for maintaining existing said facilities for the duration of the contract.
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 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 Irrigation Facilities" of these special provisions.

20-1.11R Payment

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 irrigation systems, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.
SECTION 26 AGGREGATE BASE

26-1.01 Aggregate Base

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

Full compensation for aggregate base shall be considered to be included in the contract price paid for the various items of work which involves aggregate base and no additional compensation will be allowed therefor.
SECTION 39  HOT MIX ASPHALT

39-1.01  Preparing Pavements for Overlay

The work shall consist of the preparation of existing pavement for overlay in accordance with these Special Provisions:

1. Before any street is tacked, all weeds shall be removed in the street area, especially along the gutter lip and the entire street surface thoroughly clean of all dirt, dust in cracks, and built-up car dripping. Car dripping buildup shall be scraped from the surface and all loose material shall be removed by pickup power brooms, supplemented, if necessary, by hand brooming. Brooming shall be done in a manner that will not create a public nuisance and will not throw dust and rocks in the pathway or sidewalk areas. Power brooms or sweepers shall be self-contained, pickup type.

2. Cleaning and Tack Coat – After grinding, the surface to be overlaid shall be thoroughly cleaned and tack coated. Tack coat shall be in accordance with Section 39-1.09C, “Tack Coat”, of the Caltrans Standard Specifications. All tack coat shall be hot asphalt binder grade SS-1.

3. Contractor shall remove all pavement markers, reflectors, raised concrete guide or bumper strips and thermoplastic pavement markings in street area prior to paving.

4. Contractor shall adjust existing utility boxes and manholes shown on the Plans to finish grade.

Full compensation for all work involved in pavement preparation shall be included in the contract bid price for "Hot Mix Asphalt (Type A)” and no additional compensation will be made therefor.

39-1.02  Cold Plane Asphalt Concrete Pavement

The work shall consist of the preparation of existing asphalt concrete pavement shall be cold planed at the locations and to the dimensions shown on the plans.

Planing asphalt concrete pavement shall be performed by the cold planing method. Planing of the asphalt concrete pavement shall not be done by the heater planing method.

Cold planing machines shall be equipped with a cutter head not less than 30 inches in width and shall be operated so as not to produce fumes or smoke. The cold planing machine shall be capable of planing the pavement without requiring the use of a heating device to soften the pavement during or prior to the planing operation.
The depth, width and shape of the cut shall be as indicated on Plans or as directed by the Engineer. The outside lines of the planed area shall be neat and uniform. Planing asphalt concrete pavement operations shall be performed without damage to the surfacing to remain in place.

Following planing operations, a drop-off of more than 0.15-foot will not be allowed at any time between adjacent lanes open to public traffic.

Where transverse joints are planed in the pavement at conform lines no drop-off shall remain between the existing pavement and the planed area when the pavement is opened to public traffic. If asphalt concrete has not been placed to the level of existing pavement before the pavement is to be opened to public traffic a temporary Hot Mix Asphalt taper shall be constructed. Hot Mix Asphalt for temporary tapers shall be placed to the level of the existing pavement and tapered on a slope of 30:1 or flatter to the level of the planed area.

Hot Mix Asphalt for temporary tapers shall be commercial quality and may be spread and compacted by any method that will produce a smooth riding surface. Temporary Hot Mix Asphalt tapers shall be completely removed, including the removal of all loose material from the underlying surface, before placing the permanent surfacing. Such removed material shall be disposed of outside the City right of way in accordance with the provisions in the Caltrans Standard Specifications.

The material planed from the roadway surface, including material deposited in existing gutters or on the adjacent traveled way, shall be removed and disposed of. Removal operations of cold planed material shall be concurrent with planing operations and follow within 50 feet of the planer, unless otherwise directed by the Engineer.

Cold plane asphalt concrete pavement will be measured by the square yard. The quantity to be paid for will be the actual area of surface cold planed irrespective of the number of passes required to obtain the depth shown on the plans.

Full compensation for conforming to the requirements of this provision shall be considered as included in the contract unit price paid for “Cold Plane Asphalt Concrete Pavement”, and no additional compensation will be allowed therefor.

**39-1.03 Hot Mix Asphalt**

Section 39-9.02 “Material” of the City of Stockton Standard Specifications shall not apply.

Hot Mix Asphalt used in the base, leveling and surface courses of the pavement sections shall be ¾” nominal (NMAS) maximum, medium Type A and shall conform to the provisions in Section 39, “Hot Mix Asphalt” of the Standard Specifications and
these special provisions. Asphalt binder shall have a performance grade of 70-10 as specified in Section 92 of the Caltrans Standard Specifications.

The Contractor shall submit a mix design for approval by the Engineer at least 10 days before producing Hot Mix Asphalt. The target value for asphalt binder to mixed with the aggregate for Type A Hot Mix Asphalt will be determined by the Contractor in accordance with California Test 367 using the proposed aggregate grading in conformance with Section 39-1.03.

The proposed mix design shall provide for a minimum stability value of 37 at the target value selected when measured in accordance with California Test 366. The mix design shall provide not more than 5 percent and not less than 3 percent calculated air voids at the target value when measured in accordance with California Test 308A. The minimum Voids in Mineral Aggregate (VMA) shall be 12.5%. The Contractor shall select the asphalt percentage based on the mix design. The maximum swell for the mix design shall be 0.030 inches in 24 hours when measured in accordance with California Test 305. The minimum value of stability, after testing for Moisture Vapor Susceptibility (MVS) in accordance with California Test 307, shall be 30.

Hot Mix Asphalt placed in layers of 0.15 foot or less in compacted thickness or widths of less than five feet shall be spread and compacted with the equipment and by the methods conforming to the provisions in Section 39. All other Hot Mix Asphalt shall be compacted and finished in conformance with said Section 39, amended as follows:

The Contractor shall furnish a sufficient number of rollers to obtain the specified compaction and surface finish required by these specifications.

All rollers shall be equipped with pads and water systems which prevent sticking of asphalt mixtures to the pneumatic, or steel, tired wheels. A parting agent, which will not damage the asphalt mixture, as determined by the Engineer, may be used to aid in preventing the sticking of the mixture to the wheels.

Hot Mix Asphalt shall be compacted by any means to obtain the specified relative compaction before the temperature of the mixture drops below 150° F. Additional rolling to achieve the specified relative compaction will not be permitted after the temperature of the mixture drops below 150° F or once the pavement is opened to public traffic. When vibratory rollers are used as finished rollers the vibratory unit shall be turned off.

Hot Mix Asphalt shall be compacted to a relative compaction of not less than 95 percent and shall be finished to the lines, grades, and cross section shown on
the plans. In-place density of Hot Mix Asphalt will be determined prior to opening the pavement to public traffic.

Relative compaction will be determined by California Test 375. Laboratory specimens will be compacted in conformance with California Test 304. Lots will be established for Hot Mix Asphalt areas to be tested, as specified in California Test 375.

If the test results for any lot of Hot Mix Asphalt indicate that the relative compaction is below 95 percent but above 92.9 percent, the Contractor will be advised that he is not attaining the required relative compaction and that his materials or procedures, or both, need adjustment. Hot Mix Asphalt spreading operations shall not continue until the Contractor has notified the Engineer of the adjustment that will be made in order to meet the required compaction.

If the test results for any lot of Hot Mix Asphalt indicate that the relative compaction is less than 93.0 percent, the Hot Mix Asphalt represented by that lot shall be removed, except as otherwise provided below. Hot Mix Asphalt spreading operations shall not continue until the Contractor makes significant adjustments to his materials or procedures or both in order to meet the required compaction. The adjustments shall be as agreed to by the Engineer. However, if requested by the Contractor and approved by the Engineer, Hot Mix Asphalt with a relative compaction of 90.0 percent or greater may remain in place and the Contractor shall pay the City the amount of reduced compensation for such lot with low compaction. The Department may deduct an amount of reduced compensation from any monies due, or that may become due, the Contractor under the contract. The amount of reduced compensation the Contractor shall pay to the City will be calculated using the total tons represented in the lot with low compaction times the contract price per ton for the contract item of Hot Mix Asphalt (Type A) involved times the following reduced compensation factors:

<table>
<thead>
<tr>
<th>Relative Compaction (Percent)</th>
<th>Reduced Compensation Factor</th>
<th>Relative Compaction (Percent)</th>
<th>Reduced Compensation Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>93.0</td>
<td>0.000</td>
<td>91.4</td>
<td>0.062</td>
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<tr>
<td>92.9</td>
<td>0.002</td>
<td>91.3</td>
<td>0.068</td>
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</tr>
<tr>
<td>92.7</td>
<td>0.006</td>
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</tr>
<tr>
<td>92.6</td>
<td>0.009</td>
<td>91.0</td>
<td>0.090</td>
</tr>
<tr>
<td>92.5</td>
<td>0.012</td>
<td>90.9</td>
<td>0.098</td>
</tr>
<tr>
<td>92.4</td>
<td>0.015</td>
<td>90.8</td>
<td>0.108</td>
</tr>
<tr>
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<td>0.018</td>
<td>90.7</td>
<td>0.118</td>
</tr>
<tr>
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<td>0.022</td>
<td>90.6</td>
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<tr>
<td>91.9</td>
<td>0.034</td>
<td>90.3</td>
<td>0.175</td>
</tr>
</tbody>
</table>
If paving operations are in progress and rain or fog forces a shutdown, loaded trucks in transit shall return to the plant, and no compensation will be allowed therefor.

Full compensation for conforming to the requirements of this provision shall be considered as included in the unit price paid per ton for “Hot Mix Asphalt (Type A)” as adjusted herein, and no additional compensation will be allowed therefor. No additional compensation will be paid to the Contractor if the bitumen ratio in the approved mix design increases or decreases the amount of asphalt binder assumed in preparing the Contractor’s bid.

39-1.04 Place Hot Mix Asphalt (Miscellaneous Area)

Surfacing of miscellaneous areas with Hot Mix Asphalt shall conform to the provisions for miscellaneous areas in Section 39, “Hot Mix Asphalt,” of the Standard Specifications and these special provisions.

Hot Mix Asphalt placed in miscellaneous areas shall be produced in conformance with the requirements for Hot Mix Asphalt placed on the traveled way in Section 39-1.03 “Hot Mix Asphalt,” of these special provisions.

The miscellaneous areas to be paid for at the contract price per square yard for “Place Hot Mix Asphalt (Miscellaneous Area) in addition to the prices paid for the materials involved shall be limited to the areas listed on the plans.

Hot Mix Asphalt placed in miscellaneous areas will be paid for at the contract price paid per ton for “Hot Mix Asphalt (Type A)” in conformance with the provisions in Section 39-1.03, “Hot Mix Asphalt” of these special provisions.

Full compensation for any necessary excavation, backfill and preparation of the area shall be considered as included in the contract unit price paid per square yard for “Place Hot Mix Asphalt (Miscellaneous Area)” and no additional compensation will be allowed therefor.

39-1.05 Pavement Reinforcing Fabric

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in installing the pavement reinforcing fabric, as shown on the plans, as specified in these special provisions, and as directed by the Engineer, shall be considered as included in the contract price paid per square yard of “Pavement Reinforcing Fabric” and no additional compensation will be allowed therefor.
SECTION 56  SIGNS

56-1.01 Roadside Signs

Roadside signs shall include new permanent signs installed at the locations, per the method specified, shown on the plans or where directed by the Engineer, and shall conform to the provisions in Section 56-4, “Roadside Signs,” of the Caltrans Standard Specifications and these special provisions. Temporary or relocated signs are subject to requirements located elsewhere in these special provisions.

During construction, the Contractor shall be repairing or replacing any signs that are stolen, vandalized or otherwise damaged, except by public traffic as provided elsewhere in these special provisions, at no additional cost to the City.

Roadside Signs (One Post) shall be installed in accordance with the City of Stockton Standard Plan No. 36, 36A and 36B.

Roadside Signs shall be Type IV, High Intensity signs as listed in Section 8-1.01 “Prequalified and Tested Signing and Delineation Material” of these Special Provisions. The signs shall be covered with a graffiti coating, 3M Series 1160 or approved equal.

The contract unit price paid per each for “Roadside Sign (One Post)” and “Install Sign (Strap and Saddle Bracket Method) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and placing roadside signs, complete in place, including the installation of sign panels as shown on the plans, as specified in the Standard Specifications and these Special provisions, and as directed by the Engineer.
SECTION 71 STORM DRAINAGE AND SANITARY SEWER

The Contractor's attention is directed to Section 71 "Sanitary Sewers and Storm Sewers" of the City Standard Specifications.

71-1.01 Install Storm Drain Pipe

Reinforced Concrete Pipe

Reinforced concrete pipe shall conform to the provisions in Section 65-2, "Reinforced Concrete Pipe," of the Caltrans Standard Specifications and these special provisions.

The trench backfill and compaction shall conform to City of Stockton Standard Plan No. 50 and No. 50B, except that the asphalt paving replaced in existing street sections shall be 15" thick.

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.

Reinforced concrete pipe (12" diameter, Class 3), Reinforced concrete pipe (15" diameter, Class 3), Reinforced concrete pipe (30" diameter, Class 3), and Reinforced concrete pipe (36" diameter, Class 3) shall be measured and paid for by the lineal foot of pipe installed.

Ductile Iron Pipe

Ductile Iron Pipe shall conform to the provisions in Section 76-1.02B, “Ductile Iron Pipe,” of the Standard Specifications and these special provisions.

For the under sidewalk drain at the Shell gas station, the trench backfill and compaction shall conform to City of Stockton Standard Plan No. 81. The end of the pipe behind the sidewalk shall be capped for future use.

For ductile iron pipe storm drain built over the existing water lines shall comply with the California Health Department requirements detailed out in the City of Stockton Standard Plans No. 47, 47A, 47B and 48. In general the ductile iron pipe shall have no joints within the limits specified on the Standard Plans.

Unless otherwise specified on the plans or these special provisions, joints for ductile iron pipe culverts shall be rubber gasket push-on type and conform to the requirements in ANSI A21.11 (AWWA C111).

Ductile Iron Pipe (4 inch, Class 350), (12 inch, Class 350) and (16 inch, Class 350) shall be measured and paid for by the lineal foot of pipe installed.
Plastic Pipe

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

The trench backfill and compaction shall conform to City of Stockton Standard Plan No. 81.

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.

Payment

The contract prices paid per lineal foot for the various storm drain pipes shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, for doing all work involved in installing the storm drain pipes, complete in place, as shown on the plans, as provided in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for excavation, backfill (including replacing asphalt concrete over trenches in existing paved areas), will be considered as included in the contract price paid for various items of storm drain work and no separate payment will be made therefor.

71-1.02 Drainage Structures

Drainage structures shall be paid for by each structure constructed or reconstructed.

Construct Curb Inlet Catch Basin (Type 2 and Type 2 Modified)

Curb Inlet Catch Basins, where shown on the Plans to be constructed, shall be constructed in conformance with the Plans, these special provisions, the City of Stockton Standard Plans and the Standard Specifications.

Construct Maintenance Hole (COS Type 1, 2 and Type 4)

Maintenance holes (both sanitary and storm sewer), where shown on the Plans to be constructed, shall be constructed in conformance with the Plans, these special provisions and the City of Stockton Standard Specifications and Plans.

Full compensation for conforming to these provisions shall be considered as included in the contract prices paid per each for the various drainage structure items and no additional compensation will be allowed therefor.
71-1.03 Connect Pipe to Existing Structure or Existing Pipe

Where shown on the Plans to connect storm drain pipe to an existing structure or existing pipe, a water-tight connection shall be made in accordance with the Plans, these special provisions and the Standard Specifications.

All existing pipe to pipe connections shall have a concrete collar placed around the connection as shown on the plans.

All existing structure to pipe connections shall have a six inch (6”) thick concrete collar placed around the connection extending one foot (1’) back on the pipe in the connection. Inside walls of the existing structure shall be grouted smooth with a sand-cement dry-pack grout. If the existing structure has reinforcement within the walls, the reinforcement shall be cut and bent as to incorporate it into the collar. The reinforcement shall extend nine inches (9”) back on the pipe in the connection.

Full compensation for connecting pipe to existing drainage structures shall be considered as included in the contract prices paid for the various sizes of pipe and no additional compensation will be allowed therefor.

71-1.04 Cofferdam

The cofferdam to be installed at Five Mile Slough shall be constructed as shown on the plans.

The waterproof membrane used in the construction of the cofferdams within Five Mile Slough shall be a geomembrane fabric made of polyethylene, polypropylene, or polyvinyl chloride. The fabric shall be non-permeable and have the following minimum properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>0.020 inches (20 mil)</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>43 pounds per inch</td>
</tr>
<tr>
<td>ASTM D638</td>
<td></td>
</tr>
<tr>
<td>Yield at Elongation</td>
<td></td>
</tr>
</tbody>
</table>

If the fabric is to be exposed for more than 72 hours, all fabric shall be treated with ultraviolet ray (UV) protection. The treated fabric shall provide a minimum of 70 percent breaking strength retention after 500 hours exposure when tested in conformance with the requirements in ASTM Designation: D 4355. Unless otherwise specified, the Contractor shall submit samples of the treated fabric to the Transportation Laboratory at least 45 days prior to use.

Fabric not treated with UV protection, which is exposed for more than 72 hours shall be removed and replaced at the expense of the Contractor. The replacement fabric
either shall be treated with UV protection or shall not be exposed for more than 72 hours.

The fabric shall be joined by a watertight seal with a 6 inch overlap. Refer to the manufacturer’s recommendations for other requirements.

When the cofferdam is removed, the surrounding streambed shall be restored to its preexisting condition as directed by the Engineer.

The lump sum price paid for “Cofferdam” shall include compensation for furnishing all labor (including trenching of the footing), materials (including aggregate base), tools, equipment and incidentals, and for doing all the work involved in installing and removing the cofferdams and restoring the streambed as shown on the plans, as specified in these special provisions, and as directed by the Engineer, and no additional compensation will be allowed therefor.

71-1.05  EcoStorm Plus

The EcoStorm Plus shall be furnished and installed as shown on the plans and in conformance with the manufacturer’s recommendations and these special provisions.

The EcoStorm Plus shall be a storm water filtration system as manufactured by Royal Environmental Systems, Inc. The EcoStorm plus can be purchased through Titus Industrial Group, 62292 Byram Road Bend, Oregon 97701, Telephone (877) 582-9899.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-3.05E, “Certificate of Compliance,” of the Caltrans Standard Specifications. The Certificate of Compliance shall certify that the EcoStorm Plus conforms to the contract plans and specifications and was manufactured in conformance with the approved quality control program.

The EcoStorm Plus shall be installed in conformance with the manufacturer’s installation instructions. The manufacturer will required its own inspector be present during the installation of the EcoStorm Plus unit.

The contract unit price paid per each for “EcoStorm Plus” shall include compensation for furnishing all labor (including excavation and backfill), materials, tools, equipment, shipping and incidentals, and for doing all the work involved in furnishing and installing the EcoStorm Plus as shown on the plans, as specified in these special provisions, and as directed by the Engineer, and no additional compensation will be allowed therefor.
SECTION 73 CONCRETE CURBS, GUTTERS AND SIDEWALKS

73-1.01 Concrete Curbs, Gutters and Sidewalks

Concrete curb, gutter, sidewalk, curb return, wheelchair ramp, controller walkway, retaining curb, concrete mowband, stamped concrete, commercial and residential driveway and Portland cement concrete flat work shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," and Section 90, “Concrete” of the Caltrans Standard Specifications and these special provisions. All concrete used in constructing these items shall be Class 2 Portland cement concrete per Section 90 of the Caltrans Standard Specifications.

Where existing driveways are matched with new improvements, the maximum grade difference between the new and existing driveway shall not exceed 10% maximum. The maximum slope of the new driveway apron shall not exceed 10%.

The Contractor shall align traffic signal poles, street light poles, and pull boxes so that they align with construction and expansion joints.

The Contractor shall notify the Engineer of any situations where there is less than a minimum clearance of 42” from the face of curb to the face of any pole or obstruction or such that there is a 36” clearance between any pole or obstructions and the back of walk. The Engineer will determine whether or not the sidewalk can be widened or if the pole or obstruction should be moved in order to meet these minimum clearance requirements. In situations where AC patching or import borrow are needed to conform at the back of walk or driveway, the work is considered extra work and shall be paid as separate work.

For the concrete mowband, Contractor shall provide a light broom finish with strokes perpendicular to direction of band.

For stamped concrete, imprint pattern shall be “Octagon Paver” with Limestone Sandblast texture as available from Bomanite, 8777 Auburn Folsom Rd., #108, Granite Bay, CA 95746, (303) 369-1115. Integral color admixture shall be "Mexican Tile" available from Bomanite. Mix integral color at a rate per manufacturer’s specifications.

Curb ramp detectable warning surfacing shall conform to the details shown in the City Standard Drawings No. 31 and 32. The finished surfaces of the detectable warning surface shall be free from blemishes. The current California Building Code has removed the requirement to include grooves at the top of a slope. The Contractor shall not include the grooves shown on City Standard Drawings No. 31 and 32.

The detectable warning surface shall be Armor Tile Tactile System or approved equal. The color of the surface shall be yellow (Federal Color Number 33538). For newly
poured wheelchair ramps a cast in place system shall be used. For retrofitting of the surface on an existing ramp, a surface applied system shall be used.

When the wheelchair ramp is new or being reconstructed, full compensation for constructing or installing the detectable warning surface shall be considered as included in the contract unit price paid for "Wheelchair Ramps" and no additional compensation will be allowed therefor.

The concrete and any required admixture used for commercial and residential driveways shall allow for the driveway to be open to traffic within three days of the demolition of the existing driveway. The admixture used shall conform to the requirements specified in Section 901.02E of the Caltrans Standard Specifications. The Contractor shall use the curing compound method for curing the concrete for commercial driveways and the curing compound shall be curing compound (6) as specified in Section 90-1.03B(3), “Curing Compound Method,” of the Standard Specifications.

If the Contractor elects to use the curing compound method for curing the concrete for curb, gutter, sidewalk, curb return, wheelchair ramp, and Portland cement concrete flat work the curing compound shall be curing compound (6) as specified in Section 90-1.03B(3), "Curing Compound Method," of the Standard Specifications. No additional compensation will be allowed for curing compounds used for the Contractors convenience.

The curing compound shall be applied in a manner that will provide a complete coating of all exposed faces of the concrete surface.

When the wheelchair ramp is being reconstructed, Hot Mix Asphalt placed during the reconstruction shall be paid for at the contract price per ton for “Hot Mix Asphalt (Type A)” in conformance with the provisions in Section 39-1.03 “Hot Mix Asphalt” of these special provisions.

Curb and gutter shown as part of a standard wheelchair ramp or driveway shall be paid for as curb and gutter of the designated type.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, traffic control, and doing all work involved in installing various items of work shall be considered as included in the contract prices paid per lineal for “Vertical Curb and Gutter”, “Roll Type Curb and Gutter”, “Concrete Mowband”, “Type “C” Vertical Curb”, “Type “D” Vertical Curb”, “Type “E” Vertical Curb”, “Median Curb (Type 4)”, “Median Curb (Type 4A)”, “Retaining Curb”, per unit for “Wheelchair Ramps”, and per square foot for “Sidewalk”, “Stamped Concrete”, “Residential/Commercial Driveway”, and “Controller Walkway,” and no additional compensation will be allowed therefor.
SECTION 80  Fences

80-1.01  Type 1 and 2 Fence (Wood)

Wood fence shall be constructed as shown on the plans and conform to the provisions in Sections 80, “Fences,” and 57-2.01B(3), “Preservative Treatment” of the Caltrans Standard specifications and these special provisions.

Attention is directed to “Temporary Fence” of these Special Provisions.

The contract price paid per lineal foot for various type of fence shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and installing fence, including digging holes and placing concrete, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

80-1.02  Wire Mesh and Barbed Wire Fence

Wire Mesh and Barbed Wire fence shall be constructed as shown on the plans and conform to the provisions in Sections 80, “Fences,” of the Caltrans Standard specifications and these special provisions.

Attention is directed to “Temporary Fence” of these Special Provisions.

The contract price paid per lineal foot for “Fence (WM-BW, Metal Post)” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and installing fence, including digging holes and placing concrete, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

80-1.03  Wood Gate

Wood gate shall be constructed as shown on the plans and conform to the provisions in Sections 80, “Fences,” and 57-2.01B(3), “Preservative Treatment” of the Caltrans Standard specifications and these special provisions.

Fittings, latches, rollers and other gate hardware shall be galvanized in conformance with the provisions on Section 75-1.05, “Galvanizing” of the Caltrans Standard Specifications.

The gates shall be hung by at least 3 steel hinges not less than 3 inches in width, securely clamped to the gate post and permit the gate to be swung back against the fence. The bottom hinge shall have a socket to take the ball end of the gate frame.
Gates shall be provided with a combination steel or malleable iron catch and locking attachment of approved design which will not rotate around the latch post.

The contract price paid per contract unit price for wood gate shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in installing wood gate, including digging holes and placing concrete, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.
SECTION 82       MARKERS AND DELINEATORS

82-1.01       Markers and Delineators

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

Markers and delineators on flexible posts shall be as specified in "Prequalified and Tested Signing and Delineation Materials," elsewhere in 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.

Object Markers (Type K) shall be Lake Traffic Solutions 16" "K" Marker Type 271-16-F or 271-16-D or approved equal by the City.

Quantities of markers and delineators to be paid for will be determined as units from actual count in place.

The contract unit price paid for "Object Marker (Type K)" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in installing markers, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.
SECTION 84 TRAFFIC STRIPES AND PAVEMENT MARKINGS

84-1.01 Thermoplastic Traffic Stripe (Sprayable)

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

Sprayable thermoplastic material shall be free of lead and chromium, and shall conform to the requirements in State Specification No. PTH-02SPRAY.

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

At the option of the Contractor, permanent traffic striping and pavement marking tape conforming to the provisions in "Prequalified and Tested Signing and Delineation Materials" of these special provisions may be placed instead of the sprayable thermoplastic traffic stripes. Permanent tape, if used, shall be installed in conformance with the manufacturer's specifications.

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.

Sprayable thermoplastic material shall be applied to the pavement at a minimum thickness of 0.060-inch for lines and 0.125-inch for crosswalk lines and a minimum rate of 0.13-lb/ft. The minimum application rate is based on a solid stripe of 4 inches in width.

Sprayable thermoplastic material shall be applied to the pavement at a temperature between 351°F and 401°F, unless a different temperature is recommended by the manufacturer.

Sprayable thermoplastic traffic stripes shall be free of runs, bubbles, craters, drag marks, stretch marks, and debris.

If permanent tape is placed instead of sprayable thermoplastic traffic stripes, the tape will be measured and paid for by the linear foot as thermoplastic traffic stripe (sprayable).

Sprayable thermoplastic traffic stripes will be measured by the linear foot along the line of the traffic stripes, without deductions for gaps in broken traffic stripes. A double
traffic stripe, consisting of two 4-inch wide yellow stripes, will be measured as one traffic stripe.

The contract price paid per linear foot for thermoplastic traffic stripe (sprayable) shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in applying sprayable thermoplastic traffic stripes (regardless of the number, widths, and patterns of individual stripes involved in each traffic stripe) including establishing alignment for stripes and layout work, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

84-1.02 Thermoplastic Traffic Stripe and Pavement Marking

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 Caltrans Standard Specifications and these special provisions. All pavement legends, arrows and crosswalks shall be installed with hot applied thermoplastic pavement markings.

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.

Thermoplastic materials shall be made by Flint Trading Company (Premark) or Stimsonite/Pave-Mark (Hot Tape), or approved equal by the City. All material shall be 125 mil thick and applied using propane torch. Use appropriate installation procedures according to the manufacturer.

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

If pavement markings are applied to existing surface over existing painted legends (arrows and crosswalks), existing pavement legends (arrows and crosswalks) shall be removed before thermoplastic material is applied. For either material, pavement shall be preheated to remove all residual moisture prior to installation.
All pavement arrows are to be thermoplastic with the dimensions shown on the Caltrans Standard Plans A24A and A24B. Straight arrows shall be Type I (10) and Turn Arrow shall be Type IV (R) and (L).

The contract price paid per lineal foot for Thermoplastic Traffic Stripe and square foot for Thermoplastic Pavement Marking shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in applying Thermoplastic Traffic Stripes (regardless of the number, widths, and patterns of individual stripes involved in each traffic stripe) and pavement markings including establishing alignment for stripes and layout work, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

84-1.03 Pavement Markers

Pavement markers shall conform to the requirements of Section 85, “Pavement Markers,” of the Caltrans Standard Specifications and these Special Provisions.

Retroreflective pavement markers shall comply with the specific intensity requirements for reflectance after abrading the lens surface in accordance with the “Steel Wool Abrasion Procedure” specified for pavement markers placed in pavement recesses in Section 85-1.02C, “Retroreflective Pavement Markers,” of the Caltrans Standard Specifications. Certificates of compliance shall be furnished for all pavement markers.

Where existing blue markers are removed or damaged by work performed under this Contract, Contractor shall install blue raised reflective pavement markers to mark fire hydrant locations. The blue reflective pavement markers should be placed 6 inches from the centerline stripe, or approximately center of the pavement where there is no centerline stripe, on the side nearest the fire hydrant. Full compensation for furnishing and placing of the blue raised reflective pavement markers shall be considered as included in the contract prices paid for the various striping items of work and no separate payment will be made therefor.

Adhesive shall be State approved, Rapid Set Type, hot melt flexible bituminous type. Pavement markers shall not be placed on new asphalt concrete surfacing or seal coat until the surfacing or seal coat has been opened to public traffic for a period of not less than 7 days when hot melt flexible bituminous adhesive is used.

Existing pavement markers, when no longer required for traffic lane delineation, shall be removed and disposed of as directed by the Engineer.

The quantity of retroreflective pavement markers will be measured as units determined from actual count in place.

The contract unit price paid for pavement marker (retroreflective) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and placing pavement markers, complete
in place, including adhesives, and establishing alignment for pavement markers, as shown in the plans, as specified in the standard specifications and these special provisions, and as directed by the Engineer.

84-1.04 General

Where traffic stripes and markings that are to remain in use are removed or damaged by construction activities, the Contractor shall replace them in kind when all conflicting work is complete. The Contractor shall place and maintain temporary traffic stripes and markings where existing stripes and markings have been removed until permanent replacement can be performed.

All existing pavement striping and markings which are in conflict with the work shown on the plans are to be removed by the Contractor. Contractor shall mark the location of existing traffic stripe and stencils and install new traffic stripe and stencils according to the plans. Numbers designating traffic details on the plans shall be interpreted as installing both details as shown.

Full compensation for removing and disposing of pavement markers shall be considered as included in the contract prices paid for in the various striping items of work, and no additional compensation will be made therefor.

Materials

The State Specification Number for glass beads in Section 84-1.02, “Materials,” of the Caltrans Standard Specifications is amended to read “8010-21C-22 (Type II).”

Coordination

The Contractor shall place control points for the Engineer to review and approve. No additional "cat tracks" shall be placed until control points are approved by the Engineer. The Contractor shall obtain approval from the Engineer on all striping cat tracks prior to final application and paint striping and markers.

The Contractor shall place and remove any temporary striping required for routing traffic through the project area.
SECTION 86 – SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS

Section 86-1 – General

86-1.01 Scope

a. Work covered under this division shall include furnishing all labor, material, tools, equipment, and incidentals and doing all work involved which is required for the complete installation of the electrical work.

b. Work or equipment not specified or shown on the Plans which is necessary for the proper operation of the work in this area shall be provided and installed at no additional cost to the City.

86-1.02 Regulations and Code

Regulations and Code shall conform to Section 86-1.02 of the Caltrans Specifications. Nothing in these plans or specifications shall be construed to permit work not conforming to the most stringent of applicable codes.

All individuals who perform work as electricians (kind of work apply to electrical connections 100 volt-amperes or more; Commercial and Industrial wiring, underground conduit installation, finish work and fixtures, and fire life safety), for contractors licensed as class A and C-10 electrical contractors, shall be certified according to Assembly Bill AB 931, and Labor Code Sections 3099 and 3099.2.

86-1.03 Certificate of Compliance, Warranties, Guarantees and Instruction Sheets

Certificate of Compliance, Warranties, guarantees and instruction sheets shall conform to Section 86-1.05 of the Caltrans Specifications and these Special Provisions.

All equipment furnished shall be guaranteed to the City by the manufacturers for a period of not less than one- (1) year following the date of acceptance of the project. If any part (or parts) is found to be defective in materials or workmanship within the one year period and it is determined by the Engineer or by an authorized manufacturer's representative that said part (or parts) cannot be repaired on the site, the manufacturer shall provide a replacement part (or parts) of equal kind and/or type during the repair period and shall be responsible for the removal, handling, repair or replacement, and reinstallation of the part (or parts) until such time as the traffic signal equipment is functioning as specified and as intended herein; the repair period shall in no event exceed seventy-two (72) hours, including acquisition of parts.

The one- (1) year guarantee on the repaired or replaced parts shall again commence with the date of reassemble of the system.
86-1.04 Description

Furnishing and installing traffic signals shall conform to the 2010 edition of the CALTRANS Standard Plans and Standard Specifications, the latest applicable provisions of the California MUTCD, City of Stockton Standard Specifications and Plans and these Special Provisions.

Traffic signal work is to be performed at the locations shown on the plans. Work or equipment not specified or shown on the Plans which is necessary for the proper operation of the work in this section shall be provided and installed at no additional cost to the City.

Any Contractor-requested change from approved plans and all specifications shall be made in writing to the City. No changes shall be made in the field without written approval of requested changes by the City.

The contractor is responsible to take all necessary precautions and use best practices in the industry to perform all work required in completing the project.

86-1.05 Traffic Signal Turn On and Change Over

The Contractor shall be responsible to coordinate the turn on or changeover of any traffic signal operation. He shall notify the Resident Engineer and the City Traffic Engineer of the impending turn on or activation of any traffic signal included in this contract 72 hours in advance of the turn on or changeover. No traffic signal turn on or changeover shall occur on Monday, Friday, Saturday or Sunday. Upon turn on or changeover of any traffic signal, the Contractor shall demonstrate satisfactory compliance with all requirements necessary for the operation of the traffic signal, including, but not limited to, appropriate detection, controller response, pedestrian countdown and pedestrian push button system features operating, and the traffic signal response to the various calls. In no case shall the traffic signal be left in operation if any of the design features of the operation are found to be inoperable. The contractor shall detect any inoperable equipment prior to the switch over or turn on.

The intersection shall be protected with portable “Stop” signs and certified Flaggers during any traffic signal turn on or changeover. Flaggers and stop signs shall remain on site until all attendees to the turn on or changeover are satisfied that the traffic signal is functioning appropriately.

Mounted “Stop” signs on barricades shall be maintained on site for immediate application to any intersection with traffic signal under construction. The Traffic Signal Sub Contractor shall respond to any interruption of normal functioning of a traffic signal within two (2) hours.
The Prime Contractor shall be responsible for the coordination of all of the necessary sub-contractors for a successful turn on or changeover of a traffic signal, and to determine that all of the appropriate remedies are in place to return a traffic signal to its prior operation mode should a failure of any of the components necessary for successful operation occur.

Section 86-2 – Materials

86-2.01 Materials General

Attention is directed to Section 6, except as provided under "City-furnished Materials" of these Special Provisions, the Contractor shall furnish all other materials required to complete the work under this contract.

86-2.02 Equipment List and Drawings

Equipment list and drawings shall conform to the provisions in Section 86-1.04 of the Caltrans Specifications, and these Special Provisions.

All equipment and materials that the Contractor proposes to install shall conform to these specifications and contract plans. A list of substitute equipment and/or materials along with a written descriptive summary, describing the functions of the components, which the Contractor proposes to install, shall be submitted along with his bid proposal. The list shall be complete as to the name of manufacturer, size and identifying number of each item. The list shall be supplemented by such other data as may be required. In all cases, the judgment of the Engineer shall be final as to whether substitute equipment and/or material recommended by the Contractor conform to the intent of these specifications.

THE CONTRACTOR SHALL FURNISH FINAL AS-BUILT DRAWINGS AS PART OF THIS PROJECT AT NO ADDITIONAL COST TO THE CITY.

86-2.03 Foundations

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

Concrete must contain not less than 590 pounds of cementitious material per cubic yard for CIDH concrete pile. Certification of the concrete shall be received from the vendor and delivered to the City Inspector at the time the concrete is poured. Concrete foundations shall be constructed on undisturbed ground, or in material that has been compacted to 95% relative density before excavating for foundation. The foundation shall be cast monolithically up to the top 2 inches which shall be placed after the standards have been plumbed. Construction of Concrete foundations includes placement of reinforcement required per City standards. Poles shall not be set on foundations till a 7 day concrete curing period has passed.
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Attention is directed to Section 51-1, “General” of the Caltrans Specifications regarding bonding, cold joints and construction preparations for same.

Dimensions of concrete footings for City of Stockton signal standards are shown on City of Stockton Standard Plans, Drawings 113 and 116. The 1-B pole foundation shall be installed in conformance with the City of Stockton Standard Drawings number 113.

86-2.04 Standards, Steel Pedestals and Posts


Type 1-B shall have four (4) bolt foundation, utilizing a cast iron pipe flange with eight (8) holes, with ornamental bolt cover. On Type 1-B poles, the ornamental cover shall rest on grouted surface. The 1-B pole shall be installed in conformance with the City of Stockton Standard Drawings number 113. The contractor shall furnish and install the ornamental cover.

The Contractor shall have the Engineer locate the position of mast arm poles to determine if mast arms will be in conflict with existing overhead utilities. If relocation of utilities is required, immediate notification shall be given to the appropriate utility company.

All Type 24, 26 and 29 traffic signal mast arms shall be one piece, unsleeved, and shall conform to the 2010 edition of the State Standard Plans and Specifications.

All unused signal head tenons shall be capped.

Grout height under poles shall be the height of the leveling nut plus a washer as a minimum and the height of the leveling nut, washer and one half inch as a maximum. This height will be measured from the highest point of grade under the pole.

All nuts used to attach standards to foundations and all bolts and nuts used to attach mast arms to standards shall be tightened with the correct size socket or box wrenches.

86-2.05 Conduit/Interconnect

Conduit shall conform to the provisions in Section 86-2.05, "Conduit," of the Caltrans Specifications and these Special Provisions.

All Conduits shall be Poly Vinyl Chloride (PVC), Schedule 80 with rigid steel sweeps. IMC conduit shall not be accepted. With the exception for bends to and from pull boxes and foundations the conduit shall run straight and true so that cable pulling forces are minimized. There shall be no more than 180 degree in bends. An
intermediate pull box can be installed to relieve the need for additional bends at the Contractor's cost.

Insulated bonding bushings will be required on metal conduit. All nonmetallic conduits shall have a No. 8 stranded (with green insulation) copper bonded/grounding wire. These bonding/grounding wires shall be connected in the pull box with cable connectors - Burndy-Servit No. KS-15 or an approved equal meeting Caltrans specifications.

Conduits into pull boxes and pole foundations shall be rigid metal and have 90-degree sweeps. Plastic pulling bells shall be installed on all conduit ends before conductors are pulled through the conduits.

After conductors have been installed, the ends of conduits terminating in pull boxes and/or controller cabinets will be sealed with an approved type of sealing compound. Refer to the City of Stockton Standard Drawing 111 and 111A for conduit/pull box details.

Refer to City of Stockton Standard Plan Number 50A for trench width and depth. All conduits shall be installed below the existing AC pavement regardless of the depth of the existing AC pavement. All conduits shall be installed at a minimum depth of twenty-four (24) inches (top of conduit to the finish grade).

All excavated areas in the street or sidewalk shall be completely backfilled or covered at the end of each working day and approved by the Engineer.

Where existing conduits are to be used, as directed by the Engineer, the existing conduit shall be cleaned and both old and new cables shall be pulled into the existing conduit as a unit per Caltrans Specifications in Section 86-2.09B, "Installation."

86-2.06 Fiber Optic Conduits

Conduit shall conform to the provisions in Section 86-2.05, “Conduit”, of the Caltrans Specifications and these special provisions.

All Fiber Optic Conduits shall be 2 ½” Poly Vinyl Chloride (PVC), Schedule 80 with rigid steel sweeps. With the exception for bends to and from pull boxes and foundations, the conduit shall run straight and true so that cable pulling forces are minimized. Intermediate pull boxes shall be installed every 500 feet. Conduit sweeps into No. 6 pull boxes on fiber optic interconnect runs shall enter, with rigid sweeps, at 45 degrees (in vertical plane). Plastic pulling bells shall be installed on all conduit ends before conductors are pulled through the conduits.

After fiber has been installed, the ends of conduits terminating in pull boxes and/or controller cabinets will be sealed with an approved type of sealing compound. Refer to the City of Stockton Standard Drawing 111 and 111A for conduit/pull box details.
Refer to City of Stockton Standard Plan Drawing 50A for trench width and depth. All conduits shall be installed below the existing AC pavement regardless of the depth of the existing AC pavement. All conduits shall be installed at a minimum depth of thirty (30) inches (top of conduit to the finish grade).

All excavated areas in the street or sidewalk shall be completely backfilled or covered at the end of each working day and approved by the Engineer.

Where existing conduits to be used, as directed by the Engineer, the existing conduit shall be cleaned and both old and new cables shall be pulled into the existing conduit as a unit per Caltrans Specifications in Section 86-2.09B, “Installation”.

The 2.0” rigid metal conduit between No. 6E pull box and the controller cabinet shall have 90-degree sweep and large radius bend. Sweeps shall be at least 24 inches below finished grade, unless approved by engineer. A pulling bell shall be installed at the end of each conduit.

All fiber optic interconnect conduits with fiber cable shall include one 1250lbf detectable pull tape with 22 AWG wire. A detectable pull tape shall be installed after Fiber Optic cable installation for future detection.

**86-2.07 Colored Controlled Density Fill (CDF)**

The controlled density fill for the installations of all conduits shall be a red color to distinguish the concrete backfill from other concrete and soil. The concrete shall be pigmented by the addition of commercial quality cement pigment to the concrete mix.

The red concrete pigment shall be LM Scofield Company; Orange Chromix Colorant; or Davis Colors; or accepted equivalent. A minimum of 5 lbs. of red tint pigment shall be used per yard of the CDF mix.

**86-2.08 Fiber Optic Pull boxes**

Pull boxes shall conform to the provisions in Section 86-2.06, “Pull Boxes”, of the Caltrans Specifications and these Special Provisions.

When a pull box is subjected to vehicular traffic load, the cover shall be steel embossed with a non-skid pattern.

Pull boxes shall be placed at same elevation as adjacent standard base, service cabinet base or signal controller cabinet base if not an existing or future sidewalk area and elevation is not shown plans. Pull boxes shall be five feet (5’) from base or as shown on the plans. Pull boxes in existing or future sidewalk areas shall be placed at sidewalk elevation. The pull box elevation for pull boxes installed in the median areas shall match the slope of the two adjacent curbs. The pull box elevation for pull boxes installed in planting areas adjacent to sidewalk or sidewalk area shall be at sidewalk grade. Pull boxes shall not be located within the limits of wheelchair ramps.
When pull boxes are placed in dirt and planting areas, a concrete collar shall be constructed around the pull box. The concrete collar shall be a minimum 12 inch concrete collar by 4 inch thick and at least 4 inches along the sides of the pull box to the bottom edge. The top of the pull box shall match slope of the adjacent top of curb. The surface elevation of the collar shall match the surface elevation of the pull box and slope away from the pull box at a rate of 1:50 (2%) slope.

The contractor shall clean all existing pull boxes entered for installation of conduit of all dirt and debris. All pull box lids damaged by Contractor operations shall be replaced at his/her expense. The wiring in these pull boxes shall be neatly bundled, recoiled and reinstalled in the box. Where existing pull boxes are removed and replaced with new larger boxes the existing conduits shall be cut back. When the conduits are cut, the existing conductors must either be removed or well protected. The ends of the cut conduits must have bushings placed on them.

Grout in bottom of pull boxes will not be required. Pull boxes shall be set on 6 inches of crushed rock for drainage. The conduits in the pull boxes shall be placed 2" above the crushed rock.

All pull boxes on fiber optic interconnect runs shall be No. 6 unless otherwise noted on the plans. All conduit sweeps into No. 6 pull boxes on fiber optic interconnect runs shall be 45 degrees. Contractor shall leave at least 20-foot fiber cable slack in each pull box run, between exiting conduit and entering conduit.

A State Standard No. 6E pull box with extension (17" x 30" x variable depth (inside dimensions)) shall be installed adjacent to the traffic controller cabinet for fiber optic interconnect cable. The seam between pull box and extension shall be grouted. Contractor shall leave at least 50-foot fiber cable slack in pull box, between exiting conduit and entering conduit.

### 86-2.09 Pull Boxes

Pull boxes shall conform to the provisions in Section 86-2.06, "Pull Boxes," of the Caltrans Specifications and these Special Provisions.

When a pull box is subjected to vehicular traffic load, the entire pull box shall be H20 rated. The cover shall be steel embossed with a non-skid pattern.

Pull boxes shall be placed at same elevation as adjacent standard base, service cabinet base or signal controller cabinet base if not an existing or future sidewalk area and elevation is not shown on plans. Pull boxes shall be five feet (5’) from base or as shown on the plans. Pull boxes in existing or future sidewalk areas shall be placed at sidewalk elevation. The pull box elevation for pull boxes installed in median areas shall match the slope of the two adjacent curbs. The pull box elevation for pull boxes installed in planting areas adjacent to sidewalk or sidewalk area shall be at sidewalk grade. Pull boxes shall not be located within the limits of wheelchair ramps.
When pull boxes are placed in dirt and planting areas, a concrete collar shall be constructed around the pull box. The concrete collar shall be a minimum 12 inch concrete collar by 4 inch thick and at least 4 inches along the sides of the pull box to the bottom edge. The top of the pull box shall match slope of the adjacent top of curb. The surface elevation of the collar shall match the surface elevation of the pull box and slope away from the pull box at a rate of 1:50 (2%) slope.

The contractor shall clean all pull boxes entered for installation of conduit or wire of all dirt and debris. All pull box lids damaged by Contractor operations shall be replaced at his/her expense. The wiring in these pull boxes shall be neatly bundled, recoiled and reinstalled in the box. Where existing pull boxes are removed and replaced with new larger boxes the existing conduits shall be cut back. When the conduits are cut, the existing conductors must either be removed or well protected. The ends of the cut conduits must have bushings placed on them.

Grout in bottom of pull boxes will not be required. Pull boxes shall be set on 6 inches of crushed rock for drainage. The conduits in the pull boxes shall be placed 2” above the crushed rock.

Recesses for suspension of ballasts will not be required.

All pull boxes shall be No. 5 unless otherwise noted on the plans.

All pull boxes shall include copper grounding rods per City Standard 111A.

All pull boxes on fiber optic interconnect runs shall be # 6 unless otherwise noted on the plans. All conduit sweeps into No. 6 pull boxes on fiber optic interconnect runs shall be 45 degrees. Contractor shall leave at least 20-foot fiber cable slack in each pull box run, between exiting conduit and entering conduit.

A State Standard Number 6E pull box with extension (17" x 30" x variable depth (inside dimensions)) shall be installed adjacent to the traffic controller cabinet for fiber optic inter-connect cable. The seam between pull box and extension shall be grouted. The optional base slab of the 6 (T) PB shall not be used. Contractor shall leave at least 50-foot fiber cable slack in pull box, between exiting conduit and entering conduit.

86-2.10 Street Lighting Pull Boxes

All street lighting pull boxes shall have security lids and shall conform to the provisions on Caltrans Standard Plan Drawing ES-8 and these Special Provisions.

GENERAL

- Must fit flush with pull box edge to avoid creating a trip hazard.
- The security lid shall not be labeled.
• Cover shall fasten/secure using a minimum of 2 - ½-13 thread by 1-1/2" long security bolts made by Bryce Fasteners or equal. The bolt head must be reverse thread made for City of Stockton Security Key.
• Must have embossed non-skid pattern on the surface and ADA compliant.
• Must have grounding bolt(s), washer(s), and nut(s) on bottom of cover, for bonding purposes.
• Must have “smooth” solid sides and edges to avoid the ability of prying the cover up from the side.
• All hardware shall be brass, stainless steel or other non-corroding metal material.

DIMENSIONS
• Primarily cover size to fit standard Caltrans standard pull boxes Caltrans Standard Plan Drawing ES-8.
• Material: Steel.
• Thickness – Minimum ¼ plate steel.
• Finish: Hot-dipped, Galvanized.
• Security bolts: ½-13 thread by 1-1/2" long made by Bryce Fasteners or equal.

86-2.11 Conductors and Wiring

Conductors and wiring shall conform to the provisions in Section 86-2.08, "Conductors and Cables," and Section 86-2.09, "Wiring," of the Caltrans Specifications and these Special Provisions.

The Contractor shall install individual conductors type THW Polyvinyl Chloride (600 volt). Signal wires, street light wires, and White Neutral wires shall be 14 AWG, 10AWG, 12AWG, respectively. Signal cable shall not be used. Inert lubricant shall be used in placing conductors in the conduit.

All conductors that are to be spliced together shall be twisted a minimum of 5-turns and soldered. Then, the joint shall be held by mechanical means before insulating in accordance with Method "B."

When new conductors are to be added or existing conductors are to be removed from existing conduit, all conductors shall be removed; the conduit shall be cleaned as provided in Section 86-2.05C, “installation” of the Caltrans Specifications; and both old and new conductors as shown on the plans, shall be pulled into the conduit as a unit.

All field wiring terminating in the traffic signal controller cabinet or service cabinet shall be fastened to the termination panels with copper/solderless wire lugs. Solderless/crimpless lug shall have offset shank and have a maximum wire size capacity of 6.
86-2.12 **Fused Splice Connectors**

Fused splice connectors as specified in Section 86-2.09F, "Fused Splice Connectors," of the Caltrans Specifications shall be required. Fused splice connectors shall be installed in the base of the poles, next to the inspection plate. No pigtail is allowed on the fuse holders.

86-2.13 **Bonding and Grounding**

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

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

In addition, because of past conflict monitor electronic problems associated with grounding, the Contractor shall be required to install a total of four (4) conductors between the service pedestal and the controller cabinet. These conductors shall be installed as followed;

- **Green Conductor** - No. 8 stranded conductor from Ground Bus #2 in controller cabinet to ground bus in service pedestal.
- **White Conductor** - No. 8 stranded conductor from Ground Bus #1 terminal in the controller cabinet to the neutral bus in the service pedestal.
- **Black Conductor** - No. 8 stranded conductor from the power terminal in the controller cabinet (312B) to service breaker.
- **Bare Copper Conductor** - No. 10 solid conductor from Ground Bus #2 in controller cabinet to conduit grounding bushing in pull box.

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

86-2.14 **Service**

Service shall conform to the provisions in Section 86-2.11, "Service," of the Caltrans Specification and these Special Provisions. Each service shall be suitable for the short circuit current available at its supply terminal.

Refer to Type III-AF wiring diagrams on improvements plans.

If service equipment cabinet design deviates in any way from the details shown on the plans, details of such deviation shall be submitted to the Engineer for review before fabrication of the contract cabinets. If deemed necessary by the Engineer, one complete prototype cabinet shall be delivered to the Engineer for review at least 30 days before fabrication of the contract fixtures. The prototype cabinet will be returned
to the Contractor and if permitted by the Engineer, the cabinet may be installed in the work.


Service Cabinet Fabrication:

- Maximum width 12", Maximum height 63" with a minimum of 60", maximum depth 9" Minimum opening to control section 8.25" x 39.25".
- **Cabinet shall be fabricated with anodized aluminum.**
- Internal part shall be fabricated for 14-gauge cold steel.
- Cabinet shall be welded construction with welding materials specifically designed for material used.
- All fasteners, hinges, latches, and hardware shall be of stainless steel and hinges shall be continuous piano style.
- There shall be no exposed nuts, bolts, screws, rivets, or other fasteners on the exterior.
- Cabinet shall have enclosed swept pull section with removable step.
- Cabinet shall have fully framed ride hinged outer door with swaged close tolerance sides for flush fit with top drip lip and closed cell neoprene flange compressed gaskets.
- Cabinet door shall have 2,000 LB stress rated stainless hasp, welded to cabinet door.
- Base mounting detail shall be identical to existing cabinets for emergency Dead-front Safety Door.
- Distribution and control panel shall have separate hinged dead-front panels with 1/4 turn latch and knotted knobs.
- Breaker compartment shall be safety barriered from the control compartment.
- Dead front shall be hinged on the same side as the front door and shall open a minimum of 120 degrees.
- Removable back-pan shall be mounted on 4 welded 1/4" studs.

Power Distribution Panel:

- Main breakers shall be available as 1 pole, 2 pole, 3 pole, or 4 pole.
- Provide separate metered main, lighting main and disconnects as required.
- All circuit breakers shall be installed in a vertical position, handle up for "On," handle down for "Off".
- Circuit breaker shall be industrial grade, Westinghouse Quicklag C or equal to match existing.
- There shall be no plug-in circuit breakers.
- All bushing shall be UL approved copper THHN cable bussing, fully rated 125 Amps.

Control Compartment:

- There shall be a minimum 25" from base to circuit breakers.
- All components shall match existing components in use for maintenance of spare parts and known reliability.
- Contactors shall be Westinghouse Class A202 or other to match existing.
- The cabinet shall be wired to include a spare contactor for street lighting (See the wiring diagram detail).
- The cabinet shall be completely pre-wired in the factory.
- Wiring will be to NEMA IIB standards showing external connections and external equipment.
- All control wiring shall be 19 strand #14 AWG THHN.
- All control wires shall be permanently labeled with matching engraved clip-sleeve nylon markers.
- All terminals shall be permanently labeled.

Nameplates and Drawings:

- The function of all circuit breakers, switches and other components as required shall be identified by laminated engraved plastic nameplates with minimum 1/4 " letters fastened with minimum of two 1/4", #4-40 machine screws.
- Wiring schematics shall be Computer Aided Drafted and include all external equipment and connections per NEMA IIB.
- As built factory drawings shall be enclosed in clear plastic and held inside the outer door by weld hooks.

Certification:

- Manufacturers will be required to furnish independent laboratory certification of material preparation and finish and to confirm that the overall product meets these specifications. If this agency wishes to witness this testing, all costs to be paid by the Contractor.

Photoelectric Control:

- Photoelectric control shall be Type V, three-prong, twist-lock, and housed inside the service cabinet. Photoelectric control shall have an instant on/delay (5 second) off incorporated as per State Standards, to prevent cycling if struck by vehicle headlights. The photoelectric cell shall be solid-state unit and the photocell sensitivity shall be in compliance with PG&E LS rate requirements. Photocell socket must be made of metal and not plastic.
- A secondary photoelectric control system shall be wired from the mast arm street light to the service cabinet. After testing the secondary, the wire will be disconnected, coiled, and secured in the service cabinet until needed at a future date. The mast arm PEU shall have a north orientation. The photoelectric unit shall be a multi-voltage, instant on/ delay (5 sec) off, and three-prong twist-locking type unit. The photocells sensitivity shall be in compliance with PG&E LS rate requirements.
86-2.15 Signal Faces and Signal Heads

Signal faces, signal heads and auxiliary equipment as shown on the plans, and the installation thereof, shall conform to the provisions in Section 86-4.01, "Vehicle Signal Faces"; 86-4.01A “Signal Sections”, 86-4.01A(1) “Metal Signal Sections”, 86-4.01B “Electrical Components”, 86-4.01C “Visors” 86-4.01E, "Backplates"; and 86-4.04, "Signal Mounting Assemblies," of the Caltrans Specifications and these Special Provisions.

In addition to Section 86-4.04, "Signal Mounting Assemblies," of the Caltrans Specifications, the mounting bolt spacing, cable guide location and dimensions and terminal compartment shall conform to Drawing ES-4D. Terminal compartments with hinged doors will not be accepted.

Backplate shall be fastened with stainless steel self-tapping screws.

All backplates shall be vented, colored satin black, and one piece.

Visors on mast arm hung signals shall be "tunnel" type and colored satin black with open slot at bottom.

All signal face indications shall have 12-inch sections (unless specifically noted on plans).

Polycarbonate traffic signal heads will not be accepted.

Lens doors shall be a type with a single wing nut/fastening bolt assembly, colored satin black, and made of stainless steel.

The framework for vehicle heads shall be colored traffic signal green.

TV-1 mountings on Type 1-B standards shall not be accepted.

86-2.16 Light Emitting Diode (LED) Signal Lenses Modules

All traffic signal heads and pedestrian heads shall be State approved LED modules. All the LED sections shall have internal fuses (Fusistors are not allowed). The external lens shall be smooth on the outside to prevent excessive dirt/dust buildup. The LED signal module lens shall be UV stabilized. The external lens shall be specifically designed with a sloped front face to reduce sun reflections (Sun Phantom). The LED module shall be supplied with an installed gasket. The red, yellow, and green ball modules shall have a visual appearance similar to that of an incandescent lamp (i.e. Smooth and non-pixelated). The optical assembly shall diffuse the light output and provide uniform illumination across the entire surface of circular lenses. Individual LED’s shall not be visible to the observer of indications displayed by traffic signal modules, providing an incandescent type appearance. The LED arrow modules shall have a full, filled profile, reflecting a light distribution look and appearance similar to
that of an incandescent lamp, without the individual LED’s being visible. The arrows shall meet all applicable Caltrans specifications on light intensity. The unit shall be repaired or replaced by the contractor if it exhibits a failure due to workmanship or material defect within the first 60 months of delivery. The unit shall be repaired or replaced if the intensity level falls below 50% of the original values within 60 months of delivery.

86-2.17 Pedestrian Signals--Light Emitting Diode (LED) Pedestrian and Countdown Signal Module

Pedestrian signals shall conform to the following provisions:

GENERAL

Pedestrian and countdown LED traffic signals shall be 16” X 18” Type – Full Hand/Full Man Overlay + countdown.

The framework for pedestrian signal indications shall be colored traffic signal green.

Pedestrian and countdown LED traffic signal modules shall be designed as a retrofit replacement for the message bearing surface of a nominal 16” × 18” pedestrian and countdown traffic signal housing built to the PTCSI Standard. The message-bearing surface of the module shall be supplied with an overlapping, full “HAND” and “MAN” symbol, that comply with PTCSI standard for these symbols for a message-bearing surface of the size specified. The numbers 00 to 99 on the numerical display shall have 2 rows of LEDs and a minimum height of 9 inches.

86-2.17A Installation

a. LED pedestrian and countdown signal modules shall not require special tools for installation.

b. LED pedestrian and countdown signal modules shall fit into the existing traffic housings built to the VTCSH Standard without any modification to the housing.

c. LED pedestrian and countdown signal modules shall be weather tight, fit securely in the housing and shall connect directly to existing electrical wiring.

86-2.17B Signal Lens

The lens of the LED pedestrian and countdown signal modules shall be polycarbonate UV stabilized and a minimum of ¼” thick.
The exterior of the lens of the LED pedestrian and countdown signal module shall be smooth and frosted to prevent sun phantom effect.

86-2.17C LED Pedestrian and Countdown Signal Module Construction

a. The LED pedestrian and countdown signal module shall be a single, self-contained device, not requiring on-site assembly for installation into the existing traffic signal housing and include an installed gasket.

b. All Portland Orange LEDs shall be “AlInGaP” technology or equal, and rated for 100,000 hours or more at 25ºC and 20 mA. White LEDs must be InGaN technology.

c. All internal LED and electronic components shall be adequately supported to withstand mechanical shock and vibration from high winds and other sources.

d. The signal module shall be made of UL94VO flame-retardant materials. The lens is excluded from this requirement.

e. Each individual LED traffic module shall be identified for warranty purposes with the manufacturer's trade name, serial number and operating characteristics, i.e., rated voltage, power consumption, and volt-ampere.

86-2.17D Environmental Requirements

a. The LED pedestrian and countdown signal modules shall be rated for use in the ambient operating temperature range of -40ºC to +60ºC (-40ºF to +140ºF).

b. The LED pedestrian and countdown signal modules, when properly installed with gasket, shall be protected against dust and moisture intrusion per requirements of NEMA Standard 250-1991, sections 4.7.2.1 and 4.7.3.2, for type 4 enclosures to protect all internal LED, electronic, and electrical components.

86-2.17E Luminous Intensity

a. Pedestrian and countdown LED signal modules shall be designed to operate over the specified ambient temperature and voltage range, attract the attention of, and be readable by, a viewer (both day and night) at all distances from 3 m to the full width of the area to be crossed.
b. The luminous intensity of the LED pedestrian and countdown signal module shall not vary more than ± 10 % for voltage range of 80 VAC to 135 VAC.

86-2.17F  Chromaticity

The measured chromaticity coordinates of the LED signal modules shall conform to the chromaticity requirements as follows:

“Hand” shall be Portland orange.
not greater than 0.390, nor less than 0.331, nor less than 0.997 – x.

Walking person shall be lunar white.
x: not less than 0.290, nor greater than 0.330
y: not less than 1.5x – 0.175, nor greater than 1.5x – 0.130

86-2.17G  Electrical

a. The secured, color coded, 914 mm (36 in) long, 600V, 20 AWG minimum, jacketed wires, conforming to the National Electrical Code, rated for service at +105ºC, are to be provided for electrical connection.

b. The LED pedestrian and countdown signal module shall operate from a 60 ±3 Hz AC line over a voltage range of 80 VAC to 135 VAC. Rated voltage for all measurements shall be 120 ±3 volts rms.

c. The LED circuitry shall prevent perceptible flicker over the voltage range specified above.

d. The LED pedestrian and countdown signal module circuitry shall include voltage surge protection against high-repetition noise transients and low-repetition noise transients as stated in Section 2.1.6, NEMA Standard TS-2, 1992.

e. Catastrophic failure of one LED light source shall not result in the loss of more than the light from that one LED.

f. The LED pedestrian and countdown module shall be operationally compatible with the currently used controller assemblies. The LED pedestrian and countdown module shall be operationally compatible with conflict monitors.

g. The LED pedestrian and countdown module including its circuitry must meet Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of noise.
h. The LED pedestrian and countdown module shall provide a power factor of .90 or greater over the operating voltage range and temperature range specified above for modules with 6 watts or more.

i. Total harmonic distortion (current and voltage) induced into an AC power line by an LED pedestrian and countdown module shall not exceed 20% over the operating voltage range and temperature range specified above.

86-2.17H Functions

a. Basic Operation

The control and regulation module shall be of the “smart” type in order for the countdown displays to be automatically adjusted with the programmed intervals of the traffic controller.

b. Operating Modes

The module shall operate in two different modes:

i) Full Cycle Countdown Mode – The module will start counting when the walk signal is energized. It will countdown the full walk and flashing clearance signal to reach “0” and turn off when the steady “Don’t Walk” signal turns on.

ii) Clearance Cycle Countdown Mode – The module will start counting when the flashing clearance signal turns on and will countdown to “0” and turn off when the steady “Don’t Walk” signal turns on.

Note: The units shall be set on the Clearance Cycle Countdown Mode at the factory. The units shall be easily changed to either mode by a “jumper wire” on the back of the unit.

c. Power Failure

The equipment must maintain a consistent countdown during short power failures (<1 second). A longer failure or an absence of signal superior to one (1) second must turn off display and trigger a restart system remembering the last sequence, as it is done for the NEMA traffic controller.
QUALITY ASSURANCE

LED pedestrian and countdown modules shall be manufactured in accordance with a Vendor quality assurance (QA) program including both design and production quality assurance. All QA process and test result documentation shall be kept on file for a minimum of seven years.

WARRANTY

The unit shall be repaired or replaced by the contractor if it exhibits a failure due to workmanship or material defect within the first 60 months of delivery.

The unit shall be repaired or replaced if the intensity level falls below 50% of the original values within 60 months of delivery.

86-2.18 Pedestrian Pushbuttons

Pedestrian pushbuttons shall be a 4-Wire type system which shall be compatible with existing City’s system.

A. Construction. The housing for the unit shall be 9"X12" (green) and made of 356 Aluminum heat-treated to meet Spec. T-6. It shall be of a telescoping, vandal-proof design. The color shall be Olive Green. Adaptors may be required to install the Navigator pushbutton housing and the sign plate. Where pedestrian pushbutton posts (PPP) are required, the 9"X12" housing shall be installed on a 4” PPP with adaptors. The PPB shall be installed right side up.

B. The system includes a Control Unit (CU) inside each pedestrian signal indications housing powered by 120 VAC WALK/DON’T WALK pedestrian head lamp indications, an interface panel, and a Configurator to program all the functions up to 8 Push Button Stations (PBS). Each PPB shall connect to a control unit located inside its associated pedestrian signal housing. The PBS shall provide information and cues via both a vibrating arrow button and audible message indicating the “WALK SIGN IS ON”, during WALK interval. All sounds shall emanate from the back of the unit. The weather-proof speaker shall be protected by a vandal resistant screen. A sunlight visible red LED latches “ON” to confirm the button has been pushed. PBS shall include frame, sign, ADA compliant push button, and mounting hardware.

By interfacing with the Control Unit that is installed in the pedestrian signal indication housing, the PBS shall provide the following standard features:

- Confirmation of button push via latching LED, sound, and vibrotactile bounce.
- Direction of travel (with extended button push).
- Standard locating tone during Don’t Walk (and clearance if desired).
- Standard voice messaging during Walk.
- Vibrating button during Walk.
- Standard locating tone or verbal countdown during clearance.
- All sounds automatically adjust to ambient over 60dB range.
- All sounds shall be synchronized.
- Extended button push shall turn on, boost volumes, and/or mute all sounds except those on activated crosswalk.

C. Mounting Height and Location. PPB’s Controls shall be located no more than 5 feet offset from the extended crosswalk line, at a height of 42 inches above the finished surface, and at least 10 feet apart. The PPB’s shall also be located adjacent to a paved flat area and there shall be 10 to 24-inch sides reach from the flat area to the PPB.

D. Pedestrian Pushbutton front cover plates shall be international symbol (R10-3b MUTCD sign, dated March 2012) and installed with security screws. The security screws shall be stainless steel, button head socket cap screws #8 diameter, 3/8 inch in length and 32 threads per inch. The socket shall be 3/32 inch Allen.

E. The Contractor shall verify with the City Traffic Engineering the types of verbal message to be programmed in each pedestrian push button.

86-2.19 Detectors

Detectors shall conform to the provisions in Section 86-5, "Detectors" of the Caltrans Specifications and these Special Provisions.

Sensor units shall be rack mounted.

Loop detector lead-in cable, from the pull box for the detector handhole adjacent to the loop to the field terminals in the controller cabinet, shall conform to the following:

Lead-in cable shall be Canoga (3M) detector loop lead-in cable #30003 and consist of 4 number 18 stranded copper conductors with each conductor insulated with polyethylene. The conductors shall be twisted together with a minimum of 5 turns per foot and the twisted pair shall be protected with a shield of aluminum polyester jacket with a thickness of 27 mils, minimum, at any point, and shall be UL listed, Style 2106. The diameter of the cable shall be 0.25 inch maximum. The diagonal pairs shall conform to the following color-coding: White/Black and Red/Green.

Inductive Loop Detector Installation Details: Section 86-5.01A (4), "Installation Details," of the Caltrans Specifications, shall be deleted and the following shall be substituted:

Loop lead-ins shall be individually identified as shown on the plans. Identification shall be by means of bands placed on the lead-in near the first splice.
The loops shall be installed in Type A configuration. The front loops adjacent to the limit line shall be Type D per Caltrans Specification, Standard plan ES-5B. The spacing between all loops shall be 10 feet. All loops shall be wrapped in the slots in the same clockwise direction. The loop wire ends MUST be marked START and FINISH with loop lane/phase identification number. Splices between the loop conductors and the lead-in cable shall be made in the pull box adjacent to the loops. The loops shall be joined in the pull box in series but alternating the wire ends of adjacent loops to alternate polarity to achieve optimum sensitivity at the sensor unit. Series loops shall be marked and connected as follows. First loop - "start" end to lead-in cable. "Finish" end to "finish" wire of second loop. "Start" wire of second loop to "start" end of third loop. The alternating sequence will continue for any series of loops.

For dual left or where there are multiple lanes with presence loops adjacent to each other and are 11 feet wide and narrower, inductive loops shall be 5 feet square/diameter. For lanes wider than 11 feet, inductive loops shall be 6 feet square/diameter. All advance loops and sampler loops shall be 6 feet square/diameter, regardless of lane width.

Type A or B Traffic Rated Detector Handholes shall be Type 4-TT. Metal triangular lids with metal rings shall be used. The point of the triangle shall face the direction of travel. Conduit from detector handhole to nearest pull box shall be 2" diameter or as shown on plans. If the handhole is located at the lip of the gutter, four (4)" deep concrete is required around the handhole.

Slots cut in the pavement shall be immediately cleaned by washing with water to remove all sawing residue and blown out and dried before installation of conductors.

After conductors are installed in the slots, the slots shall be filled with sealant. The sealant shall be at least one inch thick above the top conductor in the saw cut. Each loop shall be checked and filled with sealant after a minimum elapsed time of one hour. This is due to trapped air pockets and/or settling of the sealant.

All inductive loops and lead-in shown in areas paved with "Open Graded Asphalt Concrete" shall be installed a minimum of 2 inch deeper, as measured from the pavement surface, than shown on the drawings.

Loop detector sealant will be furnished by the Contractor. Sealant shall be Asphaltic Emulsion Induction Loop Sealant, State Spec. No. 8040-41A-15.

Loop detector sealant must be used at air temperatures above 40 degrees Fahrenheit. Sealant shall be placed 1/8 inch below pavement surface. At no time shall the sealant be installed if the ground is wet.

One-inch (1") minimum diameter holes shall be core drilled at the loop corner before slots are saw cut. Diagonal corner cuts shall not be permitted. Homerun cut must be at a 45-degree angle from any corner of the loop. If round loops are used, homerun
shall be cut perpendicular to the loop slot. This prohibits the loop wire from being bent more than 90 degrees.

Conductors of all loops to be operated by each sensor unit shall be run continuous to the nearest detector handhole up to the nearest pull box. The loop wires between the loop and adjacent pull box shall be twisted per State specifications. All loop wires shall have three (3) feet of slack in the pull box.

Detector loop conductors shall be Type 2 loop conductors.

Splices between loops and lead-in cable shall not be made until the operation of the loops under actual traffic conditions is approved by the Engineer. If there is more than a 24 hour lag time between the time the loops are installed and connected to the lead-in cable, both the loop conductors and the lead-in cable ends shall be water proofed until the actual splice is made (to prevent capillary action of water into the conductor insulation). The conductors and lead-in cable ends shall be waterproofed as follows:

Completely cover the conductor and lead-in cable ends with an electrical insulating coating and allowed to dry. Apply one layer of high voltage tape half-lapped then apply one layer of PVC tape half-lapped. Apply electrical insulating coating over PVC tape and at least 4 inches of conductor insulation above the cut ends.

All loops shall be marked with phase tape in the pull box as well as in the controller cabinet.

Lead-in cable for traffic signal and traffic counting installations shall be identified and banded by lane in the detector handhole and near the termination of the conduit in the controller or traffic count station cabinet. Bands shall conform to the provisions in Section 86-2.09, "Wiring," of the Caltrans Specifications.

The Contractor shall test the detectors with a motor-driven cycle, as defined in the California Vehicle Code, which is licensed for street use by the Department of Motor Vehicles of the State of California. The anodyne weight of the vehicle shall not exceed 220 pounds and engine displacement shall not exceed 100 cubic centimeters. Special features, components or vehicles designed to activate the detector will not be permitted. The Contractor shall provide an operator who shall drive the motor-driven cycle through the response or detection area of the detector at not less than 3 miles per hour nor more than 7 miles per hour. The detector shall provide an indication in response to this test.

86-2.20 Solid-State Switching Devices

Signal light circuits shall be controlled externally to each controller unit by 3-circuit solid-states switching devices, which shall be plug-in mounted to a base. Each circuit shall have a minimum rating of 1,000 watts for tungsten lamp or gas tubing transformer load at 120 volts, AC. Solid-state switching devices shall be unaffected by transient voltages when tested in accordance with California Test 667. The
switching devices shall meet the requirements of Section 5, "Solid-State Load Switches" of NEMA Standards Publication No. TS1.

Solid-state switching devices shall be provided with an indicator light for each lamp circuit input. The light shall be visible when viewing the installed switching device. No other equipment within the controller cabinet shall use a socket, which will accept a switching device.

86-2.21 Eagle (Siemens) Type M60 Controller

Solid-state traffic actuated controller units, and auxiliary equipment shall conform to the provisions in Section 86-3, "Controller," of the Standard Specifications and these Special Provisions.

TS-2, Type 2 NEMA controller with auxiliary equipment and cabinet will be furnished and installed by the contractor. The controller shall be in a 16-phase frame assembly with auxiliary equipment housed in a cabinet. Solid-state switching devices shall conform to the provisions in Section 86-2.19, "Solid-State Switching Devices," of these Special Provisions, and the following:

The controller unit shall meet the most current Caltrans Transportation Electrical Equipment Specifications (TEES) (prior to the bid date of this special provision). Controller shall have NEMA parallel connections using “A”, “B”, “C” connectors, and a 37-pin D connector. The controller shall be supplied with a 2MB Data Key.

The controller unit shall exceed the requirements of NEMA TS-2 1998 Actuated Controller Unit Standards. It shall also meet TS2 Type 2 requirements. The controller shall be capable of running on both Linux and OS9 operating systems and shall be configurable as a local, master or local/master depending on the local intersection software in use. The controller shall have a removable hand-held front panel with a multi-line alphanumeric 16X40 LCD display. The following port configurations are required:

Central Processor Unit (CPU) • Open architecture platform with standard Linux operating system • MPC 8270 266MHz processor • 512MB FLASH, 64MB DRAM and 2MB SRAM • TOD Clock with automatic daylight savings time adjustment • Power supply will power the SRAM during power failures

Keyboard and Display • Siemens Multiview Display with dual view screens • Removable light-emitting diode backlit LCD Display with 16 lines of 40 characters with adjustable contrast setting • Emulation of terminal per Joint NEMA/AASHTO/ITE Standard • Key quantity and function per Joint NEMA/AASHTO/ITE Standard

Communications Module • 10 Base-T Ethernet with built-in switch and 5 front panel RJ-45 connectors • 4 USB 2.0 Ports and a Data key Port • Dedicated GPS Port • Unique MAC address assigned by the Institute of Electrical and Electronic Engineers (IEEE) • EIA-232 port for uploading/downloading applications software and OS
updating • Single and multi-mode fiber optic options • 1200 bps Frequency Shift Keying (FSK) modem (optional)

Controller Housing • 7 expansion slots with card guides for standard size Versa Modules and 2 slots with card guides for standard Joint NEMA/AASHTO.ITE ATC modems (optional) • Polycarbonate construction (excluding back panel), rear mounting tabs and aluminum power supply mounting plate for electrical grounding • Carrying handle

Controller shall be supplied with Siemens Sepac 3.55D firmware, and a 6-foot Cat5e (Yellow Color) cable to communicate with TACTICS central traffic control server. The controller shall be provided with the following items:

1) Quality Control (QC) test sheet
2) Vendor’s test report
3) One copy of the SEPAC 3.55D user manual

86-2.22 Traffic Signal Controller Cabinet Specifications

City of Stockton traffic signal cabinet specification shall supersede any applicable parts of the State of California, Department of Transportation Standard Specifications and Standard Plans. This specification shall apply to all controller cabinet types with noted exceptions.

All specifications not covered by these specifications shall conform to State of California, Department of Transportation Standard Specifications and Standard Plans. Traffic signal cabinets shall also comply with NEMA specifications where applicable.

The State Specifications referred to in these specifications shall mean the 2010 edition of the State of California, Department of Transportation, Standard Specifications, unless otherwise is indicated.

The controller cabinet shall be furnished and installed by the contractor. The controller cabinet shall be equipped with all auxiliary equipment and plug-ins which are capable of operating 8 vehicle phases and 4 pedestrian phases (NEMA TS-2, Type 2). Solid-state switching devices shall conform to the provisions in Section 86-2.19 “Solid-State Switching Devices,” of these Special Provisions and the following:

The cabinet manufacturer shall have pre-approval by the City of Stockton on any cabinet that they propose to provide to the City. Said pre-approval shall have been obtained no less than 30 days prior to the closing date of the bid. The cabinet shall be completely wired and tested to the 2003 NEMA Traffic Controller Assemblies specification with NTCIP Requirements Version 02.06 (as amended here in). In addition, and at a minimum, the following requirements shall be met:
City of Stockton traffic signal cabinet specification shall supersede any applicable parts of the State of California, Department of Transportation Standard Specifications and Standard plans.

The cabinet shall be wired for up to a minimum of (32) channels of detection and (4) channels of Opticom™ preemption.

The use of PC boards shall not be allowed except in detector racks & SDLC interface panels.

The use of plug and play modules shall not be allowed, with the exception of detector rack(s).

All cabinet 120VAC wires shall be 18AWG or greater, including controller “A” and MMU “A & B” cables.

The complete cabinet assembly with electronics shall undergo complete input/output function testing by the manufacturer before being released to the City of Stockton.

**Type P Cabinet Enclosure**

At a minimum the cabinets shall meet the following criteria:

1. It shall have nominal dimensions of 56” high x 44” width x 25.5” depth and meet the footprint dimensions as specified in Section 7.3, Table 7-1 of NEMA TS2 standards for a Type P cabinet. The cabinet base shall have continuously welded interior mounting reinforcement plates with the same anchor bolt hole pattern as the footprint dimensions.

2. Shall be fabricated from 5052-H32 0.125-inch thick aluminum.

3. The cabinet shall be double-flanged where it meets the cabinet door.

4. The top of the cabinet shall be sloped 1” towards the rear to facilitate water runoff. And shall bend at a 90° angle at the front of the cabinet. Lesser slope angles are not allowed.

5. The inside of the cabinet shall utilize C channel rails. (2) Welded on the back wall on 34” center and (4) welded on each side wall on 08” center with 04” between sets. The C channel rails on the back wall shall be 35” in length and start 5” from the bottom of the cabinet interior. The C channel rails on the side walls shall be 48” in length and start 5” from the bottom of the cabinet interior. Adjustable rails are not allowed.

6. The Cabinet shall be supplied with an anodized finish as per the most current California Standard Specification, Section 86-3.04A, “Cabinet Construction” (prior to the bid date of this special provision). Submit alternative design details for review and approval before manufacturing a cabinet.
7. All external fasteners shall be stainless steel. Pop rivets shall not be allowed on any external surface.

8. The door handle shall be ¾” round stock stainless steel bar.

9. The main door shall contain a police door with a conventional police lock. A key shall be provided for both the cabinet lock and the police door lock. The police door shall be recessed into the main door so that the police door is flush with the main door. A closed-cell, neoprene gasket seal shall be bonded to the enclosure doors. A stiffener plate shall be welded across the width of the inside of the main door to prevent flexing. A main door bar stop shall be a two-position, three-point stop that accommodates open-angles at 90, 125, and 150 degrees. A louvered air entrance located at the bottom of the main door shall satisfy NEMA rod entry test requirements for 3R ventilated enclosures. Bearing rollers shall be applied to ends of door latches to discourage metal-on-metal surfaces from rubbing. The lock assembly shall be positioned so handle does not cause interference with key when opening the door.

10. The cabinet shall be equipped with a universal lock bracket capable of accepting a Best™ style lock and a Corbin #2 tumbler series lock. The cabinet shall come equipped with a Corbin #2 lock.

11. The cabinet shall be supplied with three door switches which control the door open status, the cabinet interior lighting circuits and the MMU override circuit.

12. All exterior seams shall be manufactured with a neatly formed continuous weld construction. The weld for the police box door shall be done on the inside of the cabinet door. All welds shall be free from burrs, cracks, blowholes or other irregularities.

13. The fan baffle panel seams shall be sealed with RTV sealant or equivalent material on the interior of the cabinet.

14. The cabinet shall be UL listed.

15. The cabinet shall come with lifting ears affixed to the upper exterior of the cabinet. These ears shall utilize only one bolt for easy reorientation.

16. The cabinet shall come with one (1) dual-ply Dustlock™ Media polyester, disposable air filter; and the filter performance shall conform to listed UL 900 Class 2 and conform to MERV-8 & ASHRAE Standard 52.2-1999. The filter element shall be secured to louvered entrance on the main door with Velcro type mounting on all four edges. The Velcro adhesive shall be rated for high temperatures.

17. The door shall be mounted with a single continuous stainless steel piano hinge that runs the length of the door. The hinge shall be attached via stainless steel tamper resistant bolts.
18. The wired cabinet facility shall use the latest technology applicable.

19. Fire Pre-empt: When a fire pre-empt is specified, either by special provisions or noted on plan with requirement of hardwired interconnect to firehouse, a pre-empt isolation relay panel shall be installed. This panel shall be easily installed without extensive modification to cabinet. If the cabinet is replaced, the modular pre-empt panel shall be easily transferred to a standard City of Stockton cabinet.

20. Vehicle Pre-empt: The vehicle pre-empt shall comply with the Section 86-2.49 “Priority Control System” of this special provisions. The Optical detection phase selector shall include the ability to directly sense the green traffic controller signal indications through the use of dedicated sensing circuits and wires connected directly the field wire termination points in the traffic controller cabinet. The phase selector shall be a plug-in, four (4)-channel, multiple-priority device intended to be installed directly into a card rack located within the controller cabinet. The phase selector shall be able to detect encoded infrared as well as other signals and provide coordinated inputs to the controller. The harness wire, which connects to the phase selector, shall be installed in the cabinet prior to shipping the cabinet to the City’s Corporation Yard for testing. Two directions with the same phasing (like; 2-6 and 4-8) shall have separate wiring from cabinet to the proper signal poles. The cabinet shall be wired such that the two phases do not turn green, at the same time, during vehicle pre-emption in only one direction.

The following configuration shall be used for detection.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Phases</th>
<th>2070/M60</th>
<th>D4/M60</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2 &amp; 5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>4 &amp; 7</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>C</td>
<td>6 &amp; 1</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>D</td>
<td>8 &amp; 3</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

A 6-foot Cat5e (Red Color) cable and a SFP-1 Copper 10/100/1000 Mbps RJ45 Small Form-Factor Pluggable module shall be furnished to enable the phase selector to communicate through the Ethernet switch with Opticom central software.

21. Railroad Pre-empt: For railroad pre-empt, please refer to plans. The City does not have a standard configuration for railroad pre-empt. Cabinet design engineer shall submit to the City a written schematic of the proposed railroad pre-empt configuration. This schematic design shall be approved by the City prior to the construction of the cabinet. If illuminated directional signs are required to be installed to restrict turns during railroad pre-emption, sign relay panel shall also be installed as well as pre-empt isolation relay panel in the cabinet.
Labels

A permanent printed thermo vinyl, engraved or silk screened label shall be provided for all terminals and sockets. Labels shall be legible and shall not be obstructed by cabinet wiring, panels or cables. All labels shall conform to the designations on the cabinet wiring prints. Labels for all shelf-mounted electronics and equipment shall be on the face of the shelf directly below their placement in the cabinet.

Shelves

Shall come with two (2) double beveled shelves 10" deep that are reinforced welded with V channel, fabricated from 5052-H32 0.125-inch thick aluminum with double flanged edges rolled front to back. Slotted hole shall be inserted every 7" for the purpose of tying off wire bundles.

Cabinet Layout

The shelves shall be populated as follows. The power supply and (2) detector racks shall be placed on the top shelf. The controller and monitor shall be placed on the bottom shelf.

The roll out drawer and LED light shall be mounted under the bottom shelf just left of center.

The display panel shall be mounted on the door.

Load bay shall be mounted on the back wall with 7" of clearance to the bottom of the cabinet.

The detector panel for all field inputs shall be mounted on the lower left wall.

The “D” panel shall be mounted on the left wall just above the detector panel.

The SDLC and power supply interface panels shall be mounted on the left wall between the shelves.

The 768 panel shall be mounted on the left wall under the bottom shelf.

The load resistor panel shall be mounted on the left wall under the 768 panel.

The power panel shall be mounted on the lower right wall.

The 120VAC video power panel shall be mounted above the power panel.

The 120VAC six position power strip shall be mounted on the right wall, between the shelves just under the top shelf.
One 12” x 12” blank panel shall be located on the upper right wall, at the top of the “C” channel.

**Ventilating Fans**

The cabinet shall be provided with two (2) finger safe fans mounted on the right and left sides of the cabinet plenum, and shall be thermostatically controlled (adjustable between 4-176° Fahrenheit). The safe touch thermostat and power terminal block(s) shall be din rail mounted on right side of cabinet plenum.

**Computer Shelf**

A slide-out computer shelf 16” length by 12” width by 2” depth shall be installed below the bottom shelf underneath the controller. The shelf shall be mounted just left of center so that controller cables will not interfere with the operation of the shelf when equipment is installed. The shelf shall have a hinged cover that opens from the front and shall be powder-coated black. It shall be a General Devices Part # VC4080-99-1168. The drawer when fully extended shall hold up to 50lbs.

**Main Panel Configuration (Load-Bay)**

The design of the panel shall conform to NEMA TS2 Section 5, Terminals and Facilities, unless modified herein. This panel shall be the termination point for the controller unit (CU) MSA, MSB, MSC, (MMU) MSA, MSB cables and field terminal facilities. The terminal and facilities layout shall be arranged in a manner that allows all equipment in the cabinet and all screw terminals to be readily accessible by maintenance personnel.

The load-bay shall be fully wired and meet the following requirements:

1. The load-bay shall have the following dimensions; constructed from aluminum with a nominal thickness of 0.125 inches, a maximum height of 19” and a maximum width of 38 inches including attached wiring bundles.

2. The entire assembly shall roll down and provide access to all of the back of panel wiring. All solder terminals shall be accessible when the load-bay is rolled down. The assembly shall be able to roll down without requiring other components, cables or switches to be removed.

3. The load-bay shall be designed so that all other cabinet screw terminals are accessible without removing cabinet electronics.

4. All the controller (CU) and malfunction management (MMU) cables shall be routed through the back of the load-bay so that they will not be subject to damage during load-bay roll down.

5. The top of the load-bay panel shall attach directly to Unistrut™ spring nuts without the use of standoffs and spacers.
6. The load-bay shall be balanced such that it will not roll down when the Unistrut™ spring nuts are removed, even when fully loaded with BIUs load switches, flasher and flash transfer relays.

7. The load-bay facility shall be wired for 16 channels. Load switch(s) 1-8 shall be vehicle phases 1-8; load switch(s) 9-12 shall be pedestrian phases 2, 4, 6 & 8; load switches 13-16 shall be overlaps A, B, C & D. All load switches shall be routed through a flash transfer relay.

8. (16) Load sockets spaced on 2" center per NEMA TS2 section 5.3.1.2, Figure 5-2.

9. (8) Flash transfer relay sockets.

10. (1) Flasher socket.

11. All load switches and flashers shall be supported by a bracket extending at least ½ the length of the load switch.

12. Wiring for controller A, B & C connectors. All CU wiring shall be soldered to backside of a load bay screw terminal. The screw terminals provide access to all functions of CU cables.

13. Wiring for one Type-16 MMU. All MMU wiring shall be soldered to backside of a screw terminal. The screw terminals provide access to all functions of the MMU.

14. All 24 VDC relays shall have the same base socket, but it shall be different from the 115VAC relays.

15. All 115VAC relays shall have the same base socket, but it shall be different from the 24VDC relays. (not applicable to flash transfer relays)

16. Shall have a relay that drops +24VDC to load switches when the cabinet is in flash. Relay shall have a test switch for troubleshooting.

17. There shall be a wire between the pedestrian yellow field terminals and another terminal on the load bay. The MMU channel 9-12 yellows shall terminate next to said pedestrian yellows terminal.

18. The load-bay shall be silkscreened on both sides. Silkscreen shall be numbers and functions on the front side, and numbers only on the back side.

19. Field wiring terminations shall be per channel across the bottom of the load-bay. Each channel shall have 3 terminations corresponding to the appropriate vehicle phase Red, Yellow and Green. Default wiring shall be left to right vehicle phases 1-8, pedestrian phases 2, 4, 6 & 8 and overlap channels A, B, C & D following the order of the load switches. Field terminals shall be #10 screw terminal and be rated for 600V.

20. All load bay field terminals shall have a copper wire lug, Blackburn part # L35.

21. All cable wires shall be terminated. No tie-off of unused terminals will be allowed.
All wiring shall conform to NEMA TS2 Section 5.2.5 and table 5-1. Conductors shall conform to military specification MIL-W-16878D, Electrical insulated high heat wire, type B. Conductors #14 or larger shall be permitted to be UL type THHN. Main panel wiring shall conform to the following colors and minimum wire sizes:

<table>
<thead>
<tr>
<th>Circuit Description</th>
<th>Wire Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle green load switch output</td>
<td>14 gauge brown</td>
</tr>
<tr>
<td>Vehicle yellow load switch output</td>
<td>14 gauge yellow</td>
</tr>
<tr>
<td>Vehicle red load switch output</td>
<td>14 gauge red</td>
</tr>
<tr>
<td>Pedestrian Don’t Walk switch</td>
<td>14 gauge orange</td>
</tr>
<tr>
<td>Pedestrian Walk switch</td>
<td>14 gauge blue</td>
</tr>
<tr>
<td>Pedestrian Clearance load switch</td>
<td>14 gauge yellow</td>
</tr>
<tr>
<td>Vehicle green load switch input</td>
<td>22 gauge brown</td>
</tr>
<tr>
<td>Vehicle yellow load switch input</td>
<td>22 gauge yellow</td>
</tr>
<tr>
<td>Vehicle red load switch input</td>
<td>22 gauge red</td>
</tr>
<tr>
<td>Pedestrian Don’t Walk input</td>
<td>22 gauge orange</td>
</tr>
<tr>
<td>Pedestrian Walk input</td>
<td>22 gauge blue</td>
</tr>
<tr>
<td>Pedestrian Clearance input</td>
<td>22 gauge yellow</td>
</tr>
<tr>
<td>Logic Ground</td>
<td>18 gauge white with red tracer</td>
</tr>
<tr>
<td>+24V DC</td>
<td>18 gauge red with white tracer</td>
</tr>
<tr>
<td>+12V DC</td>
<td>18 gauge pink</td>
</tr>
<tr>
<td>AC+ Line</td>
<td>14 gauge black</td>
</tr>
<tr>
<td>AC- Line</td>
<td>14 gauge white</td>
</tr>
<tr>
<td>Earth Ground</td>
<td>16 gauge green</td>
</tr>
<tr>
<td>AC line (load bay)</td>
<td>12/14 gauge black</td>
</tr>
<tr>
<td>AC neutral (load bay)</td>
<td>12/14 gauge white</td>
</tr>
<tr>
<td>Controller A cables</td>
<td>22 gauge blue with the exception of power wires (AC+ Black, AC- White &amp; Earth Ground Green) These wires shall be 18AWG</td>
</tr>
<tr>
<td>MMU A &amp; B cables</td>
<td>22 gauge orange with the exception of power wires (AC+ Black, AC- White &amp; Earth Ground Green Start Delay Relay Common Black, Normally open Black &amp; Normally Closed Black) These wires shall be 18AWG</td>
</tr>
</tbody>
</table>

Four conductors will supply alternating current (AC) power to the load switch sockets. The load switch sockets shall be supplied 1-4, 5-8, 9-12 & 13-16 by each conductor.

The field terminal blocks shall have a screw Type No. 10 post capable of accepting no less than 3 No. 12 AWG wires fitted with spade connectors. Four (4) 12-position terminal blocks shall be provided in a single row across the bottom of the main panel. Spade lugs from internal cabinet wiring are not allowed on field terminal screws. There shall be a second row of four (4) 12-position terminal blocks with screw type #10 above the field terminal blocks. These blocks shall operate the flash program. It shall be changeable from the front of the load-bay.
The power terminal blocks shall have a screw Type No. 10 post capable of accepting no less than 3 No. 12 AWG wires fitted with spade connectors. One (1) 12-position terminal blocks shall be provided vertically on the right side of the load bay. The placement of the power terminal block on any other panel shall not be allowed.

All load switches, flasher, and flash transfer relay sockets shall be marked and mounted with screws. Rivets and clip-mounting is unacceptable.

Wire size 16 AWG or smaller at solder joints shall be hooked or looped around the eyelet or terminal block post prior to soldering to ensure circuit integrity. All wires shall have lugs or terminal fittings when not soldered. Lap joint/tack on soldering is not acceptable. All soldered connections shall be made with 60/40 solder and noncorrosive, non-conductive flux. All wiring shall be run neatly and shall use mechanical clamps and conductors shall not be spliced between terminations. Cables shall be sleeved in braided nylon mesh and wires shall not be exposed.

All field wiring terminating in the traffic signal controller cabinet shall be fastened to the termination panels with one piece copper solderless/crimpless wire lugs. Solderless/crimpless lug shall have a maximum wire size capacity of 6.

**Load-Bay and Panel Wire Termination**

All wires terminated behind the main panel or on the back side of other panels shall be SOLDERED. No pressure or solder-less connectors shall be used. Printed circuit boards shall not be allowed on the load bay.

**Cabinet Light Assembly**

The cabinet shall have an LED lighting fixture with 15 high power LEDs using a cool white color emitting 300lm min @ 12VDC/750mA. The LED shall be a Rodeo Electronics TS-LED-05M02. The LED fixture shall be powered by a Mean Well class 2 power supply LPV-20-12 that shall be mounted on the inside top of the cabinet near the front edge. The cabinet light circuit shall be designed so a second LED fixture will be installed in the cabinet without the need a of a second power supply. It shall be attached under the cabinet drawer so that it remains stationary when drawer is extended. An on/off switch that is turned on when the cabinet door is opened and off when it is closed shall activate the lighting fixture(s) power supply.

**Convenience Outlet**

The cabinet shall be wired with one (1) convenience outlet with a ground fault interrupter (GFI) and one (1) six position power strip outlet without ground fault interrupters. The ground fault outlet (GFI) shall be mounted on the right side of the cabinet on or near the power panel. The power strip outlet shall be mounted on the right side, between the shelves just below the top shelf. No outlets shall be mounted
on the door. The GFI power shall be fed through the auxiliary breaker (CB2). The power strip outlet shall be fed through the ACO breaker (CB3).

**Auxiliary Panel**

The cabinet shall include an auxiliary switch panel mounted to the interior side of the police panel compartment on the cabinet door. The panel shall be secured to the police panel compartment by (2) screws and shall be hinged at the bottom to allow access to the soldered side of the switches with the use of only a Phillips screwdriver. Both sides of the panel shall be silkscreened. Silk-screening on the backside of the switch panel shall be upside down so that when the panel is opened for maintenance the silkscreening will be right side up.

At a minimum the following switches shall be included;

**Controller ON/OFF Switch**: There shall be a switch that renders the controller and load-switching devices electrically dead while maintaining flashing operations for purpose of changing the controller or load-switching devices. The switch shall be a general-purpose bat style toggle switch with .688-inch long bat.

**Signals ON/OFF Switch**: There shall be a switch that renders the field signal displays electrically dead while maintaining controller operation for purpose of monitoring controller operations. The switch shall be a general-purpose bat style toggle switch with .688-inch long bat.

**Stop Time Switch**: There shall be a 3-position switch labeled “Normal” (up), “Off” (center), and “On” (down). With the switch in the “Normal” position, a stop timing command shall be applied to the controller by the police flash switch or the MMU (Malfunction Management Unit). When the switch is in its “Off” position, stop timing commands shall be removed from the controller. The “On” position shall cause the controller to stop time. The switch shall be a general-purpose bat style toggle switch with .688-inch long bat.

**MMU Override Switches**: There shall be a switch that will allow the MMU to be removed without causing the intersection to go into flashing operation provided the cabinet door is opened. The switch shall be normally off and shall have a flipup switch cover. This switch cover shall force the switch to the off position when closed. The switch shall be a general-purpose bat style toggle switch with .688-inch long bat.

**Technician Flash Switch**: There shall be a switch that places the field signal displays in flashing operation while the controller continues to operate. This flash shall have no effect on the operation of the controller or MMU. The switch shall be a general-purpose bat style toggle switch with .688-inch long bat. **Preemption Test Switches**: Six (6) preempt inputs shall have momentary pushbutton test switches with red caps. These switches shall be labeled 1, 2, 3, 4, 5 & 6.
Police Panel

Behind the police panel door there shall be switches for use by emergency personnel. The wiring for these switches shall be accessible when the auxiliary panel is open. The following switches shall be included;

Flash Switch: There shall be a switch for the police that puts the cabinet into flashing operations. The switch shall have two positions, “Auto” (up) and “Flash” (down). The “Auto” position shall allow normal signal operation. The “Flash” position shall immediately cause all signal displays to flash as programmed for emergency flash and apply stop time to the controller. When the police flash switch is returned to “Auto”, the controller shall restart except when the MMU has commanded flash operation. The effect shall be to disable the police panel switch when the MMU has detected a malfunction and all controller and MMU indications shall be available to the technician regardless of the position of the police flash switch. The switch shall be a general-purpose bat style toggle switch with .688-inch long bat.

Signals ON/OFF Switch: There shall be a switch that renders the field signal displays electrically dead while maintaining controller operation for purpose of monitoring controller operations. The switch shall be a general-purpose bat style toggle switch with .688-inch long bat.

Cables

All wire cable bundles shall be encased in flex or expandable braided sleeving along their entire free length.

All SDLC cables shall be terminated on both ends, securely terminated to the SDLC interface panel with screw type connection and professionally routed in the cabinet interior to easily reach the load bay, controller, malfunction management unit and detector racks. All SDLC connectors shall be fully populated with 15 pins each.

Flashing Operation

All cabinets shall be wired to flash for all vehicle channels. Flashing operation shall alternate between the used vehicle phases 1, 4, 5, 8, pedestrian phases 2, 8, OLA & OLD and 2, 3, 6, 7, pedestrian phases 4, 6, OLB & OLC. Flash programing shall be either red, yellow or no flash simply by changing wires on the front of the load-bay. Cabinet shall be supplied with vehicle and overlap phases programed to red flash and pedestrian phases to no flash.

Detector Racks

At a minimum, the cabinet shall be wired to accommodate (32) channels of detection. One detector rack shall support (16) channels of loop detection, (1) Buss Interface Unit (BIU) and (4) channel of Opticom™. One detector rack shall support (16) channels of loop detection and one (1) Buss Interface Unit (BIU). Racks shall be capable of using...
both two channel or four channel detection devices or Opticom™ cards. The loop cabling shall be connected via a 37 pin DB connector using spring clips. The Opticom cable shall be connected via a 24 pin connector using locking latches. The power cable shall be a 6 pin connector. All power wires shall be 18AWG. The addressing of detector racks shall be accomplished via dipswitches mounted to the PCB. There shall be the capability to turn off the TS2 status to the BIU for the uses of TS1 detector equipment via dipswitches mounted to the PCB. There shall be a 34 pin connector using locking latches that breaks the output from the detector to the input of the BIU, there shall also be +24VDC and logic ground on this connector. All racks shall have space at the bottom front for labeling. All racks shall be designed for horizontal stacking. Separate racks for detection and preemption are not allowed.

768 Panel

There shall be an Opticom™ GTT 768 interface panel installed in the cabinet. At a minimum it shall be soldered to the load switch green outputs phases 1-8. This panel shall have a protective plastic cover. The panel shall be mounted directly under bottom shelf.

Detection Panel

The detection panel shall support (32) channels of vehicle detection, (4) channels of emergency vehicle preemption detection, (8) channels or pedestrian detection and (8) pedestrian returns on a single panel. The loop wires shall be a 22AWG twisted pair, color coded as follows. Channel one brown, channel two red, channel three orange and channel four yellow. One of the twisted pair wires of all colors shall have a white tracer and land on the second position terminal of each loop. The emergency preemp wires shall be color coded as follows. +24VDC orange, preempt inputs yellow and ground blue. This panel will be mounted on the lower left side of the cabinet.

Controller “D” Panel

The “D” panel shall be a raised panel with all EPAC M type “D” and 2070N type “D” cables. The “D” cable shall be soldered to the backside of the panel. All other wires shall be mounted to the front side. This panel shall be mounted on the left wall of the cabinet above the detector panel.

Power Supply Interface Panel

The power supply interface panel shall include terminations for all the cabinet power supply inputs and outputs. It shall have a protective plastic cover. This panel shall be mounted on the left wall of the cabinet between the shelves.

SDLC Panel

The SDLC panel shall have six 15 socket DB connectors mounted to a PCB. The PCB shall be mounted to an “L” bracket for attaching to cabinet “C” channel. All SDLC
cables shall attach with screw type retainers. There shall be one position with latching blocks to mate with latching spring blocks. This panel shall be mounted on the left wall of the cabinet between the shelves.

**Video Power Panel**

The video power panel shall have five (5) din rail mounted terminal blocks, capable of accommodating 4 size #14 wires in each hole. There shall be two (2) for 120 AC+, two (2) for 120 AC- and one (1) for ground. They shall be labeled respectively. This panel shall be mounted on the right wall of the cabinet above the power panel.

**Spare Panels**

A sheet metal panel 12” x 12” shall be installed on the upper right wall of the cabinet at the top of the “C” channel.

**Supplemental Loads**

There shall be a supplemental load panel with (4) 2.5K-ohm, 10-watt panel mount resistor. One side terminated to a (4) position terminal block tied to neutral. The other side terminated to another (4) position terminal block. This block shall be left open for future loading in the cabinet. This panel shall be mounted on the left side of the cabinet below the 768 panel.

**Service Surge Suppression**

The cabinet shall be equipped with an EDCO model SHP300-10 or approved equivalent surge arrestor mounted on the power panel. Power to all cabinet electronics equipment shall come through this surge suppression circuit.

**Power Panel**

The power panel shall handle all the power distribution and protection for the cabinet and shall be mounted on the lower right wall of the cabinet. All equipment shall be mounted on a 12” x 17” silkscreened aluminum panel and include at a minimum the following equipment:

- A 30-amp main breaker shall be supplied. This breaker shall supply power to the load bay, load switches and auxiliary panel. It shall also power via the EDCO SHP300-10, the controller, MMU, power supply & detector racks.
- A 15-amp auxiliary breaker shall supply power to the fans, lights and GFI.
- A 15-amp equipment breaker shall supply power to the video power panel and power strip outlet.
- A 60-amp, 125 VAC radio interference line filter.
- A normally open, 50-amp, solid-state relay. The relay shall have a green LED light that is on when energized. (No Mercury Contactors shall be allowed)
• One see-through Plexiglas cover on stand-offs to protect maintenance personnel from AC line voltages. This shall be removable by loosening screws but without removing screws.
• Two (19) position solid aluminum, tin plated neutral buss bar with raised slotted & torque style screw heads.
• One (19) position solid aluminum, tin plated ground buss bar with raised slotted & torque style screw heads.
• Two MOVs shall be terminated on the 120AC in field terminal. One tied between line and ground, the other between neutral and ground.

Display Panel

The display panel shall have LED indicator lights, with appropriate colors for each indication represented. The indicators shall be arranged to reflect a typical 8 phase intersection. The panel shall have 3-position detector switches oriented with each vehicle and pedestrian phase indicator light. The switches shall operate as follows; locking call (up), normal operations (middle), momentary call (down). They shall be labeled for each phase. There shall be a door switch to turn on power to the display when the door is open. When the door is closed the switch will remove all power to the indicators. The display LEDs shall be powered by the input side of the load switches. North orientation shall always be in the up direction. All vehicle and pedestrian phases’ indicator lights and test switches shall be programmable by connectors on the backside of display panel.

Manuals & Documentation

The cabinet shall be furnished with (3) complete sets of cabinet prints. All cabinet wiring, and layout shall come on (1) E1 size sheet, multiple pages shall not be allowed. Upon request (1) CDROM with AutoCAD v2008 cabinet drawing for the cabinet wiring.

The following auxiliary equipment and plug-ins shall be included in the cabinet unless otherwise is noted.

Malfunction Management Unit (MMU)

The cabinet shall come with a (MMU) Reno A & E 1600 GE.

Load Switch

The cabinet shall come with (12) load switches. All load switches shall be discrete type and have LED indications for both the input and output side of the load. The load switches shall be PDC model SSS-86I/O or approved equivalent.

Unused Red Jumpers

The cabinet shall be supplied with (16) unused red jumpers. They shall be made out of .063 inches thick aluminum, 2” x 11/16”. The U-shaped cut-out shall be exposed.
aluminum with the rest of the jumper covered with red, heat-shrink tubing insulation.

**Flasher**

The cabinet shall come with (1) flasher. The flasher shall be discrete type and have LED indications. The flasher shall be PDC model SSF-86-3 or approved equivalent.

**Flash Transfer Relay**

The cabinet shall come with (4) heavy duty flash transfer relays. The relays shall be Detrol Controls model 295 or approved equivalent.

**Bus Interface Unit (BIU)**

The cabinet shall come with (2) bus interface units (BIU). These shall meet all the requirements of NEMA TS-2 1988 standards. In addition, all BIUs shall provide separate front panel indicator LED’s for DC power status and SDLC Port 1 transmit and receive status. The (BIU)’s shall be Eberle Design, Inc. model BIU700 or approved equivalent.

**Power Supply (PS)**

The cabinet shall come with a shelf mounted cabinet power supply meeting at minimum TS 2-2003 standards. It shall be a heavy duty device that provides +12VDC at 5 Amps /+24VDC at 2 Amps / 12VAC at .25 Amp, and line frequency reference at 50 mA. The power supply shall provide a separate front panel indicator LED for each of the four outputs. Front panel banana jack test points for 24VDC and logic ground shall also be provided. The power supply shall provide 5A of power and be able to cover the load of four (4) complete detector racks. The (PS) shall be Eberle Design, Inc. model PS250 or approved equivalent.

**Loop Amplifiers**

The cabinet shall come with (8) 4-channel detector amps (Reno ½ width) WS Part # 5620040065 RENO A&E, 4-channel, TS2, 1.12 Wide Faceplate, E/2-1200-SS.

**STANDARDS FOR PRE-QUALIFYING TRAFFIC SIGNAL CONTROLLERS**

All local controller equipment shall be submitted to City of Stockton Signal Shop for visual inspection and field-testing (field-testing may take up to 3 weeks) prior to bidding. Only those cabinets, controllers, and modules pre-qualified will be allowed to bid. Prequalification will be based, in part, upon quality of construction, materials used, track density of boards, ability to easily repair boards, overall physical size of controllers, ease of programming, and changes thereto of the total controller for all functions including preemption at each intersection.
86-2.23  **Controller Cabinet Foundation**

Type P traffic signal controller foundations shall be 18" above finished grade. All edges and corners of foundations shall be rounded or chamfered 1.5 inches radii to prevent chipping. Top surface of foundation shall have smooth or polished surface. No broom finish allowed. This is to facilitate cleaning in the future.

Anchor bolts for the controller cabinet shall extend 1-1/2 inches (plus or minus 1/8 inch) above the top of the foundation. When installing cabinet foundation bolts, install bottom set of nut and washer threaded on the foundation bolts so the nut is embedded in the concrete foundation. The bottom washer shall rest on the top of the concrete foundation. The cabinet then is placed on the washer to prevent direct contact on the concrete foundation. Mastix or plumber's tape shall be all along the base of the cabinet between the washers. After the cabinet is installed on the foundation, silicon sealant shall be used along the outside and inside of the cabinet base to ensure waterproofing.

The one inch foundation drain pipe in the back of the cabinet shall be fitted with a union fitting, with the union fitting set just below the top of the foundation grade. A 4" piece of 1" pipe shall be placed in the fitting until the concrete is cured. Then the 1" pipe if removed to ensure the drain is the lowest point of the foundation and will drain properly if it becomes necessary. The foundation shall be located on minor street nearest approach unless indicated differently.

A.  **WORKMANSHIP - FIELD CONDUCTOR PLACEMENT**

Six to eight feet of field wiring, in two to three coils shall be placed in the bottom of the cabinet. These coils shall be neatly bound using tie wraps. Each set of vehicle, pedestrian, ped push button, DLC, common, camera wiring shall be incrementally brought out the coiled bundle depending on it’s connection point in the cabinet. All conductors or groups of conductors shall be labeled appropriately and only long enough to neatly connect to the load bay or terminal inside the cabinet. The fiber optic cable shall be securely attached to the right side of the cabinet. The connecting ends shall be long enough to be neatly placed along the back right corner of the cabinet and brought up to the camera modem or Ethernet switch. Labeling of field conductors shall use plastic labeling tie wrap, using permanent black marker compatible with nylon or plastic ty-wrap style.

86-2.24  **Luminaires**

**Intersection and Arterial Lighting**

The Contractor shall install 87 Watt LED luminaires on traffic signal poles at signalized intersections and street light poles.

**Collector Road Lighting**

The Contractor shall install 63 Watt LED street lighting on street light poles.
Residential Road Lighting

The Contractor shall install 54 Watt LED street lighting on street light poles.

Submittals

Product submittals must include:

1. Product specification sheets, including:
   1.1. Maximum power in watts.
   1.2. Maximum designed junction temperature.
   1.3. Heat sink area in square inches.
   1.4. Designed junction to ambient thermal resistance calculation with thermal resistance components clearly defined.
   1.5. L70 in hours when extrapolated for the average nighttime operating temperature.

2. IES LM-79 and IES LM-80 compliant test reports from a CALiPER-qualified or NVLAP-approved testing laboratory for the specific model submitted.

3. LED luminaire checklist.


5. Initial and depreciated isofootcandle diagrams showing the specified minimum illuminance for the particular application. The diagrams must be calibrated to feet and show a 40 by 40 foot grid. The diagrams must be calibrated to the mounting height specified for that particular application. The depreciated isofootcandle diagrams must be calculated at the minimum operational life.


7. Test report showing mechanical vibration test results as tested under California Test 611 or equal.

8. Data sheets from the LED manufacturer that include information on life expectancy based on junction temperature.

9. Data sheets from the power supply manufacturer that include life expectancy information.

10. Submit warranty documentation as an informational submittal before installing LED Luminaires.
Warranty

Furnish a 10-year replacement warranty from the manufacturer of the luminaires, including driver and any internal components (excluding photo cells) against any defects or failures. The effective date of the warranty is the date of installation. Contractor will be required to provide replacement labor, at no additional cost, to install replacement luminaires within 10 days after receipt of the failed luminaire for a period of not less than one (1) year. Beyond year one (1) the City will be responsible for the replacement of warranty luminaires at City’s cost, and at City will be responsible for coordination with fixture manufacturer to procure receipt of replacement luminaires.

Material

General

The luminaire must include an assembly that uses LEDs as the light source. The assembly must include housing, an LED array, and an electronic driver. The luminaire must:

1. Be UL listed under UL 1598 for luminaires in wet locations or an equivalent standard from a recognized testing laboratory
2. Have a minimum operational life of 100,000 hours
3. Operate at an average operating time of 12 hours per night
4. Be designed to operate at an average nighttime operating temperature of 70 degrees F
5. Have an operating temperature range from -40 to +130 degrees F
6. Luminaire shall produce 0% total lumens above 90 degree (BUG rating, U=0).
7. Be defined by the following applications

<table>
<thead>
<tr>
<th>Application</th>
<th>Maximum Consumption</th>
<th>Replaces (Watts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arterial</td>
<td>87</td>
<td>200 Watt</td>
</tr>
<tr>
<td>Intersection</td>
<td>87</td>
<td>200 Watt</td>
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<tr>
<td>Collector</td>
<td>63</td>
<td>150 Watt</td>
</tr>
<tr>
<td>Residential</td>
<td>54</td>
<td>100 Watt</td>
</tr>
</tbody>
</table>

The individual LEDs must be connected such that a catastrophic loss or a failure of 1 LED does not result in the loss of more than 20 percent of the luminous output of the luminaire.

Luminaire Identification

Each luminaire must have the following identification permanently marked inside the unit and outside of its packaging box:

1. Manufacturer’s name
2. Trademark
3. Model no.
4. Serial no.
5. Date of manufacture (month-year)
6. Lot number
7. Rated voltage
8. Rated wattage
9. Rated power in VA

All LED luminaire housing shall be labeled identifying the system wattage and light distribution pattern.

**Electrical Requirements**

The luminaire must operate from a 60± 3 Hz AC power source. The fluctuations of line voltage must have no visible effect on the luminous output. The operating voltage may range from 120 to 277 V (ac). The luminaire must operate over a voltage range of 95 to 277 V (ac). The operating voltages are 120 V (ac) and 240 V (ac).

The power factor of the luminaire must be 0.90 or greater. The total harmonic distortion, current and voltage, induced into an AC power line by a luminaire must not exceed 20 percent.

**Surge Suppression and Electromagnetic Interference**

The luminaire on-board circuitry must include a Surge protection Device (SPD) to withstand high repetition noise transients caused by utility line switching, nearby lightning strikes, and other interferences. The SPD must protect the luminaire from damage and failure due to transient voltages and currents as defined in Tables 1 and 4 of ANSI/IEEE C62.41.2 for location category C-High. The SPD must comply with UL 1449. The SPD performance must be tested under ANSI/IEEE C62.45 based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for location category C-High.

**Compatibility**

The luminaire must be operationally compatible with currently used lighting control systems and photoelectric controls.

**Photometric Requirements**

The luminaire must have a correlated nominal color temperature of 4,000K. The color rendering index must be 65 or greater.

**Thermal Management**

The passive thermal management of the heat generated by the LEDs must have enough capacity to ensure proper operation of the luminaire over the minimum
operation life. The LED maximum junction temperature for the minimum operation life must not exceed 221 degrees F.

The junction-to-ambient thermal resistance must be 95 degrees F per watt or less. The use of fans, liquid cooling systems, or other mechanical devices is not allowed. The heat sink material must be aluminum or other material of equal or lower thermal resistance.

The luminaire must contain circuitry that automatically reduces the power to the LEDs to a level that ensures the maximum junction temperature is not exceeded when the ambient outside air temperature is 100 degrees F or greater.

**Physical and Mechanical Requirements**

The luminaire must be a single, self-contained device, not requiring job site assembly for installation. The power supply for the luminaire is integral to the unit. The weight of the luminaire must not exceed 13 lb for 63 and 87 Watts LED and 11 lb for 54 Watt LED. The maximum effective projected area when viewed from either side or either end must be 0.45sq.ft for both 63 and 87 Watts LED and 0.40sq.ft for the 54 Watt LED.

The housing must be light gray and fabricated from materials designed to withstand a 3,000-hour salt spray test under ASTM B 117. All aluminum used in housings and brackets must be of a marine grade alloy with less than 0.2 percent copper. All exposed aluminum must be anodized.

The die cast and extruded aluminum housing must be provided with a slip fitter capable of mounting on a 2-inch pipe tenon. This slip fitter must be two bolts and fit on mast arms with outside diameters from 1-5/8 to 2-3/8 inches. The slip fitter must be capable of being adjusted a minimum of +/ -5. The luminaries shall pass the 3G vibration test per ANSI C136.31-2001.

The housing must be designed to prevent the buildup of water on top of the housing. Exposed heat sink fins must be oriented to allow water to freely run off of the luminaire and carry dust and other accumulated debris away from the unit. The optical assembly of the luminaire must be protected against dust and moisture intrusion to at least an ANSI/IEC rating of IP66. The power supply enclosure must be protected to at least an ANSI/IEC rating of IP43.

Each mounted luminaire must be furnished with an ANSI C136.10-compliant, locking type photocontrol receptacle and a rain tight shorting cap or photocell as required.

When the components are mounted on a down-opening door, the door must be hinged and secured to the luminaire housing separately from the refractor or flat lens frame. The door must be secured to the housing such that accidental opening is prevented. A safety cable must mechanically connect the door to the housing.

Field wires connected to the luminaire must terminate on a barrier type terminal block secured to the housing. The terminal screws must be captive and equipped with wire
grips for conductors up to no. 6. Each terminal position must be clearly identified.

The power supply must be rated for outdoor operation and have at least an ANSI/IEC rating of IP65.

The power supply must be rated for a minimum operational life equal to the minimum operational life of the luminaire or greater.

The power supply case temperature must have a self rise of 77 degrees F or less above ambient temperature in free air with no additional heat sinks.

The power supply must have 2 leads to accept standard 0-10 V dimmable standard with PCR5 or PCR7 option.

86-2.25 Copper and Wire for Street Lighting

The work shall consist of furnishing and installing street light conductor in conformance with the plans, these Specifications, and as directed by the Engineer.

Copper wire shall be UL approved A.W.G. No. 8 Minimum, 7-strand soft copper, type THWN or THHN with minimum of 3/64 in. polyvinyl chloride insulation, unless otherwise noted. No. 10 in pole may be used.

Full compensation for furnishing all labor, materials, equipment, tools and incidentals necessary to complete the installation of copper wire as indicated on the plans, in these Special Provisions, and as directed by the Engineer shall be included in the lump sum price paid for “Traffic Signals and Electrical” and no additional compensation shall be allowed therefor.

86-2.26 Numbering Street Lighting Poles and Traffic Signal poles with Luminaires

Each street light pole and traffic signal pole with luminaries shall be identified with a PG&E specific pre-determined pole number. The contractor shall obtain the pole number from PG&E. The numbers shall be reflective and made according to PG&E specifications. The contractor shall place the number nine (9) feet, on the clean surface, above the grade on street light or traffic signal pole with luminaries. The number shall be installed on the street side of the pole.

86-2.27 Fiber Optic Cabling (Existing Locations)

General

The contractor is not allowed to perform the relocation and connection of the existing fiber optic cable.

Where there is an existing fiber optic cable installed into the traffic signal cabinet, the connectorized fiber cable shall not be pulled through any conduit.
If fiber optic cables are damaged due to the Contractor's activities, the Contractor shall install new fiber optic cables from an original splice point or termination to an original splice point or termination, unless otherwise authorized in writing by the Engineer. Fiber optic cable shall be spliced at the splice vaults if available. The amount of new fiber optic cable slack in splice vaults and the number of new fiber optic cable splices shall be equivalent to the amount of slack and number of splices existing before the damage or as directed by the Engineer. 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 City may perform the repair or replacement work and the cost will be deducted from monies due to the Contractor. The Contractor shall be fully responsible for assembling, installing, testing, and troubleshooting the fiber optic cable system. Contractor shall leave at least 20-foot fiber cable slack in each pull box run, between exiting conduit and entering conduit. The contractor shall also coil 50 lineal feet of fiber cable slack cable in the No. 6 pull box at traffic signal location, and label the cable. Contractor shall complete the installation of the cable into the controller cabinet and terminate the cable in the new LIU.

The contractor shall be responsible for coordinating with AT&T to remove, replace, and test the fiber optic cabling, as necessary to maintain communications and protect cabling during construction. The contractor shall notify AT&T at least 3 weeks in advance of any work, which involves fiber optic cable/conduits, and/or utility relocation.

At locations where the contractor is allowed to remove and reinstalled the existing fiber, the contractor shall locate and protect existing signal interconnect and communication conduits and cables from damage. The cables shall not be cut, spliced, or damaged in any way. The contractor shall exercise caution to avoid damaging existing fiber optic cable(s). In the event that a fiber optic cable is damaged, contractor shall be responsible for replacing the entire segment of the fiber optic cable from [location] to [location] and include, but not be limited to, splicing of any existing branch fiber optic cables, labeling, and testing per current City's provisions. Interruptions to signal communications shall be kept to a minimum. The contractor shall notify the City of Stockton Inspection a minimum of 72 hours prior to the planned disconnect of the signal communications cable. 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. Contractor shall leave at least 20-foot fiber cable slack in each pull box run, between exiting conduit and entering conduit. The contractor shall also coil 50 lineal feet of fiber cable slack cable in the No. 6 pull box at traffic signal location, and label the cable. Contractor shall complete the installation of the cable into the controller cabinet and terminate the cable in the new LIU.

If the Contractor fails to perform required repairs or replacement work, as determined by the Engineer, the City may perform the repair or replacement work and the cost will be deducted from monies due to the Contractor.
86-2.28 Fiber Optic Cabling (New Locations)

General

At new locations, certified experienced personnel, with at least 5 years’ experience, shall do the installation and connection of any fiber optic cable. The personnel shall be certified by the Fiber Optic Material Personnel. The contractor shall submit the manufacturer’s recommended procedure for pulling fiber optic cable at least 20 working days prior to installing cable. Documentation of compliance to this specification shall be provided to the City Traffic Engineering Section of Public Works Department prior to ordering the material. All fiber optic cables shall be tested according to manufacturer’s recommended testing procedures and verified by the City prior to final acceptance.

The fiber cable shall be all-Dielectric, Gel-Free, with stranded loose-tube design with dry water blocking for outdoor duct and aerial installations. The cable shall be comprised of water-swellable yarns and/or tapes, dielectric strength members, ripcord and a medium density polyethylene (MDPE) jacket containing carbon black to provide ultraviolet light protection while inhibiting the growth of fungus. The cable shall be fully water blocked using craft-friendly water-swellable yarns and tapes, making cable access simple and requiring no clean up. Cables shall contain at least 24 single-mode, or as indicated on the plans, (SM) dual operating window (1310nm and 1550nm) fibers.

Each fiber shall be distinguishable by means of color-coding in accordance with TIA/EIA-598-A, “Optical Fiber Cable Color Coding.” The fiber shall be colored with ultraviolet (UV) curable inks. The contractor shall provide manufacturer’s certification that the cable is meeting the functional requirement of Rural Utilities Service (RUS) 7 CFR 1755.900 and fully comply with ICEA S-87-640, Standard for Optical Fiber Outside Plant (OSP) Communications Cable. Manufacturer shall be ISO9001 and TL9000 registered. Cable shall have storage temperature range of -40° to 70°C, an installation temperature range of -30° to 70°C and an operating temperature range of -40° to 70°C. The Cable shall have a short-term tensile rating of 2700N. Cable and fiber manufacturer shall be the same company with minimum of 20 years in manufacturing optical fiber cable to demonstrate cable long-term reliable field performance and to ensure the availability of fully integrated technical support.

The fiber cable installed in the traffic signal cabinet, shall be composed of factory pre-connectorized fiber optic SC pig tails and shall be terminated in the LIU wall mount box with either a twelve-(12) port coupler (Simplex) panel or single panel with 2-12 port coupler (Simplex) panels, SC compatible connector. The SC pig tail connectors shall be composed of the same optical fiber glass as used in the optical fiber cable. Contractor shall leave at least 20-foot fiber cable slack in each pull box run, between exiting conduit and entering conduit. The contractor shall also coil 50 lineal feet of fiber cable slack cable in the No. 6 pull box at traffic signal location, and label the cable. Contractor shall complete the installation of the cable into the controller cabinet and terminate the cable in the LIU.
The fiber optic cable shall consist of, but not limited to, the following components:

- Dielectric central member
- Water-swellable yarn
- Fiber and water-swellable yarns (at least 12 fiber per tube)
- Water-swellable tape
- Dielectric strength members
- Ripcord
- Outer jacket

The buffer tube shall be gel-free. The optical fibers shall be contained within loose buffer tubes. The loose buffer tubes shall be stranded around a dielectric central member using the reverse oscillation stranding process. The buffer tubes shall be made of polyethylene (PE). Each buffer tube shall contain a water swellable yarn for water blocking protection. The buffer tube shall be manufactured to a standard 3.0 mm in size. Regardless of fiber count, to reduce the number of required installation and termination tools. Each buffer tubes shall be distinguishable from other buffer tubes in the cable by means of color-coding in accordance with TIA/EIA-598-B, “Optical Fiber Cable Color Coding.”

- Dielectric Central Member

The central member which functions as an anti-buckling element to resist temperature and induced stresses, shall be a glass reinforced plastic rod with similar expansion and contraction characteristics as the optical fiber and buffer tubes. The loose buffer tubes shall be stranded around a dielectric central member using the reverse oscillation stranding process.

- Water-Swellable Yarn and Tapes

The water-swellable yarn shall be non-nutritive to fungus, electrically non-conductive, and homogeneous. It shall also be free from dirt or foreign matters. Water swellable yarn(s) shall be applied longitudinally along the central member during stranding. The water swellable tape shall be applied longitudinally over both the inner and outer layer. The tape shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free from dirt and foreign matters. Two (2) polyester yarn binders shall be applied contra-helically with sufficient tension to secure each buffer tube layer to the dielectric central member without crushing the buffer tubes.

- Dielectric Strength Member

Tensile strength shall be provided by high tensile strength yarns and/or fiberglass which shall be helically stranded evenly around the cable core and shall not adhere to other cable components.

- Ripcord
The cable shall contain at least one ripcord under the jacket for easy sheath removal.

- Outer Jacket

The cable jacket shall be marked with the manufacturer's name, the number of fiber "SM", month and year of manufacture, sequential meter or foot markings, a telecommunication handset symbol as required by Section 350G of the National Electrical Safety Code (NESC), fiber count, and fiber type. The print color shall be in a contrasting color to the cable jacket. The height of the marking shall be approximately 2.5mm. The cable jacket shall be medium density polyethylene (MDPE) jacket containing carbon black to provide ultraviolet light protection while inhibiting the growth of fungus.

86-2.29 Rack Mount Enclosure:

The Rack Mountable Connector Housings shall be mountable in an EIA-310 compatible 465 or 592 mm rack. Housings shall be available in several sizes, including 1U, 2U, 3U and 4U. One EIA rack space or panel height (denoted as 1U) is defined as being 44.45 mm in height. The unit shall meet the design requirements of ANSI/TIA/EIA-568 and the polymer compounds flammability requirements of UL 94 V-0. Manufacturer shall be ISO 9001 and TL 9000 registered. The unit shall be available in different sizes to accommodate different port count requirements. Housings shall be manufactured using 16-gauge aluminum or equivalent for structural integrity and shall be finished with a wrinkled black powder coat for durability. Installation fasteners shall be included and shall be black in color.

86-2.30 Splice Tray Fiber:

Splice Tray shall be from same manufacturer as the splice closure. Splice only 12 fibers per splice tray and label each tray with a permanent label. The splice tray shall be Wide-Style Splice Tray. Splice Tray shall securely organize and provide physical protection without stress on the fibers for both single-mode and ribbonized fiber splices. Splice Trays shall not induce attenuation of signal at operational wavelengths up to 1550 nm.

86-2.31 Advanced Splice Closure (ASC):

The closures shall be butt style splice closures with gel sealing technologies for cable termination and hinging splice trays. The closure shall be made with thermoplastic outer materials that withstand temperature and contaminate extremes. The closure shall be designed for use with any cable construction in any environment and for numerous splice applications.

The closure shall accommodate at least 24 SC/UPC connections with 12 SC/UPC connections per tray. The closure shall have at least one oval cable port to terminate at least two cables. The splice closure shall have; easy-to-use dome-to-base
clamping with O ring system, and single ended design. The splicing shall be done in accordance to the approved manufacturer’s methods, procedures and instructions to ensure warranty compliance.

The splice closure shall have at least six round cable entry ports with multi-cable capacity. This block can be opened without the need to remove or replace the gel. With the use of special kits, multiple cables per port shall be installed. The splice trays shall be hinged for access to any splice without disturbing other trays.

The closure shall be pre-assembled case with wide-style splice trays suitable for fiber capacity. To seal the cables entering the enclosure; gel sealing process or wrap around style cable seal shall be used. The closure shall have at least one storage slack tray basket for storing slack fiber. To increase splice capacity the closure can be upgraded by just adding an upgrade kit.

The fiber cable shall be labeled within six inches of the splice closure and 6” from all conductors and sleeves. Laminated labels shall be installed on the external surface of the outside closures. All optical fiber shall be neatly and efficiently dressed into splice tray management and the contractor is to ensure that splices are accessible without damage to the optical fibers or splices. Contractor shall leave at least 30-foot slack per fiber cable before entering the fiber cable in the enclosure.

86-2.32 Small Lightguide Interconnect Units (LIU) Wall Mount Box

Contractor to install one small Lightguide Interconnect Units (LIU) Wall Mount Box in the traffic signal cabinet at each location shown on the plans.

The Single Panel housings shall be available for cross-connecting or interconnecting purposes. Two (2) single panel units shall be provided. The units shall provide the means for direct connections for up to 2-12 fibers or as indicated on the plans. The units also shall provide means for pigtail splicing within the housing for at least 12 fibers or as indicated on the plans. The Single Panel housings shall accommodate a single Solutions panel. The housings shall have a small footprint and low profile to minimize the amount of occupied space. The dimensions shall not exceed the 6.3" (height) 5.5" (width), and 2" (depth). Manufacturer shall be ISO 9001 and TL 9000 registered.

Housings shall be manufactured using 16-gauge aluminum or equivalent for structural integrity and shall be finished with a wrinkled black powder coat for durability. Assembly hardware and equipment-attaching-machine screws shall be included and shall be black in color. Housing shall include a 0.4” splice holder, which will support up to 12 heat shrink splices. Top and bottom removable cable entry grommets shall be provided to allow for mid-span access and environmental sealing. The housings shall be supplied with pre-drilled holes for surface mounting on the plate in the traffic signal cabinet, but shall have an optional ledge mount bracket available. Each CCH housing should be labeled with Machine labels identifying to/from destinations and fiber counts. The units shall be installed on a mounting plate in each signal cabinet.
It is acceptable to use a single wall mountable closet housing (WMC) to fit all 24-strand fiber, where the 2 panels cannot be installed.

Laminated labels shall be installed on the external surface of the outside panels.

86-2.33 Port Coupler Panels:

The Two Closet Connector Housing (Simplex) Panels shall be in 12-fiber versions for use. The panels shall be able to be used with field-installable connectors or in applications where the pre-terminated cables are routed directly from the equipment to the interconnect hardware. The 12-fiber versions shall include in-line SC-SC Compatible Connector.

The Closet Connector Housing Panels shall be designed to accommodate applications requiring specified labeling and connector identification. Each CCH housing should be labeled with Machine labels identifying to/from destinations and fiber counts.

The panel shall be attached with two push-pull latches to allow quick installation and removal. Blank connector panels shall be available to fill unused space within the housings. The blank connector panel shall be attached with at least two push-pull latches to allow quick installation and removal. The blank panels shall be manufactured from injection-molded polycarbonate. Panels shall be manufactured from 16-gauge cold rolled steel or injection-molded polycarbonate for structural integrity.

86-2.34 Testing and Documentation:

The contractor shall retain AT&T or approved fiber optic contractor to verify and certify all fiber tests and connections. Documentation of all test’s results (factory and field tests) and fiber run as-builds shall be submitted to the Engineer within two (2) working days after completing the tests.

Testing shall include the tests on elements of the passive fiber optic components:

(1) The factory:

The Manufacturer with the appropriate documentation shall supply verification of the fiber specifications as listed in the Fiber Characteristics Table. After cabling, before shipment but while on the shipping reel, one hundred (100%) percent of all fibers shall be tested for attenuation. Copies of the results shall be (1) maintained on file at the Contractor’s, Manufacturer’s and Owner’s place of business with a file identification number for a minimum of ten (10) years, (2) attached to the cable reel in a waterproof pouch, and (3) submitted to the Contractor and to the Engineer prior to the delivery of the cable to the jobsite.
(2) **After delivery to the project site but prior to installation:**

The cable and reel shall be physically inspected by the Contractor on delivery and one hundred (100%) percent of the fibers shall be tested with the Optical Time Domain reflectometer (OTDR) for attenuation to confirm that the cable meets requirements.

OTDR testing shall be done at the following points in the system construction:

- At cable delivery (reel test).
- Following cable installation prior to connectorization, termination or splicing.
- End to End following installation of all pigtails, connectors, and termination devices.

In addition, the final test (post-connectorization test) shall be completed with an optical power meter and light source.

Test results shall be recorded, dated, compared with the manufacturer factory test results and filed with the factory manufacturer test results accompanying the shipping reel in a weatherproof envelope. Attenuation deviations from the shipping records greater than five (5%) percent shall be brought to the attention of the Engineer in writing. The cable shall not be installed until completion of this test sequence and written approval by the Engineer is received. Copies of traces and test results shall be submitted to the Engineer. If the OTDR test results are unsatisfactory, the reel of fiber optic cable shall be considered unacceptable and all records corresponding to that reel of cable shall be marked accordingly. The unsatisfactory reels of cable shall be replaced with new reels of cable at the Contractor expense. The new reels of cable shall then be tested to demonstrate acceptability. Copies of the test results shall be submitted to the Engineer for approval.

(3) **After installation but prior to connection to any other portion of the system:**

After the fiber optic cable has been pulled but before breakout and termination one hundred (100%) percent of all the fibers shall be tested with the OTDR for attenuation. Test results shall be recorded, dated, compared, and filed with the previous copies of the tests. Copies of traces and test results shall be submitted to the Engineer for approval. If the OTDR test results are unsatisfactory, the fiber optic cable segment will be unacceptable. The unsatisfactory segment of cable shall be replaced with a new segment, without additional splices, at the Contractor’s expense. The new segment of cable shall then be tested to demonstrate acceptability. The contractor shall also perform end to end attenuation test, utilizing a power meter in field, after installing the cable to establish the integrity and performance of the system and its components. The end-to-end attenuation shall not exceed the sum of the maximum allowable attenuation for the component cable segments, splices, and typical loss for connectors. Nor shall the attenuation from an individual connector exceed the maximum allowable losses. If the fibers in the cable exceed the allowable loss, the Contractor shall take corrective measures to bring the cable’s total attenuation below the allowable limit, including replacement of the cable at the Contractor’s expense.
The Contractor shall perform all OTDR testing in the presence of the Engineer. The Engineer shall attach their written mark to all test I documentation made by the Contractor at the time of the test. Testing performed by the Contractor and not witnessed by the Engineer shall not be accepted, re-testing will be required.

The Contractor shall verify that the attenuation and optical continuity of each active and spare optical fiber in the cable plant satisfies the specified requirements.

Attenuation and continuity shall be measured at the operational wavelength of the equipment being used on the link. If the operational wavelength is unknown, the attenuation shall be measured at both 1310nm and 1550nm.

Testing of fiber links shall be completed in such way, to show the loss of each connector, in the OTDR trace. The tests shall be conducted in both directions. The test shall be performed at both wavelengths (1310 and 1550 nm). The cable shall be tested in accordance with EIA-455-3A (FOTP-3), “Procedure to Measure Temperature Cycling Effect on Optical Fiber, Optical Cable, and Passive Fiber Optic Components”. Copies of the test results shall be submitted to the Engineer for approval.

(4) During the final system testing:

The active components shall be tested after installation. The Contractor shall provide all personnel, equipment, instrumentation and materials necessary to perform all testing. The Engineer shall be notified in writing a minimum of two (2) working days prior to all field tests. The notification shall include the exact location of the system to be tested.

The fiber optic shall be in one continuous length without factory splices in the fiber. Installation procedures and technical support information shall be furnished at the time of delivery. The change in attenuation at extreme operational temperature for singlemode fiber shall not be greater than 0.20dB/km, with 80% percent of the measured values no greater than 0.10dB/km. The singlemode fiber measurement is made at 1550nm.

The contractor shall also follow the following guidelines for efficient and accurate test results:

- Ensure that the test jumpers (end-to-end attenuation) or test fiber box (OTDR) are of the same fiber core size and connector type as the cable system, e.g., 50/125 μm core test jumpers should be used for testing a 50/125 μm multimode cable.

- Ensure that optical sources are stabilized and have center wavelengths within ± 20 nm of the 850/1300 nm multimode and 1310/1550 nm single-mode nominal wavelengths. In accordance with TIA/EIA-526-14-A,
multimode LED sources should have spectral widths from 30-60 nm at 850 nm and 100-140 nm at 1300 nm.

- Ensure that the power meter is calibrated at each of the nominal test wavelengths and traceable to the National Institute of Standards and Technology (NIST) calibration standard.

- Ensure that the power meter and the light source are set to the same wavelength.

- Ensure that all system connectors, adapters, and jumpers are properly cleaned prior to and during measurement.

86-2.35 **Warning Tape:**

Warning tape shall be provided and placed in the trench over conduits containing fiber optic cable as shown on the plans. The warning tape shall be four (4") inches wide with bold printed black letters of approximately seventy-five (75") inches on bright orange color background, and contain the printed warning “CAUTION BURIED FIBER OPTIC CABLE” repeated at approximately thirty (30") inches intervals.

The printed warning shall be non-erasable and shall be rated to last with the tape for a minimum of forty (40) years.

The construction of the warning tape shall be such that it will not delaminate when it is wet. It shall be resistant to insects, acid, alkaline and other corrosive elements in the soil. It shall have a minimum of 120 lb tensile strength per four (4") wide strip and shall have a minimum of seven hundred (700%) percent elongation before breakage. The warning tape shall be the detectable type with a contiguous conductor in the form of a copper wire or aluminized foil, encased in a protective plastic jacket. The aluminized foil shall be approximately 0.01" (inch) thick. Separate rolls of the warning tape shall be electrically connected by corrosion resistant clips or soldering. The ends of warning tape shall extend into pull boxes and splice vaults a minimum of twenty-four (24") inches for future connection to a warning signal device. The continuity and testability of the warning tape, for the entire conduit run, shall be demonstrated prior to and again after backfilling each trench to the satisfaction of the Engineer.

86-2.36 **Payments**

Full compensation for conforming to the provisions in this section shall be considered as included in the contract price paid for fiber optic interconnect system and no additional compensation will be allowed therefor.

86-2.37 **Street Name Signs**

The Contractor shall provide and install street name signs as shown on the plans and in accordance with these Special Provisions. Contractor shall supply sign brackets and all necessary hardware to install signs. Payment of furnishing brackets, hardware,
and installing street name signs shall be included in the lump sum bid for “Traffic Signal and Electrical”.

The contractor shall submit a street name sign design to the City Traffic Devices Staff (contact 209-937-8534) to be approved for conformance prior to ordering the street name signs. Street name sign block numbers shall be installed on the lower right hand side of each street name sign. The street name sign shall be installed in conformance with the City of Stockton Standard Drawings number 117 and 117a. The street name sign bracket shall be double banded on mast arm.

***R3-4 (No U-Turn) mast arm sign shall be 36"x36"***

86-2.38 Traffic Signal Controller Communications and CCTV System:

86-2.38A Fiber Optic Ethernet Switches

The contractor shall supply and install the following devices in the field controller cabinets and the City’s Traffic Management Center (TMC) to establish communication between the City of Stockton traffic signal controller and the central master at TMC. Each Fiber Optic Ethernet Switch shall consist of the following:

1. One (1) Comnet CNGE8US environmentally hardened 1 fiber Ethernet 8 port unmanaged switch, supports 10/100/1000 Mbps, or accepted equivalent (one for field and one for central control center installation).
2. Two (2) Comnet SFP-22A Single Mode, 1000fx, 1310nm, 60 km, 1 Fiber, SC Small Form-Factor Pluggable module, or accepted equivalent. One SFP-22A should be inserted in port 4 on CNGE8US in the traffic signal cabinet, and three are for central installations in TMC.
3. Two (2) Comnet SFP-22B Single Mode, 1000fx, 1550nm, 60 km, 1 Fiber, SC Small Form-Factor Pluggable module, or accepted equivalent. One SFP-22B should be inserted in port 1 on CNGE8US in the traffic signal cabinet, and one is for central installation in TMC.
4. Two (2) SFP-1 Copper 10/100/1000 Mbps RJ45 Small Form-Factor Pluggable module, or accepted equivalent. One SFP-1s should be inserted in port 5 and one in port 6 on CNGE8US in traffic signal cabinet, and deliver the other two are for central installations in TMC.
5. One 6-foot Cat5e cable (with yellow skin) to connect the controller’s 1B board and port 5 of the CNGE8US.
6. One 6-foot Cat5e cable (with red skin) to connect the GTT phase selector and port 6 of the CNGE8US.
7. Associated switch mounting hardware, power supply.
8. Other accessories as required by the manufacturer.
86-2.39 Fiber Optic Video Data One-port Modems (Transmitter/Receiver) for Pan/Tilt/Zoom Camera

The Contractor shall supply and install two video receiver (or transmitter)/data transceivers for the pan/tilt/zoom camera:

1. TMC Video/Data Modem: Comnet FVR1021S1 FM video receiver/data transceiver: 9/125um, or accepted equivalent in all features and functions.
2. Field Video/Data Modem: Comnet FVT1021S1 FM video transmitter/data transceiver: 9/125um, or accepted equivalent in all features and functions.
3. Associated modem mounting hardware, power supply and required cables.
4. Other accessories as required by the modem manufacturer.
5. The Pan/Tilt/Zoom control wires should be terminated to transmit the Bi-phase/RS422 protocol.

86-2.40 Fiber Optic Video Eight-port Modems (Transmitter/Receiver) - Blank

86-2.41 Video and Data Digital Networking (IP Video Encoder)

The Contractor shall supply and install Verint Systems MPEG-4 Encoder at the central control center installation) for each signal of the three locations:

a. Verint Single-Port Encoder (MPEG4 Model S1801E (5W@12VDC)), or accepted equivalent.
b. One camera license from Verint.
c. Factory warranty coverage (hardware & labor).
d. Various mounting hardware, power-supply and cables.
e. Other accessories as required.

86-2.42 Monitoring Camera Cabling (General)

- Power cable shall be A11403-BWG (water and sun resistant, 3-#14 AWG, white/green/black, UL Type TC 600V, NEC Type TFN Conductors, IEEE 1202/CSA FT4, IEEE 383, UL Subject 1277, and OSHA acceptable) or accepted equivalent.
- Composite Data and Coaxial cable for PTZ control; shall be UL approved, water and sun resistant, 3C18AWG, 75C, E108998, Max operating Voltage 300 V RMS, and CM C(UL) 3098 15:44 ROHS. The Pan/Tilt/Zoom control wires should be terminated to transmit the Bi-phase protocol.

All Coaxial BNC connectors shall be 75 ohm. All cables shall be continuous (no splices) between the controller cabinet and the cameras.

86-2.43 Traffic Monitoring Camera Conductors Field Installation (General) Field Installation

The installation of the wiring will require that a hole be drilled into the camera supporting structure for all the camera installations. Prior to drilling this hole the
existing wiring inside the pole or mast arm shall be removed or protected such that it is not damaged by the drilling operation. The edges of the drilled hole shall be smoothed. The Contractor shall install a watertight gland nut (or grommet) in this hole that securely holds the wiring. All cables shall be:

- Installed without damaging the conductors or insulation
- Installed without kinks
- Handled in accordance with manufacturers specifications and recommended bending radius
- Run continuously between terminations without splices
- Installed with sufficient slack for equipment movement
- Neatly tagged at the cabinet to indicate which camera it serves
- Rated for outdoor use and resistant to water and UV radiation
- Have a watertight, strain relieved plug type connection to the camera housing

The Contractor shall make all connections of this wiring to the camera assembly, the video transmission device, and power.

86-2.44 High Speed Dome Pan/Tilt/Zoom Traffic Monitoring Camera - Blank

86-2.45 High Speed Dome Pan/Tilt/Zoom Camera Installation

The Contractor shall install and fully adjust the camera with the associated lens, communication addressing, power supplies, housings, and all-necessary cabling, etc., to make the assembly operational. The Contractor shall firmly attach the dome system to the assigned poles as shown on the Plans. The Contractor shall exercise care to tighten the camera mount within the torque limits specified by the camera manufacturer.

The Contractor shall properly terminate all of the electrical cables to the camera and firmly attach them. The Contractor shall dress and secure the electrical cables inside the dome enclosure and traffic signal cabinet so that they do not interfere with the closing of the cabinet, with the fan, or with any other moving part.

Cameras and other video sources where possible, shall use the electrical power supply 60 Hz signal for synchronization. When cameras are initially installed, the camera shall be in a position where its view of the roadway will not be obstructed by the pole it is mounted on. At a 4-leg intersection, the camera shall be capable of seeing all four legs without its view being blocked by the signal pole.

After all cameras are installed and central equipment is operational, the Contractor shall arrange an interactive session with the Engineer to fine-tune any adjustments to the camera that require a technician in the field. This session shall enable the Engineer to observe the image at the control room while being in verbal communication with the Contractor at the camera.
86-2.46 **Temporary Signal System**

The temporary signal system (TSS) shall consist of installing and maintaining temporary traffic signal and lighting for traffic control in conformance with the details shown on the plans entitled "Temporary Signal," the provisions in "Maintaining Traffic" of these special provisions, the provisions in Section 5-1.19 – "Maintaining Existing and Temporary Electrical Systems" of these special provisions, the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications, and these special provisions.

The provisions in this section shall not relieve the Contractor from the responsibility to provide the additional devices or take the measures as may be necessary to conform to the provisions in Section 7-1.04, "Public Safety," of the Standard Specifications.

All materials and equipment for a temporary signal system including, but not limited to, signal heads, mast arms, luminaires, wood poles, vehicle detection systems, conductors, and hardware shall be furnished by the Contractor.

Materials and equipment to be used in the temporary signal system shall be either new or used suitable for the intended use.

Each signal face shall be oriented to be clearly visible to traffic approaching from the direction which the signal is intended to control.

**86-2.46A Operation**

Temporary signal system shall operate at nominal 120 VAC. Lighting shall operate at 240 VAC.

Unless otherwise directed by the Engineer, the system shall be operated on a continuous 24-hour basis except for the periods when it is necessary to control traffic by flaggers.

Timing of a temporary signal system will be performed by City forces.

**86-2.46B Maintaining Temporary Signal System**

Maintaining a temporary signal system shall be the sole responsibility of the Contractor.

If components in the temporary signal system are damaged, displaced or cease to operate or function as specified, from any cause during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location. Components shall include signs, generator, flashing beacons, and signal equipment.
In the event the temporary signal system is out of operation, for any reason, the Contractor shall provide flaggers, at the Contractor's expense, to maintain traffic control until the traffic signals are returned to service.

**86-2.46C  Bonding and Grounding**

Signal heads, standards with metal bases and the controller cabinet shall be mechanically and electrically secure to form a continuous system effectively grounded by the grounding conductor.

**86-2.46D  Commercial Power**

Power shall not be obtained from private parties, other than a direct connection to a utility company service point.

The Contractor shall make arrangements with the utility company for providing service. The cost to provide the commercial power shall be at the expense of the Contractor.

Commercial electrical power is available at the work site.

**86-2.46E  Salvaging Signal System**

Upon completion of the work requiring traffic signals, as determined by the Engineer, all components of the temporary signal system shall be removed.

Materials and equipment shall become the property of the Contractor and shall be disposed of in conformance with the provisions in the Standard Specifications. Pole holes shall be backfilled.

Conductors placed in slots across paved areas as specified herein, when no longer required, shall be abandoned in place when determined by the Engineer. Direct buried conductors, installed 12 inches or more below the ground surface, and conduit may be abandoned in place.

**86-2.46F  Payment**

The contract lump sum price paid for temporary signal system shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing, maintaining, and removing the temporary traffic signal and lighting, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

**86-2.47  Payment**

Payment for signals, lighting, and interconnect shall conform to the provisions in Section 86-8, "Payment," of the Caltrans Specifications and these Special Provisions.
Full compensation for furnishing the labor, materials, tools, equipment, including installing PTZ cameras, video and data modems, hardware, conduits, and wiring, complete in place as shown on the plans and as specified in the Standard Specifications, these Special Provisions, and as directed by the Engineer, shall be considered as included in the contract lump sum price paid for "Traffic Signal and Electrical" and no additional compensation will be allowed therefor.

Hauling and stockpiling of salvaged material off the right-of-way and delivered to the City Corporation Yard, 1465 South Lincoln Street, will be considered as included in the contract prices paid for the various items of work, and no additional payment will be allowed therefor.

**86-2.48 Removing, Reinstalling or Salvaging Electrical Equipment**

Removing, reinstalling or salvaging electrical equipment shall conform to the provisions in Section 86-7, "Removing, Reinstalling or Salvaging Electrical Equipment," of the Caltrans Specifications and these Special Provisions.

Existing facilities that are removed (i.e., streetlights, electroliers, frames, grates, covers, roadside signs, etc.) shall be salvageable wherever shown on the plans and as determined by the Engineer. Equipment shall be tagged with intersection name from which it was removed.

All equipment to be salvaged shall be handled as follows: All signal equipment (signal heads, pedestrian heads, push buttons, etc.) shall be removed from the poles and stacked on pallets. This includes signal hardware, conductors, and terminal compartments. The equipment shall be secured on the pallets and delivered to Corporation Yard. All poles shall be salvaged to the storage yard on Daggett Road. Contact the City’s Operation and Maintenance at (209) -937-8341, giving 72 hours advanced notice prior to delivery. Mike will direct contractor to Daggett Road yard and where to leave signal equipment in the Corp Yard.

All conductors shall be removed from abandoned conduits. Otherwise, removed items shall become the property of the Contractor and shall be disposed of as provided in the Caltrans Specifications.

**86-2.49 Priority Control System**

The Contractor shall be fully responsible for purchasing, assembling, installing, testing, and troubleshooting the vehicle pre-emption system. The priority system shall receive and store all information in a processor at each traffic signal controller cabinet. The priority control system shall match the existing system at other traffic signals.

I. SYSTEM DESCRIPTION
A priority control system shall operate in a manner that allows infrared as well as other signal control technologies to interoperate and activate one another in a consistent manner. The priority control system shall consist of a matched system of vehicle equipment and intersection equipment capable of employing both data-encoded radio communications to identify the presence of designated priority vehicles, as well as data-encoded infrared signaling communications. In preemption mode, the data-encoded communication shall request the traffic signal controller to advance to and/or hold a desired traffic signal display selected from phases normally available. A record of system usage by agency identification number, vehicle classification and vehicle identification number shall be created. The system software shall support call history analysis and reporting across any subset of intersections and/or vehicles independent of activation method. System software shall also support both onsite and remote programming and monitoring of the priority control system.

Intersection detection equipment will consist of an infrared detector at or near the intersection that is connected to a phase selector located in the intersection controller cabinet. The infrared detector, mounted on signal pole mast arms or vehicle signal head, receives the data-encoded infrared signal from the infrared equipped vehicle and transmits information through detector cable designed to convert infrared light energy at the proper wavelength into analog voltage signals that can be evaluated and decoded by the phase selector.

The phase selector shall be capable of receiving data encoded signals from infrared and other signals and combine the detection signals into a single set of tracked vehicles requesting priority activation. The phase selector will process the vehicle information to ensure that the vehicle is (1) in a predefined approach corridor, (2) heading toward the intersection, (3) requesting priority, and (4) within user-settable range. The phase selector shall treat the combined, single set of tracked calls with first come first served priority methodology within a given priority level. Arbitration between infrared signal intensity and other signal distance/ETA shall be first come first served methodology based on time of detection as each equipped vehicle reaches its programmed threshold.

When these conditions are met, the phase selector shall generate a priority control request to the traffic controller for the approaching priority vehicle. The system shall offer compatibility with most signal controllers, e.g. NEMA (National Electrical Manufacturers Association) 170/2070 controllers. The system can be interfaced with most globally available controllers using the controller’s preemption inputs. RS-232, USB and Ethernet interfaces shall be provided to allow management by on-site interface software and central software. The required priority control system shall be vehicle ID compatible with neighboring jurisdictions using optical emergency vehicle preemption. This will allow neighboring jurisdictions with mutual aid agreements with the City of Stockton to use the preemption system in Stockton and vice versa.
II. MATCHED SYSTEM COMPONENTS

The required priority control, data-encoded, infrared communications system shall be comprised of five basic matched components: data-encoded emitter, infrared detector, detector cable, phase selector and system software. This system shall be installed, with all five basic components, at each signalized location. In addition, a card rack and an electromechanical interface card shall be available if required. To ensure system integrity, operation and compatibility, all components shall be from the same manufacturer. The system shall offer compatibility with most signal controllers, e.g., electromechanical, NEMA (National Electrical Manufacturers Association), 170/2070. Interfacing to an electromechanical controller may require the use of an interface card.

A. Data-Encoded LED Infrared Emitter. The data-encoded LED emitter shall trigger the system. It shall send the encoded infrared signal to the detector. It shall be located on the priority or probe vehicle. A Remote Coding Unit shall be purchased and delivered with each LED Emitter.

B. Infrared Detector. The detector shall change the infrared signal to an electrical signal. It shall be located at or near the intersection. It shall send the electrical signal, via the detector cable, to the phase selector.

C. Detector Cable. The detector cable shall carry the electrical signal from the detector to the phase selector. The cable shall be made by the same manufacturer as the rest of the priority control system.

D. Phase Selector. The phase selector shall recognize inputs from both infrared and other signal activation methods at the intersection and supply coordinated inputs to the controller. The phase selector shall process the data in order to validate that all parameters required for granting a priority request are met. It shall be located within the controller cabinet at the intersection. It shall request the controller to provide priority to a valid priority vehicle by connecting its outputs to the traffic controller’s preemption inputs.

E. System Software for infrared detectors and phase selector. The system software shall be a Windows XP and Window 7 operating system for system. It supports system configuration and gathering of operational information.

III. SYSTEM COMPONENT SPECIFICATIONS

A. Infrared Detector

1. The required detector shall be a lightweight, weatherproof device capable of sensing and transforming pulsed infrared energy into electrical signals for use by the phase selection equipment.
2. The infrared detector shall be designed for mounting at or near an intersection on mast arms, pedestals, signal heads, signal head framings, pipes or span wires. All infrared detectors shall be mounted vertically.

3. Each infrared detector shall be supplied with mounting hardware to accommodate all types of installation; on mast arms, on signal heads, and on signal head framing. Additional hardware shall also be available, if span wire installations are required.

4. The infrared detector design shall include adjustable tubes to enable their reorientation for span wire mounting without disassembly of the unit.

5. The detector shall accept infrared signals from one or two directions and shall provide single or dual electrical output signal(s).

6. The infrared detector shall be Bi-directional with one output channel. Where the conduit’s capacity, at the intersection, does not allow multiple wires to be installed, the Bi-directional with two output channels can be installed as directed by the Engineer.

7. The detector shall allow aiming of the two infrared sensing inputs for skewed approaches or slight curves.

8. The infrared detector shall have a built-in terminal block to simplify wiring connections.

9. The infrared detector shall receive power from the phase selector and shall have internal voltage regulation to operate at 24 volts DC.

10. The infrared detector shall respond to a clear lens data-encoded emitter with 0.84 (±10%) Joules of energy output per flash at a distance of 2,500 feet (762m) under clear atmospheric conditions. If the emitter is configured with a visible light filter, the detector shall respond at a distance of 1800 feet (549m) under clear atmospheric conditions. The noted distances shall be comparable day and night.

11. The infrared detector shall deliver the necessary electrical signal to the phase selector via a detector cable up to 1,000 feet (305m) in length.

12. Each optical detector shall not have less than two telescopic sights that are rotational from 180 degrees to 5 degrees. Each optical detector shall be aimed and mounted for maximum line of sight for each direction.
B. Detector Cable

1. The detector cable shall deliver sufficient power from the phase selector to the infrared detector and shall deliver the necessary quality signal from the detector to the phase selector over a non-spliced distance of 1,000 feet (305m).

2. The cable shall be of durable construction to satisfy the following installation methods:
   a. Direct burial.
   b. Conduit and mast arm pull.
   c. Exposed overhead (supported by messenger wire).

3. The outside diameter of the detector cable shall not exceed 0.3 inches (7.62mm).

4. The insulation rating of the detector cable shall be 600 volts minimum.

5. The temperature rating of the detector cable shall be +158°F (+70°C) minimum.

6. The conductors shall be shielded with aluminized polyester and have an AWG #20 (7 x 28) stranded and individually tinned drain wire to provide signal integrity and transient protection.

7. The shield wrapping shall have a 20% overlap to ensure shield integrity following conduit and mast arm pulls.

8. The detector cable shall have four conductors of AWG #20 (7 x 28). The capacitance will not exceed 48 pF per foot at 1 Khz. The detector cable wires will be stranded, individually tinned copper, color-coded insulation as follows:
   a. Orange for delivery of detector power (+).
   b. Drain wire for detector power return (-).
   c. Yellow for detector signal #1.
   d. Blue for detector signal #2 or ground, depending on model.

9. The characteristic impedance of the detector cable shall be: 0.6ohms/1000’ 14.3uF/1000’

C. Phase Selector

1. The phase selector recognizes inputs from infrared and other signal activation methods at the intersection and supplies coordinated inputs to the controller.
2. The phase selector is designed to be installed in the traffic controller cabinet and is intended for use directly with numerous controllers. These include California/New York Type 170/2070 controllers with compatible software, NEMA controllers, or other controllers along with the system card rack and suitable interface equipment and controller software.

3. The phase selector will be a plug-in, four channel, multiple-priority, multi-modal device intended to be installed directly into a card rack located within the controller cabinet. The multi-mode phase selector shall be capable of using existing infrared or other signal system card racks.

4. The phase selector may be powered from either +24 VDC or 120VAC.

5. The phase selector shall support front-panel RS-232, USB and Ethernet interfaces to allow management by on-site interface software and central software. An RS-232 port shall be provided on the rear card edge of the unit. Additional RS-232 communication ports shall be available using the Auxiliary Interface Panel.

6. The phase selector shall include the ability to directly sense the green traffic controller signal indications through the use of dedicated sensing circuits and wires connected directly to field wire termination points in the traffic controller cabinet. This connection shall be made using the auxiliary interface panel.

7. The phase selector shall have the capability of storing a minimum of 10,000 priority control calls. When the log is full, the phase selector shall drop the oldest entry to accommodate the new entry. The phase selector shall store each call record in non-volatile memory and shall retain the record if power terminates. Each preemption record entry shall include the following points of information about the priority call:
   a. Agency: Indicates the operating agency of the vehicle.
   b. Classification: Indicates the class type of vehicle.
   c. Identification number: Indicates the unique ID number of the vehicle.
   d. Priority level: Indicates the vehicle’s priority level (High, Low or Probe)
   e. Direction: Channel A, B, C, or D; indicates the vehicle’s direction of travel.
   f. Call duration: Indicates the total time in seconds the priority status is active.
   g. Final greens at end of call: Indicates which phases are green at the end of the call.
   h. Duration of the final greens: Indicates the total time final greens were active at the end of call.
i. Time and date call started and ended: Indicates the time a priority call started and ended, provided in seconds, minutes, hours, day, month, and year.

j. Turn signal status: Indicates the status of the turn signal during the call.

k. Priority output active: Indicates if the phase selector requested priority from the controller for the call.

l. Historical no preempt cause: Indicates a history of conditions, which may have prevented a call or caused a call to terminate.

m. Speed of vehicle: entry speed, exit speed, average speed through call,

n. Relative priority: relative priority of vehicle class logged at time of call,

o. Directional priority: directional priority logged at time of call,

p. Preempt output used

q. Signal intensity: maximum and minimum infrared signal intensity during call.

8. The phase selector shall support a minimum of 5000 code pairs (agency ID, vehicle ID) providing unique vehicle identification and system security implementation at the vehicle level.

9. The phase selector shall include several programmable control timers that will limit or modify the duration of a priority control condition, by channel. The control timers will be as follows:

a. MAX CALL TIME: Sets the maximum time that a channel is allowed to be held active by a specific vehicle. It shall be settable from 60 to 65,535 seconds in one-second increments. The factory default shall be 360 seconds.

b. OFF APPROACH CALL HOLD TIME: Sets the amount of time a call is held on a channel after the vehicle has left the approach. It shall be settable from 4 to 255 seconds in one-second increments. The factory default shall be 6 seconds

c. LOST SIGNAL CALL HOLD TIME: Sets the amount of time that a call is held on a channel after the intersection has lost contact with the vehicle. It shall be settable from one to 255 seconds in one-second increments. The factory default shall be six seconds.

10. The phase selector shall have the ability to enable or disable all calls of both priority levels. This shall be independently settable by channel.

11. A unique intersection name, which shall be broadcasted, shall be settable for each phase selector.
12. Up to 25 different radio channels shall be available to be assigned to the phase selector.

13. The phase selector shall operate in a mode that shall vary the output based on the status of the approaching vehicles turn signal. Additional outputs available on an Auxiliary Interface Panel may be needed. Settings shall be available for this mode as follows:
   a. Output mappings for each channel.
   b. Separate setting for each of the four channels.
   c. Separate settings for each left turn, right turn or straight signal status for each of the above four channels.

14. The phase selector’s default values shall be programmable by the operator on-site or at a remote location.

15. The phase selector shall be capable of three levels of signal discrimination, as follows:
   a. Verification of the presence of the signal of either High priority or Low priority.
   b. Verification that the vehicle is approaching the intersection within a prescribed Estimate Time of Arrival (ETA).
   c. Determination of when the vehicle is within the prescribed range, either by intensity level or distance from the intersection.

16. The phase selector shall include one opto-isolated NPN output per channel that provides the following electrical signal to the appropriate pin on the card edge connector:
   a. 6.25Hz ± 0.1Hz 50% on/duty square wave in response to a Low priority call.
   b. A steady ON in response to a High priority call.
   c. The phase selector will also have the option of providing separate outputs for High and Low priority calls for controllers that do not recognize a 6.25 Hz pulsed Low priority request.
   d. Additional outputs or output modes shall also be available on the auxiliary interface panel.

17. The phase selector shall accommodate three methods for setting range thresholds for High and Low priority signals:
   a. Based on the approaching vehicle’s ETA. This shall be settable between 0 and 255 seconds in one second increments. The factory default shall be 30 seconds. The ETA threshold shall be independently settable by each of the following parameters: vehicle class, approach channel and priority level.
   b. Based on the approaching vehicle’s distance from the intersection. This shall be settable between 0 and 5,000 feet in one foot increments. The factory default shall be 1000 feet. The
Distance threshold shall be independently settable by each of the following parameters: vehicle class, channel and priority level.

c. Based on infrared emitter intensity the system shall accommodate setting a separate range from 200 feet (61m) to 2,500 feet (762m) with 1,200 range set points for both High and Low priority signals.

18. The phase selector shall support three types of green sense logging.
   a. Preemption impact logging which measures and records the impact of an individual signal preemption upon a measured green cycle time.

   b. Transit Signal Priority (TSP) impact logging which measures and records whether a TSP advantage was gained during a request and the amount of early or extended green applied.

19. Green cycle logging records changes in the average green cycle time. When the average time is measured to have changed, a new log entry is made.

20. The phase selector will have the following indicators:
   a. A STATUS indicator that illuminates steadily to indicate proper operation.
   b. LED indicators (one for High priority, one for Low priority) for each channel display active calls as steady ON and pulse to indicate pending preemption requests.

21. The phase selector shall have a test switch for each channel to test proper operation of High or Low priority.

22. If additional detectors installed, an auxiliary interface panel shall be available to facilitate interconnections between the phase selector and traffic cabinet wiring as well as provide additional outputs.

23. The phase selector shall provide the user with call play-back logs for the last 100 priority activation requests. Each log shall contain up to the last 250 seconds of a call. The call play-back logs shall include:
   a. Infrared based calls shall record intensity, coded ID, green sense state, call status (active, pending, disabled), approach channel and priority information.

   b. Data shall be recorded once per second. Recording terminates at call end.

24. The following diagnostic tests are incorporated in the multimode phase selector
   a. Power up built in test
b. Communications port tests  
c. Preemption output test call  
d. Detector response test 

25. The phase selector shall be capable of call bridging. Call bridging enables the treatment of two vehicles requesting priority activation to have their calls linked together to hold a call to the controller so that they may traverse the approach together.

26. The phase selector shall be capable of directional priority. Priority for calls may be assigned to individual approach channels such that calls in a particular direction will be given priority over calls in competing directions within the same priority level.

27. The phase selector shall be capable of utilizing time plans to allow users to vary priority activation by time of day, or for a specific time period such as special events. Time plans shall be configured via system software.

28. The phase selector shall support evacuation mode for low priority calls. Upon activation of this mode from the central management software, low priority vehicle calls shall be recognized by the phase selector as if they were high priority vehicle calls for a temporary period of time as defined by the user. This mode shall be supported for both infrared and other signal emitters. Vehicles transmitting high priority signals shall continue to maintain priority over the evacuation mode priority vehicles.

29. The phase selector shall allow relative priority. Relative priority allows emitter classes to be used as an additional level of prioritization within priority levels (i.e. high and low priority levels have different sets of relative priorities). Relative priority shall support up to 15 unique classes in each priority level (High and Low). Relative priority class level 15 will have the highest weight and 1 the lowest weight in each. If relative priority is enabled, a priority call will be granted to the caller with the higher class level within high and low priority levels. A vehicle with a call granted, shall be able to have its call taken away by a higher level class vehicle. The system shall provide a lockout threshold that once met, shall disallow higher relative priority calls from taking away a call. Separate thresholds for infrared and other signal calls shall be provided. Infrared call thresholds shall be specified as intensity with a default value of 1,000. Other signal call thresholds shall be specified as an ETA in seconds. The default is ETA shall be 12 seconds. Threshold values for both types of calls shall be settable via system software. High priority calls will always be served over low priority calls regardless of either’s relative class. Preemption for vehicles with the same base priority (high, low) and the same relative priority is done using the default first come, first served mechanism. Relative priority is capable of being enabled or disabled using system software. Relative priority for high and low can be
separately enabled or disabled using system software. The default settings for all relative priority (high and low) values will be 15. Relative priority shall be disabled by default for both high and low priority.

30. The phase selector shall be a plug-in, \textbf{four (4) channel}, multiplepriority device intended to be installed directly into a card rack located within the controller cabinet. The phase selector shall be able to detect encoded infrared as well as other signals.

The following configuration shall be used for detection:

<table>
<thead>
<tr>
<th>Channel</th>
<th>Phases</th>
<th>M60/2070</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2 &amp; 5</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>4 &amp; 7</td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>6 &amp; 1</td>
<td>5</td>
</tr>
<tr>
<td>D</td>
<td>8 &amp; 3</td>
<td>6</td>
</tr>
</tbody>
</table>

A 6 feet CAT5E (Red Color) cable and a SFP-1 Copper 10/100/1000 Mbps RJ45 Small Form-Factor Pluggable module shall be furnished to enable the phase selector to communicate through the Ethernet switch with opticom central software in the TMC.

D. Card Rack

1. The required card rack shall provide simplified installation of a phase City of selector into controller cabinets that do not already have a suitable card rack.
2. The card rack shall be factory wired to one connector, located behind the card slot, and a terminal block, located next to the phase selector slot, on the front of the card rack.
3. The card rack connector on the front, shall provide for all connections to the traffic controller. The card rack shall provide labeled terminal blocks for connecting the primary infrared detectors to a phase selector.

E. Auxiliary Interface Panel.

If additional detectors are installed, the auxiliary panel shall provide additional preemption outputs if needed. It shall also provide a connection point for the phase selector to monitor the status of the intersection’s green lights (green sense). Additional RS-232 communication ports may also be accessed via this panel. If additional outputs are not required, an auxiliary harness shall be used to monitor the status of the intersection’s green lights. The panel shall be installed in the traffic signal cabinet at the Manufacturer’s facility, with a protective plastic cover, prior to delivering the signal cabinet for testing.

F. Interface Software
1. The priority control interface software will be provided on a single CDROM or via download to interface with the phase selector. The software shall be provided to manage the phase selector while on-site at the intersection. It shall be supported on Windows™ XP and Windows™ 7.

2. The priority control interface software must accommodate:
   a. Setting up and presenting user-determined system parameters.
   b. Viewing and changing settings.
   c. Viewing activity screens and other signal channel.
   d. Displaying and/or downloading records of previous activity showing class, code, priority, direction, call duration, final greens at end of call, duration of final greens, time call ended in real time plus maximum signal intensity (vehicle location information).
   e. Agency ID, vehicle class, and vehicle ID
   f. Priority level
   g. Turn signal status
   h. No priority cause
   i. Source of the call
   j. Active preemption/priority output

3. The priority control interface software must accommodate operation via a mouse or via the keyboard, or in combination.

4. The priority control interface software must provide menu displays to City of enable:
   a. Setting of valid vehicle ID and class codes.
   b. Establishing signal intensity thresholds (detection ranges), modem initialization, intersection name and timing parameters.
   c. Setting of desired green signal indications during priority control operation and upload and download capability to view.
   d. Resetting and/or retrieving logged data and priority vehicle activity.
   e. Addressing for each card in a multi-drop connected system.
   f. Confirmation light configuration.
   g. Manual Control Parameters.

5. The interface software will provide readout of noise levels detected by the detectors. This noise level will serve as a troubleshooting tool.

6. The interface software shall provide a real-time activity screen which will provide the following information.
   a. Call intensity value even if below threshold.
   b. Emitter priority level.
   c. Indication of detection on primary or auxiliary detector.
   d. Indication if call is being serviced or is pending.
   e. Indication if vehicle is in range.
   f. Provides readout for four separate vehicles per channel.
g. Detector noise level readout.
h. Green phase monitoring with information on the current greens.

7. The on-site software shall allow the user to provide intersection name and approach names for each of the four channels and store these as part of the phase selector configuration.

8. The on-site software shall allow the user to save the configuration from the phase selector to a file.

9. The on-site software shall allow the user to restore the configuration for a phase selector from a saved configuration file.

10. The on-site software shall allow the user to print the phase selector configuration.

11. The on-site software shall allow the user to view the activity log from the phase selector.

12. The on-site software shall allow the user to save the activity log to a file.

13. The on-site software shall allow the user to print the activity log.

14. The on-site software shall allow the user to update firmware for all upgradeable modules of the phase selector.

IV. RELIABILITY

A. All equipment supplied as part of the infrared priority control system intended for use in the controller cabinet shall meet the following electrical and environmental specifications spelled out in the NEMA Standards Publication TS2 1992, Part 2:

2. Power source frequency per NEMA TS2 1992, Paragraph 2.1.3.
4. Temperature range per NEMA TS2 1992, Paragraph 2.1.5.1.

B. Each piece of equipment supplied as part of the priority control system intended for use in or on priority vehicles shall operate properly across the entire spectrum of combinations of environmental conditions (temperature range, relative humidity, vehicle battery voltage) per the individual component specifications.
V. QUALIFICATIONS

A. The manufacturer of the required infrared priority control system shall verify the proven, safe operation of the system’s infrared communication technology. Upon request, the manufacturer shall produce a list of 20 user agencies having two years or more experience interfacing priority control equipment with electromechanical, solid state and programmable controller types.

B. The manufacturer shall demonstrate the ability to finance ongoing technical support, written product warranties, and responsibility for product failure.

C. Upon request, the manufacturer shall produce a copy of its last full year and four previous year’s corporate financial statements.

D. The manufacturer shall have an independent quality department that has complete authority to control product integrity and is answerable only to the senior officer of the organization.

VI. RESPONSIBILITIES

A. The manufacturer of the required infrared priority control system and/or the manufacturer’s representative shall provide responsive service before, during and after installation of the priority control system. The manufacturer and/or the manufacturer’s representative, as consultants to the installer, shall provide certified, trained technicians having traffic systems industry experience and operational knowledge of priority control systems.

B. The lowest fully responsive bidder shall be required to supply working production components specified in this Specification within 14 calendar days from the bid opening date. Failure to do so shall render the bid nonresponsive.

C. Paragraph B (above) shall not be required if, prior to the bid opening, the bidder demonstrated to the City that the equipment bid meets these specifications.

VII. SUBSTANTIATED WARRANTY

A. The manufacturer of the required infrared priority control system shall warrant that, provided the priority control system has been properly installed, operated and maintained, component parts of a matched component system (see Section II) that prove to be defective in workmanship and/or material during the first five (5) years from the date of shipment from the manufacturer shall be covered in a documented system-protection plan, plus
provide an added five-year maintenance coverage for repair or replacement at a fixed deductible charge for a total of ten (10) years of product coverage.

The manufacturer must substantiate its financial ability to respond to warranty claims. The guarantee shall be determined in reference to the manufacturer's business assets and financial experience over the preceding five-year period.

B. In addition, upon request, the manufacturer shall provide documentation proving ability to financially support the ten (10) year provisions of the warranty/maintenance period. Documentation shall include appropriate financial reports for the previous five business years.

C. The protection plan shall warrant that component parts of a matched component system that are not subject to coverage limitations and prove to be defective in workmanship and/or material during the first five (5) years from the date of shipment from manufacturer shall be repaired at no charge, and that extended coverage with a fixed repair deductible shall be available for an additional five (5) years.

D. In total, the warranty/maintenance coverage must assure that system components shall be available to allow system operation during the ten (10) year warranty/maintenance coverage.

E. A copy of the manufacturer's written warranty outlining the conditions stated above shall be supplied with the bid. Coverage and coverage limitations are to be administered as detailed in the manufacturer's Warranty/Maintenance document.

VIII. CERTIFICATE OF INSURANCE

The manufacturer of the required infrared priority control system shall provide a certificate of product liability insurance protection for $5,000,000 assuring the priority control user that the manufacturer is insured against civil damages if proven to be at fault for an accident due to equipment failure within the system of matched priority control components. This certificate, however, need not, and is not meant to, provide liability insurance protection to the priority control system dealer, installer or user.

IX. USER SUPPORT SERVICES

The manufacturer of the required infrared priority control system shall offer support programs to assist the purchase and implementation of a priority control system program, including:

a. A preferred lease program to finance purchase of a system.
b. Public relations assistance to promote the system within the user community.

c. Intersection survey service to document appropriate equipment interfaces.

d. Customized proposals to assist the procurement process.

e. Driver Training Program

X. CERTIFICATION

The manufacturer of the required infrared priority control system shall certify that all component products are designed, manufactured and tested as a system of matched components and shall meet or exceed the requirements of this specification.

XI. SYSTEM OPERATION

The Contractor shall demonstrate that all of the components of each system are compatible and will perform satisfactorily as a system.

Operating sequence shall be initiated when the detector receives optical energy of the required identification code and sequential flash rate from an emitter.

Detector shall transform the optical energy signals into electrical signals and transmit the electrical signals to the phase selector module for processing.

The phase selector module shall place a logical true call (high priority) or a pulsing logical true call (6.25 Hz square wave for second priority) into the signal controller to advance to and hold the green display, which grants right-of-way to the authorized vehicle(s) displaying the optical energy pulses.

When a preemption call is registered while the controller is serving a vehicular phase or phase combination other than the preemption phase(s) called for, a clearance interval for the phase(s) in conflict shall be displayed immediately after the minimum green period. If a preemption call is registered while the controller is servicing the preemption phase or phase combination called for, the controller shall remain in that phase or phase combination at least four (4) seconds after the call drops out. If a preemption call is registered while the controller is servicing a pedestrian call, the controller shall immediately terminate the WALK indication and time a separately programmable flashing DONT WALK indication before serving the preemption phase(s) called for.

Phase selector module shall obtain and hold the desired green display(s) for a minimum of four (4) seconds, even if the optical energy signals cease before entering the preempt green display(s).
Phase selector module shall allow the signal controller to resume normal operation 6 to 10 seconds after optical energy signals are lost, if the optical energy signals are lost after entering the pre-empt green display(s).

Preemption equipment shall be installed in such a manner that the internal wiring of the controller, as normally furnished by the manufacturer, is not altered.

Phase selector module shall provide for assigning right-of-way to one of two (1 of 2) priority levels on either of two (2) channels. Priority is given on a first-detected, first served basis, except that a high priority optical transmission shall have precedence over a low priority optical transmission when both are detected concurrently.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing the work described in this section (10-3.28) shall be included in the contract price paid for various items and no additional compensation shall be allowed therefor.

86-2.50 Street Light Removal and Installation

The street lighting system shall fully conform with the National Electrical Code and City of Stockton Standard Specifications and details.

The work shall consist of removal and installation of street lights in connection with operating under this contract using new material where necessary.

The Contractor shall take care in removing and/or relocating the existing street light and transport to the City corporation yard. When the existing street light is damaged and new material is necessary, such material shall be a replacement of the original and shall be paid for at the Contractor's expense.

The Contractor shall coordinate the removal of street lights on utility poles with PG&E.

Existing foundations shall be removed and disposed off-site. New foundations for street lights shall be Class B concrete. The concrete foundation shall be constructed on material that has been compacted to 95% relative density before excavating for foundation. The foundation shall be cast monolithically up to the top two (2) inches, which shall be placed after the standards have been plumbed. After each standard is in proper position, mortar shall be placed under the base plate. The exposed portions shall be formed to present a neat appearance and approved by the Engineer. Mortar shall consist of one (1) part by volume of portland cement and three (3) parts of clean sand, shall contain only sufficient moisture to permit packing and shall be cured by keeping it damp for three (3) days.

High strength anchor bolts, nuts, and washers shall conform to ASTM designation A-235 and shall be galvanized.
The upper threaded portion of all anchor bolts shall be provided with two (2) nuts and two (2) washers each.

Welding shall not be performed on any portion of the body of high-strength anchor bolts.

Plumbing of the lighting standards shall be accomplished by adjusting the leveling nuts before placing mortar or before the foundation is finished to final grade. Shims or other similar devices shall not be used for plumbing or raking of standards.

Both forms and ground, which will be in contact with the concrete, shall be thoroughly moistened before placing concrete. Forms shall not be removed until the concrete has thoroughly set.

Where obstructions prevent the construction of the planned foundations, the Contractor shall construct an effective foundation, as approved by the Engineer.

Poles shall not be erected until the foundation has set for at least seven (7) days.

Forms shall be true to line and grade. Tops of foundation for poles shall be finished to curb or sidewalk grade, or as directed by the Engineer. Conduit ends and anchor bolts shall be placed in proper position and to proper height and shall be held in place by means of a template until the concrete sets. Anchor bolt extenders will not be allowed.

The contract lump sum price paid for street lighting shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in verifying street lighting conduit location (including potholing), removal of existing street lights and foundations, excavating, furnishing new material where necessary, installing street lights, reconnecting to existing street lighting system, all associated conductors, conduit, and pull boxes, to construct a complete and functioning street lighting system complete in place, as shown on the plans, as specified in the Standard Specifications, these Specifications, and as directed by the Engineer.

86-2.51 Temporary Lighting System

The temporary lighting system shall consist of installing and maintaining temporary lighting in conformance with the details shown on the plans entitled "Temporary Lighting, the provisions in Section 86, " Signals, Lighting and Electrical Systems," of the Standard Specifications, and these special provisions.

The provisions in this section shall not relieve the Contractor from the responsibility to provide the additional devices or take the measures as may be necessary to conform to the provisions in Section 7-1.04, "Public Safety," of the Standard Specifications.
All materials and equipment for a temporary lighting system including, but not limited to, mast arms, luminaires, wood poles, conductors, wiring, and hardware shall be furnished by the Contractor.

Materials and equipment to be used in the temporary lighting system shall be either new or used suitable for the intended use.

Maintaining a temporary lighting system shall be the sole responsibility of the Contractor.

Upon completion of the work requiring temporary lighting, as determined by the Engineer, all components of the temporary lighting system shall be removed.

Materials and equipment shall become the property of the Contractor and shall be disposed of in conformance with the provisions in the Standard Specifications. Pole holes shall be backfilled.

86-2.51A Payment

The contract lump sum price paid for temporary lighting systems shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing, maintaining, and removing the temporary lighting, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.