ITEM NO. 11

STAFF REPORT

DATE: JUNE 21, 2022

TO: HONORABLE MAYOR AND CITY COUNCIL MEMBERS

FROM: BILL SMITH, CITY MANAGER

PREPARED BY: BRIAN DICKINSON, PUBLIC WORKS AND UTILITY SERVICES DIRECTOR

SUBJECT: APPROVE CONTRACT AWARD TO THREE PEAKS CORP FOR THE DOWNTOWN PASEO IMPROVEMENT PROJECT.

RECOMMENDED ACTION

Staff recommends that the City Council take the following action:

Award a contract for the Downtown Paseo Improvement Project to Three Peaks Corp as the lowest responsive and responsible bidder for $496,988.50.

BACKGROUND

The City of Colton received a SB 848 Grant from the California Natural Resources Agency ($600,000) to redevelop and enhance a pedestrian walkway in the City's downtown area ("Downtown Pedestrian Paseo"). The City's Downtown Design Manual, adopted in August 2016, identified two pedestrian paseos, of which this is the first segment to receive grant funding.

The project is approximately 484 feet long and 20 feet wide alley, extends from La Cadena Drive on the east to 7th Street on the west. The walkway has become extremely blighted over the past several years, with trash accumulation, homeless camping, graffiti and crime being ongoing concerns. The intent of this improvement project is to create a safe and inviting pedestrian path in the heart of downtown, develop a new community event/gathering space, and foster exterior upgrades to the surrounding businesses. The project scope of works include concrete, landscaping, lighting, shade structures, entry monuments, sitting areas and other amenities.

ISSUES/ANALYSIS

On January 28, 2022, the project was re-bid with adjustments made to the scope of work and optional bid items added. On April 17, 2022, the City received the following bids:

1. Three Peaks Corporation $ 295,988.50
2. Gentry General Engineering Inc. $ 773,450.61

The apparent lowest bid for $295,988.50 allowed for staff to incorporate optional bid items and remain within budget.

Three Peaks Corporation bid	$ 295,988.50
Optional Bid items	$ 201,000.00
Total to be awarded	$ 496,988.50

The current project scope includes removal of building overhangs from three buildings, removal and replacement of all hardscape across the entire alley. Installation of new "Downtown Paseo" Entry Monument Signs, Installation of overhead string lighting, landscape & Irrigation, electrical work, Drainage work, Center Court Shade Structure. With the adjustment made to the scope of work, we were able to complete work across the entire length of the alley and provide room for future improvements.

FISCAL IMPACTS

Sufficient appropriations are available in the following Miscellaneous Grants Fund and Local Fiscal Recovery Fund Accounts in the adopted FY2021-22 and FY2022-23 budget for the project:

Downtown Paseo Pedestrian Improvement Project:

a. 225-6300-6306-3890-0000-000 $428,598.10
b. 219-2332-1000-3890-0000-000 $ 68,390.40

ALTERNATIVES

1. Provide alternative direction to staff.

ATTACHMENT

1. Contract Three Peaks Corp

CONTRACT

THIS CONTRACT is made this 07 day of June, 2022, in the County of San Bernardino, State of California, by and between the City of Colton, hereinafter called City, and Three Peaks Corporation, hereinafter called Contractor. The City and the Contractor for the considerations stated herein agree as follows:

ARTICLE 1. SCOPE OF WORK. The Contractor shall perform all Work within the time stipulated the Contract and shall provide all labor, materials, equipment, tools, utility services, and transportation to complete all of the Work required in strict compliance with the Contract Documents as specified in Article 5 below for the following Project:

DOWNTOWN PASEO RENOVATION PROJECT

The Contractor and its surety shall be liable to the City for any damages arising as a result of the Contractor's failure to comply with this obligation.

ARTICLE 2. TIME FOR COMPLETION. The Work shall be commenced on the date stated in the City's Notice to Proceed. The Contractor shall complete all Work required by the Contract Documents within **One Hundred Twenty (120)** calendar days from the commencement date stated in the Notice to Proceed. By its signature hereunder, Contractor agrees the time for completion set forth above is adequate and reasonable to complete the Work.

ARTICLE 3. CONTRACT PRICE. The City shall pay to the Contractor as full compensation for the performance of the Contract, subject to any additions or deductions as provided in the Contract Documents, and including all applicable taxes and costs, the sum of Four Hundred Ninety Six Thousand Nine hundred Eighty eight Dollars and Fifty Cents ($496,988.50). Payment shall be made as set forth in the General Conditions.

ARTICLE 4. LIQUIDATED DAMAGES. In accordance with Government Code section 53069.85, it is agreed that the Contractor will pay the City the sum of $250.00 for each and every calendar day of delay beyond the time prescribed in the Contract Documents for finishing the Work, as Liquidated Damages and not as a penalty or forfeiture. In the event this is not paid, the Contractor agrees the City may deduct that amount from any money due or that may become due the Contractor under the Contract. This Article does not exclude recovery of other damages specified in the Contract Documents.

ARTICLE 5. COMPONENT PARTS OF THE CONTRACT. The "Contract Documents" include the following:

Notice Inviting Bids
Instructions to Bidders
Contractor's Bid Forms
Contractor's Certificate Regarding Workers' Compensation
Bid Bond
Designation of Subcontractors

Information Required of Bidders
Non-Collusion Affidavit form
Contract
Performance Bond
Payment (Labor and Materials) Bond
General Conditions
Special Provisions (or Special Conditions)
Technical Specifications
Greenbook Standard Specifications (Sections 1-9 Excluded)
Addenda
Plans and Contract Drawings
Approved and fully executed change orders
Any other documents contained in or incorporated into the Contract

The Contactor shall complete the Work in strict accordance with all of the Contract Documents.

All of the Contract Documents are intended to be complementary. Work required by one of the Contract Documents and not by others shall be done as if required by all. This Contract shall supersede any prior agreement of the parties.

ARTICLE 6. PROVISIONS REQUIRED BY LAW. Each and every provision of law required to be included in these Contract Documents shall be deemed to be included in these Contract Documents. The Contractor shall comply with all requirements of applicable federal, state and local laws, rules and regulations, including, but not limited to, the provisions of the California Labor Code and California Public Contract Code which are applicable to this Project.

ARTICLE 7. INDEMNIFICATION. Contractor shall provide indemnification as set forth in the General Conditions.

ARTICLE 8. PREVAILING WAGES. Contractor shall be required to pay the prevailing rate of wages in accordance with the Labor Code which such rates shall be made available at Public Works Department or may be obtained online at http//www.dir.ca.gov/dlsr. and which must be posted at the job site. If the Work involves federal funds or otherwise requires compliance with the Davis-Bacon Fair Labor Standards Act, the Contractor and all its subcontractors shall comply with the higher of the state or federal prevailing wage rates.

IN WITNESS WHEREOF, this Contract has been duly executed by the above-named parties, on the day and year above written.

CITY OF COLTON	[NAME OF CONTRACTOR]
By: _____ Signature _____ Name _____ Title **Attest:** _____ City Clerk **Recommended By:** _____ Signature _____ Name _____ Title	**By:** _____ Signature _____ Name _____ Title _____ License Number

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS,_____(hereinafter referred to as "City") has awarded to_____, (hereinafter referred to as the "Contractor") _____an agreement for_____(hereinafter referred to as the "Project").

WHEREAS, the work to be performed by the Contractor is more particularly set forth in the Contract Documents for the Project dated_____, (hereinafter referred to as "Contract Documents"), the terms and conditions of which are expressly incorporated herein by reference; and

WHEREAS, the Contractor is required by said Contract Documents to perform the terms thereof and to furnish a bond for the faithful performance of said Contract Documents.

NOW, THEREFORE, we,_____, the undersigned Contractor and _____as Surety, a corporation organized and duly authorized to transact business under the laws of the State of California, are held and firmly bound unto the City in the sum of _____DOLLARS, ($_____), said sum being not less than one hundred percent (100%) of the total amount of the Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Contractor, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the Contract Documents and any alteration thereof made as therein provided, on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill all obligations including the one-year guarantee of all materials and workmanship; and shall indemnify and save harmless the City, its officers and agents, as stipulated in said Contract Documents, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees including reasonable attorney's fees, incurred by City in enforcing such obligation.

As a condition precedent to the satisfactory completion of the Contract Documents, unless otherwise provided for in the Contract Documents, the above obligation shall hold good for a period of one (1) year after the acceptance of the work by City, during which time if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the City from loss or damage resulting from or caused by defective materials or faulty workmanship. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the City's rights or the Contractor or Surety's obligations under the

Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

Whenever Contractor shall be, and is declared by the City to be, in default under the Contract Documents, the Surety shall remedy the default pursuant to the Contract Documents, or shall promptly, at the City's option:

(1) Take over and complete the Project in accordance with all terms and conditions in the Contract Documents; or

(2) Obtain a bid or bids for completing the Project in accordance with all terms and conditions in the Contract Documents and upon determination by Surety of the lowest responsive and responsible bidder, arrange for a Contract between such bidder, the Surety and the City, and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the City under the Contract and any modification thereto, less any amount previously paid by the City to the Contractor and any other set offs pursuant to the Contract Documents.

(3) Permit the City to complete the Project in any manner consistent with California law and make available as work progresses sufficient funds to pay the cost of completion of the Project, less the balance of the contract price, including other costs and damages for which Surety may be liable. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable to Contractor by the City under the Contract and any modification thereto, less any amount previously paid by the City to the Contractor and any other set offs pursuant to the Contract Documents.

Surety expressly agrees that the City may reject any contractor or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Contractor.

Surety shall not utilize Contractor in completing the Project nor shall Surety accept a bid from Contractor for completion of the Project if the CITY, when declaring the Contractor in default, notifies Surety of the City's objection to Contractor's further participation in the completion of the Project.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project to be performed thereunder shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract Documents or to the Project.

[Remainder of Page Left Intentionally Blank.]

IN WITNESS WHEREOF, we have hereunto set our hands and seals this_____day of _____, 2016.

_____
CONTRACTOR/PRINCIPAL

_____
Name

By_____

SURETY:

By: Attorney-In-Fact

The rate of premium on this bond is_____per thousand. The total amount of premium charges, $_____.
(The above must be filled in by corporate attorney.)

THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety) _____

_____

_____

(Name and Address of Agent or Representative for service of process in California, if different from above) _____

_____

_____

(Telephone number of Surety and Agent or Representative for service of process in California _____

STATE OF CALIFORNIA)
) ss.
CITY OF_____)

On this_____day of_____, in the year 2015, before me, _____, a Notary Public in and for said state, personally appeared _____, known to me to be the person whose name is subscribed to the within instrument as the Attorney-In-Fact of the (Surety) acknowledged to me that he subscribed the name of the_____(Surety) thereto and his own name as Attorney-In-Fact.

_____
Notary Public in and for said State

(SEAL)

Commission expires: _____

NOTE: A copy of the Power-of-Attorney to local representatives of the bonding company must be attached hereto.

PAYMENT BOND (LABOR AND MATERIALS)

KNOW ALL MEN BY THESE PRESENTS That

WHEREAS, the City of Colton (hereinafter designated as the "City"), by action taken or a resolution passed_____, 20 has awarded to_____hereinafter designated as the "Principal," a contract for the work described as follows: _____ (the "Project"); and

WHEREAS, said Principal is required to furnish a bond in connection with said contract; providing that if said Principal or any of its Subcontractors shall fail to pay for any materials, provisions, provender, equipment, or other supplies used in, upon, for or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, or for amounts due under the Unemployment Insurance Code or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of said Principal and its Subcontractors with respect to such work or labor the Surety on this bond will pay for the same to the extent hereinafter set forth.

NOW THEREFORE, we, the Principal and_____as Surety, are held and firmly bound unto the City in the penal sum of_____Dollars ($_____) lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, his or its subcontractors, heirs, executors, administrators, successors or assigns, shall fail to pay any of the persons named in Section 3181 of the Civil Code, fail to pay for any materials, provisions or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department or Franchise Tax Board from the wages of employees of the contractor and his subcontractors pursuant to Section 18663 of the Revenue and Taxation Code, with respect to such work and labor the Surety or Sureties will pay for the same, in an amount not exceeding the sum herein above specified, and also, in case suit is brought upon this bond, all litigation expenses incurred by the City in such suit, including reasonable attorneys' fees, court costs, expert witness fees and investigation expenses.

This bond shall inure to the benefit of any of the persons named in Section 3181 of the Civil Code so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

It is further stipulated and agreed that the Surety on this bond shall not be exonerated or released from the obligation of this bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described, or pertaining or relating to the furnishing of labor, materials, or equipment therefore, nor by any change or modification of

any terms of payment or extension of the time for any payment pertaining or relating to any scheme or work of improvement herein above described, nor by any rescission or attempted rescission or attempted rescission of the contract, agreement or bond, nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond, nor by any fraud practiced by any person other than the claimant seeking to recover on the bond and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given, and under no circumstances shall Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the owner or City and original contractor or on the part of any obligee named in such bond, but the sole conditions of recovery shall be that claimant is a person described in Section 3110 or 3112 of the Civil Code, and has not been paid the full amount of his claim and that Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed unoriginal thereof, have been duly executed by the Principal and Surety above named, on the day of_____20_____the name and corporate seal of each corporate party being hereto affixed and these presents duly signed b its undersigned representative pursuant to authority of its governing body.

(Corporate Seal of Principal,
if corporation)

_____
Principal (Property Name of Contractor)

By_____
(Signature of Contractor)

(Seal of Surety)

_____
Surety

By _____
Attorney in Fact

(Attached Attorney-In-Fact
Certificate and Required
Acknowledgements)

*Note: Appropriate Notarial Acknowledgments of Execution by Contractor and +surety and a power of Attorney MUST BE ATTACHED.

GENERAL CONDITIONS

ARTICLE 1. DEFINITIONS

a. Acceptable, Acceptance or words of similar import shall be understood to be the acceptance of the Engineer and/or the City .

b. Act of God an Act of God is an earthquake of magnitude 3.5 on the Richter scale and tidal waves.

c. Approval means written authorization by Engineer and/or City .

d. Contract Documents includes all documents as stated in the Contract.

e. City and Contractor are those stated in the Contract. The terms City and Owner may be used interchangeably.

f. Day shall mean calendar day unless otherwise specifically designated.

g. Engineer shall mean the General Manager, or his or her designee, of the Department of Public Works for the City of Colton, acting either directly or through properly authorized agents, such as agents acting within the scope of the particular duties entrusted to them. Also sometimes referred to as the "City's Representative" or "Representative" in the Contract Documents.

h. Equal, Equivalent, Satisfactory, Directed, Designated, Selected, As Required and similar words shall mean the written approval, selection, satisfaction, direction, or similar action of the Engineer and/or City.

i. Indicated, Shown, Detailed, Noted, Scheduled or words of similar meaning shall mean that reference is made to the drawings, unless otherwise noted. It shall be understood that the direction, designation, selection, or similar import of the Engineer and/or City is intended, unless stated otherwise.

j. Install means the complete installation of any item, equipment or material.

k. Material shall include machinery, equipment, manufactured articles, or construction such as form work, fasteners, etc., and any other classes of material to be furnished in connection with the Contract. All materials shall be new unless specified otherwise.

l. Perform shall mean that the Contractor, at Contractor's expense, shall take all actions necessary to complete The Work, including furnishing of necessary labor, tools, and equipment, and providing and installing Materials that are indicated, specified, or required to complete such performance.

m. Project is The Work planned by City as provided in the Contract Documents.

n. Provide shall include provide complete in place, that is furnish, install, test and make ready for use.

o. Recyclable Waste Materials shall mean materials removed from the Project site which are required to be diverted to a recycling center rather than an area landfill. Recyclable Waste Materials include asphalt, concrete, brick, concrete block, and rock.

p. Specifications means that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the work. Except for Sections 1-9 of the Standard Specifications for Public Works Construction ("Greenbook"), 2016 Edition which are specifically excluded from incorporation into these Contract Documents, the Work shall be done in accordance with the Greenbook, including all current supplements, addenda, and revisions thereof. In the case of conflict between the Greenbook and the Contract Documents, the Contract Documents shall prevail.

q. The Work means the entire improvement planned by the City pursuant to the Contract Documents.

r. Work means labor, equipment and materials incorporated in, or to be incorporated in the construction covered by the Contract Documents.

ARTICLE 2. CONTRACT DOCUMENTS

a. **Contract Documents**. The Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all.

b. **Interpretations**. The Contract Documents are intended to be fully cooperative and to be complementary. If Contractor observes that any documents are in conflict, the Contractor shall promptly notify the Engineer in writing. In case of conflicts between the Contract Documents, the order of precedence shall be as follows:

1. Change Orders or Work Change Directives
2. Addenda
3. Special Provisions (or Special Conditions)
4. Technical Specifications
5. Plans (Contract Drawings)
6. Contract
7. General Conditions
8. Instructions to Bidders
9. Notice Inviting Bids
10. Contractor's Bid Forms
11. Greenbook Standard Specifications (Sections 1-9 Excluded)
12. Standard Plans
13. Reference Documents

With reference to the Drawings, the order of precedence shall be as follows:

1. Figures govern over scaled dimensions
2. Detail drawings govern over general drawings
3. Addenda or Change Order drawings govern over Contract Drawings
4. Contract Drawings govern over Standard Drawings
5. Contract Drawings govern over Shop Drawings

c. **Conflicts in Contract Documents**. Notwithstanding the orders of precedence established above, in the event of conflicts, the higher standard shall always apply.

d. **Organization of Contract Documents**. Organization of the Contract Documents into divisions, sections, and articles, and arrangement of drawings shall not control the Contractor in dividing The Work among subcontractors or in establishing the extent of Work to be performed by any trade.

ARTICLE 3. CONTRACTS DOCUMENTS: COPIES & MAINTENANCE

Contractor will be furnished, free of charge, **five (5)** copies of the Contract Documents. Additional copies may be obtained at cost of reproduction.

Contractor shall maintain a clean, undamaged set of Contract Documents at the Project site.

ARTICLE 4. DETAIL DRAWINGS AND INSTRUCTIONS

a. **Examination of Contract Documents.** Before commencing any portion of The Work, Contractor shall again carefully examine all applicable Contract Documents, the Project site and other information given to Contractor as to materials and methods of construction and other Project requirements. Contractor shall immediately notify the Engineer of any potential error, inconsistency, ambiguity, conflict or lack of detail or explanation. If Contractor performs, permits, or causes the performance of any Work which is in error, inconsistent or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all resulting costs, including, without limitation, the cost of correction. In no case shall the Contractor or any subcontractor proceed with Work if uncertain as to the applicable requirements.

b. **Additional Instructions.** After notification of any error, inconsistency, ambiguity, conflict or lack of detail or explanation, the Engineer will provide any required additional instructions, by means of drawings or other written direction, necessary for proper execution of Work.

c. **Quality of Parts, Construction and Finish.** All parts of The Work shall be of the best quality of their respective kinds and the Contractor must use all diligence to inform itself fully as to the required construction and finish. In no case shall Contractor proceed with The Work without obtaining first from the Engineer such Approval may be necessary for the proper performance of Work.

d. **Contractor's Variation from Contract Document Requirements.** If it is found that the Contractor has varied from the requirements of the Contract Documents including the requirement to comply with all applicable laws, ordinances, rules and regulations, the

Engineer may at any time, before or after completion of the Work, order the improper Work removed, remade or replaced by the Contractor at the Contractor's expense.

ARTICLE 5. EXISTENCE OF UTILITIES AT THE WORK SITE

a. The City has endeavored to determine the existence of utilities at the Project site from the records of the owners of known utilities in the vicinity of the Project. The positions of these utilities as derived from such records are shown on the Plans.

b. No excavations were made to verify the locations shown for underground utilities. The service connections to these utilities are not shown on the plans. It shall be the responsibility of the Contractor to determine the exact location of all service connections. The Contractor shall make its own investigations, including exploratory excavations, to determine the locations and type of service connections, prior to commencing Work which could result in damage to such utilities. The Contractor shall immediately notify the City in writing of any utility discovered in a different position than shown on the Plans or which is not shown on the Plans.

c. All water meters, water valves, fire hydrants, electrical utility vaults, telephone vaults, gas utility valves, and other subsurface structures shall be relocated or adjusted to final grade by the Contractor. Locations of existing utilities shown on the Plans are approximate and may not be complete. The Contractor shall be responsible for coordinating its Work with all utility companies during the construction of The Work.

d. Notwithstanding the above, pursuant to Section 4215 of the Government Code, the City has the responsibility to identify, with reasonable accuracy, main or trunkline facilities on the plans and specifications. In the event that main or trunkline utility facilities are not identified with reasonable accuracy in the plans and specifications made a part of the invitation for bids, City shall assume the responsibility for their timely removal, relocation, or protection.

e. Contractor, except in an emergency, shall contact the appropriate regional notification center, Southern California Underground Service Alert at 1-800-227-2600 at least two working days prior to commencing any excavation if the excavation will be performed in an area which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the City, and obtain an inquiry identification number from that notification center. No excavation shall be commenced or carried out by the Contractor unless such an inquiry identification number has been assigned to the Contractor or any subcontractor of the Contractor and the City has been given the identification number by the Contractor.

ARTICLE 6. SCHEDULE

a. **Estimated Schedule.** Within fourteen (14) days after the issuance of the Notice to Proceed, Contractor shall prepare a Project schedule and shall submit this to the Engineer for Approval. The receipt or Approval of any schedules by the Engineer or the City shall not in any way relieve the Contractor of its obligations under the Contract Documents. The Contractor is fully responsible to determine and provide for any and all staffing and

resources at levels which allow for good quality and timely completion of the Project. Contractor's failure to incorporate all elements of Work required for the performance of the Contract or any inaccuracy in the schedule shall not excuse the Contractor from performing all Work required for a completed Project within the specified Contract time period. If the required schedule is not received by the time the first payment under the Contract is due, Contractor shall not be paid until the schedule is received, reviewed and accepted by the Engineer.

b. **Schedule Contents.** The schedule shall allow enough time for inclement weather. The schedule shall indicate the beginning and completion dates of all phases of construction; critical path for all critical, sequential time related activities; and "float time" for all "slack" or "gaps" in the non-critical activities. The schedule shall clearly identify all staffing and other resources which in the Contractor's judgment are needed to complete the Project within the time specified for completion. Schedule duration shall match the Contract time. Schedules indicating early completion will be rejected.

c. **Schedule Updates.** Contractor shall continuously update its construction schedule. Contractor shall submit an updated and accurate construction schedule to the Engineer whenever requested to do so by Engineer and with each progress payment request. The Engineer may withhold progress payments or other amounts due under the Contract Documents if Contractor fails to submit an updated and accurate construction schedule.

ARTICLE 7. SUBSTITUTIONS

a. Pursuant to Public Contract Code Section 3400(b) the City may make a finding that is described in the invitation for bids that designates certain products, things, or services by specific brand or trade name.

b. Unless specifically designated in the Contract Documents, whenever any material, process, or article is indicated or specified by grade, patent, or proprietary name or by name of manufacturer, such Specifications shall be deemed to be used for the purpose of facilitating the description of the material, process or article desired and shall be deemed to be followed by the words "or equal." Contractor may, unless otherwise stated, offer for substitution any material, process or article which shall be substantially equal or better in every respect to that so indicated or specified in the Contract Documents. However, the City may have adopted certain uniform standards for certain materials, processes and articles.

c. Contractor shall submit requests, together with substantiating data, for substitution of any "or equal" material, process or article no later than thirty-five (35) days after award of the Contract. To facilitate the construction schedule and sequencing, some requests may need to be submitted before thirty-five (35) days after award of Contract. Provisions regarding submission of "or equal" requests shall not in any way authorize an extension of time for performance of this Contract. If a proposed "or equal" substitution request is rejected, Contractor shall be responsible for providing the specified material, process or article. The burden of proof as to the equality of any material, process or article shall rest with the Contractor. The City has the complete and sole discretion to determine if a material, process or article is an "or equal" material, process or article that may be substituted.

d. Data required to substantiate requests for substitutions of an "or equal" material, process or article data shall include a signed affidavit from the Contractor stating that, and describing how, the substituted "or equal" material, process or article is equivalent to that specified in every way except as listed on the affidavit. Substantiating data shall include any and all illustrations, specifications, and other relevant data including catalog information which describes the requested substituted "or equal" material, process or article, and substantiates that it is an "or equal" to the material, process or article. The substantiating data must also include information regarding the durability and lifecycle cost of the requested substituted "or equal" material, process or article. Failure to submit all the required substantiating data, including the signed affidavit, to the City in a timely fashion will result in the rejection of the proposed substitution.

e. The Contractor shall bear all of the City's costs associated with the review of substitution requests.

f. The Contractor shall be responsible for all costs related to a substituted "or equal" material, process or article.

g. Contractor is directed to the Special Conditions (if any) to review any findings made pursuant to Public Contract Code section 3400.

ARTICLE 8. SHOP DRAWINGS

a. Contractor shall check and verify all field measurements and shall submit with such promptness as to provide adequate time for review and cause no delay in his own Work or in that of any other contractor, subcontractor, or worker on the Project, six (6) copies of all shop or setting drawings, calculations, schedules, and materials list, and all other provisions required by the Contract. Contractor shall sign all submittals affirming that submittals have been reviewed and approved by Contractor prior to submission to Engineer. Each signed submittal shall affirm that the submittal meets all the requirements of the Contract Documents except as specifically and clearly noted and listed on the cover sheet of the submittal.

b. Contractor shall make any corrections required by the Engineer, and file with the Engineer six (6) corrected copies each, and furnish such other copies as may be needed for completion of the Work. Engineer's approval of shop drawings shall not relieve Contractor from responsibility for deviations from the Contract Documents unless Contractor has, in writing, called Engineer's attention to such deviations at time of submission and has secured the Engineer's written Approval. Engineer's Approval of shop drawings shall not relieve Contractor from responsibility for errors in shop drawings.

ARTICLE 9. SUBMITTALS

a. Contractor shall furnish to the Engineer for approval, prior to purchasing or commencing any Work, a log of all samples, material lists and certifications, mix designs, schedules, and other submittals, as required in the specifications. The log shall indicate whether samples will be provided in accordance with other provisions of this Contract.

b. Contractor will provide samples and submittals, together with catalogs and supporting data required by the Engineer, to the Engineer within a reasonable time period to provide for adequate review and avoid delays in the Work.

c. These requirements shall not authorize any extension of time for performance of this Contract. Engineer will check and approve such samples, but only for conformance with design concept of work and for compliance with information given in the Contract Documents. Work shall be in accordance with approved samples and submittals.

ARTICLE 10. MATERIALS

a. Except as otherwise specifically stated in the Contract Documents, Contractor shall provide and pay for all materials, labor, tools, equipment, water, lights, power, transportation, superintendence, temporary constructions of every nature, and all other services and facilities of every nature whatsoever necessary to execute and complete this Contract within specified time.

b. Unless otherwise specified, all materials shall be new and the best of their respective kinds and grades as noted and/or specified, and workmanship shall be of good quality.

c. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress of The Work and shall be stored properly and protected as required by the Contract Documents. Contractor shall be entirely responsible for damage or loss by weather or other causes to materials or Work.

d. No materials, supplies, or equipment for Work under this Contract shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in the work and agrees upon completion of all work to deliver the Project, to the City free from any claims, liens, or charges.

e. Materials shall be stored on the Project site in such manner so as not to interfere with any operations of the City or any independent contractor.

ARTICLE 11. CONTRACTOR'S SUPERVISION

Contractor shall continuously keep at the Project site, a competent and experienced full-time Project superintendent approved by the City. Superintendent must be able to proficiently speak, read and write in English. Contractor shall continuously provide efficient supervision of the Project.

ARTICLE 12. WORKERS

a. Contractor shall at all times enforce strict discipline and good order among its employees. Contractor shall not employ on the Project any unfit person or any one not skilled in the Work assigned to him or her.

b. Any person in the employ of the Contractor whom the City may deem incompetent or unfit shall be dismissed from The Work and shall not be employed on this Project except with the written Approval of the City.

ARTICLE 13. SUBCONTRACTORS

a. Contractor agrees to bind every subcontractor to the terms of the Contract Documents as far as such terms are applicable to subcontractor's portion of The Work. Contractor shall be as fully responsible to the City for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by its subcontractors, as Contractor is for acts and omissions of persons directly employed by Contractor. Nothing contained in these Contract Documents shall create any contractual relationship between any subcontractor and the City.

b. The City reserves the right to Approve all subcontractors. The City's Approval of any subcontractor under this Contract shall not in any way relieve Contractor of its obligations in the Contract Documents.

c. Prior to substituting any subcontractor listed in the Bid Forms, Contractor must comply with the requirements of the Subletting and Subcontracting Fair Practices Act pursuant to California Public Contract Code section 4100 et seq.

ARTICLE 14. PERMITS AND LICENSES

Permits and licenses necessary for prosecution of The Work shall be secured and paid for by Contractor, unless otherwise specified in the Contract Documents.

a. Contractor shall obtain and pay for all other permits and licenses required for The Work, including excavation permit and for plumbing, mechanical and electrical work and for operations in or over public streets or right of way under jurisdiction of public agencies other than the City.

b. The Contractor shall arrange and pay for all off-site inspection of the Work related to permits and licenses, including certification, required by the specifications, drawings, or by governing authorities, except for such off-site inspections delineated as the City's responsibility pursuant to the Contract Documents.

c. Before Acceptance of the Project, the Contractor shall submit all licenses, permits, certificates of inspection and required approvals to the City.

ARTICLE 15. UTILITY USAGE

a. All temporary utilities, including but not limited to electricity, water, gas, and telephone, used on the Work shall be furnished and paid for by Contractor. Contractor shall Provide necessary temporary distribution systems, including meters, if necessary, from distribution points to points on The Work where the utility is needed. Upon completion of The Work, Contractor shall remove all temporary distribution systems.

b. Contractor shall provide necessary and adequate utilities and pay all costs for water, electricity, gas, oil, and sewer charges required for completion of the Project.

c. All permanent meters Installed shall be listed in the Contractor's name until Project Acceptance.

d. If the Contract is for construction in existing facilities, Contractor may, with prior written Approval of the City, use the City's existing utilities by compensating the City for utilities used by Contractor.

ARTICLE 16. INSPECTION FEES FOR PERMANENT UTILITIES

All inspection fees and other municipal charges for permanent utilities including, but not limited to, sewer, electrical, phone, gas, water, and irrigation shall be paid for by the City. Contractor shall be responsible for arranging the payment of such fees, but inspection fees and other municipal fees relating to permanent utilities shall be paid by the City. Contractor may either request reimbursement from the City for such fees, or shall be responsible for arranging and coordination with City for the payment of such fees.

ARTICLE 17. TRENCHES

a. Trenches Five Feet or More in Depth. The Contractor shall submit to the City, in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of any trench or trenches five feet or more in depth. If the plan varies from shoring system standards, the plan shall be prepared by a registered civil or structural engineer. The plan shall not be less effective than the shoring, bracing, sloping, or other provisions of the Construction Safety Orders, as defined in the California Code of Regulations.

b. Excavations Deeper than Four Feet. If work under this Contract involves digging trenches or other excavation that extends deeper than four feet below the surface, Contractor shall promptly, and before the following conditions are disturbed, notify the City, in writing, of any:

1) Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

2) Subsurface or latent physical conditions at the site differing from those indicated.

3) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

The City shall promptly investigate the conditions, and if it finds that the conditions do so materially differ, or do involve hazardous waste, and cause a decrease or increase in

Contractor's cost of, or the time required for, performance of any part of The Work, shall issue a change order under the procedures described in the Contract Documents.

In the event that a dispute arises between the City and the Contractor as to whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of The Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all Work to be performed under the Contract. Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the parties.

ARTICLE 18. DIVERSION OF RECYCLABLE WASTE MATERIALS

In compliance with the applicable City's waste reduction and recycling efforts, Contractor shall divert all Recyclable Waste Materials to appropriate recycling centers. Contractor will be required to submit weight tickets and written proof of diversion with its monthly progress payment requests. Contractor shall complete and execute any certification forms required by City or other applicable agencies to document Contractor's compliance with these diversion requirements. All costs incurred for these waste diversion efforts shall be the responsibility of the Contractor.

ARTICLE 19. REMOVAL OF HAZARDOUS MATERIALS

Should Contractor encounter material reasonably believed to be polychlorinated biphenyl (PCB) or other toxic wastes and hazardous materials which have not been rendered harmless at the Project site, the Contractor shall immediately stop work at the affected Project site and shall report the condition to the City in writing. The City shall contract for any services required to directly remove and/or abate PCBs and other toxic wastes and hazardous materials, if required by the Project site(s), and shall not require the Contractor to subcontract for such services. The Work in the affected area shall not thereafter be resumed except by written agreement of the City and Contractor.

ARTICLE 20. SANITARY FACILITIES

Contractor shall provide sanitary temporary toilet buildings for the use of all workers. All toilets shall comply with local codes and ordinances. Toilets shall be kept supplied with toilet paper and shall have workable door fasteners. Toilets shall be serviced no less than once weekly and shall be present in a quantity of not less than 1 per 20 workers as required by CAL-OSHA regulation. The toilets shall be maintained in a sanitary condition at all times. Use of toilet facilities in The Work under construction shall not be permitted. Any other Sanitary Facilities required by CAL- OSHA shall be the responsibility of the Contractor.

ARTICLE 21. AIR POLLUTION CONTROL

Contractor shall comply with all air pollution control rules, regulations, ordinances and statutes. All containers of paint, thinner, curing compound, solvent or liquid asphalt shall be labeled to indicate that the contents fully comply with the applicable material requirements.

ARTICLE 22. COMPLIANCE WITH STATE STORM WATER PERMIT

a. Contractor shall be required to comply with all conditions of the State Water Resources Control Board ("State Water Board") National Pollutant Discharge Elimination System General Permit for Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity ("Permit") for all construction activity which results in the disturbance of in excess of one acre of total land area or which is part of a larger common area of development or sale. Contractor shall be responsible for filing the Notice of Intent and for obtaining the Permit. Contractor shall be solely responsible for preparing and implementing a Storm Water Pollution Prevention Plan ("SWPPP") prior to initiating Work. In bidding on this Contract, it shall be Contractor's responsibility to evaluate the cost of procuring the Permit and preparing the SWPPP as well as complying with the SWPPP and any necessary revision to the SWPPP. Contractor shall comply with all requirements of the State Water Resources Control Board. Contractor shall include all costs of compliance with specified requirements in the Contract amount.

b. Contractor shall be responsible for procuring, implementing and complying with the provisions of the Permit and the SWPPP, including the standard provisions, monitoring and reporting requirements as required by the Permit. Contractor shall provide copies of all reports and monitoring information to the Engineer.

c. Contractor shall comply with the lawful requirements of any applicable municipality, the City, drainage district, and other local agencies regarding discharges of storm water to separate storm drain system or other watercourses under their jurisdiction, including applicable requirements in municipal storm water management programs.

d. Storm, surface, nuisance, or other waters may be encountered at various times during construction of The Work. Therefore, the Contractor, by submitting a Bid, hereby acknowledges that it has investigated the risk arising from such waters, has prepared its Bid accordingly, and assumes any and all risks and liabilities arising therefrom.

e. Failure to comply with the Permit is in violation of federal and state law. Contractor hereby agrees to indemnify and hold harmless City, its officials, officers, agents, employees and authorized volunteers from and against any and all claims, demands, losses or liabilities of any kind or nature which City, its officials, officers, agents, employees and authorized volunteers may sustain or incur for noncompliance with the Permit arising out of or in connection with the Project, except for liability resulting from the sole established negligence, willful misconduct or active negligence of the City, its officials, officers, agents, employees or authorized volunteers. City may seek damages from Contractor for delay in completing the Contract in accordance with the Contract Documents, caused by Contractor's failure to comply with the Permit.

ARTICLE 23. CLEANING UP

a. Contractor at all times shall keep premises free from debris such as waste, rubbish, and excess materials and equipment. Contractor shall not store debris under, in, or about the premises. Upon completion of Work, Contractor shall clean the interior and exterior of the

building or improvement including fixtures, equipment, walls, floors, ceilings, roofs, window sills and ledges, horizontal projections, and any areas where debris has collected so surfaces are free from foreign material or discoloration. Contractor shall clean and polish all glass, plumbing fixtures, and finish hardware and similar finish surfaces and equipment and contractor shall also remove temporary fencing, barricades, planking and construction toilet and similar temporary facilities from site. Contractor shall also clean all buildings, asphalt and concrete areas to the degree necessary to remove oil, grease, fuel, or other stains caused by Contractor operations or equipment.

b. Contractor shall fully clean up the site at the completion of The Work. If the Contractor fails to immediately clean up at the completion of The Work, the City may do so and the cost of such clean up shall be charged back to the Contractor.

ARTICLE 24. LAYOUT AND FIELD ENGINEERING

All field engineering required for laying out The Work and establishing grades for earthwork operations shall be furnished by the Contractor at its expense. Layout shall be done by a registered civil engineer Approved by the Engineer. Any required "as-built" drawings of the Work shall be prepared by the registered civil engineer.

ARTICLE 25. EXCESSIVE NOISE

a. The Contractor shall use only such equipment on the work and in such state of repair so that the emission of sound therefrom is within the noise tolerance level of that equipment as established by CAL-OSHA.

b. The Contractor shall comply with the most restrictive of the following: (1) local sound control and noise level rules, regulations and ordinances and (2) the requirements contained in these Contract Documents, including hours of operation requirements. No internal combustion engine shall be operated on the Project without a muffler of the type recommended by the manufacturer. Should any muffler or other control device sustain damage or be determined to be ineffective or defective, the Contractor shall promptly remove the equipment and shall not return said equipment to the job until the device is repaired or replaced. Said noise and vibration level requirements shall apply to all equipment on the job or related to the job, including but not limited to, trucks, transit mixers or transit equipment that may or may not be owned by the Contractor.

ARTICLE 26. TESTS AND INSPECTIONS

a. If the Contract Documents, the Engineer, or any instructions, laws, ordinances, or public authority require any part of The Work to be tested or Approved, Contractor shall provide the Engineer at least two (2) working days notice of its readiness for observation or inspection. If inspection is by a public authority other than the City, Contractor shall promptly inform the City of the date fixed for such inspection. Required certificates of inspection (or similar) shall be secured by Contractor. Costs for City testing and City

inspection shall be paid by the City. Costs of tests for Work found not to be in compliance shall be paid by the Contractor.

b. If any Work is done or covered up without the required testing or approval, the Contractor shall uncover or deconstruct the Work, and the Work shall be redone after completion of the testing at the Contractor's cost in compliance with the Contract Documents.

c. Where inspection and testing are to be conducted by an independent laboratory or agency, materials or samples of materials to be inspected or tested shall be selected by such laboratory or agency, or by the City, and not by Contractor. All tests or inspections of materials shall be made in accordance with the commonly recognized standards of national organizations.

d. In advance of manufacture of materials to be supplied by Contractor which must be tested or inspected, Contractor shall notify the City so that the City may arrange for testing at the source of supply. Any materials which have not satisfactorily passed such testing and inspection shall not be incorporated into The Work.

e. If the manufacture of materials to be inspected or tested will occur in a plant or location outside the geographic limits of City, the Contractor shall pay for any excessive or unusual costs associated with such testing or inspection, including but not limited to excessive travel time, standby time and required lodging.

f. Reexamination of Work may be ordered by the City. If so ordered, Work must be uncovered or deconstructed by Contractor. If Work is found to be in accordance with the Contract Documents, the City shall pay the costs of reexamination and reconstruction. If such work is found not to be in accordance with the Contract Documents, Contractor shall pay all costs.

ARTICLE 27. PROTECTION OF WORK AND PROPERTY

a. The Contractor shall be responsible for all damages to persons or property that occur as a result of The Work. Contractor shall be responsible for the proper care and protection of all materials delivered and Work performed until completion and final Acceptance by the City. All Work shall be solely at the Contractor's risk. Contractor shall adequately protect adjacent property from settlement or loss of lateral support as necessary. Contractor shall comply with all applicable safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the Project site where Work is being performed. Contractor shall erect and properly maintain at all times, as required by field conditions and progress of work, all necessary safeguards, signs, barriers, lights, and watchmen for protection of workers and the public, and shall post danger signs warning against hazards created in the course of construction.

b. In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization from the Engineer, is hereby permitted to act to prevent such threatened loss or injury; and Contractor shall so act, without appeal, if so authorized or instructed by the Engineer or the City. Any compensation claimed by

Contractor on account of emergency work shall be determined by and agreed upon by the City and the Contractor.

c. Contractor shall provide such heat, covering, and enclosures as are necessaryto protect all Work, materials, equipment, appliances, and tools against damage by weather conditions.

d. Contractor shall take adequate precautions to protect existing sidewalks, curbs, pavements, utilities, and other adjoining property and structures, and to avoid damage thereto, and Contractor shall repair any damage thereto caused by The Work operations. Contractor shall:

1) Enclose the working area with a substantial barricade, and arrange work to cause minimum amount of inconvenience and danger to the public.

2) Provide substantial barricades around any shrubs or trees indicated to be preserved.

3) Deliver materials to the Project site over a route designated by the Engineer.

4) Provide any and all dust control required and follow the Applicable air quality regulations as appropriate. If the Contractor does not comply, the City shall have the immediate authority to provide dust control and deduct the cost frompayments to the Contractor.

5) Confine Contractor's apparatus, the storage of materials, and the operations of its workers to limits required by law, ordinances, permits, or directions of the Engineer. Contractor shall not unreasonably encumber the Project site with its materials.

6) Take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed by accident, they shall be replaced by an approved civil engineer or land surveyor, at no cost to the City.

7) Ensure that existing facilities, fences and other structures are all adequately protected and that, upon completion of all Work, all facilities that may have been damaged are restored to a condition acceptable to the City.

8) Preserve and protect from injury all buildings, pole lines and all direction, warning and mileage signs that have been placed within the right-of-way.

9) At the completion of work each day, leave the Project site in a clean, safe condition.

10) Comply with any stage construction and traffic handling plans. Access to residences and businesses shall be maintained at all times.

These precautionary measures will apply continuously and not be limited to normal working hours. Full compensation for the Work involved in the preservation of life, safety and property as above specified shall be considered as included in the prices paid for the various contract items of Work, and no additional allowance will be made therefor.

e. Should damage to persons or property occur as a result of The Work, Contractor shall be responsible for proper investigation, documentation, including video or photography, to adequately memorialize and make a record of what transpired. The City shall be entitled to inspect and copy any such documentation, video, or photographs.

ARTICLE 28. CONTRACTORS MEANS AND METHODS

Contractor is solely responsible for the means and methods utilized to Perform The Work. In no case shall the Contractor's means and methods deviate from commonly used industry standards.

ARTICLE 29. INSPECTOR'S FIELD OFFICE

a. The Contractor shall be responsible for providing the inspector's field office. The Office shall be a substantial waterproof construction with adequate natural light and ventilation by means of stock design windows. Door shall have a key type lock or padlock clasp. The office shall have heating and air conditioning and shall be equipped with a telephone, a telephone answering machine, and a fax machine at Contractor's expense.

b. A table satisfactory for the study of plans and two chairs shall be Provided by Contractor. Contractor shall Provide and pay for adequate electric lights, local telephone service, and adequate heat and air conditioning for the field office until authorized removal.

ARTICLE 30. AUTHORIZED REPRESENTATIVES

The City shall designate representatives, who shall have the right to be present at the Project site at all times. The City may designate an inspector who shall have the right to observe all of the Contractor's Work. The inspector is not authorized to make changes in the Contract Documents. The inspector shall not be responsible for the Contractor's failure to carry out The Work in accordance with the Contract Documents. Contractor shall provide safe and proper facilities for such access.

ARTICLE 31. HOURS OF WORK

a. Eight (8) hours of work shall constitute a legal day's work. The Contractor and each subcontractor shall forfeit, as penalty to the City, twenty-five dollars ($25) for each worker employed in the execution of Work by the Contractor or any subcontractor for each day during which such worker is required or permitted to work more than eight (8) hours in any one day and forty (40) hours in any week in violation of the provisions of the Labor Code, and in particular, Section 1810 to Section 1815, except as provided in Labor Code Section 1815.

b. Work shall be accomplished on a regularly scheduled eight (8) hour per day work shift basis, Monday through Friday, between the hours of 7:00 a.m. and 5:00 p.m.

c. It shall be unlawful for any person to operate, permit, use, or cause to operate any of the following at the Project site, other than between the hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, with no Work allowed on City-observed holidays, unless otherwise Approved by the Engineer:

1) Powered Vehicles

2) Construction Equipment

3) Loading and Unloading Vehicles

4) Domestic Power Tool.

ARTICLE 32. PAYROLL RECORDS

a. Pursuant to Labor Code Section 1776, the Contractor and each subcontractor shall maintain weekly certified payroll records showing the name, address, social security number, work classification, straight time and overtime hours paid each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed in connection with the work. Contractor shall certify under penalty of perjury that records maintained and submitted by Contractor are true and accurate. Contractor shall also require subcontractor(s) to certify weekly payroll records under penalty of perjury.

b. The payroll records described herein shall be certified and submitted by the Contractor at a time designated by the City. The Contractor shall also provide the following:

1) A certified copy of the employee's payroll records shall be made available for inspection or furnished to such employee or his or her authorized representative on request.

2) A certified copy of all payroll records described herein shall be made available for inspection or furnished upon request of the Department of Industrial Relations ("DIR").

c. The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement ("DLSE") of the DIR or shall contain the same information as the forms provided by the DLSE.

d. Any copy of records made available for inspection and furnished upon request to the public shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the Contractor or any subcontractor shall not be marked or obliterated.

e. In the event of noncompliance with the requirements of this Section, the Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying any item or actions necessary to ensure compliance with this section. Should noncompliance still be evident after such ten (10) day period, the Contractor shall, as a penalty to the City, forfeit Twenty-five Dollars ($25.00) for each day, or portion thereof, for each worker until strict compliance is effectuated. Upon the request of the DIR, such penalties shall be withheld from contract payments.

ARTICLE 33. PREVAILING RATES OF WAGES

a. The Contractor is aware of the requirements of Labor Code Sections 1720 et seq. and 1770 et seq., as well as California Code of Regulations, Title 8, Section 16000 et seq. ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" and "maintenance" projects. Since this Project involves an applicable "pubic works" or "maintenance" project, as defined by the Prevailing Wage Laws, and since the total compensation is $1,000 or more, Contractor agrees to fully comply with such Prevailing Wage Laws. The Contractor shall obtain a copy of the prevailing rates of per diem wages at the commencement of this Agreement from the website of the Division of Labor Statistics and Research of the Department of Industrial Relations located at www.dir.ca.gov/dlsr/. In the alternative, the Contractor may view a copy of the prevailing rates of per diem wages at the City. Contractor shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to perform work on the Project available to interested parties upon request, and shall post copies at the Contractor's principal place of business and at the Project site. Contractor shall defend, indemnify and hold the City, its elected officials, officers, employees and agents free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or allege failure to comply with the Prevailing Wage Laws.

b. The Contractor and each subcontractor shall forfeit as a penalty to the City not more than fifty dollars ($50) for each calendar day, or portion thereof, for each worker paid less than the stipulated prevailing wage rate for any work done by him, or by any subcontract under him, in violation of the provisions of the Labor Code. The difference between such stipulated prevailing wage rate and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor.

c. Contractor shall post, at appropriate conspicuous points on the Project site, a schedule showing all determined general prevailing wage rates and all authorized deductions, if any, from unpaid wages actually earned.

d. If the Work involves federal funds or otherwise requires compliance with the Davis-Bacon Fair Labor Standards Act, the Contractor and all its subcontractors shall comply with the higher of the state or federal prevailing wage rates.

ARTICLE 34. EMPLOYMENT OF APPRENTICES

The Contractor's attention is directed to the provisions of Sections 1777.5, 1777.6, and 1777.7 of the Labor Code concerning employment of apprentices by the Contractor or any subcontractor. The Contractor shall obtain a certificate of apprenticeship before employing any apprentice pursuant to Section 1777.5, 1777.6, and 1777.7 of the Labor Code. Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, the Administrator of Apprenticeships, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.

ARTICLE 35. NONDISCRIMINATION/EQUAL EMPLOYMENT OPPORTUNITY

Pursuant to Labor Code Section 1735 and other applicable provisions of law, the Contractor and its subcontractors shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap on this Project. The Contractor will take affirmative action to insure that employees are treated during employment or training without regard to their race, color, religion, sex, national origin, age, political affiliation, marital status, or handicap.

ARTICLE 36. LABOR/EMPLOYMENT SAFETY

The Contractor shall maintain emergency first aid treatment for his employees which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.), and California Code of Regulations, Title 8, Industrial Relations Division 1, Department of Industrial Relations, Chapter 4.

WORKERS' COMPENSATION INSURANCE

The Contractor shall Provide, during the life of this Contract, workers' compensation insurance for all of the employees engaged in Work under this Contract, on or at the Project site, and, in case any of sublet Work, the Contractor shall require the subcontractor similarly to provide workers' compensation insurance for all the latter's employees as prescribed by State law. Any class of employee or employees not covered by a subcontractor's insurance shall be covered by the Contractor's insurance. In case any class of employees engaged in work under this Contract, on or at the Project site, is not protected under the Workers' Compensation Statutes, the Contractor shall provide or shall cause a subcontractor to provide, adequate insurance coverage for the protection of such employees not otherwise protected. The Contractor is required to secure payment of compensation to his employees in accordance with the provisions of Section 3700 of the Labor Code. The Contractor shall file with the City certificates of his insurance protecting workers. Company or companies providing insurance coverage shall be acceptable to the City, if in the form and coverage as set forth in the Contract Documents.

ARTICLE 37. EMPLOYER'S LIABILITY INSURANCE

Contractor shall provide during the life of this Contract, Employer's Liability Insurance, including Occupational Disease, in the amount of, at least, one million dollars ($1,000,000.00) per person per accident. Contractor shall provide City with a certificate of Employer's Liability Insurance. Such insurance shall comply with the provisions of the Contract Documents. The policy shall be endorsed, if applicable, to provide a Borrowed Servant/Alternate Employer Endorsement and contain a Waiver of Subrogation in favor of the City.

ARTICLE 38. COMMERCIAL GENERAL LIABILITY INSURANCE

a. Contractor shall procure and maintain during the life of this Contract and for such other period as may be required herein, at its sole expense, Commercial General Liability insurance coverage, including but not limited to, premises liability, contractual liability, products/completed operations if applicable, personal and advertising injury – which may arise from or out of Contractor's operations, use, and management of the Project site, or

the performance of its obligations hereunder. Policy limits shall not be less than **$2,000,000** per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

b. Such policy shall comply with all the requirements of this Article. The limits set forth herein shall apply separately to each insured against whom claims are made or suits are brought, except with respect to the limits of liability. Further the limits set forth herein shall not be construed to relieve the Contractor from liability in excess of such coverage, nor shall it limit Contractor's indemnification obligations to the City, and shall not preclude the City from taking such other actions available to the City under other provisions of the Contract Documents or law.

c. Contractor shall make certain that any and all subcontractors hired by Contractor are insured in accordance with this Contract. If any subcontractor's coverage does not comply with the foregoing provisions, Contractor shall indemnify and hold the City harmless from any damage, loss, cost, or expense, including attorneys' fees, incurred by the City as a result thereof.

d. All general liability policies provided pursuant to the provisions of this Article shall comply with the provisions of the Contract Documents.

e. All general liability policies shall be written to apply to all bodily injury, including death, property damage, personal injury, owned and non-owned equipment, blanket contractual liability, completed operations liability, explosion, collapse, under-ground excavation, removal of lateral support, and other covered loss, however occasioned, occurring during the policy term, and shall specifically insure the performance by Contractor of that part of the indemnification contained in these General Conditions, relating to liability for injury to or death of persons and damage to property. If the coverage contains one or more aggregate limits, a minimum of 50% of any such aggregate limit must remain available at all times; if over 50% of any aggregate limit has been paid or reserved, the City may require additional coverage to be purchased by Contractor to restore the required limits. Contractor may combine primary, umbrella, and as broad as possible excess liability coverage to achieve the total limits indicated above. Any umbrella or excess liability policy shall include the additional insured endorsement described in the Contract Documents.

ARTICLE 39. AUTOMOBILE LIABILITY INSURANCE

Contractor shall take out and maintain at all times during the term of this Contract Automobile Liability Insurance in the amount of, at least, one million dollars ($1,000,000). Such insurance shall provide coverage for bodily injury and property damage including coverage for non-owned and hired vehicles, in a form and with insurance companies acceptable to the City. Such insurance shall comply with the provisions of Article 30 below.

ARTICLE 40. BUILDER'S RISK ["ALL RISK"]

a. It is the Contractor's responsibility to maintain or cause to be maintained Builder's Risk ["All Risk"] extended coverage insurance on all work, material, equipment, appliances, tools, and structures which are a part of the Contract and subject to loss or damage by fire, and vandalism and malicious mischief, in an amount to cover 100% of the replacement cost. The City accepts no responsibility until the Contract is formally accepted by the Governing Board for the work. The Contractor is required to file with the City a certificate evidencing fire insurance coverage.

b. Provide insurance coverage on completed value form, all-risk or special causes of loss coverage.

1) Insurance policies shall be so conditioned as to cover the performance of any extra work performed under the Contract.

2) Coverage shall include all materials stored on site and in transit.

3) Coverage shall include Contractor's tools and equipment.

4) Insurance shall include boiler, machinery and material hoist coverage.

c. Such insurance shall comply with the provisions of the Contract Documents.

ARTICLE 41. FORM AND PROOF OF CARRIAGE OF INSURANCE

a. Any insurance carrier providing insurance coverage required by the Contract Documents shall be admitted to and authorized to do business in the State of California unless waived, in writing, by the City Risk Manager. Carrier(s) shall have an A.M. Best rating of not less than an A:VIII. Insurance deductibles or self-insured retentions must be declared by the Contractor, and such deductibles and retentions shall have the prior written consent from the City. At the election of the City the Contractor shall either 1) reduce or eliminate such deductibles or self-insured retentions, or 2) procure a bond which guarantees payment of losses and related investigations, claims administration, and defense costs and expenses.

b. Contractor shall cause its insurance carrier(s) to furnish the City with either 1) a properly executed original Certificates(s) of Insurance and certified original copies of Endorsements effecting coverage as required herein, or 2) if requested to do so in writing by the City Risk Manager, provide original Certified copies of policies including all Endorsements and all attachments thereto, showing such insurance is in full force and effect. The City, its Director's and officers, employees, agents or representatives are named as Additional Insureds and Provide a Waiver of Subrogation in favor of those parties. Further, said Certificates(s) and policies of insurance shall contain the covenant of the insurance carrier(s) that shall provide no less than thirty (30) days written notice be given to the City prior to any material modification or cancellation of such insurance. In the event of a material modification or cancellation of coverage, the City may terminate or Stop Work pursuant to the Contract Documents, unless the City receives, prior to such effective date, another properly executed original Certificate of Insurance and original copies of

endorsements or certified original policies, including all endorsements and attachments thereto evidencing coverages set forth herein and the insurance required herein is in full force and effect. Contractor shall not take possession, or use the Project site, or commence operations under this Agreement until the City has been furnished original Certificate(s) of Insurance and certified original copies of Endorsements or policies of insurance including all Endorsements and any and all other attachments as required in this Section. The original Endorsements for each policy and the Certificate of Insurance shall be signed by an individual authorized by the insurance carrier to do so on its behalf.

c. It is understood and agreed to by the parties hereto and the insurance company(s), that the Certificate(s) of Insurance and policies shall so covenant and shall be construed as primary, and the City's insurance and/or deductibles and/or self-insured retentions or self-insured programs shall not be construed as contributory.

d. The City reserves the right to adjust the monetary limits of insurance coverage's during the term of this Contract including any extension thereof-if in the City's reasonable judgment, the amount or type of insurance carried by the Contractor becomes inadequate.

e. Contractor shall pass down the insurance obligations contained herein to all tiers of sub-contractors working under this Contract.

ARTICLE 42. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

a. **Time for Completion/Liquidated Damages.** Work shall be commenced within ten (10) days of the date stated in the City's Notice to Proceed and shall be completed by Contractor in the time specified in the Contract Documents. The City is under no obligation to consider early completion of the Project; and the Contract completion date shall not be amended by the City's receipt or acceptance of the Contractor's proposed earlier completion date. Furthermore, Contractor shall not, under any circumstances, receive additional compensation from the City (including but not limited to indirect, general, administrative or other forms of overhead costs) for the period between the time of earlier completion proposed by the Contractor and the Contract completion date. If The Work is not completed as stated in the Contract Documents, it is understood that the City will suffer damage. In accordance with Government Code section 53069.85, being impractical and infeasible to determine the amount of actual damage, it is agreed that Contractor shall pay to the City as fixed and liquidated damages, and not as a penalty, the sum stipulated in the Contract for each day of delay until The Work is fully completed. Contractor and its surety shall be liable for any liquidated damages. Any money due or to become due the Contractor may be retained to cover liquidated damages.

b. **Inclement Weather.** Contractor shall abide the Engineer's determination of what constitutes inclement weather. Time extensions for inclement weather shall only be granted when the Work stopped during inclement weather is on the critical path of the Project schedule.

c. **Extension of Time.** Contractor shall not be charged liquidated damages because of any delays in completion of The Work due to unforeseeable causes beyond the control and

without the fault or negligence of Contractor (or its subcontractors or suppliers). Contractor shall within five (5) Days of identifying any such delay notify the City in writing of causes of delay. The City shall ascertain the facts and extent of delay and grant extension of time for completing The Work when, in its judgment, the facts justify such an extension. Time extensions to the Project shall be requested by the Contractor as they occur and without delay. No delay claims shall be permitted unless the event or occurrence delays the completion of the Project beyond the Contract completion date.

d. **No Damages for Reasonable Delay.** The City's liability to Contractor for delays for which the City is responsible shall be limited to only an extension of time unless such delays were unreasonable under the circumstances. In no case shall the City be liable for any costs which are borne by the Contractor in the regular course of business, including, but not limited to, home office overhead and other ongoing costs. Damages caused by unreasonable City delay, including delays caused by items that are the responsibility of the City pursuant to Government Code section 4215, shall be based on actual costs only, no proportions or formulas shall be used to calculate any delay damages.

ARTICLE 43. COST BREAKDOWN AND PERIODIC ESTIMATES

Contractor shall furnish on forms Approved by the City:

a. Within ten (10) Days of award of the Contract a detailed estimate giving a complete breakdown of the Contract price;

b. A monthly itemized estimate of Work done for the purpose of making progress payments. In order for the City to consider and evaluate each progress payment application, the Contractor shall submit a detailed measurement of Work performed and a progress estimate of the value thereof before the tenth (10th) Day of the following month.

c. Contractor shall submit, with each of its payment requests, an adjusted list of actual quantities, verified by the Engineer, for unit price items listed, if any, in the Bid Form.

d. Following the City's Acceptance of the Work, the Contractor shall submit to the City a written statement of the final quantities of unit price items for inclusion in the final payment request.

e. The City shall have the right to adjust any estimate of quantity and to subsequently correct any error made in any estimate for payment.

Contractor shall certify under penalty of perjury, that all cost breakdowns and periodic estimates accurately reflect the Work on the Project.

ARTICLE 44. MOBILIZATION

a. When a bid item is included in the Bid Form for mobilization, the costs of Work in advance of construction operations and not directly attributable to any specific bid item will be included in the progress estimate ("Initial Mobilization"). When no bid item is provided

for "Initial Mobilization," payment for such costs will be deemed to be included in the other items of The Work.

b. Payment for Initial Mobilization based on the lump sum provided in the Bid Form, which shall constitute full compensation for all such Work. No payment for Initial Mobilization will be made until all of the listed items have been completed to the satisfaction of the Engineer. The scope of the Work included under Initial Mobilization shall include, but shall not be limited to, the following principal items:

1. Obtaining and paying for all bonds, insurance, and permits.

2. Moving on to the Project site of all Contractor's plant and equipment required for first month's operations.

3. Installing temporary construction power, wiring, and lighting facilities.

4. Establishing fire protection system.

5. Developing and installing a construction water supply.

6. Providing and maintaining the field office trailers for the Contractor and the Engineer, complete, with all specified furnishings and utility services including telephones, telephone appurtenances, computer and printer, and copying machine.

7. Providing on-site communication facilities for the Owner and the Engineer, including telephones, radio pagers, and fax machines.

8. Providing on-site sanitary facilities and potable water facilities as specified per Cal-OSHA and these Contract Documents.

9. Furnishing, installing, and maintaining all storage buildings or sheds required for temporary storage of products, equipment, or materials that have not yet been installed in the Work. All such storage shall meet manufacturer's specified storage requirements, and the specific provisions of the specifications, including temperature and humidity control, if recommended by the manufacturer, and for all security.

10. Arranging for and erection of Contractor's work and storage yard.

11. Posting all OSHA required notices and establishment of safety programs per Cal-OSHA.

12. Full-time presence of Contractor's superintendent at the job site as required herein.

13. Submittal of Construction Schedule as required by the Contract Documents.

ARTICLE 45. PAYMENTS

a. The City shall make monthly progress payments following receipt of undisputed and properly submitted payment requests. Contractor shall be paid a sum equal to ninety percent (90%) of the value of Work performed up to the last day of the previous month, less the aggregate of previous payments.

b. The Contractor shall, after the full completion of The Work, submit a final payment application. All prior progress estimates shall be subject to correction in the final estimate and payment.

c. Unless otherwise required by law, the final payment of ten percent (10%) of the value of the Work, if unencumbered, shall be paid no later than sixty (60) Days after the date of recordation of the Notice of Completion.

d. Acceptance by Contractor of the final payment shall constitute a waiver of all claims against the City arising from this Contract.

e. Payments to the Contractor shall not be construed to be an acceptance of any defective work or improper materials, or to relieve the Contractor of its obligations under the Contract Documents.

f. The Contractor shall submit with each payment request the Contractor's conditional waiver of lien for the entire amount covered by such payment request, as well as a valid unconditional waiver of lien from the Contractor and all subcontractors and materialmen for all work and materials included in any prior invoices. Waivers of lien shall be in the forms prescribed by California Civil Code Section 3262. Prior to final payment by the City, the Contractor shall submit a final waiver of lien for the Contractor's work, together with releases of lien from any subcontractor or materialmen.

ARTICLE 46. PAYMENTS WITHHELD AND BACKCHARGES

In addition to amounts which the City may retain under other provisions of the Contract Documents the City may withhold payments due to Contractor as may be necessary to cover:

a. Stop Notice Claims.

b. Defective work not remedied.

c. Failure of Contractor to make proper payments to its subcontractors or suppliers.

d. Completion of the Contract if there exists a reasonable doubt that the work can be completed for balance then unpaid.

e. Damage to another contractor or third party.

f. Amounts which may be due the City for claims against Contractor.

g. Failure of Contractor to keep the record ("as-built") drawings up to date.

h. Failure to provide updates on the construction schedule.

i. Site clean up.

j. Failure of the Contractor to comply with requirements of the Contract Documents.

k. Liquated damages.

l. Legally permitted penalties.

Upon completion of the Contract, the City will reduce the final Contract amount to reflect costs charged to the Contractor, backcharges or payments withheld pursuant to the Contract Documents.

ARTICLE 47. CHANGES AND EXTRA WORK

a. Change Order Work.

1) The City, without invalidating the Contract, may order changes in the Work consisting of additions, deletions or other revisions, the Contract amount and Contract time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents. A Change Order signed by the Contractor indicates the Contractor's agreement therewith, including any adjustment in the Contract amount or the Contract time, and the full and final settlement of all costs (direct, indirect and overhead) related to the Work authorized by the Change Order.

2) All claims for additional compensation to the Contractor shall be presented in writing before the expense is incurred and will be adjusted as provided herein. No work shall be allowed to lag pending such adjustment, but shall be promptly executed as directed, even if a dispute arises. No claim will be considered after the work in question has been done unless a written contract change order has been issued or a timely written notice of claim has been made by Contractor. Contractor shall not be entitled to claim or bring suit for damages, whether for loss of profits or otherwise, on account of any decrease or omission of any item or portion of Work to be done. Whenever any change is made as provided for herein, such change shall be considered and treated as though originally included in the Contract, and shall be subject to all terms, conditions and provisions of the original Contract.

3) Owner Initiated Change. The Contractor must submit a complete cost proposal, including any change in the Contract time, within seven (7) Days after receipt of a scope of a proposed change order, unless the City requests that proposals be submitted in less than seven (7) Days.

4) Contractor Initiated Change. The Contractor must give written notice of a proposed change order required for compliance with the Contract Documents within seven (7) Days of discovery of the facts giving rise to the proposed change order.

5) Whenever possible, any changes to the Contract amount shall be in a lump sum mutually agreed to by the Contractor and the City.

6) Price quotations from the Contractor shall be accompanied by sufficiently detailed supporting documentation to permit verification by the City.

7) If the Contractor fails to submit the cost proposal within the seven (7) Day period (or as requested), the City has the right to order the Contractor in writing to commence the work immediately on a force account basis and/or issue a lump sum change to the contract price in accordance with the City's estimate of cost. If the change is issued based on the City estimate, the Contractor will waive its right to dispute the action unless within fifteen (15) Days following completion of the added/deleted work, the Contractor presents written proof that the City's estimate was in error.

8) Estimates for lump sum quotations and accounting for cost-plus-percentage work shall be limited to direct expenditures necessitated specifically by the subject extra work, and shall be segregated as follows:

(a) Labor. The costs of labor will be the actual cost for wages prevailing locally for each craft or type of worker at the time the extra work is done, plus employer payments of payroll taxes and insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessment or benefits required by lawful collective bargaining agreements. The use of a labor classification which would increase the extra work cost will not be permitted unless the contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.

(b) Materials. The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available in the quantities involved, plus sales tax, freight and delivery. Materials cost shall be based upon supplier or manufacturer's invoice. If invoices or other satisfactory evidence of cost are not furnished within fifteen (15) Days of delivery, then the Engineer shall determine the materials cost, at its sole discretion.

(c) Tool and Equipment Use. No payment will be made for the use of small tools, tools which have a replacement value of $1,000 or less. Regardless of ownership, the rates to be used in determining equipment use costs shall not exceed listed rates prevailing locally at equipment rental agencies, or distributors, at the time the work is performed.

(d) Overhead, Profit and Other Charges. The mark-up for overhead (including supervision) and profit on work added to the Contract shall be according to the following:

i. "Net Cost" is defined as consisting of costs of labor, materials and tools and equipment only excluding overhead and profit. The costs of applicable insurance and bond premium will be reimbursed to the Contractor and subcontractors at cost only, without mark-up.

ii. For Work performed by the Contractor's forces the added cost for overhead and profit shall not exceed fifteen (15%) percent of the Net Cost of the Work.

iii. For Work performed by a subcontractor, the added cost for overhead and profit shall not exceed fifteen (15%) percent of the Net Cost of the Work to which the Contractor may add five (5%) percent of the subcontractor's Net Cost.

iv. For Work performed by a sub-subcontractor the added cost for overhead and profit shall not exceed fifteen (15 %) percent of the Net Cost for Work to which the subcontractor and general contractor may each add an additional five (5 %) percent of the Net Cost of the lower tier subcontractor.

iv. No additional mark up will be allowed for lower tier subcontractors, and in no case shall the added cost for overhead and profit payable by City exceed twenty-five (25%) percent of the Net Cost as defined herein.

9) For added or deducted Work by subcontractors, the Contractor shall furnish to the City the subcontractor's signed detailed estimate of the cost of labor, material and equipment, including the subcontractor markup for overhead and profit. The same requirement shall apply to sub-subcontractors.

10) For added or deducted work furnished by a vendor or supplier, the Contractor shall furnish to the City a detailed estimate or quotation of the cost to the Contractor, signed by such vendor or supplier.

11) Any change in The Work involving both additions and deletions shall indicate a net total cost, including subcontracts and materials. Allowance for overhead and profit, as specified herein, shall be applied if the net total cost is an extra; overhead and profit allowances shall not be applied if the net total cost is a credit. The estimated cost of deductions shall be based on labor and material prices on the date the Contract was executed.

12) Contractor shall not reserve a right to assert impact costs, extended job site costs, extended overhead, constructive acceleration and/or actual acceleration beyond what is stated in the change order for work. No claims shall be allowed for impact, extended overhead costs, constructive acceleration and/or actual acceleration due to a multiplicity of changes and/or clarifications. The Contractor may not change or modify the City's change order form in an attempt to reserve additional rights.

13) If the City disagrees with the proposal submitted by Contractor, it will notify the Contractor and the City will provide its opinion of the appropriate price and/or time extension. If the Contractor agrees with the City, a change order will be issued by the City. If no agreement can be reached, the City shall have the right to issue a unilateral change order setting forth its determination of the reasonable additions or savings in costs and time attributable to the extra or deleted work. Such determination shall become final and binding if the Contractor fails to submit a claim in writing to the City within fifteen (15) Days of the issuance of the unilateral change order, disputing the terms of the unilateral change order.

14) No dispute, disagreement or failure of the parties to reach agreement on the terms of the change order shall relieve the Contractor from the obligation to proceed with performance of the work, including extra work, promptly and expeditiously.

15) Any alterations, extensions of time, extra work or any other changes may be made without securing consent of the Contractor's surety or sureties.

ARTICLE 48. OCCUPANCY

The City reserves the right to occupy or utilize any portion of The Work at any time before completion, and such occupancy or use shall not constitute Acceptance of any part of Work covered by this Contract. This use shall not relieve the Contractor of its responsibilities under the Contract.

ARTICLE 49. INDEMNIFICATION

Contractor shall defend (with counsel of City's choosing), indemnify and hold the City, its officials, officers, agents, employees, and representatives free and harmless from any and all claims, demands, causes of action, costs, expenses, liabilities, losses, damages or injuries, in law or equity, regardless of whether the allegations are false, fraudulent, or groundless, to property or persons, including wrongful death, to the extent arising out of or incident to any acts, omissions or willful misconduct of Contractor, its officials, officers, employees, agents, consultants and contractors arising out of or in connection with the performance of the Work or this Contract, including claims made by subcontractors for nonpayment, including without limitation the payment of all consequential damages and attorneys fees and other related costs and expenses. Contractor shall defend, at Contractor's own cost, expense and risk, with counsel of City's choosing, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against City, its officials, officers, agents, employees and representatives. To the extent of its liability, Contractor shall pay and satisfy any judgment, award or decree that may be rendered against City, its officials, officers, employees, agents, employees and representatives, in any such suit, action or other legal proceeding. Contractor shall reimburse City, its officials, officers, agents, employees and representatives for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. The only limitations on this provision shall be those imposed by Civil Code Section 2782.

ARTICLE 50. RECORD ("AS BUILT") DRAWINGS

a. Contractor shall prepare and maintain a complete set of record drawings (herein referred to as "as-builts") and shall require each trade to prepare its own as-builts. The as-builts must show the entire site for each major trade, including but not limited to water, sewer, electrical, data, telephone, cable, fire alarm, gas and plumbing. Contractor shall mark the as-builts to show the actual installation where the installation varies from the Work as originally shown. Contractor shall mark whichever drawings are most capable of showing conditions fully and where shop drawings are used, Contractor must record a cross-reference at the corresponding location on the contract drawings. Contractor shall give particular attention to concealed elements that would be difficult to measure and record at a later date. Contractor shall use colors to distinguish variations in separate categories of The Work.

b. Contractor shall note related change order numbers where applicable. Contractor shall organize as-builts into manageable sets, bound with durable paper cover sheets and shall print suitable title, dates and other identification on the cover of each set. Contractor to also provide an electronic version of the as-builts. The suitability of the as-builts will be determined by the Engineer.

ARTICLE 51. RESOLUTION OF CONSTRUCTION CLAIMS

a. In accordance with Public Contract Code Sections 20104 *et seq.* and other applicable law, public works claims of $375,000 or less which arise between the Contractor and the City shall be resolved under the following the statutory procedure unless the City has elected to resolve the dispute pursuant to Public Contract Code Section 10240 *et seq.*

b. **All Claims:** All claims shall be submitted in writing and accompanied by substantiating documentation. Claims must be filed on or before the date of final payment unless other notice requirements are provided in the contract. "Claim" means a separate demand by the claimant for (1) a time extension, (2) payment of money or damages arising from work done by or on behalf of the claimant and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled, or (3) an amount the payment of which is disputed by the City.

c. **Claims Under $50,000.** The City shall respond in writing to the claim within 45 days of receipt of the claim, or, the City may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the City may have. If additional information is needed thereafter, it shall be provided upon mutual agreement of the City and the claimant. The City's written response shall be submitted 15 days after receiving the additional documentation, or within the same period of time taken by the claimant to produce the additional information, whichever is greater.

d. **Claims over $50,000 but less than or equal to $375,000.** The City shall respond in writing within 60 days of receipt, or, may request in writing within 30 days of receipt of the claim, any additional documents supporting the claim or relating to defenses or claims the City may have against the claimant. If additional information is needed thereafter, it

shall be provided pursuant to mutual agreement between the City and the claimant. The City's response shall be submitted within 30 days after receipt of the further documents, or within the same period of time taken by the claimant to produce the additional information or documents, whichever is greater. The Contractor shall make these records and documents available at all reasonable times, without any direct charge.

e. The Contractor will submit the claim justification in the following format:

1) Summary of claim merit and price, and Contract clause pursuant to which the claim is made.

2) List of documents relating to claim

(a) Specifications

(b) Drawings

(c) Clarifications (Requests for Information)

(d) Schedules

(e) Other

3) Chronology of events and correspondence

4) Analysis of claim merit

5) Analysis of claim cost

6) Analysis of time impact analysis in CPM format

7) Cover letter and certification of validity of the claim

f. If the claimant disputes the City's response, or if the City fails to respond within the statutory time period(s), the claimant may so notify the City within 15 days of the receipt of the response or the failure to respond, and demand an informal conference to meet and confer for settlement. Upon such demand, the City shall schedule a meet and confer conference within 30 Days.

g. If following the meet and confer conference, the claim or any portion thereof remains in dispute, the claimant may file a claim pursuant to Government Code 900 et seq. and Government Code 910 et seq. For purposes of those provisions, the time within which a claim must be filed shall be tolled from the time the claimant submits the written claim until the time the claim is denied, including any time utilized for the meet and confer conference.

h. Submission of a claim, properly certified, with all required supporting documentation, and written rejection or denial of all or part of the claim by City, is a condition precedent to any

action, proceeding, litigation, suit, general conditions claim, or demand for arbitration by Contractor.

ARTICLE 52. CITY'S RIGHT TO TERMINATE CONTRACT

a. **Termination for Cause**: The City may, without prejudice to any other right or remedy, serve written notice upon Contractor of its intention to terminate this Contract if the Contractor: (i) refuses or fails to prosecute The Work or any part thereof with such diligence as will ensure its completion within the time required; (ii) fails to complete The Work within the required time; (iii) should file a bankruptcy petition or be adjudged a bankrupt; (iv) should make a general assignment for the benefit of its creditors; (v) should have a receiver appointed; (vi) should persistently or repeatedly refuse or fail to supply enough properly skilled workers or proper materials to complete the work; (vii) should fail to make prompt payment to subcontractors or for material or labor; (viii) persistently disregard laws, ordinances, other requirements or instructions of the City; or (ix) should violate any of the provisions of the Contract Documents.

The notice of intent to terminate shall contain the reasons for such intention to terminate. Unless within ten (10) Days after the service of such notice, such condition shall cease or satisfactory arrangements (acceptable to the City) for the required correction are made, this Contract shall be terminated. In such case, Contractor shall not be entitled to receive any further payment until the Project has been finished. The City may take over and complete The Work by any method it may deem appropriate. Contractor and its surety shall be liable to the City for any excess costs or other damages incurred by the City to complete the Project. If the City takes over The Work, the City may, without liability for so doing, take possession of and utilize in completing The Work such materials, appliances, plant, and other property belonging to the Contractor as may be on the Project site.

b. **Termination For Convenience:** The City may terminate performance of The Work in whole or, in part, if the City determines that a termination is in the City's interest.

The Contractor shall terminate all or any part of The Work upon delivery to the Contractor of a Notice of Termination specifying that the termination is for the convenience of the City, the extent of termination, and the effective date of such termination.

After receipt of Notice of Termination, and except as directed by the City, the Contractor shall, regardless of any delay in determining or adjusting any amounts due under this Termination for Convenience clause, immediately proceed with the following obligations:

1) Stop Work as specified in the Notice.

2) Complete any Work specified in the Notice of Termination in a least cost/shortest time manner while still maintaining the quality called for under the Contract Documents.

3) Leave the property upon which the Contractor was working and upon which the facility (or facilities) forming the basis of the Contract Documents is

situated in a safe and sanitary manner such that it does not pose any threat to the public health or safety.

4) Terminate all subcontracts to the extent that they relate to the portions of The Work terminated.

5) Place no further subcontracts or orders, except as necessary to complete the remaining portion of The Work.

6) Submit to the City, within ten (10) Days from the effective date of the Notice of Termination, all of the documentation called for by the Contract Documents to substantiate all costs incurred by the Contractor for labor, materials and equipment through the Effective Date of the Notice of Termination. Any documentation substantiating costs incurred by the Contractor solely as a result of the City's exercise of its right to terminate this Contract pursuant to this clause, which costs the Contractor is authorized under the Contract Documents to incur, shall: (i) be submitted to and received by the City no later than thirty (30) Days after the Effective Date of the Notice of Termination; (ii) describe the costs incurred with particularity; and (iii) be conspicuously identified as "Termination Costs Occasioned by the City's Termination for Convenience."

7) These provisions are in addition to and not in limitation of any other rights or remedies available to the City.

c. Notwithstanding any other provision of this Article, when immediate action is necessary to protect life and safety or to reduce significant exposure or liability, the City may immediately order Contractor to cease Work on the Project until such safety or liability issues are addressed to the satisfaction of the City or the Contract is terminated.

ARTICLE 53. WARRANTY AND GUARANTEE

a. Contractor warrants that all materials and equipment furnished under this Contract shall be new unless otherwise specified in the Contract Documents; and that all Work conforms to the Contract Document requirements and is free of any defect whether performed by the Contractor or any subcontractor or supplier.

b. Unless otherwise stated, all warranty periods shall begin upon the filing of the Notice of Completion. Unless otherwise stated, the warranty period shall be for one year.

c. The Contractor shall remedy at its expense any damage to City-owned or controlled real or personal property.

d. Contractor shall furnish the City with all warranty and guarantee documents prior to final Acceptance of the Project by the City.

e. The City shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. The Contractor shall within ten (10) Days after being

notified commence and perform with due diligence all necessary Work. If the Contractor fails to promptly remedy any defect, or damage; the county shall have the right to replace, repair, or otherwise remedy the defect, or damage at the Contractor's expense.

f. In the event of any emergency constituting an immediate hazard to health, safety, property, or licensees, when caused by Work of the Contractor not in accordance with the Contract requirements, the City may undertake at Contractor's expense, and without prior notice, all Work necessary to correct such condition.

g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for Work performed and Materials furnished under this Contract, the Contractor shall:

1) Obtain for City all warranties that would be given in normal commercial practice;

2) Require all warranties to be executed, in writing, for the benefit of the City; and

3) Enforce all warranties for the benefit of the City, unless otherwise directed in writing by the City.

This Article shall not limit the City's rights under this Contract or with respect to latent defects, gross mistakes, or fraud. The City specifically reserves all rights related to defective work, including but not limited to the defect claims pursuant to California Code of Civil Procedure Section 337.15.

ARTICLE 54. DOCUMENT RETENTION & EXAMINATION

a. In accordance with Government Code Section 8546.7, records of both the City and the Contractor shall be subject to examination and audit by the State Auditor General for a period of three (3) years after final payment.

b. Contractor shall make available to the City any of the Contractor's other documents related to the Project immediately upon request of the City.

c. In addition to the State Auditor rights above, the City shall have the right to examine and audit all books, estimates, records, contracts, documents, bid documents, subcontracts, and other data of the Contractor (including computations and projections) related to negotiating, pricing, or performing the modification in order to evaluate the accuracy and completeness of the cost or pricing data at no additional cost to the City, for a period of four (4) years after final payment.

ARTICLE 55. SOILS INVESTIGATIONS

When a soils investigation report for the Project site is available, such report shall not be a part of the Contract Documents. Any information obtained from such report as to subsurface soil condition, or to elevations of existing grades or elevations of underlying rock, is approximate only and is not guaranteed. Contractor acknowledges that any soils investigation report (including any borings) was prepared for purposes of design only and Contractor is required to examine the site

before submitting its bid and must make whatever tests it deems appropriate to determine the underground condition of the soil.

ARTICLE 56. SEPARATE CONTRACTS

a. The City reserves the right to let other contracts in connection with this Work or on the Project site. Contractor shall permit other contractors reasonable access and storage of their materials and execution of their work and shall properly connect and coordinate its Work with theirs.

b. To ensure proper execution of its subsequent Work, Contractor shall immediately inspect work already in place and shall at once report to the Engineer any problems with the work in place or discrepancies with the Contract Documents.

c. Contractor shall ascertain to its own satisfaction the scope of the Project and nature of any other contracts that have been or may be awarded by the City in prosecution of the Project to the end that Contractor may perform this Contract in the light of such other contracts, if any. Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy at site of the Project. Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the Project. If simultaneous execution of any contract for the Project is likely to cause interference with performance of some other contract or contracts, the Engineer shall decide which Contractor shall cease Work temporarily and which contractor shall continue or whether work can be coordinated so that contractors may proceed simultaneously. The City shall not be responsible for any damages suffered or for extra costs incurred by Contractor resulting directly or indirectly from award, performance, or attempted performance of any other contract or contracts on the Project site.

ARTICLE 57. NOTICE AND SERVICE THEREOF

All notices shall be in writing and either served by personal delivery or mailed to the other party as designated in the Bid Forms. Written notice to the Contractor shall be addressed to Contractor's principal place of business unless Contractor designates another address in writing for service of notice. Notice to City shall be addressed to the City as designated in the Notice Inviting Bids unless City designates another address in writing for service of notice. Notice shall be effective upon receipt or five (5) Days after being sent by first class mail, whichever is earlier. Notice given by facsimile shall not be effective unless acknowledged in writing by the receiving party.

ARTICLE 58. NOTICE OF THIRD PARTY CLAIMS

Pursuant to Public Contract Code Section 9201, the City shall provide Contractor with timely notification of the receipt of any third-party claim relating to the Contract.

ARTICLE 59. STATE LICENSE BOARD NOTICE.

Contractors are required by law to be licensed and regulated by the Contractors' State License Board which has jurisdiction to investigate complaints against contractors if a complaint regarding a patent act or omission is filed within four (4) years of the date of the alleged violation. A

complaint regarding a latent act or omission pertaining to structural defects must be filed within ten (10) years of the date of the alleged violation. Any questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, P.O. Box 26000, Sacramento, California 95826.

ARTICLE 60. INTEGRATION

a. Oral Modifications Ineffective. No oral order, objection, direction, claim or notice by any party or person shall affect or modify any of the terms or obligations contained in the Contract Documents.

b. Contract Documents Represent Entire Contract. The Contract Documents represent the entire agreement of the City and Contractor.

ARTICLE 61. ASSIGNMENT

Contractor shall not assign, transfer, convey, sublet, or otherwise dispose of this Contract or any part thereof including any claims, without prior written consent of the City. Any assignment without the written consent of the City shall be void. Any assignment of money due or to become due under this Contract shall be subject to a prior lien for services rendered or Material supplied for performance of Work called for under the Contract Documents in favor of all persons, firms, or corporations rendering such services or supplying such Materials to the extent that claims are filed pursuant to the Civil Code, the Code of Civil Procedure or the Government Code.

ARTICLE 62. CHANGE IN NAME AND NATURE OF CONTRACTOR'S LEGAL ENTITY

Should a change be contemplated in the name or nature of the Contractor's legal entity, the Contractor shall first notify the City in order that proper steps may be taken to have the change reflected on the Contract.

ARTICLE 63. ASSIGNMENT OF ANTITRUST ACTIONS

Pursuant to Section 7103.5 of the Public Contract Code, in entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, Contractor or subcontractor offers and agrees to assign to the City all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (chapter 2 (commencing with Section 16700) of part 2 of division 7 of the Business and Professions Code), arising from the purchase of goods, services, or materials pursuant to this Contract or any subcontract. This assignment shall be made and become effective at the time the City makes final payment to the Contractor, without further acknowledgment by the parties.

ARTICLE 64. PROHIBITED INTERESTS

No City official or representative who is authorized in such capacity and on behalf of the City to negotiate, supervise, make, accept, or approve, or to take part in negotiating, supervising, making, accepting or approving any engineering, inspection, construction or material supply contract or

any subcontract in connection with construction of the project, shall be or become directly or indirectly interested financially in the Contract.

ARTICLE 65. LAWS AND REGULATIONS

a. Contractor shall give all notices and comply with all federal, state and local laws, ordinances, rules and regulations bearing on conduct of work as indicated and specified by their terms. References to specific laws, rules or regulations in this Contract are for reference purposes only, and shall not limit or affect the applicability of provisions not specifically mentioned. If Contractor observes that drawings and specifications are at variance therewith, he shall promptly notify the Engineer in writing and any necessary changes shall be adjusted as provided for in this Contract for changes in work. If Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, he shall bear all costs arising therefrom.

b. Contractor shall be responsible for familiarity with the Americans with Disabilities Act ("ADA") (42 U.S.C. § 12101 et seq.). The Work will be performed in compliance with ADA laws, rules and regulations. Contractor shall comply with the Historic Building Code, including, but not limited to, as it relates to the ADA, whenever applicable.

c. Contractor acknowledges and understands that, pursuant to Public Contract Code Section 20676, sellers of "mined material" must be on an approved list of sellers published pursuant to Public Resources Code Section 2717(b) in order to supply mined material for this Contract.

ARTICLE 66. PATENT FEES OR ROYALTIES.

The Contractor shall include in its bid amount the patent fees or royalties on any patented article or process furnished or used in the Work. Contractor shall assume all liability and responsibility arising from the use of any patented, or allegedly patented, materials, equipment, devices or processes used in or incorporated with The Work, and shall defend, indemnify and hold harmless the City, its officials, officers, agents, employees and representatives from and against any and all liabilities, demands, claims, damages, losses, costs and expenses, of whatsoever kind or nature, arising from such use.

ARTICLE 67. OWNERSHIP OF DRAWING

All Contract Documents furnished by the City are City property. They are not to be used by Contractor or any subcontractor on other work nor shall Contractor claim any right to such documents. With exception of one complete set of Contract Documents, all documents shall be returned to the City on request at completion of The Work.

ARTICLE 68. NOTICE OF TAXABLE POSSESSORY INTEREST

In accordance with Revenue and Taxation Code Section 107.6, the Contract Documents may create a possessory interest subject to personal property taxation for which Contractor will be responsible.

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SECTION 02221 – SITE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Demolition and removal of concrete paving and base material.
2. Demolition and removal of masonry pilasters.
3. Removing below-grade concrete footings.
4. Removing existing A.C. paving and base material.
5. Removing existing concrete steps.
6. Removing of existing overhead roof structure.

B. Related Sections include the following:

1. Section 02230 "Site Clearing" for tree removals and protection of existing vegetation.
2. Section 02300 "Earthwork" for backfill preparation.

1.3 DEFINITIONS

A. Demolish: Completely remove and legally dispose of off-site.

B. Recycle: Recovery of demolition waste for subsequent processing in preparation for reuse.

C. Salvage: Carefully detach from existing construction, in a manner to prevent damage, and store in a secure location until the City of Colton can pick up items from construction site. Include fasteners or brackets needed for reattachment elsewhere.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of

interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI A10.6 and NFPA 241.

C. Pre-demolition Conference: Conduct conference at Project site to discuss scope of work items. Review methods and procedures related to demolition including, but not limited to, the following:

1. Inspect and discuss condition of construction to be demolished.
2. Review and finalize demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review and finalize protection requirements.
4. Review procedures for noise control and dust control.
5. Review items to be salvaged and returned to Owner and those to be stored by the contractor for later use.

1.6 PROJECT CONDITIONS

A. Items to be demolished will be vacated and their use discontinued before start of the Work.

B. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

C. On-site storage or sale of removed items or materials is not permitted.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soils: Comply with requirements in Division 2 Section "Earthwork."

PART 3 - EXECUTION

3.1 DEMOLITION CONTRACTORS

A. Qualified Demolition Contractor:

1. Confirm qualifications with city-authorized representative prior to action.

3.2 UTILITIES

A. Verify that utilities in areas of work have been disconnected and capped before starting demolition operations.

B. If utilities are found during operations, contract city-authorized representative prior to further action.

3.3 PREPARATION

A. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities affecting areas to be demolished.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.
2. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.

B. Salvaged Items: Comply with the following:

1. Clean salvaged items of dirt and demolition debris.
2. Store items in a secure area until needed for re-installation.
3. Transport items to storage area as designated by Owner.
4. Protect items from damage during transport and storage.

3.4 PROTECTION

A. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.

3.5 DEMOLITION, GENERAL

A. General: Demolish indicated site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until portable fire-suppression devices are present during flame-cutting operations.
2. Maintain fire watch during and for at least one hour after flame cutting operations.
3. Locate demolition equipment and remove debris and materials so as not to disrupt existing vegetation to remain.

B. Site Access and Temporary Controls: Conduct demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Explosives: Use of explosives is not permitted.

3.6 DEMOLITION BY MECHANICAL MEANS

A. Salvage: Items to be salvaged are indicated on Drawings:

B. Below-Grade Construction: Demolish foundation and other below-grade construction in their entirety.

1. Remove below-grade construction and footings completely.

3.7 SITE RESTORATION

A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.

B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from demolition operations with satisfactory soil materials according to backfill requirements in Division 2 Section "Earthwork."

C. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.8 REPAIRS

A. Promptly repair damage to adjacent areas caused by demolition operations.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site.

B. Do not burn demolished materials.

3.10 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before demolition operations began.

END OF SECTION 02221

SECTION 02230 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Removing existing trees and shrubs per plan.
2. Clearing and grubbing.
3. Temporary erosion and sedimentation control measures.

B. Related Sections include the following:

1. Section 02221 “Site Demolition”
2. Section 02300 “Earthwork”
3. Section 02900 “Landscape Planting”

1.2 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain on Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.3 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, driveways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

C. Do not commence site-clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 2 Section "Earthwork."

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly identify trees and vegetation to remain with approval from Landscape Architect.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties, streets and walkways, according to a sediment and erosion control plan, specific to the site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

D. Comply with requirements for storm water pollution prevention in section 02300 “Earthwork.”

3.3 CLEARING AND GRUBBING

A. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

B. Remove from the area of work all plants indicated on plans and verified with Landscape Architect for removal, concrete debris and trash. Vegetation and roots (2” and larger) shall be removed down to three (3) feet below grade within clearing areas and legally dispose of them off Owner’s property.

C. Clear planting areas of existing weeds by killing with systemic spray and removing vegetation to within 3” of existing grade. See also Section 02900 Landscape Planting.

D. Cut back foliage as indicated on plans and where necessary to allow for construction improvements.

E. Prune existing trees where indicated to lift skirt to a height of 6’ above existing grade.

F. Boulders 12” and larger in size encountered during operations may be retained on site for reuse.

G. No less frequently than daily, treat exposed ground areas and removal operations for dust control with water truck or equal. Provide dust control in windy conditions as required to City inspector’s satisfaction.

3.4 DISPOSAL

A. Disposal: Removed obstructions, cleared materials, and waste materials including trash and debris shall be legally disposed of off Owner's property.

END OF SECTION 02230

SECTION 02300 - EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Preparing sub-grades for paving materials and exterior plants.
2. Excavating and backfilling for structures.
3. Sub-base course for concrete walks.

B. Related Sections include the following:
1. Section 02221 Site Demolition
2. Section 02230 Site Clearing
3. Section 02960 Landscape Planting
4. Section 02810 Landscape Irrigation

1.2 REFERENCE

A. Geotechnical Evaluation prepared by Geo-Tek, Inc. dated September 27, 2019, and the recommendations contained therein shall be made a part of these specifications.

1.3 DEFINITIONS

A. Backfill: On-site soil material used to fill an excavation.

B. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

C. Excavation: Removal of material encountered above sub-grade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

D. Fill: Clean on-site soil materials used to raise existing grades.

E. Structures: Footings, foundations, retaining walls, slabs, curbs, or other man-made stationary features constructed above or below the ground surface.

F. Sub-grade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below sub-base, drainage fill, or topsoil materials.

G. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations on site. All imported soil materials shall be approved by the Geotechnical Engineer.

B. Satisfactory Soils: Soils shall be free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, equipment and other hazards created by earthwork operations.

B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 2 Section "Site Clearing."

C. Protect and maintain erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing," during earthwork operations.

3.2 EXCAVATION

A. Unclassified Excavation: Excavate to sub-grade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.3 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing base material. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and sub-grades.

3.5 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation around foundations or wall footings to ultimate dimension of concrete footing with compacted backfill. No “footing sluff” is allowed.

3.6 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.7 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under shrub and planted areas, use satisfactory soil material up to 6” below finish grade. Use topsoil material to fill the top 6” of the required fill.
2. Under walks and pavements, use satisfactory soil material.
3. For footings and foundations, use engineered fill.

3.8 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate sub-grade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.9 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, steps, and pavements, scarify and re-compact top six inches (6”) of existing sub-grade and each layer of backfill or fill soil material at 90 percent.
2. Under walkways, scarify and re-compact top 6 inches below sub-grade and compact each layer of backfill or fill soil material at 90 percent.
3. For shrub or unpaved areas, compact each layer of backfill or fill soil material at 80 percent.

3.10 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

B. Site Grading: Slope grades to direct water away from structures to prevent ponding. Finish sub-grades to required elevations within the following tolerances:

1. Shrub or Unpaved Areas: Plus or minus 1 inch.

2. Walks and Paving: Plus or minus 1 inch.

3.11 FIELD QUALITY CONTROL

A. Footing Sub-grade: At footing sub-grades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing sub-grades may be based on a visual comparison of sub-grade with tested sub-grade when approved by County-authorized representative.

B. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.

C. When testing agency reports that sub-grades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

3.12 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

D. Construction Activity Storm Water Pollution Prevention

1) The Contractor shall comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, State Water Resources Control Board Order No. 2010-0014-DWQ, NPDES, No. CAS000002.

2) The Contractor is responsible to comply with the General Permit, provide the project's Qualified SWPPP Practitioner (QSP) and the Qualified SWPPP Developer (QSD), file for coverage under the General Permit, provide the materials and services as listed, but not limited to the project's SWPPP, execute the SWPPP, and provide the documentation and filings with the State Water Resources Control Board listed in the General Permit.

3) The Contractor shall ensure that all persons responsible for implementing requirements of the General Permit shall be appropriately trained in accordance with Section VII of the General Permit.

4) The Contractor is responsible for the "Housekeeping" of the project site, and for the maintenance and housekeeping of the SWPPP and of the records.

5) The Contractor shall provide the City Engineer each week with original copies of the filed documents and/or records.

3.13 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02300

SECTION 02630 - STORM DRAINAGE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes gravity-flow, non-pressure storm drainage, with the following components:

1. Catch Basins.
2. PVC Drain pipe.
3. Trench Drains and Grates.

B. Related Sections:
1. Section 02300 Earthwork

1.2 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Non-pressure, Drainage-Piping Pressure Rating: 10-foot head of water.

B. Materials and Construction shall conform to the Standard Specifications for Public Works Construction (Green book), latest edition.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified below.
   a. NDS Inc., Lindsay, CA (800) 726-1994
   b. Brooks Products, Ontario, CA (888) 307-7470
   c. ADS, Fontana, CA (760) 220-9158
   d. J M Eagle, Fontana, CA (909) 822-3009

2.2 PVC PIPING MATERIALS

A. PVC pipe, SDR 35 minimum wall thickness, bell and spigot style, solvent cement joints, fittings, and joining materials.

B. Fittings: Standard weight schedule 40 injection molded fittings shall comply with ASTM D 1764-62.

C. Solvent Cement: Cement and primer shall comply with ASTM D2564-91 for PVC or ABS solvent welded connections.

2.3 CATCH BASINS

A. Standard Pre-cast Concrete Drain Box Catch Basins:

1. ASTM C 478, precast, reinforced concrete
2. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron flat.
3. Grate Free Area: Approximately 50 percent, unless otherwise indicated.
4. Size per plan.

B. Standard Molded High-Impact Styrene Plastic Catch Basins:

1. Basin shall be one piece, tapered sides with formed lip to accept grate and openings and adapters to connect pipe.
2. Atrium Grates: Molded High-Impact structural foam polyolefin with UV inhibitor.
3. Size per plan.

C. Cast-in-place Concrete Catch Basins: Construct of reinforced concrete; designed according to ASTM C 890 for structural loading; of depth, shape, dimensions and appurtenances indicated. Conform to the Standard Specifications for Public Works Construction.

1. Bottom, walls and top: Reinforced concrete.

D. Frames and Grates: ASTM A536, Grade 60-40-18, ductile iron designed for A-16, structural loading. Include flat grate with small square or slotted drainage openings.

1. Size: 12” x 12” and 24” x 24” unless otherwise indicated.
2. Grate Free Area: Approximately 50% open, less otherwise indicated.

2.4 TRENCH DRAINS

A. Trench Drains:

1. NDS Spee-D Channel Drain with 24" long Cast Iron Grate
2. Standard: ASME A112.6.3.
3. Body Material: PVC.
4. Flange: Anchor.
5. Clamping Device: Required.
6. Outlet: Bottom.
7. Outlet Type: Inside caulk.
8. Grate Material: Cast iron.
9. Grate Finish: Natural Patina.
10. Dimensions of Frame and Grate: 4.42" wide x 24" long.
11. Top-Loading Classification: Medium Duty.

B.

2.5 CONCRETE

A. General: Cast-in-place concrete according to ACI 318/318R, ACI 350R, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (420 MPa), deformed steel.

2.6 MISCELLANEOUS MATERIALS

A. Filter material for sub-surface drain: Non-woven geo textile filter fabric, Mirafi 140N, or equal

B. Aggregate for below basins and around perforated pipe: gravel containing no particles finer than 3/8" sieve opening size.

C. Backfill Sand: Natural river or bank sand free of silt, clay, loam, organic matter, graded in accordance with ASTM C136, all passing No. 4 sieve and only 5% passing No. 200 sieve.

D. Concrete: Conforming to Section 03300 with minimum compressive strength of 2500 psi.

E. Drainage Fill: Washed, evenly graded uncrushed gravel graded in accordance with ASTM C136, with 100% passing 1-1/2" sieve and not more than 5% passing No. 4 sieve.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install couplings according to manufacturer's written instructions for using cements, and other installation requirements.
1. Place pipe on minimum 4" deep bed of sand.
2. Lay pipe to slope gradients noted. Maximum variation from true slope of 1/8" in 10 feet.
3. Backfill sand at sides and over top of pipe and consolidate. Provide soil cover to finish grade and compact.

C. Trenches shall be dug straight and true to slope, minimum 12" in width.

D. Install catch basins at locations shown and for changes in direction unless fittings are indicated. Use fittings for branch connections.

E. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

F. Install gravity-flow, non-pressure drainage piping according to the following:

1. Install piping pitched down in direction of flow, at minimum slope of 1.00 percent, unless otherwise indicated.
2. Install PVC piping according to ASTM D 2321 and ASTM F 1668.

G. Clear interior of piping of dirt and superfluous material as work progresses.

3.2 PIPE JOINT CONSTRUCTION

A. Where specific joint construction is not indicated, follow piping manufacturer's written instructions.

B. Join gravity-flow, non-pressure drainage piping according to the following:

1. Join PVC piping according to ASTM D 2321.

3.3 CATCH BASIN INSTALLATION

A. Set pre-cast concrete boxes, frames and grates to elevations indicated. Set on 6" minimum thick gravel base pad.

3.4 TRENCH DRAIN INSTALLATION

A. Set pvc channel and grates to elevations indicated on plans. Set on 4" minimum thick concrete base per detail.

3.5 FIELD QUALITY CONTROL

A. Test new piping systems for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.

B. Clean all new sections of piping of all soil and debris.

END OF SECTION 02630

SECTION 02870 – SITE FURNISHINGS & EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Trash Receptacles
2. Removable bollard
3. Permanent bollard
4. GRFC Planter with wire vine trellis

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop drawings: Submit all necessary plans, sections, elevations and details necessary for fabrication and installation of products indicated.

C. Maintenance Data: For all site furnishings, recommended by manufacturers.

D. Warranty: Manufacturer's written warranty against material defects and workmanship for 5 years.

PART 2 - PRODUCTS

2.1 TRASH RECEPTACLES

A. Acceptable Manufacturer: QCP Precast Concrete 866.703.2282, or approved equal.

B. Product: Model #QRCAL2832WD24 - one 26 gallon capacity liner, top deposit, Precast Concrete Color: BG1 (Beige). Flip Top Lid color: Black.

2.2 FIXED BOLLARDS

A. Acceptable Manufacturer: CalPipe Industries (a part of Atkone) 562.803.4388, or approved equal.

B. Product: 5" Diameter Carbon Steel Fix Bollard. Model: IBF05040. Color: Silver to match Overhead Shade Structure Steel Posts.

2.3 REMOVABLE BOLLARDS

A. Acceptable Manufacturer: CalPipe Industries (a part of Atkone) 562.803.4388, or approved equal.

B. Product: 5” Diameter Carbon Steel Removable Bollard. Model: IBF05040 with attached flip locking lid. Color: Silver to match Overhead Shade Structure Steel Posts.

2.4 GRFC RAISED PLANTERS WITH WIRE TRELLIS

A. Acceptable Manufacturer: Tournesol Siteworks 800.542.2282, or approved equal.

B. Product: Wilshire Planter with Vertigreen 3D Trellis. Model:WCX6-961836-90 Color: Sierra or City approved other. Finish: Tier One – Sandblast

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Installing contractor shall have 5 years minimum recent experience installing Site furnishings, bollards, fountains, etc.

B. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

END OF SECTION 02870

SECTION 02751

CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes exterior cast-in-place concrete for the following:

1. Natural color concrete walkways.
2. Natural colored concrete paving.
3. Natural color concrete band for concrete unit paver paving.
4. Natural colored concrete steps

B. Related Sections:

1. Section 02764 JOINT SEALANTS

2. Section 03300 CAST-IN-PLACE CONCRETE

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete pavement mixture.

C. Samples: Provide 3'x3' sample of each type of concrete color and finish.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

B. Provide sufficient staking, shoring and/or bracing of forms as required to adequately secure forms during placement of concrete.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 40 for #3, Grade 60 for #4 and larger; deformed.

B. Plain Steel Wire: ASTM A 82, as drawn.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice."

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout the Project:

1. Portland Cement: ASTM C 150, Type II, gray

B. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate, uniformly graded, not greater than 1" size. Provide aggregates from a single source.

C. Water: ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: ASTM C 494/C 494M, of type suitable for application, certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

2.4 CURING MATERIALS

A. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

B. Water: Potable.

C. Chemical Retardant: Grace Products "Top Cast" water based top surface retarder; grade 03 light acid etch.

2.5 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis. L.M. Scofield, or equal colors as indicated on plans.

2.6 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, with the following properties:

1. Compressive Strength (@ 28 Days): Not less than 2500 psi for natural color pavements, 3000 psi for footings below grade and for integral colored pavements.
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
3. Slump Limit: Not more than 3 inches, ± 1 inch.
4. Air Entrainment by total volume of concrete should be 4 percent to 6 percent for 1" max. size aggregate.

B. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proof-roll prepared sub base surface below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Add base material as required and re-compact.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

3.4 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.

C. Isolation / Expansion Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated. Recess top ½" to receive waterproof sealant.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints to a depth equal to at least one-fourth of the concrete thickness.

E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 3/8-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.5 CONCRETE PLACEMENT

A. Moisten sub base soils to provide a uniform dampened condition at time concrete is placed. Soils shall be pre-saturated to a minimum of 100% of optimum moisture content to a depth of 12".

B. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

C. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

D. Screed pavement surfaces with a straightedge and strike off.

E. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

3.6 FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units.

Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across trowel-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

C. Light Retardant Finish: After trowel finishing, apply top surface retarder uniformly with Hudson type sprayer. Comply with manufacturer recommendations. Water wash surface to expose texture the following day.

3.7 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screening, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

3.9 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot long, unleveled straightedge not to exceed 1/8 inch.
4. Joint Spacing: 3 inches.
5. Contraction Joint Depth: Plus 1/4 inch, no minus.
6. Joint Width: Plus 1/8 inch, no minus.

3.10 PAVEMENT MARKING

A. Allow concrete pavement to cure for 28 days and be dry before starting pavement marking.

B. Sweep and clean surface to eliminate loose material and dust.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.

B. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement.

C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 02751

SECTION 02780

PRECAST CONCRETE SITE PAVERS

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish and Install Precast Concrete Site Pavers from Flatworx by QCP

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

ASTM C33 Concrete Aggregates

ASTM C39 Concrete Compressive Strength

ASTM C150 Portland cement

ASTM C642 Water Absorption, Density, Voids in Hardened Concrete

ASTM C666 Rapid Freeze/Thaw Resistance of Concrete

ASTM C979 Pigments for Integrally Colored Concrete

ASTM C1028 Coefficient of Friction

1.3 SUBMITTALS

A. Samples: Submit two full-sized samples of each type of precast concrete site pavers to show the full range of color and texture of unit for selection and approval.

B. Warranty: Provide certified copies of manufacturer's product warranties.

C. Mix Design

a. Manufacturer to provide a mix design for precast concrete paving units to meet criteria of this specification.

D. Shop drawings

1. Layout drawings showing pattern of pavers for each paved area.

1.4 MOCK-UP

A. Provide an 8 foot square minimum paver area as described in Article 3.2. Mock-up area to be used to determine joint sizes, lines, laying pattern, color(s) and texture of the job. Mock-up area to be the standard from which the work will be judged.

1.5 SUBSTITUTIONS

A. Proposed substitutions: No known equal.

1.6 QUALITY ASSURANCE

A. Compliance with Regulations: Comply with requirements of state and local building codes and with rules and regulations relating to building accessibility.

B. Qualifications of Manufacturer

1. Company specializing in manufacture of precast concrete paving units and other precast concrete products with a minimum of 10 continuous years of documented experience.

C. Manufacturer to have a robust Quality Control Program that is certified by a professional engineer in the state of operation.

D. Precast concrete paving units shall have a compressive strength of 8,000 psi minimum.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials to the installation site in the manufacturer's original packaging. Packaging shall contain manufacturer's name, customer name, order, identification number, and other related information.

B. Handle and store precast concrete site pavers in accordance with manufacturer's recommendations.

1.8 WARRANTY

A. Provide warranty covering pedestal set precast concrete site pavers against defects in material and workmanship for a period of 3 years. Unusual abuse and neglect are excepted as are Act's of God.

PART 2 - PRODUCTS

2.1 MANUFACTURER

QCP

P.O. Box 639 Norco, CA 92860

www.qcp-corp.com

2.2 MATERIALS

A. Precast concrete site pavers, pedestal supported; consisting of Portland cement, aggregate, and color admixtures.

1. Portland Cement: ASTM C 150, Type III, high early strength.

2. Aggregate: ASTM C 33.

3. Color Admixture: By Solomon Colors, or equal, as required to achieve color as selected.

4. Aggregate for exposed aggregate surface: As selected

5. Adjustable Deck Supports (Pedestals): By Bison IP or equal:

B. Precast Concrete Site Paver Style

1. QCP Flatworx Paver Model:

2. Dimensions:

2.3 COLORS AND FINISHES

A. Colors: 1.

B. Finishes: Walking surfaces of precast concrete paving slab shall have minimum coefficient of friction of 0.58, wet and dry.

1.

2.4 PHYSICAL PROPERTIES

A. Compressive strength: Minimum 8,000 psi.

B. Unit size: Within 1/32” of designated length, width and thickness.

C. Water absorption: Less than 5%

D. Pavers will contain on average 5% entrained air, with no individual piece under 4%.

2.5 FABRICATION

A. Pavers shall be fabricated of cement conforming to ASTM C 150, Type III, aggregates conforming to ASTM C 33, and pigments for integrally colored concrete conforming to ASTM C979.

2.6 SOURCE QUALITY CONTROL

A. Pavers shall be tested frequently to assure that mixes provide units having not less than 8,000 psi compressive strength at 28 days. Manufacturer to provide project owner with 6 tests taken from project batches.

B. Minor chips, hairline cracks, air voids and slight variations in color are normal in precast concrete. When viewed in typical daylight illumination from a distance of 5 feet, minor chips, hairline cracks and air voids that cannot be seen with the naked eye are not grounds for rejection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify all elevations, required pedestal heights and deck dimensions before commencing work.

D. Pedestal Set Pavers specified are to be used only in pedestrian traffic areas.

3.2 INSTALLATION - GENERAL

A. Installation shall comply with requirements of applicable building codes and state and local jurisdictions.

B. Refer to chosen pedestal manufacturer's installation specifications.

C. Approved Installation Methods

a. Mortar Set

i. Latex Mortar Mix: ANSI A-118.4

ii. Water to be portable.

iii. Grout: ANSI A-118.6 Grout – Latex

b. Sand Set

i. Sand shall be common sand generally referred to as concrete sand shall be free of organic materials and any other contaminates.

ii. Joint Filler Materials: Sand conforming with ASTM C-144 with 100% passing a No.16 sieve

D. Installer Qualifications

a. Installer to have 5 years experience in setting like pavers for a like size project. Installer to provide three references.

3.4 COMPLETION

A. Protect precast concrete paving units from damage due to subsequent building operations.

B. After installation and before completion, inspect precast concrete paving units for construction damage and obtain new precast concrete paving units if required.

C. Immediately prior to final acceptance of project, clean precast concrete site pavers.

END OF SECTION

SECTION 02900 - LANDSCAPE PLANTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the supplying and installation of the following:

1. Palms.
2. Shrubs.
3. Ground covers.
4. Maintenance for 90 calendar days.

B. Related Sections include the following:

1. Section 02300 "Earthwork" for excavation, filling, and rough grading.
2. Section 02810 “Landscape Irrigation”.

1.2 DEFINITIONS

A. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of exterior plant required.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Planting Soil: Native topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

D. Sub-grade: Surface of subsoil remaining after completing excavation.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Certificates: For each type of manufactured product, signed by product manufacturer, and complying with the following:

1. Manufacturer's certified analysis for standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Qualification Data: For landscape Installer.

D. Material Test Reports: For existing surface soil.

E. Planting Schedule: Indicating anticipated planting dates for exterior plants.

F. Delivery slips: from supplier indicating material.

1.4 QUALITY ASSURANCE AND QUANTITY DELIVERED

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of exterior plants. Installer shall have a valid contractor C-27 license for minimum of five (5) continuous current years.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when exterior planting is in progress.

B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for plant growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.

D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

E. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes.

F. Observation: City authorized representative may observe trees and shrubs at site before planting for compliance with requirements for genus, species, variety, size, and quality. City authorized representative retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify City authorized representative of planting materials 48 hours minimum in advance of delivery to site.

2. Spot plants at locations per plan for review and approval by representative.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not prune trees and shrubs before delivery, except as approved by City authorized representative. Protect bark, branches, and root systems from sunscald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery.

B. Handle planting stock by root ball, container, or box.

C. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.

1. Do not remove container-grown stock from containers before time of planting.
2. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.6 COORDINATION

A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.7 WARRANTY

A. Special Warranty: Warrant the following exterior plants, for the warranty period indicated, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control.

1. Warranty Period for Trees 15-gallon and 5-gallon Shrubs: One year from date of Substantial Completion.
2. Warranty Period for Ground Cover 1-gallon plants: Three months from date of Substantial Completion.
3. Remove dead exterior plants immediately. Replace immediately unless required to plant in the succeeding planting season.
4. Replace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
5. A limit of one replacement of each exterior plant will be required, except for losses or replacements due to failure to comply with requirements.

1.8 MAINTENANCE

A. Palms, Shrubs, and Ground cover plants: Maintain for the following maintenance period by pruning, cultivating, watering, weeding, fertilizing, restoring planting to original specification where needed, tightening and repairing stakes and supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as

required keeping trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings.

1. Maintenance Period**:** 90 calendar days from date of Substantial Completion.

2. Maintenance operations shall include:
   a. Cultivation and weeding plant beds and tree pits. Cultivation and weed removal shall be continuous throughout maintenance period.
   b. Application of herbicides for weed control shall be in accordance with manufacturer's instructions. Remedy all damage resulting from use of herbicides.
   c. Application of pesticides shall be in accordance with manufacturer's instructions. Remedy all damage from use of pesticides.
   d. Irrigating sufficient to saturate root system and maintenance of irrigation system.
   e. Trimming and pruning, including removal of clippings and dead or broken branches and treatment of pruned areas or other wounds.
   f. Disease and rodent control within project limits.
   g. Maintaining tree stakes and ties. Adjust and/or replace ties to keep tight. Repair or replace accessories when required.

PART 2 - PRODUCTS

2.1 PALM AND SHRUB MATERIAL

A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sunscald, injuries, abrasions, and disfigurement.

B. Grade: Provide Palms and shrubs of sizes and grades complying with ANSI Z60.1 for type of trees and shrubs required. Palms and shrubs of a larger size may be used if acceptable to City authorized representative, with a proportionate increase in size of roots or rootballs.

C. If formal arrangements for consecutive order of trees or shrubs are shown, select stock for uniform height and spread.

2.2 GROUND COVER PLANTS

A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots, or similar containers, and complying with ANSI Z60.1.

2.3 ORGANIC SOIL AMENDMENTS

A. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

2.4 FERTILIZER

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.5 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Ground or shredded bark or Wood and bark chips.

2.6 PLANTING SOIL MIX

A. Planting Soil and Backfill Mix: Mix topsoil with the following soil amendments and fertilizers in the following quantities:

1. Ratio of Loose Wood Derivatives to Topsoil by Volume: 1:4.
2. Weight of Commercial Fertilizer per 1000 Sq. Ft.: 10 lbs.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple exterior plantings.

3.3 PLANTING BED ESTABLISHMENT

A. Loosen sub-grade of planting beds to a minimum depth of 4 inches. Remove stones larger than 2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Spread amendments and fertilizer onto surface, and thoroughly incorporate into the top 4” depth of soil by roto-till, or equal.

B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

3.4 PALM AND SHRUB EXCAVATION

A. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as ball diameter for container-grown stock.

B. Soil removed from excavations may be used as part of backfill mix.

C. Obstructions: Notify City authorized representative if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

D. Drainage: Notify City authorized representative if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

3.5 PALM PLANTING

A. Set container-grown stock plumb and in center of pit or trench with top of root ball 1 inch above adjacent finish grades.

1. Carefully remove root ball from container without damaging root ball or plant.
2. Place SAND around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before

placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

B. Organic Mulching: Apply 3-inch average thickness of organic mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.

3.6 SHRUB PLANTING

A. Shrub installation.
1. Positioning: After removing plant from container, scarify side of root ball to prevent formation of girdling roots and position plant in planting pit.
2. Backfilling: Use planting soil mix to backfill plant pits. Set each plant plumb and brace rigidly in position until planting soil has been tamped solidly around the ball and roots. When plant pits have been backfilled approximately two-thirds (2/3) full, water thoroughly and saturate root ball before installing remainder of the backfill mix, eliminating all air pockets. Install remainder of mix to top of pit.
3. Where fertilizers are recommended, use a slow-release fertilizer. Place evenly distributed in plant pits when backfilled two-thirds (2/3) to finish grade according to the schedule.
4. Adjustment: Adjust plants to that after full settlement has occurred; the natural grade at the base of the plants is one (1) inch above the adjacent planting finish grade.

B. Watering Basin: Form saucer with four (4) inches high berm centered around shrub pits twelve (12) inches wider than ball diameter.

C. Watering: Water all plants immediately after planting.

D. Labels: Remove all nursery-type plant labels from plants.

3.7 WEED ABATEMENT PROCESS

A. Weed Abatement Prior to Planting:
1. Water all areas thoroughly and uniformly. Continue watering at the frequency and duration necessary to germinate all residual weed seeds, and as directed.
2. Unless otherwise directed, maintain watering for not less than three (3) weeks.
3. When perennial weeds appear, apply approved contact herbicide over affected areas. Apply in accord with manufacturer's instructions.
4. When annual weeds appear, apply approved contact herbicide over affected areas. Apply in accord with manufacturer's instructions.
5. Do not water affected areas for a period of four (4) days minimum, following application of contact herbicides.
6. Follow manufacturer's instructions relating to time required for chemicals to effectively destroy weed growth.
7. Resume watering, and continue for a second period of three (3) weeks.
   a. A shorter watering period may be permitted by the Agency's Authorized Representative, as determined by project conditions.

8. Discontinue watering for one (1) day prior to a second application of herbicide spraying.
   a. Reapply straight contact herbicide in accord with manufacturer's instructions.
   b. Do not water treated areas for a period of four (4) days minimum following application of herbicide.
   c. Remove all desiccated weeds from the project site to the finish grade.

3.8 PLANTING BED MULCHING

A. Mulch surfaces of planting beds and other areas indicated.

1. Organic Mulch: Apply 3-inch average thickness of organic mulch, and finish level with adjacent finish grades. Do not place mulch against plant stems.

3.9 CLEANUP AND PROTECTION

A. During exterior planting, keep adjacent pavings and construction clean and work area in an orderly condition.

B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.

3.10 DISPOSAL

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 02900

SECTION 02764

PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Expansion within concrete pavement.
2. Joints between cement concrete and walls.

B. Related Sections:
1. Section 02751 Concrete Pavement.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For each type and color of joint sealant required.

C. Product certificates and test reports.

D. Compatibility and Adhesion Test Reports: From sealant manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

1. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 COLD-APPLIED JOINT SEALANTS

A. Single-Component Urethane Sealant for Concrete: Single-component, pourable, coal-tar-modified, urethane formulation complying with ASTM C 920 for Type S; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated, O.

1. Available Products:

a. Sonneborn, Div. of ChemRex, Inc.; Sonomeric 1.

b. Craftco Inc.

c. Dow Corning

B. Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3406.

1. Available Products:

a. Crafco Inc.; Superseal 444/777.
b. Meadows, W. R., Inc.; Poly-Jet 3406.
c. Sikaflex – Construction

2.4 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.

B. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience.

C. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

D. Install backer materials to support sealants during application and at position required to produce optimum sealant movement capability. Do not leave gaps between ends of backer materials. Do not stretch, twist, puncture, or tear backer materials. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

E. Install sealants at the same time backings are installed to completely fill recesses provided for each joint configuration and to produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Immediately after sealant application and before skinning or curing begins, apply fine grade (60) silica sand to joint surface.

G. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

H. After curing, remove excess silica sand.

END OF SECTION 02764

SECTION 02826 - ORNAMENTAL METAL FENCE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Tubular steel ornamental fencing.

2. Wire Fencing with Tubular steel frame and post.

B. See Division 05521 Section "Pipe and Tube Railings" for metal pipe and tube railings.

1.2 SUBMITTALS

A. Shop Drawings: Provide complete dimensioned plans, elevations, sections, and details of tubular steel fencing and their connections. Show anchorage and accessory items.

B. Templates: For anchors and bolts.

C. Paint: Color sample for all painted or powder coated elements

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.

B. Ferrous Metals:

1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2. Steel Tubing: ASTM A 500, cold-formed steel tubing.
3. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

4. Cast Iron: ASTM A 48/A 48M, Class 30, unless another class is indicated or required by structural loads.

2.3 FASTENERS

A. General: Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless- steel fasteners where exposed. Select fasteners for type, grade, and class required.

2.4 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20, high-zinc-dust-content paint for regalvanizing welds in steel.

B. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107.

C. Concrete Materials and Properties: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi, unless otherwise indicated.

2.5 FABRICATION

A. General: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.

1. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
2. Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. Finish exposed welds smooth and blended.
3. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.
4. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

B. Miscellaneous Steel Trim: Fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

1. Exterior Miscellaneous Steel Trim and brackets: Hot-dipped Galvanized finish

2.6 METAL FINISH

A. Powder Coat Finish:

1. After assembly, steel components shall be steel shot blasted and thoroughly cleaned.

2. Apply a coating of non-toxic sealer, compatible with powder coating to all components.

3. Powder coat shall be applied in a factory controller setting by electrostatic spray process and then shall be heat cured. The cured thickness shall be 8-10 mils.

4. Color selection shall be as indicated on plans. Provide color samples.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, with edges and surfaces level, plumb, and true.

1. Fit exposed connections accurately together. Weld connections that are not to be left as exposed joints but cannot be shop welded. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication.
2. Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
3. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

B. Set bearing and leveling plates on cleaned surfaces using wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, pack solidly with nonshrink, nonmetallic grout.

C. Touch up surfaces and finishes after erection.
1. Powder Coat Finish: Clean field welds, bolted connections, and abraded areas and repair powder coat finishes per manufacturer recommendations.

END OF SECTION 02826

SECTION 02810 - IRRIGATION SYSTEM

PART 1 - GENERAL

1.1 SCOPE

A. Includes furnishing all material, labor, and equipment required to provide and install additions to the main piping system, lateral circuit piping system, flood and spray pattern irrigation specified herein and as required to complete the work per plans.

B. Related Sections:

1. Section 02900 Landcape Planting

1.2 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with the Uniform Building Code, Uniform Plumbing Code, Standard Specifications for Public Works Construction (SSPWC), and all applicable state, local, and federal codes.

1.3 PROTECTION

A. Check or locate existing structures, electric cables or conduits, utility lines and other existing features or conditions above or below ground level that might be damaged as a result of Contractor operation. Questions or conflicts arising out of such examination prior to or during operation shall be immediately directed to the attention of the Client's representative for necessary action or decisions before resuming operation. Contractor is responsible for repair or replacement, at no cost to the Client, for features or conditions damaged through failure to comply with the above procedures.

1.4 REFERENCES

A. ASTM D1784-92 - Specification for Rigid PVC and CPVC Compounds and Chlorinated Compounds.

B. ASTM D2466-90a - Specification for PVC Plastic Pipe Fittings, Schedule 40.

C. ASTM D2467-92 - Specification for Socket-Type PVC Plastic Pipe Fittings, Schedule 80.

D. ASTM D2564-91a - Specification for Solvent Cements for PVC Plastic Piping Systems.

E. ANSI B-16.3 - Specification for galvanized malleable iron fittings.

F. ASTM D-1785 and ASTM D-2466 - Specification for PVC Class 160, Class 200, Class 315 solvent weld and Ring-Tite Pipe, NSF approved Type

I, Grade I. Schedule 40 and 80 pipe shall be manufactured to conform to ASTM D-1785 and ASTM D-2466.

1.5 PERFORMANCE REQUIREMENTS

A. Drawings are diagrammatic and indicative of the work to be installed.

B. The work shall be installed in such a manner as to avoid conflicts between the irrigation system, planting, and site and architectural features.

B. Manufacturer's directions shall be followed in all cases where the manufacturer's used in the Contract furnish directions covering points not shown in the drawings and specifications.

C. Water supply: The sources of water supply shall be selected within project boundary on the “point of connection” (POC). Verify the P.O.C. with the Client’s representative.

1.6 MATERIALS AND IDENTIFICATION

A. Labels and signs must be approved by Client’s representative. Labels and signs shall be installed on all appurtanances in below grade boxes and on all designated facilities such as control panels. Every pipe shall be identified with a pre-printed, embossed or painted label.

B. All potable water piping installed within the same project limits shall be installed with potable water identification.

C. Where a potable and reclaimed water lines cross within one (1) foot vertically, the potable line shall be installed within a Schedule 40 PVC protective sleeve. The sleeve shall extend five (5) feet either side of the reclaimed water line for a total of ten (10) feet. A minimum of one (1) foot of vertical separation between utilities must be maintained at all times. The potable line must be installed above the reclaimed water line.

D. All gate valves, manual control valves, electrical control valves, pressure reducing valves and pressure releif valves for on-site potable water irrigation systems shall be installed below grade in valve boxes with green covers.

1.7 SUBMITTALS

A. Prior to beginning Work, the Contractor shall submit a material list for approval of the equipment and material to be used on this project. The material list shall include the manufacturer, model number, and description.

B. The material list shall include all equipment, materials, or processes specified by name in the drawings and specifications.

1.8 AS-BUILT FIELD DATA

A. The Contractor shall maintain a complete and accurate set of as-built drawings. These drawings shall be kept up to date with the progress of the

work. The Contractor will have blueprints for the purpose of recording the as-built conditions of the Work, with information as follows:

1. The location of the main line; quick coupling valves; electric control valves; controllers; sleeves; point of connection; any special capped lines for future work; locations of controller wire splice junctions, lateral lines, and miscellaneous equipment.

B. The Contractor shall indicate clearly and correctly work installed differently from that shown on the design contract drawings by dimensioning from two permanent points of reference.

PART 2 - MATERIALS

2.1 GENERAL

A. All equipment shall be new and unused prior to installation.

B. The equipment shall conform to the submitted Plans, Schedule, and Specifications and as specified in this section.

2.2 PLASTIC PIPE AND FITTINGS

A. Plastic Pipe:

1. All plastic pipe shall be continuously and permanently marked with the manufacturer's name, kind of pipe, material size IPS, NSF approval and schedule and type.
2. PVC pipe shall be manufactured from virgin polyvinyl chloride compound in accord with ASTM D 1784-92.

B. Main Line: Piping on pressure side of irrigation control valves below grade shall be PVC Class 315.

C. Lateral Lines: Piping under intermittent pressure shall be PVC Schedule 40.

D. Fittings and Connections:

1. Plastic PVC fittings shall be standard weight Schedule 40 injection molded. Fittings shall comply with ASTM D 1764-62 (1991), D2466-90a, and/or D2467-92. Threaded PVC fittings shall be injection molded.
2. All threaded nipples shall be standard weight Schedule 80 PVC with molded threads. All threaded nipples exposed above grade shall be gray in color.

2.3 PVC CEMENT AND PRIMER

A. All PVC cement and primer shall comply with ASTM D2564-91a and be NSF and IAPMO standards.

B. Lateral lines and fittings shall be cemented using a 100% active solvent, blue in color, medium bodied, fast setting.

C. Main line pipe and fittings shall be coated with a primer and then cemented with a 100% active solvent, gray in color, medium set, heavy bodied.

D. Both primer and solvent shall be similar in all respects to that manufactured by IPS Weld-On brand.

E. Obtain and follow the manufacturer's application directions.

2.4 GALVANIZED PIPE AND FITTINGS

A. Pipe shall be galvanized steel, American National Standard Institute (ANSI), Schedule 40 galvanized, mild steel screwed pipe.

B. Fittings shall be galvanized screwed beaded malleable iron.

2.5 BRASS PIPE AND FITTINGS

A. Brass pipe shall be 85% red brass, American National Standard Institute (ANSI), Schedule 40 screwed pipe.

B. Fittings shall be wrought copper, solder joint type.

2.6 COPPER PIPE AND FITTINGS

A. Copper pipe shall be type K, hard tempered.

B. Fittings shall be wrought copper, solder joint type.

C. Joints shall be soldered with silver solder, 45% silver, 15% copper, 16% zinc, 24% cadmium, solid at 1125 °F and liquid at 1145 °F.

2.7 SLEEVE MATERIAL

A. Sleeves for irrigation piping and wires shall be provided crossing of all walks, asphalt drives, and any other paving locations.

B. All sleeve material shall extend 18 inches beyond edges of paving, hardscape, or construction. Sleeve shall extend five (5) feet beyond potable water crossing. Provide pavement markings or witness stakes and wires for sleeve crossing locations.

C. Sleeving material for PVC main line piping shall be SCH 40 and sized to allow for piping with couplings to easily slide through the sleeving material. Minimum size sleeving material shall be as follows:

Pipe Size	Sleeve Size (Nominal Size)
3/4"	1 1/2"
1"	2"
I 1/4"	2 1/2"
1 1/2"	3"
2"	4"
2 1/2"	4"

2.8 UNDERGROUND UTILITY MARKING TAPE

A. Marking tape shall be Magnetic brand as manufactured by Griffolyn Company Inc, Terra Tape or Thor Enterprises, or approved equal.

B. Marking tape shall be a minimum of 3 inch wide, and length as needed to mark the entire length of main line within the project boundaries, where below grade.

C. Marking tape color codes are as follows:

Red	Electrical
Blue	Potable water
Purple	Reclaimed water

2.9 VALVE BOXES

A. Electric Control Valves:

1. Rectangular plastic box with green colored rectangular lid with the inscription "CONTROL VALVE & NO." cast or engraved into the lid. Provide with stainless steel bolt.

B. Gate and other valves:

1. Round plastic box with green round lid with the inscription "GATE VALVE" cast or engraved thereon. Provide with stainless steel bolt.

2.10 REMOTE CONTROL VALVES

A. Electric remote control valves shall be electrically operated, normally closed valve, glass-filed nylon contruction with operation range of 0.25 to 200 GPM, 200 PSI rated as manufactured by Rain Bird or equal for appropriate application of spray heads. Add pressure regulator to valves as required.

2.11 BACKFLOW PREVENTER

A. Febco, reduced pressure zone assembly, bronze construction with two brass full port ball valves.

2.12 SHUT-OFF VALVE

A. Acceptable manufacturers: NIBCO, Kennedy, Crane and Stockham. Equivalent products of other manufacturers will be considered in accordance with the "or equal" provision.

B. 3/4-inch through 2-inches shall be 200 lb. WOG bronze full port ball valves.

2.13 ELECTRICAL WIRING AND SERVICE

A. Low Voltage Service and Connections:

1. Connections between controller and remote control valves shall be made with direct burial AWG-UF, 600 volt wire, insulation thickness 3/64-inch, utilizing low density high molecular weight polyethylene insulation, minimum 14 AWG.

2. Common wires: White, with unique color stripe for each controller.

3. Splicing Materials: Pen-Tite or equal. Use one splice per connector pack.

2.14 AUTOMATIC CONTROL SYSTEM

A. Controller: Manufacturer, model, and size as indicated on drawings shall be utilized. Substitutions not allowed.

B. Wire Conductors: Color coded, 14 gauge size, direct burial type. Use white for ground wire.

2.15 CONTROLLER CHARTS

A. Record drawings shall be approved by the City's Authorized Representative before controller charts are prepared.

B. Provide two controller charts for each controller supplied.

C. The chart shall show the area controlled by the automatice controller and shall be the maximum size which the controller door will allow.

D. The chart is to be a reduced drawing of the actual record system, of a maximum size that will fit inside controller housing, double sided is required for readability.

E. The chart shall be a blackline print and a different color shall be used to indicate the area of coverage for each station, using pastell or transparent colors.

F. When completed and approved, the chart shall be hermetically sealed between two pieces of plastic, each being a minimum twenty (20) mils.

2.16 OPERATION AND MAINTENANCE MATERIAL

A. Delivery: Deliver 4 sets of operating and mainenance materials to Owner prior to date established in Certificate of Completion of irrigation systme Work.

B. Prepare one hard-cover theree-ring binder containing the following information.

1. Index sheet stating Contractor's address and telephone number, list of equipment with name and address of local manufacturer's representative.

2. Catalog and part sheets on every material and equipment installed under this contract.

3. Guarateed statement.

4. Complete operating and maintenance instuction on all major equipemnt.

C. Four sets of operating and maintenance mauals for the booster pumps shall be provided to the owner after startup and shall include parts manuals for major components, per formance curve for pump, general sequence of operation, and elctrial schematic for control panel.

2.17 QUICK COPLER

A. Shall be 3/4-inch size for irrigation water use, brass construction, two piece body with lockable rubber cover.

B. Provide two (2) coupler keys with hose swivals.

2.18 MASTER VALVE

A. Electrically operated, brass construction, normally closed valve, low flow design, superior brand.

B. Flow sensor, model and size indicated on drawings shall be utilized.

2.19 DRIP TUBING

A. As manufactured by Netafim with internal drip emitters and built-in check valves.

PART 3 - EXECUTION

3 .1 SITE CONDITIONS

A. Before starting work on the irrigation main line pipe system, carefully check all grades to determine that work may safely proceed, keeping within the specified material depths.

B. Do not willfully install the irrigation main line pipe system when it is obvious in the field that unknown obstructions or grade differences exist that might not have been considered in the engineering. Such obstructions or differences shall be brought to the attention of the Client's representative.

C. The installation of all irrigation materials, including pipe, shall be coordinated with the site improvement and utility drawings to avoid interfering with sign posts, park or street furniture, playground equipment and utility appurtances.

D. Layout irrigation main line pipe system and make any minor adjustments required due to differences between site and drawings. Any such deviations in layout shall be within the intent of the original drawings, and without additional cost to the Client. The Contractor shall spray paint the location of main line and flag the location of all valves for review before commencing trenching.

3.2 TRENCHING AND EXCAVATING

A. Trenches shall be dug straight and support pipe continuously on the bottom of the ditch. Snake pipe in the trench to an even grade.

B. Excavate enough soil at valve assemblies to properly align cover boxes to grade on compacted subsoil, or brick blocks.

C. Water Pipes: Unless otherwise designated on the utility drawings, provide cover over water pipes as follows:

1. Supply line (copper from the water meter to backflow prevention): 18 inches below grade minimum.

2. Main line (PVC Pipe): 18 inches below grade minimum.

3. Lateral lines (PVC Pipe): 12 inches below grade minimum.

4. All lines and sleeves under pavement shall have 18-inch minimum cover.

D. Electrical Wiring: Unless otherwise noted on utility drawings, provide cover over electrical wiring as follows:

1. Low voltage wiring 18 inches minimum below grade.

2. Do not tape wires to main line piping.

E. If tree roots larger than 1-1/2" in diameter are encountered during trenching hand dig around the roots, and avoid all damage to the root system.

F. Backfilling:

1. Backfill shall not be placed until the installed irrigation system has been observed, tested, and approved by the Client's representative. Trenches shall be backfilled promptly after the open trench construction review.

2. Backfill for trenching shall be compacted to a minimum of 90% optimum density by means of power compaction, and shall conform to the adjacent grades without dips, sunken areas, humps, or other irregularities.

a. Main Line: Initial backfill on all main lines within 6 inches of pipe shall be with clean soil with no rocks larger than 1- inch in size.

b. Lateral Line: Initial backfill on all lateral lines within 6 inches of pipe shall be with clean soil with no rocks larger than 1-inch in size.

3. All main and lateral line sleeves and electrical wiring sleeves under paving shall be backfilled and compacted in layers to 90% optimum density by means of power compaction.

4. If settlement occurs and subsequent adjustments in pipe, valves, or other construction are necessary, the Contractor shall make all required adjustments without additional cost to the Client .

3.3 UTILITY SERVICES

A. The Contractor shall utilize the Point of Connection provided by the electrical section of work.

3.4 MAIN LINE PIPING INSTALLATION

A. All plastic pipe shall be installed in complete accord with manufacturer's instructions for same. After the pipe has been cement welded, it is not to be disturbed or moved for 48 hours. During this time the pipe can be out of the trench or in it, but in either case it must be supported so that it cannot be moved or disturbed.

B. Irrigation main line and low voltage wiring may share the same trench. Provide a minimum of 2 inch soil space between piping and wiring.

C. On all main lines, provide concrete thrust blocks at each change of direction and at all terminal points.

1. Thrust blocks shall be one (1) cubic foot concrete minimum, poured in-place.

3.5 PIPE AND FITTING CONNECTIONS

A. Steel and red brass pipe and fittings shall be assembled using Teflon tape applied to male threads.

B. Plastic pipe threads shall be assembled using Teflon tape. Follow manufacturer's directions.

C. All metal to plastic screwed connections shall be male plastic threads into female metal threads.

D. Tape all open ends of pipe during installation to prevent entry of any foreign matter into the system.

3.6 MAIN LINE FLUSHING

A. After all main line piping is in place and center-loaded, and all diversion work has been completed, thoroughly flush all lines with a full head of water.

3.7 AUTOMATIC VALVES

A. Install all remote control valve assemblies at approved locations along mainline.

B. Valves are shown diagramatically on the drawings, and shall be located in planting areas 12 inches clear from hardscape or walking paths.

3.8 QUICK-COUPLING VALVES

A. Install all quick-coupling valve assemblies, maximum of 100’ spacing, around at approved locations.

B. Valves are shown diagramatically on the drawings, and shall be located in planting areas 12 inches clear from hardscape or walking paths.

3.9 PRESSURE TESTING MAIN LINES

A. Pressure tests shall consist of two parts:

1. A hydrostatic pressure test of 150 PSI for a period of two (2) hours for new mainline sections.
2. The ability of the main line to hold static line pressure indefinitely when the master control is closed.

B. Test main line before equipment and valves are installed.

C. Provide all equipment and personnel necessary to test main lines (static pressure line).

D. Perform all hydrostatic tests prior to backfilling and in the presence of the Client’s representative before proceeding with further work.

3.10 LOW VOLTAGE WIRING AND CONNECTIONS

A. Low voltage wire routing shall be the same routing as the main line unless otherwise designated on drawings.

B. Use a continuous wire between controller and remote control valves. When site conditions make continuous wire runs impossible, splice wires using approved connectors and make all splices in an approved valve or utility boxes with extensions. Provide 24 inch leads for all wires in all valve or utility boxes. This work, including utility boxes, shall be considered part of this contract.

C. Each electric valve shall have its own separate wire to the controller.

D. Allow a minimum wire lead of 24 inches at each connection. All field connections shall be made with approved water-proof connectors.

E. When designated on utility drawing, stub-out additional spare wires (red) for future use in utility boxes as noted; insulate the end of the common wire.

1. Spare Wires (yellow): all spare wires shall loop into each valve box along its path. Where the spare wires loop, they shall be labeled with a plastic or brass label with the wire number stamped onto the label. The labels shall be attached to the wires with nylon locking strips or equal, no metal wires.

F. After wiring is in place, make waterproof connections using approved connectors to all subterranean electric equipment.

G. All connections to above-grade electrical equipment shall be made with wire nuts in waterproof enclosures.

H. After all connections are complete, use an ohm meter to test the resistance reading for each electric valve circuit. Record resistance reading and call the Client's representative for an observation of completed electrical work before backfilling.

3.11 UNDERGROUND UTILITY MARKING TAPE

A. Install 'detectable' radio reflecting utility marking tape in the same trench and above all main line piping and electrical wiring. Locate marking tape 12 inches below grade after compacting partially backfilled trenches.

3.12 SYSTEM ADJUSTMENTS

A. Verify that the entire system has been flushed and cleaned. Verify that all main line shut-off valves are fully open.

3.13 CLEAN-UP AND REPAIR

A. Upon completion of the work, make the ground surface level, remove excess materials, rubbish, debris, etc., and remove construction and installation equipment from the premises.

B. Replace and/or repair to the satisfaction of the Client's representative all existing paving disturbed during the course of this work. New paving shall be the same type, strength, texture, finish, and be equal in every way to the material removed.

C. Bring all settled soil areas up to grade. As part of the contract, the Contractor shall provide clean topsoil from on-base borrow area to match existing topsoil if required.

3.14 GUARANTEE

A. The guarantee for the irrigation system shall be made in accordance with the following form..

B. A copy of the guarantee form shall be included in the operations and maintenance manual.

C. The guarantee form shall be retyped onto the Contractor's letterhead and contain the following information.

GUARANTEE FOR SPRINKLER IRRIGATION SYSTEM

We hereby guarantee that the irrigation system we have furnished and installed is free from defects in materials and workmanship including settling of backfill areas below grade, and the work has been completed in accordance with the drawings and specifications, ordinary wear and tear and unusual abuse and neglect excepted. We agree to repair or replace any defect in material or workmanship, which may develop during the period of one year from the date of acceptance and also to repair or replace any damaged resulting from the repairing of such defects at no additional cost to the client. We shall make sure repairs or replacements within a reasonable time, as determined by the Client, after receipt of written notice. In the event of our failure to make such repairs or replacement within a reasonable time after receipt of written notice from the client, we authorized the Client to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

PROJECT: _____

CONTRACTOR:_____ **PHONE NO.:**

_____ **ADDRESS:**

_____ **BY:**

_____ **DATE OF ACCEPTANCE:**_____

BY: _____

3.16 TEMPORARY REPAIRS

A. The Client reserves the right to make temporary repairs as necessary to keep the sprinkler system equipment in operating condition. The exercise of this right by the client shall not relieve the Contractor of his responsibilities under the terms of the guarantee as herein specified.

END OF SECTION 02810

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies cast-in place concrete footings, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

B. Related Sections include the following:

1. Section 2300 Earthwork
2. Section 2751 Concrete Pavement

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, (#4 Bars and larger) deformed; Grade 40 (#3 Bars) deformed.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar

supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type II

B. Normal-Weight Aggregates: ASTM C 33, graded, 3/4-inch nominal maximum coarse-aggregate size.

1. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: potable.

D. Air-Entraining Admixture: ASTM C 260.

2.4 CURING MATERIALS

A. Water: Potable.

2.5 CONCRETE MIXTURES

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

B. Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength 2500 **psi** at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.50.
3. Slump Limit: 3 inches ± 1".

2.6 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Radius exterior corners and edges of permanently exposed concrete.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

3.4 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

3.5 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Deposit concrete continuously in one layer. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

C. Cold-Weather Placement: Comply with ACI 306.1.

D. Hot-Weather Placement: Comply with ACI 301.

3.6 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss. Apply according to manufacturer's written instructions after placing, screening, and bull floating or darbying concrete, but before float finishing.

END OF SECTION 03300

SECTION 05521 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Steel handrails.

1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

   1. Handrails:

      a. Uniform load of 50 lbf/ ft. applied in any direction.
      b. Concentrated load of 200 lbf applied in any direction.
      c. Uniform and concentrated loads need not be assumed to act concurrently.

B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.3 SUBMITTALS

A. Product Data: For grout, and anchoring cement.

B. Shop Drawings: Provide complete dimensioned plans, elevations, sections, details, and attachments to other work for all required railings.

C. Samples: For each exposed finish required.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Steel Pipe and Tube Railings:

a. Pisor Industries, Inc.
b. Sharpe Products.
c. Wagner, R & B, Inc.; a division of the Wagner Companies.
d. Julius Blum & Co.

2.2 METALS

A. Steel:

1. Tubing: ASTM A 500 (cold formed).
2. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
3. Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.3 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Grout and Anchoring Cement: Factory-packaged, nonshrink, nonmetallic grout complying with ASTM C 1107; or water-resistant, nonshrink anchoring cement; recommended by manufacturer for exterior use.

2.4 FABRICATION

A. General: Fabricate railings to comply with design, dimensions, and details indicated and to meet actual field conditions.

B. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

2.5 FINISHES

A. Powder Coat Finish:

1. After assembly, steel components shall be steel shot blasted and thoroughly cleaned.

2. Apply a coating of non-toxic sealer, compatible with powder coating to all components.

3. Powder coat shall be applied in a factory controller setting by electrostatic spray process and then shall be heat cured. The cured thickness shall be 8-10 mils.

4. Color selection shall be as indicated on plans.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation.

1. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

B. Anchor posts in concrete by inserting into formed or core-drilled holes and grouting annular space with non-shrink cement grout. Fill flush with adjacent surface.

C. Adjusting and Cleaning:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas.
2. Powder Coat Surfaces: Clean field welds, bolted connections, and abraded areas and repair with an epoxy-based matching paint.

END OF SECTION 05521

SECTION 16000 - ELECTRICAL

1. PART 1 GENERAL REQUIREMENTS

1.1 SCOPE OF WORK

A. The work covered by this section consists of furnishing and installing all l, materials, equipment, fixtures and performing all labor and operations for complete and operable systems.

B. Provide all new materials, unless noted otherwise, of the best quality, and in perfect condition, and materials of the same make and quality throughout the work and as hereinafter specified. Comply with the requirements of ASTM, NEMA, U.L., and NBFM for materials and equipment.

C. The intent of these specifications is to establish a standard of quality of materials installed. Include materials as specified without exception in the Base Bid. Submit for approval any proposed substitution, complete descriptive, technical, and cost comparison data and test reports. Do not furnish or install any substitute items without written approval at the time of contract signing. Reimburse the Owner for any additional engineering charges and for any changes in the work of other trades resulting from substitutions. List proposed substitutions on the Bid Form, stating the reasons for substitution. When requested by the Architect or Electrical Engineer, samples, electrically wired at 120V. with plug, or system demonstrations of both specified and proposed items will be submitted for inspection at the Electrical Engineer's office and at a time convenient to all concerned parties.

D. Where a substitution alters the design or space requirements indicated on the plans, Contractor is responsible for all additional cost for Engineering to revise plans.

E. Verifying Drawings and Job Conditions:

1. Examine all drawings and specifications in a manner to be fully familiar of all work required.

2. Visit the site and verify existing conditions. Where existing conditions differ from drawings, make adjustments and allowances for all necessary equipment to complete all parts of the drawings and specifications.

F. Shop Drawings:

1. Submit drawings in six sets accompanied by letter of transmittal listing the number and dates of the drawings submitted.

2. Mark the drawings submitted with the name of the project, numbered consecutively, and bearing approval as evidence that the drawings have been checked. Any drawings submitted without this approval will be returned for resubmission.

3. Submit Shop drawings on, but not limited to, the following:

a. Main Meter Pedestal
b. Lighting Fixtures
c. Electrical Product List
d. I.T. Enclosure
g. Pullboxes
h. Time Switch
i. Dimmer Switches

G. Drawings of Record:

Provide and keep up-to-date, a complete record set of blue line prints. Show every change from the original drawings. Keep this set of prints on the job site, and use only as a record set. Do not make changes in the layout without definite instruction in each case. Obtain a set of Contract Drawings from Architect and incorporate all changes as noted on the record set of prints. Deliver this set to the Architect upon completion and acceptance of work.

H. Accuracy of Plans and Specifications:

Plans and/or specifications showing deviation from standard practice methods or from compliance with codes, and/or any omissions, does not relieve the responsibility of furnishing, making or installing all items required by code and/or intended for the function of the system.

I. Permits, Fees and Insurance:

Obtain and pay for all insurance, permits, etc. necessary for this Contract.

J. Codes and Regulations:

All work performed under this Section of the Specifications complies with the rules and regulations of the Division of Industrial Safety, State of California, as set forth in the latest edition of the Electrical Safety Orders, the National Electrical Code, NFPA, and all rules and regulations of local codes having jurisdiction, including the presently adopted edition Title 21 and 24 California Administrative Code.

K. Testing and Adjustment:

Test all circuits, outlets, switches, lights, motors, circuit breakers and any other electrical equipment, upon completion of all electrical work.

L. Guarantees of Materials and Workmanship:

Furnish and install all materials under this Contract, new and free from all defects, and guaranteed for a period of two years from the date of acceptance of the work. Should any trouble develop during this period due to defective material or faulty workmanship, furnish all necessary labor and materials to correct the trouble without additional cost to the Contract. Correct any defective material or inferior workmanship noticed at the time of installation immediately, to the satisfaction of the Architect.

M. Removal of Rubbish:

Remove rubbish, excess materials, tools or equipment related to this portion of the work, frequently during construction and upon completion of the work.

N. Drawings and Specifications:

1. The electrical drawings are considered as part of these specifications, and any work or materials shown on the drawings and not mentioned in the specifications, or vice versa, shall be as if specifically mentioned in both.

2. The data herein specified and shown on the drawings is as exact as could be prepared, but their extreme accuracy is not guaranteed. The drawings and specifications are for assistance and guidance. The installation is essentially as shown and specified. The exact location of the equipment, material, apparatus and devices as well as the distances and levels, are more or less governed by the physical conditions and arrangements of the building. Accept this Contract with this understanding.

3. Make minor changes, when ordered by the Architect, accommodating the installation of the work with other sections of the Contract without additional cost to the Contract.

O. Safety Conditions:

It is the Contractor's responsibility to prevent any damages to personnel and/or property resulting from contact with new or existing energized circuits, switches, circuit breakers, or other electrical apparatus. All electrical work to be constructed with electrical systems de-energized in the area of work.

P. Final Inspection and Acceptance:

After all requirements of the specifications and drawings have been fully completed, a representative of the Owner will inspect the work. Provide competent personnel to demonstrate the operation of any item or system involved to the complete satisfaction of each representative.

Q. Power Utility Service:

Comply with the requirements of the Power Utility Company when doing all electrical service work. Contact the Utility Companies and provide the following and include all cost in bid:

a. Identify local utility company service planner
b. Submittal of plans to utility company
c. Incorporation of utility company red lines onto electrical drawings
d. Approval or receipt of approved plans from utility company
e. All coordination with utility company
f. Complete installation of all required conduit, pullboxes and concrete pads.

2. PART 2. PRODUCTS

2.1 MAIN ELECTRICAL SERVICE PEDESTAL:

A. Type and size of the Main Service Pedestal is as indicated on the drawings.

B. The pedestal will consist of a completely enclosed, self-supported structure, of the required number of formed vertical panel sections, as shown on the plans. Completely enclose the gear on the front sides, top and rear with sufficient louvered openings for proper ventilation. Provide bolted frames and insulating block to support the main horizontal bus for short circuit stresses as indicated on the drawings.

C. All buses will be 100% rated, made with tin plated copper bars sized for a current density of not more than 1000 amperes per square inch. Provide a 1/4" x 2" copper ground bus within 12" of neutral bus and connect with a removable link. Where copper bus is shown, bus shall be sized for a maximum current density of 1000A per square inch and be provided with silver plated bus connections.

D. Identify each device as to what function it performs by an engraved plastic nameplate attached adjacent to the switch or device. Nameplate subject to Architect's approval.

E. Stainless Steel finish on the main service panel inside and outside.

F. The manufacturer producing the switchboard must be regularly engaged in the construction of this type of equipment, being equal to Strongbox, V.I.T or Millbanks.

G. Provide weatherproof enclosure

2.2 CIRCUIT BREAKERS:

Provide circuit breakers with inverse time characteristic thermal and magnetic tripping elements, with an interrupting capacity of not less than 10,000 amperes, UL labeled, NEMA rated, molded case type. Use common trip single handle multi-pole breakers. Handle extensions are not permitted. All circuit breakers will have covers sealed on non-interchangeable trip breakers and trip unit covers sealed in interchangeable trip breakers to prevent tampering. Be sure the circuit breaker current rating markings clearly visible after breaker is installed. One manufacturer for all circuit breakers for a given panel. Provide bolt-on circuit breakers unless specifically noted on electrical drawings.

2.3 POWER DISCONNECT SWITCHES:

A. Provide power disconnect switches having product construction requirements as specified and/or indicated. Where not otherwise indicated, the following requirements apply:

1. Enclosure: NEMA I, surface type in dry locations. Use NEMA 3R for exterior locations.

2. Ratings: Voltage, ampacity, horsepower and inductive ratings complying with power source voltage and characteristics of load controlled.

3. Mechanism: Heavy-duty, quick-make, quick-break, with voidable interlock to prevent opening enclosure in "ON" position. External lockable handle operation with provision for not less than two padlocks.

4. Poles and Fusing: Comply with load requirements. Provide unfused switches except where fusing is indicated or required to comply with Code Requirements. Where fuses are installed, use dual-element time delay fuses.

B. Provide power disconnect switches of the following manufacturers with characteristics complying with load and power source indicated:

1. Westinghouse: Type HF or HU.

2. General Electric: Type TH.

3. Square D: Type HD or HU.

C. Provide the number of poles necessary to include a pole for each ungrounded conductor. Equip switch with neutral terminal point where neutral is present. Do not switch neutral unless indicated.

2.4 PUSHBUTTON STATIONS AND CONTROL DEVICES:

The type and size of all pushbutton stations, switches, pilot lights and other control devices are as indicated on the drawings.

2.5 RELAYS:

Install control relays for automatic controls or for interlocking as indicated in the drawings. Provide relays with the number and type of poles and with operating coils as indicated. Equip relays with contacts rated not less than 15 amperes for continuous inductive load, unless otherwise shown or specified. Rate operating coils for continuous duty at the operating voltage shown on the drawings.

2.6 FUSES:

A. Provide (in a location designated by the Owner) a spare fuse cabinet with the following:

1. Nameplate "spare fuses".

2. Necessary fuse holders.

3. Spare set of each size and type of fuses.

B. Provide dual element fuses for all 600 volt or lower voltage requirements unless otherwise indicated or specified. Where fuses are not made for this application, furnish Buss "Limitron" or approved equal fuses.

C. Provide Bussman Fuses as indicated on plans.

D. Replace fuses "blown" or damaged during construction with new fuses of proper rating and type for the particular use, replace spare sets.

2.7 LIGHTING FIXTURES:

Furnish, install and connect lighting fixtures of type designed on the plans.

A. Verify all fixture locations with Landscape drawings prior to rough in.

B. Where there is conflict in fixture quantities on any of the plans the greatest amount will prevail. The description of the lighting fixture supersedes the catalog number and is to be furnished and installed with type to fit description.

2.8 CONDUIT AND FITTINGS:

A. Rigid Conduit (RGS): Hot dipped galvanized or sherardized steel. Republic Steel Co. or approved equal. Intermediate metal conduit may be used, where CEC allows, in lieu of RGS.

B. Electrical metallic tubing (EMT): Welded, electro-galvanized thin wall steel tubing. All couplings are gland compression type.

C. Non-metallic conduit (PVC): Polyvinyl chloride Schedule 40 or 80. Install a copper ground wire, sized per National Electrical Code, in all non-metallic conduit power raceways. Use PVC in underground installations only.

D. Liquidtight Flexible Metal Electrical Conduit: Hot-dipped galvanized steel with exterior, molded polyvinyl jacket. Use for all final connections to all vibrating equipment, transformers and the like. 18" maximum. Provide a code sized ground wire.

E. Flexible metallic steel tubing: Liquid tight without a nonmetallic jacket. Use as allowed by code and where permitted by this Specification, section 3.06.C. Provide a code sized ground conductor.

F. Condulet Type Fittings: As manufactured by Crouse Hinds Company, Appleton Electric Company or Pyle National or approved equal, smooth inside and out, taper threaded with integral bushings.

2.9 CONDUCTORS:

A. Provide copper conductors, 600 volt A.C. unless noted otherwise. Aluminum conductors are not permitted.

B. Use THWN conductors for underground and damp locations, THHN for dry areas.

C. Deliver conductors to the site in unbroken packages, marked with the manufacturer's name, date of manufacture, voltage and classification letters. Use only wire recently manufactured (10 months or less).

D. Provide signal service and low voltage control conductors as specified or noted on the drawings.

E. No conductor supplying 120 volts or more will be smaller than No. 12 AWG unless otherwise noted on the drawings.

F. Fixture wire to comply with latest requirements of the National Board of Fire Underwriters. The carrying capacity of the wire as per the latest requirements of the National Electrical Code. No fixture wire may be smaller than #18 gauge. Protect wiring with tape or tubing at all points where abrasion is likely to occur.

G. Install all conductors of each electrical system in an approved raceway. Factory assemblies, non-metallic/pliable/corrugated raceways, type UF cable or multi-conductor assemblies are not approved.

H. Use solid conductor, size #10 AWG and smaller, stranded for #8 AWG and larger.

2.10 JUNCTION AND PULL BOXES:

Above grade level, provide galvanized junction and pull boxes with removable covers, secured with machine screws. The sizes of all boxes determined by the number and size of conductors entering the box, and by the sizes of conduit terminating in the box. All boxes conform to the applicable Electrical Safety Orders, State of California. Pullboxes flush with grade shall be concrete, with bolt down concrete or steel covers, per plans, with engraved or beadweld identification.

2.11 OUTLET BOXES:

A. Provide galvanized outlet boxes and covers, one piece pressed steel, knockout fixture outlets equipped with 3/8" fixture studs and plaster rings.

B. Where standard boxes are not suitable, provide boxes of special design to fit space.

C. Cast aluminum or cast iron for outlet boxes exposed to weather, in damp locations, or surface mounted with threaded hubs for conduit connections; cover made watertight with gasket and non-ferrous screws.

D. Provide outlet boxes in plaster covered walls with raised covers or plaster rings to finish flush with plaster.

2.12 RECEPTACLES:

A. Convenience outlets consist of a duplex convenience receptacle mounted in an outlet box in the wall, flush with the finish surface and complete with plate.

B. Receptacles for convenience outlets: Standard duplex, 3-wire grounding type 15 ampere, 125 volt, Hubbell, Bryant, Leviton or Arrow Hart #5262 white, unless otherwise indicated.

C. Weatherproof G.F.C.I. receptacles: 15 ampere, 2P 3-wire grounding type, 125 volt with gray fiberglass lift cover plate, Hubbell #GF5262, unless otherwise shown on plans.

2.13 PLATES:

A. Provide stainless steel plates for all switches, convenience outlets, telephone outlets and all other similar outlets, unless otherwise specified or noted.

B. Television and telephone outlet cover plates to match jack.

2.14 NAMEPLATES:

Shall be micarta or lamacoid plate, 1/8" thick and have approved size, with beveled edges and engraved white letters on black background. Provide nameplates for all items of electrical equipment as well as circuits in the service distribution and power distribution panelboards; lighting distribution panelboards; separately mounted motor starting switches; disconnect switches; motor control pushbutton stations and other similar devices. Each nameplate as approved by the Architect. Use two machine screws for attachment. Cement/adhesive is not approved.

3. PART 3. EXECUTION

3.1 If construction of building reveals that any part of the Electrical Work would not be readily accessible if installed according to drawings, notify the Architect before proceeding with such installation.

3.2 All concrete work such as pull boxes, raised pads, conduit envelopes and other areas where affecting Electrical Work are the responsibility of the Electrical Contractor.

3.3 Coordinate layout and installation of electrical work with the overall construction schedule and work schedules of various trades to prevent delay in completion of the project.

A. Verify dimensions and information regarding accurate location of equipment, structural limitations, and finish with other affected sections.

B. Job Conditions:

The drawings do not always show offsets, bends, special fittings or junctions or pull boxes necessary to meet job conditions. Provide the items as required at no cost to the Owner.

C. Weatherproof Equipment:

Use weather resistant electrical devices or equipment located in damp, semi-exposed areas. Comply with NEMA Type 3R requirements for enclosures.

D. Where devices are shown diagrammatically in the same location, neatly group them together in a reasonable manner. Provide one-piece plate where such is manufactured.

3.4 Equipment requiring electrical under other sections is part of the Contract. Work includes all necessary connections.

3.5 EXCAVATION AND BACKFILLING:

Excavate and backfill in accordance with other specification section in these documents covering that work and detail on Electrical Construction Documents

3.6 CONDUIT:

A. Install all conduit concealed, except where specifically indicated as exposed. Use rigid galvanized steel or I.M.C. for all exposed conduit. Paint with two coats to match adjacent surroundings, if viewed by the public.

B. Use galvanized rigid steel on all conduit installed in concrete and masonry walls, 3/4 inch trade size minimum, unless otherwise specified and/or noted on the plans. Verify conduit runs in concrete slab, prior to placement. Otherwise, do not run conduits in slabs.

C. All conduit installed in the dry walls or dry ceilings of the building structures, shall be steel tube (EMT), except that in certain locations and for certain runs where it is impractical to install EMT, and where permission to do so has been given by the Architect, galvanized flexible steel conduit may be used, with a code sized ground conductor.

D. Run conduit so as not to interfere with or contact other piping, fixtures or equipment. Maintain 6" separation from water piping.

E. Cut the ends of all conduit square and carefully ream out to full size, and shoulder in fitting.

F. No running threads will be permitted in locations exposed to the weather, in concrete or underground. Use special watertight union fittings in these locations.

G. Use PVC Schedule 40 or 80 for all underground conduits. Install all underground conduit at a depth of not less than 24 inches below the final finish grade, unless under concrete slabs or otherwise noted and/or specified. Provide metallic high voltage tape buried 12" above conduit, except under floor slab or under concrete walk, in which case, install 6" below bottom of slab. Use IMC for all horizontal and vertical sweeps or risers with factory applied PVC coating. Verify with serving utilities for service conduits, bends, depth below grade, backfill, etc. for specific types. Schedule 80 PVC sweeps are permitted for conduits 4" diameter and greater.

H. Cut and patch all pavements, curbs, sidewalks and gutters, whenever necessary for laying conduit, or whenever damaged by the operations of this trade. Replace materials with quality and finish equal to that removed or damaged.

I. Where conduit extends through roof to equipment on roof areas, provide weatherproofing as specified in the appropriate section of these Specifications.

J. Support all conduit in intervals not less than 10'-0" and within 36 inches from any outlet and at each side of bends and elbows. Use galvanized, concealed conduit supports, heavy stamped, one hole malleable conduit clamps secured with nails. On exposed conduit supports, use two hole clamps with screws, or galvanized steel framed channels secured by screws may be used for conduit supports. Perforated iron for supporting conduit is not permitted.

K. Use rigid galvanized steel or I.M.C., threaded, for exposed conduit runs. Install parallel or perpendicular to walls, structural members or intersection of vertical plane and ceilings. Avoid field made bends and offsets where possible. Do not install crushed or deformed raceways.

L. Provide metal sleeves and install where conduit passes through masonry or concrete walls. Use No. 20 gauge galvanized steel sleeves, no more than 1/2 inch greater in diameter than the outside diameter of the conduit. Caulk conduit into sleeves with stone wool, Duseal or Oakum and weatherproof below grade. Where conduit passes through fire resistive walls, partitions, and floors, pack void spaces between conduits with U.S.G. Thermafiber or equal, as approved by the State Fire Marshal.

M. Provide a heavy nylon cord pull rope in all empty conduits for future use. Leave in place for future use in all runs and tagged with plastic tag at terminating end indicating the location of the opposite end of the conduit.

N. Use factory-manufactured ells, except where noted otherwise. Field bends are permitted for EMT conduit less than 1" diameter. Conduit radius for signal system is ten times the internal diameter of the conduit.

O. Cap or seal all conduit ends until wires are pulled.

P. Use watertight gland compression type connectors and couplings on fittings for thin wall metallic conduit. Screw type or crimp type are not permitted.

Q. Wire all rotating electrical equipment with flexible, liquid-tight conduit with appropriate slack from disconnect switch to equipment.

R. Install expansion coupling at all expansion joint locations, refer to Architectural. Drawings for locations.

S. Use approved type-bending machines for PVC conduits. Use of blow torch is prohibited.

T. For grouping, use conduit trapezes made up of suitable Unistrut or Kindorf hangers.

U. Seal or cap all conduit for a watertight installation.

V. Use approved conductor pulling machines for all underground conduits. Use of truck is prohibited.

3.7 OUTLET BOXES:

A. Attach outlet boxes on metal studs with TEC screws. Use wood screws for attachment on wood studs. Nails are not acceptable.

B. Cover all boxes with outlet box protector, Appleton SB-CK or approved equal. Keep plaster and dirt from entering box or panels. If plaster does get in, removed it prior to pulling in wires.

C. Close all unused openings with plugs.

SECTION 16000 - ELECTRICAL

3.8 INSTALLATION OF CONDUCTORS:

A. Unless otherwise indicated or specified, do not install conductors of less than No. 12 AWG size. For control conductors protected by 15 ampere or lower overcurrent protection, No. 14 AWG conductors will be installed. Where approved by Code, remote control and signal circuits utilize No. 18 or No. 16 AWG sizes. Increase No. 12 to No. 10 AWG for 120 volt home runs exceeding 75 feet.

B. Color code power wire and cable for feeders and branch circuits.

C. Install all electrical conductors, including signal and communications circuits in an approved raceway.

D. Neatly group conductors in panels, switchgear and terminal cabinets, etc., and form in a manner to fan into terminals with regular spacing. Lace formed groups of conductors with No. 12 waxed twine, or Panduit Co. Nylon Straps Numbers "SST-4-H" or "SST-2". Lace larger conductors with marlin and secure with cleats, or Panduit Co. Nylon Sta-Straps Numbers "SSC-4-H" and tie anchors ETA-1, TA-2 or TM-1-2-3.

E. Install U.L. approved covered wire from all lighting fixture lamp sockets into outlet or junction box.

3.9 WIRING COLOR CODE

A. 240/120 Volt System

Phase A - Black.
Phase A Switch Leg - Black with “S” tag.
Phase B - Red.
Phase B Switch Leg - Red with “S” tag.
Travelers - Yellow.
Neutral - White.
Equipment Ground - Green.

B. Provide identification tags on each conductor entering panel, switch, junction box and pull box to identify conductor.

3.10 UNDERGROUND PULL BOXES:

A. Set underground pull boxes at +3" above highest adjacent grade level when installed in turf areas.

B. Set underground pull boxes flush to grade when installing in concrete walkway or drive

C. No splices of low voltage conductors are permitted.

D. Size per NEC.

E. Provide nameplate on all covers.

1. "ELEC"
2. "COMM"

F. Verify exact locations with Landscape Architect (drawings) prior to rough in

3.11 CONDUCTOR JOINTS AND TAPING:

Make joints in conductors smaller than No. 6 AWG with solderless, tapeless, wing nut type pressure cable connector. Join conductors No. 6 AWG and larger together with approved type or pressure connector and tape to provide insulation not less than that of the conductor. Make connections to switch or bus bar with one-piece copper lugs for conductors No. 8 AWG or larger.

3.12 GROUNDING:

Provide grounding for entire electrical installation as required by the serving utility and codes mentioned in these specifications. Including:

A. Conduit.

B. Neutral or identified conductor of interior wiring system.

C. Power and lighting panelboards.

D. Non-current carrying metal parts or fixed equipment.

E. Electrical panels in separate buildings.

END OF SECTION

SECTION 16521 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Exterior luminaires with lamps and driver.
2. Poles and accessories.

B. Related Sections include the following:

1. Division 16 Section 16000 for exterior luminaires normally mounted on exterior surfaces of buildings.

1.3 DEFINITIONS

A. CRI: Color-rendering index.

B. LED: Light Emitting Diode.

C. Luminaire: Complete lighting fixture, including driver if provided.

D. Pole: Luminaire support structure, including tower used for large area illumination.

E. Standard: Same definition as "Pole" above.

1.4 STRUCTURAL ANALYSIS CRITERIA FOR POLE SELECTION

A. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied as stated in AASHTO LTS-4.

B. Live Load: Single load of 500 lbf , distributed as stated in AASHTO LTS-4.

C. Ice Load: Load of 3 lbf/sq. ft., applied as stated in AASHTO LTS-4.

D. Wind Load: Pressure of wind on pole and luminaire, calculated and applied as stated in AASHTO LTS-4.
   1. Wind speed for calculating wind load for poles 50 feet (15 m) or less in height is 110 mph.

1.5 SUBMITTALS

A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:

   1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
   2. Details of attaching luminaires and accessories.
   3. Details of installation and construction.
   4. Luminaire materials.
   5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories.

      a. For indicated luminaires, photometric data shall be certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.
      b. Photometric data shall be certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

   6. Photoelectric relays.
   7. Drivers, including energy-efficiency data.
   8. Lamps, including life, output, and energy-efficiency data.
   9. Materials, dimensions, and finishes of poles.
   10. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
   11. Anchor bolts for poles.
   12. Manufactured pole foundations.

B. Shop Drawings:

   1. Anchor-bolt templates keyed to specific poles and certified by manufacturer.
   2. Design calculations, certified by a qualified professional engineer, indicating strength of screw foundations and soil conditions on which they are based.
   3. Wiring Diagrams: Power wiring.

C. Samples for Verification: For products designated for sample submission in Exterior Lighting Device Schedule. Each sample shall include lamps and ballasts.

D. Pole and Support Component Certificates: Signed by manufacturers of poles, certifying that products are designed for indicated load requirements in AASHTO LTS-4 and that load imposed by luminaire has been included in design.

E. Qualification Data: For agencies providing photometric data for lighting fixtures.

F. Field quality-control test reports.

G. Operation and Maintenance Data: For luminaires and poles to include in emergency, operation, and maintenance manuals.

H. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with IEEE C2, "National Electrical Safety Code."

E. Comply with NFPA 70.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Package aluminum poles for shipping according to ASTM B 660.

B. Store poles on decay-resistant-treated skids at least 12 inches (300 mm) above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

C. Handle wood poles so they will not be damaged. Do not use pointed tools that can indent pole surface more than 1/4 inch (6 mm) deep. Do not apply tools to section of pole to be installed below ground line.

D. Retain factory-applied pole wrappings on fiberglass and laminated wood poles until right before pole installation. Handle poles with web fabric straps.

E. Retain factory-applied pole wrappings on metal poles until right before pole installation. For poles with nonmetallic finishes, handle with web fabric straps.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.

1. Warranty Period for Luminaires: Five years from date of Substantial Completion.
2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
3. Warranty Period for Color Retention: Five years from date of Substantial Completion.
4. Warranty Period for Lamps: Replace lamps and fuses that fail within **12** months from date of Substantial Completion; furnish replacement lamps and fuses that fail within the second **12** months from date of Substantial Completion.
5. Warranty Period for Poles: Repair or replace lighting poles and standards that fail in finish, materials, and workmanship within manufacturer's standard warranty period, but not less than **three** years from date of Substantial Completion.

1.9 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Driver Lamps: 1 for every 10 of each type and rating installed. Furnish at least one of each type.
2. Glass and Plastic Lenses, Covers, and Other Optical Parts: 1 for every 10 of each type and rating installed. Furnish at least one of each type.
3. Globes and Guards: 1 for every 10 of each type and rating installed. Furnish at least one of each type.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

B. In Exterior Lighting Device Schedule where titles below are column or row headings that introduce lists, the following requirements apply to product selection:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 LUMINAIRES, GENERAL REQUIREMENTS

A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.

B. Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

C. Metal Parts: Free of burrs and sharp corners and edges.

D. Metal Components: Corrosion-resistant cast aluminum, unless otherwise indicated.

E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

G. Exposed Hardware Material: Stainless steel.

H. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors. Provide one piece non yellowing flat polymer lens.

I. Luminaire Finish: Manufacturer's standard finish applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials. Color: Stealth Gray.

2.3 DRIVER AND LAMPS

A. Comply with ANSI C82.4 and UL 1029 and capable of open-circuit operation without reduction of average lamp life. Include the following features, unless otherwise indicated:

   1. Driver Circuit: Constant-wattage autotransformer or regulating high-power-factor type.
   2. Minimum Starting Temperature: Minus 22 deg F (Minus 30 deg C).

3. Normal Ambient Operating Temperature: 104 deg F (40 deg C).

B. Auxiliary, Instant-On, Quartz System: Factory-installed feature automatically switches quartz

2.4 POLES AND SUPPORT COMPONENTS, GENERAL REQUIREMENTS

A. Structural Characteristics: Comply with AASHTO LTS-4.

1. Wind-Load Strength of Poles: Adequate at indicated heights above grade without failure, permanent deflection, or whipping in steady winds of speed indicated in Part 1 "Structural Analysis Criteria for Pole Selection" Article, with a gust factor of 1.3.

B. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts, unless otherwise indicated.

C. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.

1. Materials: Shall not cause galvanic action at contact points.
2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication, unless stainless-steel items are indicated.
3. Anchor-Bolt Template: Plywood or steel.

D. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange. Concrete, reinforcement, and formwork are specified in Division 2 Section Concrete Paving.

E. Power-Installed Screw Foundations: Factory fabricated by pole manufacturer, with structural steel complying with ASTM A 36/A 36M and hot-dip galvanized according to ASTM A 123/A 123M; and with top-plate and mounting bolts to match pole base flange and strength required to support pole, luminaire, and accessories.

F. Breakaway Supports: Frangible breakaway supports, tested by an independent testing agency acceptable to authorities having jurisdiction, according to AASHTO LTS-4.

1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC- SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
2. Interior Surfaces of Pole: One coat of bituminous paint, or otherwise treat for equal corrosion protection.

3. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.

   a. Color: Stealth Gray by manufacturer's designations.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

Fasten luminaire to indicated structural supports.

1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

3.2 POLE INSTALLATION

A. Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.

B. Clearances: Maintain the following minimum horizontal distances of poles from surface and underground features, unless otherwise indicated on Drawings:

1. Fire Hydrants and Storm Drainage Piping: 60 inches**.**
2. Water, Gas, Electric, Communication, and Sewer Lines: 10 feet.
3. Trees: 15 feet**.**

C. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Division 3 Section "Cast-in-Place Concrete."

D. Foundation-Mounted Poles: Mount pole with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.

1. Use anchor bolts and nuts selected to resist seismic forces defined for the application and approved by manufacturer.
2. Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
3. Install base covers, unless otherwise indicated.
4. Use a short piece of 1/2-inch- diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.

E. Poles and Pole Foundations Set in Concrete Paved Areas: Install poles with minimum of 6-inch wide, unpaved gap between the pole or pole foundation and the edge of adjacent concrete slab. Fill unpaved ring with pea gravel to a level 1 inch below top of concrete slab.

F. Raise and set poles using web fabric slings (not chain or cable).

3.3 INSTALLATION OF INDIVIDUAL GROUND-MOUNTING LUMINAIRES

A. Install on concrete base with top 4 inches above finished grade or surface at luminaire location. Cast conduit into base, and finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Division 3 Section "Cast-in-Place Concrete."

3.4 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Division 16 Section "Raceways and Boxes." In concrete foundations, wrap conduit with 0.010-inch- thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.5 GROUNDING

A. Ground metal poles and support structures according to Division 16 Section "Grounding and Bonding."

1. Install grounding electrode for each pole, unless otherwise indicated.
2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

B. Ground nonmetallic poles and support structures according to Division 16 Section "Grounding and Bonding."

1. Install grounding electrode for each pole.
2. Install grounding conductor and conductor protector.
3. Ground metallic components of pole accessories and foundations.

3.6 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.

1. Verify operation of photoelectric controls.

C. Illumination Tests:

1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IESNA testing guide(s):

   a. IESNA LM-5, "Photometric Measurements of Area and Sports Lighting."
   b. IESNA LM-50, "Photometric Measurements of Roadway Lighting Installations."
   c. IESNA LM-52, "Photometric Measurements of Roadway Sign Installations."
   d. IESNA LM-64, "Photometric Measurements of Parking Areas."
   e. IESNA LM-72, "Directional Positioning of Photometric Data."

D. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain luminaire-lowering devices. Refer to Division 1 Section "Demonstration and Training."

END OF SECTION 16521

SECTION 129333 MANUFACTURED PLANTERS

1.0 GENERAL

1.1 WORK INCLUDED

A. Provision of fiberglass planters, steel brackets and 3D Modular Trellis.

1.2 RELATED WORK

A. Section 033000 Cast-in-Place concrete
B. Section 061000 Rough Carpentry
C. Section 062000 Finish Carpentry
D. Section 328400 Planting Irrigation
E. Section 329300 Plants

1.3 SUBMITTALS

A. Product Data: Manufacturer's standard catalog cut sheets.
B. Samples: As required for color selection or material thickness only.
C. Shop Drawings: For custom applications, showing critical sizes and dimensions for installation and integration with other work.

1.4 DELIVERY, STORAGE AND HANDLING

A. Inspect planters and trellis after delivery for signs of damage during transit.
B. Protect planters, brackets and trellis from damage during storage and handling.
C. Store planters, brackets and trellis indoors, or at least out of the rain, in their original packaging. Do not stand or walk on trellis panels.

1.5 PROJECT CONDITIONS

A. Contractor to provide adequate structural support for planter systems.
B. Protect units from damage by adjacent work.

2.0 PRODUCTS

2.1 ACCEPTABLE PRODUCTS/MANUFACTURERS

A. Wilshire Screen, manufactured by Tournesol Siteworks, 30955 San Antonio St., Hayward, CA 94544 Tel: 800.542.2282 FAX 510.471.6243 tournesolsiteworks.com

2.2 WILSHIRE SCREEN

A. Material

Planters - All parts shall be constructed of glass fiber reinforced polyester resin.

1. Glass fibers shall be PPG or equivalent, uniform chopped strand mat, 3 oz. density. Shorter planters must use min. 2 layers, longer planters must use min. 3 layers (or equivalent amount of sprayed glass).
2. Polyester resin shall be compounded by a reputable manufacturer.

3. Planter must be internally waterproofed with asphaltic damproofing material.
Brackets – Brackets shall be constructed of 3/16” carbon plate steel. Powder coat to be 40% gloss polyester over zinc-rich primer.
Trellis - All panel elements shall be constructed of galvanized, polyester powder coated steel wire.

B. Construction
Planter - fabricated by either hand layup or spray laminate method, using suitable molds to attain the desired surface finish. The finished reinforced plastic material shall be not less than 5/32" thick and thicker in those areas requiring additional structural strength.
Honeycomb, ribs and bracket pockets are to be fastened to planter sections by laminating into position, and the finished joint shall be strong and durable. Planters must have internal bracket pockets to accommodate upright brackets, with a slot in the planter lip for the bracket and fastening holes within the planter body.
Trellis - Panels will be welded, cleaned with degreaser applied at high temperature, zinc plated for long-term rust protection, then powder coated. Panels will be three dimensional welded, with trusses connecting front and rear grids as required. Grid size for panel faces shall be 3”x 3” or 6”x 6”. Wire gauge for 3”x3” grid spacing shall be 11ga., 6”x6” grid spacing shall be 3/16”. Panels shall have 3” spacing. 4 joiner brackets shall be welded to each panel, to facilitate modular connections and attachment to upright brackets. For those Wilshire Screens where trellis panels are to be joined, top and bottom reinforcement plates will be used between joiner brackets on adjoining panels.

C. Finish:
Planter - Factory finished any of Tournesol Siteworks’ standard colors and textures. See catalog or website for available options.
Bracket & Trellis – Mounting stud to be covered and the entire bracket to be powder coated black (or color to match planter if specified).
E. Sizes: Wilshire Screen planters – Available profiles – 18”W x 24”H and 24”W x 24”H, in 48”, 72” & 96”L. Other profiles and lengths may be custom fabricated. Trellis panels will be 48” x 48”, 48” x 72”, in either 3”x3” grid or 6”x6”grid size, with 3” grid spacing. Trellis extends 78” above surfact level.

2.3 PLANTER ACCESSORIES (OPTIONAL)

A. Field installed drainage/irrigation connection fitting. Thread-by-thread thermoplastic drainage adapter, ½” to 4”NPT female thread available. Contractor to locate drainage hole, drill as necessary, and install fitting.
B. CWM Manual Fill or AutoFill Container Irrigation Systems by Tournesol Siteworks, designed to fit into boxes turnkey. See irrigation specification for details.

3.0 EXECUTION

3.1 PREPARATION

A. Prior to planter or bracket fabrication, the contractor shall verify as-built dimensions of planter area or receptacles to ensure proper size, fit and quantity required. Unwrap materials and confirm complete order.

B. Unless planters have drainage fittings as in 2.3.A, drainage holes to be located and made by contractor in the field to fit to drainage system.

3.2 INSTALLATION

A. Place upright brackets into slot on planter lip, and slide into bracket pocket. Thread provided stainless steel bolts through holes in bracket pocket, and fasten brackets into place.

B. For 96” screens, connect modular trellis panels together with reinforcement plates bewtween joiner brackets on top and bottom of screen. Place trellis panels into place, and use provided hardware to attach upright to joiner bracket in two places on trellis panel.

SECTION 32 14 13.13 – INTERLOCKING CONCRETE UNIT PAVING ON AGGREGATE BASE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
1. Work consists of furnishing and installing an Interlocking Concrete Pavement System in accordance with these specifications and in general conformance with the lines, grades, design, and dimensions shown on the plans.
2. Installation work includes:
   a. Verifying subgrade elevations and slopes generally conform to the lines, grades and site conditions depicted in the construction documents.
   b. Furnishing and installing geotextile (where required), base course, bedding course, edge restraint, concrete pavers and joint filling sand as shown on the construction drawings.

B. Related Requirements:
1. Section 31 20 00 Earth Moving
2. Section 31 05 19.13 Geotextiles for Earthwork
3. Section 32 11 23 Aggregate Base Courses
4. Section 32 16 13 Curbs and Gutters
5. Section 32 17 00 Paving Specialties

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO)
1. GDPS-4-M Guide for Design of Pavement Structures

B. American Society of Civil Engineers (ASCE)
1. ASCE 58-16 Structural Design of Interlocking Concrete Pavement for Municipal Streets and Roadways

C. American Society for Testing and Materials (ASTM)
1. ASTM C33 Standard Specification for Concrete Aggregates
2. ASTM C94 Standard Specification for Ready-Mixed Concrete
3. ASTM C131 Resistance to Degradation of Small-Sized Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
4. ASTM C136 Sieve Analysis of Fine and Coarse-Grained Aggregates
5. ASTM C140 Sampling and Testing Concrete Masonry Units and Related Units
6. ASTM C144 Aggregate for Masonry Mortar
7. ASTM C936 Solid Concrete Interlocking Paving Units
8. ASTM C979 Pigments for Integrally Colored Concrete

9. ASTM C1645 Freeze-thaw and De-icing Salt Durability of Solid Interlocking Paving Units
10. ASTM D698 Laboratory Compaction Characteristics of Soil Using Standard Effort
11. ASTM D2488 Description and Identification of Soils (Visual-Manual Procedure)
12. ASTM D2940 Graded Aggregate Material for Bases or Subbases for Highways or Airports
13. ASTM D4873 Identification, Storage, and Handling of Geosynthetic Rolls and Samples

D. American Association of State Highway and Transportation Officials (AASHTO):

1. AASHTO M288 Geotextile Specification for Highway Applications

E. Interlocking Concrete Pavement Institute (ICPI)
1. Tech Specs and Technical Bulletins.

1.3 SUBMITTALS

A. Contractor shall submit to the owner for approval a minimum of four full-size samples of each concrete paver type/size/thickness/color/finish specified. The samples shall represent the range of shape, texture, and color permitted for the respective type. Color(s) will be selected by Architect/Engineer/Landscape Architect/Owner from Manufacturer's standard colors.

B. Prior to delivery of the associated material to the site, the Contractor shall submit the following product-specific documentation for approval:
1. Aggregates
   a. Sieve analysis per ASTM C136 for subbase, base, bedding and joint aggregate materials
   b. Minimum 3 lb. sample of each material for independent testing.
2. Concrete Pavers:
   a. Test results from an independent testing laboratory for compliance with ASTM C936.
   b. Manufacturer's catalog product data.
   c. Safety Data Sheets (SDS).
3. Geotextile
   a. One 18-inch x 18-inch panel of each type of geotextile to be used for inspection and testing. The sample panels shall be uniformly rolled and shall be wrapped in plastic to protect the material from moisture and damage during shipment. Samples shall be externally tagged for easy identification. External identification shall include the name of the manufacturer; product type; product grade; lot number; and physical dimensions.
   b. Current National Transportation Product Evaluation Program (NTPEP) evaluation report.
   c. Safety Data Sheets (SDS).

1.4 QUALITY ASSURANCE

A. Contractor Qualifications:
   1. Contractor shall submit a list of five (5) previously constructed projects of similar size and magnitude prior to the bid date to be qualified. Contact names, telephone numbers, and date of completion shall be listed for each project.
   2. The Contractor's site foreman shall hold a Certified Concrete Paver Installer Designation from the Interlocking Concrete Pavement Institute (ICPI). The site foreman shall be onsite for the entire installation.
   3. Contractor shall conform to all local, state/provincial licensing and bonding requirements.

B. Mockups: Build mockups to verify selections made under submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
   1. Install a 10 ft x 10 ft paver area following the installation practices described in Article 3.2 to 3.4. This area shall be used to verify joint sizes; lines; laying pattern(s); stitching details (for mechanical installation); color(s); and, texture of the job.
   2. To provide a proper representation of color blend, blending during installation of sample mock-up will be pulled from a minimum of 3 cubes.
   3. This area shall be the standard by which the work will be judged.
   4. Subject to approval by the Owner, the mock-up may be retained as part of the finished work. If mock-up is not retained, remove and dispose of mock-up at the completion of the project.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Contractor shall coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.

B. Contractor shall check all materials upon delivery to assure that the proper materials have been received and are in good condition before signing off on the manufacturer's packing slip.

C. Contractor shall protect all materials from damage or contamination due to job site conditions and in accordance with manufacturer's recommendations. Damaged or contaminated materials shall not be incorporated into the work.

D. Concrete pavers shall be delivered to the site in steel banded, plastic banded, or plastic wrapped cubes capable of transfer by forklift or clamp lift. Unload and store concrete pavers at the job site in such a manner that no damage occurs to the product.

E. Contractor shall handle and transport aggregates to avoid segregation, contamination, and degradation and keep different materials sufficiently separated as to prevent mixing. The material shall not be dumped or stored one material on top of another unless it is part of the installation process. Materials shall be covered to prevent removal by wind.

F. Geotextile shall be delivered, stored and handled in accordance with ASTM D4873.

1.6 ENVIRONMENTAL CONDITIONS

A. Pavers shall not be installed during heavy rain, freezing conditions or snowfall.

B. Base course shall not be installed on frozen soil subgrade.

C. Pavers, bedding course sand, and joint filling sand shall not be installed on frozen aggregates.

1.7 MAINTENANCE MATERIALS

A. Provide 10% of total square feet for additional paver material for use by Owner for maintenance and repair.

B. Store extra paver materials in Owner-designated location.

PART 2 - PRODUCTS

2.1 INTERLOCKING CONCRETE PAVERS

A. Interlocking Concrete Pavers Basis-of-Design:
   1. Paver Name: Moduline
      a. Thickness: 3-1/8 inches (80 mm)
      b. Color: Per Plan
      c. Finish: Standard (Smooth)
      d. Supplier:
         Sierra Building Products an Oldcastle Company
         Fontana, CA 92337
      e. Contact Person: Aurelio Barreto 714.623.8464
      f. Substitutions: No substitutions permitted.

B. Pavers shall meet the minimum material and physical properties set forth in ASTM C 936:
   1. Measured length or width of test specimens shall not differ by more than +/- 0.063 in, while measured thickness shall not differ by more than +/- 0.125 in.
   2. Average compressive strength of not less than 8,000 psi (55 MPa) with no individual unit under 7,200 psi (50 MPa) when tested in accordance with ASTM C140.
   3. Average absorption of 5% or less with no unit greater than 7% when tested in accordance with ASTM C140.
   4. Efflorescence shall not be a cause for rejection.
   5. Pigment in Concrete Pavers shall conform to ASTM C979.

2.2 BEDDING SAND

A. Bedding sand shall be clean, non-plastic sand, free from deleterious or foreign matter, and manufactured from crushed rock.

B. Screenings or stone dust shall not be utilized.

C. Verify gradation conforms to ASTM C33 requirements for concrete sand (listed in Table 1) as tested in accordance with ASTM C136.

Table 1
Gradation Requirements for Bedding Sand

Sieve Size	Percent Passing
3/8 inch (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	5 to 30
No. 100 (0.150 mm)	0 to 10
No. 200 (0.075 mm)	0 to 1

2.3 JOINT FILLING SAND

A. Joint sand aggregate shall be clean, polymeric sand, free from deleterious or foreign matter, and manufactured from crushed rock.

B. Screenings or stone dust shall not be utilized.

C. Verify gradation conforms to ASTM C144 requirements for concrete sand (listed in Table 2) as tested in accordance with ASTM C136.

Table 2
Gradation Requirements for Joint Filling Sand

Sieve Size	Percent Passing
No. 4 (4.75 mm)	100
No. 8 (2.36 mm)	95 to 100
No. 16 (1.18 mm)	70 to 100
No. 30 (0.600 mm)	40 to 100
No. 50 (0.300 mm)	10 to 35
No. 100 (0.150 mm)	2 to 15
No. 200 (0.075 mm)	0 to 5

2.4 BASE AGGREGATE

A. Base aggregate shall be clean, non-plastic, free from deleterious or foreign matter, recycled concrete, and manufactured from crushed rock.

B. Verify gradation conforms to ASTM D2940 as presented in Table 3.

Table 3
Gradation Requirements for Base Course Material

Sieve Size	Percent Passing
2 in (50 mm)	100
1 ½ in (37.5 mm)	95 to 100
¾ in (19 mm)	70 to 92
3/8 in (9.5 mm)	50 to 70
No. 4 (4.75 mm)	35 to 55
No. 30 (0.600 mm)	12 to 25
No. 200 (0.075 mm)	0 to 8

2.5 EDGE RESTRAINTS

A. Edge restraints shall be cast in place concrete bands constructed at a minimum to the dimensions per plan.

2.6 GEOTEXTILES

A. Geotextile materials shall be selected by the Design Engineer based on the intended use in accordance with AASHTO M288.

B. Only geotextiles with a current NTPEP evaluation will be accepted.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to commencement of any work, the Contractor shall conduct a pre-construction meeting with the Owner, Designer, and affected sub-trades. The pre-construction meeting should establish contractor responsibilities and at a minimum verify:
1. The location of the mock-up, and whether it will be part of the final construction or need to be removed.
2. The site layout is in general conformance with the construction documents.
3. The subgrade lines and elevations are in general conformance with the construction documents. The subgrade elevations shall be within +/- 0.1 ft of the specified grades.

4. Subgrade soil conditions and grades meet the requirements in the construction documents.
5. The details of the site's erosion and sediment control plan.

B. Proof-roll prepared subgrade according to requirements in Section 31 20 00 Earth Moving to identify soft pockets and areas of excess yielding. Proceed with subbase installation only after deficient subgrades have been corrected.

C. Contractor shall verify compaction of the subgrade is in general conformance with the construction documents prior to placing subbase materials.

D. Once the Contractor has confirmed the subgrade conditions are in general conformance with the requirements in the construction documents, the Contractor shall begin installing the base course material. By initiating installation of the base course, the Contractor acknowledges acceptance of the subgrade.

3.2 INSTALLATION OF BASE COURSE

A. Install Geotextiles as required in accordance with the construction documents. The Geotextile is applied to the bottom and sides of the excavation with overlapping joints a minimum of 12 inches. Overlaps to follow downslope.

B. Install the base course at the thickness, compaction, surface tolerances, and elevations outlined in the construction documents.
1. The aggregate should be spread and compacted in uniform layers not exceeding 6-inch loose thickness.
2. Compact base course to 98% Standard Proctor Density in accordance with ASTM D698.
3. Density testing shall be conducted to verify conformance.
4. Surface tolerance should be plus or minus 3/8 inch (10 mm) over a 10-foot. (3 m) straight edge laid in any direction.
5. Base course compaction must be achieved near curbs, grade beams, concrete collars around utility structures, lights standards, tree wells, building edges and other protrusions as applicable to the project. In areas not accessible to large compaction equipment, compact to specified density with mechanical tampers (jumping jacks).
6. The upper surface of the base shall be sufficiently well graded and compacted to prevent infiltration of the bedding sand into the base both during construction and throughout its service life. Segregated areas of the granular base shall be blended by the application of crushed fines that have been watered and compacted into the surface.

C. Before commencing the placing of the bedding course, the base shall be inspected by the Owner or the Consultant.

3.3 INSTALLATION OF EDGE RESTRAINTS

A. Adequate edge restraint shall be provided along the perimeter of all paving as specified. The face of the edge restraint, where it abuts pavers, shall be vertical.

B. All concrete edge restraints shall be constructed to dimensions and grades in general conformance with the construction documents and shall be supported on a compacted base not less than 6 inches thick. Concrete curbs shall meet local requirements or the requirements of Section 32 16 13 - Curbs and Gutters whichever is more restrictive. All concrete shall be in accordance with ASTM C94 requirements.

3.4 INSTALLATION OF BEDDING COURSE, PAVERS, AND JOINT FILLING MATERIAL

A. Spread the bedding course evenly over the base course and screed to a nominal 1-inch (25 mm) thickness. The Contractor shall screed the bedding course using either an approved mechanical spreader (e.g.: an asphalt paver) or by the use of screed rails and boards. The screeded sand should not be disturbed. Place sufficient sand to stay ahead of the laid pavers. Do not use the bedding sand to fill depressions in the base course surface.

B. Ensure that concrete pavers are free of foreign material before installation. Concrete pavers shall be inspected for color distribution and all chipped, damaged or discolored concrete pavers shall be replaced. Initiation of concrete paver placement shall be deemed to represent acceptance of the pavers.

C. Lay the concrete pavers in the pattern(s) as shown on the drawings. Maintain straight pattern lines.

D. Paving units shall be installed from a minimum of 3 bundles by hand, and 6 bundles during mechanical installation, simultaneously to ensure color blending.

E. Joints between the individual concrete pavers, and between concrete pavers and the edge restraints, buildings, collars, or other protrusions/edging, on average shall be between 1 /16 inch and 3 /16 inch (2 mm to 5 mm) wide.

F. Joint (bond) lines shall not deviate more than ±1/2 in. (±15 mm) over 50 ft. (15 m) from string lines.

G. Fill gaps at the edges of the paved area with cut pavers or edge units. Do not install cut pavers smaller than one-third of a whole paver along edges subject to vehicular traffic – trim two pavers to fit.

H. Cut all pavers using a masonry saw. Upon completion of cutting, the area must be swept clean of all debris to facilitate inspection and to ensure the concrete pavers are not damaged during compaction.

I. Using a low amplitude plate compactor capable of at least 5,000 lbs. (22 kN) compaction at a frequency of 75 Hz –100 Hz, compact the concrete pavers into the bedding course.

J. The pavers shall be compacted to achieve consolidation of the bedding sand and brought to level and profile by not less than three passes. Initial compaction should proceed as closely as possible following the installation of the paving units and prior to the acceptance of any traffic or application of joint filling sand.

K. Any units that are structurally damaged during compaction shall be immediately removed and replaced.

L. Sweep dry joint filling sand into the joints and vibrate until they are full. This will require two or three passes with the compactor. Do not compact within 3 feet (1 m) of the unrestrained edges of the paving units.

M. All work to within 3 feet (1 m) of the laying face must be left fully compacted with sand-filled joints at the end of each day.

N. Sweep off excess sand when the job is complete.

O. The final surface elevations shall not deviate more than 3/8 inch (10 mm) under a 10-foot (3 m) long straightedge.

P. The surface elevation of pavers shall be 1/8 to 1/4 inch (3 to 6 mm) above adjacent drainage inlets, concrete collars or channels.

3.5 AS-BUILT CONSTRUCTION TOLERANCES

A. Final inspection shall be conducted to verify conformance to the drawings after removal of excess joint sand. All pavements shall be finished to lines and levels to ensure positive drainage at all drainage outlets and channels.

B. The final surface elevations shall not deviate more than +/- 3/8 inch (10 mm) under a 10-foot long straight edge.

C. Lippage: No greater than 1/8 in. (3 mm) difference in height between adjacent pavers.

END OF SECTION 32 14 13.13

SECTION 13 31 23
PRE-ENGINEERED FABRIC SHADE STRUCTURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. A single, State of California-licensed fabric shade structure contractor shall be responsible for the design, wet-stamped engineering drawings, fabrication, supply, and erection of the work specified herein, including foundations. The intent of this specification is to have only one shade contractor be responsible for all of the functions listed above.

1.3 SUBMITTALS

1.3.1 With Bid Submittals:

A. Provide proof of existing reference sites with structures of similar project scope and scale, and engineered to the specified CBC requirements.

B. Provide a minimum of 7 fabric samples to demonstrate fabric color range, and a digital (PDF) or paper document showing a minimum of 9 powder coat color choices.

C. Provide proof of all quality assurance items, including;

1. A list of at least 3 reference projects with California public agencies that have been installed a minimum of 12 years.
2. Proof of General Liability, Professional Liability, and Umbrella insurance, as per Section 1.4C.
3. Proof of current State of California Contractor's License, Class A or Class B.
4. Proof of current City of Los Angeles Approved Fabricator license.
5. Proof of a minimum of $25,000,000 aggregate bonding capacity.
6. Proof of current IAS certification, as per Section 1.4E.

7. Proof of an Annual Maintenance Inspection Program.

8. Proof of a Corporate Safety and/or Injury & Illness Prevention Program.

9. Proof of current status as an ISNetworld Member Contractor.

1.4 QUALITY ASSURANCE

Fabrication and erection are limited to firms with proven experience in the design, fabrication, and erection of fabric shade structures, and such firms shall meet the following minimum requirements. No substitutions shall be allowed for the following:

A. A single shade structure contractor shall design, engineer, manufacture, and erect the fabric shade structures, and shall provide a dedicated Project Manager throughout the entire Scope of Work related to the shade structure(s).

B. All bidders shall have at least 15 years' experience in the design, engineering, manufacture, and erection of fabric shade structures, engineered to CBC requirements with similar scope, and a successful construction record of in-service performance.

C. All bidders shall provide proof with bid submittal of a minimum of $1,000,000 General/Public Liability insurance, $3,000,000 Professional Liability (PL) insurance, and additional $5,000,000 Umbrella/Excess Liability insurance.

D. All bidders shall be a currently licensed contractor in the State of California, and shall provide proof of a minimum aggregate bonding capacity of $6,000,000 with bid.

E. Manufacturer shall have a City of Los Angeles Approved Fabricator license and be accredited by the IAS (International Accreditation Service) for Structural Steel Fabrication under CBC specified requirements.

F. The fabric shade structure contractor shall have a Corporate Quality Control program (manual), which describes their complete quality assurance program.

G. All bidders must be a current Member Contractor with ISNetworld, which confirms the bidder's strict adherence to Safety, Insurance, Quality, and Regulatory standards.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for fabric shade structure(s) shown on the drawings in relation to the property survey and existing structures, and verify locations by field measurements prior to erection of the fabric shade structure(s).

1.6 WARRANTY

A. The successful bidder shall provide a 12-month warranty on all labor and materials.

B. A supplemental warranty from the manufacturer shall be provided for a period of 10 years (pro-rated) on fabric and 10 years on the structural integrity of the steel, from date of substantial completion.

C. The warranty shall not deprive the Owner of other rights the Owner may have under the provisions of the Contract Documents, and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 – PRODUCTS

2.1 GENERAL

A. The structures shall consist of (1) 4-Point Hypar Sail Model #CON-JAN-063-20 (1001) and (2) CON-JAN-063-20 (1002). Both models to have powder coated steel column with HDPE mesh fabric.

~~B. The structures shall be manufactured by Shade Structures, Inc., d/b/a USA SHADE & Fabric Structures, or approved equal, at time of bid that includes City approved/permitted engineering drawings, fabric roof, steel cables, all fasteners, and erection of structure(s)~~

~~C. Contact: USA SHADE & Fabric Structures~~
~~1085 N. Main Street, Suite C~~
~~Orange, CA 92867~~
~~Phone: 949.929.8173~~
~~Attn: Devin Christensen~~
~~dchristensen@usa-shade.com~~

~~D. To qualify as an approved equal, please submit product documentation, fabric samples, and all quality assurance criteria, as per Section 1.4, at least 10 days prior to bid in order to be considered. No substitutions will be allowed after the deadline. Any approval of alternate manufacturers shall be by addendum prior to the bid date and shall not be allowed without written notification.~~

E. The fabric shade structure(s) shall conform to the current CBC requirements.

F. Steel:

1. All steel members of the fabric shade structure shall be designed in strict accordance with the requirements of the “American Institute of Steel

Construction" (AISC) Specifications and the "American Iron and Steel Institute" (AISI) Specifications for Cold-Formed Members and manufactured in a IAS- (International Accreditation Service) accredited facility for Structural Steel Fabrication under CBC 2019.

2. All connections shall have a maximum internal sleeving tolerance of .0625" using high-tensile strength steel sections with a minimum sleeve length of 6".

3. All non-hollow structural steel members shall comply to ASTM A-36. All hollow structural steel members shall be cold-formed, high-strength steel and comply with ASTM A-500, Grade C. All steel plates shall comply with ASTM A-572, Grade 50.

4. All galvanized steel tubing shall be triple-coated for rust protection using an in-line electroplating coat process. All galvanized steel tubing shall be internally coated with zinc and organic coatings to prevent corrosion.

G. Bolts:

1. All structural field connections of the shade structure shall be designed and made with high-strength bolted connections using ASTM A-325, Grade B or SAE J249, Grade 8.

H. Welding:

1. All shop-welded connections of the fabric shade structure shall be designed and performed in strict accordance with the requirements of the "American Welding Society" (AWS) Specifications. Structural welds shall be made in compliance with the requirements of the "pre-qualified" welded joints, where applicable and by certified welders. No onsite or field welding shall be permitted.

2. All full penetration welds shall be continuously inspected by an independent inspection agency and shall be tested to the requirement of specified CBC requirements.

I. Powder Coating:

1. Galvanized steel tubing preparation prior to powder coating shall be executed in accordance with solvent cleaning SSPC-SP1. Solvents such as water, mineral spirits, xylol, and toluol, which are to be used to remove foreign matter from the surface. A mechanical method prior to solvent cleaning, and prior to surface preparation, shall be executed according to Power Tool Cleaning SSPC-SP3, utilizing wire brushes, abrasive wheels, needle gun, etc.

2. Carbon structural steel tubing preparation prior to powder coating shall be executed in accordance with commercial blast cleaning SSPC-SP6 or NACE #3. A commercial blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, mill scale, rust, coating, oxides, corrosion, and other foreign material.

3. Powder coating shall be sufficiently applied (minimum 3 mils thickness) and cured at the recommended temperature to provide proper adhesion and stability to meet salt spray and adhesion tests, as defined by the American Society of Testing Materials.

4. Raw powder used in the powder coat process shall have the following characteristics:
   a. Specific gravity: 1.68 +/- 0.05
   b. Theoretical coverage: 114 +/- 4ft^2/mil
   c. Mass loss during cure: <1%
   d. Maximum storage temperature: 80ºF
   e. Interpon® 800 is a high-durability TGIC powder coating designed for exterior exposure. Tested against the most severe specifications, Interpon® 800 gives significantly improved gloss retention and resistance to color change.

K. Tension Cable: Steel cable is determined based on calculated engineering loads.

1. For light and medium loads, 0.25" (nominal) galvanized 7x19 strand cable shall be used.

2. For heavy loads, and depending on structural size, either 0.375" (nominal) or 0.5" (nominal) galvanized 7x19 strand cable shall be used.

L. Fabric Roof Systems:

1. UV Shade Fabric:
   a. Colourshade® FR UV shade fabric is made of a UV-stabilized, high-density polyethylene (HDPE), as manufactured by Multiknit® (Pty) Ltd. HDPE mesh shall be a heat-stentered, three bar Rachel-knitted, lockstitch fabric with one monofilament and two tape yarns to ensure that the material will not unravel if cut. Raw fabric rolls shall be 9.8425 feet wide.
   b. Fabric Properties:
      ~ Life Expectancy: minimum 8 years with continuous exposure to the sun
      ~ Fading: minimum fading after 5 years (3 years for Red)
      ~ Fabric Mass: 5.31 oz/yd^2 ~ 5.6 oz/yd^2 (180gsm ~ 190gsm)
      ~ Fabric Width: 9.8425 feet (3m)

~ Roll Length: 164.04 feet (50m)
~ Roll Dimensions: 62.99 inches x 16.5354 inches (160cm x 42cm)
~ Roll Weight +/- 66 lbs (+/- 30kg)
~ Minimum Temp: -13°F (-25°C)
~ Maximum Temp: +176°F (80°C)

c. Fabric shall meet the following flame spread and fire propagation tests:
   1) ASTM E-84
   2) NFPA 701 Test Method 2
   3) California's Office of the State Fire Marshal, Registered Flame Resistant Product

2. Stitching & Thread:
   a. All sewing seams are to be double-stitched.
   b. The thread shall be GORE® TENARA® mildew-resistant sewing thread, manufactured from 100% expanded PTFE (Teflon™). Thread shall meet or exceed the following:
      1) Flexible temperature range
      2) Very low shrinkage factor
      3) Extremely high strength, durable in outdoor climates
      4) Resists flex and abrasion of fabric
      5) Unaffected by cleaning agents, acid rain, mildew, salt water, and is unaffected by most industrial pollutants
      6) Treated for prolonged exposure to the sun
      7) Rot resistant

3. Shade and UV Factors:
   a. Shade protection and UV screen protection factors shall be as follows:

Color	UV Block %	Shade %
Pacific Blue	85%	80%~86%
Rain Forest Green	85%	79%~86%
Red	86%	80%~83%
Silver	81%	80%~85%
Desert Sand	92%	80%~84%
Terracotta	82%	80%~83%
Yellow	89%	80%~82%

PART 3 – EXECUTION

3.1 INSTALLATION

A. The installation of fabric shade structures shall be performed by manufacturer or manufacturer-approved contractor, which shall be bonded and holding a current contractor's license with the State of California's Contractors State License Board. All installation personnel must have experience in the erection of tensioned fabric structures.

B. The installation shall comply with the manufacturer's instructions for assembly, installation and erection, per approved drawings.

END OF SECTION 13 31 23

SECTION 097753 – VEGETATIVE WALL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Welded wire grid panels, including gate panels.
2. Panel channel and angle trim.
3. Panel posts.
4. Necessary clips, straps and spacers.
5. Powdercoat finish.

1.3 RELATED WORK

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. Section 03 30 00, CAST-IN-PLACE CONCRETE; Concrete footings.
2. Section 32 93 00, PLANTS; Furnishing and installing related plants.

1.4 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog details for specified products demonstrating compliance with referenced standards. Provide list of fittings being provided with descriptions and either photographs or drawings for each type.

B. Shop Drawings: Submit Shop Drawings for fabrication and installation. Include the following:

1. Plans, elevations, and detail sections showing sizes, critical dimensions, panel layout constraints using a 2 x 2 inch modular grid, and details and locations of accessories.

2. Indicate materials, methods, finishes, fittings, fasteners, anchorages, and accessory items.

C. Verification Samples: Two samples representing actual products and finishes as follows:

1. Welded wire grid panel, 6 in. x 6 in., with one edge of channel trim and one edge of angle trim, all as one unit.

2. Color Submittals: Submit metal chips, 2 in. x 3-1/2 in. minimum, showing color and texture to be provided.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Building product disclosure and optimization – environmental product disclosures (Credit MRc2): Option 1: Products with a publicly available, critically reviewed life- cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope are valued as one quarter (1/4) of a product for the purposes of credit achievement calculation.

B. Building product disclosure and optimization - sourcing of raw materials (Credit MRc3.): Recycled Content: Provide products manufactured from recycled content as specified, to be measured and documented according to the LEED Green Building Rating System.

1. Recycled Content:
   a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
   b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
   c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
   d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

C. Building product disclosure and optimization - sourcing of raw materials (Credit MRc3.): Regional Materials: Provide materials or products that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles of the project site.

D. Building product disclosure and optimization – material ingredients (Credit MRc4): Option 1: The end use product has a published, complete Health Product Declaration with full disclosure of known hazards in compliance with the Health Product Declaration open Standard.

1.6 QUALITY ASSURANCE

A. Manufacturer: Minimum 5 years experience in manufacturing and supplying welded wire panel systems of the type required for this Project.

1.7 DELIVERY, STORAGE AND HANDLING

A. Protect materials from damage. Store panels flat. Provide edge protection when strapping is used. Do not apply loads to panel edges.

B. Inspect products upon delivery in order to submit timely freight claim for any damaged materials.

C. Store products in manufacturer's packaging until ready for installation.

D. Handle and store products according to manufacturer's recommendations. Leave products wrapped or otherwise protected and under clean and dry storage conditions until required for installation.

E. Exercise care not to scratch, mark, dent, or bend metal components during delivery, storage, and installation.

1.8 PROJECT CONDITIONS

A. Verify actual openings by field measurements before fabrication; show recorded measurements on shop drawings.

B. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

PART 2 - PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS

A. The welded wire panel plant support system and accessories shall have completed an ISO Compliant 14040/44, third party verified Life Cycle Assessment (LCA).

2.2 ACCEPTABLE MANUFACTURER

A. greenscreen®, 725 S. Figueroa St. Suite 1825, Los Angeles, CA 90017; Tel: 1-800-450-3494; sales@greenscreen.com,www.greenscreen.com.

2.3 PANELS

A. Panels shall be rigid, three dimensional welded wire grid fabricated of 14 gage galvanized steel wire.

1. Metallic-Coated Steel Wire: Welded-wire, galvanized in accordance with ASTM A641.

B. Face Grid: Wires shall be welded at each intersection to form a 2 x 2 inch face grid on the front and back of panels,

C. Trusses: Face grids shall be separated by bent wire trusses spaced at 2-inch centers and welded to front and back face grids at each truss apex.

D. Thickness: As shown on Drawings.

E. Length and Width: As indicated on the Drawings.

F. Tolerance: 1/8 inch in width and 1/8 inch in length.

2.4 ACCESSORIES

A. Trim:

1. Fabricate from 20-gage ASTM A879 galvanized steel.

2. Types:
   a. Channel Trim: Thickness of panel x ½ inch legs.
   b. Angle Trim: ½ inch x ½ inch legs.

3. Locations:
   a. As indicated on the Drawings.

B. Clips and Straps: Provide manufacturer's standard types of clips and straps suitable for mounting conditions. Fabricate from ASTM A879 galvanized steel. Adjustable clips shall have ¼ inch diameter 18-8 stainless steel bolt, washer, and nut.

C. Plastic Spacers: Provide ½ inch thick black Ultra High Molecular Weight polyethylene (UHMW) washers [to hold clips away from mounting surface].

D. Fence Posts: 3-inch square ASTM A500, Grade B steel tube. The steel strip used in the manufacture of the post shall conform to ASTM A1011. Minimum yield strength shall be 45,000 psi. Provide steel post caps. Overall post length shall be as indicated on the Drawings.

E. Fasteners for Mounting Clips to Fence Posts: Self drilling, self tapping hex washer head screws, with strength of Type 410 stainless steel, and corrosion resistance of Type 304 stainless steel.

F. Fasteners for Attachment to Structure Pull Out Value:

1. To Structural Steel: [480 lbs.].

2.5 FABRICATION

A. Cut to size.

B. Weld trim to panels and grind smooth exterior surfaces of welds.

2.6 FINISH

A. Metal components (except fasteners) shall receive commercial grade finish system after fabrication.

B. Finish System:

1. Pretreat with general purpose, alkaline, water based cleaner / degreaser applied at 240 degrees F.

2. Prime with fusion bond epoxy powder coat.

3. Topcoat with polyester or polyester-urethane powder coat with a minimum total dry film thickness of not less than 6 mils**.**

C. Salt Spray Resistance: Finish shall remain rust free when tested 1680 hours in accordance with ASTM B117.

D. Finish and Color: Textured Black.

E. Touch-Up Paint: Provide high quality, exterior-grade spray paint suitable for conditions of use.

2.7 WARRANTY

A. Standard 1 year warranty is available from the date of substantial completion or 18 months from the date of shipment, whichever comes first. greenscreen® warrants against defects in workmanship and materials that would result in failure under intended application and use as exterior fabricated wall grillage. “Failure” is defined as structural failure of the wire of sufficient incidents in any panel that would result in the panel not performing in a structural or safe manner under the intended application and use. Installation is excluded. Contact greenscreen® for further information, and extensions.

2.8 MISCELLANEOUS MATERIALS

A. Concrete: Refer to Section 03 30 00, CAST-IN-PLACE CONCRETE.

B. Concrete: Normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa), 3-inch (75-mm) slump, and 1-inch (25-mm) maximum aggregate size.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work.

B. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of fence lines and posts. Do not exceed intervals of 500 feet (152.5 m) or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

1. Construction layout and field engineering are specified in Division 01 Section "Execution".

B. Verify alignment, support dimensions, and tolerances are correct.

C. Inventory components to ensure all required items are available for installation. Inspect components for damage. Remove damaged components from site and replace.

3.3 INSTALLATION - GENERAL

A. Spans: For freestanding fences and screens, span between structural supports should not exceed 8’ for 3” thick panels without thorough review of specific site conditions and mounting details. For overhead horizontal or inclined panels span between structural supports should not exceed 4’. All curved panel spans should be reviewed based on specific panel radius and center to center of proposed structural support spacing.

B. Install panels plumb and square, centered within area designated for panels, and aligned to maintain modular grid.

C. Avoid cutting panels in field. Where field cutting is essential, clean and dry area and apply touch-up paint to cut edges.

D. Install securely with fasteners located to meet manufacturer's requirements.

E. Repair bent or damaged panels. If panels cannot be repaired to satisfaction of City of Colton, remove from jobsite and replace with new panels.

3.4 INSTALLATION

A. Install welded wire panel plant support system according to manufacturer's written instructions.

B. Install welded wire panel plant support system by setting posts as indicated on the Drawings and fastening panels to posts according to manufacturer's written instructions.

3.5 ADJUSTING AND CLEANING

A. Remove temporary coverings and protection of adjacent work areas. Clean installed products in accordance with manufacturer's instructions before Owner's acceptance.

B. Do not use abrasive cleaners.

C. Remove from project site and legally dispose of construction debris associated with this work.

3.6 PROTECTION

A. Protect installed products until completion of Project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

C. Protect installed products and finished surfaces from damage during construction.

D. Replace defective or damaged components as directed by Architect.

3.7 PLANT INSTALLATION

A. Refer to Section 32 93 00, PLANTS.

END OF SECTION 32 94 50